Managing a Farm

Prepared by Members of the Division of

Farm Management and Costs

Bureau of Agricultural Economics
U. S. Department of Agriculture
for the
United States Armed Forces Institute

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CONTENTS

CHAPTER 1

FARMING AS A BUSINESS AND A WAY OF LIVING

FARMING AS AN OCCUPATION

This book deals largely with the problems that confront the individual farmer in getting started in farming, in organizing the farm, and in operating it so as to provide a good and stable income and a satisfactory living for the farm family. But the farmer is also an important member of the society in which he is living. He has a responsibility as a member of that society, and the functioning of the world about him affects his business as well as the living conditions of his family. Consequently, the problems confronting the farmer in organizing and operating his business are considered in the setting of the farmer as a member of the society in which he is living.

Farming is the oldest vocation of civilized man. Even today more people in this world are engaged in farming than in any other way of earning a living. The proportion of farmers to the total population, however, has been gradually reduced in the highly industrialized nations. Machines and other improvements in farming have made it possible for fewer people to grow the food for larger and larger populations. This has meant that more people could produce those goods and services other than food which we enjoy as a part of our living today. The shift to other occupations in this country from 1870 to 1940 is shown in figure 1.

Although the United States is now one of the more highly industrialized nations, about 28,000,000 out of our present population of 134,000,000 live on farms. There are about 6,000,000 farms of different types and sizes. Some are very small. Some are part-time units operated by persons who also have other employment, at least part of the time. Many farms are too small to provide a good living for the farm family, even though the families living on these farms do not have outside employment. Only a small proportion of the

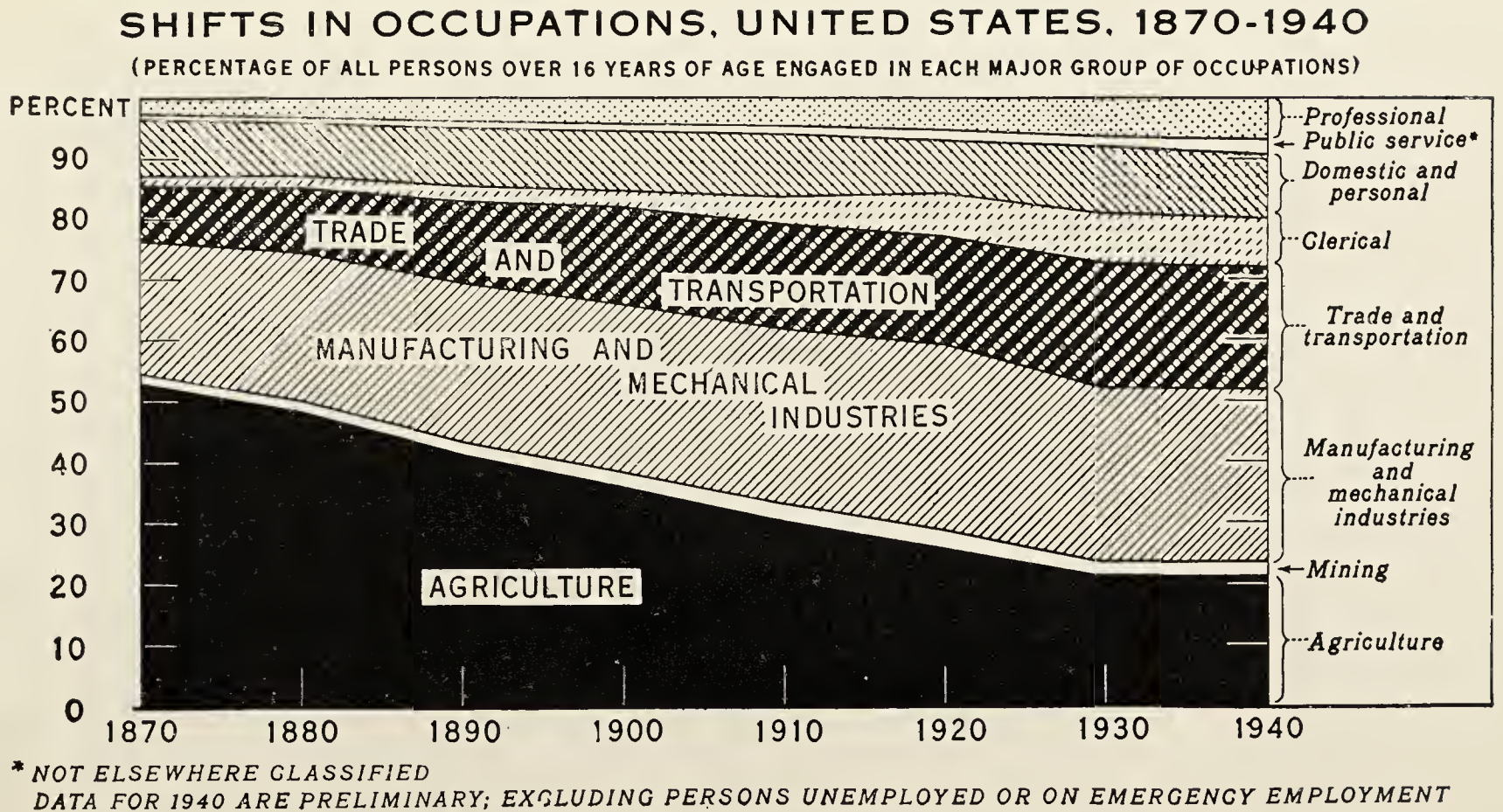


Figure 1. The proportion of all employed persons that work on farms has steadily declined and is about half what it was 70 years ago. (Bureau of Agricultural Economics.)

6,000,000 farms are very large. The great bulk, about two-thirds of the entire number, are family farms, providing about full-time employment for the farmer and his family; and the family gets its income from the output of the farm.

Farming differs from other occupations in several ways. Crops and livestock are biological products that take time to grow and mature. The farmer who wants to develop a dairy herd from heifer calves has to wait about three years before he has a producing herd. A peach orchard planted this year requires about four years to come into bearing. Even the annual crops require one growing season for maturity. There are also real hazards in farming; weather, insect pests, diseases, and other natural factors affect the growing conditions of both crops and livestock. Fire, flood, tornadoes, grasshoppers, drought, and many other disasters are common to all farmers. These disasters must be overcome without some of the specialized services,

Figure 2. Progressive farming and comfortable living are combined on the successful family farm. (U. S. D. A.)

such as fire engines, that are available to city people.

The farm is the family home, as well as the business unit, and plans that affect the farm as a business also affect it as a home. The work on the farm is done largely by members of the farm family. The farm operator, or manager, is usually also the head of the household, and he works hand in hand with other members of the family who are able to help. This means that the farm manager is also a laborer and that these two functions are not separated as they are in factory operations. Many of the farm chores such as washing dairy utensils and caring for the poultry flock are the responsibility of the farm housewife. Thus, the farm, the family, and the home are almost an inseparable trinity on the typical family farm.

Although farming differs from other business in many ways, there are also many similarities. Most of the general principles that apply to the organization and operation of other business apply also to farming. To be successful, the farm operator, or manager, must plan his production program carefully to fit his farm and local market outlets. He must plan his day-to-day operations so that the work gets done efficiently and on time, and he must prepare his product for market in such a way that he can obtain the highest possible returns.

QUALIFICATIONS OF A GOOD FARMER

A desire to live on the land is one of the most important qualifications of a good farmer. Although farms are not so isolated today as they were before the advent of the automobile, it is quite unusual to have next-door neighbors in the city sense of the word. The American farm home usually is located on the farm and not in a village, as it is in some sections of Europe. Most people who are brought up on farms take the relative isolation for granted; city people can acquire a liking for it; but many persons crave closer associations with other people than farm life affords.

The young man who has been brought up on a farm has a decided advantage over the city man in getting started in farming. From early childhood he has served an apprenticeship in learning to do different kinds of farm work. He has heard the management problems of the farm discussed by the family at the dinner table and has acquired a subconscious background in both management and skill.

The young man brought up in the city who desires to farm will need to acquire such background in some way. The best way for him to learn is to work for a good farmer on the kind of farm that he hopes to operate. Study of available reports on farming that apply to a particular locality also will be extremely helpful. Visits with

Figure 3. A farm boy learns many things about farming from his father. (U. S. D. A.)

neighboring farmers who have had long experience and whose judgments are respected in the community is another means of obtaining background.

An interest in watching plants and animals grow and in caring for them while they grow is an important qualification for a good farmer. This makes for the pride of workmanship—and a good-job-well-done feeling that stimulates continued success. Reasonably good health and physical strength are also needed for successful farming. Although machines largely take the place of hand labor on many farms today, many operations still require a strong back and skillful hands. The operator of a family farm who cannot carry his share of the load of farm work may have to cut the family income to hire the work done.

On the management side of farming, it is important that the operator possess ability to organize and plan the operations of a farm in a successful manner. To begin with, this involves the selection of a productive farm and arranging for the use of it, either by purchase or lease; also obtaining machinery, livestock and supplies needed for its operation. Planning of a production program comes next, and this means deciding on what to produce, how much of each product, and the methods that are to be followed in their production. In the day-to-day management of the farm as a going concern, technical ability is required to carry out the practices that will result in the highest returns. Mechanical skill is also needed in the handling and care of machinery on a mechanized farm. Regardless of whether the labor is furnished by the family, or part of it is hired, the question of making the most effective use of available labor in farm operations is always important. Since production takes place outdoors and requires much space instead of being concentrated under a factory roof, one man usually cannot supervise a large crew of workers. This is one of the reasons why the business unit in farming has tended to remain small. The good farmer also needs to know how to buy his supplies and sell his products to advantage, and how to keep adequate records of his business transactions.

THE FARMER'S ECONOMIC PROBLEMS

On pioneer farms in this country, the farm family produced nearly

all of the products that were consumed in the farm home. In other words, the family farm was nearly a self-sufficient unit. Under these conditions there were few necessary business contacts with other people. Today most farms are much more commercialized. The bulk of the farm products are sold in the market place and a large variety of things are bought in return, both for consumption in the farm home and for the operation of the farm business. This change from self-sufficiency to commercialization means that the welfare of the farmer and of his family is greatly influenced by changes in economic conditions—by the ups and downs in prices not only of farm products but also of the products that are bought for use in the home or in farm production. In short, agricultural prosperity rises and falls with industrial prosperity.

Since farmers borrow money to buy farms and to conduct their farm operations, they are also affected by changes in credit conditions. The rate of interest that they pay on farm mortgages, as well as on their short-time loans for livestock or crops, affects the amount of net income at the end of the year. At times, however, the most important credit question is that of being able to obtain a loan regardless of the rate of interest, or to have an old loan extended. For instance, if drought and crop failure make it necessary to buy feed for livestock, funds or credit must be available for this transaction.

Because farming is a biological industry it is subject to the hazards of unfavorable growing conditions. Drought or hail may ruin the entire crop in some years. Outbreaks of animal diseases such as hog cholera can mean the loss of all the hogs on the farm. These are all natural hazards. Insurance will protect the farmer against some of them. Others he must be prepared to meet and survive.

An example of how weather hazards affect crop yields in some sections can be cited from east central South Dakota. The average yield of wheat per harvested acre over a period of years is about nine bushels in the area centering on Huron. In 1918 it was 22 bushels per acre, and in 1934 there was a complete failure. In 1933 and again in 1936 the harvested acreage yielded less than two bushels per acre. Similar conditions have been experienced in all of the Great Plains States. In areas like this, farmers need to have reserves of cash, credit, and feed to tide over their poor crop years.

Sometimes the economic risks of falling prices and tightening of credit conditions can be just as disastrous as crop failures. Table I shows an actual listing of the prices paid to farmers for wheat and corn for four different years at Huron, South Dakota.

*Table I. Prices to farmers for wheat and corn at Huron, South Dakota, in four different periods**

Date	Price per bushel	
	Wheat	Shelled corn
November 4, 1919	$2.20 – $2.45	$0.90 – $1.16
November 4, 1932	.31	.08**
November 4, 1939	.76	.40
November 4, 1943	1.33	.88**

*From the files of the *Evening Huronite,* Huron, S. Dak. The prices given are for the highest grade quoted on that date. For example, the price of wheat is for No. 1 Dark Northern, weighing 60 pounds per bushel.

**No corn quoted at Huron on these dates. The prices given are from the Grain Bulletin for Brookings, S. Dak. (about 80 miles east of Huron). These prices were quoted for No. 2 shelled corn.

This is the area that also experienced the wide variation in crop yields mentioned above. Two of the years in table I (1919 and 1943) reflect wartime prices, and one of them (1932) the deep depression of the early 1930's. The price of wheat in 1919 was nearly eight times the price received in 1932, and the price of corn in 1919 was over 12 times the price in 1932.

These are extreme illustrations of the ups and downs in farm prices, but they show how the farmer's welfare is affected by conditions beyond his control.

The farmer works with his neighbors and with other people, partly to help reduce the natural hazards and the economic risks in farming. Neighbors help each other to harvest crops before a storm sets in. They join together in cooperative associations for buying supplies, for selling their products, and for buying insurance against fire, tornadoes, and hail. Local cooperation and good neighborliness add materially to the farmer's income and to his security, but the forces that cause the wide swings in farm prices such as those indicated above are outside the control of the local community. They are national, and even international, in scope; and they can only be influenced by individual farmers as they take their place as citizens in a democratic

society to help formulate national policies.

Because the farmer as an individual has a relatively small influence on the larger economic forces that affect his business, he often finds it necessary to adjust himself as well as he can to the impact of these outside forces. We might call such adjustment to changing conditions, keeping up with the times. Over a period of years farming has changed materially in most areas in this country. For example, in 1840, Vermont was an important State in sheep production. Now only a few sheep are kept in Vermont. Dairy cattle took the place of sheep, first for the production of butter and cheese, and later to produce milk for Boston and other city markets. Farming in Vermont has changed because the times have changed. The nearby cities require fresh milk, and Vermont farmers are so located that they have a transportation advantage in producing milk for adjacent city markets.

Farmers also need to be aware of changes that take place over a much shorter period of time. For example, the price of hogs changes from day to day and from month to month. The farmer needs to decide when it will be most advantageous to him to market his hogs within the period in which they can be made ready for market. If he markets them early, they will carry less weight, but they might bring more money. In deciding on how many hogs to produce in any year, the farmer needs to consider what the prospects will be for the price of hogs in relation to the price of feed nearly a year later than the beginning of his breeding operations. These are all management questions that the farmer must face in adjusting himself to economic forces that are outside of his control as an individual farmer.

It is evident that the successful farmer needs to have a good understanding of the nature of the economic forces that are likely to affect his success. He will especially need to consider the forces that affect the value of his own products and the costs of the things that he will need to buy in the market, both for his farm and for his home. Some economic forces may have only local effects. For example, a large crop of locally grown strawberries may glut the local market and greatly reduce the local price of berries. On the other hand, economic forces may be world-wide in character, such as the global war cutting off the supply of tropical fats and oils and, therefore, creating a shortage for the United Nations.

THE FARM BUSINESS

The successful farmer needs to combine his knowledge of economic forces external to his farm with an understanding of the principles of organization and management that will enable him to make the most out of his farm business, taking into consideration both the conditions on his own farm and the outside factors over which he has no control. This brings us to the question of what is included in a farm business. When we talk about a farm we ordinarily think of the land and the buildings on the farm. But more than land and buildings are needed to make a farm business. To operate the farm, machinery is required for land preparation, for planting, for harvesting, and for handling livestock. Power is needed to operate the machinery, and this means tractors or horses and mules, and quite likely electric power.

The active part of the farm business is the farmer and his family. They are responsible for the management of the farm and, on a family-operated farm, they also do most of the work involved in growing crops and livestock. *A farm business is the farmer's productive resources and includes land, buildings, machinery, power, livestock, labor, and management.* These resources are then combined to produce farm products of different kinds. Each crop or class of livestock in which productive resources are used is called *a farm enterprise.*

The farmer's management problems include (1) Planning the most advantageous combination of the productive resources that he has or expects to obtain for use in farming, (2) planning the most effective combination of farm enterprises, and (3) operating the farm efficiently as a going concern. These are the problems with which we are primarily concerned in this book, but as background for an examination of these problems, the next two chapters consider the reasons why we have so many different kinds and sizes of farms.

EXERCISES FOR CHAPTER 1

CHECK-UP

A. Below is a series of statements with a blank line after each. If the portion of the statement in italics is true, circle the letter T, but do not write anything on the blank line. If the portion of the statement in italics is false, circle the letter F and write the correct answer on the blank line provided.

1. T F More people, over the world, are engaged in farming than in any other occupation._____

2. T F The proportion of the population in the U.S. that lives on farms has *neither increased nor decreased* in the last 50 years. _____

3. T F Farmers *can* protect themselves from all kinds of farming hazards by taking out insurance._____

4. T F Farmers, generally *know* very accurately the prices at which their crops can be sold at the time they plant the crop._____

B. Match the following items in the right-hand column with the proper choices in the left-hand column. To do this, insert the letter or letters of choices in the parentheses in front of the proper item or items. Some items can be matched with more than one choice.

Choices	*Items*
a. dairying	1. (_____) Farm enterprise
b. land	2. (_____) Productive resources
c. prices	3. (_____) Economic forces
d. sheep raising	
e. oats	
f. alfalfa	
g. wage rates	
h. buildings	
i. hired labor	
j. tariffs	

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss the ways in which farming differs from other occupations, including (a) the dependence of farming upon the life cycles of plants and animals; (b) the importance to farmers of weather and insect and disease hazards; and (c) the importance of the home as a part of the business unit.

2. Discuss the qualifications of a good farmer, including (a) his attitude toward farm life, (b) physical qualifications, (c) managerial ability.

CHAPTER 2

LITTLE FARMS, BIG FARMS, AND FAMILY FARMS

A farm may be an overgrown garden or it may be big business. Almost any place that raises a few acres of crops or a few head of livestock is commonly regarded as a farm, even though the person living there may not consider himself a farmer. At the other end of the scale are the large ranches and farms covering several thousand acres and employing 20 or 30 men. Most farms, however, are "family" farms that can be handled by the labor force of a farmer and his family, with perhaps one hired man for all or part of the year.

As was pointed out in Chapter 1, the number of farms in the United States counted by the Census of 1940 is a little over 6,000,000. According to the Census definition, any tract of land containing three acres or more was considered to be a farm if it was used for agricultural purposes. Places containing less than three acres were counted as farms if farm products raised in 1939 were worth $250 or more.

We know, furthermore, that nearly two-thirds of the 6,000,000 farms tend to be family farms. Of the remainder, some are large-scale farms, some are part-time units, retirement homes or subsistence farms. It is important to keep in mind that there are wide differences between these different kinds of farms, and that a per farm figure based on the average of all farms, for such items as income, or acreage, may be very misleading. For example, the average acreage land per farm is 174 acres for all farms, but the average acreage for large-scale farms is around 3,000 acres, and for the part-time farms it is about 40 acres. We therefore need to know something about the different kinds of farms before we discuss the problems that arise in the management of any one of them.

PART-TIME FARMS AND RURAL HOMES

There are about 1,000,000 part-time farms. These are farms where

the operator spends a considerable part of his time in work off the farm. Many part-time farms consist of little more than a large garden and a cow or some chickens. Others may contain several acres and require a considerable share of the time of the operator and his family. Part-time farms tend to be located near cities or in areas where jobs are of a seasonal nature, such as in coal mining districts.

People engage in part-time farming for several reasons. Some of them have full-time city jobs and operate a small farm because they like to live in the country and enjoy looking after plants and animals in their spare time. Also, farm work gives the children something constructive to do. Others feel that they can live more cheaply in the country by growing some of their own food, and perhaps saving something in rent. For many people, these advantages offset the inconveniences and expense of the greater distance to and from work.

Many people who have a non-farm occupation are not fully employed the year round. Sometimes they have very little to do in the summer, as is frequently the case with the coal miners. Part-time farming can be combined with such occupations to fill in the slack periods and improve the family income.

A part-time farm operated for the purpose of supplying most of the family needs for vegetables requires only about one acre of good land and can be taken care of in the spare time available to most city workers if they are willing during the growing season to spend an hour or two in the garden each day and a considerable amount of time over the week-ends. They will need help, too, from other members of the family. A small poultry flock of 20 to 40 hens can also be kept with very little additional labor and no additional land if they are fed on purchased feed and table scraps. When the farming enterprise is on so small a scale the term "rural home" is more suitable than part-time farm.

The larger part-time farms, operated by persons who divide their working time between the farm and some non-farm job, range in size all the way from small places to farms that are almost full-time farms. The size of the farm and the kind of enterprises undertaken are generally determined on the basis of the amount of time required for the off-farm job, the season of the year that is available for farming,

and the time that can be spent on the farm by other members of the family. The larger part-time farms frequently include livestock. Types frequently kept include poultry, milk cows, pigs for fattening, and occasionally goats. One or two horses are commonly found on larger places. The addition of these classes of livestock requires more land, since pasture is essential to economical production. If all or part of the grain feed is raised, additional land is required.

RETIREMENT HOMES

There are something like a half million small country places in the United States which do enough farming to qualify as farms according to the Census definition, but are principally retirement homes. Many city people who have grown up on a farm like to spend their declining years in the country, raising a garden and perhaps keeping a cow and a few chickens. Some farmers look forward to retirement on a small place where they can retain contact with farm life. Other farmers remain on the farm and their sons or daughters take over active operations. Sometimes retirement on the farm is a gradual process, and production slackens as the farmer grows older. This situation is discussed in a later section.

SUBSISTENCE FARMS

Something like a million farms in addition to the part-time and retirement units are too small to be called family farms, yet they represent the main source of income to the families who operate them. Many of these are located in the South, but they are found in all parts of the country, especially in the mountainous and cut-over timber regions. Perhaps half of these small units could be called self-sufficing farms; that is, places upon which the operator attempts to grow as much of his own living as possible, meeting his few cash expenses by the sale of a few hundred pounds of cotton, or some other cash crop, or perhaps from wages received for a few days work off the farm.

The other half million full-time farms include farms upon which no particular effort is made to grow the major part of the family's food requirements. These are small units in cash-crop areas upon

Figure 4. Subsistence farms are frequently located on unproductive soil and have only a few acres suitable for cropland. (U.S.D.A.)

which an operator attempts to make a living by growing for sale a few acres of cotton, tobacco, wheat, or some other crop. The 1-mule cotton farm in the South is typical of a great many of the farms in this group. Such a farm might contain 40 acres of land, of which something like 15 or 20 acres would be in crops. The livestock would probably consist of one mule, a milk cow, 20 or 30 chickens and perhaps a pig to be fattened. The land needed to grow feed for the livestock and to furnish part of the food for the family would leave only about five acres for the cash crop, cotton. The net cash income would range from $100 to $200, and in addition the farm would furnish a large share of the food consumed by the family.

LARGE-SCALE FARMS

A few large-scale farms or ranches can be found in all of the better farming and ranching areas. They are not numerous. There are only about 60,000 farms which are too large to be handled by the usual farm family with one to two hired men and some additional hired help during rush seasons. Large-scale farms are most commonly found in range-livestock, fruit, and truck farming areas, and in the wheat

areas of the West. The term *ranch* is usually confined to operations which involve grazing of cattle or sheep on the open range. In some western areas all farms are called *ranches.*

In cotton areas, there are some *plantations* of large size, which are not included in the estimated number of large farms above. These usually differ from the large-scale farms of other types in the manner in which they are operated. The plantation usually is subdivided into small units, each of which is operated by a family that receives a share of the production. If the landlord supplies the work-stock and equipment, those who work the small unit are called *sharecroppers.* If work-stock and equipment are owned by the families operating the land, they are called *share tenants.* Plantation share-croppers, and even share tenants, are usually closely supervised by the landlord or sometimes by a hired manager.

An increasing number of cotton plantations operate with wage labor instead of share croppers or tenants. These are similar to other large-scale farms in the way the business is set up and operated.

Even the largest of the large-scale farms are not big in comparison with many industrial corporations. A large-scale grain farm might contain 6,000 or 7,000 acres, employ perhaps 15 men, and represent a capital investment of $300,000 or $400,000. A large ranch might consist of 60,000 acres of land, employ 20 or 25 men, and require an investment of half a million dollars. A few dairies milk as many as 1,000 cows. But there are not many large-scale farms that are as big as the examples given here.

In recent years we have heard considerable discussion of rapid increases in the number of large-scale farms. There has been some increase in certain specialized fruit and truck areas in California and elsewhere. There has also been a tendency for cotton plantations to shift to wage labor. On the other hand, livestock ranching seems to have shifted toward smaller family units, and some of the extremely large wheat farms went out of business in the drought and depression of the early 1930's. Progress in mechanization has created more of a tendency to increase the size of family farms than to increase the number of large-scale farms.

Sometimes we hear the terms *factory farms, corporation farms* and *chain farms* used in connection with large-scale farming. It is difficult

Figure 5. The broad wheat lands of the Texas Panhandle lend themselves to large-scale mechanized farming. Each of these combines can harvest 30 acres of grain in a day. (U.S.D.A.)

to organize farming on a factory basis, and strictly speaking there are no *factory farms*. Some large-scale farms, however, do combine farming and primary processing of farm products. Cotton plantations usually operate a gin to separate lint from the seed and to bale the lint. Some California vegetable farms operate canneries.

Large-scale farms may be owned by individuals, partnerships or by corporations. A *corporation farm* is therefore one that is operated by an incorporated company. It may be of any size, but usually corporation-operated farms are large-scale farms.

Chain farms, like chain stores, are separate farms that are operated under one management. They may be all located in one community or widely scattered. Some of the older cattle companies owned and operated ranches scattered from Texas to the Canadian border. The resident manager of each ranch carried a great deal of responsibility,

but he reported to the headquarters office and received his general instructions from there. More frequently, a chain of farms are in the same locality and are owned and operated by a local individual, partnership, or corporation. A resident foreman is in charge of day-to-day operations on each farm.

A few *cooperative farms* have been established from time to time, several of them during the depression of the 1930's. They usually involved the organization of a cooperative association, and the land, buildings, livestock and machinery were bought and owned by this association. Participating families were advanced association funds for living expenses, and at the end of the year settlement was made and the net income was divided as a dividend. Cooperative farms, like other large-scale farms, have the possibility of taking advantage of capable management, use of large-scale machinery, and of carrying out some of the processing functions on the farm. On the other hand, the desire for independent operation, and ownership if possible, is strong among American farmers, and many participants in cooperative farming found it difficult to adjust themselves to living and working on a cooperative farm.

The opinion is sometimes expressed that agriculture will be taken over by large, highly mechanized farms, operated by highly skilled managers in the same manner that small enterprises have been displaced by the large corporation in many lines of business and manufacturing. Farming, however, does not lend itself as readily to mass production methods as does industry. Farms cannot be organized on the assembly-line principle. In a factory, a given task, such as assembling the parts of an automobile engine, can be carried on by one crew of men, each of whom performs only one small operation in the assembly of each engine. Therefore, they become very skillful, and they also do not lose time going from one operation to another located in different parts of the plant and requiring different tools. On the farm, workers must be able to do a great variety of jobs. Some of these, like milking, must be performed at certain times during the day; others must be done at certain seasons of the year. In any one day, the farm worker may be required to perform three or four different tasks, each requiring skill of a particular sort and perhaps taking him from one end of the farm to the other. Some rather

skilled jobs, such as the care and operation of grain harvesting machinery, are called into use only once a year, and then only for a few days or weeks. There are few farm workers who can specialize in the performance of one or two jobs and do nothing else.

Even large-scale farms can divide up the work only to a limited extent. Perhaps there will be one man who repairs all the machinery, and one or two men may do all the chores, so that the others can spend the whole day in the field without interruption, but the advantage in efficiency over family-sized farms is not great. Much of the work on the farm has to be done over a large area of land. This means that each worker does his job on his own responsibility and without close supervision. Only in very intensive hand labor work where a number of men work together in a crew, such as in the harvesting of cotton or in picking fruit and vegetables, is it possible to give close supervision to farm work.

THE FAMILY FARM

By and large, people who are interested in farming are interested in the family farm. As an ideal, *the family farm may be defined as one for which the principal source of labor is the farm family, and of sufficient size and productivity to pay expenses, including maintenance of the farm, furnish an income that will provide a comfortable living for a farm family, including food and shelter, medical care, education and recreation, and permit the accumulation of a reserve sufficient to meet the needs of old age.* Such a farm is far different from the self-sufficing or subsistence farm. It is a going business, built around the resources and needs of a family. It is large enough to permit the use of labor-saving machines, which require skill in operation and maintenance. It represents a substantial investment; and, although it depends primarily on the family for labor, the cash outlay required for other operating costs, fertilizer, feed, equipment, and the like is considerable. Competent management is essential.

The family farm does not have a particular acreage or gross income or number of cows. A farm business that would be a family farm in one region might not be in another. A full-size family farm for a man 40 years old with two sons old enough to do a man's work, a growing family, and high living expenses, would be too large for a

middle-aged couple who are interested in a comfortable living but who do not want to hire very much labor.

Frequently, a family lives on the same farm for a whole generation and adjusts the system of farming in keeping with the changing family labor supply and changing needs for income. For example, a young couple just starting in farming will not have high living costs and will want to farm in a manner that will build up the place and conserve their limited capital, while keeping expenses to a minimum. Therefore, they will probably not go in for a very large acreage of crops requiring expensive specialized machinery or a large out-lay for hired labor. They will probably devote much attention to producing a considerable share of their own food requirements. As they get older and accumulate funds and raise a family they will expand their operations to utilize the labor of the children and to meet their increased expenses. This expansion may involve the keeping of more livestock, the production of crops that bring a high return per acre, the renting of additional land, or a combination of these methods. After the children are grown the farm operations will probably be maintained if a son decides to stay on the farm. If not, there will be a tendency to retrench—perhaps to work a little less hard. Probably some of the cropland will be rented out to a neighbor. It is not uncommon for an elderly couple to remain on the farm, but virtually to retire from active farming, renting out the land, sometimes leaving it in hay or pasture or even letting it lie idle. Perhaps they will keep a few head of livestock, raise a garden, and produce some feed.

The flexible nature of the family farm is one of its great advantages and is one of the principal reasons why farming is regarded as a *way of living* fully as much as a farm business. The family farm has been a persistent ideal of American democracy from the times of Thomas Jefferson to the present. Much of our agricultural legislation has been designed to promote or maintain farms of this character. It is one of the few remaining strongholds of the small proprietor.

There are several reasons why the family farm has been able to compete favorably with large-scale farming. Generally the family farm is fully as efficient and in many instances more efficient than the large unit. Although the large-scale farm may often have the advantage of superior managerial skill, the family farm is able to extend closer

supervision over the farm work. It is possible to utilize family labor in place of hired workers, and fields are close to the farmstead, so that little time is lost in going to and from work.

Family farms generally have lower cash costs than the large-scale farm and therefore are better able to survive periods of low prices. Little labor is hired, machinery investment is kept at a minimum, and buildings that would be constructed on a contract basis on the large-scale farm are frequently built by family labor or locally hired labor and of local materials on the smaller farms. These are illustrations of the many ways in which family farms are able to lower their costs.

If the family farm is owned and is relatively free of debt, the family can survive periods of low income if necessary, by cutting expenses for family living to a bare minimum. They can also forego a part of the maintenance of buildings and machines. Farmers call this "tightening the belt" in hard times.

Family farms are frequently better diversified than large-scale farms, at least in areas where it is possible to grow a variety of crops and livestock. This protects the operator against weather conditions which may be unfavorable to one crop but not to another, and against a fall in the price of any one commodity.

During recent years considerable progress has been made in the development of efficient machinery of smaller sizes suitable for family farms. Twenty years ago tractors were heavy and cumbersome machines adapted only to large fields. Plows, cultivators, and other equipment used with them were likewise hard to handle on small or odd-shaped fields. The combine, in particular, cutting a swath of 15 or 20 feet, was a machine only for large acreages.

The modern general-purpose tractor, mounted on rubber tires, with a turning radius equal to its own length, has made efficient power farming possible on the family farm. A complete line of equipment has been developed for the small tractor, including combines with a four to six foot cut. However, the introduction of power machinery on the family farm has increased the acreage that can be cared for by one man. As a result, good family farms have tended to increase in size.

Although a family farm may be a business of considerable size with a gross income of perhaps $4,000 or $5,000, the farm commonly

furnishes a considerable part of the family living needs. In most sections of the country, from one-half to two thirds of the food consumed by the family is produced on the farm. On most farms in wooded areas, part or all of the fuel needed for heating and cooking comes from the farm woodlot. The opportunity of raising a part of one's living is looked upon by some farmers as a means of lowering their living costs, and by others as a means of living better than they could in the city.

The house is a part of the farm that should not be overlooked. The farm is one of the few businesses that customarily furnishes living quarters for the working force. The adequacy, condition, and attractiveness of the farm home greatly influence the pleasantness of farm life.

Among the 6,000,000 farms in the United States, there are many kinds; some very small, and some very large. All of the groups discussed are important parts of American agriculture. Part-time and retirement farms are important because they are numerous, and because many people feel that they can secure a better living by operating a small place in the country. Subsistence farms are important because they represent the efforts of people to make a living in areas where the land is overcrowded or is of low fertility. Large-scale farms deserve consideration because they illustrate the extent to which efforts have been made to apply industrial methods to farming, and because in a few areas, they are the predominant form of organization. Table II gives some of the characteristics of typical farms of the kinds that have been discussed in this chapter.

This manual is written primarily in terms of the organization and operation of the family farm, which represents more farms than any other group, and from which most of our production comes. In the succeeding chapters we will discuss farm management problems largely from the viewpoint of family farms. The other kinds of farms have many problems that differ from family farms, and that require separate treatment. However, we should bear in mind that even family farms differ greatly as to size, the kind of products raised, and the kind of management problems encountered. The next chapter takes up some of the reasons for differences in types of farming.

Table II. Examples of the organization and income of different kinds of farms.

Item	Large-scale cattle ranch New Mexico	Family-size hog and beef farm Corn Belt†	Subsistence farm 1-mule cotton Mississippi	Part-time farm Pennsylvania	Retirement or rural home New York
Land in the farm....acres..	*35,319	191	40	21	1
Cropland....acres..	100	127	16	10	½
Investment in—					
Land and buildings....dollars..	31,097	15,000	1,800	2,294	3,250
Machinery and livestock....dollars..	33,837	3,800	380	293	125
Hours of work per year....	7,800	5,000	1,380	1,860	500
Livestock kept:					
Work animals....number..	10	4	1	1	....
Cows milked....number..	.....	4	1	1	....
Other cattle....number..	1,021	33	1	1	....
Hogs....number..	.....	42	2	2	....
Chickens....number..	50	111	30	50	50
Return from farming:					
Total income‡....dollars..	17,157	3,650	481	621	350
Total expense....dollars..	8,667	1,950	132	335	200
Net farm income....dollars..	9,190	1,700	349	286	150

*Includes 7,973 acres public domain.
†For other typical farms, see tables III and IV.
‡Includes value of living furnished by the farm including rental value of the house.

EXERCISES FOR CHAPTER 2

CHECK-UP

A. In this chapter you have read that the average acreage for large-scale farms is about 3,000 acres; that the "family farm" varies in acreage, dependent among other reasons, upon the labor available and the kind of crops grown; and that the part-time farm averages 40 acres. What is your idea of the size of 3,000 acres, or of a square mile, or of 40 acres? How big is one acre? Check yourself on your ideas of size by answering the following:

1. There are 43,560 square feet or 4,840 square yards in an acre. A football field, not including the end zones, is 100 yards long and 50 yards wide. Is a football field smaller or larger than an acre? _____

2. A 40-acre farm would be a bit smaller than _____ football fields.

3. There are 640 acres in one square mile. How many miles is it around the boundaries of a square section of 640 acres? _____ miles.

4. About what part of a square mile would a 40-acre farm cover? _____ of a square mile.

5. Suppose that a 2,500 acre wheat farm were perfectly square, about how many square miles would the farm contain? _____ square miles.

6. About how long a furrow could you plow straight along one side of the 2,500 acre farm? _____ mile furrow.

7. About how many miles would you cover if you were to walk around the entire boundary of a square 2,500 acre farm? _____ miles.

8. A 320-acre farm extends along one side of the highway and runs back from the highway to a depth of half a mile. How far along the highway would the farm run? _____ mile.

B. Underscore the words or expressions that best complete each of the following statements. There is only one correct response for each statement.

1. The number of farms in the United States according to the 1940 Census, totals about (a) 1 million; (b) 4½ million; (c) 6 million; (d) 10 million.

2. Of all farms in the U. S., the proportion that are family farms is about: (a) ⅓; (b) ¼; (c) ½; (d) ⅔.

3. A subsistence farm is one which (a) produces all of the food consumed by the family; (b) is too small to be called a family farm, but is the main source of income for the operator; (c) does not produce anything for sale.

4. One of the reasons why mass production methods have not been more extensively used in agriculture is (a) there aren't enough hired men; (b) farmers don't understand machinery; (c) few farm workers can specialize in one job and keep at it day after day; (d) few people can buy enough land to set up a large-scale farm.

5. The effect of improvements in farm machinery in recent years on family farms has been to: (a) make them smaller; (b) make them larger; (c) make no difference in size of farms.

6. One reason why family farms tend to have lower cash costs per acre than large-scale farms is that (a) they spend less money; (b) they are always more efficient; (c) they leave undone the things they can't do themselves; (d) they don't have to hire as much labor.

C. The firm of Ketchum and Fleecem offers to sell you shares of stock in a farming corporation which they are setting up to buy land near Windsor, Connecticut, for the purpose of raising potatoes by large-scale methods. They list the following advantages of large-scale operation for the raising of potatoes. Cross out the items that are unsound. (1) By specializing on potatoes and nothing else, the workers will become expert and will do each job in half the usual time required and this will cut the labor costs below those on smaller farms; (2) so many potatoes will be produced that the corporation can control the market price; (3) with a large acreage, it will be feasible to own a 2-row potato digger; (4) yields per acre will be high because there will be so many acres.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss part-time farming, touching upon (a) the reasons why people engage in part-time farming; (b) the variations in sizes of such farms.

2. Compare the advantages and disadvantages of large-scale farms

with family farms, including (a) the opportunity for specialization. (b) the supervision of workers; (c) cash costs; (d) the use of machinery.

3. Describe the way in which the system of farming on a family farm can be adjusted in keeping with changes in the family labor supply, touching upon (a) changes in the kinds of crops grown and livestock kept; (b) changes that can be made in total acreage.

CHAPTER 3

TYPES OF FARMING AND FARMING REGIONS

Farms in different parts of the country, even in the same locality, differ in size, in kinds of products produced, and in the manner in which crops and livestock are handled. The combinations of products on a given farm and the methods or practices that are used in the production of those products is known as the *system of farming* that is followed on that farm.

When farms in a group are quite similar in the kinds and proportions of the crops and livestock that are produced and in the methods and practices followed in production, that group is described as a *type of farming.* The most common description of types of farming is in terms of the most important farm enterprises. Thus we talk about *wheat farms* when we think of a group of farms on which wheat is the most important enterprise, or about *dairy farms* when milk production constitutes the most important enterprise. Usually the importance of the enterprise in a type of farming is measured by the proportion it contributes to the income from the farm. For example, if half or more of the gross income on a group of farms came from the sale of wheat, the farms would be called wheat farms. But if another enterprise, such as cattle or hogs contributed, say 30 or 40 percent of the income on these same farms, we would call this type of farming *a wheat and livestock type.*

WHY FARMS ARE OF DIFFERENT TYPES

There are about 900 types of farms in this country, different enough to be mapped for study. As previously mentioned, farms of different types can be found even within the same locality. But differences are greater if we compare farming in different areas or regions of the country. We need to examine these differences because they indicate that specific types of farms are best adapted to certain areas, and that it may be difficult to succeed with other types under these conditions.

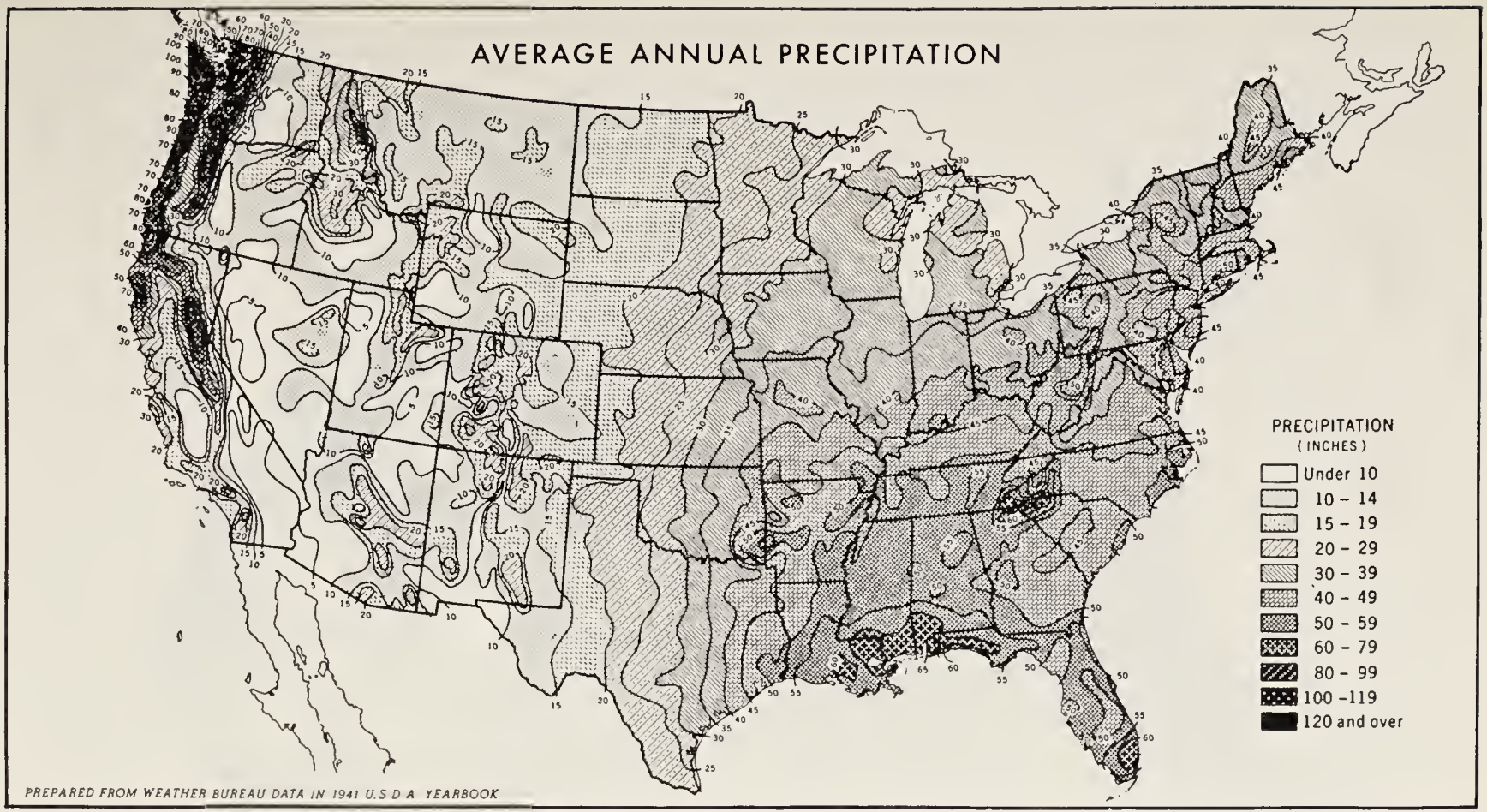


Figure 6. Average annual precipitation. Most of the country east of the Great Plains ordinarily has plenty of rain, though dry spells cut crop yields somewhere every year. Between the West Coast, where rainfall is heavy, and the eastern edge of the Great Plains (20″ line on map) rainfall is too low to make crop production sure, without special cultivation practices or irrigation. (Bureau of Agricultural Economics.)

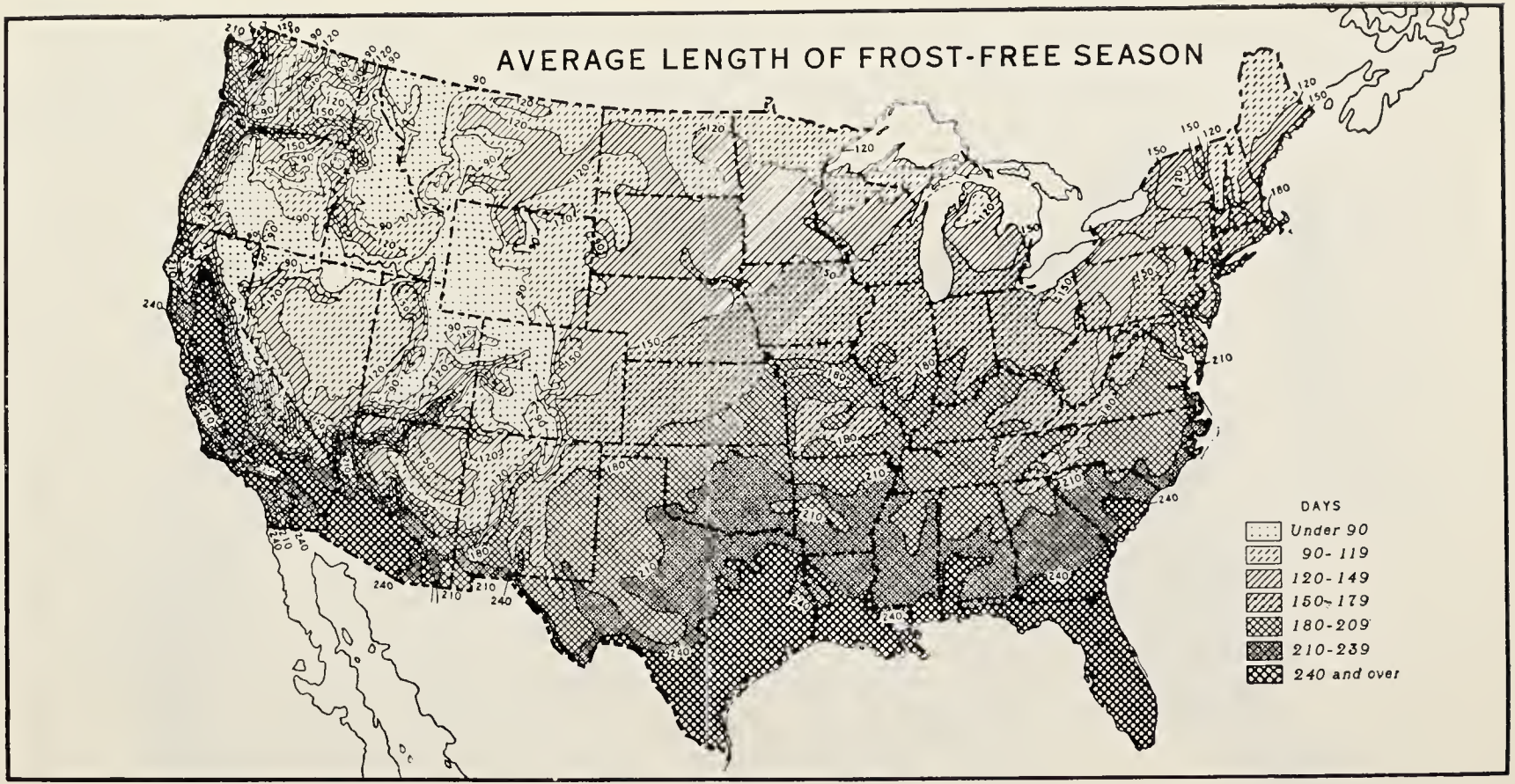


Figure 7. Average length of frost-free season. Length of growing season has set rather definite limits to the crops that can be grown in the Northern States and in the higher parts of the other States. Small grains need only a short growing season, hence can be grown to the Canadian border. Cotton, on the other hand, needs a long hot season, little being grown where the frost-free period is under 180 days. Hay and pasture do well in cool climates and are the basis for successful dairy farming. (Bureau of Agricultural Economics.)

The basic reason is the wide range in kind and quality of the resources used in agricultural production—in other words, differences in land and buildings, in machinery and livestock, and in labor and management as well. Following is a description of some of the factors that account for differences in types of farming.

Physical Factors.—Differences between areas or regions in climate, soil, surface, and water supply establish broad limits to the kinds of products that can be produced. For example, cotton requires a long, warm growing season for successful production and, therefore, cannot be grown successfully in the Northern States. On the other hand, Irish potatoes grow best in a cool climate and will mature in a short growing season. The principal commercial areas are found in our Northern States. Figure 6 shows the average annual precipitation (rain, melted snow, sleet, and hail) in different parts of the country and figure 7, the average length of the frost-free season.

Variations in these two physical factors place important limitations on the kind of crops that can be grown. For example, the farming areas known as the Great Plains, which are located west of the 20-inch rainfall line in figure 6, cannot grow successfully the crops that have a high moisture requirement, unless the land can be irrigated.

In some of the important irrigated areas in the West, precipitation may be confined to that received as light snowfall during the winter months, totally inadequate for dry farming, in fact capable of supporting only very sparse desert growth. Most of the irrigated area of the Snake River Valley in Idaho, for instance, has an average precipitation of less than ten inches, the Yakima Valley in Washington around seven inches and portions of California less than five inches annually.

Some of the better range grasses are able to make a modest growth with 12 to 15 inches of rainfall, and even wheat is produced where farmers have learned to store moisture in the soil by use of the summer fallow system, taking a crop from the same acre once in two years, two years out of three, or in some other combination that utilizes previously stored moisture. The production of small grains is further encouraged in the Great Plains because as much as two-thirds of the year's precipitation may occur from April 1 to September 30. This is the period when it can be most fully utilized by growing crops.

In some areas one seldom hears of a serious drought. In the Great

Plains, however, one must always be prepared for this contingency. A 33-year record in northwestern Montana for instance, showed eight years having less than ten inches of annual precipitation, 12 years of ten to 15 inches, ten years of 15 to 20 inches and three years of 20 to 25 inches. Figure 8 indicates the wide variability in the pattern of rainfall distribution throughout the year.

Likewise of great importance in determining the choice of crops is the number of days between killing frosts. In some of the mountain valleys heavy frosts, and even snow, have been recorded in every month of the year; the growing season may vary in important agricultural areas from three months at high elevations to nine months and more in some of the agricultural valleys of California.

The following list indicates the wide variation in the approximate number of days needed to mature different crops:

	Days		Days
Corn (northern States)	90–120	Bush beans	60
Corn (Corn Belt)	130–150	Sweet corn	75
Corn (southern States)	170–190	Peas	65
Grain sorghums	100–120	Radishes	30
Cotton	180–200	Winter squash	100
Sugar beets	160–200	Carrots	65
Sugarcane	240–270	Cabbage (late)	120

Closely allied to the length of growing season is the range in temperature. Some crops such as field and canning peas do best in areas of mild summer temperature and cool nights. Corn on the other hand does best under humid conditions and warm nights. Varieties of the same crop differ in their adaptability to the physical environment. Some of the Corn Belt's best hybrids would fail to mature in northern Minnesota and are likewise ill-adapted to conditions in southern States. Plant breeders are constantly at work to widen the adaptability of high yielding strains and to develop new ones suited to specific conditions.

The productivity of the soil and its suitability for different crops also varies greatly by local areas and by broad regions. Within a given community or locality, climatic differences are usually rather small, but there may be important soil differences which determine the cropping system that can be followed and, therefore, the kinds of

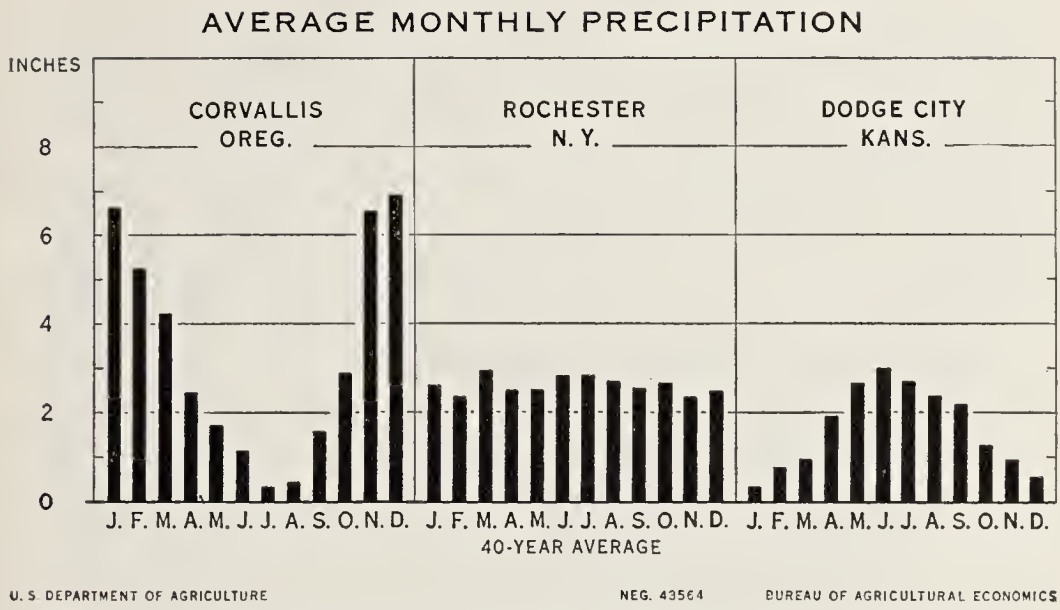


Figure 8. Precipitation comes at different times of the year in different localities, and this influences the crops that can be grown. (Bureau of Agricultural Economics.)

products that can be produced. The United States Armed Forces Institute courses on Soils (EM 825) and on Crops, (EM 826) explain these factors in detail.

Location Factors. The location of a farming area with respect to the market outlet for its products is often just as important in determining the kind of production that can be undertaken as are the physical factors. Excellent yields of potatoes might be obtained in an isolated mountain valley, but if the nearest railroad station is 40 miles away and has no facilities for handling potatoes, they could not be produced for sale outside the locality. Although the actual location of a farming area does not change, the same effect as a change in location might be experienced if new markets and transportation facilities are developed. Such changes usually make it profitable to change the type of farming.

Biological Factors. Weeds, insect pests, plant and animal diseases, and development of new breeds of animals and varieties of crops may all affect the type of farming that can be followed. For example, the appearance of the boll weevil made it difficult to grow cotton in many southern areas. The breeding of hardy corn varieties has extended northward the areas that can produce mature corn. Hybrid seed may

be developed to fit local growing conditions even more successfully.

Human Factors. The likes and dislikes of the farmer himself often affect the type of farming which he chooses to follow. Such personal factors frequently account for differences in types of farming within a locality that has uniformity of soil and other physical resources. However, if an individual farmer chooses a system of farming that is totally different from his neighbors', he is likely to find it difficult to market his products, unless he has a special outlet for them. Thus, even though certain products are physically adapted to the area it may be difficult for a single farmer to enter into their production. Sometimes, however, we find groups of farmers in an area who have developed a type of farming which is characteristic of their national origin, their educational background or some other human factor. Danish settlements in some of our Northern States have developed dairy types of farming and local marketing facilities to handle their products in areas where the surrounding farms are of other types.

Historical and Institutional Factors. If a farming area, over a period of years, has established market connections and developed a reputation as a source of supply for a farm product, this may be a decided advantage that influences the type of farming followed. For instance, one dairy area in Wisconsin has established an eastern market for Swiss cheese. There are important differences between States, and even between local units of government in systems of taxation and in regulations pertaining to such things as sanitation in milk production. Such differences may give at least temporary advantage in production over other areas. Cooperative buying and selling organizations that are established in some areas and not in others, also affect the type of farming.

The factors listed above help to determine what products or combination of products should be produced to obtain the highest income from farms in a particular area. *The alert farm operator will consider the income prospects of all the products that can be produced on his farm and then he will select the combination of farm enterprises that is likely to result in the highest net income to himself and his family for their labor, and for the investment that they have made in farming.* The following section indicates how farmers have adjusted their farming to these factors in different regions.

FARMING REGIONS

Figure 9 is a map showing the major regional types of farming in the United States. The farms in these regions are broadly similar

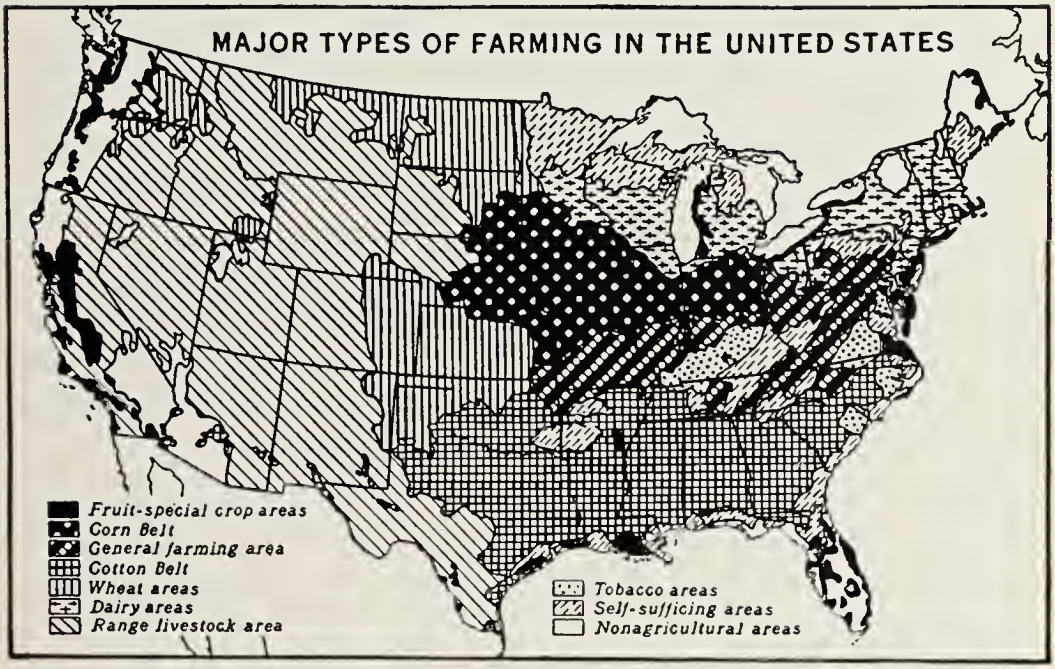


Figure 9. Major types of farming in the U. S. These regional types summarize the 900 types and subtypes that have been found useful in studying farm production plans and programs. Corn Belt, Cotton Belt, and range livestock areas stand in clear blocks. The wheat regions are mainly in the Great Plains. The dairy areas lie north of the Corn Belt, general farming areas to the south and east. The fruit and special crop areas show a great variety of locations. (U.S.D.A.)

with respect to physical resources and the types of farming followed. However, it should be recognized that wide variations exist even within these regions, because of local variations in physical resources, location with respect to markets and other economic factors. Maps have been prepared for most States that show and describe the important type of farming areas. Anyone interested in differences in farming areas in a certain State should get in touch with the State Agricultural Experiment Station in that State for publications that discuss the different farming areas in detail.

We need to keep in mind that the differences in types of farming that are found in the areas shown in Figure 9, are the result of actions of individual farmers who are constantly striving to obtain as large

incomes as possible from the land and other resources available to them. A major change in any of the factors that have been mentioned as important in determining the type of farming probably means that a change in type of farming would also be desirable. For example, the increase in population of Chicago in the last 20 or 30 years has increased the demand for whole milk, and many farmers in northern Illinois who were formerly producing corn and feeding it to hogs have found it profitable to specialize in milk production for the Chicago market.

In some areas the type of farming is determined almost entirely by physical conditions. For example, in many areas of the Great Plains region (the region west of the 20-inch rainfall line to the eastern ranges of the Rocky Mountains), wheat is about the only crop that can be grown successfully. In other regions such as in the Corn Belt, many products can be produced but few of these have income advantages over others. There is only a limited amount of land as well suited to corn production as the central Mississippi Valley is and, therefore, this region has a decided advantage in the corn-livestock types of farming.

Some areas have quite unproductive land and do not show outstanding yield advantages in any products. However, farmers in such areas usually find that some one combination of farm enterprises pays better than other combinations. Often it is possible to make relatively satisfactory incomes even in poor land areas providing the size and type of farm can be adapted to the land resources.

The following sections describe briefly the major farming regions and give some of the reasons why certain types of farming have developed in them.

The Cotton Belt. Cotton is the major crop of eight southern States, and ten others grow some cotton. It is second in farm value and fifth in acreage among all crops grown in the country. (Figure 10)

These states have a long and warm growing season and have enough rainfall for cotton. The crop will grow on widely different soils if the land is well fertilized. For the country as a whole, more commercial fertilizer is used on cotton than on any other crop.

Cotton has been grown in the South since late colonial days and has been the chief export crop of the United States. The crop requires

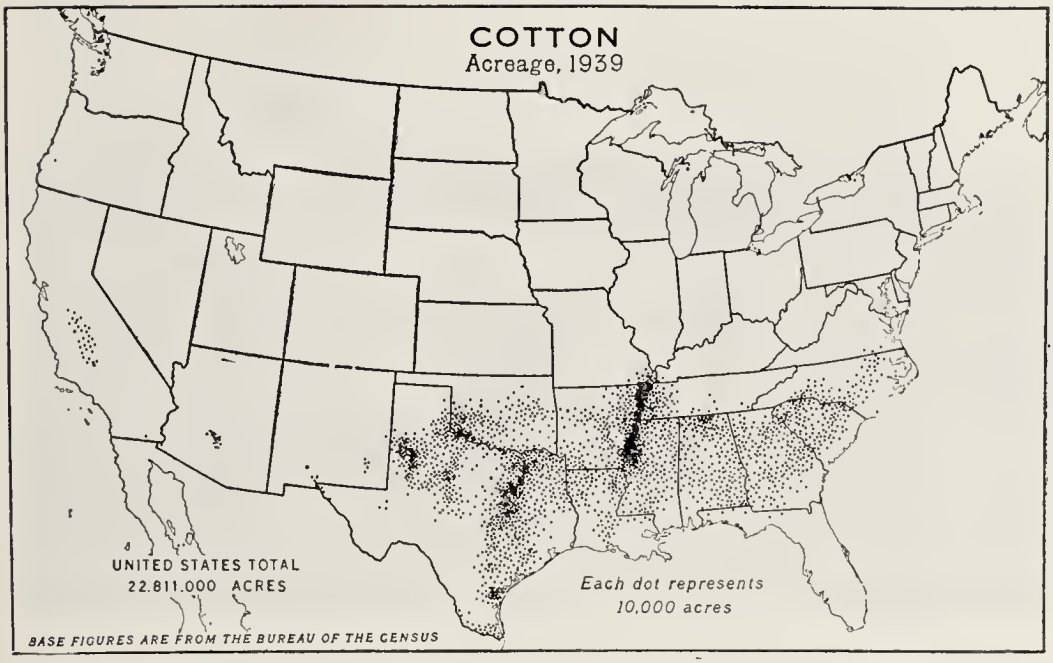


Figure 10. Acreage of cotton, 1939. The acreage in 1939 was the lowest since 1895, but the crop exceeded 11,000,000 bales. Texas, Mississippi and Arkansas led in production. (Bureau of Agricultural Economics.)

labor at chopping time and at picking time greatly in excess of that needed to plant and cultivate. This has meant that throughout most of the South the farming system has been based on the acres of cotton a man's family could handle, plus the feed crops that could be grown in slack seasons for the mules and other livestock, plus a garden for the family, and such other crops as could be grown without interference with the basic program. Cotton chopping and picking are hand labor jobs, and the earnings are rather low for the workers. On the other hand, no other crop is so well adapted as is cotton to the land resources, and to the present skills of the farm population in the South. But other crops and livestock can be grown along with cotton to add to the farm income.

A common size of cotton farm in the southeast and south central States is the two-mule farm where the family tends 40 to 50 acres of crops of all kinds. In western Texas one man with power equipment can handle 200 acres of cotton, but must have help in harvesting the crop.

In some southern areas, (particularly the Mississippi Delta and

Figure 11. Planting time on a cotton farm. This is a one-row planter. (Bureau of Agricultural Economics.)

other river bottom areas) the large cotton plantation is the dominant form of farm business organization. As mentioned in Chapter 2, a cotton plantation may be operated with a large number of share croppers and share tenants or with wage labor. In either case the manager does the production planning, the buying of supplies and equipment, and the selling of the product.

Tobacco is grown in parts of the Southern States where is has paid farmers better than cotton and other crops. It takes a great deal of labor in which women and children can help as they do in cotton. Some types of tobacco, however, are grown in northern States often in larger blocks than families can tend in the South. Certain types of tobacco have had a steady increase in domestic demand, and exports were heavy until they were reduced by war conditions.

Less widespread farm enterprises are easily fitted into the long growing season in the South, especially production of fruits and early vegetables for shipment to the metropolitan areas in the Northern States. Some of these, particularly sweet potatoes and watermelons, can be grown as sidelines in small quantities by cotton farmers, provided enough can be grown near one shipping point to furnish a local market. In Florida, citrus fruits (oranges and grapefruit) have

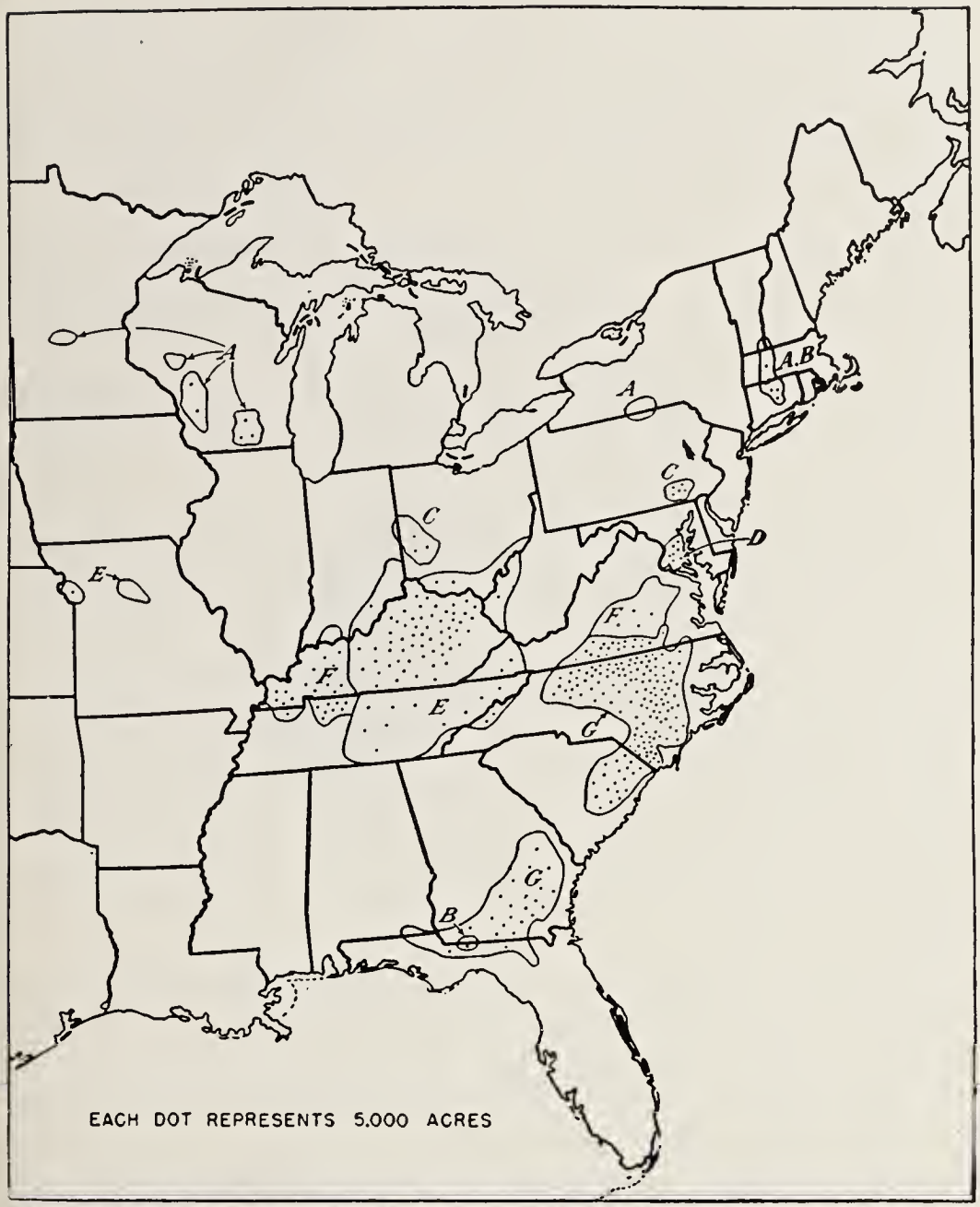


Figure 12. Tobacco growing is concentrated enough to make types of farming distinctly different from adjacent farming types. It is the principal crop in large parts of Kentucky and North Carolina, as shown in Figure 9. The areas differ in the types of tobacco grown: A is cigar binder; B, cigar wrapper; C, cigar filler; D, Southern Maryland; E, burley; F, dark air-cured and fire-cured; and G, flue-cured. (U.S.D.A.)

become the principal crop for sale in several counties. Other Florida areas have specialized in potatoes, strawberries, celery, tomatoes, and other early vegetables.

In Georgia there is a well developed peach belt centering near Macon, and extending north and south. Early peaches have been profitable in many scattered localities. Early white potatoes are grown for the northern city markets in several small areas in the southern States. Pecan groves have been started in localities throughout the South and seem likely to persist.

Rice is grown in four southern States and has crowded out cotton in the best adapted rice areas of Louisiana, Texas, and Arkansas. Rice farms are usually relatively large. Much equipment is needed for growing, irrigating and harvesting the crop. Sugar cane for sugar production is grown in Florida and Louisiana. In Texas and Oklahoma, cotton recedes in importance as one moves west, in favor of wheat and livestock.

The Corn Belt. This convenient tag has been given to an irregularly shaped block of the most productive farm land in the country. The Corn Belt centers around the central Mississippi Valley. Typically the soils are deep and fertile, and they can be worked with the most modern labor saving machinery available. The basis of all types of farms in this region is the superiority of corn as a producer of feed for livestock. However, corn is seldom grown on more than half the acreage of farm land, partly for soil maintenance reasons, and partly to distribute the work load by growing other crops such as hay, oats and soybeans. Hybrid seed corn has increased corn yields materially in recent years.

The acreage of soybeans has increased rapidly in the last few years, particularly since the outbreak of World War II. Soybeans for crushing are grown principally in the Corn Belt.

In the early days, the only feasible way to market corn in large quantities was through the feeding of livestock—hogs to use the grain, and cattle to use both the grain and the rough feed that had to be grown along with corn. This advantage of the corn-hog-cattle farming system over cash crop farming has continued in most areas of the Corn Belt. The feeding of hogs or cattle on Corn Belt farms tends to improve the distribution of labor by furnishing productive work during the winter months. Some farmers, generally on the larger farms and relatively near to the central markets, produce corn for sale.

Most Corn Belt farms are from 80 to 320 acres in size. They also

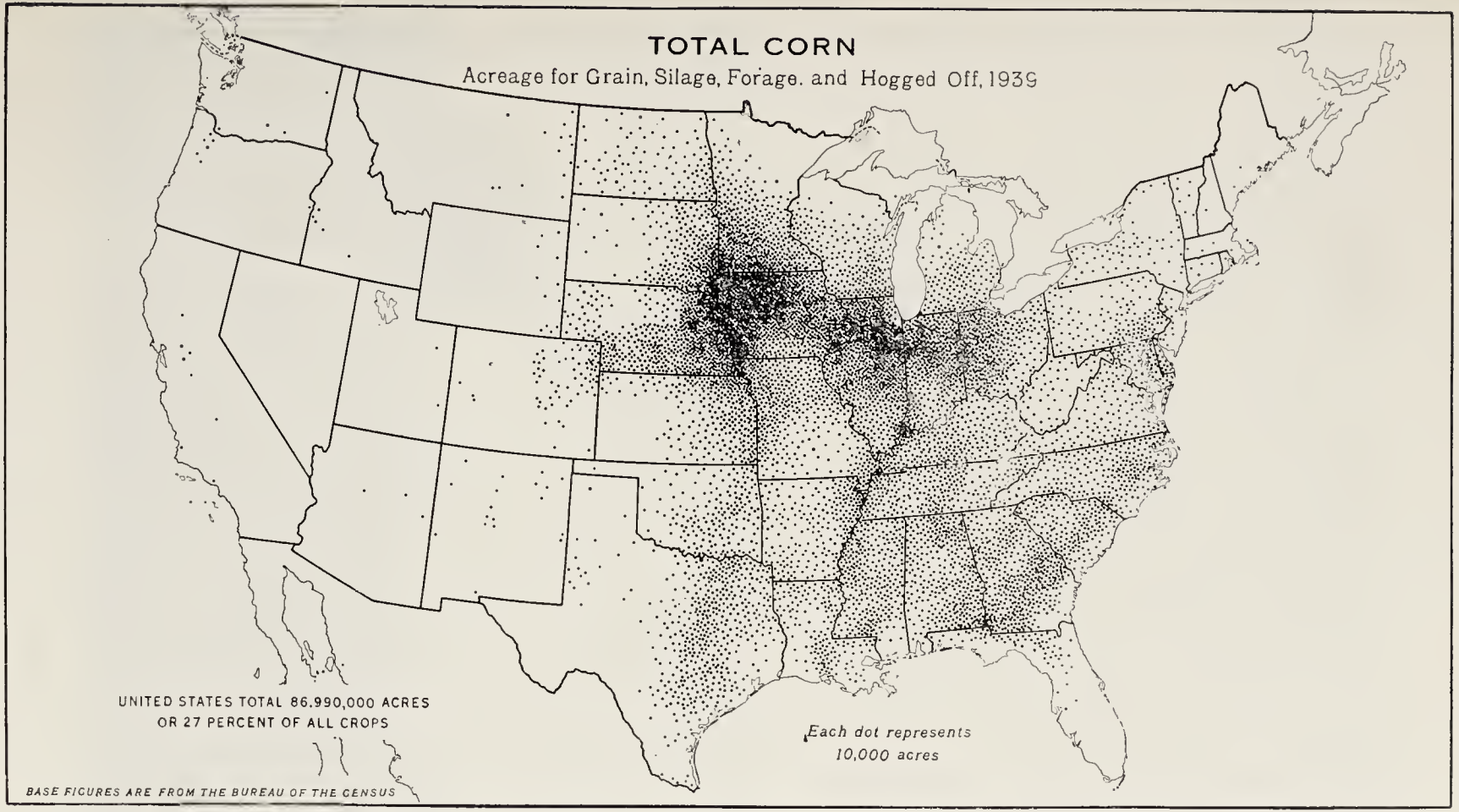


Figure 13. The Corn Belt is in the parts of Ohio, Indiana, Illinois, Iowa, and Nebraska shown with the most dots. In these parts the yields also exceed those obtained elsewhere. The South grows corn for food and feed, but normally expects to buy some corn from the cash grain markets. The distribution of hogs follows that of corn very closely. (Bureau of Agricultural Economics.)

differ greatly in the amount and kind of livestock kept. In general, there are more hogs and beef cattle per farm in the northern part of the Corn Belt than in the southern portion. While most of the cattle in the northern part are shipped in from other regions for fattening, they are frequently raised in the southern part because more of the land is in hay and pasture.

Corn frequently fails to ripen north of the Corn Belt in parts of Minnesota, Wisconsin, and Michigan, so that special, quick-maturing varieties are grown for grain. Much of the corn is grown for silage for dairy cows, and corn for grain tends to be replaced by oats and barley as a feed crop. In the west, wheat gradually supplants corn and hogs as the principal source of income.

The Dairy Areas. New York and New England and the Lake States (Michigan, Wisconsin and Minnesota) constitute the principal dairy regions. Dairy farming is the principal type in these States partly because of the relatively high value of the product in nearby

Figure 14. Hogs and cattle share the same pens on this Corn Belt hog-beef farm. The hogs pick up feed wasted by cattle. (U.S.D.A.)

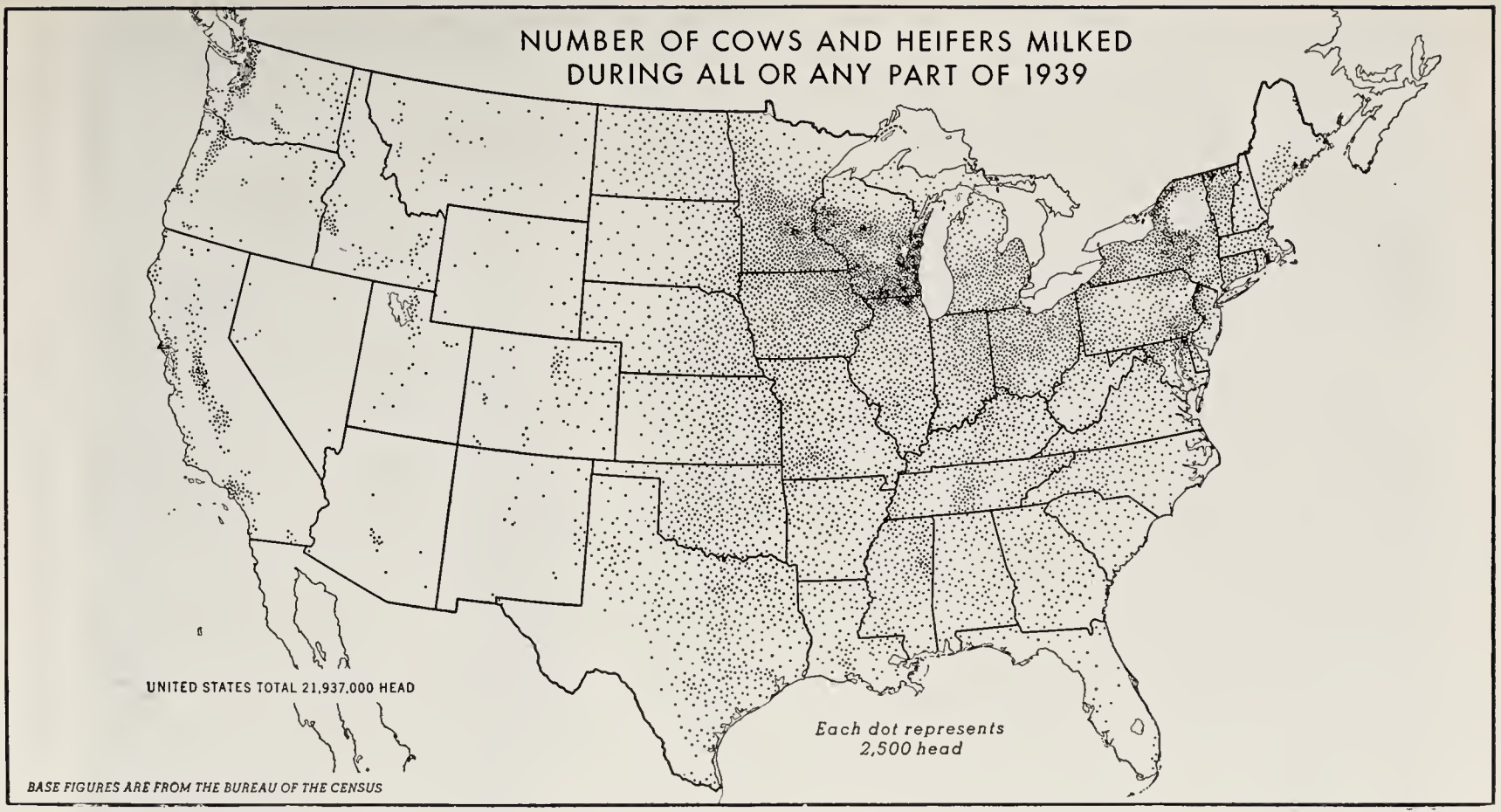


Figure 15. Cows and heifers milked in 1939. Although cows are milked everywhere for home supply and although about 3,200,000 farmers milked more than one cow in 1939, only about 600,000 sold milk enough to be classed as dairy farms. Most of these were located in the dairy regions, with small groups around every large city in other areas. The acreage of hay is distributed in about the same way as are cows milked. (Bureau of Agricultural Economics.)

markets, and partly because other crops than hay and pasture are difficult to grow in marketable quantities. In the Lake States butter, cheese and other manufactured products are made of the milk. The cropping scheme varies from that of the Corn Belt corn-oats-and-hay combination to the extent that more corn is grown for silage, and there is more emphasis on hay and pasture. Other stock and other crops are fitted around the dairy enterprise. In the Eastern sections milk production for city markets is the major farm enterprise. The sanitary regulations require much special dairy equipment, and much more work on the dairy enterprise than is required in the areas that produce manufactured dairy products. The herds are as large as can be supported by the pasture and roughage that can be supplied. Most of the grain fed is shipped in from the grain-producing regions. Under these conditions more cows can be kept than would be feasible if the grain feed were to be raised. It is much easier and cheaper to transport grain long distances than whole milk.

In the Northeast, production for markets known to be available

Figure 16. Good pastures are essential for economical milk production. (Extension Service.)

together with the nature of the soil and climate, has led to development of a great many specialty farms such as the potato farms in Maine and on Long Island, the poultry plants all over the Northeast, the cranberry bogs on Cape Cod, the blueberry farms in Maine, fruit farms in the Hudson River Valley and Lake Ontario Shore, tobacco farms in the Connecticut River Valley and in southeast Pennsylvania and the market gardens near all the metropolitan areas.

All through this region the availability of commercial and industrial employment has led to reduction of farming on many farms to a part-time level. Many places rated as farms produce the specialties that the interest of the resident owner suggests. His main source of income relieves the farm of the necessity of making every resource count. Some places have been in the same family for generations. They produce well when the current interest or need suggests farm work, or nothing at all when outside work interferes.

The Wheat Areas. The main wheat areas are in the Great Plains and the Pacific Northwest (in the eastern parts of Washington and Oregon and in Idaho). Elsewhere wheat is grown in the rotation because it is one of the more profitable of the small grains that are needed for nurse crops for grass and legume seedings. Adding wheat to the rotation also helps to distribute the work load throughout the growing season.

Wheat production in the Great Plains and the Pacific Northwest has reached a high degree of efficiency through the use of tractor power and seeding and harvesting machinery appropriate in capacity. In parts of these wheat regions yields are uncertain, so that large farms must be worked as efficiently as possible to assure the farmer income enough in the good years to carry him through the poor ones. Wheat farms of 800 to 1,000 acres are common, and many are much larger. To help insure steadiness of income and to provide a better distribution of work load, farmers in the more humid wheat areas have been adding feed crops and livestock. In such areas the farms are usually smaller in size. When irrigation water is available other types of farming are developed. In parts where rainfall is too short to assure a wheat crop at least on the basis of alternate years of wheat and summer fallow, range cattle or sheep supplant wheat as main sources of income.

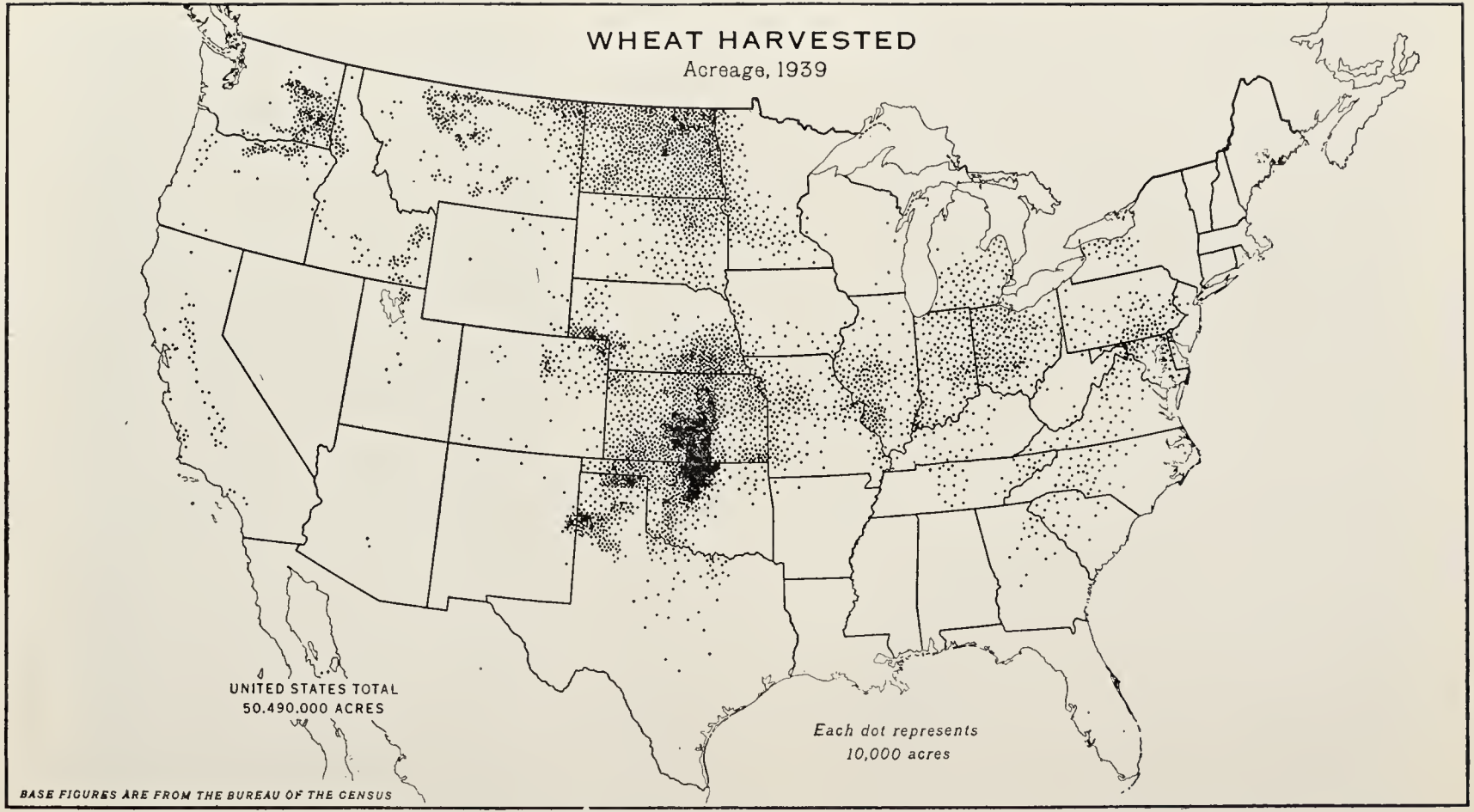


Figure 17. Wheat farms are located in the Great Plains, and Washington, Oregon, and Idaho where there is too little moisture to grow corn, and where wheat production is more profitable than grass with range livestock. East of the Great Plains wheat is grown as a part of the crop rotation. (Bureau of Agricultural Economics.)

The Range Area. The Western States and southwestern Texas have a vast expanse of grass land that is best used for cattle and sheep. The rainfall in this region is so low that only a small portion of the land area is used for crops. Without irrigation crops can be grown successfully only by the use of careful dry-farming methods to conserve moisture, including summer fallowing. There are numerous irrigated farming areas along the river valleys.

Farms and ranches include a wide variety of types and sizes. Most ranches produce either sheep or cattle, although some produce both. Some hay is raised on most ranches, and frequently a small acreage of grain is grown for feeding to livestock in the winter. During the rest of the year, livestock graze on the range, much of which is owned by the Federal and State Governments.

There are also many farms, which may be either irrigated or non-irrigated. The irrigated farms are usually general farms of 80 to 160 acres which grow such crops as alfalfa, sugarbeets, beans and potatoes and raise or fatten some livestock. Many of the cattle and sheep raised on the ranches are fattened for market on the irrigated farms or are shipped to the Corn Belt for finishing. The non-irrigated farms raise wheat, beans, corn and other crops. In this region non-irrigated farms must be large and above the average of the area with respect to soil and rainfall to be successful.

The Pacific Coast Region. From the highly productive orchards in lower California to the nonagricultural desert or mountain forest lands, the Pacific Coast region has wide diversity in types of farming. Different kinds of fruits, nuts, and vegetables predominate. The tendency is toward specialization in farming, to use fully the available resources that are best for the special crop grown. However, some growers raise a number of crops. There are some very large farms in the region. The producing areas are far from the consumers in the Eastern markets. However, the population of the West Coast cities has increased very rapidly and the nearby home market is becoming more important. The transportation costs eastward are so heavy that only fruit of the highest quality and off season vegetables can be sold in competition with areas nearer the market. If staple products are produced, costs must be low enough to meet successfully the competition from other areas.

Figure 18. A beef herd on the range. This is in one of the best range areas of Oregon; many of the cattle are marketed as grass-fat long yearlings, and two-year-old steers. (U.S.D.A.)

The General Farming Areas. South of the Corn Belt and in parts of Pennsylvania and West Virginia, and elsewhere in scattered areas throughout the country, we find farms that can be characterized as general farms. No one crop enterprise predominates and different kinds of livestock are kept on the same farm. The farm business is truly diversified. Sometimes such farms are found on productive soil, as in certain areas in Pennsylvania and Virginia. Quite frequently, however, the general farms are located in the poorer land areas, and they often represent a farm business too small to provide a comfortable living for the farm family. A large proportion of the output is consumed on the farm. The more strictly self-sufficing or noncommercial farms are usually concentrated in the poorer land areas. In such areas a man can get started in farming with very little capital but the potential returns are also limited.

Typical family farms in different types of farming regions are described in the next section.

EXAMPLES OF TYPES OF FAMILY FARMS IN DIFFERENT REGIONS

Tables III and IV give examples of types of family farms in different regions. The amount of land, labor, livestock and equipment that is used on typical farms for each type are given in broad outlines. Table III gives examples of farms with crops as major sources of income and table IV those with chief dependence on livestock. These are examples of *going concerns* that experience has proved to be reasonably satisfactory in size and scope for operation by a farm family in the areas where they are found. Usually there is considerable variation in size of farms of the same type even in the same locality. These tables show only one size for each type. A person just starting in farming should be able to make a modest living on farms smaller than these. The problem of getting started in farming on various types of farms is discussed in chapter 4.

On most of these farms a family with growing children can supply all the regular labor that is needed. Some additional labor needs to be hired for haying, harvest or other peak seasons unless more than the usual amount of family labor is available. The figures on income are average results for the prewar years 1935-1939. They do not show either wartime costs and prices or the discouraging stagnation of the drought-depression period prior to 1935. Able-bodied, intelligent farmers who had passed the apprenticeship stage, and were familiar with farming in the locality were getting such returns in the prewar period.

It should be noted that some of these farms are large in acres, without making the investment in land and buildings much larger than for some other types with a small acreage. The orange grove with next to the smallest acreage of land requires the greatest amount of labor of all the examples listed. The tobacco farm, with practically the same amount of livestock and acreage of cropland as the cotton farm has an income twice as great, but the investment on the tobacco farm is nearly three times that of the cotton farm. These are only a few of the many ways in which these typical family farms differ.

Table III. Examples of the farm business and income on family farms with crops as major enterprises in the years 1935–39

Item	Wheat farm, Winter wheat region	Cash grain, Corn belt	Cotton, Two-mules, Georgia	Bright tobacco, Virginia	Orange grove, California
Land in the farm....Acres..	605	212	82	134	20
Land cropped....Acres..	473	168	47	48	20
Investment in—					
Land and buildings....Dollars..	14,000	22,300	1,600	5,400	*40,000
Machinery and livestock....Dollars..	2,200	2,700	500	500	2,700
Hours of work, per year....	3,100	4,200	3,500	3,800	6,500
Livestock kept:					
Work animals....Number..	2	2	2	2	.....
Cows milked....Number..	3	4	2	2	.....
Other cattle....Number..	15	10	1	1	.....
Hogs....Number..	5	25	3	4	.....
Chickens....Number..	93	113	34	35	.....
Return from farming:					
Total income....Dollars..	3,325	3,775	750	1,575	6,250
Total expense....Dollars..	1,100	1,550	225	500	4,725
Net farm income....Dollars..	2,225	2,225	525	1,075	1,525

*Agricultural value of land and mature trees. Owner does not live on place, and there are no other enterprises.

Table IV. Examples of the farm business and income on family farms with livestock as major enterprises, in the years 1935–39

Item	Hogs and beef, Corn belt	Dairy, Central New York	Dairy-hog, Minnesota	Dairy on new land, Washington	Beef cattle, (90 cows) South Dakota	Poultry, (1,500 layers) Southern New England
Land in the farm.....Acres..	191	140	160	80	2,140	*10
Land cropped.....Acres..	127	53	109	30	200	.....
Investment in—						
Land and buildings.....Dollars..	15,000	4,900	14,500	5,900	14,600	6,500
Machinery and livestock.....Dollars..	3,800	3,200	4,300	2,000	7,200	2,500
Hours of work, per year.....	5,000	4,800	4,500	4,000	3,600	3,500
Livestock kept:						
Work animals.....Number..	4	2	5	2	7	.....
Cows milked.....Number..	4	16	12	12	5	.....
Other cattle.....Number..	†33	7	13	8	107	.....
Hogs.....Number..	42	3	9	5	4	.....
Chickens.....Number..	111	103	120	100	100	1,500
Return from farming:						
Total income.....Dollars..	3,650	2,850	3,175	1,675	3,700	6,100
Total expense.....Dollars..	1,950	1,625	1,525	775	2,450	4,600
Net farm income.....Dollars..	1,700	1,225	1,650	900	1,250	1,500

*This is sufficient for the hens. Such a business may be located on property of larger size or value, or both, on which other production could be arranged without much interference with the poultry business. Fruit is a common sideline for poultry farms.

†In addition these farmers usually buy cattle to fatten.

EXERCISES FOR CHAPTER 3

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. The particular type of farming practiced in any locality has developed primarily because (a) the first settlers organized their farms in that way; (b) of the amount of rainfall received; (c) farmers have a personal liking for the crops grown; (d) the products grown are the ones needed; (e) of the soil, climatic, and market conditions in that area.

2. In any area, the type of farming, once established (a) doesn't change; (b) tends to get more diversified as farmers learn to handle different crops; (c) changes with changing conditions; (d) tends to specialize on one crop as farmers find out what the one most profitable crop is.

3. The alert farm operator will (a) grow what he likes to grow; (b) grow what he can eat; (c) grow everything he can produce on his farm; (d) of the possible enterprises, consider the more promising and grow that combination which gives him the highest returns.

4. Cotton is the predominant crop in the South because (a) growing seasons are long and warm; (b) farms are organized to grow cotton; (c) cheap labor is available; (d) the demand for cotton is large.

5. Corn is the basis for the important types of farming in the Corn Belt because (a) there is a good market for corn in Chicago; (b) Corn requires from 130 to 150 days to mature; (c) corn produces more feed per acre than any other crop in this area.

6. Dairy production predominates in most of New England and the Lake States because (a) they are near large cities; (b) these areas were settled by people who were experienced dairymen; (c) markets for dairy products are good and yields of crops other than hay and pasture are not very high; (d) milk cows do best in cool climates; (e) everybody likes to milk a cow.

7. The specialized wheat areas have developed because (a) compared with other crops, wheat yields are good, and the cost of producing wheat is low; (b) markets are a long way off; (c) farmers

only have to work 3 or 4 months a year to raise a crop of wheat.

8. The Western range areas have been left largely in grass because (a) grass is needed for the cattle; (b) the grass was already there, so the ranchers didn't have to plant anything; (c) the low rainfall will permit the growth of grass but would make crop production uncertain; (d) nothing else will grow.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Physical factors influence the kinds of farm products raised in an area. Discuss the influence of (a) length of growing season; (b) temperature; (c) amount of precipitation; (d) distribution or precipitation; and (e) nature of the soil.

2. Discuss the importance of location in determining the kind of products that will be raised in an area, touching upon (a) the distance from markets; (b) the transportation facilities available; and (c) the effect upon location of the development of new markets and transportation facilities.

3. For an area with which you are familiar, or if not familiar with any area, for one of the farming regions discussed in the text, list the principal commodities grown, and give the reasons for the development of this particular type of farming, including the physical, location, biological, human, and historical factors that have been important.

CHAPTER 4

GETTING STARTED IN FARMING

GETTING STARTED RIGHT

It has been said that a young man's success in farming often depends on when he was born. Back of this statement is the general idea that there are good times and poor times in which to begin farming, and whether a young man gets started at a good time or a poor time depends on when he is ready to begin farming for himself. If a young man becomes of farming age, marries, and invests in a farm and equipment when land values and costs are abnormally high he may have difficulty in sticking it out should farm prices fall to a lower level. If the decline in prices is great enough to result in a severe depression he may lose his farm and all that he has invested in livestock and equipment. On the other hand, if he is ready to begin farming when operating costs and prices of farm products are favorable, he may have several years of successful operation in which to get established and to pay off his debts.

This means, of course, that there is nothing so important in getting started in farming as getting started right—started right with respect to the future as well as the present. To do this, it is important to buy the right kind of farm and the right livestock and equipment at the right prices. It is necessary to choose carefully, looking ahead at least a farming generation, and to make a down payment that is large enough to enable the operator to meet future interest and principal payments out of earnings, in good and in bad years. If land prices are high it may be advisable to rent land for a few years and wait for a more favorable opportunity to buy.

If the farm is bought right, organized right, and operated right, the farmer may very largely overcome the handicap of getting started at what might otherwise be considered to be the wrong time. But to do these things requires careful planning which takes into account a number of different factors. This chapter considers the factors that are related to the kind of farming; choice of location and of farm,

capital required to get started in buying or renting, and how to get the use of land.

WHAT KIND OF FARMING

Many people do not realize the great difference that exists in farming areas and in individual farms. Although individual farmers within each of the type areas mentioned in Chapter 3 have in general developed a high degree of uniformity in their farming, no two farms can be said to be exactly alike. Some have adequate buildings that are well located for the economic operation of the farm while others are under-built or over-built with poor arrangement for economical operation. Some are well fenced while others are poorly fenced. Even on the same farm there are frequently wide differences in soil, slope of land, and drainage.

To get started right the individual must first make up his mind as to what kind of farm he wishes to buy or rent. Some men are attracted by beef or dairy farming while others dislike livestock of any kind. Climate may be the deciding factor, or any one of several personal reasons. But even after the farmer has decided that he wants to go into some particular line of production, as fruit or livestock, he must satisfy himself as to what kind of fruit or what kind of livestock he wishes to produce. Fruits are not all grown in any one area of the United States, and the climate associated with the production of a fruit, or the amount of hand labor required, may be the deciding factor. There are several kinds of livestock and not many farmers can become expert in raising all of them. A choice must be made, and preferably at the beginning.

Besides the personal preferences, the adaptability of soil and climate to the farm enterprises, demands of the market, and the available local labor supply must all be considered. Often the amount of capital that can be invested will determine the size of farm and type of farming. The cost of equipment for some types of farming is much more expensive than for others. The amount of land needed varies widely. All of these things can be carefully studied and related to the resources of the person who is to begin farming. One of the most important considerations will be that of full-time employment for the operator and working members of his family. Several types of farming

lend themselves well to employment of growing children.

Consideration of soil and climate are especially important in the preparation of any farm plan. It would be unwise to plan a system of farming that would require the production of alfalfa on sour, wet ground, or the growing of peanuts in a cool climate, or the production of winter wheat where the winters are very severe. The crops to be produced and the livestock to be kept, and the methods followed in producing each of them must be suited to the locality or they will not succeed. Once the type of farming has been decided upon it will be necessary to locate where conditions are favorable to that type of farming if the greatest success is to be made of the venture. This results, of course, in considerable migration and frequent shifting about of farm families. Those who are free to choose the kind of farming they wish to follow can avoid much of this shifting by looking into the matter thoroughly before settling down. Those who are not free to move and must farm in the home locality may not always find a farm that satisfies their first choice, and may have to be satisfied with a second, or even a third choice. Some of the advantages and disadvantages of different types of farming are indicated below, from the point of view of getting started in farming. At this point it is desirable to review the discussion on types of farming in Chapter 3.

Vegetable gardening. Truck farming, or the production of vegetables, is a common type. This type of farming is intensive, does not require a great deal of land and uses a relatively large amount of hand labor. Several vegetable crops require 200 to 300 hours of labor to grow, harvest, and market a single acre. Much of this is hand work, and some operations can be performed well by women and children. Good land that can be easily tilled is required. Vegetable gardening can be carried on successfully on from five to ten acres of land per family, provided it is located properly and is highly productive. Such land often sells for $400 to $1,000 per acre. Many truck crop farms, however, contain considerable additional acreages for pasture, and other cash crops.

Vegetable farming requires considerable business ability because the marketing problems are numerous. Net income from truck crop farming is frequently very high per acre but it is less certain than for some other types of farming. Among hazards that must be coped

Figure 19. Deep, rich soil is desirable for intensive vegetable farming. (Extension Service.)

with are market gluts, insects, and unfavorable weather. One of the advantages of truck farming is the quick return from the capital invested, because many garden crops mature within six weeks to three months from the time they are planted, and are usually sold for cash. Outdoor gardening does not offer employment in the North throughout the year and frequently is carried on in connection with other farm enterprises, such as poultry. In some sections of the South truck farming can be carried on through a large part of the year.

Fruit growing. Fruit growing, like vegetable growing, is an intensive type of farming calling for a high per acre investment, and requiring a large amount of labor per acre. One family can handle from five to forty acres depending on the kind of fruit produced, although it may be necessary to hire much of the harvesting labor. Few types of farming call for greater skill, more attention to detail, timeliness in performing operations, or more business ability than

does fruit growing. The incomes that can be obtained from fruit farming vary tremendously and the selection of the orchard site is of very great importance. Many orchards have been developed to productive age that cannot be made to pay because the soil, or climate, or air drainage, are not suited to orcharding. No one should attempt to buy an orchard, or to plant and grow one, without expert advice. If the wrong soil is selected or if the orchard is planted where damaging frosts or freezes frequently occur much time and capital will be lost.

Another important consideration is the time required to raise a fruit tree to bearing age. Little production can be expected from apples, pears and cherries before the trees are six years old, and as many as 12 years will be required for some varieties. Little production can be expected from oranges or grapefruit until the trees are six or more years old. Peaches usually bear well in their fourth year, and sometimes do well in their third year. Blackberries and raspberries bear good crops in their second year after planting.

In some sections fruit farming can be advantageously combined with other farm enterprises, such as vegetables, poultry, or dairying.

Figure 20. A young peach orchard that is well located and well managed. Such trees bear considerable fruit at 4 years of age and will continue to bear good crops for another 10 to 15 years. (Bureau of Agricultural Economics.)

Where this is done, more land, and often more buildings and equipment will be required. Such combinations require large amounts of farm labor, especially at harvest time. For example, apples, peaches, and pears require from 100 to 200 hours of labor per acre of orchard, and in areas of heavy production the range will be from 300 to 600 hours per acre. Oranges and grapefruit require around 150 hours per acre; grapes, about 200 hours per acre; and blackberries and raspberries, from 250 to 600 hours per acre. Strawberries in some areas require as high as 1,000 hours per acre. On an average, about one-half the hours spent on an acre of these fruits are for harvesting the fruit. In general, children and women can work to advantage in the harvest of fruit crops.

In any event, fruit orchards should be large enough to make it worthwhile to have desirable tillage and spray equipment. A few straggly trees of various fruits, scattered here and there, are breeding places for diseases and insects, and frequently are not worth the effort. However, when a power sprayer is available for small jobs (either on a custom basis or cooperatively owned) a few acres of well chosen fruits may be made an asset to the farm business.

Other cash-crop farming. Crop systems of farming that are built around the production of some major crop, such as cotton, wheat, corn, or tobacco, generally are carried on in a more extensive way than are specialized vegetable or fruit farms. As indicated in Chapter 3, the typical family cotton farm in the Southeast consists of 40 to 50 crop acres on which will be produced three to six bales of cotton, and several acres of food and feed crops. In the High Plains of Texas, a family farm may consist of 160 acres of crops, with as much as 100 acres of cotton and the rest in grain sorghums and other feed crops. The small eastern units are frequently operated by share tenants who need little but their own labor to get started. Mules and small, inexpensive equipment are used. In the Texas area some labor will have to be hired for harvesting the cotton, but the use of tractors, gang listers, and two- or four-row cultivators enables the family to do the other work. Women and children often help in cotton chopping and picking, the two rush jobs in growing cotton. It is necessary in most areas, aside from those of low rainfall to use considerable commercial fertilizer in the production of cotton.

Wheat farmers in the Great Plains region, and in some areas of the Mountain and Pacific Coast States, farm large acreages that are well suited to a high degree of mechanization. In some areas where the land is summer fallowed and wheat is grown in alternate years, a family with tractors, gang plows, large harrows and drills, motor trucks, and a large combine can operate a wheat farm of 1,000 to 1,500 acres. This type of farming requires a large investment in equipment. Although land values in these areas are relatively low per acre, a large acreage is needed to provide a living for a farm family. It is carried on largely under subhumid conditions, and is somewhat risky because of crop failures or frequent low yields. High incomes are obtained in good years. In other areas moisture conditions are better, and it is possible to combine other crops and livestock with wheat on family farms of 300 to 600 acres.

Tobacco is an intensive crop and requires a great deal of hand labor. Five acres per family is about all that can be handled along with other farm work used in producing feed crops and caring for some livestock. Tobacco growing takes a great deal out of the soil, and particular attention must be given to rotations and other means of keeping up the soil productivity. Commercial fertilizers are used in large quantities and are absolutely essential to the economical production of some types. Tobacco growing pays well when properly conducted but requires a high grade of skill and experience that can be gotten only by working with the crop for several years. In the tobacco areas, food and feed crops can be grown along with the tobacco enterprise for farm maintenance as well as for sale. A relatively small investment is required for several kinds of tobacco farming even if the land is owned. Many tobacco farmers are share tenants.

Mixed Crop and Livestock Farming. In many sections of the North, and to some extent in the South, mixed crop farming and livestock raising is carried on. The production of legume crops in the rotation aids in the maintenance of crop yields, and especially where these crops are fed to live stock on the farm and the manure and excess roughages are returned to the land. Mixed farming is frequently found in areas where there is considerable pastureland that is rolling or broken, and where only a part of the land is suited to the production of tilled feed or cash crops.

Figure 21. Level fields for crop production, rolling pasturelands, and buildings for cattle, poultry and hogs form the basis for a well-balanced livestock and crop farm. (U.S.D.A.)

General crop and livestock farming is adapted to both large and small farms, although considerable acreage or the purchase of concentrate feeds are usually required if any large volume of business is obtained. It is one of the less spectacular types of farming, but general farming frequently insures more stability in income and less risk than accompanies highly specialized types of farming which involve large investments and cash operating expenses. Under this system the average farm family can care for from 80 to 300 acres of land, depending on its productivity, and the amount of land in pasture. It may be necessary to hire some additional labor at harvest time. In most of the good farming areas a relatively large investment is required for land and buildings.

Livestock farming. Livestock farming includes the production of beef cattle, sheep, hogs, dairy cattle and poultry, and their products. In some places income from one kind of livestock predominates,

largely to the exclusion of all others, such as specialized dairy or poultry farms. In other places, conditions are such as to encourage a combination of two or more kinds, such as hogs and cattle, or cattle and sheep. In commercial corn producing areas like the Middle West, livestock farmers usually produce their own corn and hay for feed, while in the eastern dairy and poultry areas farmers usually buy a large part of their concentrate feeds. Cattle and sheep ranchers in the range country use public and private range lands, grow their own hay and buy the protein supplement feeds.

Figure 22. Level corn and hay lands like these in central Iowa, are well suited for the production of crops for the fattening of cattle and hogs. (U.S.D.A.)

Stock raising often calls for a relatively large investment in buildings and in livestock. It carries considerable risk and requires year around labor and management. In order to be profitable the stock must be properly handled and well sold. If management is good, livestock raising is one of the most stable and remunerative types of family farming.

Dairy farming is looked upon as providing a sure income when conducted in the vicinity of good markets. Cows of high productivity are desirable, and with good management, are remunerative. In the commercial dairy areas a farm family can take care of 15 to 20 cows together with replacement heifers and calves, and also produce the roughage crops and some of the grain crops with which to feed the dairy herd. Farms having this number of cows will range in size from 80 acres to 300 acres. A large part of the land will be in pasture and hay. Some acreage also may be in grain for sale, or, perhaps in some other cash crop such as potatoes, or peas for the canning factory.

Commercial poultry farms for egg or meat production are frequently carried on in an intensive manner. Little land is required when all of the feed is bought. Investment in buildings and in poultry runs high, and risk from disease or market changes is great so that the inexperienced should begin in a modest way, and gradually work into a larger business. As a sideline to the production of other products, poultry is one of the most desirable enterprises. It is a means of enlarging a business that is too small to keep the family busy or to return a satisfactory income, and is an excellent means of marketing farm-grown grain crops.

Oddities in Farming. Many inquiries are received each year by State and Federal agricultural agencies about unusual or odd kinds of farming ventures. These are unusual in the sense that they are generally of minor importance when compared with the major types of farming, and are tied closely to special market outlets and to restricted local production conditions. They require little land, and for the most part can be started in a modest way with a small amount of capital. They appeal to those who are venturesome or uninformed, and who wish to farm without the arduous task of tilling fields and the harvesting of crops raised thereon.

The fact that neighboring farmers have not veered from the beaten path of stable lines of production is, sometimes, merely an added incentive to the unwary for undertaking a new thing that everyone else seems to have overlooked. This is not always the case, of course, for there are unusual circumstances under which unusual farms, or farm enterprises prosper. But for the most part they are risky if

undertaken on a large scale, and of little income-producing ability if too small in scope. For most farm people the sort of farming ventures referred to below must remain sidelines, and only occasionally become major sources of income. In this way any one of them may become a desirable enterprise in a well rounded farm production plan if physical and economic conditions are suitable, and if the necessary skill is available for production and sale. Some of them, beekeeping for example, can be established to advantage on some part-time farms.

The taking of *game and fur bearing animals* has a strong appeal to many farm operators and their sons. Thousands of farms have been bought primarily because they were cheap, had a small stream running through them, and consisted largely of woods and pasture, much of which had grown up to brush and briars. Basically, they were well suited for hunting and trapping but the actual money income from the game and fur taken on such farms generally was of little consequence.

Figure 23. Restful scenery in the summer, some hunting and trapping in the winter, and only limited possibilities in farming. Contrast with figs. 21 and 22. (U.S.D.A.)

If the main object of the farm operator is to carry on a farming business, this sort of setting will not do, unless it is merely incidental to a sizable acreage that will produce crops and livestock. There are many instances, however, in which wild game and fur bearing animals on farms have supplied sport to the farmer, his family, and his friends, and have enabled the farm boy to earn some spending money.

Wild animals, especially the fur bearing species, have been brought under control in captivity. *Foxes* have been the most adaptable species. Although not much land is required, nor a large investment in buildings and out yards for the beginning of such an undertaking, the breeding stock is generally expensive and the risks from ailments caused by confinement are quite high. If the enterprise is carried on under conditions that are similar to the natural conditions under which the wild animals live, they will breed well. They should be protected from their natural enemies. Large incomes were made in the early days of fox farming by the sale of young animals for breeding purposes. As the industry grew, greater dependence for income had to be placed on the sale of pelts. Some such undertakings have proven very successful, but many others have failed. Such ventures should be started only after securing advice from public officials who are acquainted with the business.

In Louisiana, the trapping of wild *muskrats* is a large enterprise. The sale of pelts amounts to several million dollars annually. Muskrats are also caught in a more limited way in many streams and swamps in various parts of the country. On some farms, the muskrat enterprise brings in considerable money, but for the most part the trapping of these fur bearers in their natural environment is only an incidental diversion from the main money-making farm enterprises.

Much has been written about the production of *rabbits* as a source of income. It is true that a start can be made with a few breeders. The life cycle is short and in many sections the necessary feed and equipment are relatively inexpensive. The fur is used for linings and for felts and the meat is salable in a limited market. As in the case of fox farming, most money probably has been made by raising breeding pairs for sale. A small rabbit enterprise on the farm requires little land, little investment in buildings, and may be looked after by the farmer's children.

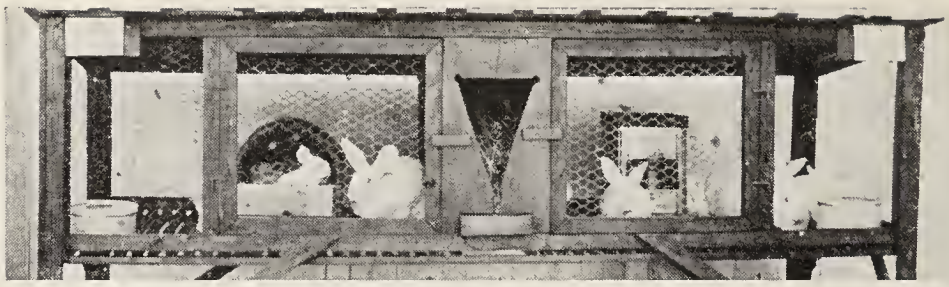


Figure 24. Inexpensive rabbit hutches serve very well for the production of rabbits as a sideline in farming. (Fish and Wildlife Service.)

If, however, the enterprise is large in scope, perhaps being the major source of income on the farm, the venture should be undertaken only aftr securing advice necessary to the planning of the rabbit enterprise and to the feeding and caring of the animals. A great deal of money can be lost quickly in a large rabbit enterprise if prices fall sharply or if losses from parasites and disease become heavy.

Large numbers of small animals are used by research institutions. Tales of the high rate of reproduction of *white rats, white mice,* and *guinea pigs* have inspired many people to undertake their production. This type of endeavor is bound to be risky, particularly when undertaken by those who are unskilled in the handling of such animals. Disease is always a factor to contend with, and unless a definite market is assured production of such animals cannot become an important source of income. Definite arrangement should be made for the disposal of the animals before such an enterprise is undertaken, even in a limited way. On commercial farms of almost any recognized type such an undertaking usually cannot be expected to be more than incidental to the main farm operations.

In some sections of the country, local conditions are suited to the production of *frogs,* or of *goldfish.* Frogs are usually sold locally to restaurants and hotels and goldfish are shipped long distances. Here again special circumstances must determine the economic possibility of undertaking such enterprises, and even then they usually should be considered as merely a part of a well-organized farming plan.

Bee Farming is not unusual in many sections of the country. In fact, honey production is one of the oldest lines of agricultural effort and is profitable for the beekeeper who understands bees and their feeding. A start with bees that costs little may yield honey enough

for the family but new keepers of a few hives should not expect any considerable quantity of surplus honey (surplus honey is honey stored by the bees in excess of their own needs) that can be marketed. Bees are a desirable means of pollination in apple orchards and are sometimes rented for that purpose. There are many large apiaries in the United States, but those of small and medium size predominate. The business organization of a small to medium-sized unit is relatively simple. The operator does most of the work, and few out yards and no important expenditures for buildings are needed. This type of endeavor is frequently carried on in connection with some other activity, either farming or some other part-time job. The large apiaries require hired labor, considerable equipment and a systematic arrangement of out yards and other production facilities.

The high prices paid for *squabs* and the rumors of the ease with which they are produced and the high prices at which they sell have caused disappointment to those who went into the enterprise without definite advice from responsible people. Prices are high because the birds are scarce, and to an extent, a delicacy. The birds are scarce because they are hard to raise in large quantities.

The rearing of *carrier pigeons* has been conducted by fanciers and these, too, command what seem to be high prices. This type of undertaking can be carried on under favorable conditions in a limited way as a sideline in farming. One should always be sure of what is involved in the handling of such an enterprise and in the possibilities of a favorable market for the birds.

Milch goats have been suggested as money makers for small places. They can be kept on places that are too small for a cow. Goat milk is used largely by babies and invalids. Milking goats of good strains bring very good prices. In Europe goats are handled and milked as our farmers handle and milk dairy cows. In this country the production of goat milk has made little headway commercially and the enterprise is naturally restricted to localities where conditions of production and sale of product are found to be satisfactory.

Near St. Louis, Missouri, and in Chester County, Pennsylvania, cultivation of *mushrooms* began in a small way about 40 years ago. Other commercial localities have developed since. Where conditions are just right, production has been profitable although there have been

years when the production was so large that prices were low. Dark, temperature-controlled cellars, plenty of horse manure, and pure seed or spawn are essential. From an insignificant sideline, dairy farmers in Chester County, Pennsylvania, have developed mushroom production along with dairying into a year around specialty that has, on the whole, been successful. A sideline of mushroom growing is the sale of manure (after it has been used one season on mushrooms) to commercial channels for application to golf course greens and lawns. Although little space is required for a fairly good sized sideline of mushroom production this space must meet rigid requirements and may be rather expensive.

Ginseng is a perennial herbaceous plant native to this country. At one time it was found in considerable quantities in many hardwood forests from Maine to Minnesota and southward in the mountain regions to the Carolinas and Georgia. Ginseng has little domestic value, but is prized highly in China. Trade in ginseng roots has been so extensive that wild sources are much depleted. Ginseng cultivation has proved successful in the hands of those who know how to grow and harvest the plant. Many persons have been disappointed because of the slowness with which the roots developed, as about six years after the seed is planted are required to produce marketable roots. Although prices have risen with depleted natural supplies, ginseng culture affords an opportunity for profit to only a limited number of well qualified growers.

Rhododendrons and other wild plants grow profusely in some parts of the Blue Ridge Mountains and other areas where conditions are similar. These plants are used for landscape gardening and have furnished considerable income to those who gathered them. The finding of such plants, and the cost of moving and selling them, has become a fairly satisfactory business for some farm families. In some sections these plants are propagated in nurseries, and are sometimes grown as a sideline to farming. Christmas trees and various forms of green plants are gathered and sold from natural growth, and in some sections of the country they are grown commercially from plantings. Ferns grow well in many woods but have proved a disappointment to most folks who attempt to make money by gathering and selling them.

In some sections of the country the *entertainment of tourists and vacationers* has been a profitable way of combining personal services with the disposal of farm products and the use of large, spacious farm homes that were built in the early days when materials and labor were cheap.

Near large cities some farm families have been able to add to their incomes by caring for *pet animals* for city folks who could not take their pets with them on trips, or at other times. These places have to be equipped to give the animals proper care. Sometimes the business is carried on in conjunction with breeding or with veterinary services. Big money is more likely to be spent than saved in raising fancy pets.

CHOICE OF LOCATION AND OF FARM

For the beginner, the type of farming he wishes to follow is largely a matter of personal choice. Once this is decided the next step is to locate a farm. City persons who take up farming for the first time often wish to introduce novel crops or kinds of livestock wherever they decide to farm. They frequently consider some of the oddity enterprises mentioned in the last section. Often heavy losses are taken before experience is gained or the enterprise abandoned. In general, the greater success is assured by sticking to those enterprises which experience has shown can be carried on profitably in the area in question. If the beginner is primarily interested in climate he should select an area from this standpoint and then follow some type of farming that has proved profitable in the locality. On the other hand, if he wants to follow some given line of production he should select an area where that line is well and profitably established.

In choosing a particular farm several things aside from type and size of farm should be considered. Topography and soil, arrangement of the farm, water supply, roads and markets, and social and economic considerations are important. The county office of the State Agricultural Extension Service (usually known as the county agent's office) is often able to give information on soil and farming conditions in a given county.

Topography and Soil. Many people do not realize the importance of the lay of the land and of the soil as factors in successful farming. Some farms have much land within their boundaries that is practically

worthless from an income standpoint. Streams, swamps, and stony areas that are not even suitable for pasture may occupy a large part of the acreage. A farm of 160 acres of good tillable land that costs $20,000 may be a real bargain compared with a farm of the same size at half the price but which has large areas of land that are useless for farming.

Some lands that are being cropped today are so steep or rough and broken that they are difficult to farm even with the simplest farm tools.

Figure 25. Cropping of steep hillsides like the one in the background requires much labor for the amount of product obtained. They usually erode severely, rapidly decrease in productivity, and finally are abandoned for crop production. (Bureau of Agricultural Economics.)

Aside from the problem of soil maintenance on such lands, there is the problem of efficient farm operation. For example, methods used in growing corn on many steep hillsides require from 50 to 60 hours of labor per acre, whereas on the level fields of the Corn Belt, where modern machines are used, the requirements are only 10 to 15 hours

per acre. Furthermore, production per acre is much greater in the Corn Belt than on the hillsides. A farm with any considerable amount of this kind of land cannot produce at low cost. A seemingly low price is often too high for such land. In other words, the value of the farm should be based upon the amount of the productive acreage it contains and not upon the total acreage. Fields, even of good soil, that are flooded in some years are limited in their agricultural use, and should be valued accordingly.

The physical characteristics and condition of farm soils are important. If the soil is a good productive type, deep, and well drained, its productivity can be rebuilt if it has been mismanaged. But this takes time and costs money directly or indirectly. In fact, the economical rebuilding of soils is something that frequently can be fully learned only through years of experience. State and Federal agencies with local offices usually in county seat towns are now prepared to furnish advice and practical assistance to individual farmers in soil building and conservation work.

The prospective farmer should distinguish between those soils which are of a poor physical condition because of improper management and which can be restored by good management, and those which are naturally of a poor physical condition and cannot be economically conditioned for production. One important thing to consider is depth of soil. One should never buy a farm without carefully examining all of the land area for soil depth. Even in the same field, great variation frequently will be found in the depth of the soil. Shallow soils may be caused by severe erosion or they may be underlaid by ledges of rock, shale, or impervious clay which prohibit proper drainage and prevent the plant roots from extending to their desirable depth. Such soils frequently will not respond properly to the use of fertilizers and soil-building practices, and may be a liability rather than an asset. They are too wet in wet seasons and too dry in dry seasons and cannot be properly drained. These conditions are not always easy to detect from outward appearance. They can be detected, however, by the use of a soil auger, but only if numerous borings are made. If these conditions are general characteristics of the region, experienced persons can detect them by an examination of trees and other plant growth natural to the land.

The texture of the soil is important. Extremely heavy clay soils, commonly referred to as gumbo, are slow to warm up in the spring, frequently are poorly drained, and are hard to plow or cultivate. Such soils are likely to be too cold and wet to permit planting at the proper time, and too wet to cultivate when cultivation is needed. Very sandy soils are easy to work and are well drained as a rule, but they are generally low in fertility, tend to blow badly in some areas and, unless they are underlain with a heavier subsoil, will not hold enough moisture for proper plant growth. For most crops the desirable soil is a loam, that is, a mixture of sand and clay particles.

Some soils are improperly drained in their natural state, but can be artificially drained. Thin soils, however, are frequently difficult to drain, chiefly because they are not deep enough to allow the tile to be put far enough below the surface. The topography of many farms is also such that good drainage is impossible because a suitable outlet cannot be had without excessive expense. Many fields are wet during certain seasons of the year because water is brought to the top of the field by rock outcropping or by layers of heavy clay or hardpan that lie near the surface. This is particularly true in some areas where the land is hilly or rolling, and is difficult to correct by drainage.

It is difficult to determine merely by looking at the crops growing on a field at some particular season whether the field needs drainage. Sometimes the best looking fields, even those with considerable slope, that appear to be well drained are very poorly drained. This is particularly true on ridges, or level areas on the top of hills, or in rolling districts where the soil is thin because it was that way originally or because of erosion.

Many fields in all parts of the United States have been severely damaged by erosion. Deep gullies cut up the fields through which large amounts of soil and fertility run off and are lost. Frequently the gullies are so deep and numerous that the cropland is all cut up into small patches that are difficult to farm with modern machinery. Some fields are so badly eroded that they have no value even for pasture.

Erosion is especially prevalent in the Southern and Great Plains Regions in which large quantities of the top soil are carried away by rains and winds, with little or no gullying. Proper practices and

Figure 26. Continued neglect of this land has resulted in the disappearance of all grass. The reclaiming of such land for pasture will require considerable time and much labor. In its present condition it has no value for farming. (Bureau of Agricultural Economics.)

systems of farming will hold soil losses from erosion to a minimum, but the beginner should make sure of the damages that have already occurred and the practicability of making such lands productive at reasonable costs.

Improvements. Farm improvements, such as buildings, water supply, fences, and orchards vary greatly on individual farms. Moreover, the need is not the same on all types of farms. For example, building and fence needs and costs are much greater on livestock farms than on grain farms. The combination and arrangement of farm improvements should be carefully examined and appraised in view of the kind of farming to be carried on. The remodeling of old buildings to fit into a particular system of farming may be quite expensive and not always entirely satisfactory. On the other hand, remodeling is quite acceptable under some circumstances, and many old buildings can be temporarily used to excellent advantage until new ones can be built.

Proper balance between investment in buildings and productive land acreage should be watched for. Expensive dwellings, barns and out-

Figure 27. Installation of numerous windows and a floor in the haymow turned this barn into a good three story poultry house. (U.S.D.A.)

buildings out of proportion to size and earning power of the farm cannot be paid for and maintained in good condition out of farm earnings.

A dependable source of good farm water for home and livestock use is a valuable asset on any farm, and absolutely essential on most. In irrigated areas the water supply for crops is very important. The source of water may be a stream, a well, or a combination of the two. Perhaps water from a stream will be held in a reservoir until it is needed. Since water is limited in irrigated areas, the share that can be used by any farm is generally established by law, and a farm is said to have a water right. Anyone interested in an irrigated farm should examine its water supply carefully to make sure that sufficient water will be available for the crops he intends to grow and that it will be available at the particular time of the year when it is needed. He should also keep in mind that some soils need more water than

others to produce the same crop, and that water requirements vary widely for different crops.

The value of a good woodlot should not be overlooked. Orchards should be appraised carefully. A young orchard of good varieties may be quite valuable if it is located on deep well-drained soil with sufficient air circulation to reduce the likelihood of frost damage. If it is on shallow soil with shale or heavy hardpan close to the surface, it may be a liability. Old orchards should be inspected carefully for stand and condition of trees. An orchard now in its prime may be of no economic value in five to ten years, depending on the kind of fruit and the orchard's location.

Grain and hay supplies bought with the farm should be examined for quality, and carefully measured for quantity. Farm machinery and equipment offered with the farm should be inspected to see that they fit in with the proposed type of farming and are in good condition.

Social and Economic Considerations. Since farming is a way of life as well as a business, an important consideration is healthful home surroundings. Climate, drainage, elevation, and even the kind of soil, all have something to do with the healthfulness of a particular home location. If stagnant water stands on the land the danger to health may become serious. A well-drained soil that can be easily tilled is more likely to be healthful. Some home surroundings that are in bad condition can be made attractive and healthful. The real problem is how this can be done and at what cost, and whether in the end it would not be more satisfactory to buy somewhere else, or to build a new home on a more desirable spot.

In most farm communities, farmers and families exchange work with each other and have interests in common. On the other hand, the nature of the farming business in some areas is such that each farm family becomes rather independent and gives little attention to community social problems. The new settler should take these things into consideration, always bearing in mind that his children will go to school with his neighbors' children and that they will meet in various other places. He will want to be sure that the surroundings are such that his children will grow up in the proper environment and enjoy their work and their surroundings. The character and interests of the people in the farm neighborhood, therefore, should be

looked into carefully before the farm is purchased.

Schools, churches, and social centers are also important, especially if the farmer is a young man with a family. Good roads and centralized school systems have brought many farm families within useable distance of good schools and churches. There still are, however, many neighborhoods where these facilities are undeveloped. Modern hospitals located in cities or towns are only an hour or less away from farm families who are located on good roads, but many hours away from families living in remote places.

It is generally believed that most farms in the United States change hands at least once in every 30 years. Many of these pass from father to son and are kept in the family. But there always has been a decided speculative tendency among those owning farm lands, and this results in much buying and selling of farms. The beginner should realize that there are several reasons why there are always

Figure 28. Good roads and automobiles enable country folks from miles around to share this religious meeting place with village residents. (U.S.D.A.)

persons who wish to sell him a farm. He should also remember that he may want to sell his own farm sometime and therefore should buy one whose productivity can be maintained, and one that will be wanted by others. Profitable farms of full family capacity are generally in considerable demand. Large farms are in limited demand because only a few operators have the amount of capital necessary for their purchase and operation.

Much has been written about one-crop and diversified systems of farming. It should be recognized at the start that farms, like people, are limited in the diversity of their output. No one can just settle down on any piece of land anywhere in the United States and do all of the things he may have dreamed about. Many skills and considerable knowledge are required in farming; and most farms are limited by the combination of soil, climate, and market outlets in the number of enterprises that can be undertaken.

If the farm is so located that it is economically desirable to produce only one product for sale, one should make sure that the product has economic stability from a long-time standpoint, and that its continuous production will not destroy the productivity of the soil, or bring about disease conditions that make its production no longer feasible. If temperature or rainfall is such that only a limited number of crops can be successfully grown and ripened, it may be impossible to have a crop rotation essential to good farming. It is desirable in the beginning to determine the extent to which climatic conditions, such as rainfall, drought, late spring and early fall frosts, hail storms, severe freezes, fogs, and strong and hot winds, actually limit the extent to which a good, diversified system of farming can be developed.

Many farms in this country were cleared and paid for largely out of sales from the farm. They supported two or three generations of farm families, and were then abandoned because they were worn out. Many of these were diversified farms, not single crop farms, but the soils when first cleared were shallow, thin soils. Good cropping systems may have been followed in the beginning, but gradually certain crops had to be dropped out of the rotation because they would no longer produce well. In the end nothing would do well enough to support a family. On the other hand, many farms have been worked for many generations and are now as productive as in the beginning. They

had good, deep soils in the beginning and have been well managed. They are the farms that will support a family for the next generation, and still be as productive as they now are. In general, this kind of farm has deep, fertile soil. Frequently it grows a diversity of crops, and large quantities of grain and forage crops are fed to livestock, and the manure returned to the land.

Figure 29. These lands in their virgin state were suitable enough for crop production to induce farmers to clear and cultivate them. After a while, many of the fields were abandoned for crop production because of lowered yields. Farms in such areas can be bought for little money, but the buyer must not expect to receive more than he pays for. (U.S.D.A.)

Soil, topography, climate, and markets determine changes that can be made in farming systems as economic conditions change. If certain crops are no longer profitable because of expansion in more favorable regions, or because of diseases or insects, drastic changes in farming may have to be made. The farm that provides several desirable choices may continue to do well under changing economic conditions, whereas the farm that is greatly restricted in farming possibilities may have to

be abandoned. An important question, then, is the extent to which the farm in question can be adapted to future economic changes. For example, can the beef-cattle farm be converted into a dairy farm? Can the dairy farm be made over into a sheep farm, or a hog farm? Can the fruit farm be made into a hay, grain or livestock farm? Can some other cash crop be economically produced in the place of peanuts, or of tobacco, or of cotton? Will the present set of farm buildings serve the future farm needs?

Figure 30. Mute evidence of economic change. This house of solid stone was needed in 1800 when more families were used to operate a given acreage. With larger farms and more machinery fewer houses are needed now. (Bureau of Agricultural Economics.)

The history of American agriculture provides many illustrations of major agricultural changes as the country was being developed. Some of these changes are of recent origin but many of them came along as our pioneer land settlements moved westward. Even at this late date many farmers are handicapped by mistakes made by our early

farm settlers. Men selected farms and constructed buildings that were all right at the time, but as market conditions changed they realized that their farms were not suitable for reorganization, or for adjustment to new conditions. The Eastern States are strewn with run-down farms that cannot be adapted to present-day conditions of high labor costs and mechanization. This is one of the main reasons why some farm lands in the Eastern States are so low in price. The same mistakes have been made in our Western States. Many farms there were selected for some special type of farming, but were found to be too small to be efficient or profitable when a more stable or diversified business became necessary. No section of the United States has been free from this kind of mistake in farm selection and planning.

GETTING ESTABLISHED

Many farm boys work at home, and then, alone or with the help of their family, operate their own farms, either as tenants or owners. The three steps, hired hand, tenant, and owner, represent what is generally referred to as *the agricultural ladder*. It is the progressive means by which many get started in farming. The greatest obstacle to climbing this ladder is getting the use of land. The young man and members of his family can furnish all or most of the necessary labor. They can usually get together a limited amount of equipment, livestock, and farm supplies, but their real problem is that of getting the continuous use of enough good land with improvements to make a farm unit of economical size.

When government land could be homesteaded it was relatively easy to get started in farming. The beginner now must in most cases either buy or rent a farm that has already been developed. A few new irrigated farms may be purchased from time to time on government reclamation projects and, although the government makes credit available to the settler, the buyer must have considerable capital of his own. Since few young men have sufficient capital to buy a good sized farm, many prefer to become tenants as soon as they have the necessary tools and stock. Renting not only helps the beginner to get started in farming, but it also puts many farms in the hands of young operators who can supply the necessary labor for their operation.

Getting Started as a Tenant. Farms are rented in many ways. Share

renting is the most common form, and requires about as little capital by the tenant as any method. As a matter of fact, the beginner who has little money and limited experience in farming may find share tenancy better than remaining very long as a hired man. Under this system the landlord often gives considerable attention to the management of the farm, and if he is a good manager, the tenant will benefit by the experience of the owner. Young farmers who are willing to learn can find no better way than to work under the supervision of a capable owner. Then, too, farms are sometimes rented for a given period of time with the option of buying at a stipulated price. This gives the tenant an opportunity to try out the type of farming he is engaged in, and to become familiar with the income possibilities of the farm, and what is most important, to determine the continuous productive possibilities of the soil.

There are wide differences in what landlords and tenants furnish in the operation of a share rented farm and, consequently, in the proportion of the products paid for rent. In the Cotton Belt, a common practice is for the landlord to furnish the land, buildings, teams, and tools, and give the tenant half of the crop for doing the work. Those who work on this basis are not generally known as tenants but as *sharecroppers*. In reality they are hired laborers who receive a share of the crops in the place of cash wages. After the cropper has advanced to the place where he owns his own work stock and farm tools he will receive a larger share of the crop produced—usually two-thirds of the feed crops, and three-fourths of the cotton. To get started as a small cotton renter in the South requires a few hundred dollars for mules and equipment, and enough to live on until the cotton crop is produced. Sometimes much of the living expenses can be earned by working in slack seasons for day wages on neighboring farms. There are many other types of small farm businesses that require only small amounts of capital for farming on a share basis. The income from such businesses is usually small because they do not furnish full-time employment for the operator and family workers, and there is scarcely any additional income from invested farm capital.

In the principal grain-growing areas the landlord may furnish only the land, or he may furnish half of the seed and pay half of the twine

and threshing, or half of the combining. The landlord's share of the grain usually is one-third if he furnishes only land, or one-half, if he shares the operating costs. The grain is delivered by the tenant to some designated place, either on the farm or at the local elevator. In the Great Plains wheat areas a share or cash renter will need several thousand dollars for the purchase of farm equipment and supplies. This type of tenant farming will enable the tenant to carry on a large family business, if he can get the necessary modern equipment, and the use of sufficient land.

In some sections the landlord furnishes the land, buildings, and the productive livestock, such as dairy cows, sheep, or beef cattle breeding herd, and the tenant furnishes all the labor and the machinery. The share of the proceeds received by the tenant is in proportion to what he puts into the operation of the farm. Generally where each furnishes one-half of the stock, it is fed out of the feed crops raised on the farm, and each receives half of the proceeds from the sale of the stock, or the livestock products. Purchases of additional feed or livestock are also shared equally by landlord and tenant. Sometimes arrangements can be made with the landlord that will enable the tenant to begin in a modest way and gradually acquire a half interest in the dairy herd, the flock of sheep, or the breeding herd of cows or sows, or the laying flock of chickens.

There are many variations in any generally accepted system of renting a farm. Each system is fairly well standardized in each locality, but can be determined in detail only by inquiry in the locality. For example, some landlords make a special cash charge for pasture lands on which the tenant runs his work stock and milk cows. Some make an additional cash charge for firewood cut on the place, or for a field of corn from which the tenant gets all of the proceeds.

Another form of renting is for cash or for fixed rent. Fixed rent, as in the Cotton Belt, is a fixed number of bales of cotton which the tenant gives the landlord for the use of the farm. Where cash, or fixed rent, is paid to the landlord the tenant furnishes all the equipment, labor, seeds, and supplies necessary to operate the farm and the landlord supplies only the land and buildings. There may be many modifications to this general practice, particularly for some specific part of the farm that is not included in the over-all cash

rental agreement. For example, special arrangements may be made on a share basis for the handling of an orchard, or the production of some special crops in which the landlord is particularly interested as, for example, a field of potatoes. This type of agreement is more likely to be arranged if the landlord and not the tenant has a piece of machinery that is necessary to the production of the special crop such as a potato digger, or potato sprayer.

The landlord and the tenant are partners in the farming business. Successful tenant farming requires observation of partnership rules. If the farm is rented on a share basis, and if the tenant is honest and capable, and has the contract for several years' duration, the farm is likely to be well handled, and the soil will not be depleted. On the other hand, a one-year contract without the necessary restrictions on exploitation of the soil may lead to serious damage to the land. If the tenant does not have assurance of a suitable lease for several years he has little incentive for keeping up the soil, fences, and buildings. On the other hand, if the landlord does not have assurance that the tenant is honest and capable, he has no incentive for offering a long-time lease.

Becoming a Farm Owner. Farms in the United States range in market value from a few hundred dollars to several hundred thousand dollars, or more. Inventory valuations of several typical family farms are shown in tables III and IV. They are examples of farm property values that are accumulated by many operators during their farming life. They range from about $2,000 to over $40,000 per farm for land, buildings, and equipment. Few who must make their own way would have sufficient funds early in life to buy outright any of the farms with the higher inventory values.

Many farmers, however, have been able to accumulate early in life enough money with which to buy a small farm. Large enough in the beginning, these farms often became too small as the children grew up and became old enough to help in the farm work. At this stage the small farm could be sold and a larger one bought if there were sufficient funds for the change. In many instances this is not necessary, however, since additional land can be rented nearby to provide a farm large enough for more adequate family development.

Those with plenty of money can buy the kind and size of farm

they want, if it can be found for sale. But more often the problem is to find a business that can be bought with the funds and credit available. Once a young man has a minimum amount of farm equipment and livestock that is free of debt, and a year's supply of farm raised food and feed, he can start farming for himself with a limited amount of cash. For example, an $8,000 farm (land and improvements) might be safely contracted for with a cash payment of $2,000 to $3,000 at time of purchase, and by giving a mortgage on the farm for the balance. If the equipment and supplies are bought at the time the farm is bought the cash needed for a down payment and for the purchase of machinery and supplies would be at least $4,000 to $6,000.

In this type of transaction two don'ts are in order:

(1) *Don't* agree to pay more than the farm is worth from a business standpoint. Remember interest and principal must be paid for out of farm earnings.

(2) *Don't* go into debt so far that there is danger of losing the farm because the required payments cannot be met on time.

If the farm is considerably larger and more expensive than indicated above, it is considered good policy by some to require that a larger proportion of the cost be paid in cash at time of purchase. This is merely a safety measure, the reason being that large commercial farms depend on hired labor, and this cash cost may not leave anything for interest and mortgage payment in years of severe drought, or of low crop and livestock prices. On the other hand, the typically American family farmer can cut corners, and get along for a time on a lower income.

The beginner should watch carefully the distribution of capital among land, buildings, equipment, and livestock. The greater the part of his investment that can be put in productive enterprises, the greater will be his income. A good, productive milk cow at $100 may be a better investment than two low producing cows at $50 each. Expensive buildings make a nice showing, but the income from the stock housed in them may be no greater than if they were housed in buildings that cost half the price. The beginner can often start with a small investment in machinery and gradually add desirable machines and tools. Some of these can be purchased at farm sales for

a small part of their cost when new. The same procedure can be followed in acquiring breeding stock from which to build a dairy herd, a flock of sheep or poultry, or a drove of hogs. The main thing is to invest what little capital one has in farm resources that will produce something to sell, and to increase the productive resources as fast as is consistent with good management.

There are several sources of credit open to the farmer for buying and operating a farm.

In the field of private credit agencies, long-term loans for the purchase of a farm, for the erection of buildings or for other permanent improvements may be obtained from life insurance companies, mortgage bankers, savings banks, savings and loan associations, private investors, and other sources. Short-term loans for farm operation during a particular season, crop year, or other similar period may be gotten from local banks.

Loans also may be obtained from several Federal sources. In several ways the Farm Credit Administration with the various institutions that operate under its supervision, is the most important source. The Federal Land Banks of the Farm Credit Administration make loans to farmers through local farm loan associations upon the security of first mortgages covering land and improvements of the farm. These loans are made to those who are farming or who shortly will be engaged in farming. Funds are thus supplied with which to buy land for agricultural purposes, farming equipment, fertilizers, and livestock necessary for the proper operation of the farm, and to provide buildings, and for the improvement of the farm land.

The Land Banks also make what are known as Commissioner loans. These are often made upon the security of second mortgages on farm property for the same purposes as loans made by the Federal Land Banks. The use of such loans in refinancing farmers' indebtedness are somewhat broader in purpose than those supplied by the Federal Land Banks.

The production credit associations of the Farm Credit Administration make loans to farmers and stockmen to finance the production, harvesting, and marketing of crops; the breeding, raising, fattening, and marketing of livestock and commercial poultry; the repair, improvement, and alteration of farm buildings; and for other agricul-

tural purposes, such as the buying of seed, feed, fertilizer, spray materials, farm machinery, and livestock, and to hire labor. The Farm Credit Administration also makes emergency loans to farmers who are not able to get funds on reasonable terms form other sources. These loans are made for the purchase of seed, fertilizer, and other supplies or expenses necessary for production and harvesting of crops, and for the repair of farm machinery and equipment, and for the purchase or production of feed for livestock. The collateral or security required is the first lien (claim) on the crop financed, or livestock being fed. At the present time the Farm Credit Administration makes war production loans for the purpose of producing more essential food and fiber. The loans are made for all production purposes including the hiring of labor.

The Farm Security Administration is designed to assist farm people who are unable to get from any other source, including the Farm Credit Administration, the credit they need to carry on their farming, or to expand their food production facilities. There are three classes of loans made by this agency: operating loans; farm ownership loans; and water-facilities loans.

The operating loans are made for farm and home use to enable families to increase production on farms they are operating, or to expand their operations by taking over vacant farms. They can be used for purchasing farm supplies, livestock and equipment and for home needs, such as canning equipment, clothing, and medical care. They may be used also for payment of land rentals, repairs to farm buildings, soil-building materials, fences, and other improvements necessary for efficient operation of the farm.

The farm ownership loans are long-term low interest loans to enable a limited number of tenants, sharecroppers, and farm laborers to buy farms of their own. They are made only in designated counties. Similar loans are sometimes made that will enable farmers to buy additional land so that the family will have an adequate sized unit.

Water-facilities loans are made for the construction of certain kinds of water facilities in the arid and semiarid country of 17 Western States. These loans may be used for constructing ponds, reservoirs, wells, dams, and for pump installations, motors and windmills. They are also made for other purposes in connection with water facilities,

to individual families or to small groups of families. Loans are made also for the purchase of water stock of companies or associations where this seems to be desirable from the standpoint of making more effective use of the land. At the present time the water-facilities program is primarily focussed on repair and maintenance of existing water facilities.

EXERCISES FOR CHAPTER 4

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. Getting started right in farming involves (a) starting with a large farm; (b) having up to date equipment; (c) taking a course in agriculture at a college; (d) getting the right kind of a farm and the right kind of livestock and equipment.

2. A wise policy to follow at times when land prices are very high is to (a) buy a farm because the high prices mean that farms are in demand; (b) rent for a few years and wait for a more favorable opportunity to buy; (c) quit farming; (d) make a small down payment and buy on credit.

3. The best way for a city boy to learn how to farm is to (a) buy a farm and try to run it; (b) write to the agricultural college of his State; (c) read some bulletins on farm management; (d) talk with the County Agent; (e) work for a good farmer for a year or two.

4. If a farm is so located that it is economically desirable to produce only one crop for sale it is important that the crop be one which (a) can be produced with very little labor; (b) can be produced year after year without damaging the productivity of the soil; (c) can be stored; (d) is in demand for export.

5. The *agricultural ladder* is a term used to describe (a) a special ladder used in the haymow in New England; (b) the tenure steps from hired work to full ownership; (c) changes in the size of farms; (d) changes in intensity of farming; (e) the steps many farmers follow in acquiring larger and larger farms as they accumulate funds.

6. It is frequently desirable for a man with limited resources to rent a farm for a few years before buying because as a tenant (a) he can farm more intensively; (b) he can overwork the soil and then move to another farm; (c) he doesn't have to pay real estate taxes; (d) he will not need to undertake all the financial risks involved in buying.

B. In the table below check the items that are characteristic of each of the systems of farming listed.

Item	System of farming				
	1 Vegetable farms	2 Cotton farms	3 Wheat farms	4 Dairy farms	5 Poultry farms
a. Large acreage.....					
b. Medium acreage...					
c. Small acreage.....					
d. Large investment in machinery.....					
e. Small investment in machinery.....					
f. Large investment in buildings.....					
g. Small investment in buildings.....					
h. Much total labor per acre of crop land					
i. Little total labor per acre of crop land					

C. The following groups of items are all things that should be considered in selecting a farm. For each group, underscore the most important item in that group.

1. (a) Depth of soil, (b) presence of weeds, (c) condition of fences.

2. (a) Adequacy of water supply, (b) water piped into dwelling, (c) water supply near the buildings.

3. (a) House located near the highway, (b) distance from town, (c) buildings in a central location.

4. (a) Size of the barn, (b) number of buildings, (c) suitability of buildings for the type of farming practiced.

5. (a) Shape of fields, (b) economical arrangement of fields, (c) adequacy of drainage, (d) number of fields.

6. (a) Distance from schools, (b) distance from stores, (c) desirability of the neighborhood as a place to live.

7. (a) Acres now in crops, (b) acres in pasture, (c) total farm business large enough to return an adequate living, (d) total acres in the farm.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss any two of the kinds of farming mentioned in this chapter in terms of (a) amount and kind of land required per farm; (b) amount and seasonal distribution of labor per acre; (c) the investment required.

2. Describe the important qualifications of a good soil including (a) depth; (b) productivity; (c) drainage; (d) condition.

3. For a person of limited means, what are the advantages of getting started in farming as a tenant? Discuss the following points: (a) investment required; (b) opportunity to learn; (c) opportunity to accumulate funds.

4. You have received a letter from your uncle in Missouri in which he writes that he has been looking at a 160-acre general farm near Warrensburg which is in the central part of the State. He can rent this farm with a 10-year lease and wants to do so if you will operate it with him as a partner after the war. You know something of the area, that it is in a rolling area of generally good soils but with rather poor drainage in places and thin soils in others. There are only a few dairy farms in the area but he thinks the farm would make a good place to raise corn and to keep about 20 milk cows. You want to write him for more information. Write a paragraph, just as you would in a letter of this kind, covering each of the following points: (a) soils and topography; (b) improvements; (c) markets; (d) terms of the lease; (e) the community.

CHAPTER 5
DECIDING ON SIZE OF THE FARM

MEASURES OF SIZE OF FARM

In the discussion of different types of farms in chapter 3 it was said that a typical wheat farm in the southwest winter wheat region would have over 600 acres of land, and that an eastern poultry farm could get along with only ten acres. Each of these farms provides a living and substantially full time employment for a farm family. This means that the amount of land is not an adequate measure of the size of a farm business. What other measures are there? How can one determine whether a farm can be worked by the farm family and whether it will provide sufficient income for family living? Actually there are several measures of size of the farm business.

Fixed Plant. Land area can be measured in acres, but not productivity. On farms such as the poultry farm already mentioned, the necessary buildings are part of the fixed plant. Land and buildings together can be measured only in value terms. In other words, we place a dollar value on the land and buildings and this gives one measure of size. An 80-acre farm with highly productive land and good buildings requires a larger investment and is potentially a larger business than another 80-acre farm in the same locality with unproductive land and poor buildings.

Other Resources. The amounts of labor, livestock, and machinery that are used along with land and buildings are also measures of size. For example, we speak about a one-man dairy farm, meaning by that the size of dairy business that can be handled by one man with occasional hired help. Similarly, a two-man dairy farm is one that requires the time of two men. It is common to speak of livestock ranches in terms of the number of livestock handled, for example, a 50- or a 100-cow cattle ranch, or a one-band sheep ranch (number of sheep handled by one herder). Cotton farms are often described in terms of the number of mules that are used as power. This determines the number of acres that one man can plant and cultivate. The Georgia cotton farm shown in Chapter 3, table 3, is known as a

Figure 31. Acres of cropland would be a satisfactory measure of size of this wheat farm in western Nebraska. (U.S.D.A.)

two-mule farm, which means that the plows and tillage tools require two mules for power. Many of the very small cotton farms have only one mule for power and use one-mule equipment.

These measures of size are all in terms of resources other than land and buildings.

Output. In factory operations it is common to speak of size in terms of the product that can be turned out per day or per year. For example, the size of a flour mill is usually expressed in terms of the number of barrels of flour that can be milled per day. It is difficult to measure the size of farms in terms of physical output because several products are usually produced on the same farm. We could measure the size of a specialized wheat farm by multiplying the crop acreage available for wheat each year (say, 400 acres) by the average yield per acre of ten bushels, and say that the wheat farm had an average annual output of 4,000 bushels of wheat. But if the same

Figure 32. Acreage would be a poor measure of size for this Minnesota dairy farm. Either the total number of cows or the total investment in the farm would be a better measure. (U.S.D.A.)

farm also produced some livestock we could measure the total output only in value terms, that is, by the annual value of the products for sale from the farm. This is one of the measures of size that is needed, but to use it effectively it is also necessary to know what the operating expenses are so that one can determine the income left for the farm family.

DETERMINING THE PROPER SIZE OF FAMILY FARMS

All the measures of size that have been described need to be considered in deciding on the size of farm that a farm family can operate. It is evident that the acres of land a family can handle varies with the productivity and lay of the land and the kind of products grown. It is true also that if a combination of products are grown, the work tends to be spread throughout the crop season and more of it can be done by the farm family. If machines can be substituted for hand

labor, one man can produce more. *Therefore, a practical approach to the proper size of a family farm (without reference to a specific operator) is in terms of the fixed plant (land and buildings) that can be operated by a farm family, perhaps hiring some labor in peak seasons, following the system of farming that is most profitable for the locality and using the kinds of machinery that are available for that type of farming.*

For most types of farms there is a minimum combination of men, machines, livestock, and land that constitutes an efficient operating unit. Since we are dealing primarily with family farms, we are seeking for a given type of farming, the size of unit that can be most efficiently handled by the labor force available in a typical farm family.

Because the amount of labor available varies through the life cycle of a farm family, it is necessary to plan for a farm big enough to occupy the family labor that is likely to be available over the greater part of the farmer's lifetime. Growing children or older people are usually available to furnish labor at least equivalent to a man's work for six months out of twelve on most family farms. Thus, from a labor standpoint, the family farm should be thought of as at least large enough to furnish employment for about two workers in the growing season and one worker in the winter. This means that some labor has to be hired if the operator has no growing children or other family labor to help with the work. However, there are so many operations on most farms that require more than one man that a strictly one-man unit is much less effective even for operators who do not have any help from other members of the family.

The type of farming and the machinery available determine how much land one man, with the assistance of others in peak seasons, can handle efficiently. For example, in the specialized wheat farming areas, one man with a two-plow tractor can perform the tillage and seeding operations on 500 acres of crops and in addition, take care of a few head of livestock. He will need extra help in harvest time, but if he has less than 500 acres under cultivation his time will not be fully occupied during the crop season.

In ranching areas where sheep are herded they are handled in bands of 1,000 to 1,200 ewes with their lambs for summer herding on

Figure 33. Many farm jobs are more easily and effectively done if two men work together. (U.S.D.A.)

forest ranges, but in the wintertime, when they are not on the forest and the lambs are sold, two bands can be combined into one. Extra help is needed for lambing and shearing operations.

On a southeastern cotton farm, one man with two-mule equipment can perform the tillage, planting and cultivating operations on 15 to 20 acres of cotton, and also handle some feed and home food crops. All members of the family help in cotton chopping and picking time, and sometimes extra help has to be hired for picking. In the western part of the Cotton Belt one man using a general purpose tractor can handle as much as 200 acres of cotton. Most of the picking is done by hired labor and paid for at piece rates.

These examples indicate that for most types of farms we can determine a minimum size of farm from the standpoint of efficient use of labor and machinery. A smaller farm means that these resources are less fully utilized. Sometimes operating efficiency is increased fur-

Figure 34. This herder has about as many sheep as he can take care of. With half as many sheep a herder would still be needed and the cost per sheep would be doubled. (Farm Security Administration.)

ther if the farm unit is larger than this minimum size. But the larger family farms are more efficient only if the manager, or operator, is capable of handling a larger business.

THE PROPER SIZE OF FARM FOR THE INDIVIDUAL FARMER

So far little has been said about how the operator's ability to plan and operate a farm affects the size of farm on which he is likely to be most successful. Some farmers do their work slowly but they perform every task carefully and well. Their neighbors say that they like to putter around. No matter what type of farming they are following, the farmers who have a tendency to spend much of their own time on each operation will do better if they operate farms smaller than is common for that type. For example, a dairy farmer who likes cows and gives much individual attention to each cow may do well with a small herd of eight to ten high producing cows, but poorly with a larger herd. Such a farmer is *efficient,* but he has a limited *capacity* for operating a farm. He is efficient because with a given amount of feed and other resources he can get a large output per

cow, but he cannot handle many cows successfully; therefore, his capacity for dairy farming is limited. Although he does well with each cow, he can handle so few that his total *productivity* is low. Similarly, some can get large yields of crops per acre but can handle only a few acres.

Some farmers, on the other hand, have the capacity for handling a large-scale farm business. They are usually men who prefer to spend most of their time on management problems and who, therefore, hire help for much of the farm work. If they are capable managers, their large-scale business is also operated efficiently and it becomes a successful large-scale farm. On the other hand, a large farm in the hands of a poor manager soon becomes run down and unprofitable.

The type of native ability which is required for the successful management of a farm is not equally distributed among all farmers. A few have exceptional ability in this direction, others are poorly endowed, and the majority of farmers probably have about average managerial ability. Although even the poorer managers can improve their abilities in this direction by training and experience, there are some people who dislike responsibility so much that they do very much better when they are working for others. Such persons should not attempt to become independent farm operators.

We must not lose sight of the fact that there are many farmers who are not capable of operating farms that are large enough to permit efficient use of labor and machinery. This means, of course, that considering the ability of the manager as well as the other resources, a smaller farm becomes the most efficient unit of operation for the man who is not capable of handling a larger business. In our previous illustration the dairy farmer who takes good care of cows, but can handle only eight to ten cows would be most successful on a midwest farm of say 60 to 80 acres. His income on such a small farm would be small, but he would not be able to increase it by farming more land and keeping more cows because the production he would obtain per cow would go down and this would offset any advantage of more land.

Unless a man of limited capacity for farming can do better in some other occupation, or as a hired man, he will do best if he operates

the small farm. It should be understood that there are many reasons for limited capacity for farming. Sometimes it is poor health, and if this can be overcome the operator can handle a larger farm. If it is lack of credit for acquiring more land, livestock or equipment, it is possible to get assistance from either private or public agencies, provided that the operator shows promise of handling a larger business effectively. If more fundamental personal factors limit his capacity, however, the size of his operation is more definitely fixed.

Before undertaking the operation of a farm it is important that a young man take his own measure and decide whether he is well fitted to become a farm operator, and if so, what size of business he can handle at the start. One way in which he can gain experience and also test himself as a manager is to rent a small farm at the start and then look for a larger farm as he gains confidence in his ability as an operator.

The conclusion then as to the proper size of farm from an individual operator's point of view, and from the standpoint of economical operation is this: *The proper size depends upon the operator's ability as a manager; that is, on his ability to acquire control of the land and other productive resources, and on his planning and operation of the business as a going concern.* This means that the proper size of farm for farmers of limited ability is smaller than the size that would constitute the minimum from the standpoint of operating efficiency in the hands of a more capable operator.

SIZE OF FARM NEEDED TO PROVIDE A MINIMUM FAMILY INCOME

The question of size of farm is sometimes considered from the standpoint of the size of farm that is needed to provide at least a minimum income for a farm family over a period of years. This question is approached in terms of a physical budget of the goods needed for family living, and then an estimate is made of the amount of money that would be required to buy the things included in this budget that ordinarily cannot be produced on the farm. Usually those who calculate budgets of this type have in mind a desirable level of living, and their minimum income may be a rather high figure. But suppose a low figure is used as the minimum—say $1,000

for a family living in the Corn Belt. There is no reason why a capable operator should limit himself to a farm of this size unless he has no opportunity of acquiring the resources to operate a larger business. On the other hand a man of limited ability needs to estimate the amount that will be available for family living from the small farm that he can handle. He should strive to increase that amount as much as possible, but if he cannot handle a larger farm business, or engage in some other line of work, his family will have to manage with the smaller income.

Many farms are smaller than the size that can be most efficiently operated by a typical farm family, and they do not provide an income of minimum adequacy for a farm family. They are too small to utilize the labor and management of even those operators who have limited capacity for management. Some farmers with limited capital have bought farms too small for efficient family operation under the mistaken notion that if they were good farmers they could make just as good a living on a small acreage as on a larger farm. Many people with little agricultural experience sincerely believe that it is possible to make a comfortable living on a small acreage of land without regard for location or type of farming. Some have actually tried it to their sorrow. Many farming areas originally were subdivided into small units that failed, and present operators have combined these units into larger farms. Such failures are costly in terms of blasted hopes and family welfare. The readjustment process usually involves public expense and welfare as well.

One should recognize that if a family owns a small farm free of debt the family can use for living all the annual income from the farm in excess of that needed to cover the farm operating and maintenance expenses. On the other hand, if the same farm were rented or owned with a heavy indebtedness, the rent or interest has first claim on the income. The balance may then be too small for an adequate living for the family. This point is often missed by people who say that they know of farm families who are living comfortably on a small holding. They do not realize that a young man starting in farming cannot obtain an adequate living from a small farm unless he has sufficient capital to pay for the farm, livestock and equipment. He is then using the return on his own invested capital

for part of the family living. This part of the farm income would have to be paid out as rent or interest if he were less fortunate.

WAYS OF INCREASING SIZES OF FARMS

Because there are so many farms that are too small to provide an adequate income for family living the possible ways of increasing the size of small farms needs to be considered. The simplest method of course, is to buy or rent adjoining land. If land can be rented, it is relatively easy to determine what the additional expenses are likely to be and to subtract them from the prospective income to see whether it pays to rent the land. If the land has to be bought, all of the questions that arise in buying a farm in the first instance have to be settled. (See ch. 4.) But sometimes the possibilities of increasing the income with additional land are so great that one is justified in paying somewhat more than prevailing prices for the land in order to get a more efficient unit.

If farming is mechanized and a truck and a tractor are available, the additional land need not necessarily lie adjacent to the home farm, although it is more desirable if it is so located. In some sections of the country, the renting of tracts of land that are some distance from the home farm is becoming common. The purchase of a tractor or a truck may save considerable labor that the farm family can utilize to advantage in renting additional land. Sometimes whether to do so or not is decided on the basis of whether the increased income is prized more highly than the additional leisure that would otherwise be available—the opportunity to go fishing more often.

Frequently there is no additional land available either for sale or rent. Are there other ways of increasing the size of the business? One of the first ways that should be examined is the possibility of building up the productivity of the soil to produce more per acre. On many farms an investment in lime, phosphate and other commercial fertilizer may nearly double the crop yields, and in that way increase the effective size of the farm business. The carrying capacity of pastures can be increased in the same way. For example, the application of one ton of ground limestone and 180 pounds of triple superphosphate per acre on pasture on a group of farms in West

Virginia increased all forage production 57 percent, and also improved the quality of the forage. One should carefully examine the available evidence on results from lime and fertilizer, and if possible try it out in a small way before making a large investment, but very often it will pay to increase greatly the amount of lime and fertilizer that is used.

Another possibility on some farms is draining low spots. A former wet spot, if well drained, is usually the most productive field on the farm. But tile drainage is expensive, and the job needs to be carefully done.

Sometimes there are small areas that can be cleared of stumps and rocks and added to existing fields. Even old fence rows cleared out sometimes help considerably because the brush and trees shade the crops. Clearing brush out of pastures increases their carrying capacity. A farm woodlot that is handled on a sustained yield basis can be made to furnish supplementary income in some areas.

If family labor is not fully utilized, it is sometimes possible to add or shift to enterprises that require more labor. For example, a farm flock of chickens can be expanded into a commercial flock. This would probably mean a new poultry house and buying feed, but if a good market for eggs is available, it may pay to do so. In some localities certain truck or specialty crops that require much labor can be added. Some of the unusual or oddity enterprises that are mentioned in Chapter 4 might also be considered, but such ventures need careful study before they are undertaken even on a small scale. If tractor equipment is owned, custom work for neighbors can furnish a sideline to farming. It is also frequently possible to do other spare time work for neighboring farmers.

Many writers have made much of the possibility of doing some of the processing of farm products on the farm. Because of the size and cost of the equipment required for most processing operations, the opportunities for this are usually fewer on the small farms than on the large ones. It is sometimes possible, however, for a number of small farmers to cooperate in establishing a processing plant. If certain specialty products can be developed in that way, they can become profitable for products from small farms. Examples are Virginia hams and sorghum or maple syrup. Farmers with small

Figure 35. In cut-over timber areas, the clearing of additional land for crops is one way of increasing the size of the farm. (Bureau of Agricultural Economics.)

apple orchards frequently set up a cooperative packing shed so they can grade, pack and sell their apples at a higher price.

Some of these ways of adding to the size of the farm business may not give a high return per hour, although they will furnish employment to labor that otherwise would not be employed. Whether a farm family finds them worth while depends on how badly the additional income is needed. It is usually much more satisfactory to operate a farm that is large enough to give full time employment to the farm family in the regular enterprises and in that way provide income sufficient for a comfortable living.

EXERCISES FOR CHAPTER 5

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. The amount of land that can be handled by one able-bodied man is determined by (a) how hard he works; (b) where the land is located; (c) the type of farming and machinery available; (d) the number of days he works; (e) length of the growing season.

2. Sometimes farms which are larger than the minimum size that will fully employ a farm family are more efficient, provided (a) land is cheap; (b) the operator can get hired help; (c) the operator has a full line of machinery; (d) the operator is capable of handling a larger business.

3. A dairy farmer is said to be *efficient,* if he (a) gets high production of milk from each cow compared with the amount of feed fed; (b) spends a great deal of time on each cow; (c) keeps a large herd; (d) feeds properly; (e) produces Grade A milk.

4. A dairy farmer is said to have limited *capacity* for operating a farm if he (a) doesn't know how to look after cows; (b) has only a few cows; (c) gets low production from each cow; (d) does not hire any help; (e) is able properly to care for only a few cows.

5. The amount of family labor available to a farmer varies through the life cycle of a farm family, therefore, a farmer should (a) move to a larger farm as his labor force increases, and to a smaller one as it declines; (b) work less hard as the children become able to do part of the work; (c) try to get a farm big enough to occupy the family labor that is likely to be available during the greater part of his lifetime.

B. What is a good measure of size of the types of farms shown in the right-hand column below? To answer, match the items in the right-hand column with the proper choices in the left-hand column. To do this, insert the letter of each choice in the parentheses in front of the proper item. Some of the choices are not the best measure for any of the types listed.

Choices	*Items*
a. acres, total	1. ( ) poultry farm (eggs)
b. acres, cropland	2. ( ) beef ranch
c. number livestock fed	3. ( ) wheat farm
d. size of breeding herd	4. ( ) dairy farm
e. cows milked	5. ( ) farm on which cattle are bought and fattened
f. number of layers	
g. dollars spent for feed	6. ( ) cotton farm

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Describe and give an example of each of the following three ways of measuring the size of a farm business: (a) in terms of investment; (b) in terms of acreage; (c) in terms of the amount of labor required.

2. Discuss ways of increasing the size of the farm business including (a) increasing the acreage; (b) increasing productivity; (c) introducing new enterprises; (d) processing some of the products grown.

CHAPTER 6
PLANNING THE FARM LAY-OUT

Planning the farm lay-out may be thought of as making a blueprint of the farm. Three steps are involved: (1) planning the internal arrangement of buildings to see that they are adequate to house the livestock and for the storage of crops, and are so arranged as to be economical of time; (2) planning the location of the buildings so that they are conveniently arranged with respect to one another and to the fields; and (3) planning the shape and location of fields to fit the rotations and lay of the land, and so that field work can be done economically.

In planning the farm lay-out, the location of the farm home needs to be considered in relation to other buildings on the farmstead. The size and arrangement of the house and its immediate surroundings are factors that need to be given a great deal of consideration from the standpoint of the personal needs and desires of the family, and the investment that they can afford to make in a home.

With six million farms already in the country and little more unsettled land, planning the farm lay-out usually means replanning farms to suit the current occupant. This sort of planning is a continuous problem for farmers because of the need for shifts in the kind of products grown. Technological changes, moreover, alter the economical sizes and shapes of fields and the construction and arrangement of buildings. These changes have included the shift from horse to tractor power, the replacement of binders by combines, the adoption of mechanical corn pickers and the increasing popularity of electric fencing. The mechanical cotton picker, when it is perfected, will call for the enlargement and rearrangement of fields on many cotton farms. New building materials that are now available will probably result in many changes in the construction of farm buildings.

Some of the problems of lay-out have been settled as a matter of experience in the area, and by previous operators. But certain changes often should be made in the layout of fields and in the size

and arrangement of buildings. Some are easily made; others are expensive. Much money can be sunk in unwisely chosen facilities. When buying or renting a farm the suitability of the lay-out for the kind of farming projected must be carefully considered. Poor arrangement may mean a serious annual drain on the working force, or expense for correcting faults.

BUILDINGS

Farm Buildings to Fit Type and Size of Farm. The size and condition of a set of farm buildings usually reflect the success of the farming previously done. The outward appearance will begin to show signs of neglect after as little as five years of hard times, but the size and construction reveal the confidence of the builders in the permanence of their type and size of farm. In the good farming areas of this country, farmers by 1942 had rather generally repaired and renovated the buildings and fences that had been neglected in the depression of the 1930's. But in the poorer areas the struggle

Figure 36. These farms are small and close together on rolling land in Tennessee. Tobacco is the cash crop. The other cropland is in a three year rotation made up of corn, wheat and barley, and lespedeza or some other hay crop. (U.S.D.A.)

to keep going at all had made it difficult to maintain the improvements. The new buyer does well to understand the testimony of these silent commentators on the farming possibilities of an area, and to heed their guidance.

To the extent that the locality has been settled and become adjusted, the capacity of the buildings will conform rather closely to the usual production for the size of farm. Of two farms, each of 160 acres, that on the better land will have the larger barns and granaries. The size and condition of the farm house is less revealing than that of the storage barns and livestock accommodations. Old houses are used until the farm is set up to pay for the new dwelling. Many a farmer has built up his capital to high effectiveness before providing the new house his income could sustain. On the other hand, a new house or a remodelled house, in a locality with a pre-

Figure 37. Also taken in Tennessee, this picture shows the larger buildings in better condition on better soil and more level fields than those of figure 36. (U.S.D.A.)

ponderance of small unproductive farms and poor buildings frequently is an indication that the owner has substantial regular income from non-farm sources, or perhaps it may be a country summer home. It sometimes happens, however, that a single farm in an area is much more productive than the others, or that someone has discovered the size and type of farm that can succeed in the area.

The buildings already on a successfully operated farm are frequently well suited to the existing type and size. These vary from Maine to Florida and from New Jersey to California. Small barns for work stock and the family cow, a pen for the pig and a shed for the chickens are all that is needed in the way of buildings for livestock on a potato farm in Maine. The important buildings there are the potato-storage cellars and the machine shed. Even the potato-storage warehouses may be omitted if the crop can be sold from the field or stored near the railroad track. Orchard farms in the North will have packing sheds, storage buildings, and machine sheds of sizes adapted to the kind of fruits and volume to be handled, besides the accommodation for a few livestock. Fruit growers tend to use public cold storage rather than try to operate farm storage of their own. Vegetable farms may have only machine sheds and packing houses though the larger vegetable farms are supplied with barracks for accommodation of seasonal harvest help. Cotton plantations are dotted with tenant family houses. They usually have their own cotton gin, and at headquarters there are buildings for work stock, feed, and equipment. The larger plantations also have a commissary or central store that sells supplies of all kinds to families living on the place. On family-size cotton farms in the Southwest hired help needed only for chopping and harvest are transported from town daily. On wheat farms in the Great Plains, few buildings are needed unless livestock are kept and feed for them is raised. Some farm storage of grain, generally in portable metal bins, has been encouraged in recent years of heavy carryovers, but ordinarily a farmer can expect to deliver grain from the combine to a nearby elevator.

The greatest variety in size and style of buildings is found on livestock farms. In city milk sheds, the number of cows kept and hence the size of barn depends on the roughage production capacity of the farm—hay, ensilage, and pasture—because most of the grain

Figure 38. Farm buildings like these are common on general livestock farms in the Eastern Corn Belt. (U.S.D.A.)

feed is bought, and usually the other livestock consists of horses and a few chickens. One cow to two acres of cropland including hay can usually be kept under these conditions. Sanitary regulations have encouraged the building of one-story cow sheds that can be closed off from the silos and the hay storage barn and all other stock. Where side-hill barns and conventional two-story barns are still in use they have been ceiled tight, ventilated, and provided with concrete floors, and an outside milk house. Some interest has developed in open barns for milking herds like those common for beef cattle but with a separate building for milking. This arrangement requires less labor for handling the dairy herd.

Milk with low bacteria content can be produced in a frame wooden shed of low cost, but more work daily is required to keep cows and equipment clean than is required in stables especially designed and equipped. Hence, over a long period, 10 years or more, the larger

investment for making cleanliness easy may pay in time saved, and also add to the workers' satisfaction.

Central hog houses are sometimes provided, but frequently separate colony houses for each sow and litter constitute the only housing for hogs. Colony houses are movable, and can be easily shifted to disease free grounds. Market hogs from spring litters are ready for shipment before they need much shelter. The accommodation required for fall pigs must be more elaborate, but need not be expensive. In handling hogs emphasis on strict sanitation is insurance against disease. Concrete floors in permanent houses can be cleaned and disinfected much more easily than wood floors.

Beef cattle need protection only from rain and snow and from winds. On the range, brush and trees in a wind protected location may provide all the shelter. The rancher matches his losses of animals

Figure 39. This is the farmstead on a wheat farm in Washington. Grain is sold at harvest time or put in storage warehouses near the railroad. Cattle need not be housed. Hence, rather small buildings serve a large business. (U.S.D.A.)

against the cost of moving the cattle and of providing more formal shelter.

Accommodations for livestock are adequate if the animals are not crowded, if they are protected from bad weather, and if the buildings are arranged to permit easy feeding and cleaning out. Substantial buildings are cheap in the long run, but fancy finishings and furnishings usually are wasted.

Attractive farm buildings are good advertising for a specialty business, such as purebred livestock or fancy fruits. This is especially important if buyers are expected to visit the farm. To be effective, everything must be appropriate to the general scheme. For example, if porcelain tiles are used back of the cow stalls they must be spotless, and the bedding must be clean.

Buildings are changeable. If more capacity is needed an addition

Figure 40. Cow barns are large and elaborate on hundreds of specialized dairy farms in the North and East. The frills that cost money do not always bring appropriate returns. Expensive layouts are justifiable when a high priced product can be marketed over a long period, such as certified milk, or milk for hospitals and invalids. (U.S.D.A.)

may be made, or perhaps a building can be bought and moved from another farm. It is frequently possible to remodel an old building to adapt it to new uses. In the Northeast some dairy farmers have shifted to poultry, converting their cow stable and hay storage space into pens for layers. Some dairymen have made space for milk cows by moving the bulls and young stock into other space. Plans for buildings usually should provide for some expansion. Crowding livestock is courting danger of loss from disease.

The possibility of remodelling an old building should be considered from several angles in addition to the immediate cost. Remodeled buildings frequently are less economical of time and less satisfactory in other ways than new buildings designed specifically for the job at hand. Frequently, farmers are reluctant to scrap an old building that is hopelessly out of date from the standpoint of efficiency and sanitation because it is solidly built and can be made to last many more years.

New Ideas in Materials and Construction. The traditional farm building material has been lumber. Other materials have been used, of course, such as concrete, hollow tile and some sheet metal for roofs and grain bins, but by and large, frame buildings are the rule on American farms. In recent years, new materials have been introduced and their suitability for use in farm buildings is being tested. These materials include plywood, various kinds of insulating board, gypsum and asbestos board, and sheet metal that can be made up into insulated panels if desired. Along with these materials, new ideas about construction and design are developing that promise to make the building layout more efficient and to reduce fire hazards, improve ventilation and sanitation, and reduce damage from rats, vermin, and termites.

Moreover, some of these materials are less expensive than lumber for some purposes. They also lend themselves to prefabrication. It is possible that within the next few years, these new developments will materially lower the cost of equipping a farm with an adequate set of buildings. Some of these buildings may not be as permanent as most present-day farm buildings, but buildings, like machinery, tend to become obsolete. Therefore, where changes in enterprises are likely to occur it may be an advantage to have buildings that repre-

sent a smaller fixed cost and that can be written off over a period of 20 to 30 years; to be then replaced by new and improved structures that serve the new needs more efficiently.

The possibilities for improvement in farm buildings have not yet been fully explored. However, it is evident that broad changes in building plans are in the making, and one who buys a farm should exercise great care in determining the suitability of the buildings to his needs and should place a conservative value upon them in appraising the value of the farm.

Water Supply. A dependable source of water is necessary on nearly all farms. The water should be free from germs and objectionable flavors. The adequacy of the supply becomes of special importance to a farmer who expects to change the scope of the business. More livestock means more water. Modern improvements for the house mean more water. Daily water requirements are about as follows: one person, 40 gallons for drinking, bathing and household use; one horse, mule or cow, 12 gallons; one hog or sheep, one gallon. In most parts of the country, some water is needed for the garden.

Buildings Should be Arranged and Equipped to Save Labor. Within the buildings many small rearrangements of facilities and devices that cost little can save a great deal of time. Even changing the order of doing work may provide enough extra minutes to take care of another cow or another pen of poultry. Cows can be watered by turning them out into the yard twice a day, or by running water into the barn and providing individual drinking cups, always full when the cow feels like wetting her tongue or softening her cud. One man who had drinking cups installed was so pleased at the results that he said he could better afford to install new cups every year than go back to "hand watering."

Barns which provide a stock-hay storage combination can be arranged to save time because each class of stock can be fed and otherwise cared for without leaving the barn. Feed is lowered through chutes to the level of the stock feeding floor. Then if feed carts are available still further time is saved. In a study in New Hampshire a farmer was making five trips with buckets from the feed box to feed 20 cows. With a cart one circuit took care of the grain and another took care of the ensilage feeding. Some cow barns are built

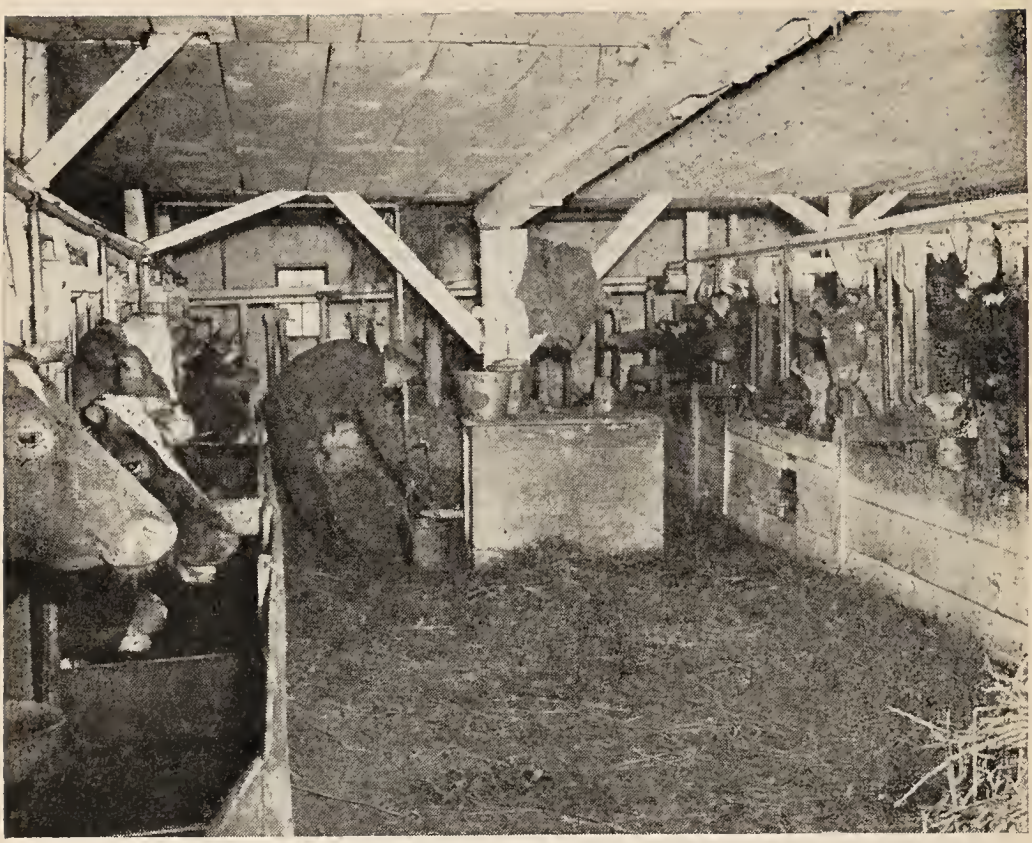


Figure 41. This New Hampshire barn is without frills. By tying the cows on three sides of a square the farmer can do all feeding with little movement, and with his son cares for 30 milk cows. Note the drinking cups that save a lot of time otherwise needed for watering cows. Clean milk can be made in such old barns as this, if proper care is exercised at every step. (Bureau of Agricultural Economics.)

so that a manure spreader can be driven through and the manure spread daily. Other barns are fitted with litter carriers which run the manure into a covered pit outside. Tossing the manure through a small barn window into the barnyard is very wasteful of plant food, is unsanitary, and not economical of labor, even if clearing out is accomplished readily. The old custom in some areas of hoeing the litter to holes in the gutters to accumulate underneath the barn was better for manure than for the grade of the milk.

One of the standard devices for saving hard labor at a peak load time is the installation of a hay fork in the hay storage barn. (See fig. 61.) Not all old barns can be fitted with the best type, but most barns can be equipped with a fork. Extra work can be saved by fitting the poultry houses with hoppers for mash and for scratch

feed, running water, and drop boards that are easily cleaned.

In the recent labor shortage, studies have been made of typical farm jobs as farmers were doing them. Thrown on the screen as motion pictures, some of these were laughable, even to the men whose practices were thus shown to them. Out of these recent studies came some general rules for cutting down time consumed. One of the first is the answer to the question "Does the job need to be done?" Close to that is "Can I find another way that is easier?" Labor, or time, saved makes other work possible. If no other profitable work appears at the time, there is less wear and tear on the worker. Workers feel that increasing output with the same expenditure of energy is fun if they get the benefit. Family workers get *all* the benefits of productive work efficiently done.

Attention to saving labor by "short cuts" can be carried too far if, during the process, crowding of stock creeps into the picture or sanitary practices are slighted. Any practice that saves labor at the price of inferior quality of the product or of volume of product may be distinctly unwise. One of the easy jobs that is short cut too often is keeping nests in the laying houses clean. Putting in new shavings or straw frequently takes time and material, as does trimming the nests as eggs are picked up. Yet soiled nests mean soiled eggs. Soiled eggs must be washed or be discounted in price. Washed eggs must be used promptly as they do not stand storage as well as unwashed eggs.

Cleanliness is often expensive in milk production. Lack of cleanliness can be even more expensive, whenever it means loss of market or lower grade of milk. Clean milk can be produced in old-fashioned barns if the dairy workers take extra pains about bedding, washing the cows and keeping dust and odors down. Milk inspectors have found that so much care is hard to achieve and they insist on modern equipment and arrangement of cow barns.

THE FARMSTEAD

The farmstead includes buildings, wells and the water system, corrals, stock pens, scales and dipping vats, and space for the garden and orchard. On most farms it will cover an area of from 2 to 5 acres, the acreage varying with type and size of farm.

It is important that buildings and yards for livestock be so placed that they are sheltered from the prevailing winds, have good exposure to sunlight, and are well drained. The farmstead should be situated on fairly high ground with some slope, so that it will have good drainage and air circulation. However, a high elevation, involving steep grades in travelling to and from the fields, should be avoided. In the Middle West, and in some other regions, the prevailing winds in winter come from the north and west. It is therefore desirable to select a site for the farmstead with a south or southeast slope.

Location with Respect to Water, Roads, and Fields. In some areas a good source of water is hard to find. In such cases, the location of the farmstead may be largely governed by the location of the water supply, although it is possible, of course, to pipe water a considerable distance to the buildings if a suitable building site is not available nearby. It is also important to locate the buildings near a public road and within reach of power and telephone lines if the community is, or can be served by them. If the buildings are set far back from the highway a farm lane is necessary which may be difficult to keep free from snow and mud.

It is desirable to have the buildings in a location that shortens the travel distance to and from the fields as much as possible without sacrificing the advantage of being close to the highway. An effort should also be made to locate the farmstead in such a way that it has direct access to as many fields as possible, or so that they can be reached with short lanes. Long lanes from the farmstead to the fields are an unproductive use of land and may require additional expense for fencing. Easy access to the farmstead also simplifies the problem of providing water for the stock when fields are used for pasture.

Location of Buildings in Relation to Each Other. The buildings are best placed in a compact group. We have gotten away from the European peasant's homestead, which houses all stock, tools, and feed and supplies under the same roof with his own living quarters. The stock is then literally "under the eye of the master," and it does well. The peasant can't afford losses, or inefficient use of feed. Here

we like to live near our chores and other work without having small animals or poultry under foot.

The barn is the main service building, the others being placed relative to it, at both sides or behind. In most of the country, the farm buildings have been built around the sides of a rectangle with the open side to the road, for ease of access. Exposure of buildings for animals should be southern to the extent possible. Thus most light is available. Quite as important as exposure to sun is drainage. If there is any choice, water should drain away from all buildings rather than toward them. Water from livestock and poultry buildings and pens must not be allowed to drain toward the well. Exercise yards for stock bulls and other animals can usually be laid out in the sun.

The dwelling is usually set apart from the other farm buildings so that the family may not be annoyed by odors, flies, and dirt from the farmyard. The house should be located so that the prevailing winds will not blow barnyard odors in the direction of the house. To secure the lowest fire insurance rates the house should be at least 100 feet from the barn. In parts of New England, the need for taking care of stock in bad weather without going outside led to joining all structures with covered passage ways, but this practice is seldom followed in new construction.

When planning a new layout, or considering possible changes in an old one, it is worth while to draw a map showing the location of buildings and the routes to be traveled in doing the chores. The times at which animals of different kinds must be fed and cared for should be considered, and the number of yards that must be walked each day determined. Then an effort should be made to rearrange the buildings in a manner that will reduce the distance traveled. Of course, the other requirements for satisfactory arrangement that have been discussed will have to be kept in mind also. The careful relocation of farm buildings on some farms has resulted in savings of as much as 150 to 200 miles a year in the walking distance required for chores. Anyone who has been in the army will agree that such a saving would be distinctly worthwhile.

Figure 42 shows a well-planned lay-out for the farmstead on a diversified corn-beef and hog farm. The location of the dwelling

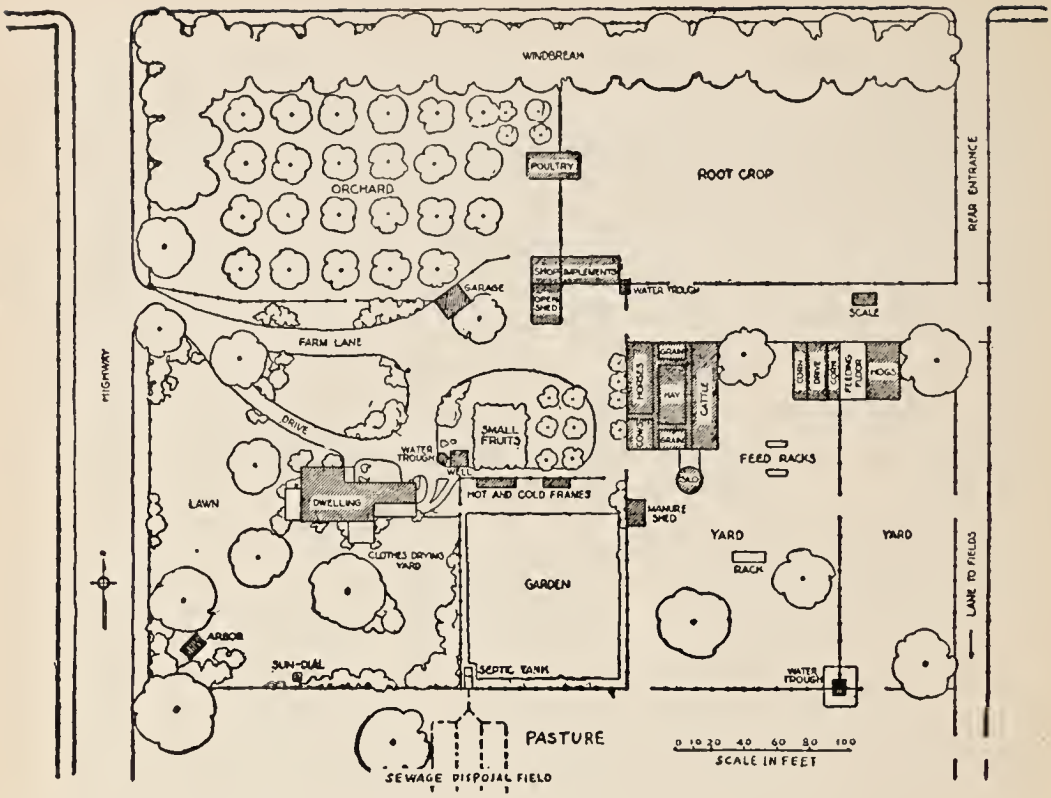


Figure 42. This shows details of a well developed farmstead on a Corn Belt farm. A windbreak protects the buildings from north winds. House is near the highway. Farm buildings set well back from the road are near the lane to the fields, and they are reached without going through the door yard. (U.S.D.A.)

is given first consideration and the other buildings are placed in relation to it. In this plan the house is set back from the highway about 100 feet, which is sufficient to give an attractive setting with a short driveway from the road to the farm buildings. The driveway is placed to the north of the house, to provide a direct road to the farm buildings and to reduce the amount of dust blowing toward the house. The farm buildings and livestock yards are placed east of the house so that the prevailing summer winds will not blow barnyard odors toward the dwelling.

The barn and the house are the focal points of the plan, the smaller buildings and livestock yards and pens being placed relative to them. The barn is about 150 feet from the house. The axis of the barn is north and south, so that the livestock on both sides will have

the benefit of sunlight. The lane north of the barn is fenced, and can be used as a horse lot.

The silo is located so that it is convenient to either barn or yard feeding of livestock. The corn crib and granary is placed east of the barn, a convenient location for yard feeding.

The hog lot adjoins the cattle yard so that, by opening a gate, the hogs can be allowed to follow the cattle. The implement shed is connected with the shop, so that machinery can be overhauled and repaired under cover.

The vegetable garden is conveniently located near the house and the orchard is located to the northwest of the buildings where it will help break the cold winter winds.

In this illustration the farmstead is east of the highway; a different plan would be required if it were north, south, or west of the road. No two farmsteads can or should follow exactly the same pattern. The lay-out must be adapted to the buildings needed and to the field arrangement as influenced by the topography.

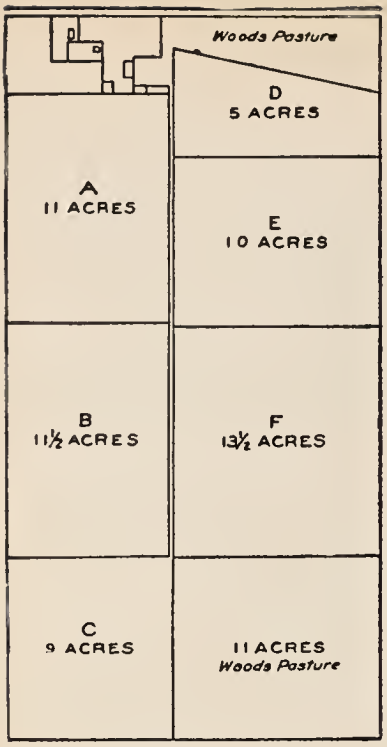
FIELD LAY-OUT

The lay-out of fields on a farm at any one time reflects the judgments of the farmer for several years before, and illustrates his efforts to overcome the handicaps of nature. Planning the field lay-out involves the consideration of the rotation to be followed, economical operation, and the conservation of the soil.

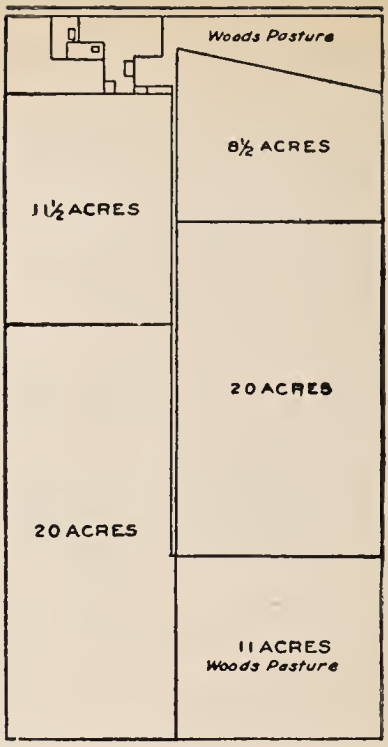
Crop Rotation and Field Lay-out. Most crop production systems require putting a crop on different fields year after year, unless very special conditions permit consecutive cropping. If a crop combination has been worked out as discussed in chapter 10 best results are obtainable by rotating these crops around the cropland available in about the same acreage each year. That has meant as many fields as there are years in the rotation during stable periods. The bigger the field, the more effectively all the field work proceeds.

The ideal lay-out for level land would be three, four, or five rectangular fields of the same size. The production plan would then be as stable as the seasons would permit, the size of fields being the same and the acreage balanced for soil and livestock.

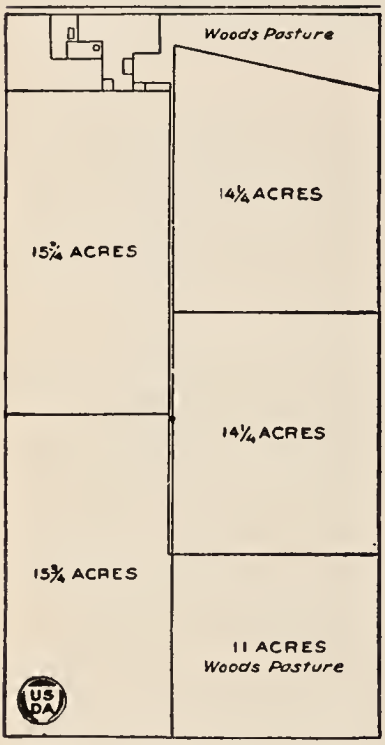
The basic rotations of the Corn Belt are variations of the three-



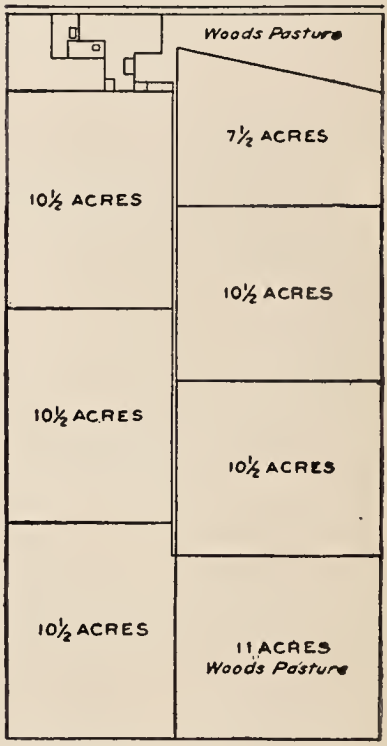
As it is now



Rearranged for three-year rotation.



Rearranged for four-year rotation



Rearranged for five-year rotation

Figure 43. Here the improved lay-outs of an 80-acre farm for three-, four- and five-year rotations are compared with the original lay-out. The lane of this farm was kept the same because of the pasture. The revised lay-out saves some fencing and makes it easier to rotate the crops because all fields used in the rotation are nearly the same size. (U.S.D.A.)

year corn-oats-clover succession. The feed supply provided by equal acreages of these crops will support the same number of animals each year—work stock, cattle to eat the roughage, hogs to eat the corn, and poultry for home supply in numbers adjusted to the yields of these crops. Variations in crop production are taken up by buying and selling feed or animals or both. With good level land, uniform soil and no obstructions, the farm can be laid out in three fields of equal size with the building lot at one side of the middle field. One field is in corn followed by oats in which clover will be sowed for hay the next year. The second field is in oats and the third field is in clover. This is the simplest of the standard rotations.

In much of the Corn Belt, other cropping plans have seemed desirable. In the cash corn section of Illinois half the land can be put in corn or soybeans by having four fields, two in corn and soybeans, one in oats and one in clover. The corn and soybean fields can be worked as one unit three years of the four, which is advantageous. Less livestock is kept on these cash corn farms than on regular livestock farms. Other plans include winter wheat seeded on the ground from which the oats were harvested, the clover being seeded in the wheat. This combination is a four-year or a five-year rotation, according to the acres of corn to be grown.

Alfalfa is a much better feed crop than clover wherever conditions for its normal growth prevail. It can be kept on the land for several years, as compared with two years for clover. Alfalfa also costs more for seed, so that rotations with alfalfa often run to seven years in which alfalfa occupies each field three years or four years. Some farmers prefer to block off their alfalfa field expecting to use it for hay several years, perhaps as many as ten, and dividing up the rest of their cropland for one of the short rotations.

Other crops take their places in the rotation. Soybeans, for example, are like corn in their demands on the land, and they do not come off the land early enough to precede wheat as do oats. Potatoes also are commonly grown in place of corn. Barley can be used in place of oats, or more often in place of part of the oats, in order to stretch the time available for work on spring grains over more acres. Whenever plans call for extra grassland some of the acreage will be used as pasture. Such use requires temporary fencing to keep

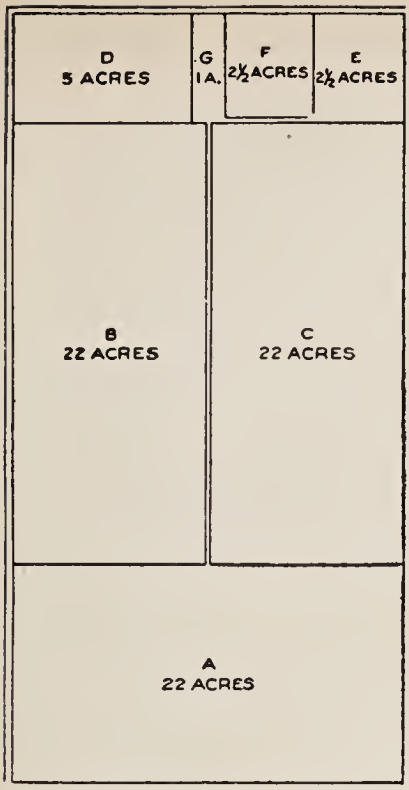
stock out of other crops and provides good feed without harvesting expense.

In a few areas, such as the specialized wheat areas, there are farms on which only one crop is grown. In such cases the farm may contain only one field, or there may be two fields of equal size, each of which is kept in fallow every other year.

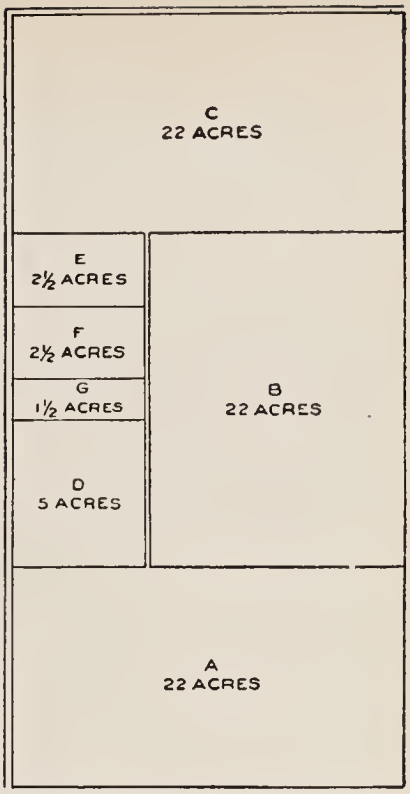
Field Lay-out for Economical Operation. Over most of the Middle West and the Great Plains land was surveyed in rectangles and farms are commonly made up of combinations of 40- or 160-acre tracts. The roads lie on the section boundaries. In the older regions, and wherever there were forests and rough hilly lands, farms are irregular in shape, roads run along grade lines, fields are small and cut by streams. Often rock outcrops or swampy places interfere with tillage so much as to make hay, pasture, or woods the only feasible use. Even in the best agricultural areas the ideal layout remains something to be worked toward.

In rectangular fields the plowing and cultivating is done in less time in fields at least twice as long as they are wide, because fewer turns are needed. A square field, if it is large, can be handled as though it were two or three rectangular fields for most farm operations. For example, fewer turns will be required in mowing if the field is split into two or three parts rather than mowing around the border of the entire field. With horse power, turning time is not all time lost, because horses need rest. The larger the implements used the more important is the time required for turning and the space used for headlands. A small field, two-and-a-half times as long as wide, can be plowed the long way in 88 percent of the time required for plowing the other way. With tractors the bigger the field the better. Triangular fields take most time because of so many more short rows.

Fences are intended to confine stock. They have small justification otherwise. Now that electric fence has become rather commonly understood and adopted it can be set up where wanted, leaving the fields open for work on the contour or in whatever size seems best. A barbed wire fence keeps about three feet of ground out of use for harvested crops on each side of the fence. In addition to the cost

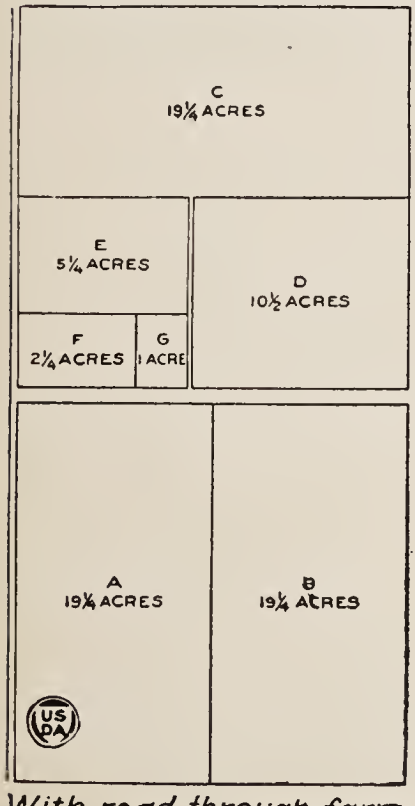


With buildings at end



With buildings along side

A,B,C, Rotation fields.



With road through farm

D, E, Fields, either or both of which may be used for permanent pasture, for alfalfa, for silage, or for corn to "hog off." By dividing field D, a three-year rotation may be run on these fields.

F For garden, orchard and poultry yard.

G For buildings and lots.

Figure 44. These three lay-outs show ideal arrangements of fields and lanes of 80-acre farms with respect to the farmstead in three locations. (U.S.D.A.)

of fencing, an unnecessary fence wastes land and furnishes a breeding place for weeds and insects.

Square fields take less fence per acre than oblong, or irregular fields. Above ten acres a field twice as long as wide has about six percent more fence than a square field of the same acreage. A 20-acre field has only 40 percent more fence than a 10-acre field and only twice as much as a five-acre field.

The possibilities of improving the arrangement of fields stand out in relief when the farm is mapped. Even farmers who have been on the same farm many years have found fields too small, fences badly located, wet places to drain, stumps or rocks to move. Having decided on the best rotation the switch-over may be something of a job. Most farmers have been able to work out plans in a single year, but more time may be needed if it is necessary to clean out fence rows and run new lines.

Because farms aren't always all cropland of uniform quality, but have woods, rough land, streams, roads, fences from previous uses, and the like, the problem of planning field lay-out is an individual problem that cannot stay solved after marked changes in economic conditions appear.

The Lay-out of Fields to Conserve the Soil. Farmers now are learning that a field that is not level must be treated with special care lest fertility be wasted by traditional methods of tillage. Farming on the contour, with or without terracing, is increasing. All of the tenets of good farming still apply, except for straight rows.

When slopes make contour farming advisable the whole farm may need to be laid out anew and lanes and interior fences taken down. Farming on the contour means that some rows will be longer than they would have been if the rows were straight, but it is likely that some short rows and small irregular-shaped pieces also will result. The difficulty of farming these can be reduced by putting sharp corners and small odd-shaped areas into grass. The rearrangement in field layout required to conserve the soil on an actual farm shown in Figs. 75, 76, and 77 illustrates the special problems that arise when farming on the contour. Helpful suggestions for planning the fields to conserve the soil can be obtained by writing the Soil Conservation Service, U. S. Department of Agriculture, Washington,

Figure 45. Here grain, corn, hay, and potatoes are planted in strips on the contour with terraces. Treated in this way, corn and potatoes can be grown on this slope without danger of damage from gullying. (Soil Conservation Service.)

D. C., or to the State Agricultural Extension Service of each State. In some localities the Soil Conservation Service is able to furnish expert technical guidance in laying out contour lines and field boundaries.

EXERCISES FOR CHAPTER 6

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. In judging the adequacy of the buildings on a particular farm, the most important thing to consider is (a) whether or not they are fire proof; (b) whether they are more than 50 years old; (c) how much it cost to build them; (d) how well they fit the size and type of the farm; (e) how long they will last.

2. The internal arrangement of a dairy barn should (a) provide for keeping as many cows as possible in a given amount of space; (b) be arranged to save labor and promote cleanliness; (c) permit all the cows to face the same direction.

3. The farmstead should be situated on fairly high ground with some slope so that (a) it will have good drainage and air circulation; (b) it can be seen from the highway; (c) the operator can look out over the fields from the house.

4. Farm buildings are usually located near a public road in order to (a) be close to neighbors; (b) avoid the necessity of maintaining a farm lane; (c) have the buildings where they can be seen by passers-by.

5. In hilly and rolling areas it is desirable to have (a) fields twice as long as they are wide; (b) many small fields; (c) no cultivated fields on slopes of more than 2 percent; (d) fields that permit cultivation on the contour of the land.

B. From the following group of items check the 3 most important in planning the lay-out of fields:

(a) The crop rotation.
(b) Distances from fields to the farmstead.
(c) Prevention of erosion.
(d) Present location of fences.
(e) Location of rock outcroppings.
(f) Having fields all the same size.
(g) Economical operation.
(h) Having fields twice as long as they are wide.

C. Two fields contain approximately four acres each. If a crop

is planted two feet apart how many times will a farmer have to turn around in cultivating with a two-row cultivator if (a) the field is half a mile long and 64 feet wide? _____; (b) one eighth of a mile long and 256 feet wide?_____.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss the conditions that frequently make it necessary for farm lay-outs to be changed, including (a) technological changes; (b) changes in products grown.

2. Discuss the importance of the following points in determining the adequacy of the buildings on a dairy farm: (a) shelter; (b) convenience; (c) sanitation; (d) cost.

3. Discuss the ways in which field lay-out in rolling and hilly areas differs from that in level country, touching upon (a) size of fields; (b) shape of fields; (c) crops grown on different fields.

CHAPTER 7
SELECTING AND USING FARM EQUIPMENT

From earliest times, farming has been an occupation requiring hard work, much of which has been with the hands or with simple tools. Even today after many years of progress in farm mechanization in the United States—progress in the last 30 years alone probably has increased output per farm worker in this country by 25 percent—there still remains much hard work in farming. This will never all be done away with, but much of the drudgery once connected with some farm jobs, and even with some lines of production, has been eliminated through the use of farm machines and tools. And even some of the jobs that still require the use of hands, back and legs are now done in half the time formerly required. Further progress along these lines is sure to follow.

FARM MECHANIZATION

Much of the increase in mechanization of farming is associated with the use of tractor power, which makes it possible to use larger and more effective machines. Figure 46 shows the rapid increase in the number of tractors on farms since World War I. The first large increase came shortly after the war ended, when agricultural production was at a high level. Development of the general-purpose type of tractor, and its widespread adoption by farmers in the late 1920's did much to maintain the rapid upward trend in the number of tractors on farms. A third large increase in the use of tractors on farms came in the late 1930's when rubber-tired general-purpose tractors came into general use, and when farmers were recovering from the drought and depression years immediately following 1930.

The increasing use of automobiles, motor trucks, and tractors on farms and in cities in the 1920's finally resulted in almost completely eliminating the commercial horse farms that produced draft and carriage animals. Farmers who bred their work mares in order to produce their own work stock, and a colt now and then for sale,

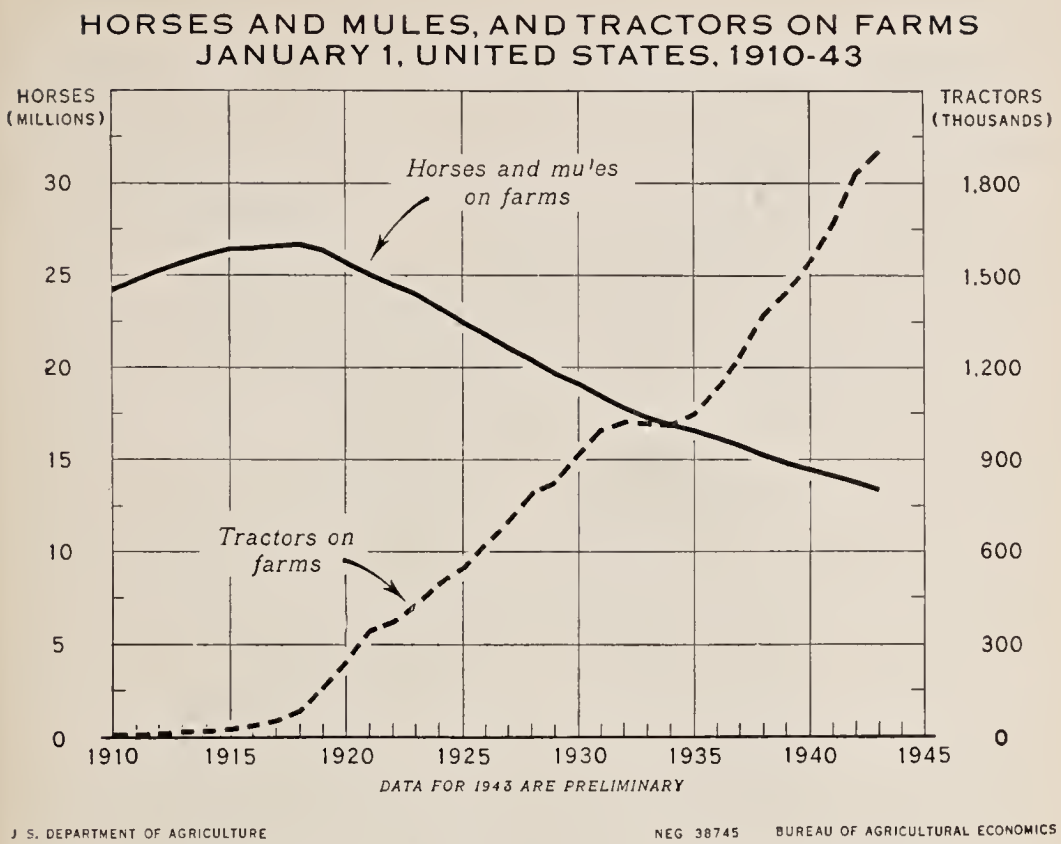


Figure 46. The number of horses and mules declined 13,000,000 and the number of tractors increased nearly 2,000,000 in the 25 year period from 1918 to 1943. On this chart, the scale for horses and mules is at the left and for tractors at the right. (Bureau of Agricultural Economics.)

raised fewer and fewer colts as farms became more mechanized. The wide adaptability of the general-purpose tractor for doing so many kinds of farm work, including crop cultivation, has decreased the need for work stock on farms.

The upward trend in the use of tractor power and the downward trend in the use of animal power probably will continue for some time, as tractors and tractor machines are being developed for use on smaller farms. This means that some areas where horses or mules are now used extensively will gradually shift to the use of tractors. More machines adapted for tractor power will be used, and one man will be able to farm a larger acreage than was farmed with work stock. Farmers will also have more money invested in machinery, which will increase the importance of the selection and use of the right kinds and sizes of equipment.

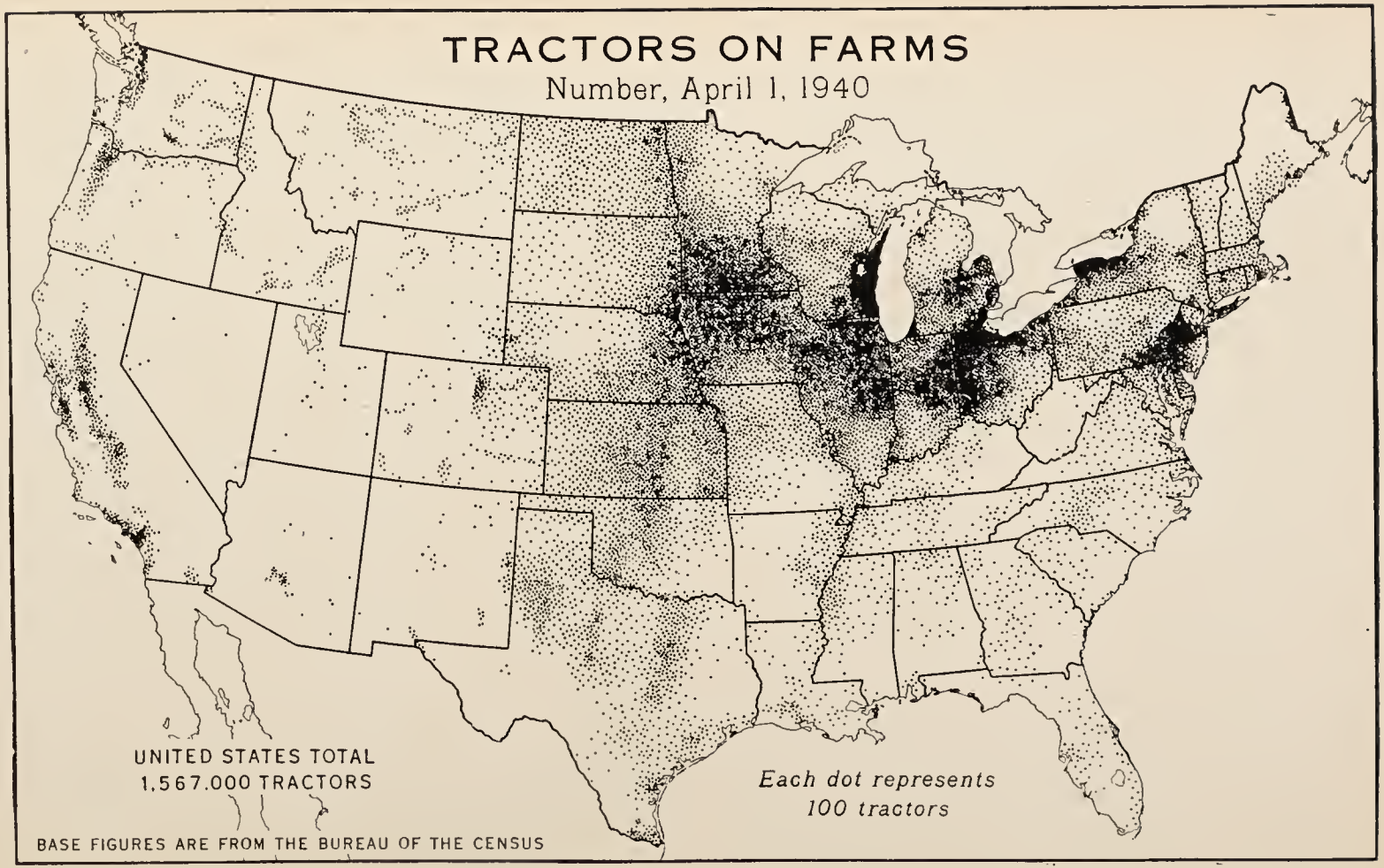


Figure 47. Tractors are concentrated in areas where most of the work on crops can be done with machinery. Relatively few tractors are used in the eastern cotton areas, but even here, tractor farming is increasing, as tractors and tools adapted to the farming become available. (Bureau of Agricultural Economics.)

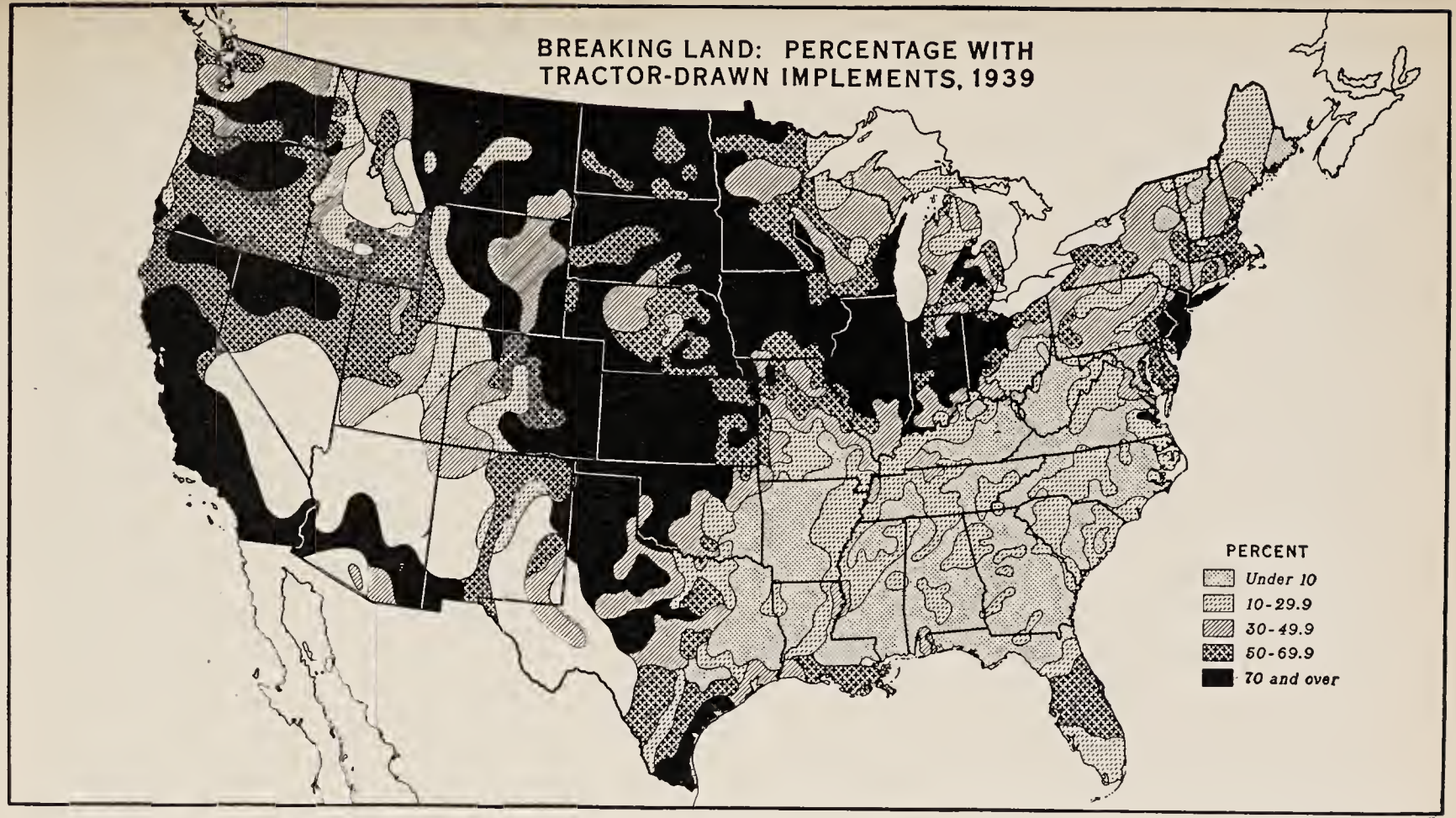


Figure 48. Most of the land seeded to crops is broken (plowed, listed, or bedded) one or more times before being seeded. Tractors furnish the bulk of the power for breaking land in most areas of the western half of the country and in the central Corn Belt. (Bureau of Agricultural Economics.)

Figure 47 shows the regional distribution of tractors on farms at the last census date, April 1, 1940. Heavy concentration of tractors on farms is shown in the Corn Belt, the wheat areas, fertile fruit and crop areas in the East, and in the irrigated valleys of the West.

Land preparation and seeding is a big job each year. The work is heavy and time consuming and the seasons in which the work must be done are short. Early tractor models were designed largely to do the heavy field jobs in preparing the land, such as plowing, listing, bedding, and disking. Tractors are still used extensively for the heavy farm jobs, and also for many of the lighter jobs, such as harrowing, planting, and cultivating.

More than 325,000,000 acres of land in the United States are seeded to crops each year, and most of it is broken before seeding (plowed, listed, or bedded). In 1939 more than 55 percent of the land-breaking was with tractor power. (fig. 48). Disking is an operation that is common in tree fruit and nut orchards and on farms with relatively heavy soils. Harrowing, either with spike tooth or spring tooth, is common in all crop sections. In 1939, about 55 percent of the disking, and 43 percent of the harrowing was done with tractor-drawn implements. The regional pattern for tractor disking and harrowing follows closely the regional pattern for land-breaking with tractor power.

In the Great Plains and other western wheat regions tractor pulled combines (see fig. 55), which cut and thresh the grain in one operation, have largely replaced grain binders, headers, and custom threshers. In the Corn Belt, and farther east, tractor-drawn combines for harvesting soybeans and small grains have increased greatly since development of the small combine (fig. 49).

The large level cotton areas of the Southwest have been considerably mechanized, but in the eastern cotton belt where large numbers of workers are kept on farms for cotton chopping, hoeing, and picking, and where many of the fields are small and terraced, one-mule and two-mule outfits for preparing land, and for seeding and cultivating crops continue in wide use. Recently, there has been an extensive demand for farm tractors and equipment to go with them in southern cotton and tobacco areas. This demand probably will

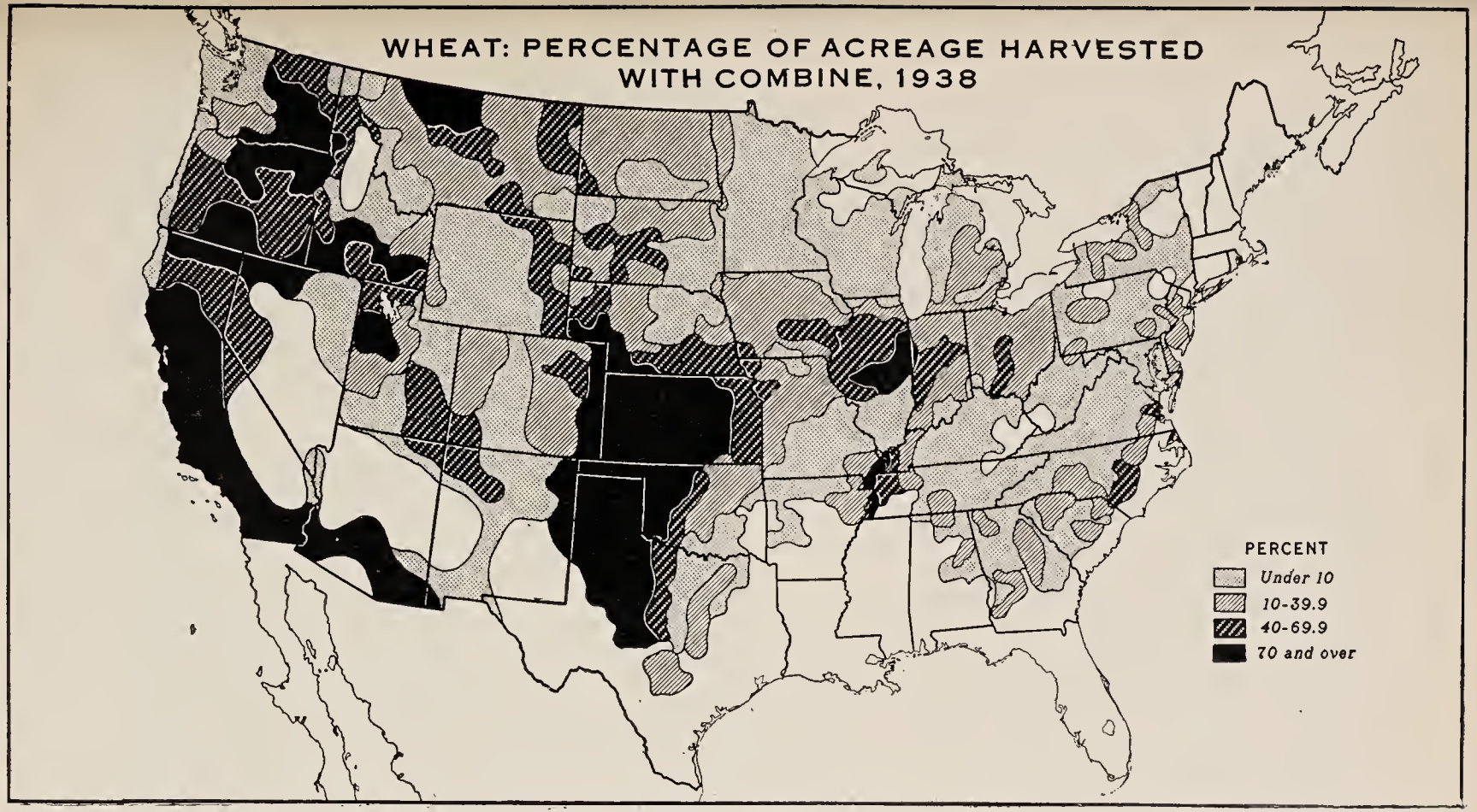


Figure 49. The combine was used for harvesting 49 percent of the wheat acreage of the United States in 1938. Over 70 percent of the acreage in the Southern Great Plains and in the principal wheat areas of the Pacific Coast and Mountain States was harvested by this method. Combining of grain has increased in all areas since 1938. The combine has the greatest advantage on farms that have relatively large acreages of wheat and where but little value is placed on the straw. (Bureau of Agricultural Economics.)

continue for some time as more power units and machines suitable for southern farms are developed.

Row-crop cultivation is a large and vital job throughout the country each year. In the early days one-horse cultivators that required from one to two trips across the field to each row were in general use. These are still used extensively in the Southeast and in some other sections where row-crop acreages are small. In the Corn Belt, and other similar areas, two-horse, one-row riding cultivators were in common use many years ago, and three-horse, two-row cultivators have been in use for several years. Development of the general-purpose type of tractor in the 1920's made possible the use of tractor power for pulling row-crop cultivators. These usually are of two-row, three-row, and four-row sizes, and are used in all parts of the country, but most extensively on relatively large farms within the Corn Belt and the Great Plains (fig. 50).

Hay harvest is another vital summer job throughout the country. Regular hired and family workers, many hired seasonal workers, and

Figure 50. The use of tractor-powered cultivators has expanded rapidly with the increased use of general-purpose tractors. This is a four-row cultivator in a Minnesota cornfield (Bureau of Agricultural Economics.)

numerous types of labor-saving implements are needed each year to harvest the hay crops without undue loss in quality or tonnage. Although tractor power and motor trucks are used in harvesting hay, horses and mules continue to be the source of motive power for hay harvest on most farms. Tractor mounted and drawn mowers are used extensively where large, level acreages are harvested. Side delivery rakes, sweep rakes, windrow pick-up balers, and stackers are widely used in the western hay areas where rainfall does not hinder the curing of hay. Dump rakes, side delivery rakes, hay loaders, and hay forks and slings, are essential equipment in the other areas where much of the hay is stored in barns and hay sheds. Corn Belt and Northeastern farms depend largely on hay loaders to get the hay onto wagons for hauling from field to barn (fig. 51).

Figure 51. When a hay loader is used for loading, and a hay fork or slings are used for unloading, a crew of two men, one boy, and two horses can usually load, haul, and store about ten tons of hay in a day. (Bureau of Agricultural Economics.)

Figure 52. After the hay is windrowed or bunched, a stacking crew of five men and six horses can put up about 30 tons of hay in a day. This type of stacker is called an overshot stacker. (U.S.D.A.)

Sweep rakes and hay stackers do an excellent and quick job of stacking hay in the western hay areas (fig. 52).

WHAT MACHINES TO BUY

Farm machines and tools that lighten the load and save time are always wanted by farmers. Not always, however, can this equipment be bought and paid for out of farm earnings. Machines and tools are especially expensive for small farmers, because their purchase price is high in relation to the amount they can be used, and in relation to earnings on small farms. Machines also need repairing with use, and they eventually wear out and must be replaced.

It is not unusual to find on a farm machines and tools ranging in age from one year to 20 years. The reason for this range in age is evident. The farmer doesn't want to spend everything he earns for the working tools he uses in making a living, and even if he did there usually would not be enough money available to him to buy each year the newest models of all the machines wanted. This means that few farms are perfectly equipped at any time, although a great many may be classed as well equipped for practical purposes. This doesn't mean that all the other farms are under-equipped. Many of them may have more machines than the minimum actually needed, but because of poor judgment, obsolescence, or change in farm plans, they do not fit well into the current jobs to be done.

The first thing the farmer must do is to decide which machines to buy and which to do without. To do this, he needs a long-time farm plan as discussed in chapter 10, a plan showing the acreage of each crop he expects to have each year, and how he will prepare the land, and cultivate and harvest the crops. He will have to decide upon what crops he expects to sell and what he intends to feed to livestock. On the basis of such information it is possible to reach sound conclusions concerning the operations which justify the purchase of special machinery. A modern potato digger of the elevator type might strike his fancy because of its mechanical appeal, or because of the hours he has spent digging potatoes the hard way, but here his interest in ownership should end, unless the acreage to be dug is large enough to make the machine pay (fig. 53). Or, he may have to make a choice between buying a tractor and using horses, or between

Figure 53. It takes a large acreage of potatoes to justify the ownership of a machine of this size. This two-row tractor-drawn digger is at work in a field in Aroostook County, Maine. (Bureau of Agricultural Economics.)

buying a combine and having his grain threshed with the community separator; or between buying a windrow-pick-up hay baler or a stationary outfit, or of handling the hay loose. Or, he might have his hay or grain harvested by someone who has the necessary machinery. This is commonly known as custom work.

In any event, it is up to each farmer to determine what individual machines or implements to buy. Most farmers cannot afford to experiment with new, untested machines and tools. They may not work satisfactorily, repairs may be hard to get, and the machines become obsolete quickly. In general, they do well to stick to standard machines of makes known in the community. Reliable local service facilities are also an essential consideration in case of the more complicated machines. Machinery costs are large enough when the farmer's choice of machines is good; poor choices result in the dis-

carding of many machines soon after they are purchased and in correspondingly high replacement costs.

On many farms, investment in machinery and tools is a large item. If each machine has been selected carefully and wisely the total investment may be kept in line with that which is economically desirable. But there is a tendency for farmers to overstock with equipment.

The man who is buying a set of equipment to begin farming will do well to buy conservatively at first. If tractor power is decided upon he should get a tractor and only the main tillage tools to go with it. He should then add the other items that are necessary on any farm, such as wagons, planters and the basic small tools. To begin with he might be able to hire equipment for harvesting some crops and add to his machinery inventory as he gains both capital and experience in need for and use of equipment.

If capital is limited the first investment in machinery often can be cut down considerably by buying some of it at farm sales. Before doing so one should be careful to appraise the condition of the machines for sale and not overpay for old worn out machines. Sometimes the competitive bidding at farm sales, spurred on by the hypnotic voice of the auctioneer, results in paying more than the value of the remaining life of the second-hand machine.

After the basic machinery inventory has been acquired, new machines will be added as old ones wear out or as new enterprises are taken on that require different machinery. Additional equipment should also be acquired when it becomes evident that a job can be done more cheaply if a machine is bought than if the job is done on a custom basis, or by hand labor.

The purchase of any large machine should be undertaken only after a careful calculation has been made, and the added costs balanced against the additional returns. For example, in buying a tractor to replace horses it is necessary to consider the first cost of the tractor and the annual interest charge on this investment, the annual depreciation based on the expected life of the tractor, and the annual repairs, fuel and other supplies. These annual costs added together should be balanced against the saving in horse feed and maintenance costs of horses and harness, and the saving in labor,

especially if it has to be hired, or if it occurs in busy seasons. Any increase in size of business or outside work for pay as a result of shifting from horses to tractor power, and timeliness and a better job in doing field work also need to be considered. If it is possible to hire the use of a tractor for the more important operations the custom rate should be balanced against the cost of owning one.

MACHINERY WEAR AND OBSOLESCENCE

At times in the past, a common sight in and around farm buildings was an accumulation of various machines and tools that were no longer in use. These are the places from which much of the farm metal came in the scrap metal drives in 1942 and 1943. Much of this equipment was discarded by farmers for something more suitable. Obsolescence was particularly heavy at the time tractors and tractor equipment were being developed, for improvements were bound to be numerous as the new machines were tried out under actual farm conditions. Furthermore, many machines and tools made to be drawn by teams were not very satisfactory for tractor operation. They were discarded gradually after purchase of a tractor as the farmer was able to buy new ones.

Many of the discarded horse-drawn tools were obsolete only because the farmer had changed his power unit. If they had been shifted to other areas where horses and mules were still used for farm power, many of them would have been suitable for many more years of service (fig. 54). Instead they were set aside at home to wear out from rust and disuse. The rate of obsolescence of farm machinery probably is less now than it was 20 years ago, and consequently the average useful life of many machines on farms is greater now than it was then.

The inventory values of farm machinery are shown for each type of family farm in tables III and IV. If it is assumed that these machines are half worn out, then the original investments and annual depreciation and cash repair costs would be roughly as indicated in Table V.

The annual rate of depreciation plus the indicated allowances for repairs are about 10 percent of the value of the machines for the types of family farms shown. The range in annual use and the care

Figure 54. The purchase of a tractor would make this sulky plow obsolete on this farm, but it would be up to date and good for many more years of service on many horse-operated farms. (Soil Conservation Service.)

given machines on different farms is wide, and although the figures in table V are presented as illustrations they may be used as guides under average conditions. Machinery costs should always be considered along with the other farm operating costs. Machinery costs may look high as a single item but prove to be money savers when the books are balanced, or they may appear of little importance when purchased but turn out to be expensive in the end.

The test comes when costs are considered along with quantity of work done with the machine, and resultant increase or decrease in quality and yield of product, reduction in the hired labor bill for running the farm, and saving in labor of the operator and members of the family. Other factors also should be considered. For example, the purchase of a tractor may enable the operator to increase the size of his business by renting additional land, or a milking machine may make possible the handling of more cows with the same labor force or may result in saving valuable time needed for other things. Timeli-

Table V. Original investment per farm in machinery and equipment, and average annual depreciation and cash repair costs, specified types of family farms

Type of family farm	Investment per farm in machinery and equipment	Average depreciation per year	Average annual cash cost of repairs
	Dollars	*Dollars*	*Dollars*
Wheat, winter wheat	3,000	220	65
Cash grain, Corn Belt	3,100	240	70
Cotton, 2-mule, Georgia	220	15	5
Flue cured tobacco, Virginia	350	25	10
Hogs and beef, Corn Belt	2,400	250	50
Dairy, Central New York	1,800	180	40
Dairy-hog, Minnesota	2,500	200	50
Dairy on new land, Washington	1,000	60	35
Beef cattle, South Dakota	3,000	200	90
Poultry, So. New England	1,200	125	50

ness of doing certain operations, such as planting, spraying, and harvesting may, under unusual circumstances, result in the saving of enough crop to pay the cost of the machine in a single year.

FITTING MACHINERY TO THE FARM

Machines are made in many sizes. The reason is, of course, that there is variation in the size of the many jobs to be done on our 6,000,000 farms. Generally, large machines are associated with large acreages, large fields and extensive types of farming, and small machines with small acreages, small fields, rough lands, and some of the more intensive types of farming. It is a mistake to buy too small a machine. And it is also a mistake to buy a machine that is too large for the work to be done and for the fields on which it is to operate.

Once the farm plan is decided upon, and the power unit for field work selected, the remaining choices become relatively easy. Machines and tools are made today to fit various sizes of tractors and various sizes of teams. For example, moldboard plows range in size from a five- or six-inch one-mule plow to large gangs of several bottoms for the larger tractors. Grain combines in the Pacific Northwest that at one time were pulled by more than 20 horses are now pulled by a single tractor of 25 to 40 d.b.h.p. (drawbar horsepower)

(fig. 55). The grain binder has been displaced on many farms by combines, and for small farms there are small combines that cut less than a six-foot swath.

Table VI gives several examples of an average day's work with different sized machines and units of power. These illustrate the great number of choices the farmer has in selecting equipment, and emphasize the need for careful judgment in making selections that fit the job to be done. Some of these machines cover an acre in one-fourth, or one-tenth, of the time required by others. But plowing or harrowing an acre of land on a 60-acre farm is a different job from plowing or harrowing an acre on a 600-acre farm.

The real problem is to select the machine that will do the work economically and in the time that can be allotted to the operation, rather than to select a machine that will do the work in the shortest time possible. On a 60-acre farm much more time can be spent per acre in preparing the land and seeding small grains and the job will still be done on time as compared with a 600-acre farm where perhaps ten times as much grain must be sown during the time available for this operation.

It is not always easy to fit a farm perfectly with machinery and equipment. This is one of the primary reasons mentioned earlier in this chapter for buying machinery conservatively at the beginning of farming, and then gradually building up the machinery inventory as the need becomes clear. But even this procedure may not solve the problem of the farmer who needs more than one tractor and its equipment but who doesn't have enough land for the full use of two tractors and their equipment; or of the farmer who raises some grain each year but has too small an acreage for the economical ownership of a binder.

In the first example, such a farmer may have several alternative choices. He may be able to lease some of his surplus acreage to a neighbor who has too little, or he may be able to rent or buy enough additional acreage to round out a two-tractor farm unit. There is the possibility also of using the tractor and some of the other equipment for doing custom work in the community, or of buying the second tractor, and perhaps some of the additional larger machines, cooperatively with nearby farmers. The decision should be made after

Figure 55. A modern grain combine that is especially adapted to grain harvest in hilly areas. On this machine the platform can be raised and lowered to conform to the slope of the land. (Bureau of Agricultural Economics.)

balancing probable costs against expected income from alternative ways of handling the problem.

In the second instance mentioned above, the farmer may find enough custom work at rates of pay that will make the purchase of the binder desirable. Cooperative ownership of the binder, on the other hand, may be the most satisfactory solution to the problem.

COOPERATIVE AND CUSTOM USE OF MACHINERY

American farmers, in general, have been accustomed to own most of the farm machines considered by them to be necessary. This is especially true of the smaller and less expensive machines and tools, such as plows, cultivators, and planters. These implements need to be at hand when the work is to be done. Some of them are needed off and on throughout the growing season. Such implements are not well suited for custom work or exchange work on a large scale. Machines like tractors, trucks, hay balers, corn pickers, and grain

threshers are adaptable to outside work on a custom or an exchange basis. In fact, this type of machine is often bought with the intention of helping other farmers with their work on a custom or exchange work basis.

Such machines as grain threshers, corn pickers, and silo fillers are often owned jointly by a few neighboring farmers who help each other harvest their grain or corn crops, or fill silos. These machines cost a considerable amount of money and can be used in season to harvest the crops of several farmers. On the other hand, an orchard spray outfit may cost nearly the same, but not be so well adapted to cooperative or exchange use because the range in time for putting on a specific spray is not a matter of weeks, or even days, but a matter of hours (fig. 56).

On many farms there are machines that are not fully used. Some of these are relatively large horse-drawn machines for which there now is no great use in the neighborhood. Others are modern in design, but are so located that there is only a limited amount of work available to them. Then, as indicated above, there are those whose timeliness of use is so important that their annual use in terms of acres or hours is very restricted. These are not the only reasons, however, why some expensive machine is often kept in the shed when the next door neighbor could use it. Careful operators are needed to operate such machines, and if the owner, or someone else he can depend on, cannot accompany the machine, it may be kept in the shed, although the home work has been completed.

Table VII shows the extent of annual use of some farm machines. The milking machine, which is ordinarily used twice during nearly every day in the year is used more than any of the other machines shown, or an average of 684 hours per year. Farm tractors are used an average of about 500 hours and cream separators about 140 hours per year. Plows, binders, mowing machines, and drills usually

Table VI. Daily duty of machines of specified kinds and sizes

Operation	Kind and size of implement[1]	Power used[2]	Average acres covered per 10-hr. day
Plowing	Moldboard, walking, 8-inch	1 horse	1.0
	Moldboard, walking, 14-inch	2 horses	2.0
	Moldboard, 2-bottom, 14-inch	5 horses	4.0
	Moldboard, 2-bottom, 14-inch	15 h.p. tractor	8.0
	Disk plow, 50-inch	20 h.p. tractor	13.0
	Disk plow, 10-foot, vertical, one way	20 h.p. tractor	28.0
Disking	Single disk, 8-foot, once over	4 horses	15.0
	Single disk, 20-foot, once over	20 h.p. tractor	60.0
Harrowing	Spike-tooth, 10-foot, once over	2 horses	15.0
	Spike-tooth, 20-foot, once over	4 horses	30.0
	Spike-tooth, 24-foot, once over	15 h.p. tractor	70.0
	Spike-tooth, 32-foot, once over	20 h.p. tractor	90.0
Cultivating—Corn or cotton	½-row, walking (2 times to row)	1 horse	2.5
	1-row, riding (1 time to row)	2 horses	7.0
	2-row, riding (1 time to 2 rows)	3 horses	12.0
	2-row, riding (1 time to 2 rows)	15 h.p. tractor	20.0
	4-row, riding (1 time to 4 rows)	15 h.p. tractor	35.0
Cutting corn	Binder, 1-row (corn not shocked)	3 horses	6.5
	By hand (corn shocked)	Hand	1.2
Picking corn	Mechanical picker, 1-row	15 h.p. tractor	7.0
	Mechanical picker, 2-row	20 h.p. tractor	12.0
	By hand	Hand	1.5
Mowing hay	Mower, 5-foot	2 horses	8.0
	Mower, 7-foot	15 h.p. tractor	20.0
Drilling grain	Disk drill, 7-foot	3 horses	12.0
	Disk drill, 10-foot	6 horses	18.0
	Disk drill, 10-foot	20 h.p. tractor	25.0
	Disk drill, 20-foot	20 h.p. tractor	50.0
Harvesting grain	Binder, 6-foot	3 horses	9.0
	Binder, 8-foot	4 horses	14.0
	Binder, 8-foot	15 h.p. tractor	20.0
	Combine, 5-foot	15 h.p. tractor	11.0
	Combine, 10-foot	20 h.p. tractor	22.0
	Combine, 16-foot	20 h.p. tractor	30.0
			Minutes per cow
Milking cows[3]	Milking machines, 2unit (one milking)	Electric motor	5
	Milking by hand (one milking)	Hand	9

[1]Size represents working width.
[2]For modern tractors equipped with rubber tires.
[3]Minutes per cow include time for caring for machine and milking utensils.

Figure 56. Spray rigs must be immediately available when the pest strikes. For this reason they are not so well adapted to cooperative use as several other machines. (U.S.D.A.)

average well under 100 hours of use per year. The range in the annual use of all machines on individual farms is very wide. Some of the smaller and less expensive machines are sometimes used no more than one full day per year. It must be remembered, however, that farming is a job of doing many things, each at the right time, and consequently the machine is fitted to the job and not the job to the machine.

CARE AND REPAIR OF MACHINERY

For each mowing machine or grain binder that is in continuous use for 25 years, many thousands are broken up, worn out, or discarded before one-fourth as many years of use. Variations in the years of service of other farm machines are also great. Two principal causes are responsible for this wide difference in life: (1) amount of annual use; (2) amount and quality of attention and repairs given the machines. No one objects to having his farm machine wear out because of usage, for greater use means more business, and more business usually means more income. The expensive kind of machinery

Table VII. Extent of use and work done in 1941 for indicated kinds and sizes of machines[1]

Kind of machine	Size of machine and power used	Time machine was used in 1941		Average amount of work done with machine in 1941
		Usual range	Average	
		Hours	*Hours*	*Acres*
Row crop planters	2-row, tractor-drawn	20–250	76	131
	4-row, tractor-drawn	20–250	80	262
	2-row or more, horse-drawn	10–250	40	46
	1-horse	5–300	50	28
Row crop binders	1-row, tractor-drawn	10–250	51	38
	2-row, tractor-drawn	20–350	91	130
	Various sizes, horse-drawn	10–250	34	20
Mowing machines	Various sizes, tractor-drawn	20–500	78	154
	Various sizes, horse-drawn	10–400	63	54
Grain drills	Various sizes, tractor-drawn	20–500	79	201
	Various sizes, horse-drawn	10–350	44	44
Grain binders	Various sizes, tractor-drawn	20–350	55	100
	Various sizes, horse-drawn	10–225	34	37
Grain combines	6 feet and less, tractor-drawn	25–400	110	126
	Over 6 feet and under 10, tractor-drawn	25–400	126	207
	10 feet and over, tractor-drawn	25–400	143	400
				Tons
Manure spreader	Various sizes, horse-drawn	25–1,000	142	177
Farm tractors[2]	Various sizes and types	100–1,400	493	
Milking machines	Various sizes	200–2,000	684	
Cream separators	Various sizes	50–800	139	

[1]Adapted from F. M. 42, Work Performed with Principal Farm Machines. A. P. Brodell and James W. Birkhead.
[2]F. M. 32, Fuel Consumed and Work Performed by Farm Tractors. A. P. Brodell and M. R. Cooper.

wear is that caused by careless operators and by improper care when the machine is idle (fig. 57).

Unskilled and careless operators who fail to keep motors and machines oiled and greased, or overload the machines to the point where vital parts are strained, or bent, or broken, will have high

Figure 57. Improper storage of machinery frequently results in the rusting of delicate mechanism, the rotting and warping of wooden parts and breakage from livestock. (Bureau of Agricultural Economics.)

operating costs. Furthermore, machines so handled are often out of order when needed badly.

The good operator and caretaker will avoid such mistakes, and furthermore, he will take positive steps to keep his equipment in good working order and to prolong its life. In addition to keeping the machines under cover when not in use and to keeping the motors and bearings oiled and greased, small details will be looked after. Nuts and screws will be kept tight so that parts will not become loose and out of alignment. Bearings will be adjusted and cutting devices will be kept sharp and adjusted, as need arises. Attention to these details results in a higher quality of work and increases the life of the machines.

Rainy days and slack work periods are good times to go over farm equipment and put it in shape for the busy seasons ahead. A good workshop, including the tools and materials for welding and repairing metal and wood parts and structures are almost essential

Figure 58. Time spent in the farm shop during the winter saves valuable time in rush seasons. (Bureau of Agricultural Economics.)

to well equipped farms that have considerable equipment (fig. 58). Much valuable time can be saved in rush seasons by having on hand assortments of screws and bolts, and by the use of such simple tools as a screw driver, a wrench, or a brace and bits for wood and metal.

EXERCISES FOR CHAPTER 7

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. The expansion in farm mechanization in the last 30 years has increased output per farm worker by approximately (a) 5%; (b) 10%; (c) 25%; (d) 75%.

2. The development in tractor design that made possible the use of tractor power in pulling row crop cultivators was (a) rubber tires; (b) tractors with extra width between the rear wheels; (c) the general purpose type tractor; (d) reducing the weight of tractors.

3. In order to determine which machines he needs to buy, a farmer needs to (a) determine the amount of hard work that can be saved by machinery; (b) find out the ones that can be borrowed or rented; (c) make a long-time farm plan showing the acreages he expects to have in each crop and how the crop is to be handled.

4. For most farm machines annual depreciation and repairs amount to about (a) 5%; (b) 10%; (c) 25%; of the original value of the machine.

5. A machine becomes obsolete when (a) it is worn out; (b) it is broken beyond repair; (c) a new model comes out; (d) it would be advantageous for the farmer to get a more up-to-date model.

6. In the selection of the proper sizes of farm implements for a given farm the item to be considered first is the (a) plow; (b) planter or drill; (c) harvesting machinery; (d) tractor or other power unit.

B. Below is a series of statements with a blank line after each. If the portion of the statement in italics is true, circle the letter T, but do not write anything on the blank line. If the portion of the statement in italics is false, circle the letter F and write the correct answer on the blank line. In some cases there are three possibilities, for example, in question two you must decide between *not changed, increased,* and *decreased.*

1. T F Recent developments in tractors and tractor-drawn machines have made them *less suitable* for use on the smaller farms.

_____

2. T F The number of horses and mules in the United States has *not changed* in the last 25 years._____

3. T F All machines *are available* in sizes to fit every size of farm._____

4. T F Machines that may be urgently needed on short notice generally *are not* well adapted to custom or cooperative use.

C. 1. You are operating a well diversified corn, hay, and dairy farm which keeps you very busy during the crop season. Which of the following would be the best way to keep your machinery in condition?

a. Whenever you finish using the machine for the season take time to go over it completely then and there, replacing worn and broken parts before you forget to do it.

b. The day before taking the machine out at the beginning of the season go over it carefully, replacing worn bearings, broken parts, etc.

c. Make a note of needed repairs when you finish using the machine, but delay a complete overhaul until you have more time in the winter.

d. Maintain a good stock of spare parts so that without spending time in overhauling and inspection of the machine you can take the machine into the field and if it breaks down you can repair it without very much delay.

2. You are a farmer in Iowa. Your farm plan usually involves raising 60 acres of corn. There are about 30 days in November and December when you have very little to do. You have a 10 (drawbar) h.p. tractor. Your farm machinery dealer suggests that you buy a one-row corn picker that will cost you $450.00, because it will save a lot of time and permit you to get more use out of the tractor. Would you consider this a wise purchase (a) if you could use the machine only on your own farm; (b) if you would get enough custom picking in the neighborhood to keep you and the machine busy during November and December?

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss the importance of studying the farm plan as a guide to what machines to buy, showing the way such a plan will help in

deciding (a) whether or not a machine should be purchased; (b) what size of machine is needed.

2. Many farm machines become obsolete before they wear out. Discuss the reasons for this, touching upon (a) the effect of improved models upon costs; (b) changes from horse to tractor power.

3. Describe the manner in which the purchase of an expensive machine should be considered, touching upon (a) increased costs; (b) possible savings; (c) possibility of increasing income.

HALF COURSE REVIEW

A. Underscore the words or expressions that best complete each of the following statements.

1. There are fewer farmers today in proportion to the total population than there were 100 years ago because (a) modern farm machinery enables farmers to produce more; (b) increased industrialization has drawn many people from agriculture into industry; (c) the majority of people are unwilling to face the hazards and uncertainties of farming.

2. The majority of American farms today are (a) family farms; (b) large-scale farms; (c) part-time farms operated by people who have other jobs.

3. Cotton is not grown in the Northern States because (a) markets are not available; (b) farms are not equipped to handle the crop; (c) the growing season is too short; (d) prices are higher for other crops.

4. In most irrigated areas the amount of water available to a farmer (a) depends upon how much he can afford to pay for water; (b) how near he is to a river or stream; (c) is established by law.

5. There are several advantages to diversified farming. However, there are some areas in the United States where farmers depend upon only one crop for their income. Farms in such areas (a) are large-scale farms; (b) have low incomes; (c) cannot be maintained; (d) may be successful if one crop can be produced year after year without seriously reducing yields per acre and if the price of the crop is stable from year to year.

6. Cash renting is well suited to (a) farmers who have limited financial resources; (b) farmers who have ample funds and equip-

ment; (c) farmers who are inexperienced and who want the landlord to make most of the management decisions.

7. Some farmers are poor managers because they are *inefficient,* which means that (a) they do not get very much work done each day; (b) with a given amount of feed or land, and other resources, they get low production per animal or per acre of crops; (c) they do not put in a full day's work; (d) they do not work hard enough.

8. Farmers are said to have high *capacity* for managing a farm if they (a) can look after a large acreage or large number of livestock; (b) can make money in times when most farmers are not succeeding; (c) are located on large farms.

9. The proper size of a machine for a particular farm is the one that will (a) do the work in the least possible time; (b) do the work economically and in the time that can be allotted to the operation; (c) require the least number of men to operate it.

10. Sometimes it is advantageous for a group of farmers to purchase a machine together, and run it on a cooperative basis. This arrangement is most satisfactory for (a) the simpler machines that are used frequently; (b) machines that must be available on short notice; (c) expensive machines of types that permit some flexibility in the time they are to be used.

B. Underscore the phrases or expressions that correctly complete each of the following statements. There may be more than one correct response to a statement.

1. The family farm (a) is usually a combination of home and vocation; (b) is a private enterprise maintained by a single proprietor or operator; (c) is certain to be displaced by the mechanized, corporation farm; (d) should provide sufficient income to maintain the farm and to provide for normal family wants.

2. The size of the family farm should be determined by the (a) region and amount of acreage required for kinds of crops; (b) labor supply; (c) amount of income operator wants for his family; (d) amount of land that can be purchased cheaply.

3. In general, the family farm (a) is as efficiently operated as the large-scale farm; (b) has a lower overhead than the large-scale farm; (c) has a greater variety of enterprises than the large-scale farm; (d) specializes in a single crop.

4. Most family farms provide considerable security for the operator and his family because (a) there is always a good market for farm products; (b) much of the family's food is raised on the farm; (c) housing for the family is part of the farm equipment; (d) diversification of crops provides a kind of insurance against falling prices and natural hazards.

5. The range of temperatures during the growing season is important because (a) all crops do better when it is hot than when it is cool; (b) some crops do best in cool weather and some in hot weather; (c) some crops do best when the days are warm and the nights cool.

6. In the course of time, changes may be expected in the type of farming practiced in any area because (a) any system of farming tends to exhaust the soil after a while, and it is necessary to introduce different enterprises; (b) new markets may develop and thus make it profitable to develop new enterprises; (c) diseases may appear which reduce yields and returns from some crops; (d) new varieties of crops and livestock may be developed which permit them to be grown in areas where they had not been profitable; (e) farmers make more money as they increase the number of different crops grown.

7. In fruit-growing areas, a farm on which an orchard has already been established (a) is worth more than it would be without the orchard; (b) may be worth less than it would be without the trees, for several reasons; (c) is valuable, provided the soil has good drainage.

8. Some of the ways in which the size of a well diversified general farm might be properly measured include (a) acres in crops; (b) total number of livestock; (c) number of cows milked; (d) average value of farm products sold each year; (e) total value of land and buildings; (f) total hours of labor required to operate the farm.

9. There are several ways in which a farmer can increase the size of his business without moving to another farm. Some of the common ways of doing this are (a) to rent or buy additional land; (b) apply lime or fertilizer; (c) keep more livestock; (d) use his truck, tractor or other machinery on neighboring farms for a fee; (e) buy more machinery.

10. Buildings and yards for livestock should be so located that

they are (a) in sight of the farmhouse; (b) sheltered from winter storms; (c) well drained; (d) in the shade most of the time.

11. It is essential that fields be laid out in a manner that will (a) prevent erosion; (b) permit a corner of each field to touch the farmstead; (c) provide livestock water in each field; (d) fit into the rotation for the farm; (e) require the least amount of fencing.

12. It is not advisable to buy a machine if (a) it cannot be paid for in cash; (b) repair parts are hard to obtain; (c) it is not the latest model; (d) it will be used less than 50 days a year; (e) it will not increase income enough to pay for itself.

C. The prosperity of the American farmer rises and falls with industrial and commercial prosperity. In other words, farm prices reflect economic conditions elsewhere. Write in the blank space provided after each of the following four statements, the main reason for the indicated price of wheat.

1. In November 1919 wheat brought from $2.20 to $2.45 per bushel. Reason_____

2. In November 1932 the price of wheat per bushel dropped to $.31, probably the lowest in 300 years. Reason_____

3. In November 1943 the price of wheat per bushel was $1.33, more than four times that of 1932. Reason_____

D. When a person speaks of a farm, he may be thinking of any one of many kinds of farms. In the left hand column below, are listed the kinds of farms mentioned in chapter 2. In the right hand column below, are items that describe each of these kinds of farms. Match the kind of farm with the descriptive item that best fits it by placing the number of the kind of farm in the parentheses in front of the descriptive phrase.

1. Part-time farms	a. ( ) Worked by wage-labor, or sharecroppers, or share tenants
2. Retirement homes or farms	b. ( ) The most common of the kinds of farms
3. Subsistence farms	c. ( ) Separate farms under one management

4. Plantations	d. ( ) Rather small farms from which the operator attempts to get the greater part of his livelihood
5. Corporation farms	e. ( ) The operator can add to his income in his spare time
6. Chain farms	f. ( ) Owned and operated by a group who furnish labor and equipment
7. Cooperative farms	g. ( ) Operated by stock companies
8. Family farms	h. ( ) Enables continued contact with farming and provides some security

CHAPTER 8
THE FARM WORK PROGAM

Labor may be a limiting factor in farming, just as land, buildings, and machinery may be limiting factors. A shortage of labor may be the cause for not renting an additional piece of land although machinery is available, or the reason for not increasing the number of dairy cows even though the full capacities of the barn and silo are not being used. On the other side, however, are the thousands of small farmers whose land and buildings are not sufficient fully to use the labor of the farm operator and members of his family.

In either case the farmer in planning his work program must make the best of his available labor resources. He must consider the seasonal nature of the work, what tasks can be effectively performed by women and children, and what jobs will require skilled help. Wages need to be compared with prices of farm products and anticipated income to find out how much help can be employed profitably. Work directly related to farm overhead, such as farm maintenance and upkeep must be considered in deciding how much labor to hire. He must consider also the jobs that result directly in products for sale, such as the feeding and care of dairy cows. He should likewise take into consideration available facilities and pay offered for off-farm work during slack farm seasons.

FARMING IS A FAMILY JOB

On many family sized farms the operator does most of the regular farm work and members of the family help with the chores and with various field and livestock operations. Sometimes an older son makes a full farm hand during all or most of the farm year. An uncle, or grandfather, or some other member of the household may contribute substantially to getting the work done.

While the farmer is rearing a family he may hire considerable help. As the children increase in age and strength their work contribution can increase. In time they will make up a substantial part of the farm labor force, providing the operator has planned the

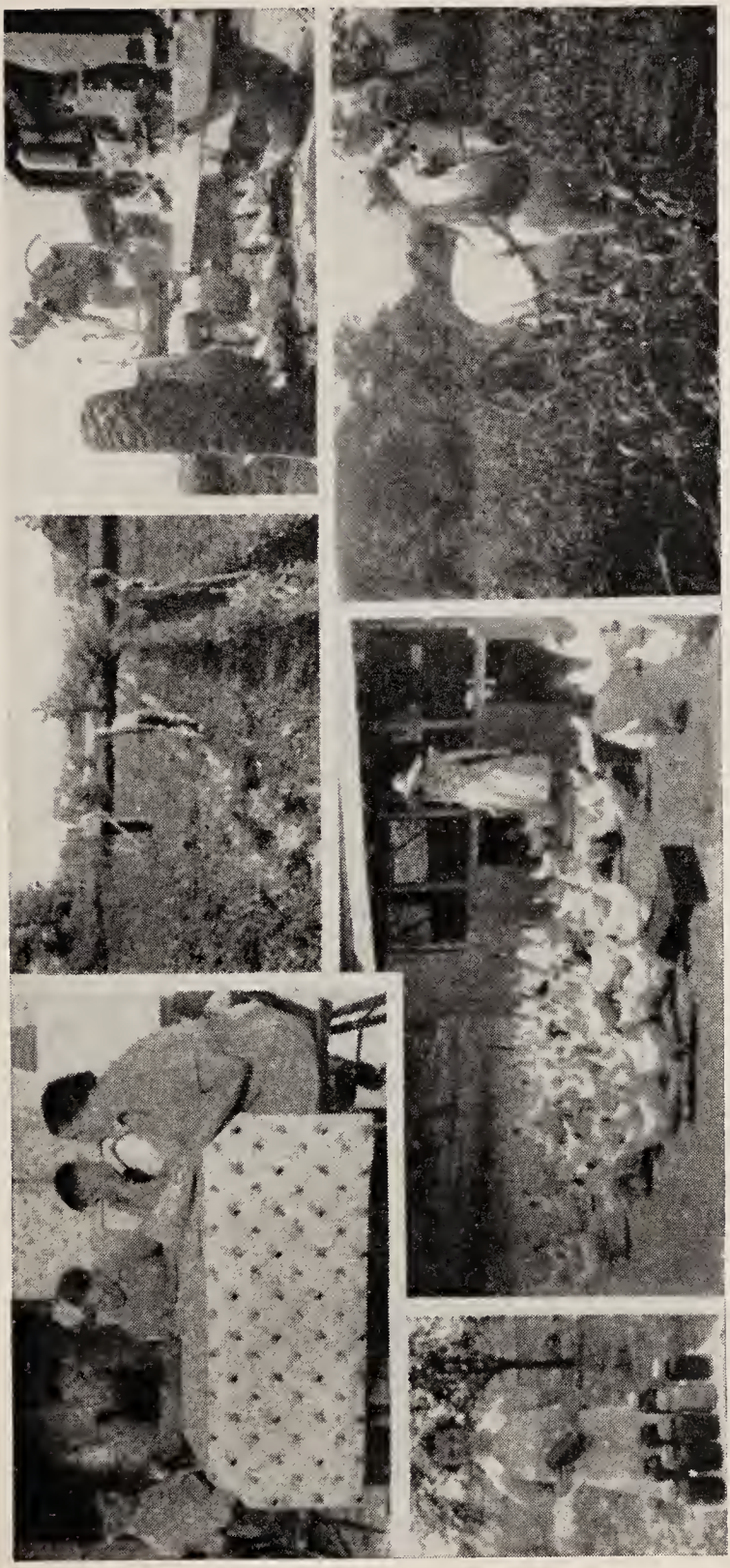


Figure 59. The thoughtful operator will find worth while jobs for each member of the family. (Bureau of Agricultural Economics.)

work so as to keep them interested and busy. After the children grow up and marry, and seek other places for themselves, the operator may have to resort again to hired labor, or get a smaller place.

Almost any type of family farm provides work for each member of the family group. There are plenty of heavy or skilled jobs for the men, and plenty of the lighter and less exacting jobs for the women and children.

Many of these jobs cannot be done alone, and a boy and a man can do some of them as well as two men. If more help is needed there are the neighbors to call on in exchange for work already done or to be done for them. A neighbor's son may be available for hire during the rush planting or harvest season.

Work on a farm is not all in the fields and barns. The home itself is an important workshop where much is done to feed, clothe, and keep clean and healthy each member of the family. The mother's part in this is large and vital. But other members can help. The family cows, chickens, and even the family garden, often are all cared for by the farm women folks and children. Canning and drying of fruits and vegetables for winter use is the type of job that daughters can help with to advantage.

If each member of the family is fitted properly to the farm jobs, the work will be done right and in season. If the operator is wise and a good teacher, he will see that each youngster or beginner learns much of the why and the how of farming as he goes along. It is in this way that the foundation for good farmers is laid. Systematic planning and guidance of the work program is as much a part of profitable farming as is the laying out of fields and of crop rotations, or the buying and selling of livestock, or equipping the farm with machinery and tools.

Work Plan for the Youngsters. Healthy, growing children are an important farm resource. Plans should be carefully laid for using this valuable resource wisely. A reasonable amount of work under pleasant surroundings is enjoyed by farm boys and girls. Unlike many of his city cousins, the farmer has every opportunity to keep his youngsters busy at home under his own direction, and at things that are worth while and educational.

The year's work plan should not overlook the youngsters. They

can do many things well if given a chance. Too often we are inclined to leave to them many little, tedious jobs that seem to get no one anywhere. Strong, healthy boys, and even girls, like to do some of the bigger things like driving the tractor, or using the team. They want to plow, to cultivate, to help harvest the hay and grain. Youngsters are also good at hoeing, chopping, weeding, picking fruit, and many other hand jobs. Almost every farm boy has his daily chores of filling the wood box, bringing in the cows, and similar routine tasks.

Figure 60. Farm boys can handle responsible jobs if instructed properly and given a chance. (U.S.D.A.)

Growing children should not be overworked. Too long hours should be avoided. Occasional days off for themselves should be a part of the plans, and strictly adhered to. Spending money in the form of an allowance, or a calf, or a pig of their own, makes them feel more responsible for their assignments, and is little enough for their share in the family business.

The farm work load of the youngsters must be eased during school months. Even so, many of the routine chores can be continued and special jobs can be planned for Saturdays. Schools can help farm boys and girls by fitting the school work into something of interest on their home farms.

SEASONAL CHARACTER OF FARM WORK

Crops are raised in the open, and the length of growing season for the different crops varies from a few weeks to several months. The work program should be arranged so that in spite of variations in weather each crop and class of livestock will get the proper amount of attention at the right time.

As the season opens in the spring there is a rush to get the land ready and the crops seeded. As the season advances there are cultivating and weeding and spraying and numerous other jobs sufficient to keep everyone busy. Hay and grain crops must be harvested, vegetables taken care of and prepared for market, and fruit crops sprayed and harvested. In some sections there is a lull in the farm work during the latter part of July and early part of August while crops are ripening. This is a good time to fix fences, repair buildings, clean up the farm, and get ready for the fall harvest. After the major crops are harvested in the fall there is a rush to get ready for winter in the northern States. Fuel for winter has to be put in, vegetables stored for home use, buildings made warm, machinery put away for the winter, and butchering around Thanksgiving time.

Many farmers always hire some labor in rush seasons. This is better than hiring a year-round man if there is no productive work during a part of the year. The spreading out of some farm jobs may help in extending the season during which hired labor can be profitably used. Fall plowing, where advisable, reduces the amount of spring work. The spreading out of planting dates will even out the needs for labor during planting and harvest seasons. Vegetable growers who grow several crops, with double or triple cropping, have practiced staggered planting dates to advantage. There are innumerable situations in which something of this sort can be done.

Such practices will help spread the work load, but they will not entirely do away with busy times on the farm. Extra men, women,

and children from neighboring towns and the countryside are needed to chop and hoe cotton in the early summer, and to pick the crop in the fall. The entire family is busy during tobacco suckering (removing shoots that grow out from the tobacco plant), worming, and harvesting seasons. Hay crops in the North, sugar beets, fruits and vegetables, and numerous other crops require special labor at critical times.

These important seasonal jobs are always with the farmer, and must be done at the right time. Although they cannot be eliminated, much can be done to lighten the labor load by the most effective use of machinery and tools. Such plans are usually built around the farm power unit. If a tractor is available the use of machines and tools of the proper size and type for the tractor will get the work done in less time than the use of equipment that is not adapted to the power unit. Even if animal power is used jobs can be speeded up by the use of the proper sizes and types of tillage and harvest machines.

Tools that will do a high quality of work will reduce the number of operations needed to prepare the ground or to take care of the crop. Good tools may cut down the number of sprayings necessary to get a crop of clean fruit, or they may reduce the time needed to get in the winter's wood supply. There is nothing more annoying or wasteful of energy and time than a dull ax or saw, or the lack of an iron wedge, sledge hammer, or hatchet when they are needed badly. Handy facilities all over the place save time that can be used in getting the bigger jobs done quickly. Wider, well-hung gates and doors that will take wide, high loads, and strong wagons, racks, and hay forks or slings will reduce the time required to put in the hay. An elevator at the corncrib saves time and energy at corn harvest time. Hen houses that are easy to clean, self-feeders that work, and handy watering facilities, are especially appreciated at the end of a long, hard day in the harvest field. The list of things that can be done to make farming easier at rush periods is a long one. If they were put into operation much of the work that must be done now would no longer be necessary.

There is often the possibility of doing more with less work by increasing production per acre or per animal. Twenty acres of good

Figure 61. Most of the hay in the North Central and Northeastern States is stored loose in barns. Strong wagons, racks and slings or forks will speed up the work and make the job easier. (Extension Service.)

alfalfa or clover hay may produce as much as 40 acres of poor, trashy hay and require less labor at harvest time. Ten good cows may produce as much milk as 15 poor cows, and require little more labor per cow for their care. Proper field arrangement, contour planting and soil-conserving practices, result in more production per day of work.

Another way to lighten the seasonal labor load is to change the system of farming. More pasture and hay land, or more grain acreage, can take the place of cultivated crops that require larger amounts of labor. The method of harvesting the corn crop can be changed and the amount of labor reduced considerably. It takes only about six hours of labor to husk corn by hand from the standing stalk compared with 16 hours if the corn is cut, shocked, and husked by hand. Corn and grain crops can be grazed if properly fenced. A word of warning is necessary here, however, for there is no ad-

vantage in saving labor if the change in the farming system is such that food or feed production and the resulting farm income are reduced materially. This is a problem that each farmer must work out for himself. But there are many farms for which a rearrangement of the farm plan will not only distribute labor better through the year but will increase the farm income. Livestock and poultry will use the idle winter time of many crop farmers. A field of potatoes may fit well into the labor program to increase the farmer's income. Any extensive period of time in which the labor force is idle, or has little to do, should be inspected carefully for possibilities of better use of the available labor supply.

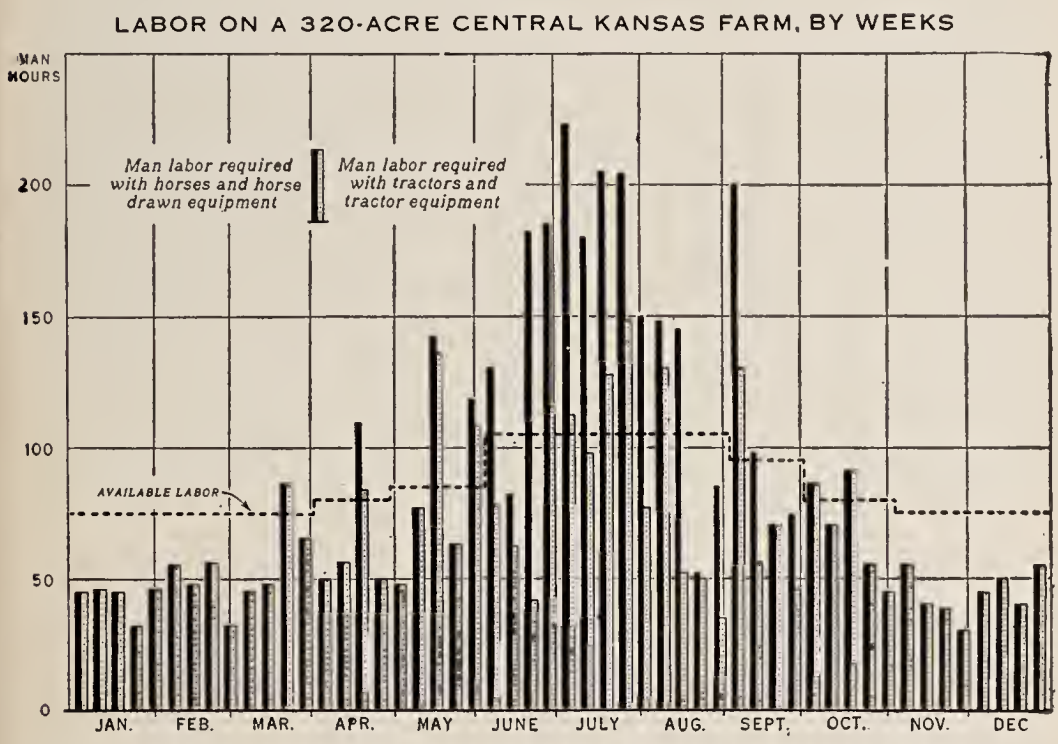


Figure 62. One man and wife and their son during the summer, can operate this 320-acre farm by hiring about 90 days of extra labor if they use horse drawn equipment, or by hiring or exchanging about ten days of labor if they use tractor equipment. If tractor operated, there is need for a little extra farm labor in each of only 12 weeks. During the other 40 weeks this family could have done more work than was required by the farm as organized. (Bureau of Agricultural Economics.)

IMPORTANCE OF TIMELINESS IN DOING FARM WORK

Closely related to the seasonal character of farm work is the effect on production and farm income of doing farm operations on time.

Field work is of greatest importance in this respect. There are two reasons for this. In the first place, crop production on most farms is the keystone to the farm business because most farmers produce crops for sale, or to feed to their livestock. In the second place, crop yields on a particular farm can vary from season to season by as much as 50 percent or more because of variations in weather, and this effect of weather makes necessary the performance of certain operations at exactly the right time.

A long soaking rain may seriously handicap the farmer who is behind in his planting schedule, but help the farmers whose crop is planted; or it may cause weeds to grow profusely in the late cotton field but benefit the neighbor's crop that is well up, and chopped and hoed. In general, the farmer who is always a little ahead of his schedule has an advantage over the farmer who never quite catches up.

The importance of a good stand of any crop cannot be overstated. Proper timing of the planting operation has a direct bearing on the stand of many crops. If the stand is so poor that the crop has to be completely replanted there is always the danger of not getting a good stand because of the lateness of the season. Furthermore, the less reworking of land and replanting of crops, the more labor, machinery and power there are available for doing other things.

The farmer who prepares and cultivates his land at the proper time, saves labor in the operations that are to follow, and increases his production. If the land is too wet when plowed it is likely to puddle and become difficult to break down into a good mellow seedbed. If plowing is postponed too long the land may become so hard that it is practically impossible to do a good job of plowing, and in addition large amounts of extra disking and harrowing will be required to put the land in condition.

Timely and careful plowing, harrowing and cultivating may, therefore, eliminate considerable hand work in the care of such crops as cotton, vegetables, sugar beets, and in some sections corn. On some lands weeds start early and grow profusely and can be eradicated only by timely tillage and hand work. A good early job with the cultivator destroys weeds before they get a good start and may save many hours with the hoe. Almost every year in various sections of the country there are farms on which weed growth gets

so far ahead of the plowman that the crop and weeds are plowed under and the land reseeded. Because of weather conditions, or some emergency, this situation cannot always be avoided, but too often it is the result of careless or faulty planning.

Figure 63. Good crop prospects in a field of potatoes that is kept clean with good equipment and timely cultivation. (U.S.D.A.)

Timeliness in harvesting grain crops saves waste caused by shattering of over-ripe grain, or by the spoilage of grain in the field. Strawberries, and some other fruits, if let go a day too long before harvesting are no longer suitable for shipping. Many other similar examples could be cited. The final result is a reduction in the crop that is suitable for sale and consumption.

The quality of fruit crops is directly affected by the time at which they are sprayed. For many crops there is only a matter of hours during which the spray application will be most effective. Timeliness of spraying potatoes, other vegetables, and of dusting cotton are important also.

The real reason for doing the various crop operations on time is not merely to save labor, but to produce larger and better crops with the same amount of labor. Where the margin of profit is small the difference between doing a thing at the wrong time rather than at the right time may mean the difference between having or not having the margin needed to pay the farm taxes, or the installment on the mortgage.

The care of livestock at critical times is very important. It is essential that sows at farrowing time and ewes at lambing time be given close supervision and care during night and day. Unless they are well cared for, chickens and turkeys are hard to raise. Proper feeding at regular periods, and protection from rodents and inclement weather are necessary if the chicks and poults are raised to salable age without heavy death losses.

Health, flow of milk, and gain in weight must be watched carefully when changing stock from barns or feed lots to pasture fields. The loss of a hog or a steer while taking the animals to market may take all the pleasure out of the trip to town. Each class of livestock should be fed regularly. This insures better health, a lower rate of death loss and a higher rate of production for the same amount of feed. Feed is by far the largest item in the cost of livestock production and should be used wisely.

There is the family side also of chore-time on the farm. Animals must be taken care of every day of the year and someone must be there to do the work. A definite schedule enables the family to have a definite time for eating, especially in the evening. This is important from a health standpoint, and for family satisfaction and well-being. Such a schedule is of particular help to the women who always have plenty of work to do after the meals are eaten, and to youngsters who have lessons to get, and to those who want to plan ahead for an occasional trip to town.

Timeliness in making repairs saves money, and frequently much hard work. A fence that needs repairing will take no longer before the cattle break into the corn field than after the damage is done. A leaky roof can result in the spoilage of a large tonnage of hay or grain. If the foundation sills of a barn are allowed to rot out, it may be much more expensive to put in shape than if taken care of in

Figure 64. A modern kitchen is an important health asset, and saves many hours of work in the never ending job of preparing meals for the men. (U.S.D.A.)

time. Facilities in the home should be planned for and installed in a systematic way so that the various labor-saving devices and the numerous comforts can be had by the farm family at an early date.

ADVANTAGE OF A WORK CALENDAR

The typical family-sized farm has the labor of the operator, several months of family labor, and some hired labor at peak seasons. The total is equivalent to the work of about one-and-a-half to two men for the year. To make the most profitable use of this labor it is desirable to have a definite and complete work schedule. This schedule, or work calendar, should include work plans for the farm operator and his family, and for hired workers. Special attention should be given to a schedule for exchange work with neighbors, and this part of the plan should be worked out with each neighbor concerned.

It may be desirable also to have a work schedule for the use of machines that are used jointly by two or more families.

Since income from farming cannot be had without physical effort, the farmer who wants to make the greatest income must plan to keep the farm workers continuously busy at productive work. A work calendar will help do this because it enables the operator to plan ahead so that no one is idle, and to see that the most essential jobs are done first.

Farm work calendars are the result of planning from years of experience with a lot of common sense thrown in. Eventually the routine jobs become standardized within reasonable limits, and schedules of past years become those of the future. It is then less necessary to put in writing many of the things that had to be worked out during the first few years of farming in the neighborhood. The development of a work calendar, whether written in some prescribed form or not, is rather easy for some types of farming but difficult for others.

The following samples of work schedules for July, and for rainy and cold days, illustrate a way of recording some of the more important things that need to be arranged for in advance.

JULY WORK CALENDAR

First Week

Time of myself, binder, and tractor will be used to cut the following wheat crops: Our crop, 20 acres; Jack Arner's crop, 10 acres; Joe Park's crop, 15 acres; Bill McElhiney's crop, 15 acres (total 60 acres). (Rate of pay, $1.25 per acre—twine to be furnished by them.)

John and Charles (sons 16 and 18 years old) will shock our wheat, cultivate the corn and potato crops for the last time, and cultivate and hoe the garden.

Grandfather will salt and inspect the cattle and sheep in the North pasture and change the sheep to the South pasture, get things ready for haying next week, and help the boys with the garden.

Second Week

Thirty acres of hay will be ready to harvest—will take the time of myself, John, Charles, and Grandfather for entire week if weather is suitable.

Days unsuitable for haying will be used by all four of us for cleaning up fence rows and cutting fence posts for our half of Northrup line fence.

Third Week

Time of myself, binder, and tractor will be used to cut oats for the following: My crop, 10 acres; Jack Arner's crop, 10 acres; Bill McElhiney's crop, 5 acres. (Total 25 acres—three days.)

Entire family will attend sale at Art Graham's on Meigs Creek on July 18.

Grandfather and I will haul and spread manure on South meadow and finish cleaning fence rows, providing hay was finished last week. Otherwise, we will try to complete haying. May have to get Jack Arner's boy to help.

John and Charles will help Joe Barnett for three days in hay and oat harvest at $2.00 per day. The money earned is theirs.

Fourth Week

We will shock-thresh wheat last week of July and may have to continue into August if weather is bad. Will thresh at my place first, Jack Arner's second, Joe Park's third, Bill McElhiney's fourth, and John Malster's place last. (Total of 100 acres, will probably average 20 to 25 bushels per acre, commercial threshing outfit with separator, tractor, light truck, and three men, charge five cents per bushel delivered at machine in farmer's sacks.)

All of the above farmers are to exchange work in getting bundle grain to separator and threshed grain to storage. Will need five to six bundle wagons, ten men, and one truck. Work hours to be balanced and excess time to be paid for in cash at rate of 20 cents per hour for man, 20 cents for team, and 50 cents per hour for truck in hauling grain to storage. John, Charles, and I will help at each place. We will furnish one bundle wagon and team at each place. At our place, Arner will furnish two men, wagon and team; Park, one man, wagon, and team; McElhiney, two men, one wagon, and team; Malster, two men, one wagon and team.

Grandfather will help with threshing at home.

For rainy day and cold weather jobs a form similar to the one below, displayed in some conspicuous place, will be useful in listing things to be done as they come to the notice of the operator.

Items that need attention	Date when work should be completed
1. Repair barn door to hay mow	May 15.
2. Have mowing machine spare cutter-bar welded	May 1.
3. Whitewash hen house	April 15.
4. New blower for ensilage cutter	September 1.
5. Haul brick and lumber for new hog house	December 15.
6. Sharpen 200 fence posts for repairing fence	March 1.
7.	
8.	
9.	
10.	

The very fact that the time schedules must be changed as the season advances because of changes in weather and other factors, increases the need for the schedule. This is especially true where the farm business is so large that the work of several hired workers must be planned for. Assurance of their services when needed can be had only if they can be assured of regular employment.

Although many think of a calendar of farm work as applying to a single year, it necessarily must include things that affect the farm for many years in advance. Crop schedules help to get the work done well and on time, and this results in a larger product of a higher quality for a given amount of effort. But some of the things done in a single year without definite plan may place the farm under an operating handicap for many years.

Plowing a field of sod at the wrong time, or planting a crop up and down instead of around the slope of a hill, or overworking a soft team in the spring, may be the result of a faulty labor schedule. More often, however, it is the things that go undone that count most.

Often a drainage job must be planned and scheduled in advance if it is ever to be completed. Sometimes the complete drainage schedule will extend over two, or even three years. It is the same way with extensive building repairs, or with new buildings, or with pasture improvement, or orchard development, or any of many other farm jobs that are a part of farm development and maintenance.

The farmer who starts out to build up a pure-bred dairy herd must set up a schedule of operations extending over several years. He may have to start by building a dairy barn, or merely by buying a pure-bred bull. But ordinarily these things are not scheduled until a cropping system is worked out that will supply the herd with feed.

A work schedule of rainy day or cold day jobs is essential on

any farm. These are the days when good licks can be gotten in that will save labor and expense on the days when the men should be in the field. These are the planning days when neighbors can be consulted and operating schedules worked out for cooperative use of labor and machines. Rainy days are ideally suited for cleaning and whitewashing barns and hen houses, and for repairing doors, windows, floors, and gates. This is a good time also for indoor painting of wagons, hay racks, and other farm machines and tools. Machines can be greased and oiled, and mower sickles, axes and other tools sharpened and put away for use when needed. It is a good time to select and prepare seeds for planting, and to grind feed and mix rations.

In cold weather, building materials and farm supplies can be hauled. Manure can be hauled and spread in many sections. If a suitably heated shop is available, harness can be oiled and repaired,

Figure 65. There is usually plenty of home and contract hauling for a good farm truck. (U.S.D.A.)

machines and tools can be put in shape, and numerous other jobs completed. A well-planned labor schedule finds plenty for everyone to do but may actually result in less work for what is accomplished.

A work calendar helps in scheduling time for work off the farm. This can be worked out with neighbors where work is exchanged, but of just as much importance is the work plan of those who have time to spend away from the farm at work for pay.

Of all the jobs that farmers do, work off the farm is often the most profitable for farm people who have limited resources. Even farm operators of large means sometimes spend a great deal of time at other work. Fitting into the farm business rather closely is the buying and selling of livestock, poultry and eggs, and even crops, sometimes for immediate turnover and sometimes for feeding or for finishing on the farm.

Hauling for others can often be done more cheaply when the operator's own products can be delivered at the same time. Merchandise of all kinds can be sold, or hauled for others, by a man with a truck.

The carrying of mail is a job that small farmers can do without interfering too much with their farm production program. Veterinarians often have substantial farm businesses along with their professional services. Farm people are frequently called upon to perform some of the services for government programs at stipulated pay.

THE FARM WORK DAY

Those who are familiar with farming realize that it is an occupation requiring considerable physical effort, skill at a variety of tasks, and adherence to definite time schedules in getting certain jobs done. Crops must be planted in season, they must be taken care of while growing, and harvested when they are ripe. Livestock must be fed and cared for each day of the year, including Sundays.

Some believe that the average length of the farmer's work day throughout the year is from 14 to 16 hours. This is an exaggeration. Although farmers work long hours during certain seasons of the year there are seasons when the average work day is cut to seven or eight hours because there are many days on most farms when practically no farm work is done except the feeding of livestock. Recent studies

indicate that the average length of work day in 1943 was approximately ten hours for hired workers, and about 12 hours for farm operators. In the latter case the hours include time for doing chores in the morning and evening, the type of work that can be done while the city man is going to and from his work. Furthermore, the 12 hours probably represent an average of the full days worked, and do not include days only partly worked because of bad weather, or because of time off for personal reasons.

Because of the care needed by livestock, and the uncertainty of weather, and other hazards, the farmer cannot rigorously follow a given length of work day. Nine or ten hours in the field with the work effectively organized and executed will usually accomplish the work to be done on most farms. This may not be enough, however, during serious rush seasons, and at such times the farmer may find it necessary to work in the fields from sunup to sundown, and do the chores before and after work in the fields. On the other hand, there are some jobs in some sections of the country that cannot be undertaken until after the sun has dried the moisture from the plants, and a long day cannot be worked in the field. The problem in such cases is to find something else to do during the rest of the day, especially for hired hands.

At no time, however, can a farmer or his help disregard their responsibility in taking care of the stock and crops. They must be prepared at all times to work hard and long hours in emergencies. There are times when, for example, the season is so delayed because of rainy weather that it becomes necessary to work rapidly, and even on Sundays, so as to get the crops seeded before it is too late, or to harvest some crop before it is too ripe. Tractors with headlights now make possible day and night shifts in some crop seeding and harvesting emergencies.

As a general rule, farm hands do not object to working in these emergencies provided they are paid for overtime or get time off when work is slack. Month and year-round hands are frequently engaged with the definite understanding that a part of the day's work includes chore work early in the morning and after supper.

Dairy farming requires full days of work during winter and summer and for this reason is well adapted to the use of year-round hands.

Figure 66. Full days in the field are required in the busy planting and harvesting seasons. (U.S.D.A.)

Cows must be fed and milked regularly throughout the year, and during the summer when they are on pasture there is work in the fields to be done. Grain farmers, on the other hand, have very busy seasons in the fall and spring in getting the ground ready and the crops seeded. Sometimes there is not much farm work thereafter until harvest when there is a considerable rush again. If other crops are added to the cropping plan, the labor force may be kept busy throughout the growing and harvest seasons, but there will not be much farm work in the winter months, unless livestock enterprises are added.

Generally it is customary for the farm operator and members of the family to bear the brunt of long working hours during rush periods. They work alongside the hired men in the field throughout the day, and then look after the livestock and do the numerous odd chores in the evening. This is all a matter of arrangement where hired workers are involved. Usually the amount of pay and time off

at slack seasons influence the length of work day of the hired man.

In table VI, the amount of work done by various sizes of machines and tools was listed. There are, however, a great many jobs that require hand labor, and some of these are listed below as a guide to what might reasonably be expected of a farm hand under usual conditions. It must be recognized that there is a tremendous difference in the amount of work done by farm workers because of differences in the workers and in the specific jobs to be done. Even the wide range shown for some items may not be wide enough to cover the very unusual situation. This is understandable when it is realized that a large percentage of the people who work on farms are youngsters, old folks, and women, and that crops in some areas yield two or three times as much as in other areas. There are some jobs that can be done as quickly, or more so, by women and children as by men. Quickness of motion helps considerably for such things as picking cotton, picking strawberries, and thinning sugar beets.

Figure 67. A good day's work in cutting seed potatoes by hand is 15 to 18 bushels. (U.S.D.A.)

Table VIII. An Average Day's Work for an Experienced Farm Hand

Corn:			
Hand husking from the stalk, and cribbing, (40 to 60 bu. yield), bu.	60	to	80
Cutting and shocking corn by hand, (40 to 60 bu. yield), acres	1	to	1.5
Shocking corn after a binder, (40 to 60 bu. yield), acres	2.5	to	4
Husking corn from the shock by hand, (40 to 60 bu. yield), acre	.75	to	1
Hoeing corn, acres	1	to	4
Cotton:			
Chopping and hoeing cotton (first time), acre	.75	to	1.5
Picking cotton (main picking), pounds of seed cotton	150	to	200
Hand stripping cotton, pounds of seed cotton	300	to	400
Potatoes:			
Cutting seed by hand, bushels	15	to	18
Cutting seed by cutter, bushels	25	to	35
Dropping potatoes by hand, acres	1.5	to	2
Planting, two-horse planter, acres	3	to	5
Picking up (commercial areas), bushels	100	to	200
Fruit, picking, average yields:			
Raspberries, (commercial—season's average), quarts	30	to	60
Blackberries, (commercial—season's average), quarts	40	to	70
Strawberries, (commercial—Intermediate Eastern States), quarts	70	to	100
Apples, Eastern Orchards, bushels	30	to	50
Apples, Western irrigated, bushels	40	to	60
Peaches, Eastern, bushels	30	to	40
Vegetables, average yields:			
Picking tomatoes for processing, ton	1	to	2
Picking snap beans for processing, pounds	300	to	350
Harvesting beets and carrots for processing, ton	.5	to	1
Fence Building, posts approximately 20 feet apart:			
Posts driven, per man (two-man crew):			
Two strands of barbed wire, rods	40	to	60
Six strands of barbed wire, rods	25	to	40
Wide woven wire with one barbed wire, rods	35	to	45
Posts set, per man (two-man crew):			
Two strands of barbed wire, rods	30	to	45
Six strands of barbed wire, rods	12	to	20
Wide woven wire with one barbed wire, rods	15	to	25
Tiling:			
Digging three-foot ditch by hand, feet	100		
Digging four-foot ditch by hand, feet	60		
Laying four to six inch tile, feet	1,500	to	2,000
Cutting firewood by hand:			
Four-foot length, cords	1	to	2
Milking dairy cows once:			
Cows milked by hand, per hour, head	6	to	8
Cows milked with two-unit milking machine, per hour, head	12	to	14
Grain:			
Shocking, acres	5	to	10
Stacking, two-man crew (rate per man), acres	4	to	6
Scooping from bin or box, tons	18	to	25

Figure 68. In many of our Eastern orchards a full day's work for one man in picking apples of average yield is 30 to 50 bushels, depending on the amount of climbing, and size of fruit. (U.S.D.A.)

HIRED MEN IN AGRICULTURE

During the winter months of 1943 about 8,700,000 persons worked on farms, 21 percent of whom were hired workers and 79 percent were farm operators and family workers. By June and July, the busy season of the year, farm employment had increased to 11,700,000 workers, 24 percent of whom were hired. During the busy fall months of September and October the total remained at about 11,700,000, but some of the summer workers had gone back to school and the number of hired workers had increased to 26 percent of the total.

According to a recent study made by the Bureau of Agricultural Economics about 14,500,000 different persons worked on farms of the United States in 1943. This is nearly 6,000,000 more than the average number employed in the winter months of that year, and nearly 3,000,000 more than the average number employed at the

year's busiest season. This means that there were many different persons employed on farms for only a part of the year. Some of these came from many occupations in cities and towns and some were brought in from outside of the United States expressly for agricultural work. Boy and girl scouts helped, and housewives and businessmen did their part. Altogether, nearly 25,000,000,000 hours of farm work were performed to keep the farms going and to produce and harvest more crops and livestock products than ever before.

Although hired workers usually make up only about 25 percent of the total farm employment their services are indispensable. They are the workers who make possible the harvesting of the cotton crop in season, the timely harvesting of fruits, berries, and vegetables, the grain and hay crops, and other crops. Some of the hired workers are year-round standbys whose work contributes a great deal to the record production of milk, pork, beef, poultry and numerous crops grown throughout the United States.

In June and July of 1943 around 6,000,000 of the farm workers were farm operators, 2,900,000 were family workers, and 2,800,000 were hired workers. Women and children must help with the work on many farms. Sometimes they work in the fields at home and sometimes they are hired workers who may be permanently located or who may migrate from North to South and from West to East when work becomes available.

Because of the great variation in latitude and elevation above sea level in the United States there is great variation in climate, and consequently in planting and harvesting dates. The same crop often is grown within a very wide range of climate, and as a result the time of specific operations varies widely. For example, wheat harvest begins in lower Texas in late May and extends northward with the season until in North Dakota and Montana the crop is harvested in August. Fruit harvest begins with citrus in Florida in October; peaches are ripe in southern Georgia in June; farther north they are ripe in July; and still farther north in August, or even September. Early apples ripen in Arkansas, Tennessee, and New Jersey in July and August, but the big fall and winter crops are picked in these States and farther north in September and October.

Migratory hired workers work north in the spring to do the

various jobs and south again in the fall. In the cotton and vegetable areas of the southwest there is considerable movement of migratory workers from the eastern parts to the western parts. Some of the important streams of farm labor migration are shown in Figure 69. The women and children of migratory workers, and also of those that are located permanently, are used in greatest numbers in the cotton, sugar beet, truck crop and fruit areas.

Probably the best farm workers are those who were reared on farms. Those from other walks of life can make good farm hands, too, if they don't start too late in life and really want to learn. But many farm boys who start as hired workers are looking towards the day when they can become operators of their own farms, and they usually like farm work and have a real incentive to learn.

Married men with their families can be employed to advantage on many types of farms. In this way it is possible for the farmer to obtain a good worker, and the help of growing children who are useful in doing certain jobs. Sometimes the hired man's wife can help on the farm and in the farmer's home. This type of labor has been tried to a considerable extent in some places and found to be satisfactory. To be most satisfactory the head of the family should be assured steady employment, and the other workers enough employment to meet their wishes. If there is not enough work to go all the way round, the children often can help the neighbors. Under some circumstances it is possible to have the family of the hired man supply room and board for additional hired workers. A hired family appreciates a permanent place to live and work, and along with the house and various conveniences, a piece of land for a garden, a few chickens, and pigs for their own meat.

There are great differences in the efficiency of hired workers. Total farm employment is made up of male workers who are in their prime; of those who are physically under par; of old men; and of others with too little ambition ever to try to become more than farm hands. Many of these are suitable farm workers. They have had experience and they can do things well, but the daily amount of work accomplished by some of them may not be large. Those who wish nothing more than to be someone's farm hand frequently are good workers under close supervision.

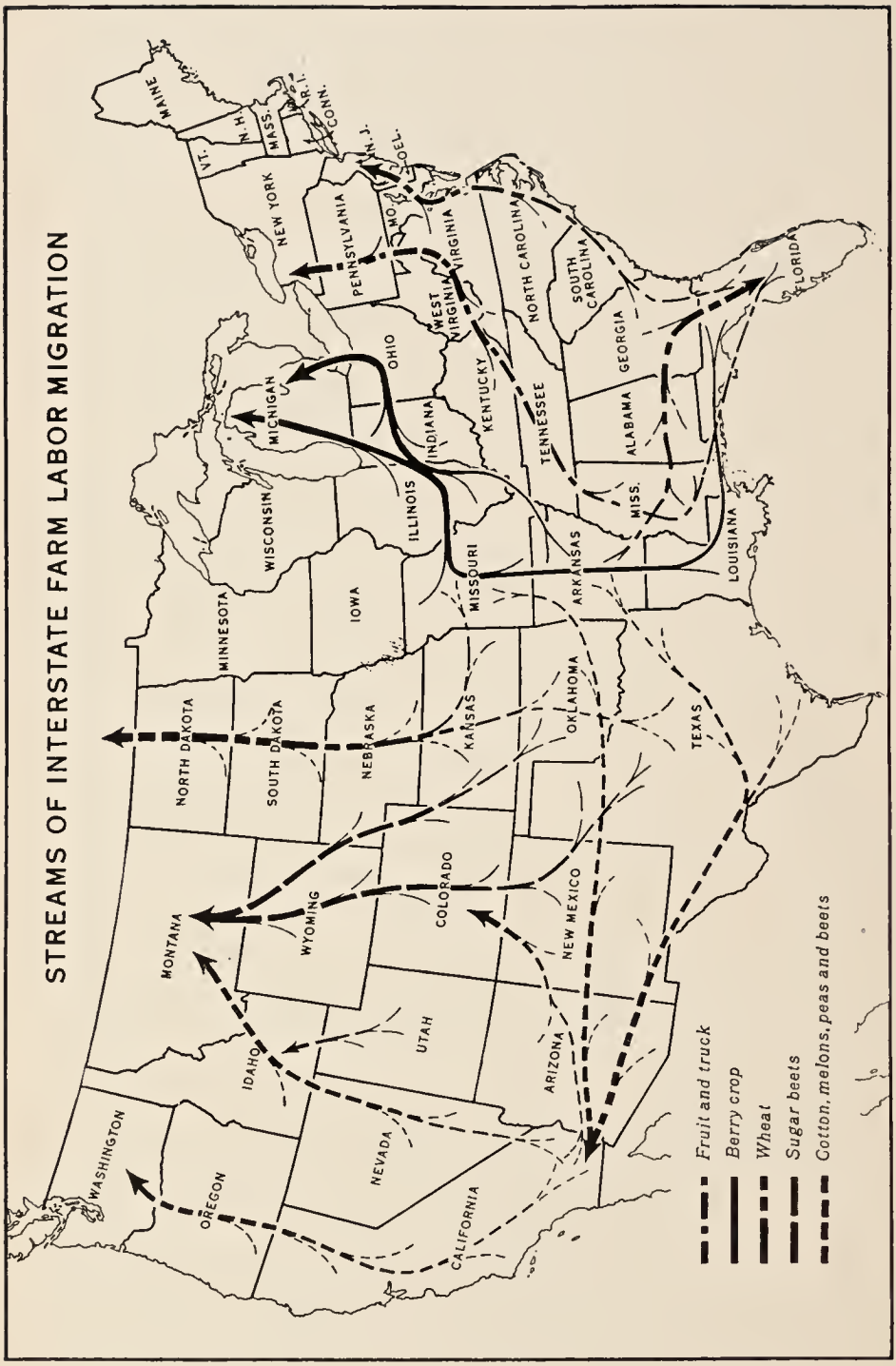


Figure 69. For some crops, migratory farm workers provide much of the seasonal labor needed, especially during harvest. Some of these workers travel as much as 3,000 miles in a year. (Bureau of Agricultural Economics.)

In almost any community it is possible to find farm operators with unsatisfactory reputations in the handling of hired help. Oftentimes the operator's attitude towards the worker greatly affects the value of the worker to the operator. Many little things all taken together tend to make a farm worker satisfied or dissatisfied. If the attitude of the operator is such that the worker feels that he is an essential part of the farm business, and if he is made comfortable, and is well fed, he will probably make a good worker. Consideration toward the other members of the hired man's family is just as essential as the cash wages he receives. Oftentimes various family members can be given jobs to do for pay in cash or produce, that make them feel that they are not only essential but that their services are appreciated.

Above everything else the worker wants a definite understanding of the conditions under which he is to work. It is desirable to have a definite contract covering various phases of the employment. If the work period is short a simple oral understanding will usually suffice; otherwise it is desirable to have a written contract which will cover the amount of wages to be paid, the date when payments will be made, and to some extent describe the duties of the hired man. Specific mention should be made of time off, including holidays and short periods for the transaction of the worker's private affairs. Something should be included about the length of the work day, and particularly about pay for overtime. The obligation of the worker on Sundays should be set forth clearly. If any personal privileges are to be granted, such as using the operator's truck or automobile, or various farm tools in the preparation and care of the worker's farm garden, these should be described.

The lot of the seasonal worker is none too good at best. This is particularly true of married families. These workers want a definite understanding as to what they are to do, what they are to be paid, and what is their obligation to the operator. Frequently they lay considerable stress on things that may be overlooked or considered too small for attention. For example, lack of good drinking water, lack of rest periods, or clean quarters, or good food, or lack of a reasonable amount of full-time work may be just as important as the cash wages they receive. These workers have their own habits of work and of living which should be respected.

If we are to consider the wide differences that exist in the ability of different hired workers, and in the variations in the conveniences and non-cash items of food and fuel furnished to them by farm operators, we can readily understand why cash wages in various parts of the country, and even in the same neighborhood, vary widely. In some sections the same worker is paid different wages during different seasons of the year. The main reason for this is the character of the work to be performed during the different seasons. In the rush seasons wages are high because the work day is long, the work is hard, and the demand for seasonal workers is heavy. But in the winter months on some farms the main job is the necessary chores to keep the place running until spring weather opens up and work in the fields can be started. This is not always the case, however, for lines of production, such as dairy farming, furnish full-time employment throughout the year.

Table IX contains average wages paid per month to hired hands without board for several States selected to show State and seasonal variations. Farm wages are highest in the Western States and in parts of the East near industrial centers. They are lowest in the

Table IX. Quarterly farm wage rates per month without board, United States, and selected States, 1943

(States arrayed from highest to lowest wage rate on 1 Jan.)

United States and selected States	January 1	April 1	July 1	October 1
United States	$ 62.43	$ 67.21	$ 76.00	$ 75.44
California	128.00	140.00	152.00	153.00
Washington	118.00	143.00	151.00	160.00
Utah	105.00	105.00	115.00	118.00
Connecticut	100.00	102.00	108.00	111.00
Montana	95.00	111.00	121.00	131.00
New York	80.75	91.50	93.75	96.50
Wisconsin	73.00	83.00	87.50	89.25
Iowa	72.50	90.25	91.00	92.00
Kansas	70.25	77.00	85.00	84.00
North Dakota	67.00	92.00	106.75	119.00
Ohio	61.00	68.50	72.00	72.00
Texas	57.50	61.00	65.00	72.75
Florida	53.00	52.00	59.00	62.00
Virginia	48.25	49.25	54.00	55.00
North Carolina	42.50	44.25	48.00	52.00
Mississippi	33.25	36.75	38.00	39.00
Georgia	30.50	33.50	35.25	35.25

Southeast, and are in between the two extremes in the Corn Belt. Although a part of the increase from January to October in 1943 is due to an upward trend in farm wages, most of the increase is seasonal in character, State average wages ordinarily being higher in the busy summer and fall months than in the winter months.

EXERCISES FOR CHAPTER 8

CHECK-UP

A. Underscore the words or expressions that best complete each of the following statements.

1. In assigning work to the children, a farmer should try to (a) give them jobs which require hand labor only; (b) give them some jobs which are interesting and instructive; (c) have them do the jobs nobody else wants; (d) keep them busy all the time.

2. On most farms, work will be better distributed if (a) all crops mature at about the same time so a large crew can be hired; (b) several kinds of crops are grown; (c) only one crop is grown; (d) a number of crop and livestock enterprises are included in the farming system.

3. Proper timing of the planting operation means that (a) each crop should be planted on or before the date recommended as the best average planting date for your locality; (b) crops should be planted at a time that fits into your work calendar; (c) crops should be planted as early as possible; (d) using the recommended average planting date as a guide, crops should be planted at the time the growing conditions are right for that particular year.

4. One of the most important reasons why a farmer should have a work calendar is that (a) it will help him remember what he did on a certain day; (b) he will have a complete set of records; (c) the most essential jobs will be done first; (d) he can tell which days he can take off.

5. The average length of the farm work day for hired men is about (a) eight hours; (b) ten hours; (c) twelve hours; (d) fourteen hours.

6. In dealing with a hired worker, one of the most important things to do is to (a) give him considerable voice in managing the farm; (b) give him Saturday afternoons off; (c) make him comfortable; (d) have a definite understanding with him regarding his wages, hours, duties and living conditions; (e) pay a higher wage than other farmers in the community.

7. In most sections of the country, farm wages tend to be low in the winter because (a) more people are working on farms; (b) there

is little work to be done; (c) it doesn't cost as much to live.

B. Underscore those operations in the following list for which it is especially important that the work be done at a particular time:

(a) Spraying fruit trees.
(b) Fixing fence.
(c) Laying out terraces.
(d) Hauling manure.
(e) Cultivating corn.
(f) Applying lime.
(g) Sorting potatoes.
(h) Combining wheat.
(i) Grinding feed.
(j) Repairing machinery.
(k) Milking.
(l) Putting up hay.
(m) Planting cotton.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Describe some of the common farm jobs that are suitable for different kinds of labor, including (a) men in good physical condition; (b) women and older men; (c) children.

2. Discuss ways in which the work load can be reduced during peak seasons, including (a) changes in the system of farming, (b) changes in ways of handling an enterprise; (c) having proper tools and equipment.

3. Discuss the importance of a farm work calendar from the standpoint of (a) finding the right job for each worker; (b) timeliness of operations; (c) reducing labor costs.

CHAPTER 9

GETTING THE HIGHEST RETURN FROM EACH ENTERPRISE

There is an old proverb, "The eye of the master fattens his cattle." Watchful care and judgment, backed up by experience and knowledge of the rules of production are the fundamentals of good management. One of the important factors distinguishing management from just plain work is the use of judgment in solving problems. How often should the corn be cultivated? How much fertilizer should be applied to the cotton? How much grain should be fed the milk cows?

Production of crops and livestock is a technical job involving the mixing of several ingredients in just the right proportions and adding them at the right times. For crops the ingredients include land, labor, machinery, fertilizer, and spray materials. For livestock they include feed, water, shelter, and many operations that might be included under the term "care." A farmer needs to understand the general principles underlying the combination of these ingredients if he is to arrive at sound decisions that will result in the highest returns from each enterprise. These principles, applied to the use of fertilizer on cotton, are stated in simple terms in the paragraphs which follow.

PRODUCTION VARIES WITH THE CARE GIVEN THE CROP

Production per acre increases as more fertilizer is applied. If cotton is planted and no fertilizer is applied at all, the yield on most soils will be rather poor. The application of a little fertilizer will increase the yield somewhat, and heavier application will increase it still more. The yields per acre obtained with different amounts of fertilizer in an experiment at Bishopville, South Carolina, are shown in table X.

With the addition of more fertilizer, yields increased. It would be possible to show increases in yield resulting from additional cultiva-

*Table X. Quantity of fertilizer applied and yield of cotton per acre at Bishopville, South Carolina**

Fertilizer per acre	Yield of lint cotton per acre
Pounds	*Pounds*
None	276
200	340
400	373
600	399
800	419
1000	436
1200	451
1400	465
1600	478

*Adapted from data in South Carolina Agricultural Experiment Station Bulletin 245.

Figure 70. These two fields of corn are on the same soil but one has received more fertilizer than the other. (U.S.D.A.)

tions per acre in the same manner. The same principle applies to the feeding of animals. The pounds of milk produced per cow tend to increase as the cow is given more grain. However, for most crops and livestock there is a limit beyond which additional pounds of feed, or fertilizer, or some other factor will not increase production and may actually cause it to decline.

THE TENDENCY FOR INCREASES TO TAPER OFF

Production increases taper off as more and more fertilizer is applied per acre. In the experiment shown in the table above, fertilizer was added in equal units of 200 pounds. It will be noted that as the

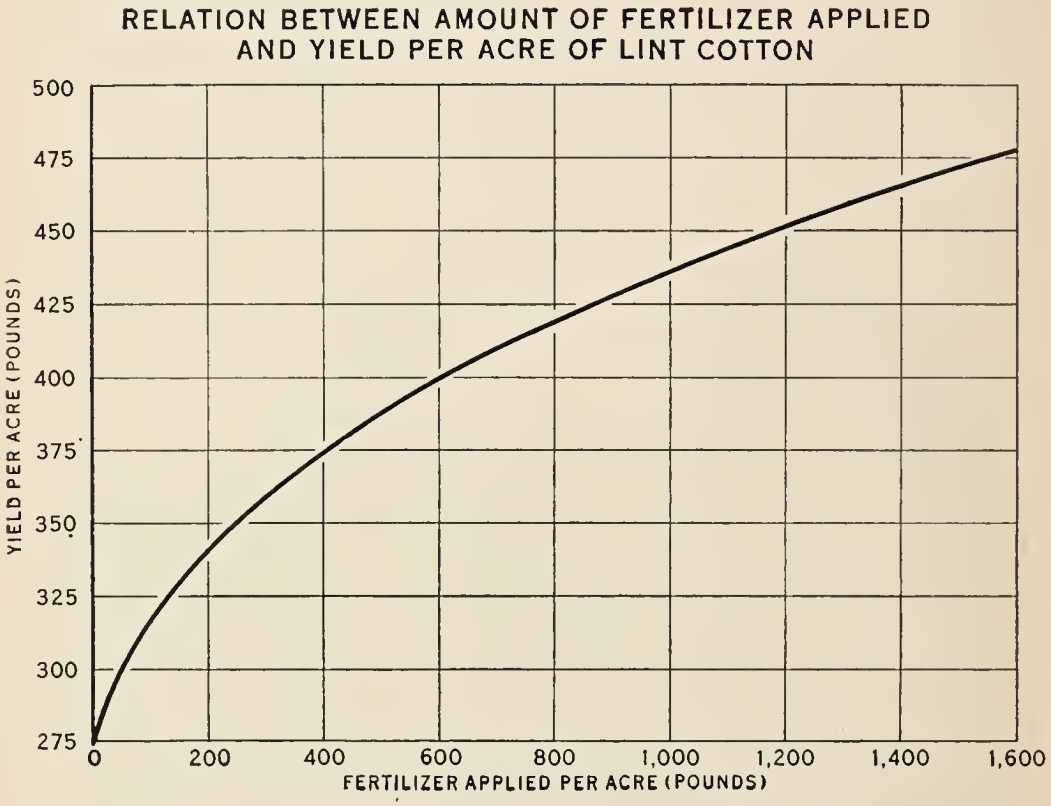


Figure 71. Total yield goes up as more fertilizer is applied to an acre, but the amount of increase becomes less with each additional application (see table X). The amount by which the curve rises with the addition of 200 pounds of fertilizer measures the increase in yield resulting from that particular application. For example, the yield increased 20 pounds when the amount of fertilizer was increased from 600 to 800 pounds (see table XI). (Bureau of Agricultural Economics.)

amount of fertilizer was increased, the corresponding increases in yield became smaller.

The manner in which total yields increased as more and more fertilizer was applied is shown graphically in Figure 71. Notice how slowly the yield curve rose with later applications compared with the first 400 pounds. The increases resulting from each additional 200 pounds of fertilizer are shown in table XI.

Table XI. Increases in yield of cotton resulting from successive additions of fertilizer

200 pound units of fertilizer	Increases in yield, pounds
1st	64
2nd	33
3rd	26
4th	20
5th	17
6th	15
7th	14
8th	13

It will be noted that the first 200 pounds of fertilizer increased the yield of lint cotton by 64 pounds; the fourth 200 pounds increased the yield 20 pounds, and the 8th application of fertilizer resulted in an increase of only 13 pounds.

This tendency for increases in yields to taper off as more and more fertilizer is applied illustrates a general rule which applies in the same manner to the increases in yield resulting from additional cultivations, heavier rates of seeding or other increases in the care given to a fixed acreage of any crop. Similarly, when the pounds of grain fed a milk cow are increased beyond a certain point, the increase in milk production will tend to be less from each additional pound fed. This rule is commonly called the *law of diminishing returns* by economists. There is much more to it than has been brought out here, but perhaps this simple discussion will permit the use of the principle as a working tool. It is important to bear in mind that this law refers to increases in production that result when the quantity of one or more ingredients is increased while other ingredients, such as acreage of land or number of livestock remain the same.

BALANCING INCREASED RETURNS AGAINST INCREASED COSTS

How much fertilizer will it pay to apply? If fertilizer were free, it would be worthwhile to make very heavy applications per acre. In fact one could add more and more until the increases in yield were so small as to be not worth the time involved in spreading the fertilizer on the land. But fertilizer costs money, so it is necessary to determine the amount of fertilizer it will pay to apply to an acre of cotton. Therefore the operator must consider the *cost* of the fertilizer in comparison to the *value* of the increase in cotton that will result from its use. To arrive at a decision it is not necessary to determine the total returns from an acre of cotton with different amounts of fertilizer. Neither is it necessary to figure the total cost of growing the crop. All we need to know is the additional yield we can expect from each additional quantity of fertilizer used, and the additional expense involved. With this information we can make the calculations shown in table XII.

In this table we have set down an estimate of the additional costs involved when 200 pounds of fertilizer is applied. These increased costs include the fertilizer itself, and the cost of spreading the fertilizer and of picking and marketing the increased yield of cotton. To simplify the calculation we have assumed that the cost of ginning the extra cotton is equal to the value of the additional seed produced. The added costs are not so great for the third or fourth 200 pound application of fertilizer as for the first and second because these applications did not produce as much additional cotton and therefore did not add as much to picking costs.

From this table we find that the application of 200 pounds of fertilizer to an acre increased yields by 64 pounds, worth at 13 cents a pound, $8.30. Per acre costs were increased by $3.60 and it was obviously worthwhile for us to apply this much fertilizer. The third 200 pound application of fertilizer increased yields by only 26 pounds, worth $3.40. This application resulted in an increase in cost of $3.00 so that it was barely profitable for us to apply this much fertilizer. When another 200 pounds is added, the value of the crop is increased only $2.60, while costs increase by $2.80 which is more than the increased production was worth. Therefore, to get the highest money return from a given acreage of cotton we would apply 600 pounds

Table XII. Additional costs and returns with increased quantities of fertilizer

200 lb. application of fertilizer	Additional yield per acre lint cotton	Added costs per acre	Cotton at 13c per lb. Value of added yield*	Cotton at 13c per lb. Added net return	Cotton at 20c per lb. Value of added yield	Cotton at 20c per lb. Added net return
	Pounds	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1st	64	3.60	8.30	4.70	.....	.....
2nd	33	3.20	4.30	1.10	.....	.....
3rd	26	3.00	3.40	.40	.....	.....
4th	20	2.80	2.60	— .20	.....	.....
5th	17	2.75	2.20	— .55	.....	.....
6th	15	2.75	1.95	— .80	.....	.....
7th	14	2.70	1.80	— .90	.....	.....
8th	13	2.70	1.70	—1.00	.....	.....

*Figured to nearest 5 cents

of fertilizer per acre and no more, with these given prices and costs.

Perhaps the next year the price of cotton will have gone up to 20 cents a pound. What happens then to our calculations? They must be done over, because the amount of fertilizer that it will pay to apply may be different. This can be determined by entering the value of the added yields and added net returns in the blank columns in table XII.

In practice, calculations of this kind are not so complicated as they appear here. From experience a farmer would know without making any computations that 300 or 400 pounds of fertilizer would pay, and that 1,000 or 1,200 would be a waste of money except in the few years when cotton prices were unusually high. He would probably run through a reasoning process similar to the one we have discussed to determine whether 600 or 800 pounds was the best quantity to use, although he might not put it down on paper in the manner that we have.

Similar problems arise in the handling of livestock. In livestock production it is very important to know how much to feed in order to secure the highest returns. With hogs, for example, a farmer must decide whether to sell them when they weigh 150 pounds or continue to feed them until they weigh 250 pounds or more. It takes more feed to put 50 pounds on a 200 pound hog than it does to put 50 pounds on a hog weighing 100 pounds (table XIII).

*Table XIII. Relation of weight of hogs to gain in weight for each 200 pounds of feed**

Pounds of feed	Gain in weight	Total weight
	Pounds	*Pounds*
200	57	92
400	53	145
600	48	193
800	44	237
1000	41	278
1200	38	316
1400	34	350

*From unpublished data, Division of Farm Management and Costs, Bureau of Agricultural Economics.

The weight at which a hog feeder will plan to sell his hogs will depend upon the price of hogs in comparison with the price of feed. If feed is cheap or if hogs are bringing a good price, the farmer will feed them to heavier weights than he will if feed is expensive or if

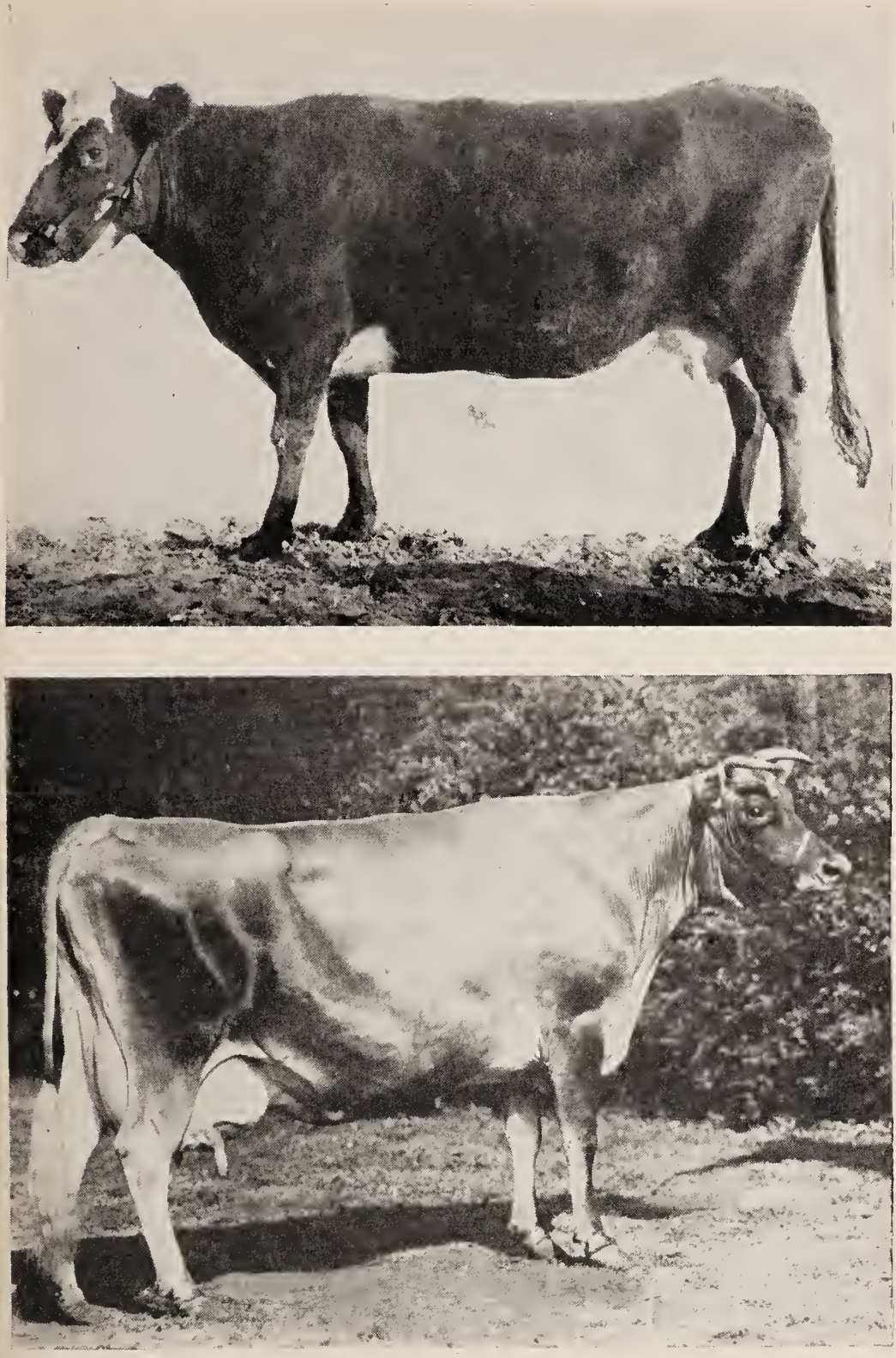


Figure 72. The amount of milk produced by a good cow for each pound of grain fed will be much greater than for a poor cow. (Bureau of Dairy Industry.)

hogs are low in price. The reasoning in this case is exactly the same as in the problem of applying fertilizer to cotton. As the price of hogs becomes higher in relation to the cost of feed, more feed can profitably be given to each hog.

BALANCED USE OF ALL INGREDIENTS

Returns from additional fertilizer depend upon use made of other ingredients. How profitable additional applications of fertilizer will be depends upon the time and materials devoted to the crop in other ways. Before the cotton crop is planted, the farmer must decide in a general way the proportions of all ingredients that he is going to put into the crop, so that a balance is maintained between them. It will not pay him very well to fertilize heavily and cultivate often if he fails to plant enough seed per acre to begin with; if he fertilizes heavily he should cultivate often enough so that the growth of weeds will not rob the crop of the plant food he has applied. With milk cows, the farmer's decision as to how much feed will be given will depend upon how good the cow is. A scrub cow does not respond to heavier feeding as well as does a well-bred dairy animal. If she is a good cow and he is feeding her a heavy ration of grain, he will also take good care of her in other ways, providing plenty of water, and good shelter, milking her at regular hours, perhaps three times a day.

The principle to be remembered is that all of the ingredients that go into the making of a crop or into production from livestock must be supplied in such proportions that no one ingredient limits the production. Someone may raise the question: "Why not continue to add more of the production ingredients, keeping them in the right proportion, and thus add more and more production?" The answer is that we are not able to increase the amount of all ingredients at will. Perhaps one farmer can find only so much good land to buy or rent, and that becomes his limiting factor. Perhaps another is limited by the amount of money he can borrow to carry on his farming operations. For a good many farmers the limiting factor is the number of acres they can take care of properly, keeping the machinery in repair, supervising the hired men, and getting the work done on time. This was brought out under size of farm in chapter 5.

NUMBER OF ACRES AND YIELD PER ACRE

Returns depend upon the number of acres as well as yield per acre. Thus far we have discussed the question of securing the greatest net return from one acre of a crop or from one head of livestock. The farmer must also consider whether he should plant 20 acres of cotton and give it the best of care, or plant 40 acres and spend less time on each acre. Even though heavy applications of fertilizer pay for themselves, he may raise more cotton and make more money by planting an additional acreage and by spreading the same amount of fertilizer over the larger acreage. Remember that the first few hundred pounds brought a much larger return than additional applications. With dairy cattle a given amount of grain and work devoted to ten milk cows may produce more milk and produce it more cheaply than if it is given to only five for the same reason.

Returns from one enterprise must also be weighed against returns from others. A farmer may find that, although it will pay him to spend more time in his cotton field, adding more fertilizer and cultivating more frequently, it will pay him still better to spend that time milking two or three more cows. The number of times he cultivates the corn cannot be decided without taking into account the other things he might be doing that would pay him better. He may feel that money spent for more fertilizer for the cotton would pay, but that it would not pay as well as additional grain for the hogs.

This intricate and interrelated chain of decisions may be formidable in a text book, but it is fascinating in practice. The farmer fortunately in most cases can start with some given plan and system of operation that is reasonably satisfactory. Even when he makes his first start as a farmer, he is generally on a place that has been farmed for many years and it is not difficult for him to find out the manner in which it had been operated, the crops that were grown and the livestock that was kept. Then too, he can learn from his neighbors the customary rates of fertilizer application and the usual amounts of feed fed. As he goes along he can work out new combinations. It will pay him well to be on the alert for opportunities to improve his ways of putting together the productive resources and to think them through carefully before acting upon them.

It is apparent now that what started out as a simple question of

mixing the ingredients of land, labor, machinery, fertilizer, feed and so on that go into one crop so as to obtain the highest returns is far from a simple problem. In other words, the final decision concerning the manner in which each crop and each kind of livestock is to be cared for cannot be made without considering the ways in which they all add up into a farm business.

EXERCISES FOR CHAPTER 9

CHECK-UP

A. Below is a series of statements with a blank line after each. If the portion of the statement in italics is true, circle the letter T but do not write anything on the blank line. If the portion of the statement in italics is false, circle the letter F and write the correct answer on the blank line.

1. T F Usually, heavy applications of fertilizer to an acre will give *the same* increase in production per pound of fertilizer as a light application. _____

2. T F A hog weighing 100 pounds is fed 200 pounds of mixed feed and gains 55 pounds in weight. If he is fed another 200 pounds he should make *a smaller* gain than this. _____

3. T F To get the highest net returns from a crop of corn it *is always necessary* to secure the highest possible yield from each acre. _____

4. T F In deciding upon the time that it will pay to spend on the corn crop one *must* also consider the time to be spent on other enterprises. _____

B. Underscore the words or expression that *best* complete each of the following statements:

1. The amount of fertilizer that it will pay to apply to a crop of corn depends upon (a) whether or not additional fertilizer will increase the yield; (b) the price of corn; (c) the cost of fertilizer; (d) the value of the increased crop compared with the additional expense involved.

2. In deciding upon the amount of fertilizer to apply, it is important to consider also the need for cultivation because (a) cultivation takes the place of fertilizer; (b) increased application of fertilizer will encourage weed growth; (c) it is more difficult to cultivate if fertilizer is applied.

3. An example of the law of diminishing returns is (a) the tendency for profits to be smaller on small farms than on large ones; (b) the tendency for yields to decrease if a crop is planted on the same ground year after year; (c) the tendency for increases in yield per acre to taper off as more and more fertilizer or labor is applied

per acre; (d) the tendency for income per acre to be smaller for crops that require very little labor per acre than for crops requiring a great deal of labor; (e) the tendency for profits to be lower if work is done by hand than if it is done with a machine.

C. In table XII, the added yields and costs involved in applying various amounts of fertilizer to a cotton crop are shown. It appears that with cotton at 13 cents per pound, it would pay to apply 600 pounds of fertilizer. How much fertilizer would it pay to apply if cotton were 20 cents per pound?

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Describe the manner in which yields per acre of most crops change when the amount of fertilizer applied per acre is increased. Do yields respond in the same way to increases in the amount of labor, or seed, applied per acre?

2. If an increase in the price of cotton of 2 cents per pound makes it profitable to increase the amount of fertilizer applied per acre by 50 pounds, will a further increase of 2 cents in the cotton price make it profitable to apply an additional 50 pounds? If not, will the amount be more or less? Why? Will a decrease in the price of fertilizer have the same effect on the amount applied per acre as an increase in the price of cotton? Why?

3. Discuss the factors that generally make it profitable for a farmer to use less labor on each acre of crops if he has 100 acres than if he has 50, discussing (a) yields per acre; (b) total production; (c) net income per acre; (d) total net income.

CHAPTER 10

PLANNING THE FARM FOR PROFIT AND STABILITY

IMPORTANCE OF ADVANCE PLANNING

Decisions of great importance face each prospective farmer. First, the selection of the type of farming. Then follows a choice from one of the many areas where this type of farming is practiced. Later comes the choosing of the specific farm, and finally the farming system to be carried out on it. These decisions, taken together, will shape the pattern of a man's whole life and the welfare of his family.

Some who read these pages will tend to dismiss these subjects lightly. They are returning to the home farm where these decisions were made years ago. Nothing could be farther from a wise course of action. Perhaps they are planning to establish a new family unit in the near future. Has the home farm supported the parental family well in the past? Does it now have the capacity to support an additional family in the future, seeing the movies on Saturday night, paying the life insurance, meeting the doctor bills, placing well educated youngsters on their own two feet with a start in life second to none? If these questions cannot be answered in the affirmative, thought must be given to ways and means of expanding the size of the business or of setting up an independent farming unit. Times have changed since father considered these points,—so have methods of farming, levels of rural living, and market prospects. It will pay *any* prospective farmer, regardless of the closeness or the lack of home ties, to give careful thought to these things.

We have stressed the importance of wise selection of the farming type, the farming location, and the specific farm. No less important is the job of organizing the farm business and proceeding with its day to day conduct. This affords opportunity for realizing on the managerial abilities one may have, using the brains as well as the brawn, bringing into full play the qualities that make the difference

between the farm hand and the farm operator or manager. It is the exercise of these abilities with which we are concerned in discussing the planning of a stabilized farming program.

The word "planning" greets the eye on the pages of every newspaper and periodical these days, planning for a better post-war world; planning to avoid unemployment and deep depression, planning for better roads, better schools, better nutrition, better business, better something in every aspect of life. On the farm, planning involves taking stock of the resources available to the individual farmer and determining the best uses of these resources to gain certain future ends.

These ends or goals may consist in nothing more than giving thought to ways and means of obtaining the largest possible current farm income. The accumulated result of such short-term year by year planning is likely, however, to fall far short of yielding the income and satisfaction that could have been attained by thinking a little farther into the future. At the outset, it is well to visualize as best we may the income possibilities of the farm when it is fully developed under a stabilized system of farming. A system in which the soil resources are being maintained or improved, in which crop yields and livestock production are sustained or increased, and one which gives every evidence of continuing the farm as an income producing asset. Having established this desirable long-time goal, the year by year planning can be aimed at (1) the largest possible current farm income (compatible with a stabilized system of farming), and (2) the steps to be taken annually in the direction of the long-time goal to develop the farm as a stabilized income producer.

Farm planning should also include those things which provide the greatest day to day satisfaction from farming as a way of life. The arranging of fields to save labor and conserve soil, laying out the farm buildings to permit doing chores with a minimum of effort after a day of toil, landscaping the farm home, planting shade trees and shelter belts are all sources of lasting satisfaction with only indirect financial benefits. In farming as in no other occupation is the home so closely associated with the business. "Man does not live by bread alone," and the song of the lark in the fragrance of a calm sunny morning may outweigh in the farmer's book of debits and credits the metallic clink of a few extra dollars.

TAKING STOCK OF RESOURCES

Land Resources. Farms frequently include varying proportions of rich land, poor land, stony land, sandy land, clay land, wet land, well-drained land, level land, and rolling land. Some land may be suitable only for permanent pasture, some only for woodland, while the rest can be safely tilled. Discussions in previous chapters have emphasized that much lost motion will be saved if at the outset these physical resources are carefully appraised, both as to present conditions and to potentialities. Mother Nature is most rewarding when we work with rather than against her. If the land has been farmed before, it is already laid out in fields, and areas of cropland have been segregated from those used as pasture and woodlot. These boundaries,

Figure 73. Here is farming neatly fitted to the land. Contour strip cropping with corn, grain, alfalfa, grain, alfalfa. Farmers are coming to take as much pride in these gracefully curving fields as they formerly did in plowing straight furrows. This scene is eloquent testimony of a farm being operated under a plan—planning for tomorrow as well as today. (U.S.D.A.)

however, like Topsy, may have "just growed" and they may not reflect desirable land uses.

A great deal is now known about the physical properties of soils, the type of uses to which they are best adapted, and their surpluses or deficiencies in minerals and plant foods. Rather definite prescriptions can now be made that include tillage methods, cropping patterns, and supplemental use of lime and fertilizer to bring soils to a high degree of sustained productivity. It is not necessary that each farmer know all these things for himself. The county agricultural agent or the local representative of the Soil Conservation Service will be able to assist materially on these problems. In special cases the Agronomy Department at the State Agricultural College also stands ready to render helpful service through the county agent's office.

By one means or another, then, it is necessary to know rather definitely both the amount and location of the land that may be safely cultivated, its present state of productivity, and the crops to

Figure 74. The conventional up-and-down hill farming makes for instability and insecurity and aggravates the "ups and downs" of life. Note the silting in of furrows near the bottom of the hill and other evidences of soil washing. (U.S.D.A.)

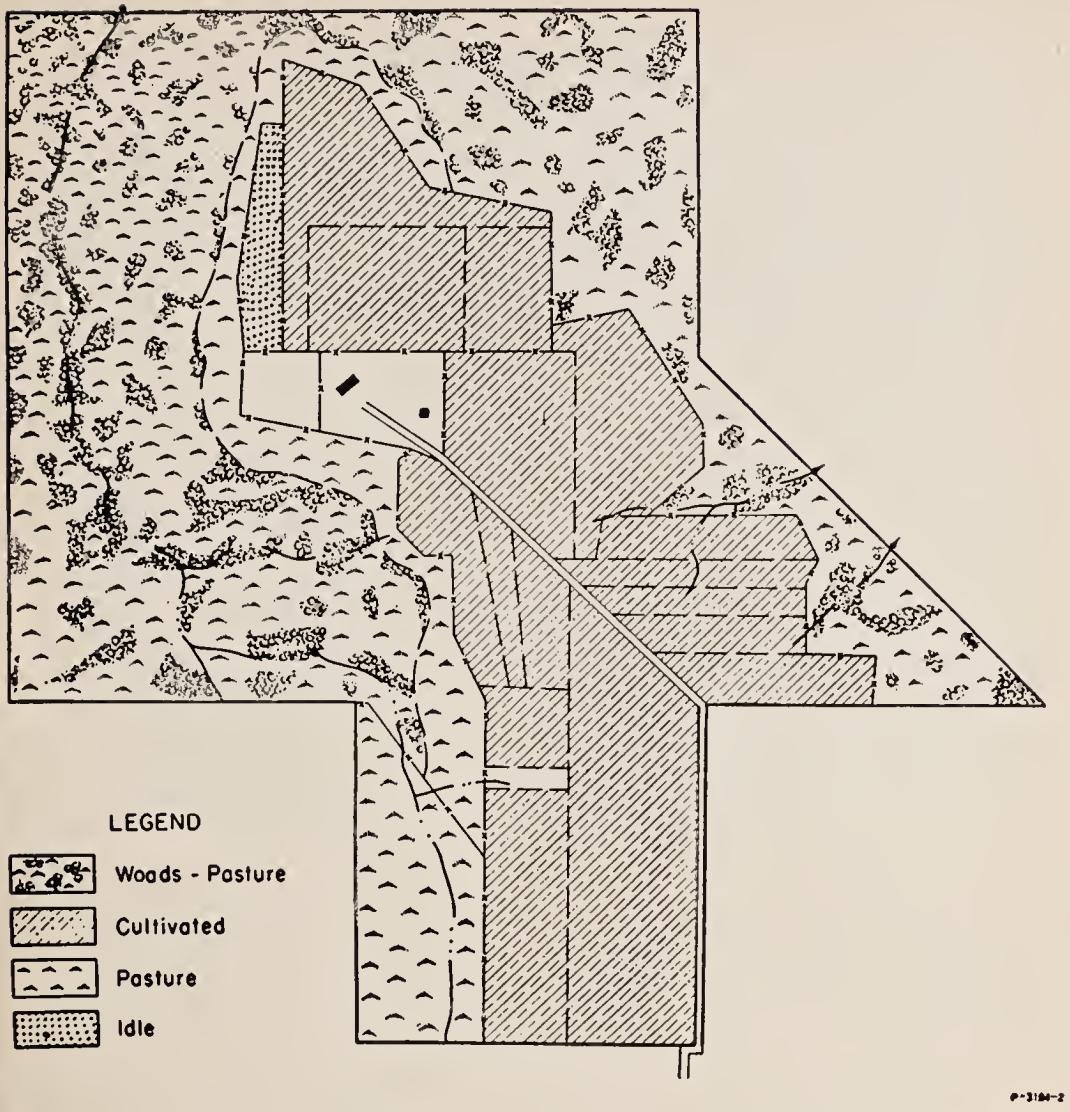


Figure 75. Lay-out of a Minnesota dairy farm as it was being operated in 1938. Only the gentler slopes were being cultivated, but the up-and-down hill farming was creating erosion problems that could not be ignored. The woods-pasture nearly surrounding the farm was relatively unproductive both of grass and of timber. (Soil Conservation Service.)

which it is best adapted. Similarly, one should know the total acreage and condition of the land suited only to sod crops for feed and pasture and the degree of flexibility in the use of land for either of several purposes.

This process of taking stock of the land resource can be made much more specific and helpful by making a rough map of the farm, field

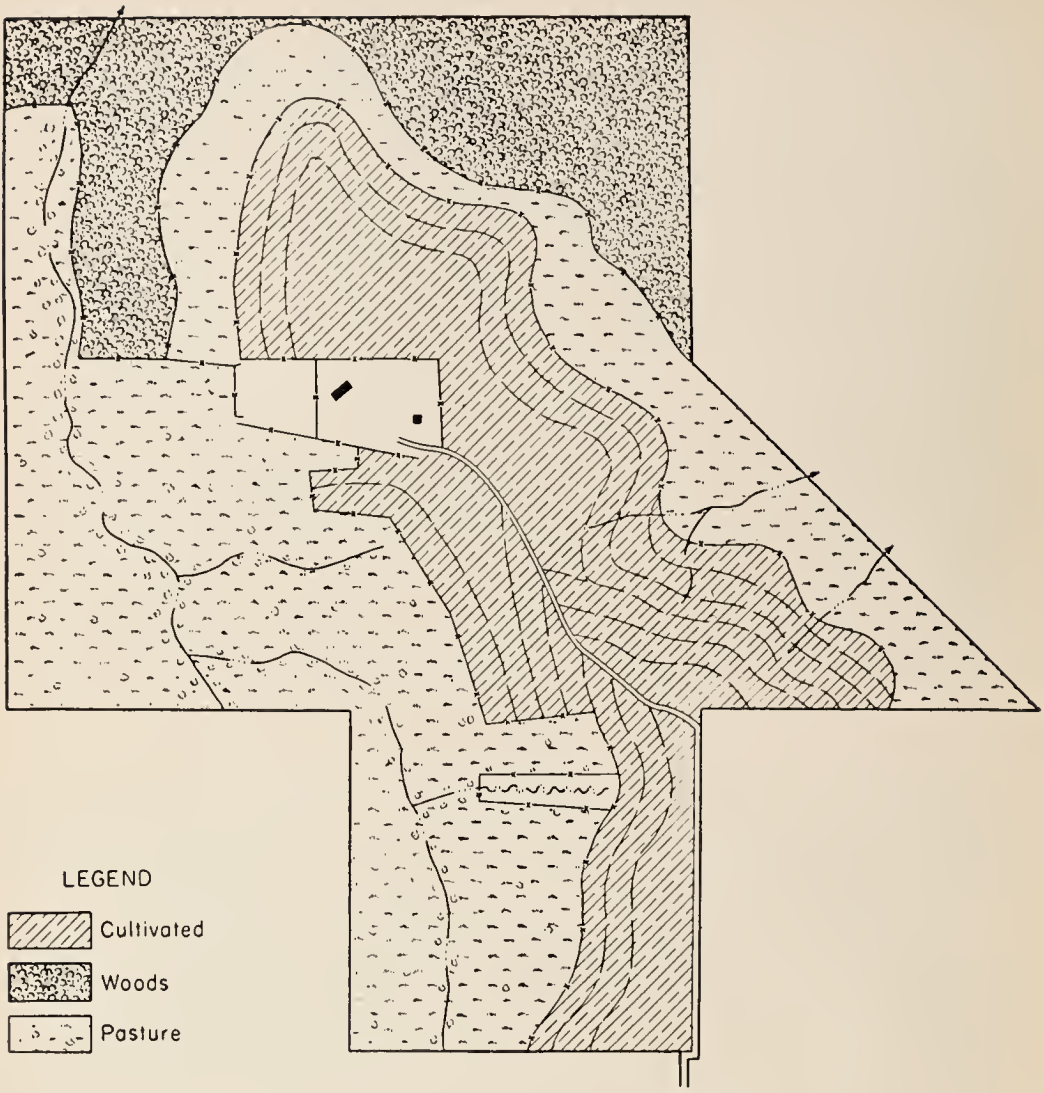


Figure 76. The long-time farm plan has been developed for the farm shown in figure 75. Strip farming on the contour will hold the soil in place. Some of the woods will be cleared and all the pasture land improved. The livestock will be fenced out of the woods which will be developed as a supplemental source of income. Less land is in cultivated crops than formerly, but more cows can be kept because of increased crop yields and additional carrying capacity of the pasture. (Soil Conservation Service.)

by field as it is now and another as it should be arranged eventually to adapt each kind of land to its proper use. Notes on the map or accompanying it could indicate the present condition of each field and what is needed to bring it to the desired state of productivity. With at least a rough picture of the farm as it is now, and another as it should be, the first step in each year's planning would be to

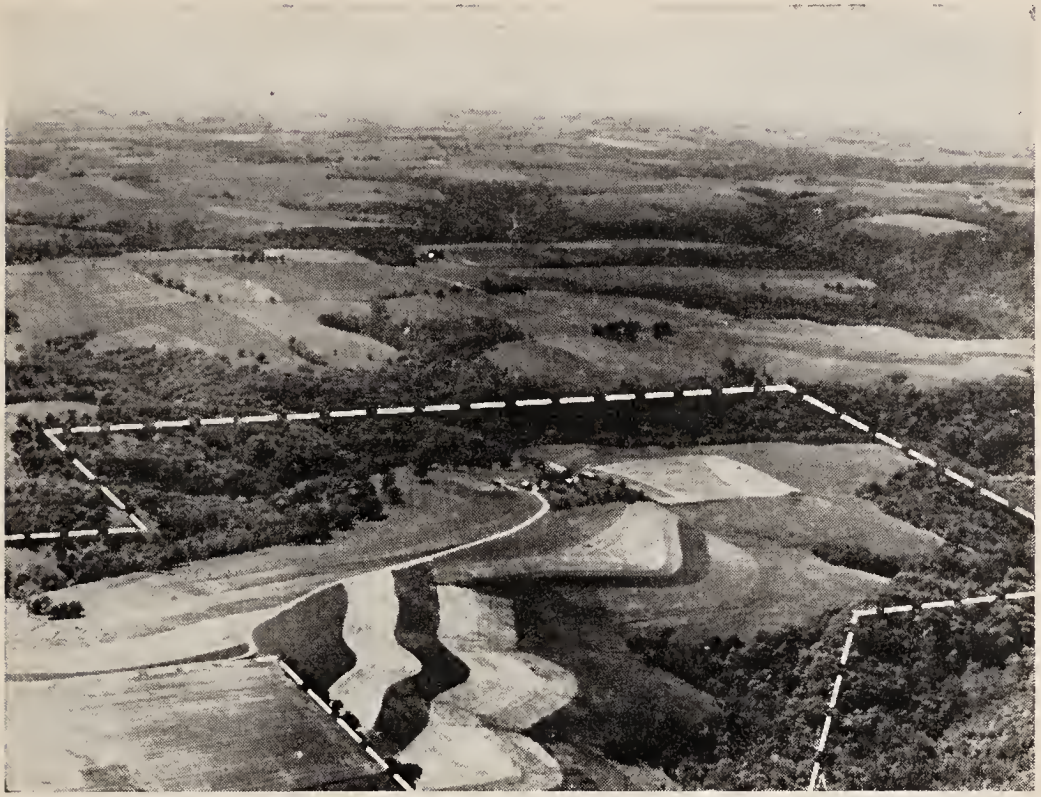


Figure 77. This air view shows progress in putting the long-time plan of Figure 76 into effect. The fields in the foreground are now being strip cropped on the contour, and the road to the farmstead has been relocated. The fields in the distance show the traditional rectangular pattern of field lay-out. The contouring job has not been completed, but the long-time plan is an objective to be reached over a period of years. (Soil Conservation Service.)

rough out a new farm map showing any changes in field boundaries, in field uses, or in improvements such as draining, contouring, fertilizing or liming the land.

One need not qualify as an expert draftsman to develop these year by year blueprints of farm operations. They may be drawn to scale with the greatest of care or they may be roughed out as simple pencil sketches. In either event, they will assist materially in current operations and, when preserved, will form a record of the past uses of each field. This, in itself, is an important aid in indicating what is needed to maintain productivity.

Labor Resources—In taking stock of the labor resource the prospective farmer should not fail to include himself. In this book we are concerned primarily with the family farm, and very few of these can

afford the luxury of a full-time manager. Successful operators of most family farms are the mainstays of the farm labor force as well as the quarterbacks calling signals for both the organization and operation of the farm.

Here, as with land, it will pay to appraise the present condition of the resource, seeking to capitalize on the strong points and to face the weak points frankly with a view toward their improvement. Most types of farming call for spending a full day in the field and what city folks might consider half a day more in doing the morning and evening chores. (City people, however, sometimes spend as much time going to and from work as farm people spend on chores.)

Although the total amount of available labor is of great significance, so are the skills brought to each job. A good milker can get all a contented cow has to offer. A poor milker can cause the same cow to give less milk and that grudgingly. In some of the western States in the areas where sheep raising is important, the number of Spanish names in the telephone directory is surprising. Basque sheep herders are known the world over for their skill with sheep, and they have migrated to this country to carry on the same job. In the process of growing up on the farm, boys acquire many of these skills. Preferences disclosed then for work with different kinds of livestock, with field crops, truck crops or fruits may crystalize later in the type of farming selected as a life work.

The kinds of crop and livestock enterprises selected and the emphasis given to each will produce a certain total labor requirement and, equally important, will dictate how this labor is distributed throughout the year. We have seen that agriculture, as a whole, is rapidly shifting to a more commercialized basis, producing largely for market and in turn depending more on things purchased at the store. The actual cash the farmer lays out to produce a crop thus represents an increasing proportion of his total expenses in production. This increase in "out-of-pocket" costs is therefore an added risk, particularly when producing things that are subject to wide fluctuation in market value.

Chapter 8 stresses the importance of giving consideration to full utilization of the labor of the farmer and his family throughout the year and to ways of economizing on the use of hired labor. In

farm planning it will pay to draw up some such table as the following which makes it easy to compare the labor needs month by month with the supply of home labor, the balance indicating when help must be hired and the approximate amount. The data used in table XIV have been adapted from information on a small cotton-livestock farm in Texas. Although the total needs are estimated to be 310 hours less than the available family labor, it is still necessary to hire 520 hours of labor. In the months of peak labor demands the farmer's son is in school. Thus we see the need for comparing the labor available each month with the needs for that month; figuring on the yearly basis alone may easily be misleading.

Table XIV. Man labor needs on farm enterprises

Month	Estimated man labor needs for:							Source of labor	
	Cotton (16 acres)	Corn (10 acres)	Oats (7 acres)	Cane (3 acres)	Rotation pasture (12 acres)	Livestock[1]	Total needs	Family	Hired
	Hours	*Hours*	*Hours*	*Hours*	*Hours*	*Hours*	*Hours*	*Hours*	*Hours*
Jan.	25	10	10	5	15	125	190	200	.....
Feb.	.....	15	10	.....	.....	120	145	200	.....
Mar.	.....	25	.....	.....	10	135	170	200	.....
Apr.	40	15	.....	.....	20	110	185	220	.....
May	175	60	30	25	10	120	420	260	160
June	120	35	35	.....	.....	85	275	360	.....
July	30	.....	.....	.....	.....	50	80	360	.....
Aug.	.....	.....	.....	80	.....	50	130	360	.....
Sept.	370	10	.....	.....	.....	100	480	240	240
Oct.	220	40	.....	.....	.....	100	360	240	120
Nov.	15	10	.....	.....	.....	115	140	240	.....
Dec.	45	35	10	5	25	115	235	240	.....
Total	1,040	255	95	115	80	1,225	2,810	3,120	520

[1]Two mules, 4 dairy cows, 3 hogs and 150 hens. About half the total hours spent on livestock are devoted to the cows and about a third to poultry.

In taking stock of the labor resource we should remember that this is subject to change. If there are young boys in the family, will the long-time farm plan furnish remunerative work for them at a later time? What will the situation be as the gray hairs begin to dominate and the main brunt of the labor load must fall on younger, sturdier shoulders? Farms can be planned to increase or diminish

the labor load over a period of years, and thought given now to these longer time considerations can make the transition easier when what seems so far away inevitably catches up with us.

Capital Investment. As indicated in chapter 4, the farmer's capital investment takes a number of forms. It includes that in land and buildings, as well as in livestock, in equipment, in various types of supplies, and in cash to meet the day to day operating expenses. In previous chapters we have discussed the magnitude of these items on farms of different types and sizes. Our concern here is with appraisal of what is now available with a view to utilizing it to the best advantage in planning the farm business.

The investment in livestock may vary tremendously between farms of different types. Some highly specialized wheat producers buy eggs, butter, and evaporated milk at the country store and may not even have a dog or a cat. An opposite extreme is found in the occasional sheep producer in the West who may have no land holding at all—leading the life of an American Nomad, grazing his flocks on abandoned farm land, on the public domain or the national forests, wintering where the weather is not too rigorous and where hay can be purchased if necessary. No farm plan should be completed without considering the possibilities of investing part of the farm capital in livestock—if only to the extent of supplying the family table more adequately.

The investment in productive livestock is one that can be started in a small way and built up to a major source of farm income over a period of years. Some of our finest herds of pure bred cattle can be traced back to a 4–H high school boy and his pure bred calf. A tendency common to us all is to want to *go* into a particular business rather than to *grow* into it; the office boy wants to start as vice president, etc. A carefully chosen herd of grade dairy cows will respond well to good feeding and good care and when bred to proven sires, offer a sure means of increasing the quality of the herd at much less original outlay than that involved in the purchase of pure breds. Artificial insemination is making it increasingly easy to build up high quality stock at modest cost. Then, too, if the farm operator is relatively unskilled in the handling of livestock, the quality of his experience grows along with the quality of the herd without so much

risk of ruining a pure bred animal through poor handling and management.

While the horse and the mule appear to be on our list of "vanishing Americans", there are still large areas of hilly lands, small farms, and small fields where they furnish the chief source of farm power. Despite the trend toward farm mechanization, the relative cost of horse and tractor power should be considered very carefully before making the shift. The horse or mule can be fed largely from feeds raised on the farm at little out-of-pocket cost. They will represent a smaller investment than that involved in the purchase of a tractor, and a full complement of tillage implements to go with it. On the other hand, when a change to tractors has been made farmers are frequently reluctant to dispose of their horses or mules, and find themselves with an over-load of capital tied up in power equipment that is only partially utilized.

Despite the advantages in the greater timeliness of farm operations that can be achieved with tractor power, it hardly pays to invest in a tractor on some of the smaller acreages and under some farming types. In such situations one may be able to trade work with the neighbors, or can even afford to hire the heavier work done, rather than to maintain an investment in farm power that is but little used. An alternative, of course, is to own the equipment and do work at custom rates for others, thus making the investment contribute directly to the farm income.

A cardinal principle of success in farming requires that a high proportion of the total investment be in factors that are directly productive, such as cropland, dairy or beef cattle, hogs, sheep, or poultry. Livestock must, of course, be adequately housed, but substantial buildings of modest character are more likely to contribute to farm success than heavy over-investments that cater to the pride but not to the pocketbook. All too frequently farms are purchased because they offer an unusually good set of farm buildings when this is about all they do have to offer.

The investment in supplies is usually but a small part of the total capital. It includes such items as stocks of purchased concentrate feeds, seeds, insecticides, wire and lumber for repairs, milk cans, egg crates, stock medicines, and motor fuels. For the items that do not

deteriorate in storage the farm operator will do well to consider the substantial savings that may be made by purchase in large quantities. Several farmers can frequently club together to buy a carload of feed or lumber at much lower costs than those involved in purchases on a "hand to mouth" basis. This is one of the main reasons why farmers' cooperative organizations come into being.

It is important to reserve a part of one's capital to meet the day to day operating expenses. A farmer who overlooks this point may find himself running the farm according to the dictates of whoever is willing to finance production. It may be good policy to get along for a few years with secondhand machinery or some make-shift building rather than to have this happen. After all, one of the main compensations in farming as a way of life is the independence that derives from being one's own boss.

The need for sizable reserves of operating capital varies markedly with different types of farming. The producer of a single product that is harvested but once each year is the most vulnerable in this respect. The specialized growers of cotton, of apples, or of wheat are examples. In growing apples in the West, for instance, there is a major labor peak in early summer when the crop must be thinned if high-quality, large sized fruit is to result. This operation should be done rather quickly and it frequently calls for much more labor than the farm family can supply. Spray materials must be purchased periodically throughout the season, and it may also be necessary to hire help for the spraying operation. Box shook must be purchased and made up in anticipation of the harvest, which brings its own demands for cash for picking the crop, for washing, sorting, and packing the fruit, and generally getting it ready for market. Relatively few apple growers are able to finance all these operations. Cooperative or independent marketing agencies customarily make cash advances within conservative limits on the prospective crop to assure themselves a sufficient volume of business when the marketing functions are brought into play.

We can contrast such systems with dairy farming, with its monthly pay check and its relative independence from outside assistance in the financing operation. In general, a higher degree of managerial ability is required to maintain financial independence in the highly

specialized one-crop systems of farming.

CHOOSING THE CROP AND LIVESTOCK ENTERPRISES

The physical, economic and personal factors that were considered in selecting the farming type and the specific farm within that type come into play again in determining the crop and livestock enterprises that are to make up the farm business. In taking stock of one's own abilities and inclinations, we can assume that personal factors have been pretty well considered. Through the development of a farm map we are also aware of the strong points and the limitations of the soil resource on the farm of our choice. What then are the crops that should be grown? A good starting place is to find what crops the neighbors are growing successfully and what ones generally receive greatest emphasis locally. These are the crops that have stood the test of time, the ones that farmers have learned by trial and error are most reliable. This guide is most dependable in a well established farming community. In new areas the pioneering farmers are still likely to be trying to transplant the crops and ways of farming with which they were familiar in some other locality and under totally different conditions. Although many crops will grow after a fashion under widely variable conditions of soil and climate, each has its own requirements if best results are to be obtained. It is no mere accident that we have a corn belt, a cotton belt, and large areas where wheat is almost the sole crop.

Chapter 3 has stressed these physical differences as they apply to broad regions and to the commercial production of important crops. In addition, one should investigate the particular farm for its own physical peculiarities. In some areas there are rather well defined hail belts, and a farm located in these storm paths may be much more subject to hail damage than one but a few miles away. Air drainage is as important as water drainage for some crops. An orchard planted in a frost pocket may never set a satisfactory yield.

These physical factors have an impact on livestock production as well as on crops. In the range country, wide variations exist in the length of the winter feeding period. This in turn influences the quantity of hay that must be put up per head and thus has an im-

portant bearing on how the ranch is organized and operated. The rigor of the winter and the violence of spring storms have their effect on death losses and calf and lamb crops and even the presence or absence of shelter in the form of brush along creek banks is of significance. Cold winters may necessitate heavy investments in farm buildings to protect valued breeding stock; they may also make advisable the feeding of more concentrates. These disadvantages may, however, be offset by economic advantages.

The physical factors and the skill of the operator largely determine the yield expectancy from crops and livestock on a given farm. The economic considerations tell us whether the effort will be profitable. It costs nearly as much to feed and care for a dairy cow producing 3,000 pounds of milk annually as one twice that productive. An acre yielding 100 bushels of corn can be cared for and harvested at much less cost than two acres yielding but 50 bushels each. These statements reflect the economic advantage that comes from carefully adapting crop and livestock enterprises to their physical environment and then giving them proper care.

It takes other things than physical adaptation to produce high yields of crop and livestock products. Labor, wear and tear on various types of equipment, and supplies such as seeds, feeds, fertilizers, and insecticides enter into the expense of production. In one area hired labor may cost fifty cents an hour, in another, twenty-five cents. Concentrate feeds may need to be transported long distances at high cost for conversion into meat while in other instances they may be obtained direct from the processor in a nearby town at low cost. One of two quarts of milk for sale in a Miami, Florida store may have been produced a few miles from the city limits—the other quart under the stress of wartime need was poured from a milk can into a tank truck in New York State and, despite shortages of gas, oil, and rubber, transported the length of the land.

Here is a Northern city with land close by suited to the production of truck crops. Some, to be sure, are grown but the great bulk of the fresh garden produce is shipped from areas much father South. Local farmers have discovered that the edge of people's appetites for fresh vegetables wears off long before their late maturing crops are ready for market and that this is quickly reflected in the price.

When all these pros and cons are added up some areas in the United States are shown to have an advantage over all others in the production of certain farm products. The economic and the physical forces may combine to leave a wider margin of profit than is experienced in other places, or it may be found that these products pay better than anything else that can be produced in the area even though returns are comparatively low. There will then be a tendency to make the most of this situation by specializing in the production of a favored product or combination of products. Economists speak of this as the principle of comparative advantage. The same principle operates when considering the relative emphasis to place on different crop and livestock enterprises on a specific farm.

Over the long pull the Nation will be better off and its resources most productively employed if the bulk of each product is produced in those areas and on those farms having the greatest income advantage in producing it. This does not mean that specialization should be carried to an extreme that leaves the farmer with nothing to fall back upon in case of crop failure or the disastrously low prices that confront us from time to time.

A question that should influence such decisions is, "How well is my family going to live?" A good garden, fresh eggs, milk, fruits, and berries and a home meat supply add much to the satisfaction of farm life. These enterprises can cushion the shock of an adverse year and when expanded somewhat beyond the family needs may provide supplemental sources of income. In recent years cold storage lockers have been made available in many farm communities. These can be rented for a small annual charge and offer a means of preserving for future use many types of farm produce that formerly went to waste.

Farmers soon learn that the battle is only half won when the crop is produced. There still remains the problem of marketing to advantage. This involves many considerations besides the price the farmer receives for his product. It may start with problems in harvesting or in the availability of local facilities for assembling, cleaning, packaging, storing or transporting the crop. In certain areas where the production of sour cream butter is an important sideline, farmers are effectively prevented from selling whole milk or sweet

Figure 78. A good garden adds immeasurably to the satisfactions of farm life. It contributes to better nutrition, to lowered expenditures for purchased food, and utilizes labor that might otherwise go to waste. All efforts are repaid when the winter's supply of fruits and vegetables broadcast their goodness from the cellar shelves. (U.S.D.A.)

cream because they lack the all-weather farm to market roads that permit frequent delivery of the product.

If one intends to produce livestock, tree fruits or nuts, he will do well to look a little farther than the end of his nose. A number of years is involved in the production process and one should not only do a little thinking for himself as to probable future market outlets but should seek the advice of marketing specialists at the agricultural college before making too many commitments. Many an apple grower has gambled seven or eight years of his life in bringing a young orchard into production only to find that his varieties are no longer in popular demand.

COMBINING CROPS AND LIVESTOCK INTO A BALANCED FARM PLAN

Having decided upon the crop and livestock enterprises that are

adapted to the farm we are faced with the problem of the relative emphasis to give to each in building the system of farming. This involves simultaneous consideration of the factors previously discussed not unlike the problem of the juggler keeping half a dozen balls in the air at the same time. The result we are seeking is the farm plan that rings up the most sales on the cash register with due regard to stability in the farming venture, a plan that not only fits the bank account but the soil resource and the farming type and home of our choice.

Two further types of considerations will be of aid in developing a balanced farm plan.

Full Utilization of Resources. We have already taken stock of the resources available to us in farming—a certain acreage of crop and pasture land, a certain quantity of labor, of livestock, of buildings and equipment, of supplies and of operating capital. It generally pays to plan so that all these resources are kept in active use. In one of the early farm management texts this was vividly illustrated by a wooden barrel, each stave of which represented a factor in the farm organization. The staves, however, were of unequal length and the farm profits liquid in the barrel was pouring out over the shortest stave. Perhaps the farmer's special interest was represented by one of the longer staves, pure bred dairy cows for example, but the farm profits as a whole were not likely to increase until attention was given to lengthening the short stave, which might be pasture improvement.

The barrel illustration probably over-simplifies the problem as it usually occurs on the farm. There are so many interrelationships between the different farm enterprises that what is done to one is likely to influence several others. Closer study of the problem might show that for any significant increase in farm income, *several* of the shorter barrel staves should be raised at the same time. The pasture improvement in our example might permit adding a few head of beef cattle or sheep. The forage supply might be increased so much that a part of the land formerly in pasture could now be released for the production of cash crops. These changes would influence the labor needs of the farm, its cash operating expenses and finally the income for the year. The good farm manager, then, will visualize the direct

effects of any change in the organization or operation of the farm—he will study also the indirect effects and take advantage of what he finds there.

Relationships Between Enterprises. Like people, some farm enterprises get along especially well together while others are in open conflict. When we know the requirements of each crop and kind of livestock we are in a position to determine how compatible they will be. The economists classify these relationships as complementary, supplementary, and competing. The words almost explain themselves. In the *complementary* relationship the product of one farm enterprise becomes the supplies of another—the corn crop is fed to hogs, the alfalfa hay is the mainstay of the dairy enterprise, etc. In some instances two-way relationships exist; that is, the corn is hogged off and the hogs return manure to the corn land in the process.

Figure 79. A complementary enterprise in action. This field of high yielding corn is being obligingly harvested by the farmer's hogs, the end product going to market on the hog. The harvesting costs are greatly reduced and manure is returned to the soil in the process. (Bureau of Agricultural Economics.)

Supplementary relationships, on the other hand, are those that make possible a fuller use of our production resources. The wheat farmer may add a few head of beef cattle as a supplemental enterprise. He hires no more labor and buys little if any additional feed—just uses the resources at hand more fully, adding to the farm income and reducing the risk in one crop farming in the process. An undeveloped wood lot on the farm offers the opportunity for a supplemental enterprise in getting out fence posts and cordwood in the slack winter months. The farmer may do custom plowing with a tractor that would otherwise stand idle or custom hauling with his truck. These also are examples of supplemental enterprises that provide fuller use of farm resources.

Competing relationships, on the other hand, are about the opposite of supplemental. They are the ones that cause a pyramiding of labor demands at peak seasons, forcing the hiring of additional help and

Figure 80. The farm wood lot can be a good source of supplemental income. Relatively little is needed to maintain its productivity and its product can be harvested during the winter when work in the fields is over. (U.S.D.A.)

reducing the margin of profit. Cotton, corn, and tobacco compete for the farmers' labor in certain areas of the South, while sugar beets, field beans, and potatoes make simultaneous demands on the farmers' time in some irrigated valleys of the West. A little pencil pushing on a table such as that previously shown (table XIV) will aid in organizing the farm to avoid too much labor competition between enterprises.

There are many considerations that grow out of our knowledge of the techniques of producing crops and livestock to the best advantage. Crops must be rotated in ways that will aid in building the soil, in keeping weeds down and in combating certain soil borne crop diseases. This is so important that in many areas farmers have developed rough guides indicating desirable proportions between the acreages of intertilled, close growing and sod crops. Good crop rotations go a long way toward conserving the soil and when supplemented with desirable methods of tillage and proper supplemental practices lay the groundwork for a permanent and prosperous agriculture.

Most cropping systems will include both cash crops and feed crops —those to be sold direct and those to be marketed through livestock. Their significance varies with the farming type. In most instances, however, we will be thinking of relating the feeds raised to livestock numbers, the utilization by livestock of crop aftermath and other low grade farm produce, the possible need for purchasing feeds other than those raised on the farm, the value of farm manures in keeping up soil fertility and other related factors. In other words, the cropping pattern and the livestock program need simultaneous consideration to attain our objective of a well-balanced farm plan.

PLANNING FOR THE FARM AS A WHOLE

A page full of figures carries a certain air of authority. It at least took some little effort to set them down, and too often we are prone to accept them at face value. Sometimes the results can be very misleading. Nowhere is this more likely to be true than in the field of farm accounting and particularly so when we try to determine the profits or losses from a single farm enterprise. It has been frequently demonstrated that an acre of pasture is the most profitable

acre on the farm. Relatively little goes into it in terms of labor or expense, but the resulting forage when calculated at current market values produces a handsome margin of profit. If this is true, why doesn't the farmer close out all his other farm enterprises and put the entire farm into pasture?

Another example is that of the small acreage of oats grown for horse feed. On paper it is likely to appear just as unprofitable as pasture seemed profitable. In the face of this why do farmers persist in raising oats when it would be cheaper to buy them? These distortions arise from the difficulty in properly apportioning the costs of production between each of the farm enterprises and our tendency to credit an enterprise with market values that for us do not exist. Neither the pasture nor the oats are marketed directly; they are fed to the livestock and we are likely to obtain a less distorted picture by figuring the probable net income for the farm as a whole than trying to isolate the profits on its component parts. Enterprise cost accounting can, of course, be done in a way that will reflect a true picture, but the process involves more of a knowledge of bookkeeping than most of us possess.

It is, of course, very important to know which of the major farm enterprises is paying best, which should be given further emphasis and which curtailed. Truck farms and many types of diversified farms must continually watch their markets and shift resources among enterprises to take advantage of changing demand. Fortunately, we do not need to resort to cost accounting methods to discover this. In any given year many of the farmers' obligations must be met regardless of the changing emphasis on different lines of production. Unless more land is purchased or rented the farm acreage is fixed, interest on the mortgage and payments for taxes will in most instances remain the same, and expenses for upkeep of buildings and machinery are not likely to be greatly different. Under these conditions we can take a "short cut" by confining our figuring to the *cash* costs and *cash* returns that are reasonably sure to be realized in the coming year. This involves setting up a tentative production plan for the new year that will carry one's thinking through about these steps—

1. Indicate the number of acres of each crop to be grown and the

number of head of each kind of livestock to be kept.

2. Estimate the total production of each crop and each kind of livestock assuming normal yields.

3. Calculate how much of each product will remain for sale after taking care of quantities used on the farm for feed, seed, and in the household.

4. Estimate the cash receipts from the sale of these products using one's best judgment regarding prices that will prevail. Set down also cash receipts from any other sources such as custom work with the tractor.

5. Think through the steps in the production process and set down the cash items of expense, including such things as farm taxes and the cost of operating the farm car that are chargeable against the whole farm business.

6. Subtract total cash expenses from total cash receipts to arrive at an estimate of the probable net cash income. The figures derived from these steps could be set down in any number of different ways. The whole process is illustrated in very compact form in the work sheet for farm planning (table XV). The figures shown by way of illustration in this work sheet are for a small cotton-livestock farm in Texas and represent prewar levels of prices and costs.

Year to Year and Long-time Plans—In the earlier pages of this chapter we have stressed the importance of planning next year's farming operations in the light of a well conceived long-time farm plan. Each tentative plan that is considered for possible adoption in the new year should be subjected to this test. Are we still "on the beam" that will carry us toward an eventual goal of a well-balanced, well organized farm? What can we do next year in the way of farm improvement that will have lasting value? A long-time farm plan can be especially helpful now as a direction finder in correcting wartime maladjustments. As a result of wartime needs farmers in parts of the Corn Belt, for instance, have too high a proportion of their acreage in soil depleting crops in general and in soybeans in particular. Wheat in the Great Plains has been extended to acreage that from the long-time standpoint should remain in grass. This keeping of one eye on the long-time implications of what it is proposed to do next year is not listed above as a separate

Table XV. Work sheet for farm planning

Crops	Acres	Unit	Production		Amount kept for			Cash income			Farm expenses	
			Per A. or head	Total	Feed	Seed	House-hold	Amount sold	Price	Value	Item	Value
Cotton:											Crop expense:	
Lint	16	Lb.	208	3,328				3,328	.16	532.48	Seed	30.30
Seed		Lb.		5,568	3,556	461		1,551	.015	23.27	Fertilizer and lime	
Corn	10	Bu.	25	250	249	1					Other supplies	16.26
Oats	7	Bu.	35	245	224	21					Seasonal labor	185.75
Cane	3	Lb.	6,000	18,000	18,000						Livestock expense:	
Rotation past.	8										Purchased feeds	86.31
Permanent past.	4										Other supplies	19.75
											Veterinary	
											Service fees	
Livestock and											Seasonal labor	
livestock	Head											
products											General expense:	
Work stock	2										Monthly labor	
Dairy cows	4										Machinery repair	68.00
Butterfat		Lb.	250	1,000	52*		237‡	711	.36	255.96	Building and fence repair	68.00
Cull cow	½	Lb.	560	280				280	.04	11.20	Gas and oil	60.00
Veal		Lb.		300				300	.08	24.00	Auto, tractor and truck	20.00
Hogs (sows)	3										Property insurance	
Pork		Lb.		600			450	150	.09	13.50	Cash rent	
Poultry	150										Current interest	
Eggs		Doz.	8⅓	1,250		45†	182	1,023	.27	276.21	Farm taxes	21.00
Meat		Lb.		600			250	350	.21+	75.50	Irrigation and drainage charges	
Other farm income											Total cash operating expense (b)	575.37
								Total cash income (a)		1,212.12		
											Net cash income (a−b)	636.75

*Calves allowed to suck cows to equivalent of 52 lbs. butterfat.
†Used for hatching.
‡Milk, cream and butter have been converted to their equivalent in pounds of butterfat.

step, instead it should influence our thinking in all the steps.

Balancing Livestock and Feed. Where livestock enterprises are or will be significant in the farm business, it is especially important that we make adequate provision for the feed supply throughout the year. Where home-grown feeds are depended upon, livestock and feed crops must be kept in reasonable balance. A simple form such as that shown as table XVI can help us visualize surpluses or deficiencies in needed feeds for the coming year. This form needs little explanation. It does assume, however, that the farm planner knows the kinds and quantities of feeds per head to be fed during the year. By writing the kinds of feeds in the spaces provided at the top of the form and by multiplying (on scratch paper) the per head requirements by the number of head to be fed, we arrive at the total quantities needed for each kind of livestock. It is assumed that the quantities of feeds on hand at the beginning of the new year will be about balanced by those on hand at the year's close, and hence can be ignored. If this is not the case, surplus feeds can be included on the form with those listed under the item "Total produced."

Alternative Plans. By changing the number of acres in a given crop or the kinds or numbers of livestock kept and correcting for the changes in the cash costs and returns involved, a new work sheet or budget (such as shown in table XV) can be developed and its probable net cash income compared with that of the first. Any number of these comparisons can be made and the one selected that gives promise of yielding the highest cash return consistent with maintaining the farm plant in good condition. The keeping of simple accounts with at least the more important enterprises on the farm will help indicate those that should be considered for possible expansion as well as those that can be decreased to permit this. Information of this sort reduces the number of alternative plans that may need to be considered for the new year. The keeping of these records is described in chapter 12. Table XVII shows our small cotton-livestock farm in Texas organized in 5 different ways and the estimated net cash income that would result from each.

Are we safe in making a choice on the basis of the differences in cash income from alternative plans for this small farm? The answer is no for the alternative plans that involve considerable change, es-

Table XVI. Work sheet for balancing farm feed supply with feed needs

Kind of livestock	Number head	Grains (List kinds)			Roughages		Protein supplements			Pasture
		Corn	Oats	Chick feed	Cane hay		Bran	C.S. meal	Meat scraps	
		Bu.	*Bu.*	*Lb.*	*Tons*	*Tons*	*Cwt.*	*Lb.*	*Lb.*	*Acres*
Workstock	2	70	60	.....	3.0	....	.....	600	.....	1.5
Colts	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Dairy cows	4	24	56	.....	5.4	....	22.4	2,480	.....	6.0
Beef cows	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Young cattle	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Feeder cattle	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Sows and boars	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Pigs	3	36	.....	.....	.....	....	.....	120	.....	.5
Ewes and bucks	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Native lambs	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Feeder lambs	.....	.....	.....	.....	.....	....	.....	.....	.....	.....
Poultry[1]	150	120	105	600	.....	....	.....	.....	134	.....
Amount needed for feed		250	221	600	8.4	....	22.4	3,200	134	8.0
Amount for seed and household		1	21	.....	.....	....	.....	.....	.....	.....
Total needed		251	242	600	8.4	....	22.4	3,200	134	8.0
Total produced		250	245	.....	9.0	....	.....	3,195	.....	8.0
For sale		.....	.....	.....	.....	....	.....	.....	.....	.....
To purchase		.....	.....	600	.....	....	22.4	.....	134	.....
Price per unit		$....	$....	$ .035	$....	$...	$ 1.75	$.....	$ .045	$....
Value of purchased feed		$....	$....	$21.00	$....	$...	$39.20	$.....	$6.03	$....

[1]1050 pounds oyster shell ($15.75) and 214 pounds shorts ($4.33) are also purchased. If the poultry business were large, this form could be modified to include columns for "mixed feed" and "miscellaneous feeds."

pecially when new investments in building or livestock are required. We must at least review certain supplemental considerations. Confining the analysis to changes in cash receipts and cash expenses short circuits a number of the items economists rightly consider as legitimate costs and returns. For example, depreciation on buildings and equipment are charges we have here ignored. Some of these costs can be postponed, but in the year a new tractor is purchased an unusually heavy cash outlay must be made or a new debt contracted with its financing costs and interest charges. The labor and man-

*Table XVII. Different ways of organizing a small cotton-livestock farm in Texas and the probable resulting cash income from each system**

Item	Plan in use	Alternative plans			
		I	II	III	IV
Acres in crops					
Cotton	16	44	22	11	6
Corn	10	.....	8.5	12	14
Oats	7	.....	5	7.5	8
Cane hay	3	.....	2.5	3.5	4
Sudan pasture	8	4	6	10	12
Permanent pasture	4	.....	4	4	4
Total	48	48	48	48	48
Numbers of livestock					
Work stock	2	2	2	2	2
Dairy cows	4	.....	3	5	9
Hogs	3	.....	3	7	1
Poultry	150	20	100	150	150
Net cash income	$637	$600	$622	$654	$568

*(Adapted from a study in the Black Waxy Prairie Belt of Texas. Prices and costs are at prewar levels and are not indicative of current income expectations.)

agement contributed by the farmer and his family has not been considered as a cost, but rather as a claim on the net cash income.

Similarly, no credit has been recognized for returns such as farm produce used in the home. In Plan I for our Texas farm, for example, cotton is almost the sole income producer, and less than $100 worth of produce would be contributed to the family living as contrasted with about $250 worth for the alternative plans.

Changes in investment may be necessary if marked shifts are made in the farm organization. Plan IV of our Texas farm, with its livestock enterprises, calls for an investment in livestock, buildings and equipment of more than $1,600 compared with less than $600 for Plan I. Furthermore, we may have given additional emphasis to enterprises that make heavy demands on farm labor and, as indicated earlier in this chapter, we need to visualize the size of these demands and when they will occur. The importance of these supplemental

This Texas farm has been introduced to show alternatives that vary so widely that they amount to drastic changes in the type of farming. Such wide explorations have their place in discovering the

considerations is emphasized for our Texas illustration when the information is arranged in tabular form.

Item	Plan in use	Alternative plans			
		I	II	III	IV
Value of land	$7,000	$7,000	$7,000	$7,000	$7,000
Value of farm buildings	$450	$180	$350	$470	$500
Value of farm machinery	$280	$110	$270	$290	$300
Value of livestock	$665	$265	$555	$755	$820
Hours of man labor on crops*	1,035	1,320	1,108	983	930
Hours of man labor on livestock	1,240	180	930	1,440	1,630
Value of products used in the home	$250	$94	$250	$250	$250

*Exclusive of labor picking cotton which is included as a cash expense.

long range possibilities of a farm before its purchase, or when unexpected pressures make drastic change necessary. They are part of the figuring that should be done in developing a long-time farm plan.

For the more common short range year-by-year farm planning, however, our cash cost-cash return basis will serve very well and it may not be necessary to figure any great number of alternative plans to get the guidance one needs. The experience of the current year as one basing point and one or two possible alternative plans as others (keeping in mind our long-time farm plan) should prove adequate. Our Texas farmer, for instance, would be doing the more usual kind of farm planning if Plans II and III were all he compared with his present farming system.

For the sake of making a very important point, let us look at the following figures for a representative large-sized cotton-tobacco-peanut farm with 130 acres of cropland (adapted from a study made recently in Bulloch County, Georgia):

Net cash income	Prewar plan	Alternative plans			
		I	II	III	IV
With 1932 prices	$ 774	$1,317	$1,266	$1,159	$ 988
With 1940 prices	1,298	2,057	1,982	1,757	1,392
With 1942 prices	1,720	4,027	4,235	4,122	4,963

We will not go into the details of the suggested changes that resulted in the figures given above. They are presented to show how widely

returns can fluctuate on the same farm under different levels of prices and costs. Such explorations are especially valuable as an aid in the purchase of a farm where one is trying to guage its upper and lower limits of income possibilities over a period of years. The differences in net cash income between alternative plans for this larger farm are much greater at any income level than those on the small Texas farm we have examined in more detail.

Relatively few farmers go through a formal planning process such as that described in this chapter. More frequently they tend to produce about the same amount of each commodity each year, trusting that in the long run farm returns will average out fairly well. In our better farming areas and in periods of stable prices and costs, this system works fairly well. In areas where nature is not so bountiful and in periods of great instability such as the present, it would pay most farmers to examine the farm business more closely, making the adjustments that appear to be indicated.

A famous painting shows a forlorn figure with a sloping forehead and a vacant stare supporting himself on a hand tool. The title of this picture is, "The Man With The Hoe." Too many people think this is a good portrayal of the farmer. The modern farmer, however, can be the man with the head as well as the man with the hoe. By combining the simple principles of business management with modern techniques of crop and livestock production the farm can become an independent unit of American democracy of which the whole Nation can be proud.

EXERCISES FOR CHAPTER 10

CHECK-UP

A. Below is a series of statements with a blank line after each. If the portion of the statement in italics is true, circle the letter T, but do not write anything on the blank line. If the portion of the statement in italics is false, circle the letter F and write the correct word or phrase on the blank line.

1. T F If a farm makes a profit every year with a given system of farming, it *may still be advisable* to change the system of farming. _____

2. T F *Greater reserves* of operating capital are required for a one-crop farm than for a diversified farm. _____ .

3. T F A crop that is well adapted to a given locality *can always* be successfully grown on any farm in that locality. _____

4. T F In the determination of whether or not an enterprise should be dropped from a farming system it *is necessary* to figure the cost of production for that enterprise. _____

B. Underscore the words or expressions that *best* complete each of the following statements:

1. In the year to year planning of the farm business one should seek the largest possible farm income for the year ahead, but his plans should also be aimed at (a) paying for the farm in 25 years; (b) enlarging the farm; (c) cutting down on the amount of work required; (d) developing the farm as a stabilized income producer.

2. In taking stock of the land resource one needs to know the acreage that can be safely cultivated, the crops to which it is best adapted and the (a) degree of slope; (b) productivity; (c) real estate taxes per acre; (d) sale value of the land.

3. The labor resource on a farm should be measured in terms of the total amount of labor available and (a) whether it is hired or family labor; (b) the wages paid; (c) the skills brought to each job; (d) the number of workers of all ages.

4. On a small cotton-livestock farm in Texas, the total needs for labor for the year were estimated to be 310 hours less than the total

number of hours of family labor available during the year. Yet on this farm it was necessary to hire 520 hours of labor. Situations like this are common and arise because (a) in some months labor demands are much higher than in others; (b) farmers don't work hard enough; (c) farmers get jobs away from the farm in slack seasons; (d) many farmers do not use their family labor force efficiently.

5. A rule to be followed on all farms is that a high proportion of the total farm investment should be in (a) livestock; (b) buildings; (c) items that are directly productive; (d) equipment that will last several years.

6. In meeting day-to-day operating expenses it is a good idea to (a) borrow the money; (b) let the bills accumulate for two or three months until you can pay them off with current income; (c) plan the business so that monthly receipts exactly balance monthly expenses; (d) maintain a sufficient cash reserve to meet these expenses.

7. According to the principle of comparative advantage, the production of a crop tends to become concentrated in the areas in which this crop has an economic advantage over all other crops. It follows that (a) yields per acre for this crop will be higher in this area than in any other; (b) no other crops will be grown in this area; (c) although returns from this crop may be lower than they are in other areas, this product pays better than any other that can be grown in the area.

C. Each enterprise in a system of farming has a relationship with other enterprises that can be described as complementary, supplementary, or competing. Group the choices in the left hand column below under the proper item in the right hand column by inserting the letter or letters of choices in the parentheses in front of the proper item.

Choices	*Items*
a. Corn, raised and fed to hogs.	1. (_____) Complementary
b. Feeding cattle to utilize winter labor on a corn farm.	2. (_____) Supplementary
c. Pasture for milk cows.	3. (_____) Competing

Choices	*Items*
d. Producing cream for sale and feeding skim milk to hogs.	1. (_____) Complementary
e. Beets and beans that require cultivation at the same time.	2. (_____) Supplementary
f. A wood lot that furnishes work in the winter on a general farm.	3. (_____) Competing
g. Cotton and tobacco that must be planted and cultivated at the same time.	
h. The addition of a flock of hens to a farm that was too small to utilize the labor available in all months.	

D. You are operating a 300 acre wheat farm in central Kansas. You have been putting the entire farm into wheat, but you wonder if it would not give you a better distribution of labor and improve your income to plant 100 acres in grain sorghum. You can handle this crop without buying any additional machinery. You estimate that you should be able to obtain a yield of 18 bushels per acre, and the average price of grain sorghum in your locality is 55 cents per bushel. Four-tenths of a bushel of seed is needed per acre, which you will raise yourself. You estimate that you will need to hire a total of eight days of labor per year under the reorganized plan. Your income and expenses for the farm as now operated are shown on the worksheet, page 232. What would be your estimated net cash income if 100 acres of grain sorghum were substituted for 100 acres of wheat? (There are no changes in expenses other than labor. Use the wheat yields and prices shown for the present plan.)

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss the important things a farmer should know about his land in order to make a good farm plan, touching upon (a) uses to which adapted; (b) productivity; (c) present condition.

2. Having set up a tentative farm plan which includes both crop and livestock production, describe the steps you would go through

Crops	Acres	Production		Amount kept for seed	Cash income		
		Per acre bu.	*Total* bu.	*Bu.*	*Quantity sold* bu.	*Price* dol.	*Value* dol.
Present plan							
Wheat	300	12	3600	300	3300	.80	2640
						Total cash income	2640
						Total cash operating expenses	1105
						Net cash income	1535
Proposed plan							
Wheat							
Grain sorghum							
						Total cash income	
						Total cash operating expenses	
						Net cash income	

Expenses		
Item	*Present plan*	*Proposed plan*
Labor		
20 days @ $2.50	$ 50	
Machine repair	360	
Bldg. and fence repair	200	
Gas and oil	180	
Insurance and taxes	290	
Miscellaneous	25	
Total cash operating exp.	1105	

to estimate net cash income, including (a) production; (b) feeds raised; (c) expenses; (d) receipts.

3. Discuss the ways in which a long-time farm plan is related to the plans made each year, touching upon (a) the use of the long-time plan as a guide to the choice of enterprises each year; (b) the manner in which yearly plans can help to accomplish long-time objectives.

4. This chapter suggests a method of comparing alternative farm plans by estimating the net cash income that would result from each plan. What supplemental considerations must be taken into account that may influence (a) costs; (b) returns; (c) distribution of work over the year.

CHAPTER 11
AIDS TO FARM PLANNING

It is apparent from reading the previous chapter that we are "counting our chicks before they are hatched" in this farm planning process. We have, in fact, gone much further back than that to consider seriously the kinds of eggs to put under the hen. Because of this element of uncertainty that is recognized in any look into the future, it is highly essential that we use mature judgment in estimating the probable yields, probable costs, and probable returns for a new year. We are kidding no one but ourselves if our enthusiasm leads us astray— and it is well to allow some margin for error in such calculations. A pleasant surprise is preferred to a disappointment.

Principal aids for farm planning are available from three major sources: (1) the past performance of the specific farm, (2) from published sources, and (3) the personal assistance afforded by representatives of State and Federal agencies. Our farm plan is likely to be most reliable when it is built upon aid from all these sources.

PAST PERFORMANCE OF THE SPECIFIC FARM

As one might guess, what is put into farming in the way of seed, feed, fertilizer, elbow grease, etc., the "inputs," and what results in the way of production, "the output," vary widely from region to region and even from farm to farm. As a consequence, the farm planning job is much easier and much more trustworthy if the information can be provided from records and experience on the farm in question. The average per acre yield of wheat for the United States as a whole reached the unparalleled height of 20 bushels in 1942, yet certain small areas in the best wheat producing regions consistently average more than 55 bushels. The same principle applies to State or county average yields, and our farm planning may count for little unless we know whether our own wheat acreage is capable of 20-bushel or 55-bushel crops. In Chapter 9 it was brought out that the yield per acre and per animal could be in-

creased within rather wide limits, but that extra labor, fertilizer and other expense might be involved. Therefore, it was necessary to determine whether it would pay to strive for the higher yields. Usually, a little extra attention to key operations increases income much more than it adds to expenses.

Chapter 12 discusses useful records that help in answering some of these questions. Records do not fulfill their over-all purpose unless they are designed to furnish the guidance needed in planning the farm business, and in its day to day conduct. The final goal, of course, is the highest profit combination of crop and livestock enterprises that is consistent with maintenance of the farm plant in a good state of fertility. Farm planning, however, is dependent on many more things than the dollar and cents profit on each farm enterprise. Consider, for example, some of the questions that arise in connection with planning for the farm crops:

1. When do we prepare the land for seeding?
2. How much seed do we sow per acre?
3. Of the several varieties of seed we have used in the past, which have been most satisfactory from the standpoints of yield, quality, and resistance to drought, to disease, to insects?
4. When do we cultivate—irrigate—harvest?
5. What will be our peak labor needs and when will they occur?
6. Is the farm labor supply ample or must we hire additional help?
7. What and how much will be needed of insecticides, of fungicides, of containers?
8. What grades of fertilizer and what rates of application have given the best results?
9. What are these purchased items likely to cost?
10. Considering what has been planted on these fields before, and assuming normal weather conditions, what is a reasonable expectation of yield per acre?
11. How much of the crop will remain for sale after we have made conservative deductions for the amount to be retained on the farm for seed, and home use?
12. What is a reasonable expectation with regard to the quality of the crop?
13. What degree of variability have we experienced in past years:

in planting dates, harvest dates, yields per acre, date of last frosts in the spring and first frosts in the fall?

Let us also briefly visualize some of the questions that arise in planning for livestock:

1. Which of the dairy cows are paying their way and which should be culled out as boarders?
2. How much of each kind of grain, of roughage, of protein supplement, and of pasture must we reserve per head for each kind of livestock in the new year?
3. Is the pasture program adequate to provide pasture throughout the season?
4. What are the total quantities of the different feeds that will be needed?
5. How much of these feeds will we raise and how much must we purchase?
6. What are we likely to have to pay per hundredweight or ton for purchased feed?
7. Where and when can these feeds be purchased to the best advantage?
8. What is the right time for livestock to be bred so that the cheaper summer feeds will be utilized as fully as possible and still permit marketing the livestock to advantage?
9. What variation in calf crops and lamb crops have we experienced through the years and what are the reasons for this?
10. What variation have we had in death loss and what were the causes?
11. What marketing weights and grades have generally proved most profitable?
12. How much expense should we figure on for stock medicine, salt, sheep dip, veterinary fees, service fees, etc.
13. What is the relation of number of young stock to breeding stock and is it in line with our plans for expansion or contraction of the enterprise?

Although rough answers to some of these questions can be provided from the general knowledge most farmers carry in their heads, the guess work can be eliminated and more reliance placed in the resulting farm plan when the information is available from care-

fully kept farm records. The value of such records increases with the number of years they cover. Almost any farmer can remember an exceedingly good year or a year of crop failure, but the normal expectancy on yields, costs, and returns is most reliable when it is based on recorded experience covering a span of years, including the more nearly normal conditions as well as the extremes.

Perhaps the reader had not realized that many of the questions listed above could be answered by keeping farm records. By figuring in advance the types of information that would be helpful in operating the farm efficiently it is possible to design the type of record that will supply the needed information.

If one is just starting to farm in a strange community where information is not available for the specific farm, he will still find that farm planning is helpful. Perhaps a friendly neighbor or the County Agricultural Agent will be glad to go over the farm field by field, discussing its possibilities and its limitations, thus providing the basis for rough approximations that can be trued up as experience is gained.

AIDS FROM PUBLISHED SOURCES

As previously indicated, farm planning is most reliable when it leans heavily upon the records of past years for the specific farm. In periods of instability, however, we are sometimes at a loss to know what hired labor and supplies are likely to cost in another year and what prices we should expect for our products. It is always unwise to count on high returns in the new year just because they were high this year. We need to know something about the forces that influenced prices or costs this year and whether they are likely to persist.

The newspapers and farm periodicals of different kinds are one source of information of this type. However, we should not be satisfied that we have the best possible advance information without double checking it in every way. Most of the agricultural colleges have specialists who make a business of analyzing the agricultural situation from time to time, and the results of their analyses can usually be counted upon as coming from a reliable, unbiased source. The State Agricultural Extension Service maintains a mailing list

of farmers to whom are sent free releases on items of current agricultural interest and on the future outlook for various farm products.

The Agricultural Experiment Stations at the State Agricultural Colleges and the U. S. Department of Agriculture are continually carrying on research work— developing improved varieties of crops, breeding more productive types of livestock, discovering more effective ways of combating pests and diseases, pioneering with new types of machines, with new ways of organizing the farming business for greater profit and stability. The results of this work are usually reported in bulletins and here again one's name can be placed on mailing lists to receive items of special interest. The progressive farmer will be incorporating some of these new ideas and innovations into his current farm planning.

The United States Department of Agriculture, and particularly the Bureau of Agricultural Economics, is continually making available economic information that will have a bearing on probable prices and costs for the year ahead. "The Agricultural Situation," a monthly publication of this Bureau, can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a cost of 50 cents per year. This reviews the outlook for production and prices of important commodities, carries comparative statistics and contains articles of general interest to farmers. A number of the State Agricultural Colleges issue similar publications, adapting the national information more closely to the situation within the State.

The Bureau of Agricultural Economics also issues a series of monthly reports covering important commodities or groups of commodities in more detail. Some of the titles in this series are as follows: *The National Food Situation, The Fats and Oils Situation, The Cotton Situation, The Dairy Situation, The Livestock and Wool Situation, and The Poultry and Egg Situation.* These can be obtained upon request from the Division of Economic Information of the Bureau of Agricultural Economics.

The Agricultural Research Administration, the Soil Conservation Service, the Forest Service, and many other branches of the United States Department of Agriculture issue technical information of value in the organization and operation of a farm. Perhaps the wise

thing to do is to drop a card to the Department and another to the State Agricultural College, telling the type of farming in which one is engaged and asking for lists of the published aids that are available for distribution. The appropriate titles can then be selected and requested.

In recent years, a number of the State Agricultural Colleges have issued guides to assist in planning the farm business, and they even provide forms for making the job easy. A post card mailed to the Director of the State Agricultural Extension Service should return useful information on how to approach the job of farm planning.

PERSONAL ASSISTANCE AVAILABLE

There are slightly more than 3,000 counties in the United States; almost all are served by a County Agricultural Agent and many of them by a Home Demonstration Agent. These local representatives of the State Agricultural Extension Service can give technical assistance on almost any phase of the farm business and the home; or—if not—can put one in touch with those who can. Their offices are generally located at the county seat, but they are periodic visitors in most every local community.

In a few areas the Extension Service has sponsored the organization of local *farm business associations*. These are voluntary associations of neighboring farmers who employ a farm management specialist to assist them in planning work. (See Chapter 13.)

In many instances field representatives of the Soil Conservation Service will be available, particularly where farmers have established soil conservation districts. They will be glad to go over the farm field by field, assisting the farmer in developing a long-time farm plan that will adapt each field to its proper use, conserving the soil and building a stable and prosperous agriculture. Perhaps some of the farm land is so steeply rolling or the soil composition such that farming on the contour or the use of terraces is advisable. In most instances, the Soil Conservation Service can provide the technical assistance needed for the change-over, and perhaps make available the heavy equipment needed in the construction of terraces.

The Farm Credit Administration, the life insurance companies, and the local banker stand ready to extend financial aid to the com-

Figure 81. The technician aids the farmer in developing a long-time farm plan while the younger generation, who will reap the ultimate benefits, looks on. (U.S.D.A.)

mercial farmer who has adequate security for his loan. Many of these agencies develop a tentative plan for the farm as a basis for judging the size of the loan and the length of time for which it should be advanced. Such agencies are generally concerned more with the im-

mediate revenue possibilities of the farm than with plans for the long-time pull. This is particularly true where credit is advanced for relatively short periods.

The Farm Security Administration, designed to assist farmers who are unable to obtain credit through regular channels, offers a service which includes financial assistance and guidance in the management of both the farm and the home. Their assistance leans heavily upon the results of detailed farm and home plans. The local office of the Agricultural Adjustment Agency can offer advice regarding the incorporation of various soil-building practices into the farm and render other allied services.

As with the published aids, the available personal services that can contribute to the planning of a farm and its day-to-day conduct are many and varied, and one will do well to learn of them through the office of the County Agent.

EXERCISES FOR CHAPTER 11

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. Aids to farm planning are available from three major sources: the assistance of representatives of State and Federal agencies, published sources, and (a) the radio; (b) the past performance of the farm itself; (c) farm implement dealers; (d) bankers.

2. The aim of farm planning is the highest profit combination of crop and livestock enterprises which means (a) producing those commodities which have the highest prices; (b) producing more than one crop; (c) feeding all the crops grown to livestock; (d) combining enterprises and caring for each one in a way that will give the greatest net income for the farm as a whole.

3. The normal expectancy on yields, costs, and returns for a farm is most reliable when based on (a) experiment station records; (b) county average yields for the last 20 years; (c) records covering several years for the particular farm; (d) the records of nearby farms.

4. In estimating probable prices for the year ahead one should (a) determine what have been the average prices during the past several years; (b) determine the trend of prices during the last five or six years and project this trend for another year; (c) get the opinion of grain and livestock buyers; (d) try to find out something about the forces that are likely to influence prices during the coming year from various impartial economic analyses available.

5. One way to get assistance with farm planning problems is to get in touch with the County Agent. He is (a) a representative of the local Board of Real Estate Dealers; (b) a representative of the State Agricultural Extension Service; (c) an individual who operates a farm advisory service for a fee; (d) a person who makes Federal farm loans.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Describe some of the specific items that one needs to know in order to make a crop production plan for a farm, including one or two

items under each of the following: (a) timing of operations; (b) materials required; (c) costs; (d) production; (e) returns.

2. Describe the kinds of assistance in farm planning that can be obtained from any three of the following sources: (a) the County Agricultural Agent; (b) Soil Conservation Service; (c) Farm Security Administration; (d) State Agricultural Experiment Station; (e) Bureau of Agricultural Economics.

CHAPTER 12
USEFUL RECORDS

WHY RECORDS NEED TO BE KEPT

In day-to-day operations and in planning the production program as discussed in chapters 10 and 11, farmers need to know the answers to a great many questions about which their own past experience is the best guide. Those who have no experience of that kind must rely on some one else's say so. Most of a farmer's everyday actions are natural responses to past experience. These become so nearly automatic, that sometimes it is hard for him to make changes. But now and then decisions are to be made that will greatly affect the income from the farm. Some successful men work such decisions out in their heads. Their memories supply the facts they need. On a very small farm memory may be enough. However, on most successful farms, the operators admit that they need written records as guides for planning their future operations.

The story is told about a farmer whose barn was on fire, and he was seen running into the burning building. Soon he came out with a barn door. One of his neighbors who had arrived on the scene asked him why he had risked his life to save the barn door. The farmer's reply was that all his records from 30 years of farming were kept on that door. Fortunately, there are more convenient and more systematic ways of keeping records of the farm business.

Some people remember things better than other people, but even they would do well to relieve their minds of the burden of details that may be set down on paper. What to write down and how to arrange the records for subsequent use are matters of personal judgment. A bound book is a handy place to keep written facts. Two or more kinds of books may be desirable.

One of the important needs for records is to provide the information required for income tax purposes. Income tax laws require filing returns by persons who make as little as $500 in a year even though no tax is payable. The tax is against the farmer as a person

rather than against the farm business, but for most farm families the farm business provides the principal income of the family. The farm return is made on Treasury Form 1040F, which requires a summary statement of all business transactions. The taxpayer certifies to his report as full, complete, and correct under the penalties applying to cases of perjury.

The income tax regulations permit a taxpayer a great deal of liberty as to the form of his records. In practice, no formal books need be kept, and questions of fact raised by the Bureau of Internal Revenue may be explained by presenting appropriate documents rather than a book of account. Forms designed for getting the figures for the income tax forms are available.

However, a farmer can keep records that will contribute the information most helpful to him in running his farm business and at the same time supply the information needed for tax purposes. The records here discussed provide for all of the information needed—if the facts are put in writing and receipted bills are kept. Many farmers are said to have paid large sums to experts for filling out their income tax forms. Most farmers could save those fees by doing the work themselves.

KINDS OF RECORDS TO KEEP

The bookkeeping recommended for farmers has been as varied as the situations to be treated. Farm management specialists have developed sets of forms that are helpful to a great many farmers. The current farm account book distributed by the State Extension Service in each State is the book that has seemed adequate to most farmers who wanted a prepared form.

One book, no matter how well prepared, cannot serve all persons who wish to keep farm accounts unless it includes provision for whatever anyone may want, or unless each user will use such parts as suit him and add any other desired forms that the book lacks. Too much point has been made by farmers of having *one* book of account.

As noted, one book can be designed to cover everything a farmer may wish put in writing, but experience shows that after a practice period, many farmers branch out and keep a group of books, each

covering one part of the farm business or one kind of record and all of them adding up to the information needed. Two, three, or even more books mean no more record work than one holding the same information. It is not time lost to have a pocket notebook to catch on paper any ideas that occur in the field, nor to write a diary or journal from which selected facts may be restated in another place for another use. A farmer must avoid spending needless time on records, but good records pay large returns for the time spent on them. By good records we mean recorded facts that the farmer can use in managing his resources to obtain the highest possible net returns.

The principles of bookkeeping persist decade after decade. Only the kinds of goods and kinds of deals change. Farmers' needs change with their personal experience, so they do well to shift their record-keeping details. This shifting can be accomplished without change in the basic system of their record work.

Personal and Documentary Records. Some records of transactions must be available for self-protection. To make sure that some of these are not lost local governments provide for recording deeds of sale of property, deeds of trust, easements, rights of way, leases, wills and birth certificates. Usually these are at the Court Houses or other safe places. Other documentary evidence like war savings bonds, insurance policies, and stocks and bonds can be placed in bank vaults by arrangement with the banks, or a safe deposit box may be rented for a small fee. Failure to produce these documents is very troublesome, although laws protect holders from complete loss of value in case of fire or theft.

Also important are the records of business transactions with other people, especially the credit transactions. A seller wants to have from the buyer a written receipt for goods delivered, and the buyer wants a receipt for the money he is paying for those goods. If there is any possibility that the seller might be selling something which he did not own, the buyer will want a bill of sale. People well acquainted with each other drop some of the usual formalities, especially if their total number of exchanges and the amount of money involved is small. Canceled bank checks are good evidence of money paid to another.

Besides these documents that are the result of transactions with other people, there are other statements of fact that a farmer must

have as a basis for negotiations, or is supposed to produce to prove statements about his business affairs. These include the items for filling out a statement when credit is to be obtained from a bank or commercial creditor, the pedigrees of purebred stock, and details of many other kinds. The essential facts about these transactions are conveniently recorded in the careful farmer's books of account or kept with them. For many purposes it is useful to separate the strictly personal affairs from the farm business; farm and farmer do not always have a single interest. However, it is the manager's personal efforts that guide the farm operations.

Business Records. All the *business records* a farmer will ever want to keep fall into three classes. (1) A property list or *inventory* which describes the property he started with and what he had on successive inventory dates. The differences between successive inventories constitute important information. (2) Records of *receipts* and *expenses,* including capital outlays, can be made to show what products were sold and what expenditures were made. These financial records and the property lists or inventories are very closely related. The true picture of the year's business is available only when both are worked together. (3) The *production, performance* and other *incidental records* fit in with inventories and financial transactions and are necessary for working out such efficiency factors as production of milk per cow, the reasons for change in yield per acre, gain of hogs per hundred pounds of feed, and other figures farmers talk about when they compare notes; and of which they make important use when planning changes in the farm business. By the rearrangement of these three kinds of records, according to an appropriate scheme that has to be planned in advance, costs can be worked out and one can find out what practices are paying best.

A FLEXIBLE SET OF BOOKS FOR A FARMER

A farmer has to have a great deal of accurate information about his own ways of doing things. Not all of that needs to be in writing. Parts for the record are given him by others and need only sorting and saving until used. Some things had best go into his record, so they will not be forgotten. The desk work here suggested requires a few minutes regular work per day as chores do; and other periods of an

hour or two at a time for routine checking and study. It is time profitably spent.

It is possible to start formal record keeping simply and correctly, doing only as much desk work as is currently worth doing. Each farmer determines the extent of his record keeping according to his personal interest in getting facts.

The system recommended here is based on the same principles as are used by successful merchants and successful manufacturers in their accounting. Farmers' needs for accounting are similar except in the number of sales made, kinds of goods handled, the volume of business and kinds of expenses they keep track of.

A business has at any stated moment a *collection of property,* called its *assets.* On a farm these are: land, livestock, machinery, supplies, and cash or its equivalent. All of these assets are owned by some arrangement or other by one or more people who provided the funds out of which the assets were bought or otherwise obtained. The sums contributed by persons are called the *liabilities* of the business; the names used next to each figure show the source of the funds. The total of assets is expected to be precisely the total of the liabilities.

Business is done, resulting in sales of goods out of the stock listed as inventory in the assets, or produced, or bought for sale. Doing business involves payments of money for materials, for personal services, and sometimes for capital goods. Unless money is borrowed to make payments or unless cash on hand is reduced, cash payments will not exceed cash received during a period. In the process many changes may have been made in the property list. The management may pay out the proceeds of sales of assets, thus reducing the capital. Cashing assets is sometimes done without profit. At the end of the business period a new statement of assets and liabilities is made out. A summary of the transactions during the period also is made up. This is the *income statement* and shows what business was done and who got the money received.

The individual operator of a farm business does just the things mentioned in the stream-lined description of accounting in the preceding paragraph, but he short-cuts most of the record work, because only he is responsible for the results. The proceeds are his,

except for his commitments to other people. He must measure a few facts and fix them in writing to meet his obligations to other folks. A few others the operator can use in improving his management, unless of course he is satisfied that no one could possibly have done a better job. Once a year he can (January 1 is a good time) check his list of property in detail and place values on each item. The sum of the values so placed, less all the obligations to other people (bills, notes, mortgages), shows his *net worth* on the date of enumeration. The difference between the net worth figures for successive dates shows the amount of financial progress during the year.

The operator wants to know the main facts of his business as a whole, that is, what he has from time to time, what he made (gross receipts) in a year and what he did with what he made. Whatever further detail he puts in his bookkeeping can be used in planning operations and appraising the probable results of alternate plans as discussed in chapter 10. The operator uses his experience in working out the factors. Attention may be centered on any enterprise, one at a time, or in any combination.

PROPERTY LISTS, OR INVENTORIES

If a farmer were to start a new business he would buy all the articles to be used out of personal savings or with credit. The bills of sale together would form the first *list of property,* the *inventory of capital goods,* or the *assets invested in the business.* The *liabilities* would be distributed among the people who extended credit and his own share or his net worth at the start.

For a business already in operation, the property list that starts the formal record keeping is made by actually listing every valuable article on the place and assigning to each a value to the business. For this purpose a composition book is useful because there are pages enough to make some classification of items without crowding. The same book can be used for checking at the next enumeration.

A summary property list for Brook Farm is shown in the form used by commercial and financial institutions (fig. 82). The operator's personal effects and other property are not shown. The farm dwelling is included in the value of the buildings in accordance with common farm practice. In all, nearly 1,200 described items were

counted or measured and valued to make up this summary. Since the operator did not have all the money to match the investment, the amounts owed to others are shown as well as the value of the farmer's own investment. The farmer's investment is the *net worth.* In other business enterprises it is also called *proprietary interest* or capital and surplus. Year to year changes in net worth show the financial progress of the farm business. This significant information can be had by spending a few hours each year on making a list of the property and then adding up the results.

Property list for Brook Farm, Jan. 1

Farm Business Capital (Assets)		Source of farm capital (Liabilities)	
Land, 125 acres @ $89.60	$11,200	Bank loan	$ 200
Buildings	8,600	Store accounts	25
Machinery	2,000	Jane's father	5,000
Tools and equipment	550	My father	3,000
Work stock, 4 head	400	Total owed to others	8,225
Livestock		My own investment (net worth)	17,275
Cattle, 5 head	415		
Hogs, 42 head	900		
Poultry, 52 head	80	Total capital fund	25,500
Feed	800		
Supplies	130		
Cash, including money and credits of all kinds	425		
Total investment	25,500		

Figure 82. Some 1,200 items found on Brook Farm on January 1 as the farmer made up his property list, took inventory, as many say, are here shown in summary. This kind of statement is fairly common among commercial and financial institutions.

The land in this farm was of different grades. In the inventory the orchard was valued highest, $250 an acre, plow land $90, and pasture $15. Buildings were built at different times. The values assigned to them are the depreciated values or the values remaining in the buildings at the inventory date. Machinery and equipment likewise was of all ages and conditions as is indicated in figure 83 which shows a partial record of twelve major items. The stock, and

the feed and supplies were counted or measured conservatively, present condition duly considered. The financial items, cash, bank balances and accounts due for produce delivered are counted at face value.

6 Crop Equipment

Machine	Bought		1943	1944	1945	1946	1947	1948
	Year	Price						
Tractor	'41	1400	1010	850				
2 - bottom plow	37	110	39	33				
8 - ft. tandem disc	39	130	65	55				
4 - sec. spring tooth	33	75	13	11				
6 - sec. harrow	35	40	10	9				
8 - ft. packer	36	135	40	33				
Lime sower	40	100	60	50				
manure spreader	40	175	105	88				
grain drill - fert.	42	265	225	192				
7 - ft. mower	38	140	60	50				
grain binder	34	240	85	70				
corn binder	36	250	75	65				

Figure 83. Part of a page of a property record book. This record serves for 6 years. The age and purchase price were entered from other records. The values shown here are the farmer's estimate of the sale value in mid-winter 1943 and again in 1944. The differences are not to be taken as depreciation allowed or allowable for income tax purposes unless adjusted for facts shown in the depreciation schedule. There are several ways of figuring depreciation, any of which may be followed consistently.

The major difficulties with the property lists relate to the values placed on the items. Ideas of value change and market values change too. The valuation basis should be reasonable and consistent as the changes in the net worth total are first signs of progress. For income tax purposes, certain schemes for reporting valuations are available to the taxpayer and the one used for tax purposes may be adopted for use in the farm records. Under the tax regulations paper losses are excluded from income statements and farmers need not pay tax on paper profits. Changes in the market valuations of the land, equipment, and other capital goods used in production, do not affect the

income one way or the other unless they are sold.

Capital goods cost money and they wear out or become useless in the course of time. One may consider as current expense (as if it were actually paid in cash) as large a share of the purchase price of capital goods as the obsolescence and use in the current years amounts to, in relation to the total service obtainable from them. This is called a depreciation charge.

The main suggestion for determining the annual depreciation charge is that the cost of the livestock, buildings or equipment be divided by the number of years it will be used. This can not be decided in advance down to the last dollar of value or the last year of service, but a satisfactory estimate can be made.

If the tractor shown in figure 83 as costing $1,400 in 1941 were to be used eight years and have a junk value of $100 at the end of the 1948 season, income tax regulations would suggest one-eighth of $1,300 or $162.50 as the proper *depreciation* figure for each year of use. So with every other item of durable equipment, (machines or tools expected to last more than, say, 2 years) and with every building and with improvements to land like fences, drainage, or irrigation facilities.

The farm business finances the purchase of capital goods; and by the time the individual items are disposed of the total value has been transferred from the capital assets to the annual costs of doing business. If the farmer spends annually for replacements an amount equal to the depreciation allowances, the value of the capital assets will remain the same.

Taken one by one the inventory record for all items can be satisfactorily set up in a few hours—for old things in use, the requirements are for a reasonable value figure—one that can be used as a fair basis for all purposes. After the first property list is made up, adding new items is no special problem.

Depreciation in any year is only a part of the annual use cost of buildings and machinery. Repairs and other maintenance expenses are to be added. Extensive repairs or reconditioning that add to the life of machines or buildings are treated as if they were additions to capital and are retired over the estimated use period.

Work stock and breeding stock are durable capital. They are

held for use rather than for sale. Each animal can be listed separately, or in groups of similar description. The values are fixed with reference to cost if purchased, or to market value if raised, and decreased according to established practice.

The valuations of growing stock and produce raised for sale are to be set conservatively and in the same general way year after year. These groups of property and any supplies bought but not used before inventory time make up the inventories mentioned in the income tax regulations. They are best priced at what they cost, what was paid for them if bought, or at market price if they have deteriorated in quality, or if the market price is down and is expected to stay down until after they are used. As farmers can't easily say what their growing stock cost them at the inventory date, a fair market price is reasonable and acceptable. The same comments apply to produce.

Land is not depreciable for income tax reporting, and is put on the property list at purchase price or value on 1 March 1913, or some other stated basis. Changes in land value may be taken into account, however, in credit statements and for other purposes; but for most uses the value of land should be held at the same level from year to year, unless important land improvements have been made. The point is that one cannot spend money that he has not received, and higher prices for land may vanish before a buyer turns over the cash.

Changes in the value of the items on the property list may change the total value very little during many years, because of current replacements. In times of shifting market prices, the nature and amount of the changes observed in the list must be borne in mind; they do affect the policies of the operator as to when to sell and what to keep. But increasing or decreasing prices affect surely only the goods sold or about ready for sale.

Because it furnishes an opportunity to compare year-to-year changes, an inventory book providing for several years of values on a page is attractive to some people. However, if we are to keep things straight by calling each article by its own proper name, we must have only a few items on each page, so that space may be available on the proper page. A book of this kind can be worked up from a ruled blank book, but a special ten-year capital record book has been pre-

pared by the U. S. Extension Service and can be ordered from the Office of Information, U. S. Department of Agriculture. This form provides space for all items a farm is likely to have over a ten-year period and includes income tax details as well as the valuations.

RECORDS OF RECEIPTS AND EXPENSES

Some kind of record of money taken in and money paid out is necessary. One needs to know more about the sales and the outlays than the current difference between the amounts. Otherwise counting pocket money and bank balances would be enough. Buyers often want time to pay for farm produce, and farmers often want to run up store bills until enough money comes in to pay them. A simple memorandum of amounts received and amounts spent can be carried in the pocket at all times. It fixes details that otherwise might be forgotten and serves later on when rearrangement of the record may be undertaken. Financial records should provide some information on what is coming in from time sales, although farmers usually do not consider things as sold until they have the cash in hand.

In part, records of receipts and expenses serve to keep relations straight with other people. That is reason enough for doing the work. More important are services of these records in measuring how the management of the farm is going.

A great many different forms have been prepared to keep track of receipts and expenses. Most attractive is some form of book having many columns. A form prepared for dairy farmers in dairy herd improvement work is shown in figure 84. Notice a wide space for describing the item bought or sold, and a column next to it for stating the quantity changing hands. Full detail written in these two spaces saves rewriting details anywhere else unless for some special purpose. From the standpoint of use in farm planning a record of physical quantities bought or sold is just as important as the dollar values. The amount received is put in the appropriate column. These records are entered in the book in the order in which they occur. The page for receipts should cover all the money received. The columns may be labelled to take special care of any part of the business. One column (headed "Other") is used to collect the infrequent receipts or expenses.

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FARM RECEIPTS

Month March 1944

Day	Items	Quantity	Milk or butterfat	Dairy cattle	Other livestock	Poultry & eggs	Crops sold	outside work		Other receipts
2	Veal calf to Brown			14 50						
3	Eggs	60 doz				21 00				
7	Potatoes to gen'l store	10 bu.					11 50			
10	Feb. milk	240 gal	67 20							
11	Town Warrant (road work)							6 00		
14	Hay for Clarence	1 ld					16 00			
17	Eggs	60 doz				20 00				

FARM EXPENSES

Month March 1944

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Day	Items	Quantity	Labor hired	Feeds bought	Farm improvements & repairs	Mach. & equipment bought, repairs, oil & gas	Livestock bought and expenses	Crop expenses	House	Other expenses
1	Sarah for house								40 00	
3	Dairy ration	1 ton		57 00						
	Corn for hogs	36 bu.		40 00						
	Oats for horses	50 bu		25 00						
10	Hauling milk	Feb					4 10			
	Dir. Edge (cow)						3 10			
13	Bal. Income Tax									39 68
	Gasoline (Feb.)	35 gal				7 14				
	Coal for brooder	½ ton					6 75			
	Fertilizer	3 ton						105 00		

Figure 84. These are tops of pages used by dairy farmers in Dairy Herd Improvement Associations. For other types of farm business other column headings would be used. Note that feed bought March 3 amounting to $122 has been divided into cow feed, hog feed, and horse feed. Such separations are a help, if one may want to work out at the end of the year the feed bought for any class of stock. Note that three items incurred in the previous month's business are entered in the March accounts because the actual payment or receipt occurred during March. This is common practice.

Some people who use a cash record like this make it self-checking page by page by setting down the total receipts (or expenses) in a column next to the descriptions. The column headings of kinds of sales or receipts can be changed annually or oftener. Some books are ruled for as many as 13 columns. One section could be used for receipts only and another section for expenses only. All the expenses should be entered on the expense page—not just part of them.

The columns on both pages represent enterprises or parts of enterprises. Most of the expenses cover services or materials for more than one enterprise. Hired labor, for example, works on different enterprises wherever needed, and the operator is rarely able to assign to any one enterprise the wages paid to any worker. Similarly, although the feed bought may go into one column, it will help if the detail can show that one item of $57 was for cow feed, quantity and kind to be named, another $40 for hog feed, and another $25 for horse feed. Other expenses can be identified the same way.

Big books with many columns require more care lest items get into the wrong columns and defeat the purpose of the book, which is to accumulate the total for the kind of product or expense listed in the column heading. One line usually is needed per entry.

The only items that need writing twice are summary totals, which are put into spaces prepared for them. Regardless of number of books, pages, or columns on which money payments are shown, all of the expenses plus cash in sight should equal the total receipts added to the cash available to start off the period being summarized. Often the two sums are different the first time the amounts are added. A paid bookkeeper or a person responsible for money must find out why the totals differ and correct the record. A farmer who keeps his own books can usually decide promptly what the trouble was and make satisfactory entries. Often the difference is merely a number of small purchases not jotted down. Books may be brought into balance by saying that the small difference not otherwise on the record was spent for personal or household small stuff. This short cut takes most of the drudgery out of record keeping. This kind of short cut must not be overworked, else the record keeper will be misled.

Column headings in the cash book should correspond with sum-

mary groups in the property list, at least for enterprises being studied. This is for the purpose of keeping the record of these enterprises clear of receipts or expenses for other purposes. Thus, when a study of the milk production enterprise is undertaken, the column showing receipts from dairy cows should not be mixed up with veal calves, bulls, or other stock sold. The expense side is harder to manage but yields to methodical separation of the expenses for cows and milk production from all other expenses. These are not half as hard to do at the time as they may seem when described many miles from a farm before they happen.

Some farm people have developed records in which separate pages in a book are used for each enterprise instead of columns on a page of a book. Choice depends largely on when the work of summarizing is to be done. The page-for-an-enterprise type of book, or ledger, is a little more work to keep day by day, but it has the advantage of showing in one place everything about the enterprise that has been entered in the book.

Occasionally some item will be sold off the property list. The money received from the sale is income only to the extent that more was received than the previous listed value. Such sales should always be shown separately from sales of things produced, to avoid exaggerating the volume of business. Similarly, merely changing assets from one form to another, as is done when money in hand is exchanged for a plow or a mowing machine, does not set up additional operating expenses merely because someone else got the money. The plow or mowing machine instead of the cash appears on the next inventory. Therefore, the cost of the plow is not considered as operating expense, but the annual use cost is included as depreciation. Whenever supplies are bought in excess of needs of the year, the true expense of the year's business for the supplies is represented by the quantity actually used times the average purchase price—not the whole payment made. The balance appears on the closing inventory. This fact can be tested by observing that if none had been left over, or only the actual needs bought, the bill would have been less by the value of the quantity left over. The property list and cash book together should always tell the full story.

PRODUCTION, PERFORMANCE, AND INCIDENTAL RECORDS

Besides the financial records which assemble information in terms of money, other records help give meaning to changes in the amounts. These are as numerous as the questions farmers want answered. With these, as with the accounts they help explain, no more need be attempted than current interest suggests. The starting place is the facts that are needed to show how income can be increased.

Grade B milk sold to Shipper delivered at station 10 miles

Month	Lbs. basic	Price	Lbs. s'plus	Price	Test	Value	Hauling		Other	Net rec'pts
Jan.	7996	2.80	—	—	3.8	223.89	15.99		8.00	199.90
Feb.	7390	2.75	—	—	3.8	203.22	14.78		7.39	181.05
March	8037	2.60	—	—	3.7	208.96	18.07		8.04	182.85
Total										

Figure 85. Summary form for a milk producer. The buyer's statement of quantities delivered, price, gross value, hauling charge (20 cents per 100 pounds) and sales promotion charge (ten cents per 100 pounds, in column headed "Other"), are entered here, besides the "net receipts" or amount of cash check. Some farmers can haul their own milk and collect that much more cash from the buyer.

The *milk production score* (fig. 85) based on the statements returned by the milk buyer is a typical performance record. Some would leave the table as quantity sold, from which the pounds sold per cow could be computed. There were 13 cows on this farm as recorded from inventories, sales and purchases. The average sales in March were 20 pounds per cow per day. Sometimes the farm use is a considerable quantity and should be added to sales, especially if feeding for efficiency is to be studied. One question to watch on some farms is how much whole milk can profitably be fed to calves.

Cow testing is a special way of getting at the relative value of

individual cows as producers. Cow testing includes records of *feed consumption* of each cow, both grain and roughage. These are figured out by a tester hired to calculate, from one day's weighings each month, the milk production and feed consumption. When market prices are placed on milk and on the feeds consumed the margin available for labor and overhead can be figured for each cow. The results are sometimes startling.

The *egg production record* (fig. 86) can be used as an original score card or to summarize the production of several pens with different numbers of hens, as in this case. One way of telling to what

YEARLY EGG RECORD

Day of month	January	February	March	April	May	June	July	August	September	October	November	December
1			590									
2			600									
3			610									
4			595									
5			600									
6			620									
7			606									
8			630									
9			632									
10			625									
11			650									
12			620									
13			618									
14			630									
15			620									
16			615									
17			625									
18			638									
19			620									
20			612									
21			630									
22			633									
23			635									
24			620									
25			624									
26			636									
27			650									
28			660									
29			675									
30			690									
31			680									
Total			19486									
Average number of hens			1500									
Average egg production			13									

Figure 86. This summary egg production record brings together the daily egg production of eight to 15 pens for March. Poultrymen have many ways of stating efficiency of egg production among them eggs per hen (13 for March as shown here) and percentage production, or rate of lay, the number of eggs per 100 hens in the pens. Careful watching of the rate of lay often reveals trouble in the flock before other signs can be seen.

extent hens need grain feed or mash is to count the eggs before and after change in kind or quantity of feed.

Performance records similar to the milk and egg records can be devised and kept for other crop and livestock enterprises. The results obtained can be compared with the estimated yield or production that was used for the farm plan (ch. 10), and then used as a basis for next year's estimate. Production per cow, per sow and per hen can also be compared with what farmers in the area consider as standards of good accomplishment.

A *farm map* even of the roughest sort drawn on wrapping paper and tacked to a cardboard can be made to show the crop grown on each field for a number of years, the yield per acre, the manure, lime, or fertilizer treatments given, and notations as to why results were better than expected, or worse. Many a man looking at his map has wondered why the fields were all so small and irregular. The usual answer was a new layout to make the fields larger and easier to work. (See the before and after maps in chapter 6; also the use of the map in farm planning in chapter 10.)

Some farmers still find a *diary* useful in planning their work. They write down what they did on the farm and, among other things, make notes on the weather. One form of diary page, including a record of money received and money spent, is shown in figure 87. Such a cash account might serve a small farm business for many years, but as soon as any use is to be made of the figures it would be necessary to hunt through the pages in search of figures, all of which might not even be there.

Feed is one of the major items of cost of a livestock farmer though generally a small proportion of the feed used is bought from other farmers or from a grain elevator. The cost of home-grown feed is the cost of land use, power and machinery, and labor to work the land, and some materials. All of these costs are shared among the crops grown and the livestock kept. The quantities of the kinds of feed used by each kind of stock can be very closely approximated. The value of the feed used at home can be divided among the livestock according to the feeding record and used as one factor in analyzing net returns from each class of livestock.

Bulky feeds are hard to measure and, even though they are care-

Thursday, March 16

Clear 60° F	Field	Men		Horses	
		Hours	Min	Hours	Min
Hauled and spread 10 lds. manure	C	6		12	
John got brooder ready for chicks. Hatchery phoned that the 400 chicks would be ready Saturday P.M.		2			
John finished pruning		4			
while I disked for oats.	A	4		12	
Big cow had 10 pigs about 9 o'clock — they look good.					

	Received		Paid out	
Milk check Feb. 8400 lb @ $3.50	294	00		
Hauling milk @ 15 cents			12	60
Co-op. Service			2	94
500# starter mash @ $3.85 deliv.			19	25

Figure 87. Sample page of a diary ruled for time scores and receipts and expenses. Notes on chores would be made when routine changes with seasons. With cash booked this way, rearrangement for summarizing can wait. If another kind of cash book is used the space on this page could be used for next year.

fully measured at harvest time, they shrink during storage. Hay may shrink as much as 25 percent between putting up and feeding late the next spring. In appraising values of feeds or other crops on hand

at inventory, is is best to use a conservative figure. The conservative figure will usually be less than the market price and less than the proceeds to be expected from sale or from feeding out. Any purchased feed held over is properly put into inventory at the price paid.

Most farmers shy away from a *labor* record. That means to them accounting for all their working hours for 365 days a year and the working time of their farm helpers for every job done. Such detailed scoring has been done in time studies for short periods. Some record of wages paid and the time worked by paid labor is already in the cash book. An estimate of the board and other non-cash pay can be added to cash wages to find out what the hired work cost. A sketchy memorandum of days worked and kind of work done would provide a close estimate of the cost per hour of labor. It requires only a few figures a week to line up the time worked by each farm worker on the main jobs. Even though such a record can be a few hundred hours a year too high or too low, the figure holds some interest. Farmers who have kept such records have occasionally been surprised by the number of days they had puttered away at odd jobs, or the number of days lost because of bad weather. Use of time is discussed at greater length in chapter 8. There may be some object in computing earnings at a wage rate that the operator feels he would pay his family if they were to be hired for comparison with what the business provided after bills were paid.

Records can be interesting from the very beginning; just as a baseball score card shows how the game is going, even though the game is not over till the last man is out. Feed to dairy cows, for example, can be increased at any time that production will be favorably affected by increase, or can be decreased as production is falling off, but it takes records to show what should be done. On the whole, it is wise to keep the record up to date, checking cash as often as once a month, reviewing unpaid bills, adding columns, and working up such summaries as crop yields after the harvest. Above all, one should avoid undertaking too elaborate a scheme of record keeping.

HOUSEHOLD ACCOUNTS

In managing the household the housewife has the same sort of use for information on expenses as the farm operator has for details he

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March 1944

Day		Total	Food	Clothing	Home Supplies	Personal	Misc.
1	Cash, from February (1.50)						
	Cash, from farm book (40.00)						
3	Meat	2.65	2.65				
	Groceries	4.38	4.38				
	1 box soap (10¢ bars)	5.98			5.98		
	Haircut (.75) Shampoo, trim (2.50)	3.25				3.25	
	Postage 25 3¢	.75					.75
5	Church pledge, March	3.50					3.50
6	Money order, underwear (Jos.)	2.83		2.83			
7	Dr. T. for filling tooth	2.50				2.50	
8	Red Cross drive, school	5.00					5.00
11	Groceries (4.28) 2 shirts (3.45)	7.73	4.28	3.45			
12	Plate collection	.15					.15
15	Totals to date (41.50)	38.72					
	Cash balance (2.78)						

Figure 88. Part of a page of a household account book ruled with six columns for expenses and a line for every day. The trip to town on Friday, March 3, required more than one line, but household expenditures are not made every day. This book shows $40 of cash from farm funds set aside on March 1, with all of it but $2.78 spent by March 15. In fig. 84 the $40 was entered in a separate column on the expense page. The right-hand page of this book has been used for scribbling and will carry at the end of the month whatever summary the housewife may make.

needs in planning the farm work. She has priority ratings for everything the family needs. Study of family expenditures to make the best use of the money available is the objective of the household accounts, but in the home as in the field work, the measurements in terms of quantities often are more informative than the money values assigned.

The housewife may know that half or more of the family food comes from the farm without direct payment, but she can't forget that milk and eggs sold instead of eaten would provide money for something that the farm does not provide. The urge to sell is so strong that for some farm women it is a treat to have for home use something good enough to sell.

In the farm accounts provision is made for separating the household accounts by providing a column in which the amounts spent are

set down. The household accounts will show in detail the kinds of things for which those sums of money were spent and the quantities obtained. The household normally has only as much money income as the operator sets aside for spending on food, supplies, clothes, telephone, electricity, furnishings and equipment, medical services, automobile, schooling for children, and entertainments for the family, gifts, and other things.

Perhaps most women will find it easiest to keep track of the cash outlays by using a stiff covered blank book ruled with 5 to 7 columns per page of 30 to 36 lines. Headings may be written in month by month. (See fig. 88.) Prepared books with printed column heads can be obtained from State Extension Services or from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. (Among these is Form FSA-RR 195 Farm Family Record Book.) Several of these household account books have forms for recording the noncash items from the farm.

The housing expenses usually are paid for out of farm funds. Taxes, interest, insurance, and maintenance of the dwelling are part of the farm bills unless the family share is separated. In some parts of the country fuel for cooking and for general heating is available on the farm.

Among the contributions of the farm women to the success of their family budgets is the boarding of hired men. Cash wages on the average are one-third less than the real wages of regularly hired labor. Part of the difference is due the farm woman for her personal services.

The Bureau of Human Nutrition and Home Economics has studied family living of farmers in many States. In Northern Illinois the value of family living for 122 families averaged $1,983 of which 34 percent was food, housing, and other goods and services without direct expense. In Tennessee, 198 families got along on $975 in the same year, 49 percent of which came from the farm without direct expense. Both groups had four persons living in the household. The total food value for the Tennessee families was 68 percent as large as that for the Illinois families, and only 21 percent of this was purchased as against 37 percent by the Illinois families.

More important to family welfare than the money value of food

used is the sufficiency of the food supply. Does the farm provide the quart of milk a day each child needs? Is the supply of vegetables liberal enough and varied enough to provide the vitamins and minerals they need? Few farm families need to be as short of food as many are for want of putting in the time to grow the food supply and store the surplus. Some score of the produce actually used by the family will be useful in deciding whether to have more or less next season.

A farm garden would perhaps be better appreciated in the farm income scheme if the value of the product as human food were to be stated instead of the cost of the garden in terms of time put on it. City retail prices need not be used in estimating the value of the produce, but the too common practice of putting in a round figure of $25 or $50 for the garden is almost sure to understate the value. The cash expenses incurred in raising the garden are generally entered in the farm account rather than in the household record. These include seed, fertilizer, spray materials and a few other small items.

The total value of the family living from the farm is an interesting figure compared with the value of the time and outlays used in producing the items and with the output for sale. Whatever the figure, it is real income of the farm family and part of the farm production. Because no money passes, too many farm people do not count the value of the home-used produce as income of the farm business or as income of the family. Income tax regulations do not require farm people to report the income represented by food, fuel, and house rent if the cost of providing them is excluded from farm business expenses. This is a real advantage to farmers.

SUMMARIZING THE YEAR'S RESULTS

At the end of the year, time is taken to work out the answers to questions raised when the forms of the records were set up. Completing the financial and other records by adding the columns (or pages) is a necessary chore, though not burdensome if the records have been checked from time to time during the year.

Another thing to get done promptly is the new property list, again counting, measuring, and valuing all of the assets and the amounts owed to everyone else. The list made the previous year is a help in

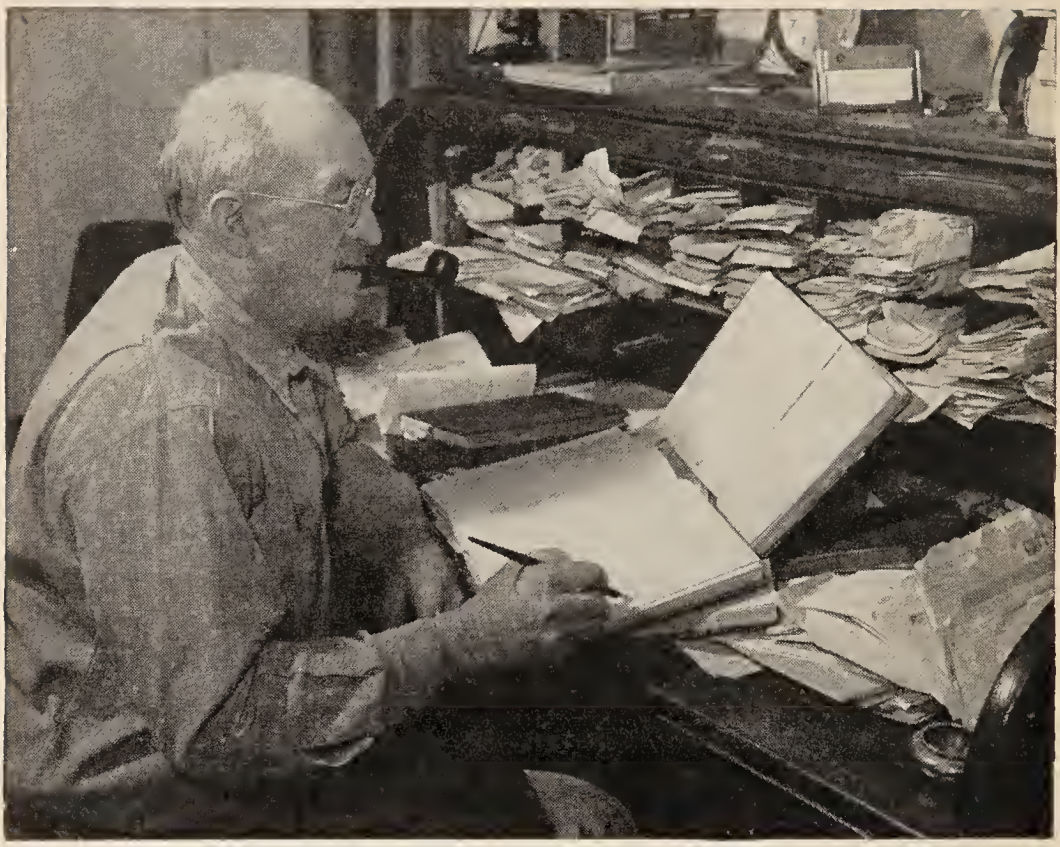

Figure 89. William Lauderdale began complete farm records in 1908 and is using blank books with his own headings written in. Here he is transferring to the ledger records of cash transactions from the chronological order of his journal. Just before this picture was taken, he had been looking up prices received in 1918; eggs were $1.00 a dozen, hay $42 a ton, but a tire cost $34, bran $55 a ton, and labor $5.00 a day with dinners. A roll top desk is a great convenience. (U.S.D.A.)

checking items that ought to be on the list. The values should be arrived at in the manner described in the section beginning on page 249. Items sold or exchanged are noted for checking against receipts, and items bought are to be added to the property list. Then the group items on the pages are added until the total assets, the total amounts owed, and the net worth are found and compared with the similar totals at the first of the year. At this stage the bookkeeping may be considered to be finished for the year of record and the farmer as manager devotes his attention to his study of the meanings of the figures in terms of profitable changes in his practices.

A net worth smaller than that twelve months earlier may mean—(1) farm and family expenses in excess of income for the year; (2)

depreciation totaling more than the replacements and values added in other forms; (3) partial or total loss of items by destruction or other disappearance; (4) damage from any cause; (5) loss in quality of produce and supplies in storage; (6) shift in the market prices of produce and supplies. On the other hand, a gain in the net worth is a part of the income of the operator, even though it is still in the business in the form of goods. It may have come about for reasons just the opposite of those given above. This gain is as good as money in hand, if the valuations have been reasonably made. A well-organized business in times of stable economic conditions may go on for years with very little change in net worth—if the owners choose to spend each year all of the proceeds of the business. Young men will want increasing net worth, every year if possible. In times of wide price changes one may need to look closely into the effect these changes may have had on the change in net worth.

One should avoid complacency about a net worth figure that shows little or no change from the previous year, because there may have been large decreases in one part of the list that were made up by large gains in another. For example, a farmer may find that he has been building up his inventory of machinery while letting his buildings run down, and this situation may suggest some adjustments in his capital expenditures for next year.

Besides the cash income from operations (and the occasional drawing of past savings) farmers get considerable food and sometimes fuel from the farm without direct expense, and they have the use of the house and other facilities of the farm business that usually are paid for out of the farm business receipts. These items are important to the family and should be valued, as discussed in the section on household accounts. It is well to keep them separate from the cash transactions. For income tax purposes, these items need not be counted as income if the costs of providing them are not counted among the business expenses.

One summary report form for a general farm business is shown in fig. 90, representing average experience on a general farm in Pennsylvania in the years just before World War II. All of the possible items that appear in any book of farm accounts are provided for in the form. One summarizing for his own farm would use the figures from his own books of records, using the totals previously found.

Income Summary of General Farm

Received for		
Crops sold		
Potatoes	$ 300	
All other	113	$ 413
Livestock products sold		
Milk	1,200	
Eggs	200	1,400
Livestock sold		
Cattle	300	
Hogs	180	
Hens	143	623
Miscellaneous receipts		
Trucking and other work	140	
Other miscellaneous	141	281
Cash receipts		2,717
Paid for		
Cattle bought	200	
Sow bought	30	
Baby chicks bought	40	270
Feed bought		258
Hired labor		251
Taxes		126
Machinery repairs		20
Tractor, truck, and auto expense		137
Seed and plants		40
Fertilizer and lime		84
All other cash farm expenses		311
Cash expenses		1,547
Balance of cash transactions		1,170
Less decrease in inventory (shown in the property record book)		53
Cash income, corrected for decrease in inventory		1,117
Add home use of food and fuel (total from household book)		350
Family net income from farm		1,467

Figure 90. In this income summary the main figures are group totals, or column totals, from the book of receipts and expenses. Of the balance of $1,170 remaining after deducting expenses from receipts, $53 was treated as income earned in a previous year and cashed during the current year. The $350 item for house use of food and fuel is often set apart from other income of the family because it is an estimated figure.

The prime object here is to show the amount of cash income, the amount of correction to be made for changes in value of the physical property, and the personal income from home use of farm products. Unless the financial records use these groups of items, the items to match this particular form would be obtained by going over the record and reclassifying the entries.

Even if one has not kept formal books he can get some ideas about his own farm business profits of the year before by figuring out his results item by item in this way, being careful to put in all receipts and expenses, many of which are not listed specifically in fig. 90. Several other combinations of the same basic figures might be made for special comparisons.

This Pennsylvania farm family had no debts. Therefore, the entire family net income of $1,467 was available for use by the family; $1,117 of it in cash, and the balance in food and fuel. Actually the $53 deducted for decrease in inventory could be spent in any one year, but it would mean decreasing the capital investment by that amount. To simplify the computations, the inventory changes, whether decreases, as in this example, or increases, are figured as the change in total value of the *physical* assets. The income available for the farm family on this farm would have been quite different if the farm had been rented, or if it had carried a large debt. The income for the family under either of these circumstances might have been as follows: If the farmer had to pay $500 for cash rent, besides the taxes and upkeep of buildings (in the expenses) the $1,467 would shrink to $967 available for family living as income of the year. If on the other hand he owed $6,000 on mortgage at 5 percent the interest payment would have taken $300, leaving him $1,167 as income.

This summarizes the common observation that a farm family on its own farm free of debt can live more comfortably than one renting the same farm or one paying interest on a heavy mortgage. A family free of debt can live on the earnings of the capital in addition to their return for labor and management.

The total farm business capital on this farm amounted to $11,400. A 5 percent interest return on this amount would be $570. Subtracting that from the family net income would leave $897 return for the labor and management contributed by the farm family. Since

the work done by the operator and members of his family was equal to about 1.5 man years, the annual return per family worker was $589 after allowing 5 percent interest on the farm investment. This return per worker was somewhat more than prevailing wages for hired labor. It should also be pointed out that 5 percent was somewhat higher than prevailing rates of return on invested capital.

The real point to figuring income, aside from the legal income tax requirements that apply to most farmers now, is to reach an understanding of what the changes in the values of the business enterprises mean in terms of amounts available for the family and in terms of improvements and additions to the farm business.

There are times when it matters a great deal to a farmer whether the money in sight is income that he may properly spend, or someone else's money. The flexible set of books here recommended takes somewhat more work than the simpler sets of books that go by the name of the cash system. They give more information, and they can be made to hold as much as any farmer can ever need. There are many points to work out from the performance or production records without direct reference to costs and returns; but sooner or later the question of paying off turns up. The answer has to be a guess unless there is a record to supplement the memory.

The record keeping discussed in this chapter is possible and practical for any man who is capable of managing a farm, if he assembles a few essential total figures and attempts details only as fast as he needs them for improving the management of the farm.

The seasons come and go. The fields blossom and bear fruit, and the livestock grow and reproduce under the care of people who keep no records. Records themselves add nothing, but the weight of evidence piles up that those farmers who have studied their facts can do better with records than without them. Records never made a farmer, but good records are a great help to the good farmer.

EXERCISES FOR CHAPTER 12

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. A farmer should keep a record of (a) all details of the farm business; (b) only the items he needs for making an income tax return; (c) the facts that he can use in improving the management of his farm; (d) cash transactions only.

2. Such records as deeds, leases and wills should be kept (a) by the farmer so they will be available at all times; (b) at the court house, or in a bank vault; (c) by a disinterested third party.

3. There are three classes of business records kept by farmers. These are: records of receipts and expenses; records of production and performance, and (a) inventories; (b) bank balances; (c) interest payments; (d) check stubs.

4. By assets, we mean (a) the number of dollars on hand at a given time; (b) money owed the bank; (c) amount of money a person can raise in a short time; (d) the total value of the property under the control of the operator at a given time, without any deduction for debts against it; (e) value of the property owned by the operator minus indebtedness.

5. An operator's liabilities are (a) the sums of money he owes at a given time; (b) enterprises that don't pay their way; (c) bad investments; (d) debts that are past due.

6. The net worth of a farm business is (a) the total value of the farm; (b) the value of all the property included in the farm business minus all the debts owed; (c) the value of the land and buildings; (d) the net income for the year.

7. The annual depreciation charge on any farm machine is based upon (a) actual repairs required during that year; (b) the part of the purchase price represented by use or obsolescence in the year; (c) the cost of running the machine; (d) damage to the machine from accident or weather.

8. For inventory purposes the value of land should be (a) changed from year to year as land prices go up or down; (b) reduced every year; (c) held at the same level year after year unless important

land improvements have been made; (d) listed as 50 percent of its assessed value.

9. When an item on the property list is sold the money received is (a) part of the income for the year; (b) increase in net worth; (c) an expense for the year; (d) income for the current year only to the extent that more was received than the previous listed inventory value.

10. When supplies are bought in excess of the needs of the year the true expense of the year's business for the supplies is (a) the quantity actually used times the average purchase price; (b) the total amount spent for the supplies; (c) the value of supplies left over at the end of the year.

11. A good performance record for a flock of chickens should show, among other things, the (a) cash expenses for the flock; (b) cash receipts from the sale of eggs; (c) inventory value of the flock; (d) the number of eggs produced by each pen.

B. 1. For many farm machines, the number of years the machine will last depends largely on the amount of work to be done each year. Therefore, when considering how much one should charge a neighbor for work with a machine, the effect of the additional work on the life of the machine must be considered. For example, you own a grain binder that is worth, at the present time, $300. You estimate that the binder will run, in good order for 900 acres. Your own acreage of small grain is about 60 acres; and therefore you can expect the machine, if used only on your farm to last (a)_____ years. Each year, therefore, you will reduce the inventory value of the binder by (b)_____dollars. If you should decide to bind 90 acres of grain a year for the neighbors the binder will last only (c)_____years, and your custom fees should be sufficient to cover not only your labor, gasoline, oil, repairs and interest on investment, but also (d)_____cents per acre to allow for the depreciation of the machine.

2. On June 15, 1944 you sell a cow for $175. Bearing in mind the distinction between receipts from the sale of assets and income from farm production and assuming that income from milk was equal to the cost of keeping the cow, how much of the $175 can be regarded as income from production if—

(a) you raised the cow? $_____.

(b) you bought the cow 3 years ago for $75? $_____.
(c) you bought the cow Dec. 10, 1943 for $190? $_____
(d) you bought the cow Feb. 5, 1944 for $160? $_____

3. Leghorn hens require roughly 25 pounds of feed per year to maintain a hen (regardless of the number of eggs laid), plus 3.5 pounds for each dozen eggs. How much feed will be required in a year for a flock of 100 hens, laying 1000 dozen eggs?_____.

4. You have three pens each containing 100 Leghorn hens of the same age. After keeping performance records for 3 months you find that the hens in pen A are laying at the rate of 72 eggs a year per bird; pen B at the rate of 120; and C at 180. Estimate the pounds of feed required by each pen for a year based upon the standards given in question 3.

(a) pen A_____; (b) pen B_____; (c) pen C_____.

5. For the three pens of Leghorns in question 4, what are the returns above feed costs if feed is $3.50 per hundred pounds, and eggs are 35 cents per dozen? (a) pen A_____;
(b) pen B_____; (c) pen C_____.

6. If feed is 60 percent of the cost of eggs, labor 30 percent, and all other expenses 10 percent, what selling price per dozen eggs is necessary to cover the costs of production for the three pens in question 4? (a) pen A_____; (b) pen B_____;
(c) pen C_____.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss the principles that should be followed each year in the valuation of items on the property list, including (a) land; (b) buildings, machinery and livestock; (c) feed and supplies.

2. Discuss the important points that should be kept in mind when setting up a record for receipts and expenses, touching upon (a) what items should be recorded; (b) desirability of describing kinds and quantities of things bought and sold; (c) ways in which items might be grouped for analysis of the farm business.

3. Describe one performance record, pointing out (a) the kinds of information that might be kept; (b) some of the analyses or comparisons that might be made; (c) the way information from this performance record will help in making farm plans.

CHAPTER 13

WORKING WITH OTHERS ON FARM MANAGEMENT PROBLEMS

We are accustomed to think of the farmer as being independent—as being in complete charge of his own farm—a man who makes his own business decisions, who decides what equipment to buy, what crops to grow and what livestock to keep. In fact, many people consider farming as the last stronghold for independent family business units in our economy. As a matter of fact, most farmers share many of their management decisions with others, and even though some are independent with respect to management decisions on their own farms, it is necessary for them to work with other farmers and with other groups on those aspects of their management problems that extend beyond the boundary of the individual farm.

Work with others sometimes involves one or all three of the following major problems: (1) production planning, (2) efficient operation, and (3) buying farm supplies and selling farm products.

The following sections take up some of the common relationships with other farmers and with other groups in society.

SHARING THE MANAGEMENT JOB ON THE FARM

Most farmers find it necessary to share some of their management decisions with others. Division of management responsibility takes place along three principal lines: (1) through the landlord-tenant relationship, (2) through the debtor-creditor relationship and (3) through public programs and regulatory activities.

Everyone recognizes that an operator on a tenant farm shares a part of the management duties with the landlord. The landlord's responsibility varies considerably on different types and sizes of farm in different parts of the country. He makes nearly all the management decisions under the common cotton sharecropper arrangement on a southern cotton plantation, but on a specialized wheat farm in one of the principal wheat areas his primary concern may be to get

his share of the crop in accordance with the lease contract.

The landlord-tenant relationship in management can be very helpful to the young farmer, especially if the landlord is a retired farmer who himself has lived on and operated the same farm. Under such favorable circumstances the young farmer can benefit from the lifetime farming experience of his landlord. Sometimes, however, the landlord attempts to dictate operations in a way that results in definite disadvantage to the tenant. If the landlord is an absentee owner it is much more difficult for him to participate in the management of the farm. If he attempts to make detailed management decisions by long distance he may frequently handicap the operation of the farm. Wise decisions concerning the details of farm planning and operation can be made only on the ground where the problems can be seen first hand.

The division of managerial responsibility that is involved in the debtor-creditor relationship has not been so well recognized as the landlord-tenant relationship, but local bankers especially have exercised considerable authority over farm operations on which they have loans. In more recent years some holders of real estate mortgages have also assumed considerable management responsibility by taking part in production planning and sometimes in the selling of farm products. In case of loan delinquency the creditor sometimes takes over a great deal of management responsibility. The higher the loan in relation to the total investment and to the annual earnings, the more nearly the debtor-creditor relationship becomes a business partnership which involves a sharing of management decisions.

The loan program of the Farm Security Administration is organized on a partnership basis. A farm and home plan is required as a basis for a rehabilitation or tenant purchase loan, and the local Farm Security supervisor assumes considerable responsibility in consulting with the operator on the current operations of the farm.

Other public agencies such as the Agricultural Adjustment Agency, the Forest Service, and the Grazing Service to some extent limit the scope of the management decisions made by the operator. Conservation practices carried out under the AAA program affect in important ways the operations of the farm and the net returns that are received. The western rancher who uses public lands for grazing

does so under the rules and regulations established by the Forest Service and the Grazing Service, chief of which is the limitation on numbers of head that may be grazed during each season.

Limitations that result from government programs and regulatory activities represent the injection of public interest in the management of land resources and in achievement of farm production. Some of the public regulatory activities, such as sanitary regulations for milk production, are devised to protect the health and well-being of consumers. They greatly modify the planning and operation of the farms to which they are applied, but if they are properly conceived and administered they help producers as well as consumers because they require all producers to adhere to the same standards. This protects producers who voluntarily use sanitary methods. In these and in other ways the farmer shares the management job with others even on his own farm.

WORKING WITH THE NEIGHBORS

In the previous section it was indicated that the management job is shared with others to a certain extent even inside the line fence of the individual farm. Farming also involves many contacts outside of the farm. A close working relationship with immediate neighbors and with the entire farming community facilitates many farm operations and is likely to result in increased farm income. Moreover the social and citizenship contacts with neighbors are extremely important in the home aspects of farming. Getting along with the neighbors increases tremendously the enjoyment of the farm life of the entire family.

On the business side of farming many day-to-day problems involve contacts with the neighbors. Perhaps the most common is exchange work during peak load periods. Such neighborly exchange of work to make up a crew takes place in threshing, silo filling, haying, potato digging, wood sawing and many other activities. Sometimes work is done for or by neighboring farmers on a custom basis as discussed in chapter 7.

Certain items of machinery may be owned in partnership by two or more neighbors. Unless the terms of use and care of a machine owned in partnership are specifically agreed upon, misunderstandings

Figure 91. Sheep going on to summer range in the Gallatin National Forest, Montana, where public regulation of grazing is necessary for continued use and watershed protection. (U. S. Forest Service.)

may arise. For example, if two or more farmers own a potato digger in partnership, there should be an agreed upon schedule of use, otherwise an early frost may occur before all the potatoes are dug and one member of the partnership may suffer greater loss than the others who had the use of the machine in the early part of the season. Another way of sharing equipment is to organize a cooperative service for the larger items of equipment and to designate one man as the operator and custodian on a fee basis. This procedure is discussed later.

Many business contacts with the neighbors are so common that they are taken for granted, and yet they are very important in balancing the operations on all farms in the community. For example, some farmers may run short of hay for their livestock and others have hay to spare and can therefore sell the surplus to their neighbors. Hay is bulky and to ship it in from outside is very expensive. Therefore, such balancing of the feed supply is very

advantageous for the community. Sometimes the farmer who has a surplus of hay and other feed buys the livestock from those who are running short of feed. Home grown seed supplies are balanced out among local farmers in the same way as feed.

These illustrations indicate that even though a farmer considers himself an independent operator he does not live by himself alone. He is an integral part of the community in which he resides and operates his farm.

ORGANIZED PRODUCTION SERVICE ACTIVITIES

We have discussed activities that most frequently are carried on informally among neighboring farmers in a community. Another group of production activities are usually organized on a more formal business basis. On the production side of farming they may involve cooperative associations for use of heavy items of equipment such as threshers, corn shellers, ensilage cutters, etc. Dairy herd improvement associations, veterinary associations, farm business associations and other activities of this kind are usually formally organized by groups of farmers. Associations of this type frequently are sponsored initially by some outside agency, such as the local county agent. A fee is charged for the service performed by the association and a manager is hired for the work. For example, a local dairy herd improvement association is organized to weigh and test milk for production records and to keep records of feed consumed. The association usually hires a young man with some training in this type of work to do the testing for a group of farmers. He spends a day at each farm, and at that time does the check testing and helps the farmer with records of his herd. The association of farmers has regularly elected officers and collects membership fees from each farmer on the basis of the number of cows in the herd. Farm veterinary associations and other service associations are operated in a similar manner.

In recent years a number of farm business associations have been established in some States to assist farmers in keeping records of their entire farm business, and to interpret such records for use in production planning, and for increasing the efficiency of farm operation. If the local manager of a farm business association has

Figure 92. A cow tester employed by a group of farmers samples milk while the owner watches. (Bureau of Agricultural Economics.)

adequate training and experience in the farming problems of the community he can be of very material assistance to the membership on their management problems. A competent manager of a farm business association can usually render sufficient service to make it worthwhile for a farmer to belong to the association. For instance, if a farmer has twenty dairy cows and the association manager helps him to plan a pasture and feed program that will reduce the summer slump in milk production, and increase butter-fat production per cow twenty-five pounds per year the result is an increase in butterfat production of 500 pounds, or $200 with butterfat selling at 40 cents a pound.

MARKETING AND PURCHASING ACTIVITIES

Farming communities frequently organize cooperative associations for the marketing of their products and for purchasing of farm

Figure 93. Dairymen's League cooperative milk plant handles fluid milk for Clinton County, N. Y. farmers. Many of these plants also manufacture dairy products from milk not needed to supply the fluid market. (Extension Service.)

supplies and services. The size and scope of such cooperative activities vary from a small group of neighbors getting together to buy supplies or to market a certain product to well-organized and well-operated local marketing and purchasing companies with several hundred members. Examples of these types of marketing associations are local grain elevators, local cooperative creameries, livestock shipping associations, fruit and vegetable marketing associations, etc. Sometimes these local associations are federated into the large cooperative companies for the handling of production from a group of local cooperative associations. However, the local associations remain as the important cogs in the larger machine.

The local manager in his working relations with the membership performs an extremely important function in marketing and purchasing associations. His efforts and his ability as a businessman often determine the success or failure of the enterprise.

Frequently side lines are developed to the main market enterprise. For example, grain elevators handle livestock feeds, salt, seed, and other supplies for farmers. Sometimes they even take on a line of farm machinery and repair parts.

Local marketing associations of this type often furnish markets where none existed before, or provide needed competition in markets that previously were dominated by one firm. They may also take leadership in improving the quality of the product with the result that higher prices can be obtained, and the area can develop a lasting reputation for quality goods. Cooperation with neighbors and with the entire community in activities of this type may result in a considerable increase in income to the farmer.

Purchasing associations sometimes are organized to provide services rather than supplies and equipment. For example, many cooperative associations provide insurance on buildings, crops, livestock, automobiles, and even life insurance to the farmer and his family. In recent years some cooperative associations have been formed for provision of medical service to farm families. Since rural areas are less adequately provided with medical and hospital facilities than are most urban areas, it is often desirable to provide these facilities by some method of community action.

PUBLIC AGENCIES

Today there are a number of State and Federal agencies that are organized to assist farmers with their production and marketing problems, and to protect the public interest in agricultural production and distribution.

Public research and education in agriculture has a long history. The Department of Agriculture was organized in 1862, and the Land Grant Colleges of Agriculture were established under the Morrill Act in the same year. Legislation of this type has recognized that since farming is typically a small scale business it cannot afford to maintain private research activity on the scale that would be required to obtain answers to some of the problems that are confronting farmers. Public funds, therefore, have been provided to support agricultural research, and to insure that the results of research become known to farmers through school and college teaching and through

adult extension education. Thus the Agricultural Experiment Station, the College of Agriculture, and the Agricultural Extension Service in each State have become important public agencies dedicated to the service of agriculture. Today nearly every agricultural county in the country has a local office of the Agricultural Extension Service. The man in charge of this office is usually known as the County Agricultural Agent. Usually, a Home Demonstration Agent is also employed to work on home problems. This local office serves the farmers of the county in an educational capacity on their production, marketing, home management and community problems. Farmers may come here for information about adapted crop varieties, crop and animal diseases, market reports, government programs, and many other questions. If there is a Home Demonstration Agent in the county, farm women look to her for information on such matters as meal planning, budgeting family expenses, and home canning. But most of the work of the County Agent and Home Demonstration Agent is done out-

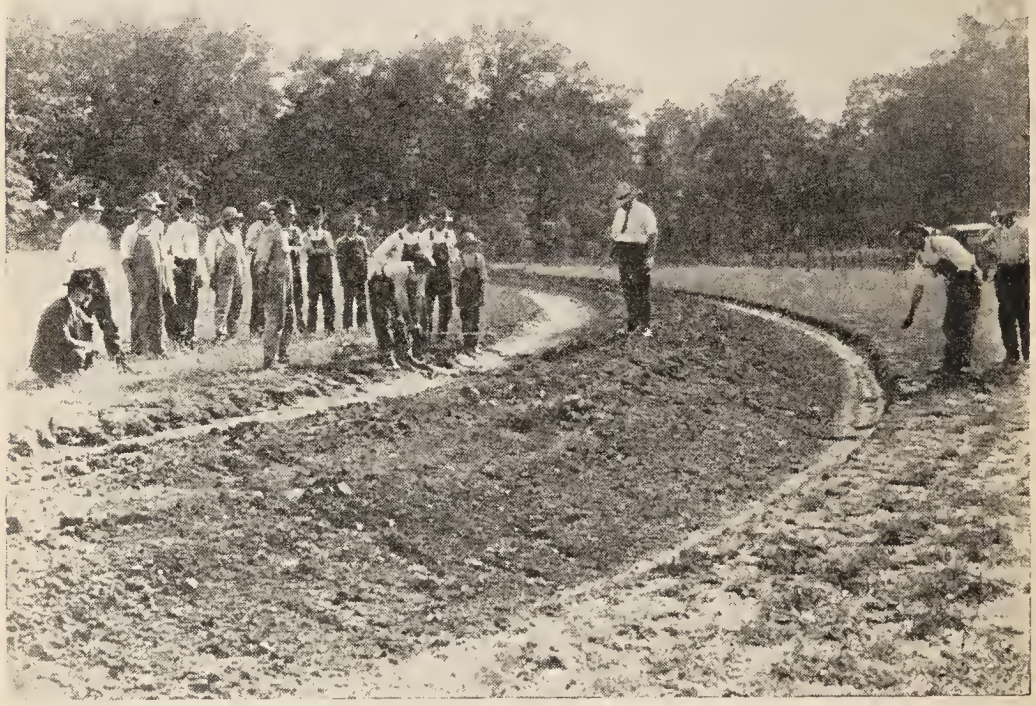

Figure 94. This county agent is showing farmers how to make a terrace. (Extension Service.)

side of the office. They conduct demonstrations and educational meetings at the different community centers and they bring together groups of farmers and farm women in the local communities for the purpose of discussing farm and homemaking problems and the broader community and economic and social questions of interest to farm people.

Expenditure of public funds for these purposes has resulted in benefits to all of the people, as well as to farmers as a class, because the improvements developed have resulted in a cheaper and a better food supply for consumers. These educational institutions benefit individual farmers only to the extent that farmers have an opportunity to take advantage of the improvements suggested and actually to carry them out in practice. The alert farmer who recognizes the possibilities of adapting new developments in his business is, therefore, likely to benefit the most by agricultural research and education.

For more than 20 years the Bureau of Agricultural Economics in the Department of Agriculture has cooperated with the State Agricultural Extension services in a program designed to acquaint farmers with prospective economic developments, and to suggest ways and means of adapting farming to the economic situation that is likely to prevail when their products are marketed. Educational programs of this type have been called "outlook work." During the war years specific goals for the production of agricultural products have been established to meet the wartime food needs.

During the depression of the early 1930's a number of federal agencies were established to assist farmers with their production and marketing problems in a way that would increase incomes, conserve the soil and improve living conditions on American farms. The Agricultural Adjustment Agency organized at that time functions through State, county and local committees of farmers. These committees assist farmers with the various phases of the AAA program. This in the past has included payments to producers for adoption of specific soil building practices, acreage adjustments, parity payments and marketing quotas on certain farm products, and local handling of commodity loans and crop insurance.

The Soil Conservation Service works through local soil conservation districts in assisting farmers to plan and apply programs and practices that result in soil conservation and improved land use.

The Farm Security Administration operating through local supervisors carries out a program of rural rehabilitation for needy farm

Figure 95. The round purple stamp on carcasses means that the meat has been inspected by a Government official and found wholesome for food. The "U. S. Choice" mark is a grading mark to indicate quality. Here the Government inspector has marked this side of beef with the Navy stamp—it meets Navy specifications. (U.S.D.A.)

families. This includes production loans and other services based upon farm and home management plans. The Farm Security Administration also provides a program of long-term loans to worthy farm tenants who desire to become farm owners.

The Commodity Credit Corporation is a federal lending institution organized primarily to make loans on farm commodities that are designed to protect and increase farm income through stabilizing farm prices and assuring adequate supplies of farm products. Local administration of Commodity Credit Corporation loans is handled by the county AAA offices.

A complete credit system is available to farmers through the Farm Credit Administration. This includes long-term real estate mortgage loans by Federal Land Banks through local units known as National Farm Loan Associations; loans for crop and livestock production through local Production Credit Associations, and loans to farm cooperative organizations through district banks for cooperatives.

A number of local, State and Federal regulatory agencies are organized to administer grades and standards for agricultural products, to supervise weights and measures, and to carry out sanitary regulations for the protection of the public. Meat, milk and other food products must conform to sanitary and quality standards that are established for the mutual protection of producers and consumers. Farmers in every section of the country who produce products for sale come in contact with one or more of these regulatory and service agencies. They are a necessary part of the complex society in which we are living.

FARM ORGANIZATIONS

Farmers as well as other groups in our country have formed organizations that represent their interest in the shaping of public policy on local, State and national levels. Some farm organizations serve only limited groups of farmers who have special interests, such as those who belong to certain cooperative associations; or farmers who produce certain crops or livestock; for example, Wool Growers Associations and Cattle Producers Associations. Other organizations aim to serve all farmers who become members. Some general farm organizations also sponsor cooperative buying and selling associations.

PRIVATE AGRICULTURAL AGENCIES

A number of private business firms have established direct contact with farmers because they are engaged in types of business that are dependent upon farming for their supplies or their sales outlet. Examples are: the processors of farm products, the sellers of farm equipment or supplies, and the farm press. The latter furnishes an advertising medium for other types of agricultural business.

Among these private agencies the most influential contact with farmers on management problems is the farm press. Most of the farm papers published in this country are carrying on a high type of educational effort in agriculture. However, the material published is more frequently confined to questions on how to produce farm products than to discussions of economic problems on either the individual or the social level. Since the farm press receives most of its income from

Figure 96. Farmers and people from town work together on the town council. Here they are buying hose for the fire department. (Bureau of Agricultural Economics.)

advertising, subscription rates are low and a relatively large group of farmers are reached through these channels.

Farm implement companies, fertilizer companies, livestock packers, feed mixers and other processors of farm products and handlers of farm supplies from time to time carry out educational programs among farmers. Sometimes their programs are directly related to the advertising of specific products. At other times they participate in general programs of information and education.

PARTICIPATION IN PUBLIC AFFAIRS

The farm is a home as well as a business and the farmer is a citizen as well as a producer. The functioning of government at local, State and national levels affects both immediately and ultimately the farmer's home as well as his business. The kinds of schools that are available to his children affect their training as future citizens. The kinds of local taxation and regulatory policies that are adopted affect immediately the net income that is available to the farm family for their living.

For these reasons and others it is important that all farmers take seriously their responsibility as members of a democratic society. Participation in the major public problems at State and national levels, to the extent that there is opportunity to do so, is also important in a functioning democracy.

Very often participation in citizenship duties involves a certain amount of sacrifice. Frequently a choice has to be made between devoting time to such duties or spending the time in direct production activities that might seem more important at the moment. It is necessary for most farmers to strike a happy medium in the amount of time that they give to public affairs, but no farmer should neglect his public duties. Too frequently the greatest complainer at the village store spends the least time in civic work.

EXERCISES FOR CHAPTER 13

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. Most farmers find it necessary to share some management decisions with others. The division of management responsibility takes place along three principal lines:
(1) through the debtor-creditor relationship; (2) through public programs and regulatory activities and (3) through the (a) employer-employee relationship; (b) landlord-tenant relationship; (c) father and son relationship.

2. A landlord is likely to be of the greatest assistance in the management of a farm if he (a) lives a long way off; (b) visits the farm once a month; (c) puts the farm in the hands of an agent; (d) lives nearby and has operated the farm himself.

3. Credit agencies tend to participate to a greater extent in management decisions when (a) loans are made for a great many years; (b) the loan is high in relation to the total value of the farm; (c) the lender lives nearby.

4. Sanitary regulations for market milk help producers as well as consumers because (a) they set uniform standards for all producers of market milk of a given class; (b) they lower the cost of producing milk; (c) they make it easier for new producers to become established.

5. A dairy herd improvement association is (a) an organization that judges cows at county fairs; (b) an agency of the State government that tests cows for tuberculosis; (c) a group of farmers who form a voluntary association for the purpose of keeping production and feed records for their herds; (d) an association of farmers whose herds are free from Bang's disease.

6. The Agricultural Extension Service is (a) a private farm management service; (b) a public agency for the education of farm people in better methods of farming and homemaking; (c) an agency that gives correspondence courses in farming.

7. If you were in good financial condition and interested in obtaining funds for the purchase of livestock from a Federal Credit Agency, you would go to the (a) Commodity Credit Corporation;

(b) Agricultural Adjustment Administration; (c) local Production Credit Association of the Farm Credit Administration.

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Describe some of the important ways in which public laws and regulations influence farm management decisions, including (a) the manner in which commodities can be produced and marketed; (b) the manner in which resources, such as land, can be used.

2. Describe some of the ways in which farmers cooperate in meeting their management problems, touching upon (a) informal cooperation in the use of labor and equipment; (b) organized production service activities; (c) marketing and purchasing cooperatives.

CHAPTER 14

IMPROVING THE MANAGEMENT OF FAMILY FARMS

In the preceding chapters we have discussed certain management jobs that must be handled effectively to obtain a satisfactory income from farming. The principal ones can be summarized as follows:

1. Selecting the size and type of farm that is adjusted to the ability and experience of the operator and his family.
2. Planning production to take full advantage of the land and other farm resources as well as available market outlets.
3. Conducting all farm operations efficiently.
4. Buying and selling farm products successfully.

The farm operator and manager has the responsibility for seeing that these factors in the planning and conduct of farm operations are carried out in a way that will achieve and maintain a high level of farm income.

To select the proper type and size of farm and to plan profitable production organization requires ability to see the whole problem, and to look ahead to the time when the products that are to be produced will be ready for marketing. Planting of an apple orchard or the building of a barn for the dairy enterprise requires looking ahead and estimating the income results of the investment for the entire period of the use of the orchard or the barn. For nearly all farm products, the production program must be planned about a year in advance of the sale of the product. This involves taking risk with respect to price changes, crop failure, and other factors.

Management of day-to-day operations involves ability to watch details and to perform many tasks with skill and dispatch. If hired help is employed management requires a knack for supervision that, among other things, aims to obtain their confidence and to utilize their labor as effectively and fairly as possible.

Successful buying and selling is important in some types of farming. For example, farmers who purchase feeder cattle or sheep to carry

through a feeding period must have intimate knowledge of the possibilities of gain from such transactions; otherwise, heavy losses may be experienced. Establishing local market outlets for perishable products such as fruits and vegetables is also important. Ability to grade and pack and to meet required quality standards is a part of this problem.

IMPORTANCE OF THE HOME AND FAMILY IN SUCCESSFUL FARMING

In the preceding chapters we have mentioned several times how the home and business are inseparable on the family farm. Financial success in farming is affected by successful planning in the farm home. If money is made on the farm and spent too rapidly in the home the farm eventually becomes starved for capital. This means that buildings, equipment and livestock will not be maintained, and as a result, income in later years will be reduced. On the other hand, some farmers sacrifice too much of the living of the farm family in order to build up the farm business. This may result in family illness, or at least in lowered morale on the part of members of the family.

Unpreventable illness and misfortune of various kinds may occur in the farm family and upset an otherwise successful farming business. Such misfortunes are more serious in farming than in other business because farming is so closely tied to the home. As partial insurance against various types of misfortunes it is important to plan the family living budget and all farm and family expenditures in a way that provides cash for emergencies. Insurance against building, equipment, livestock and crop losses should be provided. Life, accident and health insurance also should be considered as emergency protection to the farm family.

An important part of planning the family living budget is adequate provision for producing the food and other supplies to be used in the farm home. To have a good garden requires selection of the most suitable spot, adequate preparation and fertilization of the soil, planning the crops to mature at different times during the season and for winter storage, cultivation when necessary, and protection against insects and diseases. Harvesting the crop requires equipment for canning, freezing, drying or other preservation of the surplus above daily needs.

An orchard for home use requires planning ahead for an even longer period than the garden. Moreover, greater care needs to be exercised in planting adapted fruits, and to provide for insect and disease control. If wood is used for fuel it should be cut in the wintertime and seasoned before it is used. Milk, meat and eggs produced for home use require daily chores.

All of these tasks require time. Often they must be done when all members of the family are tired and when it would be much more pleasant to listen to the radio, or read the daily paper. But this is part of the discipline necessary for successful farm life. Growing children who help with these tasks learn how to assume responsibility for getting a job done, for doing it well, and on time.

If adequate attention is given to the home use side of farming it is possible to add the equivalent of $500 to $600 a year to family living. A part of this amount would be paid out directly for groceries and supplies if they were not produced on the farm. But what is more important, the family would try to get along without some of these products because they would seem too expensive to buy if they were not produced at home. This is often true of milk, fresh vegetables and fruits.

It is evident that home planning should go hand in hand with farm planning, and that it needs to be done with equal care. On the farm both can be undertaken as family responsibilities, in which all members participate, and with specific jobs assigned to each. This is the most desirable form of apprenticeship in management. The work done by growing children contributes significantly to farm and home production, and if jobs are assigned with good judgment the work is helpful rather than harmful to the growing child.

ADAPTING FARMING PLANS TO CHANGING CONDITIONS

Farming plans must be sufficiently flexible so that they can be quickly adapted to changing conditions. If we lived in a world where changes took place only slowly it would be possible to develop farming plans that could be carried out over a period of years without much change, but neither farmers nor other groups in our society enjoy a high degree of stability of income and working conditions. Farming is subjected to the physical hazards of crop failure and livestock

losses as well as to changing economic conditions. It is therefore necessary that farming plans be made sufficiently flexible to meet periods of prosperity and adversity arising from either physical or economic causes.

Some farmers have made production plans that are well adapted to provide high incomes in periods of prosperity, but their commitments are so inflexible that the business cannot survive adverse conditions. Thousands of farmers lost their farms in the depression of the 1930's because they had incurred high real estate and other indebtedness in more prosperous times. Their fixed costs therefore were too high to be met under conditions of low prices and low incomes. It is difficult indeed to arrange farming plans that will permit the business to survive under conditions as severe as the depression of the 1930's. However, many farmers so overextend their fixed commitments that they

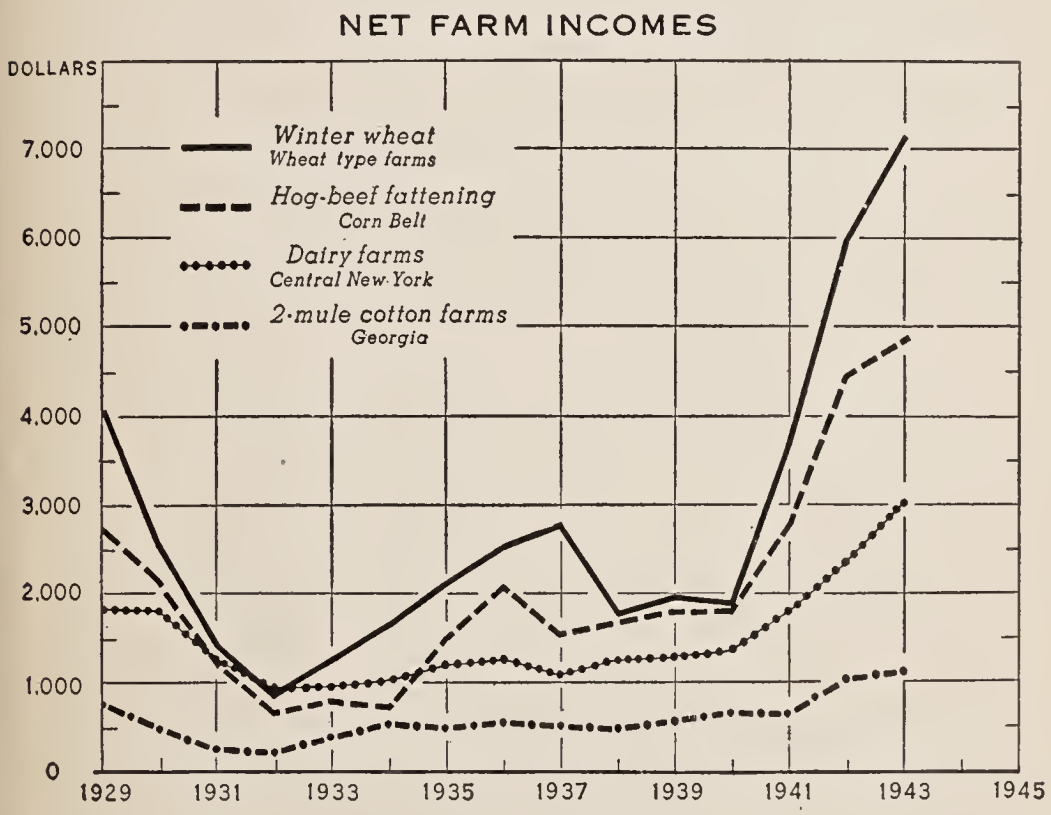

Figure 97. For any type of farming, income varies from year to year. Several years of high income may be followed by a period when income is low. Adapting the farm business to these changing situations is part of the management job. (Bureau of Agricultural Economics.)

find it difficult to survive periods of depression or crop failure that are much less violent.

In working out farming plans that will ride out depression as well as taking advantage of prosperity, it is important to have clearly in mind the nature of the farmers' cost problem. The statement is often made that a large proportion of farming costs are *fixed costs*. This means that they cannot be reduced readily by curtailing output when prices fall.

Fixed costs as contrasted with *variable costs* arise from the fact that the productive life of land, bulidings and some equipment and livestock extends over a period of several years. Payment contracts or indebtedness for the use of land and buildings, and sometimes for livestock and equipment, extend over a period of years, and therefore remain fixed without regard to output or income in a given year. Variable costs, on the other hand, are those that vary directly with the current operation of the farm. The different cost items can usually be classified as follows:

Fixed costs:

(1) Rent for land and buildings, (or interest on, and amortization of mortgage).
(2) Interest on investment in equipment and livestock.
(3) Obsolescence and that part of the depreciation on buildings, machinery, and livestock which does not vary with their use.
(4) Insurance on buildings, equipment, and livestock.
(5) Taxes on real estate and personal property.

Variable costs:

(1) Current supplies, such as seed and fertilizer.
(2) Hired labor and other services.
(3) Current repairs and replacements, which vary with the use of buildings and equipment.

Once commitments have been made on a farm for the items called *fixed costs* in the above list, these costs cannot be avoided by reducing production. How, then, does a farmer meet a situation when prices do not cover the costs of production listed above? The answer is that settlement for some of these costs can be postponed. In other words, whether or not they have to be met in periods of low income depends

upon the kinds of commitments that the farmer has made. If he owns the land free of debt he will need no cash outlay for land and interest. Interest on debts of all kinds may go delinquent. Depreciation on buildings, machinery, and on livestock, can be postponed for a time. Insurance can be reduced, or dropped if necessary, but to do so means that the farmer runs the risk of heavy losses.

In periods of low income the expenses for current supplies, such as seed and fertilizer, can also be reduced to some extent. The family will have to work harder, and less labor and other services will be hired. Current repairs and replacements also may have to be cut to the minimum. Thus on the side of farm expenses some adjustments can be made in periods of adversity.

Some adjustments can also be made in production to try to maintain income at as high a level as possible. But in a depression prices of all farm products are likely to be low and, therefore, shifts in production may not greatly increase farm income. Some farmers find it possible to increase output in depression by working harder and by using their equipment without adequate care and maintenance. The increased labor supplied by the farmer and his family is not considered an additional expense under those conditions. The Corn Belt farmer, for example, may forget about a good rotation and plant a larger acreage to corn, or he may increase the size of his dairy herd and work longer hours milking cows.

Even after all these adjustments have been made the returns available for family living, after the necessary expenses have been met, will be reduced in periods of adversity. This means that the farm family will find it necessary to economize in every way.

Figure 98, which indicates the adjustments that were made by a group of dairy farmers in New York from 1929 to 1941 to meet periods of falling and rising income, illustrates the general way in which farmers change their farm and family expenses from prosperity to depression and back through the recovery period. Although expenses for family living can be reduced in hard times, once they drop to a minimum level they become a part of the fixed costs that must be met if the farm family is to continue on the farm. Current operating expenses can be reduced in periods of depression because prices of the things farmers buy are lower, and because some expenditures can

be avoided. Perhaps less feed and fertilizer will be bought or less labor hired. That part of the drop in income that cannot be absorbed by reducing operating expenses and living costs must be met by postponing the payment for some of the fixed costs. The upkeep and repair of buildings and fences can be put off for a few years. Old equipment can be made to last a little longer before being replaced. Taxes can go unpaid for a year or two and frequently arrangements can be made with creditors for the extension of mortgages and the deferment of interest payments.

As farm income improves, operating expenses increase somewhat, and heavy expenditures are required to repair and replace machinery

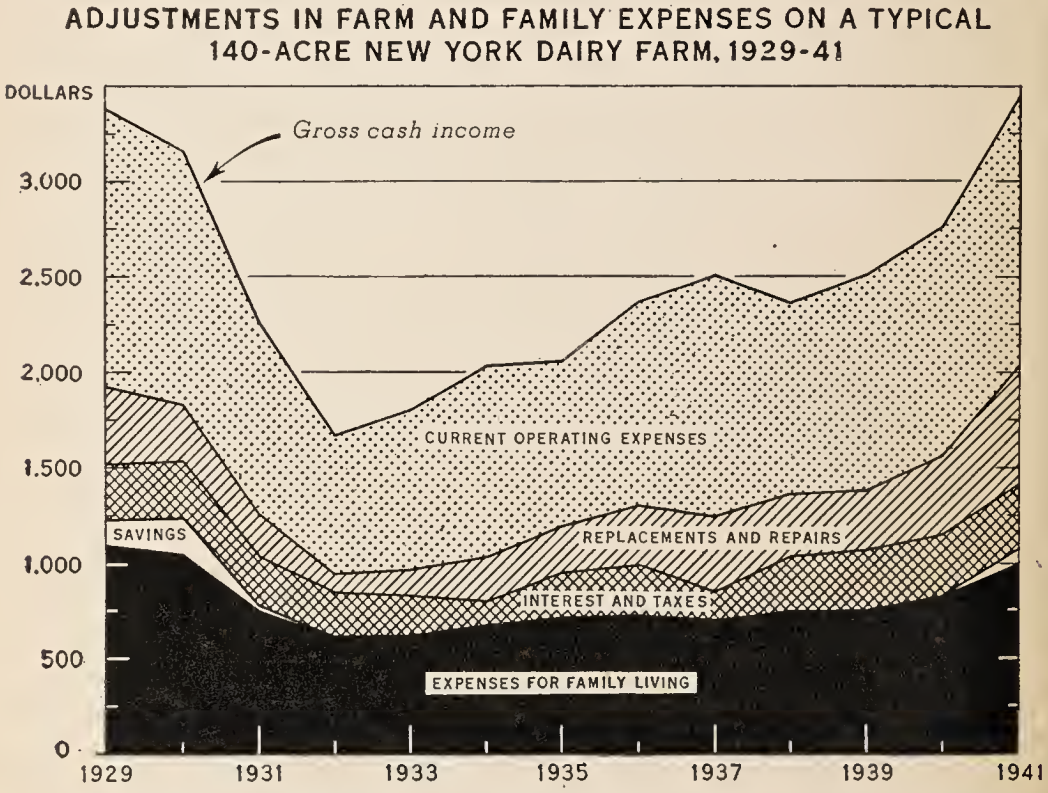

Figure 98. This chart pictures the fluctuations in gross cash income that were typical for a group of New York dairy farms from 1929 to 1941, and the adjustments that were made in farm and family expenses to meet periods of falling and rising income. It took several years of rising income before the farmer had caught up on the fixed costs that had been allowed to accumulate during the depression. Nothing was left over for savings from 1932 until 1941. On this chart each band represents a group of expenses (except one which represents savings); the way to read the chart is to compare the width of each band in different years. (Bureau of Agricultural Economics.)

and buildings, and to take up delinquent taxes and interest. After these items have been taken care of the farmer can improve his level of living.

For the nation as a whole the severity of economic depressions can be reduced by following economic policies that will tend to prevent serious maladjustments in the national economy, and to correct for any disturbances that arise. However, the farmer as an individual has little influence on these broader economic forces. If economic depressions occur he has no choice but to adjust his business to survive adversity. On the other hand, he should plan to take advantage of prosperity both to increase income and to invest his savings in a way that will make him less vulnerable to possible hard times in the future.

Changes in farming plans to take advantage of prosperity are made more easily than changes to meet periods of adversity. In periods when prices for farm products are increasing operating expenses usually rise more slowly, and the farmer has an opportunity to take advantage of wider margins between expenses and returns on his products. This means that it is profitable to increase output. Plans therefore should be made to farm the land as intensively as possible and still maintain soil resources. Without increasing the amount of land that is farmed it is possible to shift to products that will increase income, and to produce more per acre and per head of livestock. In some sections of the country crop shifts might be made from oats to soybeans; and livestock shifts from beef cattle to dairy production. On some farms shifts in enterprises are not feasible, but it is possible, for example, to feed the dairy cows more concentrates and to produce more milk per cow, or to grow more pasture and roughage and keep more cows. More commercial fertilizer can be used to increase yields of crops, with the result that more feed can be grown on the same acreage.

Sometimes it is possible to rent more land in order to increase the size of business to take advantage of higher prices. The question of buying additional land in boom periods should be considered very carefully because of the necessity for avoiding commitments that become fixed costs in periods of adversity.

Booms and depressions are not the only forces that necessitate

changes in farming plans. Crop failure occurs in some years in all sections of the country, and rather frequently in the sub-humid regions of the western States. An open winter in the northern States may mean that the new seedings of legume hay have been winter killed, and that annual hay crops will have to be grown as an emergency measure. Sometimes severe frosts kill orchard trees and it is necessary to decide whether to replant or to go into other enterprises.

Sometimes markets for new products are developed in an area by changes in population, or by the establishment of new marketing or processing plants. Such developments call for changes in farming plans to take advantage of the new situation. Quick freezing plants for fruits and vegetables have established new markets for high quality products in some areas. On the other hand, a rapid growth of this industry after the war may limit the market outlets for growers in the present winter vegetable areas. Farmers there may need to shift

Figure 99. The mechanical cotton picker is being improved every year, and the time will come when it will be much cheaper to harvest cotton with a machine than by hand picking. As a result, many small hilly fields may go out of cotton. (U.S.D.A.)

their plans because they are supplying a smaller share of the vegetable market at the same time that farmers in the areas with the new quick freezing plants are increasing production to meet new market outlets.

New developments in farm machinery, or other scientific advances in farming, may bring in new producing areas to compete with the older areas. Wheat production shifted to the sub-humid areas with the development of mechanized wheat farming and wheat varieties especially adapted to low moisture conditions. After the war, the introduction of the cotton picker may reduce the cost of producing cotton in the level, large farm areas to a point where it will be more difficult for the small hill farm growers to compete in cotton production.

These illustrations of adjustment to changing conditions indicate that the farmer's job of keeping up with the times as mentioned in the first chapter is an extremely important one. It is also a job that requires an alert mind, access to up-to-date information, and contacts with other people. The isolated farmer who has few outside contacts is likely to drop far behind the procession on problems of this kind.

DIVIDENDS ON EFFICIENT MANAGEMENT

Farm management studies in different sections of the country indicate wide variation in yields per acre and production per animal on farms that are located within the same general area and are operating under essentially the same conditions. Such differences within the same locality are not due so much to better land or to better market outlets as they are the result of better use of land and of other productive resources—in short, better management.

If the higher production per acre and per animal is obtained without a correspondingly large expense it naturally results in a higher net income for the farmer and his family. One or several of the factors associated with good management may be involved in obtaining this greater efficiency in farming. Frequently the adoption of improved farm practices as soon as they have proved adaptable to the local area is an important factor in increased efficiency.

In the first chapter and again in the above section we discussed

the need for a farmer to keep up with the times. One of the reasons why this is necessary is to take advantage of new developments in farming that will increase farm incomes. New machines, new crop varieties, and new methods of fertilization and tillage are continually being developed. When these first make their appearance only the venturesome farmers try them out. Sometimes the new methods are still in the experimental stages and those who try them first may incur losses because they are not yet fully adapted to local conditions. However, as soon as they become adapted for use on farms in a given locality those who first adopt them will gain the most in increased income. For example, suitable varieties of hybrid seed corn were developed for the Corn Belt about ten years ago. They resulted in yield increases of 20 to 25 percent over open-pollinated seed. Now nearly all farmers in the Corn Belt are using hybrid seed corn. This is a relatively simple improvement, but one that returns big dividends in increased yields of corn per acre. Still it required ten years for many Corn Belt farmers to adopt the practice.

By the time the majority of farmers have adopted a new practice, such as hybrid seed corn, some other new developments have taken place that are also in the process of adoption, and already in use by the better ten to 15 percent of the farmers in an area. In other words, the more capable farmers in any community are always ahead of the procession on better farm practices.

Table XVIII. Butterfat production per cow on farms in east central Minnesota

Pounds butterfat per cow		Number of farms
Group	Average	in group
0- 99	81	1
100-149	142	1
150-199	173	11
200-249	223	42
250-299	275	47
300-349	322	14
350 plus	372	4
All farms	253	120

Table XVIII shows the butterfat production per cow on a group of farms in east central Minnesota in 1935. It should be noted that although the average production per cow was 253 pounds of butterfat, 15 percent of the farmers averaged 300 pounds or more per cow. A difference of 50 pounds per cow at 40 cents per pound for

butterfat is $20 per cow or $400 from 20 cows. Perhaps only a fourth of this increased income is absorbed in additional expenses. Over a period of years the average production per cow has increased on all farms in this area, but the better dairymen have increased relatively more than the average of the entire group.

There seems to be a tendency to widen the gap between the poorer farmers and the better farmers in an area as new developments occur in farming. Rapid adoption of mechanized power means more products produced for sale because the land used to grow horse feed can now yield products for market. It also means an increase in the size of farm that can be operated by a farm family under capable management. This in turn means greater opportunity to capitalize on good management and more possibility of loss with poor management.

Operation of a family farm today is a rather large business undertaking. It requires a considerable investment in machinery and livestock in most areas. It also requires skill in handling machinery and livestock and in growing crops, as well as ability in handling the managerial jobs that have been stressed in this book.

If one is looking forward to a career in farming one needs to consider carefully his training for the job. If it seems inadequate perhaps the best beginning would be to hire out for a while to a successful farmer who is operating the kind of farm in which one is interested. This would serve as an apprenticeship to farming for the beginner. There is need for organized apprenticeship arrangements in farming today, but since few opportunities of this kind are available the best that can be done is to work for a while as a hired man on the right kind of farm.

When independent operations are undertaken, either as a tenant or owner, there are many types of assistance available. Some of them were mentioned in chapter 13. Membership in a farm management association can aid materially if there is one in the locality and if an experienced man is heading it. The county agricultural agent will be able to help with many problems that arise. Other agencies, and other sources of information should also be sought. Helpful guidance can be obtained from neighbors who have farmed in the locality over a period of years.

Records of his own performance compared with his production

plan, and with results obtained by others in the locality will help the young farmer gradually to acquire proficiency in the various enterprises. Standards of performance with respect to crop yields, livestock production per animal, labor used, and other items, should be set up as goals to be attained. The value of such measures of performance has been discussed in chapter 12. They are guides to better management.

The ways in which farmers can approach their management problems to achieve higher farm incomes and a more satisfactory farm life have been discussed in this book. It should be emphasized in closing that management of a farm is an individual problem. The approach is analytical and not mechanical. It is a matter of judgment rather than of routine. There is no real substitute for natural management ability. Therefore, we cannot expect that all 6,000,000 American farmers would do an equally good job of management if they were given the same opportunity. Fortunately, however, both good and poor managers can increase their abilities with training and experience. Management problems differ from farm to farm, but there are some approaches that can be standardized and better understood by all farmers.

In the years ahead it seems probable that American farmers will need to make more rapid changes than ever before in farming plans. Farm management techniques can be used by capable farmers to help in cushioning the shocks of rapid change. Trained assistance may be needed by the rank and file of farmers to take full advantage of farm management techniques. The family farm and the way of life associated with it have been looked upon as the mainstay of democracy in this country. Training, and some assistance in better management, can help farmers on family farms to achieve more effective use of resources for the purpose of providing a more satisfactory living, and for maintaining the family farm as one of the bulwarks of our democracy.

EXERCISES FOR CHAPTER 14

CHECK-UP

A. Underscore the words or expressions that *best* complete each of the following statements:

1. For success in farming it is essential that home planning go hand in hand with farm planning. This means that (a) a specific amount be set up at the first of each year to run the household; (b) funds should not be used for living needs that are not absolutely essential as long as they can be invested with profit in the farm business; (c) the needs of the farm home and the possible contribution of home grown foods and family labor to the farm business should all be considered in the process of planning for the farm.

2. The farm business can be made more flexible, and thus better able to withstand hard times if the farmer will (a)) borrow heavily, so that his creditors will see him through a depression to protect their investments; (b) reduce his fixed costs; (c) expand the size of his business; (d) buy more land with his farm profits.

3. Fixed costs are (a) the costs that are established by law; (b) costs that are the same per unit of product, per bushel of wheat for example, regardless of the quantity produced; (c) the costs that tend to remain the same for the farm without regard to output or income in a given year.

4. It is possible to increase the total output of a farm without increasing the land acreage by (a) shifting to more intensive enterprises; (b) charging higher prices for farm products; (c) selling farm products formerly consumed by the family; (d) raising only one crop.

5. Adoption of tractor power on a farm run by a poor manager will (a) make it easier for him to run the farm; (b) result in higher profits; (c) increase the possibility of loss; (d) increase his volume of business.

6. You are operating a two-mule cotton farm in a hilly area of Georgia. The area has a good market for sour cream. You could raise corn or winter oats on some of the cotton land, and you also have 30 acres of pasture which is in poor condition but could be improved by the application of proper conservation measures. How-

ever, it has always paid you best to raise cotton so you depend on it as your one cash crop. You also keep two milk cows, a sow and 50 hens, and raise most of the feed for them. Now some of the farmers in the area whose fields are larger and more level, are getting a new mechanical cotton picker which cuts their cost of cotton production three cents per pound. This disturbs you because you realize that this decrease in the cost of production might result in a similar decline in the price of cotton, but your fields are so small and hilly that a mechanical picker is not feasible. You wonder what long-time adjustment you should make in the plans for your farm. After much thought you decide that you can meet the situation in this way (a) farm as you always have and see what happens; (b) plan on cutting the wages of hand pickers enough to permit you to compete with the machine; (c) work out a plan which combines the best adapted enterprises in such a way as to give you the highest possible net return although it may not be as high as your previous income from cotton; (d) set up a dairy and sell sour cream; (e) work out a plan based upon dairying and corn production that will give you as high an income as you previously had from cotton.

B. Below is a series of statements with a blank line after each. If the portion of the statement in italics is true, circle the letter T, but do not write anything on the blank line. If the portion of the statement is false, circle the letter F and write the correct answer on the blank line.

1. T F For nearly all farm products, the production program must be planned *about a year* in advance of the sale of the product. _____

2. T F The incomes of farmers, as a group, *do not* rise and fall greatly over a period of years. _____

3. T F The total cost of hired labor for the year is a *fixed* cost. _____

4. T F Settlement for some of the fixed costs *can be* put off for a time in periods of low income. _____

5. T F In periods when prices for farm products are rising, operating expenses usually rise *more slowly*. _____

CORRESPONDENCE OR CLASS ASSIGNMENTS

1. Discuss the ways in which the success of the farm business can be advanced by careful planning of the needs and possible contributions of the farm home and family, touching upon (a) adequate living requirements; (b) reserves for illness and other misfortunes; (c) production for home use; (d) the labor contribution of members of the family.

2. Discuss the adjustments farmers can make in their farm plans to meet periods of low income, including adjustments in (a) fixed costs; (b) current farm expenses; (c) family living expenses.

END OF COURSE REVIEW

A. Underscore the word or expression that *best* completes each of the following statements.

1. A farmer's productivity as a manager is said to be high if (a) he gets high yields per acre or high milk production per cow; (b) his efficiency and capacity are high; (c) he is original and introduces a lot of new ideas; (d) he gets a great deal of work done each day.

2. When deciding upon the way the fields are to be laid out on a farm, one of the first things to consider is the rotation, because (a) the number and location of fields usually determines the rotation; (b) having decided upon the rotation to be followed, it is usually desirable to lay the fields out in such a way that approximately the same acreage of each crop can be grown every year; (c) the fields will have to be laid out in a different way for each year of the rotation.

3. A work calendar is helpful in getting the work done efficiently and on time. To be most useful it should (a) include jobs that will not be completed for several years; (b) be followed without change; (c) be made a month in advance.

4. When a farmer is considering the amount of labor he should put into his wheat crop, he must also consider the time he is to devote to other crops because (a) his time is limited; (b) one crop takes about as much time per acre as another; (c) he will want to raise less wheat if it competes for labor with other crops; (d) he wants to use his labor where it will pay him best.

5. Generally, production of each crop tends to become concentrated in certain areas. These are areas in which (a) returns from growing certain crops are higher than from growing others; (b) markets for the crops grown are near by; (c) the crops grown yield better than in any other area.

6. Two enterprises on a farm are said to compete with each other if (a) it is difficult to determine which one pays the best; (b) they ripen at the same time; (c) they require labor at the same time.

7. Enterprises are supplementary if (a) they increase the total farm income; (b) they make it possible to use production resources more fully; (c) one enterprise can't be maintained without having the other.

8. Complementary enterprises are those (a) in which the product of one enterprise is used in producing another; (b) which can be added to the farming system without getting more land or hiring more labor; (c) are not essential to the farm business but are frequently added to increase diversification.

9. The easiest way to determine whether or not a crop should be included in the farming system is to (a) determine the costs of producing the crop and the profits that can be expected from it; (b) see what the effect will be on net income from the farm; (c) see whether or not the crop will fit into the rotation.

10. Some of the questions that arise in making a farm plan require information that cannot be supplied from farm records. For example, a farmer may need to know the outlook for prices of his crops and livestock, or about new varieties of crops, or where he can get technical assistance for laying out a terrace. There are several sources from which this information can be obtained, but in most areas the most convenient single source will be the (a) newspapers; (b) State Agricultural College; (c) United States Department of Agriculture; (d) county agricultural agent.

B. Underscore the phrases or expressions that correctly complete each of the following statements. There may be more than one correct response to a statement.

1. Of our total population of over 130,000,000 people about (a) one-fifth live on farms; (b) about one-third live on farms; (c) about one-half live on farms.

2. When we say that an area has a particular *type of farming,* we mean that (a) the farms are either owned, or operated, according to a particular system of tenure; (b) farms in the area tend to grow a particular product or combination of products; (c) farms tend to be of a certain size, such as family size farms, or large scale farms.

3. In deciding upon the suitability of a soil for a particular kind of farming one should keep in mind among other things that (a) poor or run down soils, if originally productive, can easily be built up by scientific methods; (b) an examination of the condition of the crops growing on a field in the late summer will show whether or not the soil is well drained; (c) steep and rough areas make farm operations difficult and expensive; (d) if the soil is deep in the

valleys it can be expected to be deep on other parts of the farm; (e) thin soils are not very productive.

4. Livestock production is an important part of many diversified farming systems because (a) livestock production requires less skill than crop production; (b) the addition of livestock to a farming system may improve the distribution of work over the year; (c) manure is returned to the land.

5. A farm plan is helpful in deciding whether or not a machine should be bought because from the plan it is possible to (a) determine the proper size of a machine; (b) decide whether a crop can be handled a different way to eliminate need for a machine; (c) decide whether one should farm with horses or a tractor; (d) determine how many years it will be before a machine becomes obsolete.

6. Peak work loads can be spread out by (a) fall plowing; (b) staggering planting dates; (c) growing only one crop; (d) increasing production per acre.

7. The efficiency of farm workers can be improved by (a) better training of workers; (b) finding the right job for each worker; (c) having proper equipment; (d) working longer hours; (e) giving the children jobs that are interesting.

8. A change in the system of farming that will reduce the amount of hired labor needed is desirable, provided (a) the change does not require the purchase of additional machinery; (b) net income will not be reduced; (c) the new system will not injure the soil; (d) it will also furnish more work for the family in the winter.

9. On many farms two or three hours are required every day for chores. It is generally desirable to (a) eliminate enterprises that require time for chores if possible; (b) hire a boy to do all the chores; (c) invest in self feeders and other handy facilities; (d) do chores at the same time every day.

10. In order to find out if it will pay to increase the amount of grain fed to a milk cow by two pounds per day, it is necessary to know (a) how much milk the cow is giving; (b) the price of milk; (c) the price of grain; (d) the total pounds of grain now being fed; (e) the number of cows in the herd; (f) the increased production of milk that can be expected.

11. Making a good farm plan requires information about many

details of the farm business. Some of the questions that arise in planning for crops are (a) when land should be prepared for seeding; (b) how much seed is required per acre; (c) when crops should be cultivated and harvested; (d) how much hired labor will be needed; (e) how much fertilizer should be applied; (f) what yields can be expected; (g) how much of each crop must be saved for seed and feed; (h) what cash expenses will be incurred in raising the crops.

12. A good set of farm records should (a) include a list of the farm property; (b) cover all details of the business; (c) be kept in one book; (d) account for all farm receipts and expenses; (e) show, for important items, the quantities bought and sold; (f) furnish the information needed for making an income tax return; (g) be set up in such a manner that the farmer can study what *he* thinks is important.

13. Once a year, a new inventory should be taken. At this time, the farmer should (a) change the values of all items on the property list to a current market value; (b) keep the value of land about the same unless substantial land improvements have been made; (c) depreciate buildings and machinery unless they have been extensively overhauled or remodelled; (d) depreciate the value of horses; (e) value calves raised and to be sold next year at the market price.

14. With properly kept accounts, an increase in net worth is a sign of financial progress and may mean that (a) debts have been reduced; (b) savings from income have been invested in additional livestock and equipment; (c) livestock or equipment have been purchased with borrowed funds; (d) market prices have risen for livestock and crops on hand and soon to be sold.

15. The principal management jobs that must be handled effectively to obtain a satisfactory income from farming are (a) selection of a farm of the right size and type for the operator and his family; (b) getting a large farm; (c) making a good farm plan; (d) buying and selling products wisely; (e) keeping out of debt; (f) conducting all farm operations efficiently.

C. What are some of the skills, experiences and qualifications that a good farmer should have? Place the letter C in the parentheses in front of each item mentioned, or the letter X if the item in question

is not mentioned in this book. If the item is not a quality that a good farmer needs, cross it out.

1. Liking for farm life; 2. ( ) Willingness to be more or less isolated; 3. ( ) Liking for close social relationships; 4. ( ) Background of farm experience; 5. ( ) Study of reports on farming conditions in a particular area; 6. ( ) Study of biology, botany, chemistry and physics; 7. ( ) Good organizing ability; 8. ( ) Health and physical strength; 9. ( ) Mechanical skill; 10. ( ) Knowledge of simple bookkeeping; 11. ( ) Reputation as a "good credit risk; 12. ( ) Imagination and ingenuity; 13. ( ) Disinterest in making money.

D. Many public agencies assist the farmer with his management problems. In the left-hand column below, are listed the names of some of these organizations. In the right-hand column are items that describe the services rendered by these agencies. Match the agency with the descriptive item that best fits it, by placing the number of the agency in the parentheses in front of the descriptive phrase.

1. Agricultural Extension Service.
2. Bureau of Agricultural Economics.
3. Agricultural Experiment Station.
4. Agricultural Adjustment Agency
5. Soil Conservation Service.
6. Farm Security Administration.
7. National Farm Loan Associations.

a. ( ) Makes real estate mortgage loans.
b. ( ) Assists farmers with plans to build up the soil and improve land use.
c. ( ) Conducts research on agricultural problems.
d. ( ) Conducts educational work with farmers.
e. ( ) Studies prospective economic developments.
f. ( ) Encourages soil building practices, and acreage adjustments. Makes parity payments.
g. ( ) Makes loans and gives management assistance to needy farm families.

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KEY TO EXERCISES

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B: 1,a,d,e,f(10); 2,b,h,i(10); 3,e,g,j(8).

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