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THE FARM SUPPLY INDUSTRY
A Report on Opportunities and Problems

SMITH, WILLSON, MOELLER, FOSCHIA, and HWANG

Agricultural Extension Service, University of Minnesota
in cooperation with

U.S. Department of Agriculture, Federal Extension Service,
Division of Marketing and Utilization Sciences

AGRICULTURAL EXTENSION SERVICE, UNIVERSITY OF MINNESOTA SEPTEMBER 1965

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A Report on Opportunities and Problems

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CHAPTER I

INTRODUCTION

U. S. farmers purchased nearly 67 percent of inputs used in their farming operations in 1964, compared to only 46 percent in 1940. Increased use of such items as fertilizer, gasoline, weed sprays, pesticides, machinery, formula feeds, protein supplements, minerals, and other feed additives, as well as associated services such as spraying, spreading, and mixing account for this growth. Proprietary and cooperative business organizations, ranging in size from one-man local operations to large national corporate firms are involved in supplying these goods and services to farmers.

To compete effectively for the farmers' business a farm supply firm, large or small, cooperative or proprietary, must provide quality inputs and services at reasonable prices. How well this is done depends largely on the firm's technical and managerial efficiency. With this in mind the University of Minnesota entered into a cooperative agreement with the Federal Extension Service to "develop an educational program for use by state extension services in carrying out their educational responsibilities related to reducing the cost of distributing farm inputs and increasing the effectiveness of those supplying farm inputs."

One difficulty in a project of this nature is to focus on relevant problems. The logical first step in this process is developing a "feel" for the industry. Accordingly, at the outset of the project an economic description of the industry was undertaken. Trends in expenditures for farm supplies by region and nationally, in the composition of the input mix, in product market shares held by proprietary and cooperative organizations, and average expenditure per farm for specific items were examined. In addition, qualitative observations of trends in the kinds and numbers of services offered and the changing organizational patterns in the industry were made. These are covered in chapter 2.

A major objective of this project was to assess management skills in the farm supply industry. This assessment was aimed primarily at managers of local organizations but it also recognizes certain inevitable relationships between local and affiliated regional organizations. The methods utilized in assessing management skills are discussed in chapter 3 and the results of this assessment are presented.

Concurrent with the assessment of management skills, an analysis of financial performance of farm supply firms was undertaken. Its purpose was to identify relevant financial indicators useful to educators and managers in assessing the financial strengths and weaknesses of farm supply businesses. From this analysis, a relatively simple financial control system was derived. These results are reported in chapter 4.

Over the years the U. S. Department of Agriculture has invested heavily in research designed to reduce the distribution costs of food. Much of this work was done on physical handling operations connected with wholesaling and retailing. Since there are some obvious similarities in warehousing operations between food handlers and farm supply firms, previous research on food handling was studied for its possible adoption by farm supply firms. The results of this effort are reported in chapter 5.

Chapter 6 is a summary and assessment of the current status of the farm supply industry and suggested areas for additional needed research.

Educational materials related to a selected number of problems discussed above are published separately as:

Managing the Farm Supply Business--Ten Areas, University of Minnesota, Agricultural Extension Service Special Report 16.

Financial Analysis and Control of the Farm Supply Business, University of Minnesota, Agricultural Extension Service Special Report 17.

Budgeting for the Farm Supply Business, University of Minnesota, Agricultural Extension Service Special Report 18.

Warehouse Operations in the Farm Supply Business, University of Minnesota, Agricultural Extension Service Special Report 19.

CHAPTER II

AN ECONOMIC DESCRIPTION OF THE FARM SUPPLY INDUSTRY

This chapter gives an economic overview of the farm supply industry. In particular, it includes a description of the trends in expenditures for farm supplies by regions and nationally, in the composition of the input mix, in the average expenditures per farm for specific items, and in the market shares held by proprietary and cooperative organizations for selected products. It also includes qualitative observations of trends in the kinds and numbers of services offered and the changing organizational patterns observed in the industry.

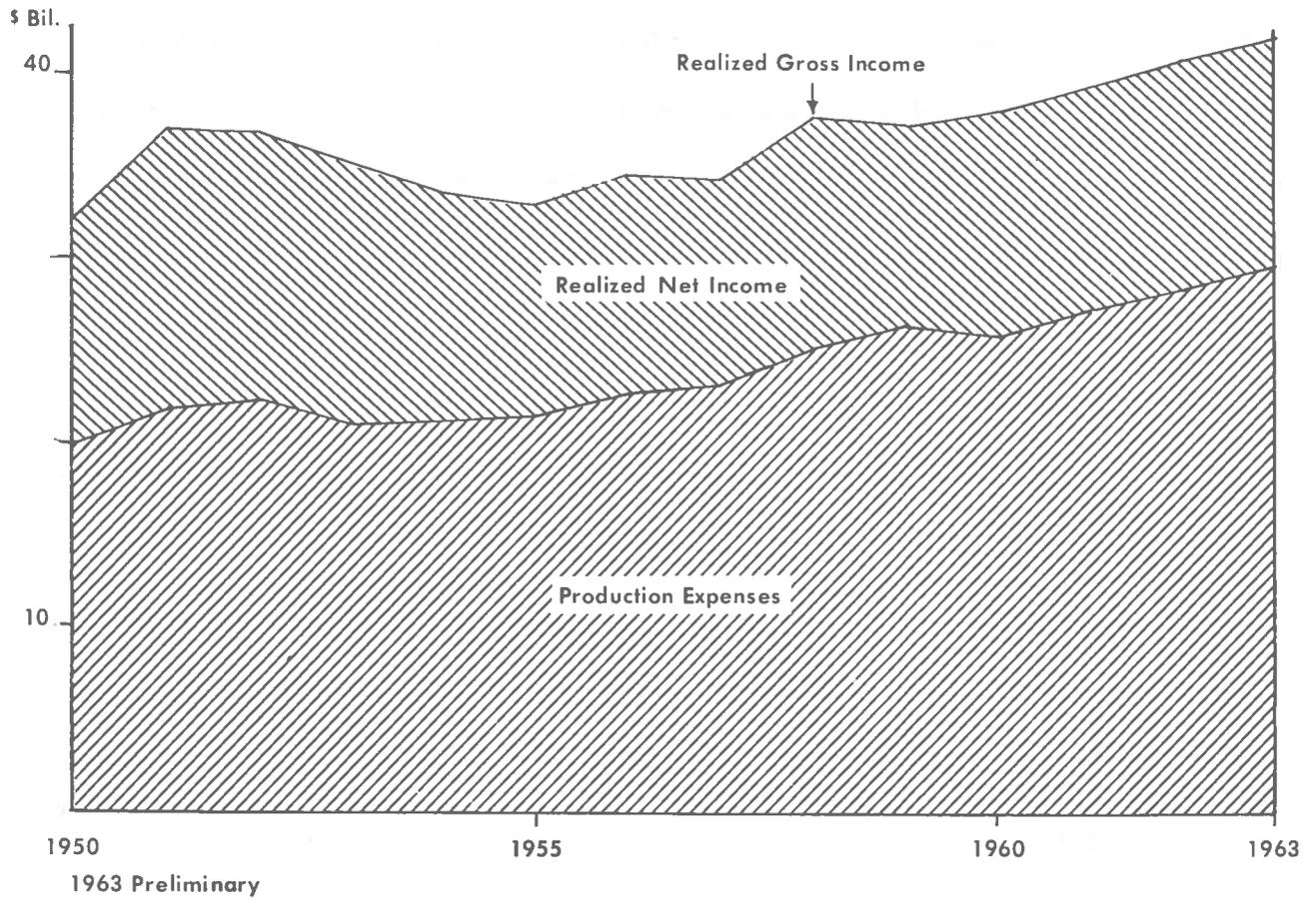
To suggest the challenge confronting the farm supply industry, figure 2.1 is presented. It shows that between 1950 and 1963 realized gross farm income increased from about \$32.4 billion to \$41.7 billion, or by 29 percent. During the same period production expenses increased from \$19.2 billion to \$29.2 billion, or by 51 percent. The upward pressure of costs on gross income resulted in a decline in realized net farm income from \$13.2 billion to \$12.5 billion, or roughly 5 percent. In 1963 production expenses amounted to 70 percent of gross income as compared to a little over 59 percent in 1950.

A primary factor affecting the expense-gross income ratio for agriculture has been the dramatic increase in the use of purchased inputs as compared to nonpurchased. Purchased inputs constituted nearly 67 percent of all inputs in 1964 as compared to 63 percent in 1959, 57 percent in 1950, and only 46 percent in 1940.

Figure 2.2 shows the trends in the utilization of farm inputs between 1950 and 1963. The quantity of total inputs used in production was virtually unchanged for the entire period. The use of nonpurchased inputs, which include operator and family labor, operator-owned real estate, and other capital items declined by 24 percent. Meanwhile, use of purchased items--fertilizer, gasoline, weed sprays, pesticides, machinery, electricity, formula feeds, protein supplements, minerals, and other feed additives--increased by 20 percent.

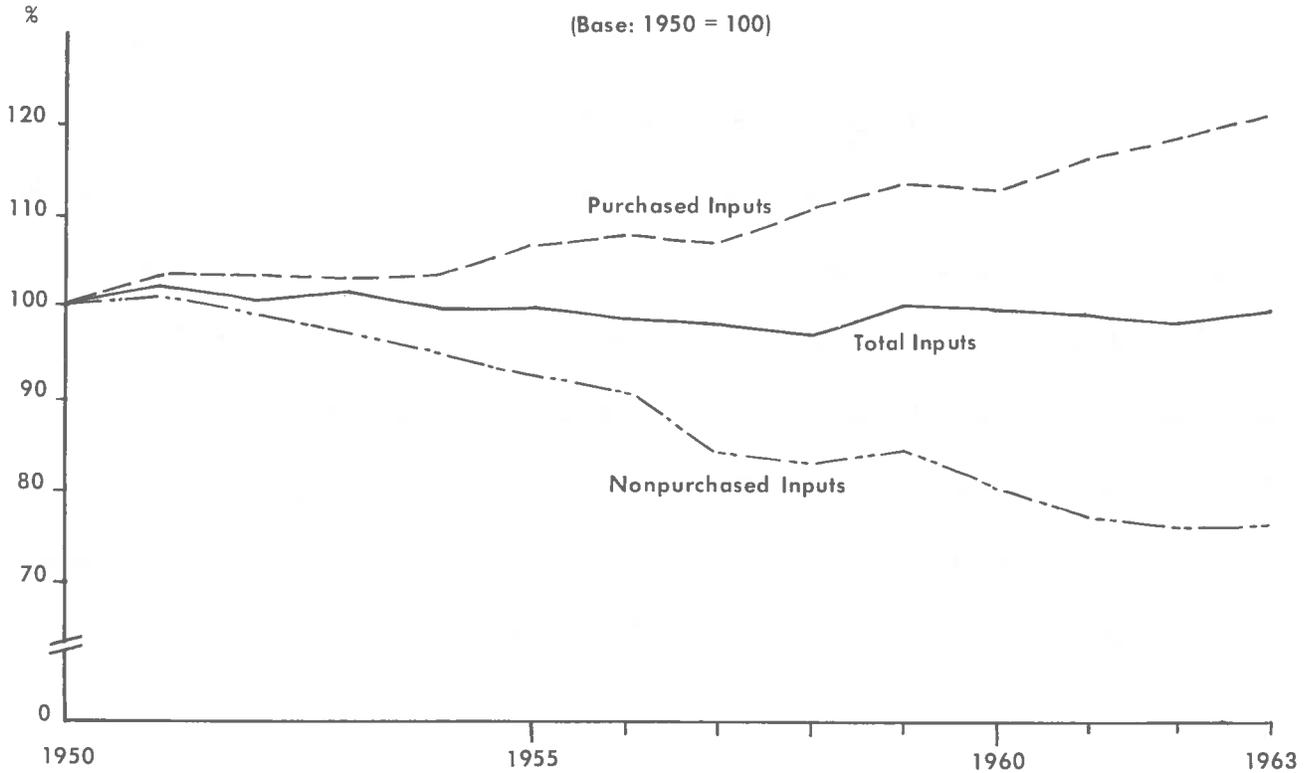
FIG 2.1:

FARM INCOME AND PRODUCTION EXPENSES



INDEX OF PURCHASED, NONPURCHASED, TOTAL INPUTS

FIG 2.2:



A second factor contributing to the increase in production expense is an increase in the price of inputs, particularly those of nonfarm origin. Prices of production items (see appendix table 2A) excluding such things as allowances for family living, wages, taxes, and interest--increased by 10 percent between 1950 and 1963. This compares to a 20 percent increase in overall prices paid by farmers and a 21 percent increase in the wholesale price index. Most of the upward pressure on prices of production items came from increases in the prices of farm machinery and equipment, motor vehicles, and motor supplies. The price of fertilizer has been remarkably stable and feed prices have been stable to declining over the period.

Substantial increases in productivity of the inputs utilized tended to hold expenses down. A composite input in 1963 resulted in 29 percent more output than did a similar unit in 1950 (see appendix table 2B). Improved fertilizers, insecticides, and seed varieties coupled with better machinery and equipment, account for this spectacular rise.

Overall industry performance in terms of growth, prices, and quality of products has been respectable but costs continue to rise. Herein lies the challenge to the farm supply industry.

Expenditure Patterns on Farm Supplies

A more precise picture of the magnitude of the farm supply business presented in table 2.1 shows the total dollar volumes of individual farm supplies purchased in the United States in 1962. Table 2.1 excludes expenditures on machinery and durable equipment but those included constitute about 40 percent of total production expenses. In 1962 farmers spent \$11.4 billion on the items listed. Feed purchases at \$5.5 billion accounted for 48.3 percent of this total; fertilizer and lime accounted for \$1.6 billion or 14.4 percent; petroleum products, \$1.5 billion or 13.4 percent; and seed, \$0.5 billion or 4.7 percent.

Table 2.1
Total Dollar Volumes of Farm Supplies Purchased
by Farm Operators, United States, 1962

Items	1962	Percent of Total
	(million)	(percent)
Feed	\$ 5,520	48.3
Petroleum, Fuel and Oil	1,533	13.4
Fertilizer and Lime	1,641	14.4
Seed	533	4.7
Building Materials	476	4.2
Parts, Tires and Batteries		
For Motor Vehicles	483	4.2
For Other Machinery	244	2.1
Pesticides	354	3.1
Miscellaneous Hardware	159	1.4
Containers	142	1.2
Veterinary Medicine	123	1.1
Binding Materials	65	.6
Dairy Supplies	58	.5
Greenhouse and Nursery Supplies	54	.5
Small Hand Tools	29	.2
Harness and Saddlery	8	.1
TOTAL	\$11,422	100.0

Source: The values for feed, fertilizer and lime, seed were from "Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA. The values for petroleum products were obtained from a communication with the Statistical Analysis Division, ERS, USDA. The values for miscellaneous items were from "Cash Expenditures for Production Supplies and Equipment, by Farm Operators, By States," Purchasing Division, Farm Supply Branch, FCS, USDA.

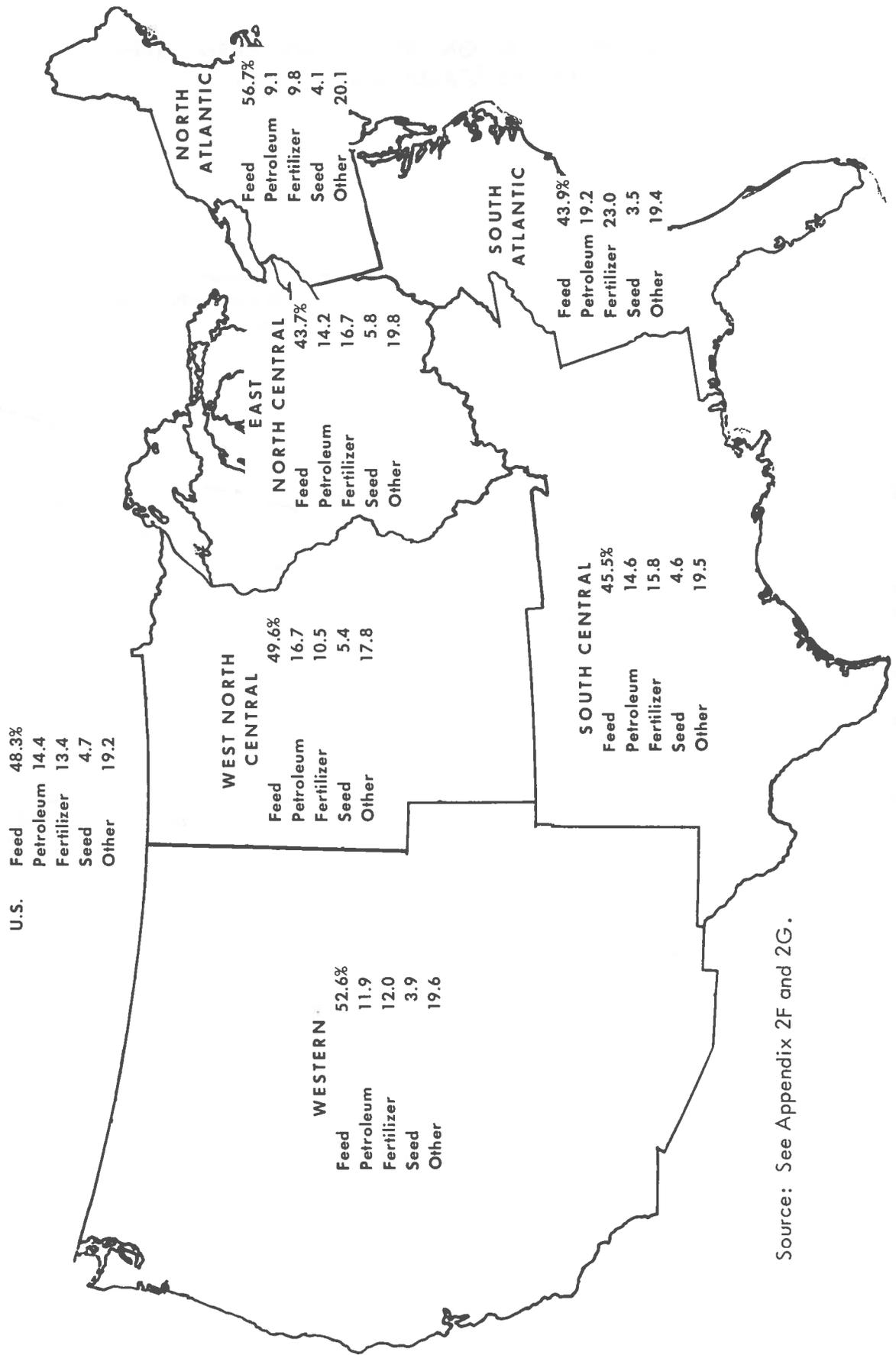
The combined expenditures on the above four items accounted for about 80 percent of the \$11.4 billion and represent one-third of total production expenses. Tires, batteries, and accessories, building materials, pesticides, miscellaneous hardware, containers, veterinary medicines, binding materials, dairy supplies, greenhouse and nursery supplies, small hand tools and harness and saddlery, in that order, account for the remaining 20 percent.

As can be seen in figure 2.3, the distribution of expenditures by farmers differs substantially from region to region. For example, while feed is the most important single item in all regions, it was proportionately highest in the North Atlantic region and lowest in the South Atlantic region. Expenditures on petroleum products, on the other hand, were proportionately highest in the west north central region and lowest in the North Atlantic region. Expenditures for fertilizer were proportionately highest in the South Atlantic region and lowest in the west north central region. Expenditures for seed were proportionately highest in the west north central region and lowest in the South Atlantic region. These differences in the distribution of cash expenditures reflect major differences in types of farming operations. Differences at least as great as these exist between areas within a region. It is clear that needs and opportunities with respect to serving the farm market differ from area to area.

Figure 2.4 shows trends in expenditures (deflated for price changes) on the four major farm supplies, during the period 1950-63. Expenditures on petroleum products and seed increased only slightly during the period. On the other hand, expenditures on feed and fertilizer increased dramatically--82 percent and 67 percent respectively.

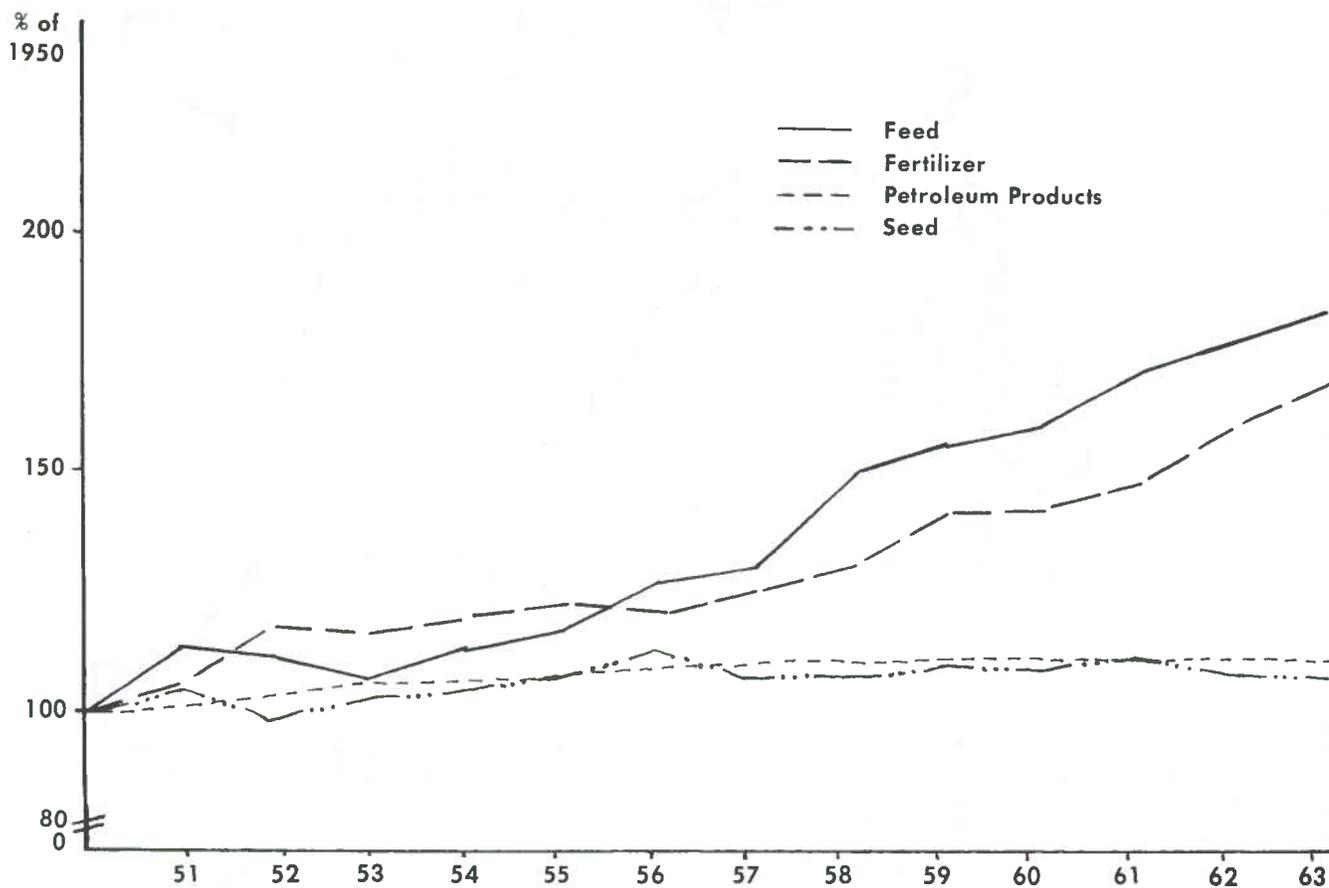
Regional differences in the trends in expenditures on farm supplies are illustrated in figure 2.5. The North Atlantic region appears to be at a relative standstill. Expenditures on seed declined slightly as did, surprisingly, expenditures on fertilizer. There was a minor increase in expenditures on petroleum products. Feed made the best showing with a 23 percent increase but this lags the rest of the country considerably.

FIGURE 2.3 THE EXPENDITURE PATTERN FOR FARM SUPPLIES BY FARM OPERATORS, BY REGIONS, 1962



Source: See Appendix 2F and 2G.

FIG. 2.4 INDEX OF EXPENDITURES ON FOUR MAJOR FARM SUPPLIES —
THE UNITED STATES (Base 1950 = 100)

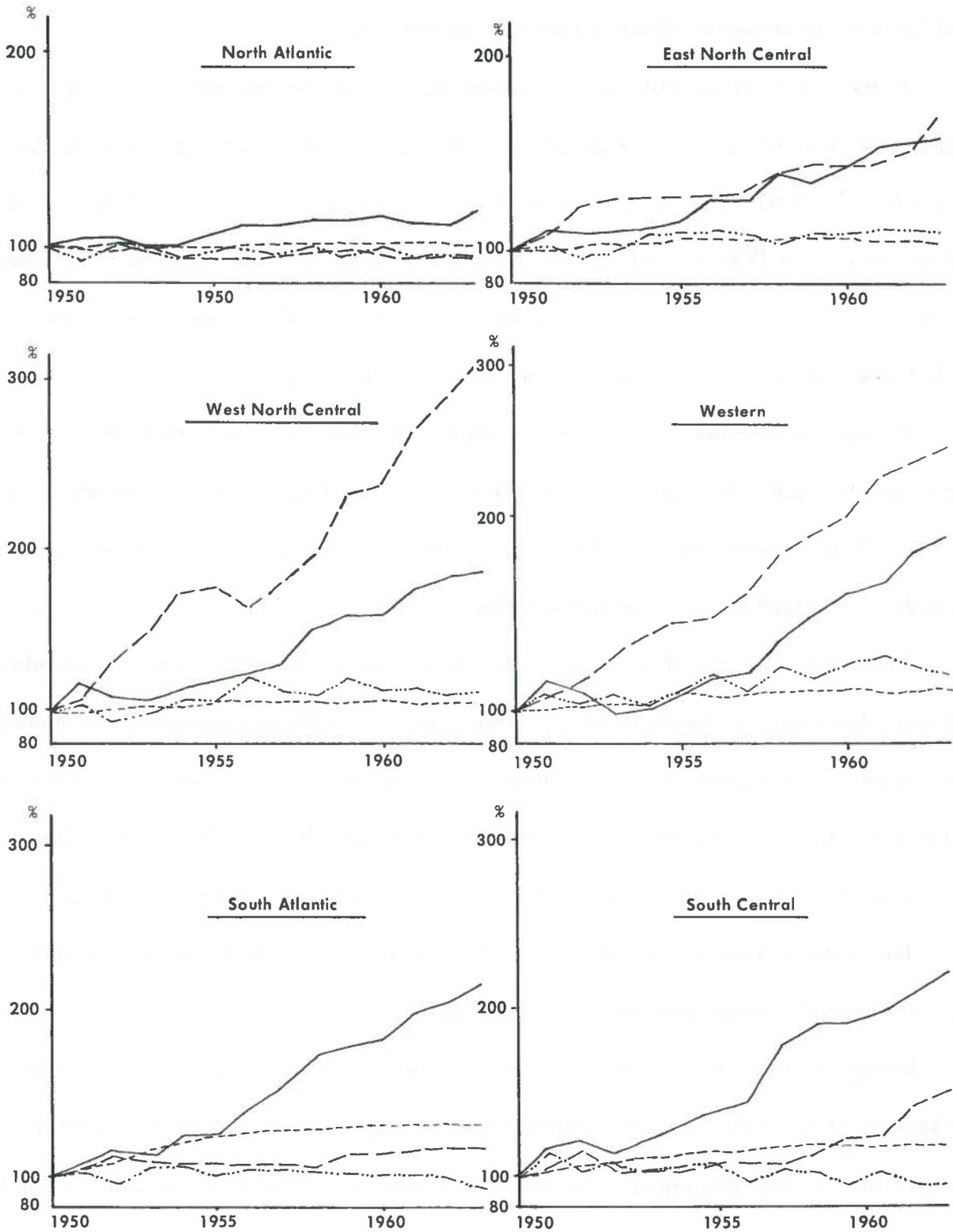


Source: See Appendix 2C

FIG. 2.5 INDEX OF EXPENDITURES ON FOUR MAJOR FARM SUPPLIES BY REGIONS

(Base 1950 = 100)

Legend: — Feed - - - Fertilizer
 - - - Petroleum - · - · - Seed



Source: See Appendix 2D

Trends in expenditures in the east north central region were roughly similar to those for the United States as a whole but with the positions of feed and fertilizer reversed. There were relatively small increases in expenditures on petroleum products and seed, but those on feed and fertilizer increased by 68 and 83 percent respectively.

In the west north central region, expenditures on feed and petroleum products roughly approximate the average U. S. experience. The expenditures on fertilizer have risen spectacularly since 1950. The rise has occurred in two spurts, one running from 1950 to 1955 and the other from 1956 to 1963. Expenditures on fertilizer in 1963 were over three times greater than they were in 1950 but it should be noted that in 1950 expenditures of \$90 million on fertilizer (see appendix 2G) were lower than any other region.

Trends in expenditures in the western region are roughly similar to those in the west north central region. Expenditures on fertilizer followed a steady upward trend and in 1963 were 2-1/2 times greater than in 1950. This increase also started from a relatively low base. Expenditures on feed doubled during the period.

The southern regions of the country show approximately the same trends in expenditure patterns. Feed sales in the South Atlantic region show a steady and above average increase over the period--more than doubling between 1950 and 1963. The increases in expenditures on petroleum products have also been greater than average, rising by 29 percent. On the other hand, fertilizer expenditures in 1963 were only 15 percent greater than they were in 1950, but in that base year expenditures of \$277 million were up to 3 times greater than other regions. Expenditures on seed have declined slightly.

Except in fertilizer, the pattern in the south central region is quite similar to that in the South Atlantic region. Feed, petroleum and seed follow almost identical courses as those observed for the adjoining region. However, fertilizer expenditures turned upward after 1958 and were 48 percent above 1950 in 1963.

Another way of looking at the expenditure picture is on a per farm basis. This is done in figure 2.6 which shows the average expenditure per farm for the four major farm supplies, by regions, for 1950, 1960, and 1962.

The average feed expenditure per U. S. farm in 1950 was \$581 as compared to \$1,497 in 1962. Similar increases were realized in every region of the country. Per farm expenditures for feed in 1962 were considerably above the average in the North Atlantic and western regions, approximately on the average in the east north central and west north central regions, and below the average in the South Atlantic and south central regions.

Between 1950 and 1962 expenditure per farm for fertilizer and lime increased from \$173 to \$445, or over 2-1/2 times. Farm expenditures on fertilizer are considerably above average in the South Atlantic and western regions, slightly above average in east north central, on the average in the North Atlantic and below average in the west north central and south central regions.

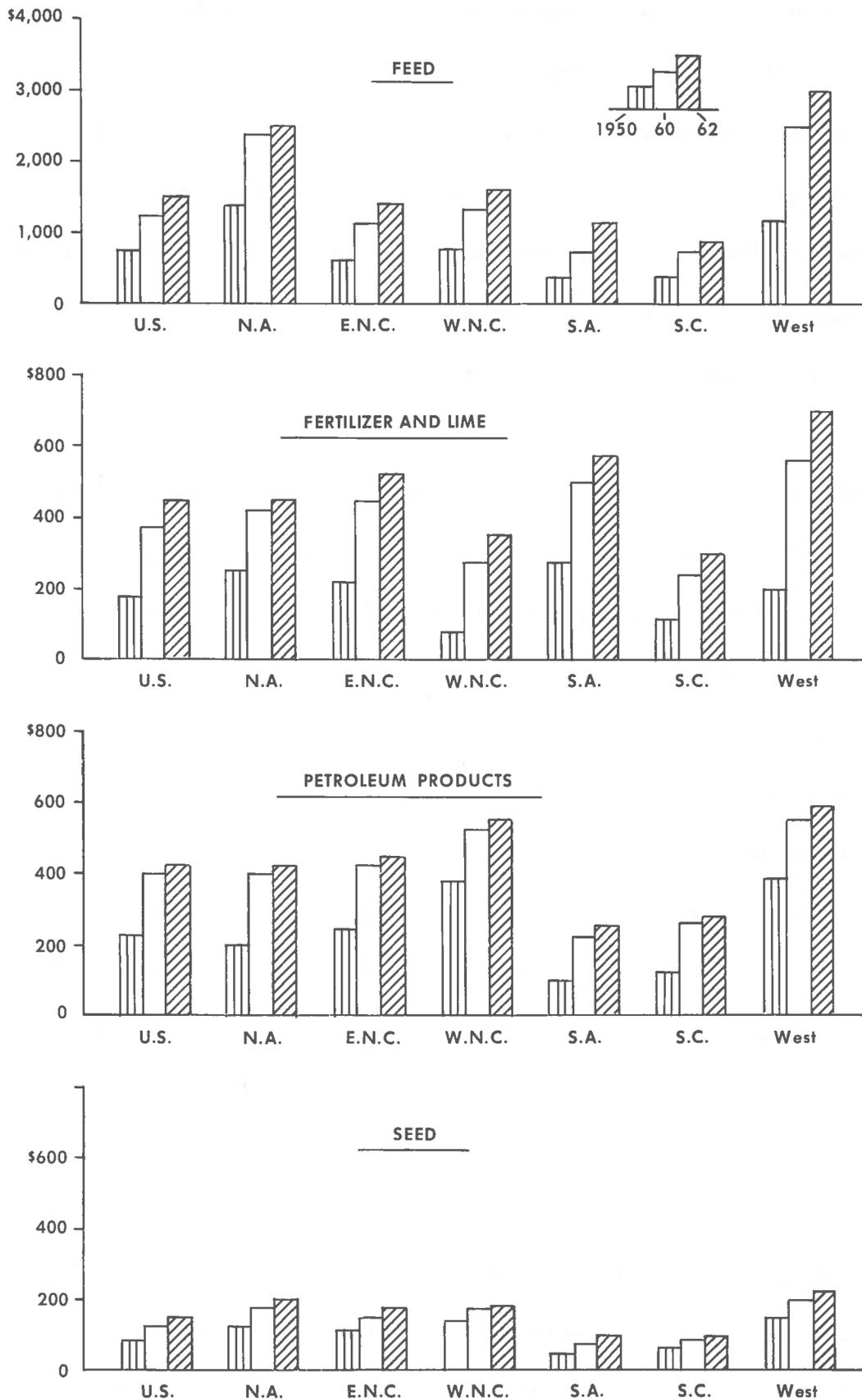
Average per farm expenditures on petroleum products between 1950 and 1962 nearly doubled, increasing from \$211 to \$416. In 1962, the west north central and western regions were well above the national average, east north central and North Atlantic about on the average, and the South Atlantic and south central regions below the average.

Average per farm seed expenditures of \$145 in 1962 compared to \$94 in 1950. Expenditures were above average in the North Atlantic, east north central, west north central, and western regions and below average in the South Atlantic and south central regions.

Market Shares Estimates

A matter of considerable interest in any market analysis is the market shares controlled by various competitors. No attempt was made in this study to identify shares of individual firms, but a breakdown of the shares held by cooperative and proprietary organizations (including individual proprietorships, partnerships, and corporations) was made. The market shares are shown in figure 2.7. The data is presented on a fiscal year basis.

FIG. 2.6 AVERAGE PER FARM EXPENDITURES ON FOUR MAJOR FARM SUPPLIES, 1950, 1960 AND 1962 — BY REGIONS



Source: See Appendix 2E

To supplement figure 2.7, table 2.2 is presented. It shows the percentage change in dollar volume of sales of farm supplies for each product group in each geographic area and will explain in part the reason for shifts in market shares between cooperative and proprietary organizations.

Feed Shares

In 1950-51 farmer cooperatives sold 18.7 percent of the total feed in the United States and proprietary organizations sold 81.3 percent. By 1960-61 the cooperative share had declined to 17.8 percent. Proprietary organizations were evidently quicker to respond to the rapidly growing feed market. Total dollar volume of feed purchased by all farmers increased 34.8 percent. Proprietary sales increased by 36.3 percent--which was above the overall experience--whereas farmer cooperative sales rose only 28.3 percent during the period.

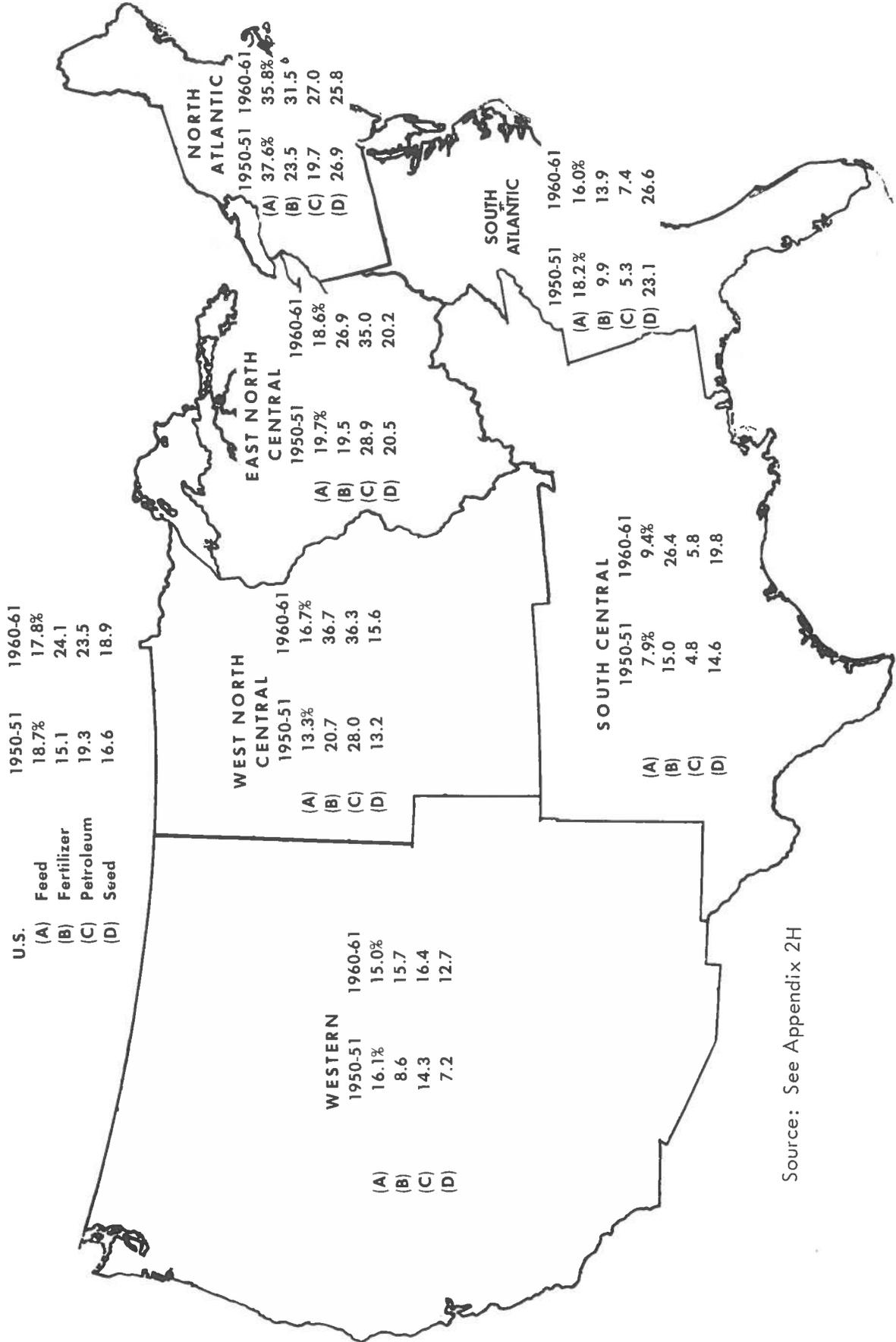
Regionally, the cooperatives' share of the feed market in 1960-61 was highest in the North Atlantic region, followed by the east north central region, South Atlantic region, the west north central region, and the western region, and was lowest in the south central region. Proprietary organizations made gains in all but the north central and south central regions.

Fertilizer Shares

The trends in shares in the fertilizer market are quite different than those in feed. Between 1950-51 and 1960-61 the total dollar volume of fertilizer purchased by farmers increased 45.1 percent. Sales by cooperatives increased by 131.5 percent whereas those by proprietary firms increased by only 16.4 percent (see table 2.2). As a result, the market share held by cooperatives increased from 15.1 percent to 24.1 percent.

Gains in shares have been made by cooperatives in all regions. In 1960-61 the cooperative share was highest in the west north central region (36.7 percent), followed by the North Atlantic region, the east north central region, the south central region, and the western region, and was lowest in the South Atlantic region (14.0 percent).

FIGURE 2.7 MARKET SHARES OF FARMER COOPERATIVES FOR FOUR MAJOR FARM SUPPLIES



Source: See Appendix 2H

Table 2.2
Percentage Change in the Dollar Volume of Sales of Farm Supplies
From 1950-51 to 1960-61, by Types of Dealers and by Regions

Region	Type of Dealer	Item			
		Feed	Fertilizer	Petroleum Products	Seed
- - - - - percent - - - - -					
U.S.	Total	+34.5	+ 44.9	+ 26.3	- 2.9
	Coop	+28.3	+131.5	+ 54.1	+10.9
	Private	+36.0	+ 29.4	+ 19.7	- 5.7
N.A.	Total	+ 1.8	+ .4	+ 21.7	- 7.7
	Coop	- 4.8	+ 33.6	+ 66.7	-10.7
	Private	+ 4.8	- 7.7	+ 10.6	- 5.2
E.N.C.	Total	+29.0	+ 47.7	+ 21.6	0
	Coop	+21.6	+102.6	+ 47.4	- 1.3
	Private	+30.8	+ 34.3	+ 11.1	+ .3
W.N.C.	Total	+35.7	+150.2	+ 20.4	+ 2.1
	Coop	+70.7	+343.5	+ 55.7	+20.9
	Private	+30.4	+ 99.7	+ 6.6	- .7
S.A.	Total	+60.1	+ 14.1	+ 45.3	-10.2
	Coop	+40.9	+ 74.1	+100.1	+ 3.7
	Private	+64.4	+ 8.1	+ 42.2	-14.3
S.C.	Total	+56.4	+ 23.6	+ 33.3	-15.4
	Coop	+85.3	+116.9	+ 60.4	+14.9
	Private	+53.9	+ 7.1	+ 31.9	-20.5
WEST.	Total	+37.8	+125.0	+ 28.0	+11.8
	Coop	+28.7	+309.3	+ 45.8	+96.2
	Private	+39.6	+108.0	+ 25.0	+ 5.2

Source—Calculated from:

"Statistics of Farmer Cooperatives," FCS, USDA, General Reports for each year. Adjustments were made on the values of petroleum products sold by farmer cooperatives to exclude the sales made for nonfarm purposes.

The values for feed, fertilizer and lime, and seed were from "Farm Income, 1949-63," FIS Supplement, August 1964, ERS, USDA. The value for petroleum products was obtained from communication with the Statistical Analysis Division, ERS, USDA. Data were adjusted to conform to the fiscal year by taking an average of the two calendar years.

Petroleum Shares

For the United States as a whole, the dollar volume of petroleum products purchased by farmers for farm use increased 26.3 percent between 1950-51 and 1960-61. Sales of petroleum products by cooperatives have grown more rapidly than those by proprietary dealers (table 2.2). Sales by cooperatives increased 54.1 percent as compared to 19.7 percent for proprietary organizations between 1950-51 and 1960-61. Thus, the cooperative market share increased from 19.3 percent to 23.6 percent during the period.

Market shares held by cooperatives vary widely by region. As was true with fertilizer, the cooperatives' share was highest in the west north central region with 36.3 percent, closely followed by the east north central region, the North Atlantic region, and the western region, with the South Atlantic and south central regions well below the rest with 7.4 percent and 5.8 percent respectively.

Seed Market Shares

The dollar volume of seed purchased by farmers decreased by 2.9 percent from 1950-51 to 1960-61. For the United States as a whole, sales by cooperatives increased by 10.9 percent while sales by proprietary firms decreased by 5.7 percent in the period. Sales performance by both classes of firms differed considerably from region to region (table 2.2). In any case, the market share held by farmer cooperatives increased from 16.6 percent to 18.9 percent of the U. S. market during the period. Regionally, cooperatives made market share gains in the South Atlantic, south central, western, and west north central regions but experienced declining shares in the east north central and North Atlantic regions.

In summary, proprietary organizations have evidently perceived and acted upon the opportunities prevalent in a rapidly expanding feed market. Cooperatives lost ground in this area. The reverse is true in the case of fertilizer. Here it is quite clear that cooperatives responded quickly and vigorously to the dramatically expanding fertilizer market. Cooperatives have also made gains in the petroleum and seed markets.

Some General Observations

The general statistical description of the farm supply industry just completed provides background for the qualitative observations with respect to the kinds and number of services offered and the changing organizational patterns observed in the farm supply industry to be discussed in this section.

While it is evident that feed and fertilizer are the most rapidly growing farm supply markets, it is increasingly clear that farm customers are demanding something more than just the physical products. Increasingly, farm supply firms are providing additional services such as soil testing, prescription, and custom blending as well as technical advice on animal nutrition, health, and husbandry practices. Firms which have perceived these changing requirements have added personnel with the appropriate technical training to their staffs to provide assistance to their customers. Not all farm supply firms have become this customer conscious because it is difficult for organizations that have operated successfully on their own self-imposed standards for many years to swing over to an operation based on the objective analysis of customer needs. It is probable that many firms will never make this adjustment but those that do not will be operating under a clear competitive disadvantage.

Providing additional technical services calls for increased emphasis on research and development in the industry. In any sophisticated sense, this is clearly beyond the capacity, though not the concern, of local organizations. But it should be accepted as the responsibility of affiliated regional organizations. Some of these organizations are already involved in the research function. Some have excellent technical field service staffs to assist local firms. But many lag in research, and this will ultimately be reflected in the performance of their local associates.

Competitive price pressures are increasing at the local level. There was a time when the local farm supply organization was relatively insulated from "outside" competition. Numerous small farmer customers, each representing a relatively small sale, were not attractive

to large centrally located organizations many miles away. But that picture has changed. The growth in the size of farm and the increasing importance of purchased inputs in the total farming operation has greatly increased potential sales per farm. The regionally based petro-chemical company finds a \$15,000 fertilizer sale to a single farmer just as attractive as does the local organization. In fact, some farmers are aware enough of their attractiveness to request bids on their purchases and a number of large organizations have been quick to respond to these requests.

As a result of this increasing price pressure, increasing pressures to reduce administrative overhead and distribution costs are being felt throughout the industry. The number and location of service centers required to meet customer needs, as well as product mix are under close scrutiny. Small organizations or those unstrategically located with respect to their markets and supplies are struggling for survival. Direct physical distribution of certain kinds of merchandise from regional warehouses to farmer customers, thus eliminating handling costs incurred by the local affiliate, is increasing.

Diversification of product lines handled is also on the increase. Major petroleum organizations have been and are moving rapidly into the fertilizer field as well as into feed. There is increased adventuring into the marketing field by many farm supply organizations while at the same time many marketing organizations are moving into farm supplies.

The increasing complexity of the farm supply business has created new and acute pressures in the areas of financial management and credit for local farm supply organizations. Appropriate financing of growth, either internally or through merger, is a common problem. Adequate provision for liquidity as well as solvency has become more compelling. Management of individual credit accounts, which invariably involve higher stakes, requires additional skill. In some cases it is clear that local organizations lack the skills and resources to handle the job. Traditional institutional arrangements contribute to the problem. Banks, for example, have been willing to finance farm production elements on which they could claim a chattel

but most are unwilling to pick up the whole package, which would include such things as the feed fed to the livestock they financed. There is a tremendous need to re-examine the whole production credit structure.

Summary

The farm supply industry is one of substantial growth in terms of total dollar volume involved and kinds of services being offered, but fewer firms will be required to handle this increase. A long-run trend is for farmers to purchase an increasing proportion of the total inputs they use in production, and this trend is likely to continue in the foreseeable future. Fertilizer and feeds seem to be the opportunity products at this time. Opportunities in the petroleum business seem somewhat more limited and the market for seed appears to have passed its peak.

Regionally, the North Atlantic appears to represent the area least likely to grow as far as agriculture and the market for farm supplies are concerned. The outlook is more favorable in every other region. A challenge confronting the industry is estimating the potential saturation points for each of the major supplies considered here. For example, how long can the rapid growth in fertilizer expenditures in the west north central region be expected to be sustained? This rise started from a very low base. Will it take on the characteristics of growth evident in the South Atlantic region where fertilizer sales were initially higher than anywhere else in the country? Similar questions may be asked of feed and petroleum products as well as the miscellaneous other items involved in the farm supply business. Obviously the problem of anticipating new farm technologies as well as new technologies in the production of farm supply goods and services must overlay these considerations.

It appears that regionally based firms will be providing more direct services to farmers in the future. The total impact of this on local organizations is not entirely clear. Some

will be forced to leave the business. But it is clear that not all merchandise and not all service that farmers require in their production processes can be supplied from a distance. Direct shipment is easiest to accomplish in the case of highly standardized items such as petroleum and feed concentrates. But peculiar local requirements related, for example, to the types of feed crops grown, may dictate local feed processing. Peculiar soil conditions by area and by individual customer will likely dictate the need for local fertilizer blending operations. Certainly, the handling of miscellaneous small items such as hardware, medicines, and parts and accessories for machinery equipment will require a local outlet.

In part the problem lies in trying to define what is "local." There may not be a farm supply store in every hamlet or every small town in the future, but there is likely to be one located in the major trade center of the area serving a much larger geographic market. This concept is firmly in the minds of many who were interviewed in the course of this study.

APPENDIX TABLES FOR CHAPTER II



Appendix Table 2A
 Prices Paid by Farmers: Production Items With
 Farm and Nonfarm Origin, 1950-63
 (1957 - 59 = 100)

Year	Items with Farm Origin				All Items	Nonfarm Origin			
	All Items	Feed	Seed	Feeder Livestock		Motor Supplies	Fertilizer	Motor Vehicles	Farm Machinery
1950	112	105	109	113	80	86	94	78	77
1951	127	118	111	138	86	90	100	83	83
1952	122	126	125	115	89	91	102	87	87
1953	104	114	114	83	90	92	103	86	87
1954	104	113	107	85	90	94	103	86	87
1955	99	106	112	83	91	95	101	87	87
1956	96	103	99	78	94	97	100	89	92
1957	97	101	103	86	98	100	100	96	96
1958	102	99	101	107	99	100	100	100	100
1959	101	100	96	107	103	100	100	104	104
1960	99	98	100	100	105	101	100	102	107
1961	99	98	100	100	106	102	100	102	110
1962	101	100	103	104	108	101	100	105	111
1963	103	104	110	98	110	101	100	109	113

Source: Handbook of Agricultural Charts, 1964. Agricultural Handbook, No. 275, USDA.

Appendix Table 2B
Index Numbers of Nonpurchased, Purchased,
Total Inputs and Total Farm Output

Year	Nonpurchased	Purchased	Total Inputs	Total Farm Output
1950	100	100	100	100
1951	102	103	103	103
1952	101	103	102	107
1953	99	103	102	108
1954	96	104	101	108
1955	93	107	101	112
1956	91	108	100	113
1957	85	107	98	110
1958	83	110	98	119
1959	84	113	101	120
1960	81	113	100	123
1961	78	116	100	124
1962	76	118	100	126
1963	76	120	101	130

Source: Handbook of Agricultural Charts, 1964, ERS, USDA.

Appendix Table 2C
Index of Expenditures on Four Major Farm Supplies —
The United States

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	112	104	100	104
1952	110	116	102	98
1953	106	116	105	101
1954	111	119	105	104
1955	116	120	107	106
1956	126	119	108	111
1957	129	123	109	106
1958	148	129	109	107
1959	154	140	110	109
1960	158	141	110	108
1961	168	147	109	110
1962	177	158	110	106
1963	182	167	109	105

Source: Computed from data in Appendices 2A and 2F.

Appendix Table 2D-1
Index of Expenditures on Four Major Farm Supplies
in the North Atlantic Region

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	105	98	99	94
1952	107	104	99	102
1953	102	101	101	98
1954	101	94	100	96
1955	108	97	102	98
1956	116	94	103	100
1957	115	96	104	98
1958	118	98	104	102
1959	119	100	105	96
1960	121	97	105	102
1961	117	94	104	96
1962	117	96	104	96
1963	123	96	103	94

Appendix Table 2D-2
Index of Expenditures on Four Major Farm Supplies
in the East North Central Region

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	111	108	99	103
1952	112	125	101	96
1953	112	132	103	98
1954	114	133	103	108
1955	119	132	105	109
1956	130	133	105	112
1957	131	136	105	110
1958	145	145	105	104
1959	141	152	106	111
1960	148	148	106	110
1961	163	149	104	113
1962	167	163	105	113
1963	168	183	104	112

Source: Computed from data in Appendices 2A and 2G.

Appendix 2D-3
Index of Expenditures on Four Major Farm Supplies
in the West North Central Region

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	115	107	99	103
1952	107	129	100	95
1953	107	146	103	97
1954	113	172	101	106
1955	117	175	104	108
1956	123	162	105	120
1957	127	174	104	113
1958	152	192	104	110
1959	157	230	104	118
1960	157	235	105	114
1961	175	269	103	113
1962	182	291	104	109
1963	185	313	104	110

Appendix 2D-4
Index of Expenditures on Four Major Farm Supplies
in the Western Region

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	117	108	100	108
1952	108	118	101	102
1953	96	132	104	108
1954	99	146	102	103
1955	108	154	111	113
1956	119	155	107	120
1957	120	171	109	110
1958	141	196	109	124
1959	155	206	110	118
1960	168	214	111	124
1961	173	241	110	132
1962	194	248	111	124
1963	202	258	111	119

Source: Computed from data in Appendices 2A and 2G.

Appendix Table 2D-5
Index of Expenditures on Four Major Farm Supplies
in the South Atlantic Region

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	107	103	103	102
1952	115	110	109	96
1953	111	108	116	106
1954	123	106	120	106
1955	122	105	122	100
1956	140	104	124	104
1957	154	105	127	102
1958	172	104	127	102
1959	178	114	128	100
1960	180	112	129	100
1961	198	114	127	100
1962	206	116	128	96
1963	215	115	129	94

Appendix Table 2D-6
Index of Expenditures on Four Major Farm Supplies
in the South Central Region

Year	Feed	Fertilizer	Petroleum Products	Seed
1950	100	100	100	100
1951	117	102	101	113
1952	120	114	104	101
1953	110	101	108	104
1954	120	101	109	101
1955	126	100	112	103
1956	137	106	113	105
1957	143	105	114	96
1958	177	104	115	102
1959	190	112	116	102
1960	191	121	117	96
1961	197	122	115	103
1962	209	142	117	97
1963	222	148	116	96

Source: Computed from the data in Appendices 2A and 2G.

Appendix Table 2E
Average Per Farm Cash Expenditures for Farm Supplies by
Farmers by Regions — 1950, 1960 and 1962

Items	Year	United States	North Atlantic	East	West	South Atlantic	South Central	Western
				North Central	North Central			
dollars								
Feed	1950	581	1,281	615	757	327	261	1,208
	1960	1,228	2,371	1,121	1,339	866	634	2,441
	1962	1,497	2,578	1,367	1,650	1,103	896	3,009
Fertilizer and Lime	1950	173	245	215	89	272	119	192
	1960	370	415	448	270	512	241	564
	1962	445	446	521	348	578	310	685
Petroleum Products	1950	211	188	259	363	99	122	388
	1960	391	381	425	538	236	264	654
	1962	416	414	445	554	256	288	680
Seed	1950	94	118	118	137	57	58	142
	1960	133	182	158	173	82	80	206
	1962	145	193	176	178	88	92	223
Miscellaneous*	1950	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1960	527	782	563	562	403	333	994
	1962	595	920	620	592	486	383	1,120
Total**	1950	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1960	2,650	4,130	2,714	2,882	2,099	1,652	4,858
	1962	3,097	4,550	3,129	3,323	2,511	1,968	5,716

N.A. — Not available.

* Miscellaneous includes building materials, parts, tires and batteries, pesticides, miscellaneous hardware, containers, veterinary medicines, binding materials, dairy supplies, greenhouse and nursery supplies, small hand tools, harness and saddlery.

** May not add due to rounding.

Source: Computed from:

"Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA.

"Number of Farms 1910-59, Land in Farms 1950-59," Statistical Bulletin No. 316, and "Number of Farms and Land in Farms, U.S., 1950-64, By States 1960-64," Sp Sy 3 (1-64), Statistical Reporting Service and Crop Reporting Board, USDA.

Appendix Table 2F
The Expenditures for The Four Major Farm Supplies, U.S., 1950-63

	Feed ^{1/}	Fertilizer ^{1/}	Petroleum ^{2/} Products	Seed ^{1/}	Total of 4 Items
----- million dollars -----					
1950	3,283	978	1,192	531	5,984
1951	4,144	1,085	1,245	561	7,035
1952	4,331	1,229	1,283	594	7,437
1953	3,770	1,245	1,337	560	6,912
1954	3,906	1,274	1,364	542	7,086
1955	3,840	1,256	1,414	577	7,087
1956	4,058	1,241	1,457	537	7,293
1957	4,083	1,280	1,507	529	7,399
1958	4,592	1,338	1,508	526	7,964
1959	4,808	1,460	1,520	509	8,297
1960	4,849	1,463	1,545	524	8,381
1961	5,148	1,526	1,534	536	8,744
1962	5,520	1,641	1,533	533	9,227
1963	5,930	1,741	1,528	564	9,763

Source:

^{1/} "Farm Income, 1949-63" FIS-195 Supplement, August 1964, ERS, USDA.

^{2/} The data on the value of petroleum products were obtained by direct communication with the Statistical Analysis Division, ERS, USDA.

Appendix Table 2G-1
Expenditures for Feed — By Regions — 1950-63

	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western
	----- million dollars -----					
1950	574	566	764	333	461	586
1951	679	707	984	401	606	767
1952	730	755	974	456	659	756
1953	635	685	886	402	549	613
1954	625	696	928	441	594	623
1955	626	681	899	409	585	640
1956	654	723	920	458	618	684
1957	636	715	930	493	634	675
1958	641	774	1,095	540	767	776
1959	651	762	1,133	563	836	863
1960	647	783	1,121	559	822	918
1961	628	859	1,251	616	847	947
1962	642	902	1,323	654	919	1,080
1963	698	939	1,402	709	1,012	1,171

Source: "Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA.

Appendix Table 2G-2
Expenditures for Fertilizer and Lime — By Regions — 1950-63

	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western
	----- million dollars -----					
1950	109	198	90	277	211	93
1951	114	227	103	305	229	107
1952	123	269	126	332	260	119
1953	120	287	144	327	233	135
1954	112	288	170	322	234	148
1955	114	282	170	313	225	154
1956	109	280	155	308	237	153
1957	111	287	167	310	236	169
1958	114	305	184	308	232	194
1959	116	320	221	337	251	204
1960	113	313	226	330	270	212
1961	109	314	258	335	274	237
1962	111	344	279	343	318	246
1963	111	386	318	339	332	255

Source: "Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA.

Appendix Table 2G-3
Expenditures for Petroleum Products — By Regions — 1950-63

	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western
	----- million dollars -----					
1950	84	238	366	101	215	188
1951	87	247	380	109	227	196
1952	88	254	388	116	236	201
1953	91	263	402	125	248	209
1954	92	268	405	132	257	211
1955	95	277	422	136	266	220
1956	98	283	432	141	274	228
1957	102	291	442	148	286	238
1958	102	291	442	148	287	238
1959	103	293	444	150	290	241
1960	104	296	451	153	295	246
1961	104	294	447	152	294	245
1962	103	294	445	152	295	244
1963	103	292	445	152	294	244

Source: The data were obtained from communications with the Statistical Analysis Division, ERS, USDA, and are not published elsewhere.

Appendix Table 2G-4
Expenditures for Seed — By Regions — 1950-63

	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western
----- million dollars -----						
1950	53	109	138	58	103	69
1951	51	114	145	60	118	75
1952	62	120	150	64	119	80
1953	55	112	140	64	112	78
1954	50	116	144	60	102	70
1955	54	122	154	59	109	80
1956	49	111	150	54	98	74
1957	49	113	147	56	93	71
1958	50	105	141	55	97	79
1959	45	107	144	51	92	71
1960	50	110	145	53	90	78
1961	47	113	144	53	97	83
1962	48	116	143	52	94	80
1963	50	123	154	55	99	82

Source: "Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA.

Appendix Table 2H-1
 Feed Market Shares Held by Farmer Cooperatives by Regions and the United States

Year	United States	East			West		
		North Atlantic	North Central	South Central	North Central	South Atlantic	South Central
1950-51	18.7	37.6	19.7	13.3	18.2	7.9	16.1
1951-52	19.1	38.7	18.8	13.3	19.4	8.7	17.6
1952-53	21.0	38.4	20.4	15.6	20.0	10.5	21.2
1953-54	21.1	39.0	21.1	15.7	20.0	10.5	21.3
1954-55	20.9	37.9	21.8	16.5	18.7	9.9	20.9
1955-56	19.6	34.0	19.5	16.9	18.5	9.7	19.2
1956-57	19.8	34.8	19.6	17.0	17.8	10.6	19.2
1957-58	18.7	34.9	19.6	15.7	18.4	9.3	16.6
1958-59	19.1	37.8	20.8	16.1	19.6	8.9	16.1
1959-60	18.1	35.3	20.5	16.9	16.2	9.0	15.9
1960-61	17.8	35.8	18.6	16.7	16.0	9.4	15.0
1961-62	17.5	36.8	18.4	17.4	14.3	9.1	14.5

Source -- Calculated from:

"Statistics of Farmer Cooperatives," FCS, USDA, General Reports for each year. The values exclude intercooperative business. Years are fiscal, i.e., July 1 to June 30 of the subsequent year.

"Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA. The data were adjusted to conform to the fiscal year by taking an average of the two calendar years.

Appendix Table 2H-2
Fertilizer Market Shares Held by Farmer Cooperatives by Regions and the United States

Year	United States	East			West		
		North Atlantic	North Central	South Central	North Central	South Atlantic	South Central
1950-51	15.1	23.5	19.5	20.7	9.1	15.0	8.6
1951-52	15.8	25.7	20.5	21.8	9.3	14.8	10.1
1952-53	17.5	26.4	21.6	25.1	9.4	18.2	11.3
1953-54	18.4	26.9	23.6	27.0	9.8	18.0	11.8
1954-55	19.6	28.7	24.6	29.6	10.9	20.3	9.2
1955-56	20.9	30.3	25.7	32.1	12.9	19.8	11.6
1956-57	21.8	31.9	26.1	35.8	12.2	21.1	12.5
1957-58	21.7	30.9	25.6	34.6	12.6	21.5	12.6
1958-59	22.4	27.7	26.6	35.4	13.1	23.7	14.0
1959-60	22.9	28.6	26.4	35.4	13.1	25.6	13.6
1960-61	24.1	31.5	26.9	36.7	13.9	26.4	15.7
1961-62	24.4	33.2	26.3	36.9	13.6	27.3	15.4

Source—Calculated from:

"Statistics of Farmer Cooperatives," FCS, USDA, General Reports for each year. The values exclude intercooperative business. Years are fiscal, i.e., July 1 to June 30 of the subsequent year.

"Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA. The data were adjusted to conform to the fiscal year by taking an average of the two calendar years.

Appendix Table 2H-3
Seed Market Shares Held by Farmer Cooperatives by Regions and the United States

Year	East				West				
	United States	North Atlantic	North Central	South Central	North Atlantic	North Central	South Atlantic	South Central	Western
1950-51	16.6	26.9	20.5	23.1	13.2	14.6	7.2		
1951-52	16.5	27.1	18.3	24.4	12.9	14.6	8.8		
1952-53	17.2	26.3	20.9	22.8	13.9	14.5	13.0		
1953-54	17.2	27.0	21.3	21.3	15.1	12.7	10.5		
1954-55	17.8	29.8	20.3	24.4	14.2	14.1	12.5		
1955-56	17.5	28.7	20.8	22.8	13.6	15.3	11.6		
1956-57	18.7	32.4	20.8	24.7	14.5	15.5	14.8		
1957-58	18.2	26.5	21.5	23.6	14.8	16.4	12.3		
1958-59	18.8	24.8	21.2	25.3	15.7	17.8	14.1		
1959-60	19.7	26.7	21.0	27.1	16.2	19.6	14.5		
1960-61	18.9	25.8	20.2	26.6	15.6	19.8	12.7		
1961-62	18.9	26.3	20.0	26.9	16.9	20.4	9.3		

Source — Calculated from:

"Statistics of Farmer Cooperatives," FCS, USDA, General Reports for each year. The values exclude intercooperative business. Years are fiscal, i.e., July 1 to June 30 of the subsequent year.

"Farm Income, 1949-63," FIS-195 Supplement, August 1964, ERS, USDA. The data were adjusted to conform to the fiscal year by taking an average of the two calendar years.

Appendix Table 2H-4
 Petroleum Products Market Shares Held by Farmer Cooperatives by Regions and the United States ^{1/}

Year	East				West		
	United States	North Atlantic	North Central	South Atlantic	North Central	South Atlantic	South Central
1950-51	19.3	19.7	28.9	5.3	28.0	4.8	14.3
1960-61	23.5	27.0	35.0	7.4	36.3	5.8	16.4

^{1/} The net values of petroleum products sold by farmer cooperatives includesales made for nonfarming purposes. Therefore, adjustments were made to exclude these sales. The adjustment factor for sales for nonfarm purposes was estimated as 37.6 percent of the total net sales of farmer cooperatives in 1950-51. For 1960-61, it was 41.7 percent. These adjustment factors were applied uniformly to all regions.

Source—Calculated from:

"Statistics of Farmer Cooperatives," FCS, USDA, General Reports of 1950-51 and 1960-61. The values exclude inter-cooperative business. Years are fiscal, i.e., July 1 to June 30 of the subsequent year.

For data on expenditures for petroleum products by farmers see Appendix 2G. The data were adjusted to conform to the fiscal year by taking an average of the two calendar years.

CHAPTER III

ASSESSMENT OF MANAGEMENT SKILLS

This chapter is built on the assumption that effective management education programs demand careful identification of management problems and needs. Then, and only then, is it appropriate to consider the development of educational materials. Too often, management programs are developed on the basis of what the "trade" is demanding. This demand is frequently shaped by what is considered fashionable rather than by an assessment of operational needs. Thus, communications and personnel and public relations are frequent themes for management conferences. This is not to deprecate any of these areas in terms of their importance in management operations, but there is a danger of overemphasis in some areas while other important problem areas are largely ignored. There is also some danger that without careful identification of relevant problems, management education programs will be of the shotgun variety in that they attempt to cover a broad spectrum of interests superficially.

The Assessment Process

No one approach is completely adequate for use in assessing management skills. Obviously, an appropriately trained professional can gain an insight into a manager's skill in an interview situation. But this must be buttressed by fairly clear understanding of what that particular manager, operating in a particular industry, should know. Material, such as that presented in chapter 2, provides part of this information. But other viewpoints help round out the picture. Thus, executive personnel of major regional cooperatives and proprietary corporations, as well as commodity line directors and field service personnel, were consulted and their views on farm supply industry and management problems recorded.

With this background, an informal management audit was utilized in assessing weaknesses of local management. No questionnaires, as such, were used in interviewing local

management personnel. Instead, a carefully developed outline highlighting the kinds of information with which knowledgeable management is expected to be familiar with was employed. Six areas of the business--administration, sales, production, personnel, finance, and procurement--received particular attention. In some cases, particularly in smaller firms, the general manager was directly responsible for all of these areas and he was, therefore, the only one interviewed. In larger businesses where there are varying degrees of departmentalization the appropriate questions were directed to the department manager.

In the sections that follow an outline for making an assessment of management problems and needs is presented. Not all areas need to be covered in every case nor were they in this study. The particular situation dictates the depth of the probe.

The Inquiry Into Administration

Interviews begin with the general manager. Focus here is on administration of the total company. To put him at his ease initially, he is asked to describe his business and to identify the major opportunities which he perceives as well as the major obstacles in the way of his company's progress. He is asked in what particular respects he anticipates that his business will shrink or expand. After this general background is developed other more specific areas are probed. Below are the areas covered.

- A. It is assumed that a prime function of the chief executive is to give overall direction to the company not only conceptually, but in clearly stated, coordinated, purposeful objectives and plans and schedules of work as well. Lacking such direction the company tends to react to whatever pressures are currently most acute. Thus, questions are asked to discover if the manager has a clear concept of the firm's objectives, what direction is being given, how it is expressed and how the

stated purposes of the business could be achieved. Questioning in this area provides some measure of the degree of genuine management leadership being given to the company.

- B. The next area explored is the growth experience of the company and particularly the degree to which the general manager understands the pattern. He is asked, therefore, for some of the records of growth in sales, assets, and profits on sales; as a check on the health of this growth, he is asked about the returns on invested capital. If the general manager is unsure of how well or poorly the business is doing with respect to these factors, he may be assumed to be in need of help in the development and use of adequate records to guide management decisions. This lack is one of the prime causes of collapse of small businesses.
- C. A further indication of a manager's understanding of his function is what he knows of the advantages and disadvantages inherent in his company's present location in relationship to its market, its relations with the community and the local government, as well as other external factors which affect his firm's ability to do business. For example, poor location of physical facilities with respect to the market they are designed to serve increases the vulnerability of the firm to competition; mounting costs of utilities such as sewerage or fuel, or mounting burdens of local taxation can threaten a company's ability to survive. It is important that the general manager be aware of these pressures and even more so that he is actively compensating for them. To the extent that he is not he needs help in developing the tools necessary to make these assessments.
- D. It is a matter of concern throughout business that managers are seldom well-trained to perform their functions. Frequently they must learn the unique skills of their office on a trial and error basis. General management calls for a different kind of

management understanding than does the direction of any particular function within the business. Thus, questions are asked to discover how the general manager actually manages the company through his subordinates, about his relationship with his peers, and about his contacts with his board of directors. What is his grasp of each major function which the company performs and has he distinguished which of these are most in need of assistance? Questions in this area measure his breadth of understanding of the firm's operations and the answers indicate whether or not he is really functioning as a general manager or as a department head occupying the front office. Weaknesses in this area suggest that help can be given to improve the caliber of general management direction.

The Inquiry Into Sales

Turning to the sales function, many questions can be used to explore the responsible executive's grasp of the problems and opportunities implicit in marketing. Initially the sales executive, frequently the general manager in small firms, is asked to describe the method by which sales are affected and how sales and production, when appropriate, are integrated. After this initial description, other more specific areas are explored.

A. Assuming that the sales executive should have a firm grasp of his total sales opportunity, can he give an authoritative description of the size of the total market in which his products are entered? Does he know his present market share and what share might be possible in view of the strength of competition and other restricting factors? Does he know whether his market is likely to shrink or grow? Is he guided in his efforts to expand sales by some specific assessment of his present customers, as well as how his products and services stack up against those offered by competitors, or does he lack a coordinated understanding of his market in these

terms? Where such an understanding is deficient, another area for teaching assistance is identified.

- B. Another area explored is the degree to which the sales effort is tied in with other company concerns such as production, finance, personnel development, distribution, etc. Is the sales effort being directed by a superpersonal salesman who does not have a grasp of the total business, or is the function well integrated with other departments? Thus, the sales executive is asked to describe his budgeting and sales forecasting procedures; how he establishes prices; how sales expenses are controlled; in what way he measures his relationship with the trade; what controls exist over levels of inventory of finished goods. Questions in this area uncover the need, if it exists, for giving the sales manager broader understanding of business functions.

The Inquiry Into Production

Production processes carried on by local farm supply firms are usually limited to feed mixing or fertilizer blending. However, if all physical handling and warehousing operations are included in this category, production represents an important segment of the total business. New equipment and improved operating methods place tremendous pressures on all existing production processes. It is important to assess the flexibility and innovation evident in the direction given to these processes. With respect to the products themselves, it is important to know whether the firm is operating on the premise that its self-imposed standards with respect to kind and quality of product automatically assure business or whether the firm places its emphasis on defining consumer needs and then building product or services to meet these. Hence, the following specific areas are explained.

- A. In terms of cost, how effectively is the existing productive capacity being used? Knowledge of the present degree of utilization of capacity, the trend of major

manufacturing or handling costs over the last few years, and the methods of coordinating sales and production through specific production planning measures which control the flow of product or service and the maintenance of inventory levels is important. If production is not being so managed, the company is in danger of being overextended in investment or rendered noncompetitive by excessively high costs.

- B. Production management can be a seat of the pants effort or can be based on a thorough understanding of the function. Questions about programs of work, method studies, quality control measures, regularly scheduled maintenance as well as costs of warehousing, storage, and internal transportation help identify needs and weaknesses in the production management area.
- C. One of the evidences of vitality of a company is its degree of interest in diversifying and updating its products and services. This has been characterized by some as "healthy dissatisfaction." Questions relating to the history of product changes and the present extent of new product research suggest the spirit of inquiry which exists within the company. Recovery of capital investments over the past several years as well as estimates of the degree of obsolescence of existing plant and equipment suggest how up-to-date production processes and equipment are. When evidence of this overall vitality does not exist, an additional educational need is uncovered.

The Inquiry Into Personnel

The degree of purpose and plan that may be evident in a company's utilization of human resources and its acceptance of the need for concern with this factor is important evidence of its management sophistication. A company's ability to survive profitably is influenced considerably by the spirit among its employees and their dedication to the company's purposes. The executive responsible for personnel administration is asked, initially, for a description of the employees. This will lead to the discovery of how

effective the personnel records are and how sharp the interest in management is. He is asked about the availability of labor at this particular location and the degree of skill necessary to keep the business going. With this background a group of specific questions is probed.

- A. The first questions are based on the concept that human resources should be directed rather than reacted to on the spur of the moment recognition. Thus, questions relating to the effectiveness of the labor force as compared with that of other companies and the effectiveness of its supervision are raised. It is important to know whether the personnel factor is a real concern of management and if so, how much time is spent on it. What kind of a plan is there for promoting good people within the organization? Is there a performance appraisal system and how is it used?
- B. There should be some evidence of purpose in selecting, training, and placing personnel. The routine by which people are recruited, appraised, and placed is scrutinized. A description of training and development programs and how these are conducted is asked for.
- C. In the area of compensation, evidence that the personnel manager understands that this is a major investment is sought. For example, are there incentive programs and, if so, are they designed to induce the kind of behavior the company wants? Do the employees know this? What are the compensation programs? What fringe benefit programs are there? Are they designed to assist the company achieve its purposes? How do compensation programs compare with those of competitors in the community?
- D. Some degree of union-management cooperation is vital to the company's survival if the employees are organized. Thus, for a union firm, details on the union's organization, the contract, and an assessment of the climate in which union-management relations are conducted are probed.

- E. It is important to discover whether a manager understands that the organization structure itself costs money and directly influences the results achieved by the business. Thus, it is pertinent to discover how recently the organization's structure has been changed, whether there are job definitions published, whether the various responsibilities have been discussed with all management, and whether there is evidence that the various functions of the company are recognized and understood.
- F. Finally, it is important to know which function within the business makes the most and the least use of the personnel function or shows the greatest or least understanding of the need for using human resources wisely. Whether or not the general manager knows this is a clue to company education needs.

The Inquiry Into Finance

A primary concern in any business organization is the chief financial executive's degree of understanding of the use of the company's money. It is also desirable to probe for evidence that the rest of his management associates, if he has any, are calling on his financial know-how in making decisions affecting the course of the business.

- A. A first question area relates to the types of cost records and cost analyses used, whether there is understanding of the concept of standard costs, and what kinds of measures of variation in costs are utilized. The way in which income and expense are predicted is an indicator of the degree of sophistication in financial management practice.
- B. A second set of questions explores the lines of credit open to the company and whether it is in a sound position to expand its cash resources if the need should arise.
- C. Questions are asked about the company's alertness to the value of money--whether, for example, discounts are claimed when available, whether an adequate cash flow is maintained, and whether there is evidence of earmarking current revenues for

replacement of facilities or equipment. In this area, the degree of the manager's understanding of the vulnerability of the company's cash position is assessed and evidence that sufficient financial planning had been done so that the company will not be caught short is sought.

- D. Finally, probes are directed to determining whether or not the personnel concerned with accounting are well informed and currently trained, and whether the accounting processes and equipment are up to date are made.

The Inquiry Into Procurement

A particularly critical area with farm supply firms is the matter of procurement. The money and time invested represent a substantial part of the total business activity. Thus, the degree to which the person responsible for purchasing understands the significance of this service to his company and the degree of control over the cost of purchases which he is able to exert have major impacts on profitability.

- A. At the outset the appropriate person is asked to describe the suppliers and the company's relationship with them. Of particular interest is the time spent in selecting suppliers and how frequently their performance is reviewed. What evidence is there of a favorable relationship with suppliers and how dependent is the company on them?

One indication is the component of the company's profit and loss statement represented by the cost of materials.

- B. Questions relating to how the purchasing function is handled are asked: whether purchases are made on a contract or spot basis, whether there is some precision in the specifications to guide buying, whether there is some evidence of value analysis in buying, and whether the purchasing executive consciously weighs whether or not materials and services should continue to be bought outside or performed within the business.

C. Internally, questions designed to uncover how the purchasing function is tied with other functions of the business are asked. For example, what relationship is there between purchasing and production and/or the finance functions? How much freedom does the person responsible for purchasing have in committing the company to purchases? These inquiries provide an opportunity to assess the weight given the function.

It is clear that the questions suggested are by no means inclusive. Other questions will arise as a direct result of those asked. The primary purpose throughout the inquiry is to discover evidence in the respondent's conduct and answers of specific needs for management training. To the degree that there are either blind spots or lack of information concerning key management functions, educational needs can be identified and/or clarified.

The Results of the Assessment

From an assessment based on the preceding outline, 23 significant management problem areas were most frequently identified. To confirm the diagnosis or reject it, the preliminary findings were circulated among major regional cooperative and proprietary corporate organizations and university-based educators interested in the management field. The respondents were asked to indicate their points of agreement or disagreement with the findings based on their own experience and to suggest problems which may have been overlooked. They were also asked to rate the 10 problem areas they consider most important. There was general agreement with the diagnosis. The problems presented below represent a consensus and consolidation of the top 10. They are not necessarily in rank order because many respondents did not rank the top 10.^{1/}

^{1/} For a summary of all 23 problems, see Appendix A.

First, and in many respects probably the most critical, is the almost total lack of planning by managers of local farm supply organizations. In this is included long-range planning which can involve the next 5 to 10 years, and short-range planning which may simply involve developing a budget for the next operating year. This area was the one most frequently marked as an important problem by the respondents. It is conservatively estimated that less than 10 percent--most likely 5 to 6 percent--of managers of farm supply firms develop any formal operating budget.

To be sure, a certain amount of informal forecasting is done. Facilities must be built, operating capital must be borrowed, and these things require some estimate of future events. Yet there is little evidence of any established procedure for weighing alternative investment choices or disciplined analysis of the probable income flow from the proposed project. These decisions are frequently made in reaction to the events of the moment. Thus, examples of new facilities which are obsolete almost before they are put to use or which have too much or too little capacity with the passage of time are manifold. Examples of firms strapped for working capital because of inadequate planning are likewise easily found.

"Seat of the pants operations" seem to be a tradition in rural America as well as with a surprising number of seemingly more sophisticated regional and national organizations. In spite of the fact that in recent years a large amount of written material has become available on planning and that a number of extension services and regional organizations are actively engaged in educational work in this area, the degree of application and understanding remains low. It seems that the idea of planning is difficult to sell.

The second clear weakness in farm supply management operations is the fact that records are not devised in a way that the local manager finds convenient to use and in many cases they were not sufficiently understood by him to become a part of his daily

operations. This discovery is consistent with the lack of planning evidenced. Records can be used to measure the performance of a business, but there must be a clear prior idea of what performance is wanted. Good performance is usually measured in terms of the achievement of some desirable objective--and the identification of an objective is usually associated with the act of planning. Thus, those who have not been actively involved in planning their operations usually do not have an objective basis for measuring performance and are not interested or even aware of the usefulness of records for this purpose. This general lack of interest extends in some cases to the balance sheets and to the profit and loss statement. It was clear in a number of cases that managers had not consulted these statements for some time even though they would be expected to be constantly referring to them. In many cases they saw records as necessary evils associated with making out income tax returns or, additionally, in the case of cooperatives, the distribution of patronage refunds, and that is all they saw in them. In the case of cooperatives, directors frequently had difficulty interpreting the firm's balance sheets and profit and loss statements when they were placed before them.

Another area of weakness is the management of accounts receivable. Managers often are too preoccupied with maintaining the goodwill of their customers or patrons and not enough with the impact of their credit extensions on the ability of the firm to survive. No one likes to play Uncle Shylock, but few local organizations are organized to function as credit institutions and consequently many fall far short of adequate credit management. The life of the organization is thereby endangered. This is not to say that the extension of credit should be discouraged; it can be an effective competitive weapon and can provide additional income to the firm. But it must be properly managed.

It is evident that there is much to be desired in regard to price consciousness of local managers, even though there might be some constraints on the kinds of actions

they can undertake with regard to pricing at the local level. There is need for additional research in this area. Managers must develop a greater interest in the impact of alternative pricing policies on their firm's net margins, as well as on its competitive position. The usual response to questions regarding how prices were established was that they were designed to "meet" competition. This response is difficult to interpret since the competition was not always clearly identified. Furthermore, the assumption that competitors, whoever they were, always had the right price for the particular item in question was also disturbing. There is at least a remote danger that a particular competitor could be leading the parade over a cliff.

There is little evidence that local managers recognize the impact of product mix on the net margins of the operation. Long established practice seems to be the frequent and uncritical criterion for stocking and promoting particular lines of merchandise. It is recognized, of course, that there may be marketing interdependence among various product lines and that the sale of some low-margin merchandise may increase the sale of other high-margin merchandise. But the willy-nilly selection of items to be stocked without reference to the contribution to earnings tends to jeopardize the existence of the organization.

It is evident that many local managers lack skills as marketers. This, of course, is related to their shortcomings in their pricing and product mix areas. Few local managers grasp the fundamentals of market research, merchandising, and promotion. This research need not be as sophisticated as that carried on by large corporations or public and private universities. But questions designed to identify customers or patrons in the market area served, their needs, the firm's market share, and the like would be extremely helpful. As the marketing job becomes more complex, decisions must of necessity be based more and more on objective evaluation techniques and less on happy accident or intuition.

It is clear from the field studies that there is a lack of basic management "set" among many local managers. Few are interested in the processes of management, such as delegation, control, job description, policy definitions, and other devices by which managers cause work to be done. Many managers become managers because they were capable of doing more physical work than anyone else in the organization. Since they attribute their success to hard physical work, they are extremely reluctant to be caught in a sitting position for fear that someone might think they are not working. It is recognized, of course, that some organizations are so small that the manager may, of necessity, be involved in physical labor. However, in many cases managers are doing work that someone else, probably paid less, could do just as well. By definition, a manager is one who gets results through others. Management is, except in the most unusual cases, a full-time job. Clearly the concept of planning the effective use and scheduling of their own time was not widely understood by managers.

Closely tied to the above is a lack of creativity and innovativeness among local managers. Most are intuitively familiar with their business, but not many are probing for better results or for new approaches to continuing problems. This may stem from an inherent lack of curiosity about the business itself. This is less evident at the corporate level or at the central cooperative management level where there seems to be an eagerness to explore.

Cooperative organizations need to develop better communications and rapport between the manager and the board of directors. Some managers lack the techniques necessary to make effective presentations to their boards and some simply are not interested. This is compounded by the fact that many directors of local cooperative organizations bring no particularly relevant management skill or managerial understanding to the affairs of the cooperative business. This is true even though they may be successful in the operation of

their own farms. In most cases they lack an understanding of the board's function and the extent of its authority in managing the cooperative's affairs. This results in friction with the manager and can greatly reduce the reflex time for the organization. Often the proprietary or corporate franchise manager is able to introduce new methods and new concepts more quickly than is the local cooperative manager who cannot proceed without approval of the local board. This is not to suggest that the board should be proscribed or otherwise circumvented but rather that it should be kept fully informed, more fully involved in the business, and more effectively committed to the long-term fortunes of the organization.

Appropriate educational materials have been developed for each of the problems outlined above. This material is not unique or all-inclusive. It was developed to provide the instructor with an outline of what the authors considered to be relevant ideas in the specified problem areas. Selected additional references are included in the materials so that the instructor can enrich the offering to suit his own taste.

Clearly there is no one way to develop management education programs. But it does seem that a program must be built on the clear identification of problems and the development of appropriate materials engineered specifically to meet these problems if it is to achieve success. This is the message of this chapter.

APPENDIX A

Management Problems Identified in Farm Supply Firms

The 23 management problems initially identified in this project are listed below.

They are in much the same form as they were when circulated among major regional cooperative and proprietary organizations and university-based educators for comment and criticism.

1. The local supply manager within the family of a major noncooperative company seems to us to have little self-determining influence. We get the impression that he may be overprotected by his central staff and this tends to reduce his innovativeness in seeking out opportunities within the community.
2. We achieved no reassuring answers to our questions probing the price consciousness of local managers. We gathered that they have not studied price formulation theories or the impact of pricing upon the fortunes of the company's profitability. This is one area that we think needs strengthening across the board as a management function.
3. We find little evidence that the local manager recognizes the impact of product mix on the profitability of his operation. He is not able to tell us which products he should order to achieve maximum dollar returns. Long established practice seems to be a frequent and uncritical criterion for stocking and promoting particular lines of merchandise.
4. Management of accounts receivable and of credit generally is a particularly sensitive point. Some major companies are distressed by the inability of their local managers to show objective judgment in this area. Local managers themselves seem exclusively preoccupied with the goodwill of the community which they serve rather than with the impact of their credit extensions on the ability of the company to survive. There is a real need to give accounting management education--not as bookkeepers--but

in terms of understanding the impact of management decisions upon the company's financial fortunes.

5. This lack of credit appreciation is paralleled by insufficient understanding of financial statements generally. We don't think that the balance sheet or profit and loss statement or any of the other records usually available to these managers are adequately used--or understood. In many cases, the manager was unable to give us an immediate reading on the business, where we might have expected him to be instantly conversant. It was evident that he had not consulted his statements for some period of time.
6. There is little understanding of budgeting or planning. We think the two should be developed concurrently as matters of essential concern to these managers. Skill in this area alone would furnish the means for closer rapport with other echelons of management and with their boards of directors.
7. There is insufficient understanding among managers interviewed of the value of planning one's work. Instruction in the effective use and scheduling of their own time would, in our judgment, be rewarding.
8. We detect insufficient innovation or creativity. Most of the managers we have seen are intuitively familiar with their respective businesses but do not appear to be probing for better results or for new approaches. There is an inherent lack of curiosity. This is not so at the corporate level or at the central cooperative management level where there seems to be an eagerness to explore. However, this does not get translated into action at the local level.
9. There is insufficient interest or skill in inventory management. Various conversations made us believe that there is appetite for information concerning inventory control but at the moment neither the records nor the management of inventories satisfies us.

10. We would like to see much more purposeful measurement of the market potential of the areas served by the local suppliers. Not only are they unsure about the total market for their existing products or services, but they do not show sufficient zeal in exploring new opportunities. There are exceptions to this observation, and these are fortunately still recognizable by their entrepreneurial interests. A good example of the lack of market information is in the propane field. We have yet to meet a local manager who can tell us just how big a market this is.
11. We detected insufficient understanding by local managers of the need of establishing their own lines of succession. This void is being filled in part by central management recruiting new graduates at various universities and putting them on training programs for later delivery to local outlets. However, there seems to be only a passive interest in the need for creating a reservoir of followup management within the company. The necessity and process for doing so should be taught.
12. Managers of cooperative outlets and others express a general attitude of only passive interest bordering upon resistance to the need for working with central management representatives or boards. This is an attitude on the part of the manager which precludes optimum realization of the strength available to him through these advisors. We would like to see a greater desire to manage these inevitable relationships.
13. We would like to see cooperative managers trained to work more effectively with their boards of directors. For example, they do not seem to have the techniques necessary to make effective presentations to their boards. On the other hand, the directors should be educated to discharge their responsibilities, particularly in giving appropriate support to their managers. While each of the major cooperatives is now doing some work in this respect we think that their efforts can be further strengthened and supplemented. Courses in the effective utilization of each other's contributions

- by directors or managers could be offered. The principles which would be enunciated would be of equal value to local managers and regional managers who bring them services from central headquarters.
14. Despite the work already done by some of the companies, there is still lack of basic management "set" on the part of many of the local farm supply managers we have met. Thus, they are not immediately interested in the processes of management such as delegation, control, job description, policy definitions, and other devices by which the manager causes the work to be done. We feel that a basic course in management processes is necessary.
 15. It was evident to us in most of our contacts that records are not devised in such fashion as the local manager can immediately use--or, alternatively, they are not sufficiently understood by him to become a part of his daily operation. Since lack of adequate records is one of the major causes of failure in smaller businesses, it is urgent that these managers be taught to recognize the control points of their business, and what information is needed on a recurring basis to insure that these checkpoints are always under scrutiny. There is a tendency to regard records as "after the fact" or historical bookkeeping chores rather than investments in sound management.
 16. We would like to see the local manager made freer to make profit-influencing decisions. We sense a passivity which is likely encouraged by central control in whatever form. We would like to see a manager given more freedom to commit himself meaningfully on behalf of his own operation and on behalf of the company. But we recognize that this must be a reflection of considerably increased management sophistication on his part and increased confidence in him expressed by his central management people.

17. We are sufficiently concerned about this lack of adequate intreprenurial opportunity by the local manager that we propose to make a comparison between the attitudes and the results of a successful independent operator and a successful "team man."
18. There is little understanding of the need for capital budgeting on any long-range basis. We find that this is essentially a "seat of the plants operation" at the local level and that predictions seldom are made with any precision for more than a year ahead. Greater skill in this area could help the profitability of the local distributors to a considerable degree.
19. While we would not want to diminish in any way the rapport that the truly successful distributor appears to develop with his farmer customers and which is essentially a reflection of personal art or skill, it is evident to us that there will be greater demand for a somewhat more scientific approach to the services provided. Thus, we think that considerably more stress must be placed on technical knowledge concerning the services and range of products offered, and courses should be devised to assist the local manager to get this knowledge.
20. We should work with local managers to help them develop skill in reporting their ideas and recommendations up the line, whether to boards or to central management. It appears that they need more skill in formulating their ideas and expressing them in report form so that decisions can be made to better reflect the judgment and experience of the local manager. This is not now done by the degree we believe it should be.
21. There is insufficient understanding of the impact of public relations upon the fortunes of the company, although we recognize in the attitudes and values of several individual operators an intuitive feel for the need of maintaining sound customer relations. However, we feel that as the local organization becomes larger it will not

be sufficient to rely on this intuition and that more sophisticated approaches to public relations planning will be needed.

22. Increasingly, it will be necessary for the local manager to be a skilled marketer. We believe that he should be taught the fundamentals of market research, merchandising, and promotion. In many cases, he is already a successful personal salesman; but, again, because of the growth in size and complexity of his operation, he will need greater general management skills in marketing. He should be able to utilize the various media available to him with skill and decisiveness rather than by happy accident or intuition. We would like to see more alertness in marking down his inventory at the shelf price level occasionally as department stores are able to do so skillfully. This is but one aspect of a marketing course which we believe he needs.
23. Increasingly, as the investment of the local outlet in facilities and diversified product lines increases, we believe the manager should become more familiar with real estate management. The investment in his own outlet, his location, and his property will be increasingly substantial. He should be aware of this as an investment to be managed, and we do not believe that he now has sufficient understanding of this concept.

CHAPTER IV

FINANCIAL ANALYSIS

Concurrent with the work described in the previous chapter a financial analysis of firms operating in the farm supply industry was undertaken. It was designed to identify relevant financial indicators that could be used by educators and managers in assessing the relative financial strengths or weaknesses of farm supply businesses. This chapter reports on this analysis and describes a relatively simple financial control system that derived from it.

Method of Analysis

In the analysis that follows the standard operating statement and balance sheet ratios designed to measure liquidity, solvency, efficiency, and profitability were calculated. While the 16 ratios considered below are excessive for practical use they were studied to determine whether any one or group were clearly superior as indicators of financial performance for farm supply firms.

For purposes of analysis, 79 firms were selected.^{1/} Data on each firm, covering 5 years of operations, was derived from audit reports. The firms were divided into 3 product groupings:

- Firms with two-thirds or more of their sales in petroleum and related products were classified as petroleum firms.
- Firms with two-thirds or more of their sales in feed, seed, and related products were classified as feed and seed firms.
- Firms were placed in a combination group if they sold petroleum, feed and seed, and related products but if no one of these classifications represented two-thirds of the sales.

^{1/} All firms were cooperatives.

Moreover, firms within each product group were selected to represent either "most profitable" or "least profitable" operations (as reflected in net operating margins and returns on net worth).

Table 4.1 shows the sample composition of firms. The number of most profitable and least profitable firms in each of the three product categories are roughly equal. However, in terms of sales volume the concentration is heaviest below \$800,000. This is logical since the majority of firms in this industry have sales volumes in the neighborhood of \$300,000 to \$400,000.

Table 4.1
Sample Composition

Sales Volume (.000)	Petroleum			Feed and Seed			Combination		
	Net Operating Margin			Net Operating Margin			Net Operating Margin		
	No. of Firms	7.00% &Above	Below 7.00%	No. of Firms	2.80% &Above	Below 2.80%	No. of Firms	3.50% & Above	Below 3.50%
\$000-200	9	4	5	5	2	3	0	0	0
201-400	9	4	5	8	3	5	8	2	6
401-600	6	4	2	0	0	0	8	6	2
601-800	6	4	2	1	0	1	6	5	1
800-1,000	2	1	1	1	1	0	4	1	3
1,000 +	1	0	1	3	3	0	2	1	1
TOTAL	33	17	16	18	9	9	28	15	13

Table 4.2 summarizes selected operating statement data for firms in the three product groupings. Several conclusions can be drawn:

Table 4.2
Comparative Median Operating Statement
Values of Farm Supply Firms

	Petroleum		Feed and Seed		Combination	
	Most profitable (n = 17)	Least profitable (n = 16)	Most profitable (n = 10)	Least profitable (n = 8)	Most profitable (n = 14)	Least profitable (n = 14)
	-----percent of total sales-----					
Sales	100.00	100.00	100.00	100.00	100.00	100.00
Gross margin	23.60	20.22	18.43	17.66	21.85	18.90
Merchandising expense .	8.22	11.41	8.90	9.80	10.93	11.06
Merchandising wages .	5.57	8.00	6.44	6.95	6.94	7.93
Administrative expense .	3.00	3.16	2.25	3.39	2.59	2.62
Manager's salary . . .	2.33	2.40	1.66	2.59	1.58	1.56
Net operating margin . .	8.68	4.01	3.49	0.12	4.49	1.76

1. Gross Margins--total sales less cost of goods sold (including losses from shrinkage, theft, or obsolescence) divided by total sales--were consistently higher in the "most profitable" firms. Gross margins are affected by prices received for merchandise sold, the particular combination of products handled, and the net prices of goods purchased for processing and/or handling and "leakage." Evidently, managers of the "most profitable" firms controlled these variables effectively.
2. Merchandising Expenses--wages, commissions, truck expenses, and advertising divided by total sales--were uniformly lower on a relative basis in the "most profitable" firms. Table 4.2 indicates that differences occur primarily in merchandising wages. Less profitable firms probably are underutilizing their labor force. This conclusion suggests a need for careful evaluation of total labor requirements and adequate labor supervision.
3. Administrative and General Expenses--heat, lights, power, manager's or owner's salary, and other expenses not included under merchandising expenses, divided by total sales--were also lower in the most profitable firms. The manager's salary is the largest

item under administrative expense. Only in feed and seed firms was the manager's salary as a percent of sales relatively lower in the most profitable firms.

4. Net Operating Margins--total sales less cost of goods sold, merchandising expenses, and administrative and general expenses, divided by total sales--from 2 to 30 times higher in the "most profitable" firms as compared to the "least profitable" firms studied. This result was due to effective control of factors influencing gross margins and merchandising expenses.

Table 4.3 presents a summary of balance sheet - operating statement ratios designed to measure the liquidity, solvency, efficiency, and profitability of the three categories of farm supply firms. It also includes average total dollar sales for each category:

Table 4.3
Comparative Median Financial Ratio Values of Farm Supply Firms

	Petroleum		Feed and Seed		Combination	
	Most profitable (n=17)	Least profitable (n=16)	Most profitable (n=10)	Least profitable (n=8)	Most profitable (n=14)	Least profitable (n=14)
Liquidity:						
Current ratio	6.3	3.3	4.6	2.9	4.3	2.5
Acid test ratio*.	4.6	1.7	2.7	1.2	2.3	1.3
Working capital/sales	32%	21%	17%	16%	22%	16%
Solvency:						
Net worth/total assets	90%	82%	76%	63%	90%	76%
Net worth/fixed assets	8.2	3.5	2.8	3.0	3.5	3.3
Net worth/total liabilities.	10.0	4.8	4.3	3.1	9.4	3.3
Efficiency:						
Cost of goods sold/ inventory.	7.3	4.7	7.4	5.0	6.8	5.4
Sales/net worth.	1.2	1.7	2.5	2.1	1.5	1.8
Sales/fixed assets.	10.6	7.0	7.1	7.4	5.4	6.7
Average collection period+ (days).	33.3	33.1	20.8	21.7	25.4	29.9
Profitability:‡						
Net margin/net worth	10.6%	4.9%	10.4%	0.4%	6.7%	3.6%
Net margin/total assets	10.1%	4.4%	8.2%	0.6%	5.7%	2.7%
Total sales dollars	397,468	237,010	227,720	224,106	580,561	584,966

* Cash, marketable securities, accounts receivable under 60 days old ÷ current liabilities.

+ Accounts receivable x 300 ÷ sales.

‡ Net margins exclude dividend payments from outside investments as well as patronage refunds to the firm from related regional organizations.

The current, acid test, and working capital/sales ratios were used as liquidity measures. Such measures indicate whether or not the firm can meet its current obligations. A firm could conceivably be "debt free" but not have sufficient working capital to take advantage of quantity and purchase discounts, to meet emergencies, or even to pay current bills. As can be seen in table 4.3, liquidity ratios for the "most profitable" firms were, on the average, considerably higher than for "least profitable" firms.

The net worth/total assets, net worth/fixed assets, net worth/total liability ratios were used to measure solvency. They reflect the amount of permanent capital requirements for the business supplied by its owners and may suggest whether the creditors or owners are likely to control the firm. From a lenders point of view, they indicate the problems they would have in recovering their money in the event of failure. In this study the net worth/total liabilities and net worth/total asset ratios were considerably higher for the most profitable firms in each product grouping. The net worth/fixed asset ratio was higher for the most profitable in petroleum and combination firms but was reversed in the case of feed and seed firms.

The cost of goods sold/inventory, sales/net worth, sales/fixed assets, and average collection period ratios are commonly used as measures of efficiency. The cost of goods sold/inventory ratio is a measure of inventory turnover and indicates the efficiency with which working capita (tied up in inventory) is utilized. In all cases this ratio was significantly higher among the most profitable firms. On the other hand, high values of the sales/net worth and sales/fixed assets ratios, which measure the intensity with which the owners' capital and the physical facilities are being utilized, were not consistently related to "most profitable" operations.

The other frequently used efficiency measure--average collection period for accounts receivable--provides a rough indication of the amount of annual sales revenue tied up in receivables. Data in table 4.3 reveal that the average collection period for the "most

profitable" and "least profitable" firms does not differ significantly and in the case of petroleum firms was actually slightly longer. This may suggest one of two things: that collection of accounts receivable was not a major problem for the least profitable firms included in this study or that a more precise measurement of the relationship between receivables management and profitability is needed.

Finally, the net operating margin/net worth and net operating margin/total assets ratios are indicators of the overall profitability of the business in relation to the capital invested in it. These ratios provide a basis for evaluating opportunity costs (what could be earned by a similar investment elsewhere) of providing capital to the particular business. If return on investment falls below what could feasibly be earned in another investment over time, capital would be withheld or withdrawn. As can be seen in table 4.3, performance of the "most profitable" firm was from 2 to 25 times better in this area than for the "least profitable" ones.

Also included in table 4.3 are the average total dollar sales volumes. In the case of petroleum and feed and seed firms, the average size of the most profitable firms was larger than for the least profitable ones. This situation was reversed in the case of combination firms. The evidence presented here is too sketchy to base firm conclusions on. There appears to be a clear need for further research into the extent and magnitude of scale economics in retail farm supply operations.

Regression Analysis

Simple regression analysis was used in an effort to determine to what degree changes in the ratios discussed above, excluding those with net margins "built in," related to changes in net operating margins (as a percent of sales), as well as to ascertain whether any one ratio was a better indicator of changes in profitability than the others. The results, are presented in table 4.4

Table 4.4
Simple Regression Analysis Relating Changes in
Net Operating Margins to Changes in Selected Financial Ratios

	Petroleum			Feed and Seed			Combination		
	a	b	r ²	a	b	r ²	a	b	r ²
<u>Liquidity</u>									
Current	5.79	.0003	.0003	1.61	.0313	.0096	2.20	.2970*	.2266
Acid Test	5.62	.0000	.0110	1.42	.1126#	.0372	2.32	.5050*	.2798
WC/SALES	5.53	.1197*	.0400	1.92	-.3903	.0002	1.41	.0011*	.1529
<u>Solvency</u>									
NW/TA	5.44	.0744*	.0484	-4.60	8.6671*	.2450	-4.87	.0010*	.4032
NW/FA	5.35	.2401*	.5373	.26	.4055	.0818	2.15	.5035*	.1267
NW/TL	7.22	.0004	.0019	1.18	.0553#	.0552	4.81	.0868	.0025
<u>Efficiency</u>									
CGS/INV	4.73	.1477*	.0328	1.21	.0612*	.0949	1.15	.3665*	.1406
SALES/NW	5.90	-.0516	.0064	2.94	-.3956	.0276	6.40	-.0510*	.2314
SALES/FA	5.87	.0000	.0000	1.54	.0169*	.0697	4.04	-.0804	.0740
Ave. C.P.	7.58	-.0093	.0055	4.898	-.1606*	.1689	3.96	.0000	.0001

* Significantly different from zero at the .02 level of confidence.

Significantly different from zero at the .01 level of confidence.

Examination of the simple regression coefficients (b's), which measure the magnitude of the change in net margins associated with a unit change in each of the respective ratios, and the coefficients of determination (r^2 's), which measure the proportion of variation in net margin associated with variation in each of the respective ratios, indicates that at best no one ratio is a strong indicator of profitability.

As can be seen a number of the regression coefficients (b's) are significantly different than zero at the level of confidence specified. However, several ratios (WC/Sales, NW/TA, Sales/ NW, Sales/FA, average collection period) had negative signs which would normally not be expected. These were the same ratios that showed "inconsistent" patterns with respect to "most profitable" and "least profitable" operations when median values were compared in the previous section.

It is also clear, as reflected in the coefficients of determination (r^2), that the proportion of variation in net margin associated with variation in any particular ratio is low.

These results are not entirely surprising. A solvent firm need not be a profitable one. The same may also be said of a firm in a strong liquid position. A better showing might have been expected from the efficiency measures, however.

A reasonable conclusion that may be drawn from this section is that a balanced look at the liquidity, solvency, and efficiency areas is required. It is also apparent that some care must be exercised when selecting a ratio as an indicator. Some suspicion is cast on those negatively related to profitability.

Methods Employed in Developing A Financial Control System

As part of the overall analysis of financial performance, informal interviews were conducted with farm supply managers in Minnesota and Wisconsin to determine the control points they considered most important in the operation of their business. These interviews included discussions of accounting information, how it was kept, how up to date it was,

and in general how frequently managers felt the measurements should be examined. Several conclusions were drawn from these interviews:

1. Most managers interviewed looked at monthly sales and compared them to the previous year's sales.
2. Some managers examined liquidity and calculated a liquidity ratio.
3. A few attempted to assess their profitability on a monthly basis.
4. Some at the other end of the spectrum did almost no analysis of their financial records.

In most cases records were poorly kept and managers were not systematic in their approach to financial analysis and control. In general, the very small firms did the poorest job of planning, analyzing, and controlling their financial operations. As was estimated in the previous chapter, less than 10 percent, and more probably 5 to 6 percent, of all managers developed a formal operating budget.

On the basis of the above findings, as well as from findings in other parts of this study, it became apparent that any system developed would have to be fairly simple; if it was not, it just would not be used. While many financial control systems are available, most are too complicated or require more effort than the typical local farm supply manager is willing to exert. What follows was developed with this in mind.

Essentials of a Control System

According to William Newman, there are three essential steps in any control process:

- (1) setting standards at strategic points; (2) checking and reporting on performance; and (3) taking corrective action.^{1/}
- A step-by-step elaboration of this process is as follows:

^{1/} William H. Newman, Administrative Action, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1961, p. 420.

1. Establish profitability centers.
2. Establish budgets for each profitability center.
3. Select the most important control points.
4. Establish operating standards.
5. Make use of the "management by exception principal."
6. Facilitate information flow.
7. Aid the decision making process.

The above served as a framework in setting up a control system to meet the needs of farm supply firms. In developing the system, the assumption was made that firms using it would have enough accounting data available to make up simple balance sheets and income statements. This may not be an entirely valid assumption in the case of some very small firms but the development of an entire accounting system as well as a control system was beyond the scope of this project.

The control system is designed to move step-by-step from basic general ledger information, through simple calculations, to a two-page graphic summary of the major control points in the operation. In selecting the control points the following questions were considered:

1. Is the measure important from the managerial viewpoint as opposed to an investor or lender viewpoint?
2. Is the measure meaningful to farm supply firm managers?
3. Does it effectively present the condition of an important factor in the operation?
4. Does it have real meaning on a monthly basis?
5. Is the measurement "action oriented"--i.e., does it allow easy understanding of the problem and facilitate decision making?

By judging each potential control point against these criteria, several common ratios were rejected (e.g., current ratio, return on total assets) because of their lack of clear meaning or their applicability to monthly use in this industry. The control points ultimately selected were: (1) a measure of liquidity--an acid test ratio consisting of cash, marketable securities, notes receivable, and accounts receivable of less than 60 days divided by the current liabilities, (2) measures of efficiency as indicated by inventory turnover, the average collection period of accounts receivable, and sales per dollar of merchandising wage expense;^{1/} (3) measures of growth and profitability as indicated by sales volume, gross margins, and net operating margin. The use of the average collection period of accounts receivable as a measure of efficiency in spite of its apparent limitations discussed earlier, is based on the assumption that variations in the indicator can have meaningful implications for an individual firm.

Developing Associated Materials

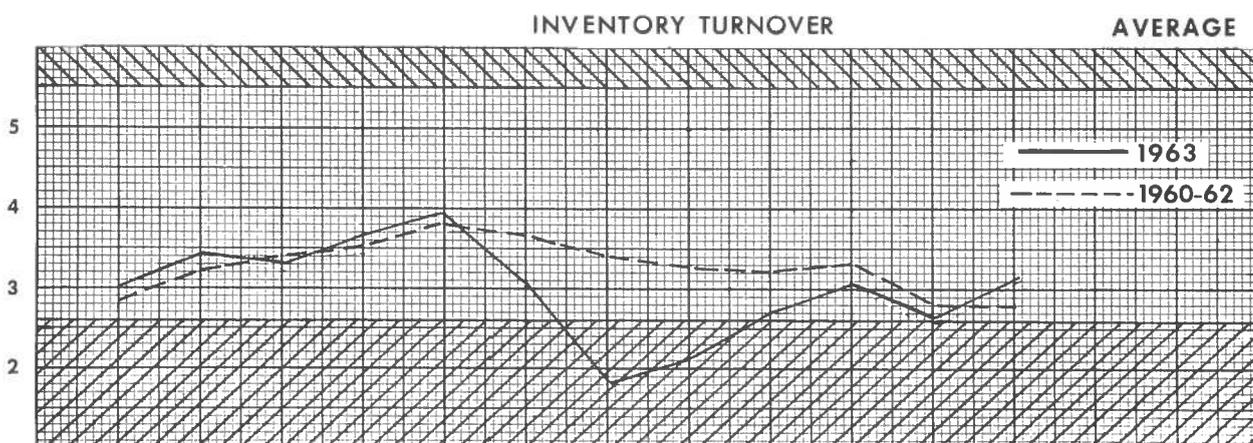
After the selection of the control points was made, the development of coordinated materials to permit computation of the control points was undertaken. To assist managers in determining sales, inventory, cost of goods sold, gross margins, merchandising expenses, and sums available for fixed expenses and profits, basic data sheets in which profitability centers are clearly identified were developed.

Another feature of this system is a method of coding designed to aid the users in completing the necessary bookwork with maximum simplicity. Furthermore, operating standards and the principle of management by exception have been incorporated into the system. The complete system (see appendix 4A) is composed of the following items: (1) a form for a departmentalized breakdown of sales, inventories, costs of goods sold, gross margins, merchandising expenses, leaving a final figure of the amount of money available

^{1/} Sales per dollar of merchandising wage expense is simply the inverse of the merchandising wages/total sales ratio illustrated in table 4.2.

for the payment of fixed expenses and administrative expenses, with net income as a residual; (2) a form for determining the monthly rate of depreciation and the total accumulated depreciation; (3) a comparative operating statement; (4) a comparative balance sheet; (5) a work sheet for accumulating and summarizing all of the data needed for the development of two control charts; (6) two control charts which present the control variables graphically; and (7) a work sheet for inventory calculations.^{1/}

Figure 4.1 is an illustration of one of the graphs presented in the control charts. This one in particular relates to inventory turnover. Several features are readily apparent. (1) It permits easy analysis of a particular facet of the business, in this case inventory turnover, on a monthly basis. (2) It encourages planning and budgeting by the use of operating standards and management by exception techniques. As can be seen, the graph has two shaded areas on it. For example, if after due consideration the manager of a feed and seed firm has set upper and lower limits of six and three inventory turns respectively, should it fall in the shaded area any one month the manager's attention is immediately called to it. Action is called for. If, on the other hand, it never goes beyond the two limits, by using the principal of management by exception he reduces the time spent in analysis of this factor.



^{1/} For the control system complete with instructions to the bookkeeper see R. J. Moeller and F. J. Smith, Jr., "Financial Analysis and Control of the Farm Supply Business," University of Minnesota, Agricultural Extension Service Special Report 17.

The operating standard boundaries are straight. In an industry where seasonality is such a strong factor the effectiveness of a fixed standard is reduced. It would be extremely difficult, however, to design a form for general use that would have a variable boundary line; to compensate for this it is suggested that in addition to the fixed standards, an average of the past two or three years performance is plotted on the same graph. This would provide a basis for comparison which takes seasonality into account.

Problems of Implementation

To arrive at accurate costs of goods sold figures or accurate ending inventory figures a monthly inventory is needed. To require an actual physical inventory each month would likely curtail the use of this system because managers simply will not take the time to do it. Two alternatives to a monthly physical inventory exist. One is the use of a perpetual inventory system with a quarterly physical inventory. The other is to estimate the cost of goods sold (which in this industry usually means the amount of inventory used) by multiplying their average gross margins times the monthly sales volume. Where departmentalization exists, more specific gross margins can be used. A quarterly physical inventory is recommended when using this method of determining inventory levels also. In cases where a few items make up most of the sales, a combination of the two could be used--keeping a perpetual record of the few important items sold and estimating the inventory level of the goods sold less frequently.

Another problem is that of adjusting entries necessary for a completely accurate statement. It seems unrealistic to assume that all managers will take the trouble and time to make the necessary adjusting entries in order to make the books exactly correct. Insofar as they do not, they may get a distorted picture.

On the other hand material is developed in such a way that any reasonably competent bookkeeper following step-by-step instructions can make all of the calculations necessary

and develop the final graphic presentation. If, in fact, the major reason for the lack of managerial control is the time consumed in studying large volumes of data from many sources, then, the system presented above may seem attractive to them.

Summary

In this chapter certain standard operating statement and balance sheet ratios were examined in relation to their applicability to firms in the farm supply industry. Of those ratios which showed a consistent relationship to higher net margins, no one appears to be a more reliable indicator of profitable operation than the others. A balanced look at liquidity, solvency, efficiency, and profitability is required.

In developing a control system which would assist the manager in identifying the trends and magnitude of the most important financial variables in his operation, some accuracy was sacrificed for simplicity. This system, when used monthly should greatly increase managerial awareness of key financial areas in his business. Furthermore, because of its step-by-step development it should improve the financial management ability of many who presently have little knowledge or training in this area.

FORMS AND CHARTS FOR THE
CONTROL SYSTEM

For periods beginning _____
 and _____
 And ending _____
 and _____

Form *A*
 OPERATING STATEMENT

19__ 19__

		\$	%	\$	%
SALES	(C1)				
Less: COST OF GOODS SOLD (CGS)	(C2)				
GROSS MARGIN (GM)	(C3)				
OPERATING EXPENSES SECTION					
MERCHANDISING EXPENSES					
Merchandising Wages (MW)	(A4)				
Commissions					
Truck Expenses					
Supplies					
Advertising					
TOTAL MERCHANDISING EXPENSES					
ADMINISTRATIVE EXPENSES					
Auditing Fees and Expenses					
Directors' Fees and Expenses					
Manager's (Owner's) Salary					
Office Wages					
Office Supplies and Postage					
Telephone and Telegraph					
Travel Expenses					
TOTAL ADMINISTRATIVE EXPENSES					
GENERAL EXPENSES					
Depreciation	(D5)				
Insurance					
Rent					
Repair and Supplies					
Fuel, Water, Heat, Light					
Property Taxes					
Payroll Taxes					
Employee Benefit Expenses					
Dues and Subscriptions					
Miscellaneous Expenses					
TOTAL GENERAL EXPENSES					
TOTAL OPERATING EXPENSES					
NET OPERATING MARGIN (NOM)	(A6)				
Plus: Interest and Dividends Earned					
Gain on Fixed Assets					
TOTAL NONOPERATING REVENUE					
Less: Interest Paid					
Bad Debt Expense					
Cash Discounts					
TOTAL NONOPERATING EXPENSES					
NET INCOME (NI)	(A7)				
Plus: PATRONAGE REFUNDS					
Less: DIVIDENDS AND REFUNDS TO PATRONS					
Less: FEDERAL AND STATE INCOME TAX					
RETAINED INCOME FOR PERIOD	(A8)				

Form *B*
BALANCE SHEET

Financial Position as of _____, 19__ and _____, 19__

ASSET SECTION

		19__	19__
Total Cash	(B9)		
Marketable Securities	(B10)		
Notes Receivable	(B11)		
Accounts Receivable			
Less: All. for Doubt. A/R			
Net Accounts Receivable (A/R)	(B12)		
Inventory on Hand			
Feed			
Seed			
Fertilizer			
Petroleum			
Farm Supplies			
Grain			
Other			
Total Inventory (INV)	(C13)		
Prepaid Expenses			
Other			
TOTAL CURRENT ASSETS (CA)	(B14)		
Book Value of Fixed Assets (D20) + (D21)			
Less: Accum. Depreciation (D22)			
TOTAL FIXED ASSETS (FA)	(B15)		
Investments			
TOTAL ASSETS (TA)	(B16)		

LIABILITY SECTION

Accounts Payable			
Notes Payable			
Taxes Payable			
Wages Payable			
TOTAL CURRENT LIABILITIES (CL)	(B17)		
Mortgage			
TOTAL LIABILITIES (TL)	(B18)		

NET WORTH SECTION

Owner Invested Capital			
Retained Earnings (E26)			
TOTAL NET WORTH (NW)	(B19)		
TOTAL LIABILITIES & NET WORTH			

Form *C*
SALES, COST OF GOODS SOLD, & GROSS MARGIN COMPOSITION

For period beginning _____
 and ending _____

	(R)	(S)	(T)	(U)	(V)	(W)	(X)	(Y)	(Z)
	SALES	BEG. INV. + PURCH.	END. INV.	COST OF GOODS SOLD (S)-(T)	GROSS MARGIN (R)-(U)	% OF SALES (V)/(R)	MERCH. EXPENSES	CONTR. TO FIXED EXP. & PROFIT (V)-(X)	% OF SALES (Y)/(R)
<u>FEED</u>									
Hog									
Poultry									
Dairy Cattle									
Beef Cattle									
TOTAL FEED									
<u>SEED</u>									
Barley									
Beans									
Corn									
Oats									
Rye									
Others									
TOTAL SEED									
<u>FERTILIZER</u>									
Bag									
Bulk									
TOTAL FERTILIZER									
<u>PETROLEUM</u>									
Gas-Bulk									
Gas-Station									
Fuel Oil									
Motor Oil									
TBA									
Other									
TOTAL PETROLEUM									
<u>FARM SUPPLY</u>									
Insecticides									
Chemicals									
Hardware									
Other									
TOTAL FARM SUPPLY									
SUB-TOTAL									
TOTAL GRAIN									
MIX-GRIND. REVENUE									
TOTAL									
	(C1)		(C13)	(C2)	(C3)				

Form *D*
WORK SHEET FOR DETERMINING DEPRECIATION COSTS

The present fiscal year began: _____

This report covers the period beginning: _____ and ending: _____

The number of months that have elapsed during this fiscal year: (A) _____

	(B) Book Value- end of fiscal year	(C) Annual rate of depr. (\$)	(D) Monthly rate = $(C) \div 12$	(E) Book Value of new assets purch. this fiscal year	(F) Annual rate of depr. on new assets	(G) Monthly rate = $(F) \div 12$	(H) Present Monthly depr. rate = $(D)+(G)$	(J) Accum. depr. at end of fiscal year	(K) Accum. depr. on old assets from 1st of new fiscal year to present $(A) \times (D)$	(M) Accum. depr. on new assets= # mos. in use $\times (G)$	(N) Total accum. depr.= $(J)+(K)$ $+(M)$
LAND											
BUILDINGS											
TRUCKS											
MACH. & EQUIP.											
OTHER											
TOTALS											

D20

D21

D5

D22

Form *E*
WORK SHEET FOR CONTROL POINT CALCULATIONS

Step 1. Using the data from the BALANCE SHEET, fill in the following blanks.

(B9) TOTAL CASH _____

(B10) MARKETABLE SECURITIES _____

(B11) NOTES RECEIVABLE _____

TOTAL (E23) _____

Step 2. After aging the ACCOUNTS RECEIVABLE, add all A/R 60 days old or less together and write the total here:

(E24) _____

Step 3. To compute TOTAL QUICK ASSETS (QA), add (E23) + (E24) from above.

QUICK ASSETS (E25) _____

Step 4. Using the data from the BALANCE SHEET OPERATING STATEMENT and (QA) from this work sheet, fill in the blanks below and calculate the indicated ratios.

$$\frac{(E25)}{(B17)} = \frac{(QA)}{(CL)} = \text{ACID TEST RATIO}$$

$$\frac{(C2)}{(C13)} = \frac{(CGS)}{(INV)} = \text{INVENTORY TURNOVER}$$

Step 4 (Con't.)

$$\frac{(B11)}{(C1)} = \frac{(A/R)}{(SALES)} \times 30 \text{ Days} = \text{AVERAGE COLLECTION PERIOD}$$

$$\frac{(C1)}{(A4)} = \frac{(SALES)}{(MW)} = \text{\$ SALES PER MERCH. WAGE DOLLAR}$$

$$\frac{(A6)}{(C1)} = \frac{(NOM)}{(SALES)} \times 100 = \text{\% NET MARGIN}$$

$$\frac{(C3)}{(C1)} = \frac{(GM)}{(SALES)} \times 100 = \text{\% GROSS MARGIN}$$

Step 5. Plot sales and the above calculated values on Control Graphs 1 and 2.

STATEMENT OF RETAINED EARNINGS

BEGINNING RETAINED EARNINGS BALANCE

Date _____ \$ _____

ADDITIONS:

RETAINED EARNINGS FOR PERIOD (A8) _____

DEDUCTIONS:

LOST FROM OPERATIONS (A8) _____

DIVIDENDS OR PATRON REFUNDS PAID _____

ENDING RETAINED EARNINGS

Date _____ (E26) \$ _____

Form *F*
WORK SHEET FOR INVENTORY CALCULATIONS

1. If Physical Inventory is taken at end of Period:

	Inventory at Beginning of Period	_____
plus:	Purchases during Period	_____

	Total Inventory and Purchases	_____
less:	Inventory at End of Period	_____

	Cost of Goods Sold During Period	_____
	Sales for Period	_____
less:	Cost of Goods Sold During Period	_____

	Gross Margin	_____
	$\frac{\text{Gross Margin}}{\text{Sales}} = \% \text{ Gross Margin}$	_____

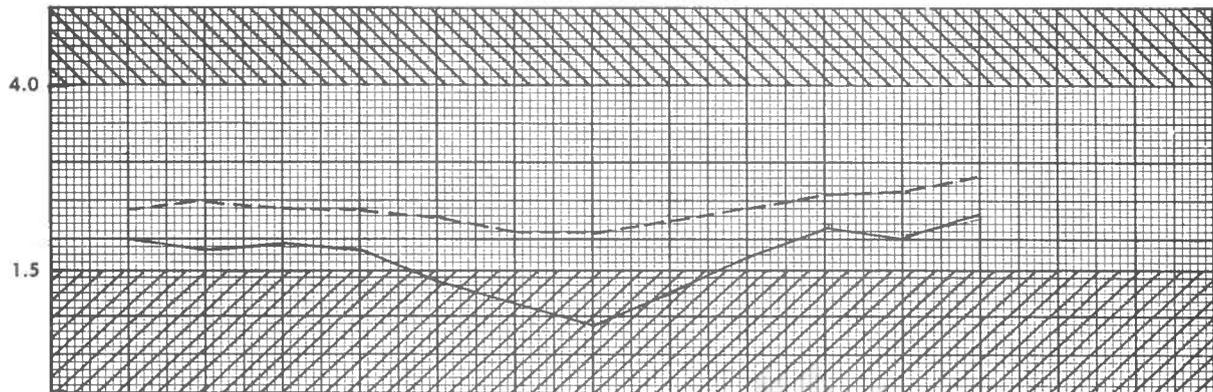
2. If Physical Inventory is not taken at end of Period:

Inventory of Product Line at Beginning of Period	(A) \$ _____
Purchases of Product During Period	(B) \$ _____

Total Inventory and Purchases (A) + (B)	(S) \$ _____
Sale of Product Line for Period	(R) \$ _____
Estimated Gross Margin (%) for Product Line	(W) _____ %
Estimated \$ Gross Margin (R) x (W)	(V) \$ _____
Estimated Cost of Goods Sold During Period (R) - (V)	(U) \$ _____
Estimated Inventory Remaining at End of Period (S) - (U)	(T) \$ _____

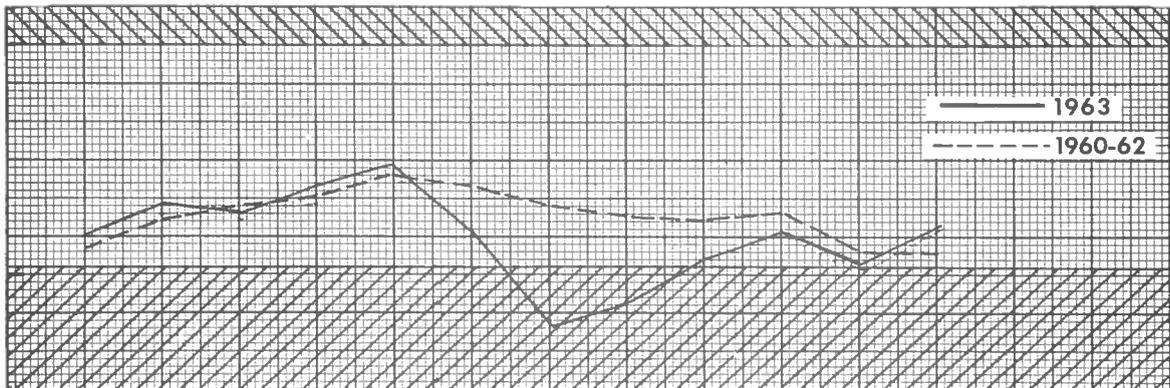
CHART 1 - CONTROL POINTS

ACID TEST RATIO



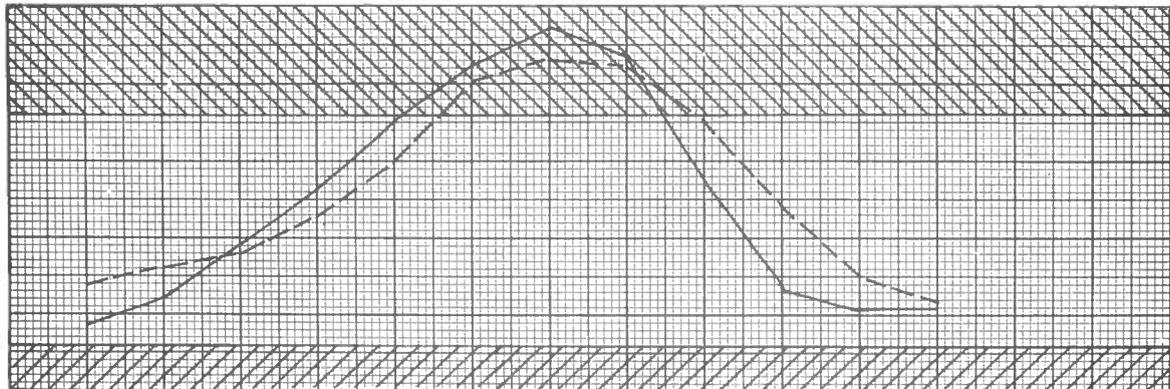
INVENTORY TURNOVER

AVERAGE



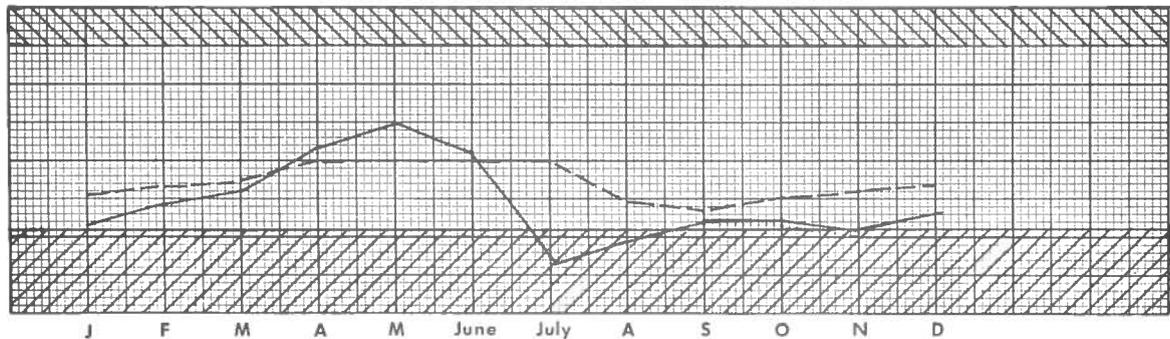
(DAYS)

AVERAGE COLLECTION PERIOD



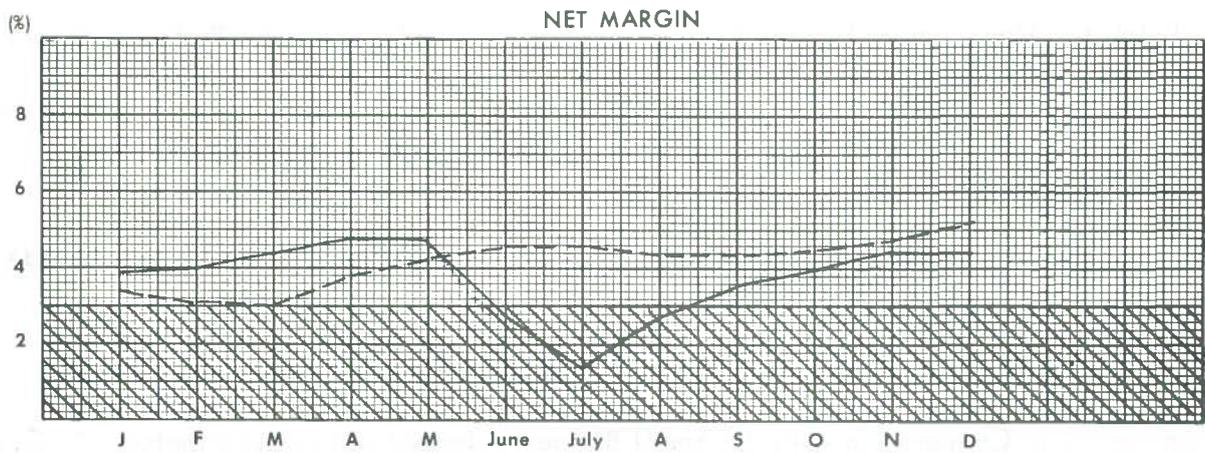
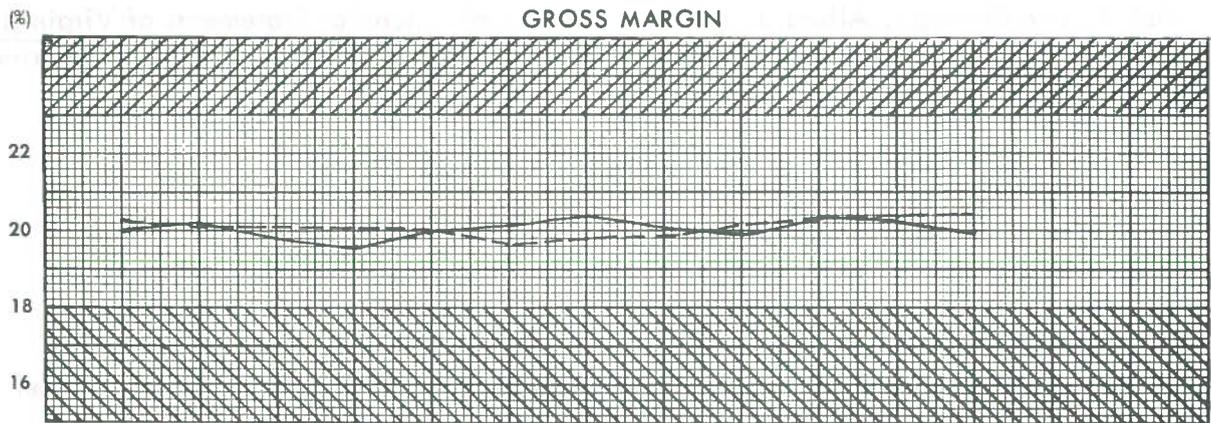
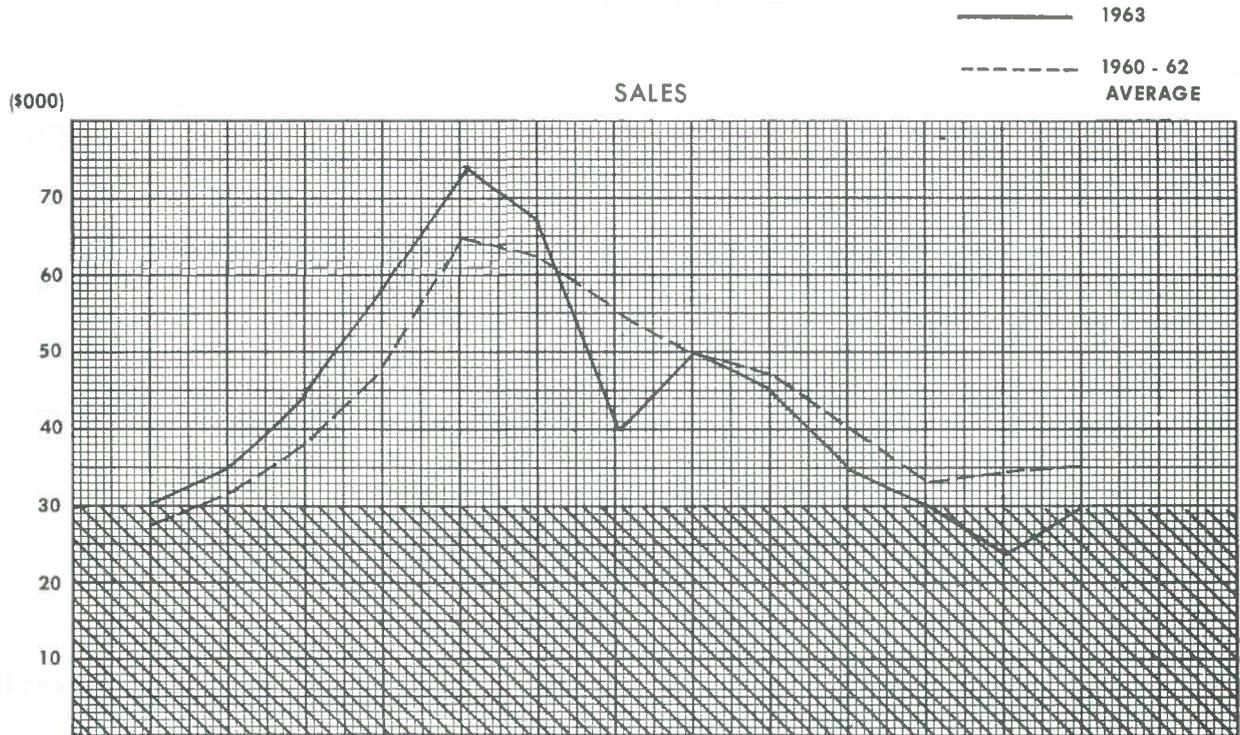
(\\$)

SALES PER MERCHANDISING WAGE DOLLAR



J F M A M June July A S O N D

CHART 2 - CONTROL POINTS



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CHAPTER V

ANALYSIS OF WAREHOUSING OPERATIONS

The U. S. Department of Agriculture has performed a great deal of research in seeking methods of reducing the distribution costs for food products. In particular, many studies have been made of the physical handling of these products at the wholesale warehouse and retail store levels. A primary purpose of this phase of the Farm Supply Project was to determine if the methodology employed by the researchers to improve the physical operations performed in food wholesale warehouses could be advantageously applied to the farm supply industry.

Industry Observations

The farm supply wholesale industry is experiencing a period of rapid change similar to that faced by the wholesale grocery industry within the past 10 years. The problems and opportunities inherent in this current period of rapid change are materially affecting every phase of their total marketing operations. A continued rise in labor costs, increases in the demand for customer services, and a wider variety of products, to mention a few, have forced the owners and managers of marketing firms to seek areas in which operating costs can be reduced.

Observations of several leading farm supply marketing firms indicate that one of the major handicaps to progress in the reduction of operating costs is a noticeable lack of appreciation of the significance of internal costs which burdens the products before reaching the hands of the dealers.

One interesting case which illustrates the importance of internal wastes, is that of a wholesale house which in one year went from a 7-percent loss on sales to a 12-percent net profit. One of the major wastes found was in the number of sizes and varieties in the line. Engineering-economic analysis showed that this firm had accumu-

lated a number of sidelines which could not justify their inventory cost even if the full requirements of all the customers of these items had been sold. It was also found that a great deal of sales time was being spent on customers who were uneconomic to serve because of their small size or because they were largely buying these sideline items. Sales costs were reduced considerably by the simple process of listing all accounts for each of the 27 sales territories and showing for each account the following basic information: City, purchases for two accounting periods, returned goods, markdowns, credit status, number of times called on by salesmen, estimated total purchases from all sources, and estimated total requirements in lines sold. As a result of this analysis, approximately 3,000 of the firm's 9,000 active accounts were dropped.^{1/}

Obviously, it is not possible for all firms in the farm supply industry to achieve such dramatic results. It is possible or more correctly, necessary, for management of these firms to place greater emphasis on cost reduction as a means of improving their competitive positions. There is an increasing tendency for farm supply wholesaling firms to add to the number of lines handled as well as to the number of varieties within each line. Because of the desire to have as wide an assortment as possible to meet the varying demands of customers, a broader and more complicated product line is gradually accumulated. These products burden the efficiency of the operation, with the danger that many items will become unprofitable due to standard markups, slow movement, and obsolescence. The solution to this problem requires the development of unit costs and profit data for each item carried. This information, when related to sales volume, will provide a basis for weeding out lines and items that do not make an adequate contribution to net profit.

^{1/} Lyndon O. Brown. Marketing and Distribution Research, The Ronald Press, New York, New York, 1955, pp. 458-459.

Along with management's lack of recognition of the importance of internal operating costs is the noticeable lack of adequate use of records and forms to effectively measure operating efficiencies within the warehouse. This observation, however, is not limited to the farm supply industry alone. There is an ever-increasing need for wholesalers of all types of merchandise to achieve higher degrees of efficiency in the physical operations of their warehouses.

This need has long been recognized by the food wholesaling industry. Research efforts on the part of individual food wholesaling firms and by the U. S. Department of Agriculture, in cooperation with these firms, have been specifically aimed at cost reductions. Studies of records and forms used by leading food distributors have been made in an attempt to measure operating efficiencies. Other studies include measurement of labor productivity, work quality, and effective plant and equipment use. As an example of the effectiveness of these research programs, studies by the U. S. Department of Agriculture have shown that warehouse labor cost, one of the largest single costs of the food wholesaler, can be reduced considerably through the use of more effective work methods and improved warehouse facilities.

Another observation made of marketing firms within the farm supply industry is the apparent lack of adequate initial facilities planning. An actual example of the experience of one major farm supply firm will serve to illustrate this point.

Several years ago this firm constructed a large, modern, one-story warehouse facility. In order to get an idea as to the amount of total warehouse space needed for the new facility, the company's buyers were asked to give estimates on what their maximum future orders would be for their respective lines. Warehouse space was calculated on this basis with an additional 25 percent added to this estimate to allow for increased volume in the following 5-year period. As it turned out, however, the company

grew faster than the estimates and additions to the warehouse had to be constructed within 2 years. At the present time, the company is still feeling the pinch of a lack of sufficient warehouse space. Several other like examples can be cited, but suffice it to say, firms operating under these circumstances cannot hope to achieve minimum warehousing costs regardless of efforts directed toward cost reductions.

Unfortunately, there are no simple solutions to this problem. However, some of the methods presently used in facilities planning can be improved upon. In firms that do not have a facilities planning department or personnel within the organization capable of performing this function, a joint effort on the part of the company's management directly responsible for the warehousing operation and a reputable outside consulting firm is in order. In this case, it is extremely important for the consulting firm to become thoroughly acquainted with the business in question. This means it must know its marketing operation in detail before making any specific recommendations on plant layout. On the other hand, it is the responsibility of the marketing firm to indicate present and future facility needs in light of its total marketing operation. In other words, in order for the consulting firm to perform an adequate job, it is up to the company to make known its present and future objectives and what part their plant facilities will play in the attainment of these objectives. This is not to say that a pat solution will be found in this joint effort. Changes in the marketing of farm supplies are bound to occur; these changes will affect the firm's facilities needs as well as many other areas of the total marketing operation. But firms who put more effort on facilities planning will reap cost advantages over the long-run.

Differences and Similarities

A number of observations were made of leading farm supply firms in the eastern and midwestern sections of the United States in order to obtain an overview of their ware-

housing operations. During the course of these observations it became evident that a number of similarities exist between the operation of firms in the food and farm supply industries. Although farm supply warehouse facilities differ from food warehouse as to type of business, there are a number of striking similarities in construction and layout. Both are constantly faced with the same basic day-to-day problems of receiving, storing, order selection, and shipping. In many cases, similar work methods and equipment are employed in carrying out these functions. Similarities in order taking procedures are also apparent.

The greatest single difference between food and farm supply wholesalers is in the type of merchandise handled. The large majority of items carried by food wholesaling firms are supplied in fairly uniform case cartons whereas farm supply wholesalers must contend with merchandise of all shapes, sizes, and weights, many of which are not supplied in standardized containers. Farm supply equipment such as shovels, pipes, buckets, wheelbarrows, watering tanks, and large tractor tires, to mention a few, are examples of this. At the other extreme, a large number of farm supply wholesaling firms are forced to carry many small items of merchandise for distribution in less than case quantities; radio batteries, toys, sporting goods, fanbelts, nuts and bolts are examples of some of these items. The many different types of merchandise handled by farm supply wholesaling firms creates a unique set of circumstances whereby operational problems tend to be greater than those faced by food wholesaling firms even though methods of operation and plant equipment are similar. The problems created by this merchandise will be found in all areas of the warehousing function from the time the merchandise is received from the suppliers to the time it is ultimately delivered to the customer. A wider variety of work methods and plant equipment such as storage racks and material handling vehicles are necessarily employed to handle this merchandise. The time required

to fill orders will tend to increase as the bulkier merchandise becomes harder to handle and the small, less than case items, require repacking. The loading operation will be affected due to the increased time required to arrange the various sizes of merchandise in the delivery trucks in a properly balanced manner. A greater amount of time is consumed in delivering the merchandise to the customers, particularly the heavier, more bulky items. Receiving incoming merchandise to the warehouse, in many instances, requires more time and labor than in food warehouses. Stacking such items as wheelbarrows, watering tanks, and piping, requires the use of two or three men so that the merchandise rests securely in place.

Another significant difference observed between the food wholesaling and farm supply marketing firms is that outlets for farm supply merchandise are, generally speaking, considerably smaller in size than the usual outlets for wholesale food products. Many of the outlets for general line food wholesalers include large chain stores as well as medium to large size independent food stores. On the other hand, farm supply wholesale outlets usually consist of many small petroleum, feed and seed, and general merchandise stores located in and near sparsely populated farming communities. This difference is reflected in the greater number of small orders and less than case merchandise handled by farm supply firms which significantly affect the efficiency of the order selection operation. Small orders and orders of less than case items results in selectors using valuable time breaking cases of merchandise and in travel through the selection areas. Order selector productivity increases as order size increases primarily because more time is devoted to selection of merchandise than in travel time from one selection point to another. By the same token, small orders will adversely affect the efficiency of the delivery operation.

Just as order selector productivity increases as order size increases, so will delivery productivity increase as more time is devoted to the actual unloading of the merchandise than in travel time from one delivery point to another.

Application of Methodology

To determine if the methodology employed by U. S. Department of Agriculture researchers to improve the physical operations performed in food wholesale warehouses could be advantageously applied to the farm supply industry, it was utilized in appraising the operation of a representative wholesale farm supply warehouse. During the course of the study it was found that observational and survey procedures and time study techniques, previously employed in food wholesale warehousing studies, could be successfully applied to the farm supply warehouse under study.

Two examples will serve to illustrate how this methodology was actually employed in the study; the first example deals with a combination of the observational procedure and the use of time study techniques and the second example concerns itself with the use of survey procedures.

Order selection operations in one area of the farm supply warehouse were observed and time studies made in fall 1964. Subsequent to this study a number of changes in the operation were made. Several aisles within the area were widened sufficiently to allow passage of the order selector's 4-wheel handtruck. This greatly reduced the travel and selection time previously required by the selector to park his truck in the main aisle, walk down the narrower aisles to the point of selection and return to his truck with the selected merchandise. Merchandise location numbers were attached to the racks; also, since this particular company uses IBM equipment for invoicing an effort was made to place the commodity code numbers of the merchandise in specific sequences on the IBM order copies used by the selectors. This combination of the location numbers on the racks

and the sequential commodity code numbers on the order copies made the location and selection of ordered merchandise easier and more efficient. An effort was also made to place as much merchandise as possible within reach of the order selectors. This has eliminated to a large extent the use of ladders which previously increased order selection time and created aisle blockages. A second time study, conducted in the spring of 1965 showed an average productivity increase in this operation of 23 items per man-hour--a substantial 5 percent.

Another aspect of the warehousing operation under study was that of the warehouse foreman's job. The objectives of this study were to determine the responsibilities placed on the foreman and secondly, to ascertain if his time was profitably spent in carrying out these responsibilities. In order to accomplish this a survey procedure was employed by having the foreman keep daily production records. Since all nonmanagement aspects of the warehouse operation are his direct responsibility, the records were designed to determine time spent on each major function of his particular duties. Because the warehouse foreman's job involves a multitude of functions which require him to wear many hats and be in many different areas of the warehouse during a typical working day, time study techniques could not be successfully applied. Although the production records were not as detailed and accurate as elemental time studies, they do provide an adequate alternative method of time determination. The records were kept by warehouse foremen for a period of 29 working days. The following is a facsimile of the production record used:

<u>WORK PERFORMED</u> <u>WAREHOUSE MANAGER</u>		DATE _____
FUNCTION	TIME	
	HOURS	MINUTES
<u>REMARKS:</u>		

A list of the functions performed as recorded by the warehouse foreman accompanied by the percentage of time spent on each function is as follows:

Functions	Total Time (hrs.)	Percentage of Time Spent on Each Function
Check order flow	94.42	37.38
*Trade show	33.08	13.10
Location shifting	21.83	8.64
Miscellaneous office and paper work	19.42	7.69
Confer with and line up night crew	15.17	6.00
Talk with supervisor	12.00	4.79
Check errors	9.83	3.89
Determine morning work load	9.00	3.56
Inventory checks	8.17	3.23
Supervisor's meeting	4.00	1.58
Talk with survey engineer	4.00	1.58
Check receipt handling	3.67	1.45
Check claims	3.25	1.29
Check order filling accuracy	3.25	1.29
Special project-order flow charts	2.83	1.12
Assist shipping clerk	2.08	.82
Arrangement of grease	1.50	.56
Check on shortages	1.00	.40
Check handling of parcel post orders	1.00	.40
Lube plant	.75	.30
Check on scale and post meter	.75	.30
Check on frozen rail switches	.75	.30
Followup on "R" orders	.50	.20
Read literature	.33	.13

* The percentage of time indicated as "trade show" (13.10%) was necessarily spent in getting merchandise ready for the company's annual trade show which occurred during the course of the study.

An analysis of this data indicated that a large percentage of the foreman's time (12.42%) was consumed on minor, routine details such as assisting the shipping clerk, or on checking, such as the handling of parcel post orders, claims, order filling accuracy, shortages, etc. The production records indicated that a greater percentage of the warehouse foreman's time should have been spent in maintaining overall control of the flow of merchandise through the warehouse and in seeking every possible method of increasing total operational efficiency. This does not mean that the less significant duties shown by the records had to be or could be eliminated. The question was who was to do them. The decision in this case was to hire an additional man to serve as the warehouse foreman's assistant, thus relieving him of these minor duties.

The case study approach has indicated many other areas within the warehouse having operational weaknesses which can be improved upon by the use of more efficient work methods, facility layout, and plant equipment. It has also shown, as in the two examples cited above, that methodology previously employed in increasing efficiencies in food wholesale warehouses can be applied or adapted to fit the needs of farm supply marketing firms.

Projected Analytical Needs

More work needs to be done in this area. As was mentioned earlier, one of the greatest single costs of the food wholesaler is warehouse labor. Farm supply firms, as well as the majority of other multiproduct wholesaling firms are presently feeling the pinch of rising labor costs. The modern emphasis on physical distribution has, in fact, been brought about by the need to reduce costs and to improve customer service.

Storage and transportation costs constitute a substantial portion of the total marketing costs for farm supplies, and such costs have risen appreciably since World War II. Management, in an effort to control these costs, has found it imperative to

devote more attention to the various alternatives available for the physical distribution of its products and to engage in a greater amount of planning for such distribution. Obviously, warehousing costs and transportation costs must be balanced to determine the lowest cost combination. Previous U. S. Department of Agriculture studies of food wholesaling firms indicate that many savings are to be made in general inventory control and in order handling costs, areas of control that have been largely neglected in the past. These potential savings must be brought to the attention of farm supply marketing firms if they are not now aware of them.

In addition to these cost considerations, many new developments in data processing equipment and materials handling equipment have taken place. Properly used, computers can improve efficiency and provide greater control over operations. However, to achieve these advantages may necessitate a revision of the traditional organizational structure to allow close coordination of all phases of the physical distribution system. It stands to reason, therefore, that a continued emphasis on cost reduction efforts and the proper planning and coordination of the physical distribution process cannot be stressed too strongly as a means of improving the competitive positions of farm supply firms. If proper planning and coordination are obtained, not only will efficiencies be realized but the customer will receive better service. And this is the primary objective, or it should be the primary objective, of the entire marketing operation.

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CHAPTER VI

SUMMARY AND RECOMMENDATIONS

The overall objective of this project has been to develop an educational program that can be used by state extension services in their educational efforts related to reducing the costs of distributing farm inputs and increasing the effectiveness of those supplying these inputs.

Summary

As a first step toward developing a "feel" for the farm supply business, an economic description of the industry was undertaken. The findings suggest that the farm supply industry is one of substantial growth in terms of total dollar volume and the kinds of services being offered. On the other hand, fewer firms will be required to handle this increase. Farmers are purchasing an increasing proportion of their production inputs and this trend is likely to continue in the foreseeable future. Fertilizer and feeds seem to be the opportunity products in terms of growth potential. Opportunities in petroleum business appear somewhat more limited and the market for seed appears to have passed its peak.

Regionally, the outlook for growth for the farm supply industry is favorable in every one but the North Atlantic. One challenge confronting the industry is estimating the potential saturation points for major growth items. For example, the industry in the west north central region should be attempting to estimate how long the rapid growth of fertilizer expenditures in that area can be expected to be sustained. The penalty for not doing so will be excess capacity which in turn will result in unstable and costly competitive relationships.

There appears to be a general trend toward regionally based firms providing more direct services to farmers. The total impacts of this on the future of local organizations

is not clear. Direct shipment is easiest to accomplish in the case of highly standardized items such as petroleum and feed concentrates. Unique local feeding operations tied to available local feed crops may dictate local feed processing; peculiar local soil conditions may require local fertilizer blending operations. Service operations and miscellaneous items such as hardware and medicines will also require a local outlet. But it seems reasonable to conclude that every hamlet or small town will not have a farm supply store in the future as has been the case in the past, although there is likely to be one located in the major trade center serving a large geographic area.

A second objective of this project was an assessment of management skills of local managers in the farm supply industry. Consultation with executive personnel of major regional cooperatives and proprietary corporations as well as direct contacts, using auditing techniques, with local farm supply managers revealed 23 recurring management problems. This diagnosis, when circulated to major executives in cooperative and proprietary organization as well as those involved in management education, was confirmed. Top priority problems, for which special educational materials have been developed, include lack of short- and long-range planning, record systems inadequate for purposes of control, ineffective management of accounts receivable, lack of price consciousness by local managers, little recognition of the impacts of product mix on net margins, lack of skill in marketing, lack of basic management "set," lack of creativity and innovativeness, and, in the case of cooperatives, lack of communications and rapport between the manager and his board of directors.

One of the perplexing aspects about the lack of management sophistication at the local level, and in some cases at the regional and national level, is that in recent years much educational material has been developed and a number of business and educational organizations have been actively engaged in promoting understanding in this area. In

spite of this, the degree of application and understanding remains low. This may reflect on the educational techniques employed which on face value seem to have been less than successful in motivating great interest in the management process.

Perhaps sharper identification of needs, recommended in this report, will assist bringing this area into focus. Moreover, traditional lecture techniques are probably not entirely appropriate for educational efforts with "action oriented" management personnel. Finally, of course, even though there has been a rapid growth in educational materials and programs in the management area, many managers at the local level have not had the opportunity or the intensity of exposure required to substantially upgrade their performance in this area. This is particularly true of managers in organizations not affiliated with some regionally or nationally based firm.

Concurrent with the assessment of management skills, an analysis of financial performance of farm supply firms was undertaken. Its purpose was to identify relevant financial indicators that could be used in assessing the financial strength and weaknesses of farm supply businesses. Financial ratios which measured the liquidity, solvency, efficiency, and profitability were examined. "Most profitable firms" invariably had superior performance in these areas than those designated as least profitable. Excluding those ratios with returns built in (e.g., net margin/net worth and net margin/total assets), variations in each ratio were studied in relation to variations in net margins. This analysis showed that variations in net margins are not significantly associated with variations in any particular ratio value. Thus, no one ratio may be considered a more reliable indicator of profitable operations than others. Apparently good management of the liquidity, solvency, and efficiency areas of the business act cumulatively to generate acceptable net return performance.

As a result of the analysis of financial performance a financial control system was developed. It is designed to minimize the amount of time a manager must spend studying data as he attempts to measure business performance. The system moves step by step from basic general ledger information, through some calculations, to a two-page graphic summary of the major control points of the operation. All calculations can be performed by a bookkeeper. If a major reason for lack of interest in controls by the manager is the time consumed developing them, this system may prove attractive.

A final objective of this project was to determine if methodology employed by USDA researchers to improve physical handling operations in wholesale food warehouses could be advantageously applied to the farm supply industry. Since the farm supply industry is undergoing a period of rapid change similar to that experienced by the wholesale grocery industry in the past 10 years, this effort was particularly timely. Increases in labor costs, increases in the demand for consumer services, and a wider variety of products, among other things, have made it necessary for these firms to seek areas in which operating costs can be reduced.

On the basis of studies conducted in several farm supply firms in the east and mid-west, it became evident that several similarities exist between the operations of these firms and those in the food industry. There are striking similarities in the construction and layout of facilities. Both kinds of firms are constantly faced with the same basic day-to-day problems of receiving, storing, order selection, and shipping. In many cases, similar work methods and equipment are employed in carrying out these functions. Similarities in order taking procedures are also apparent. The greatest single difference seems to be in the type of merchandise handled. Thus, the methodology utilized in food warehousing studies seem appropriate for application to the farm supply industry. Furthermore, it is clear on the basis of this study that many of these areas have been and

are being neglected. Major cost savings can be affected through proper planning and coordination of the physical distribution process.

Recommendations

Several areas of research need became evident in the course of this study:

To avoid development of overcapacity, particularly in fertilizer and feed processing, there is need for regional demand projections with particular emphasis on the rate of increase in demand as well as projection of the "saturation level." Some work in this area with respect to fertilizer has been done at Iowa. Such projections should be made for all major farm supplies.

Another area of research need is the identification of relevant local data which may be used in the decision making process of local farm supply firms. Several national economic indicators which may have value to firms selling in national markets are of little value to the local farm supply manager. This may require the development of data on less than a county basis.

Research is needed to identify factors that have direct impact on the size, number, and location of locally based farm supply firms. Such things as scale economies, transportation costs and competitive structure, as well as demand considerations would necessarily be included.

Because more and more farm supply firms are moving into marketing operations, and vice versa, there is need for careful study of the advantages and disadvantages of vertical integration with particular emphasis on its impacts on both profit performance and the firm's ability to survive.

Rapidly increasing size and complexity of the farm supply business has created new and acute pressures in the area of financial and credit management for local farm supply firms. Discovering and choosing among appropriate methods for financing growth, whether

it be internally or through merger, is a common problem. Well managed firms have little or no problem in obtaining necessary capital. On the other hand, some firms are dying because they lack sufficient funds. Thus, the area of research need seems to be financial and credit management.

There is need for further refinement in the traditional internal financial indicators used in assessing performance by firms. In view of improved data processing techniques these indicators may be excessively crude.

Additional research is needed in identifying the factors affecting acceptance or rejection by managers of management education programs. Is it a matter of autonomous motivation or are the programs themselves entirely at fault?

Finally, the whole area of physical handling efficiency with respect to farm supplies must be explored further. Methodology gaps utilized in measuring and improving physical efficiency between the food and farm supply industry need to be filled.

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