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Minnesota AGRICULTURAL ECONOMIST



Starting Farming in Southern Minnesota

K. H. Thomas and H. R. Jensen

Modern farming requires large amounts of capital, which makes it difficult for a young man to start farming if he can't go into partnership of adequate size with his father or get strong financial backing from the family. To succeed, he must be able to (1) borrow the needed capital and rent land and (2) operate efficiently enough to carry this debt load. Investment timing is of utmost importance, not only as it relates to business growth, but also as it relates to financial strength.

This article reports some results of a recent study designed to test the possibility of success under such conditions. The study applies directly to farms with the Clarion-Nicollet-Webster soils of southern Minnesota, but some of the implications apply to farms in other areas as well. A study of the past experiences of young farmers in the area did not appear instructive because of the rapid changes in farming, so this study projects what a young man might accomplish over the next 10 years.

The opportunities open to young men depend on the amount of money credit agencies will lend them, the willingness of landlords to rent to them, and their own management abilities. To make realistic estimates of these factors, we obtained the cooperation of six experienced men from credit agencies and an experienced area farm management agent. Each step was checked with these consultants.

We began with this question: What can a young man hope to accomplish if: he has \$2,000 in cash; he owns a car; he has a reasonable number of household goods, so his borrowings and most of his savings can go into the farm; he can rent 240 acres (225 acres tillable) on a crop-share lease; and his farm is near enough to his father's so he can exchange his labor for the use of machinery during the first years.

We laid out the operation plans for the first and succeeding years and checked them with the consultants. Crop and livestock yield expectations were developed with the help of the area farm management agent. Then we estimated the pro-

duction, income, and expenses for each year, together with the inventory and financial position of the operation. Our consultants checked the results with us at the end of each year and made suggestions on alternative crop and livestock investments to be considered for each succeeding year, together with the amount of credit they would probably lend.

The success of a farmer and his ability to obtain credit and land depend on the efficiency of his operation. We therefore made estimates for three levels of ability: "excellent" (he eventually will be in the top 10 percent of the commercial farmers of the area), "average," and "good" (half way between excellent and average).

Since it is difficult to predict the ability of a beginning farmer, we recommended the same organization (corn and soybeans) for all for the first year. By the end of year 1, individual ability would begin to show through some differences in yields and earnings. The consultants then would be able to make some distinctions in the credit they would allow.

We made our calculations as if there were no weather or price fluctuations from year to year. All three levels of management were expected to operate under the same product prices: \$1.10 per bushel for corn, \$2.55 per bushel for soybeans, and \$17 per hundredweight for hogs. Except for land, taxes, and interest rates, input costs were considered to be the same among management levels. We wanted to include price and yield fluctuations, but time did not permit us to explore all the possible combinations of risk. Also, using constant yields (except as they improved through experience and technology) and prices provided a first estimate of the success of young men of different abilities. Of course, the probable effect of these risks should be considered when evaluating study results.

EXCELLENT MANAGEMENT

We assumed that this operator could begin with 90 and 27 bushel corn and soybean yields, respectively, in the 1st year and increase them to 120 and 38 in the 10th year. Our consultants said that this man could get credit backing to rent a little more land, buy some good used machinery, and start to raise hogs in the 2nd year. They said his available credit would increase as he improved his efficiency and demonstrated his ability.

By the 4th year, this man could be independent in machinery, expand his hog business, and buy some land on contract. He would have several opportunities open to him; we considered only two. He could expand land and hold hog numbers down to what he could handle or he could hold land constant and increase hogs. Both are one-man operations.

Expanding Land

Starting with 225 crop-share rented acres in the 1st year, this operator would crop-share rent an additional 75 acres the following year for a total of 300 (table 1). In the 4th year, he would reduce his rented crop acres by 75 and buy 150 crop acres on contract for deed, bringing crop acres to 375. In the 6th year, his business would be strong enough financially to change from crop-share to cash renting and in each of years 6, 8, and 10 he would rent an additional 150 crop acres to bring the total to 825 in the 10th year.

Of course, such expansion in crop acres could not be realized without crop machinery and facilities investment. Having started with his own plow and tractor and with access to his father's machinery in the first years, the excellent operator would be largely self-sufficient in machinery by the end of the 3rd year, having purchased a disc, 6-row-30 inch planter and cultivator, one-half share in a 6-row-30 inch combine, stalk chopper, digger, harrow, sprayer, and truck. Some of this would be new and some would be good used equipment. In the 4th year, he could buy a second tractor, plow and disc, and an elevator. In year 6, he could buy his own corn drier, and the following year he could buy a new combine. Because of the large acreage, he would have to change from 6-row to 12-row-30 inch planting and cultivating equipment in the 8th year. Bin space would be added as needed.

Because of the heavy emphasis on crops in this alternative, the available resources and the consultants' judgments limited hog expansion and improvements in production efficiency to modest rates and levels.

The hog program was begun in the fall of the 1st year, with the purchase of 14 bred gilts. They farrowed in December of that year and in July of the following year. Twice per year farrowing was continued through the 5th year, with 17 sows farrowed in the 3rd and 4th years and 21 in the 5th. With some remodeling of existing buildings and the purchase of some equipment, a shift to three farrowings per year with 21 sows was made in the 6th and 7th years. From that time on, a reversion to twice per year farrowing with 21 sows seemed best, due to the expanding crop program. Thus, number of hogs raised was 210 in the 2nd year, peaked at 505 in the 6th and 7th years, and dropped back to 335 from then on.

Investments in hog facilities and equipment for this hog program were held at minimal levels so the enterprise could be discontinued without a large amount of sunk costs. The initial investment in hog feeders and a manure spreader with loader was made in year 2. In the 5th

Table 1. Growth patterns and financial outcomes, 10-year period, expanded land situation under excellent management

Item	Year									
	1	2	3	4	5	6	7	8	9	10
Crop acres	225	300	300	375	375	525	525	675	675	825
Rented	225	300	300	225	225	375	375	525	525	675
Owned .....	...	...	...	150	150	150	150	150	150	150
Hogs raised .....	...	210	255	270	335	505	505	335	335	335
Investment, current year										
Crop machinery & facilities, \$	4,800	13,600	5,075	13,150	1,050	29,650	23,950	28,970	.....	4,400
Hog facilities & equipment, \$ .....	...	1,500	...	.....	5,860	.....	.....	720	.....	.....
Family consumption, \$	3,500	3,800	4,500	4,800	5,600	6,700	7,500	7,800	8,300	8,600
Financial outcomes										
Gross farm income, \$	8,775	20,095	22,720	31,045	36,485	72,060	81,675	91,425	94,785	111,135
Profit, \$*	2,285	6,085	6,240	9,955	5,500	12,345	12,750	12,975	14,405	19,345
Repayment capacity balances, \$†	+1,575	+4,060	+955	+6,460	+1,150	+8,720	+6,500	+7,905	+6,095	+13,810
Total farm assets, \$	7,760	20,745	22,610	99,275	105,905	128,425	138,005	153,745	141,265	132,970
Total farm liabilities, \$	3,505	13,800	14,300	85,120	90,540	107,160	112,285	122,770	104,525	88,655
Net worth, \$	4,255	6,945	8,310	14,155	15,365	21,265	25,720	30,975	36,740	44,315
Liquid asset/liability ratio	1.7	1.1	1.1	1.1	1.5	1.1	0.8	0.60	0.70	0.80
Non-real estate asset/liability ratio	2.2	1.5	1.6	1.3	1.3	1.3	1.3	1.3	1.5	2.0
Net worth/liability ratio	1.20	0.50	0.58	0.17	0.17	0.20	0.23	0.25	0.35	0.50

Table 2. Growth patterns and financial outcomes, years 5-10, limited land situation under excellent management and good management

Item	Excellent Management						Good management					
	5	6	7	8	9	10	5	6	7	8	9	10
Crop acres	375	375	375	375	375	375	375	375	375	375	375	375
Rented	225	225	225	225	225	225	225	225	225	225	225	225
Owned	150	150	150	150	150	150	150	150	150	150	150	150
Hogs raised	385	575	800	910	970	970	240	315	480	480	490	490
Investment, current year												
Crop machinery & fac., \$..	1,750	1,750	12,000	18,300	2,200	3,750	.....	.....	1,000	7,600	13,750	.....
Hog fac. & equip., \$	10,180	.....	5,785	.....	.....	.....	.....	3,855	600	.....	.....	.....
Family consumption, \$	5,600	6,700	7,500	7,800	8,300	8,600	4,800	5,300	6,000	6,200	6,400	6,600
Financial outcomes												
Gross income, \$	35,990	41,415	50,310	70,480	73,735	73,735	27,545	29,300	36,980	36,980	41,530	41,530
Profit, \$*	6,135	7,980	10,090	12,180	14,495	15,020	10,430	7,300	7,770	7,495	7,830	7,910
Repayment capacity, bal., \$† +2,250	+1,170	+3,320	+4,535	+4,180	+6,090	+6,920	+3,165	+2,655	+2,690	+3,650	+1,840	.....
Total farm assets, \$	112,150	113,840	126,630	136,630	130,930	126,220	73,305	81,130	79,680	83,750	93,020	88,760
Total farm liabilities, \$..	95,990	95,255	105,075	110,170	98,175	87,830	60,780	65,845	62,510	64,960	72,500	66,615
Net worth, \$	16,160	18,585	21,555	26,460	32,755	38,390	12,525	15,285	17,170	18,790	20,520	22,145
Liquid asset/liability ratio	1.5	2.4	2.2	1.9	2.2	2.7	2.1	2.5	3.4	2.9	2.1	2.5
Non-R.E. asset/liability ratio	1.3	1.3	1.3	1.3	1.5	1.8	2.1	1.7	2.0	1.8	1.5	1.8
Net worth/liability ratio ..	0.17	0.20	0.21	0.24	0.33	0.44	0.21	0.23	0.27	0.29	0.28	0.33

* Gross income less operating and depreciation expense, plus or minus change in inventory.

† These balances are the amounts left over after payment of farm and household operating expenses, income taxes, and scheduled debt payments and after inventory adjustments.

year, the hog and dairy barns were remodeled for farrowing and finishing and a portable mixer was purchased, for a total outlay of \$5,860. This was the full extent of the investment in hog facilities and equipment, except for the purchase of a new manure spreader in year 8.

With the operator's major emphasis on crops, the consultants considered that pigs raised per litter would only increase from 7.5 in the 2nd and 3rd years to 8.0 over the remainder of the period and that feed efficiency would improve from 15 bushels of corn and 180 pounds of protein per hog raised in the beginning to 13 bushels of corn and 155 pounds of protein by the 9th year.

With excellent management under this alternative, total farm assets or total capital managed (exclusive of rented land) could be expected to range from about \$7,700 initially to almost \$154,000 in year 8. The capital and labor could be expected to generate a volume of business growing from a gross of almost \$12,000 in the 1st year to about \$111,000 in year 10. By the year 5, this increase in gross income not only could be expected to provide a family consump-

tion level commensurate with that of the successful farmers in the area, but also to leave sizable net balances (repayment capacity balances in table 1) after inventory adjustments and after meeting farm and household operating costs, income taxes, and scheduled debt payments. These net balances reflect the capacity to weather a bad year. Generally, this capacity looked very good, except for years 3 and 5, when it was rather small. Throughout the period, the financial ratios were relatively narrow, reflecting the fact that our consultants placed considerable weight on high level management and repayment capacity in this situation. Besides the potential growth in family consumption, the net worth of this operation could be expected to grow at the rate of about \$4,000 per year.

What if this farmer and/or his wife had earned more from off-farm work during the first 2 years? The growth patterns in tables 1 and 2 assume that they earned \$1,000 per year. If this figure had been \$3,000 per year, net worth over the 10-year period would have increased by \$4,500. If they had reduced family consumption from \$3,500 to a level of

\$3,200 at the beginning and from \$8,600 to a level of \$6,600 at the end of the period, an additional \$13,500 in net worth would have developed over the period. If farm product prices were 10 percent lower, growth would have been severely stifled and financial strength weakened, even at average consumption levels.

Limiting Land

By the 4th year under this alternative, the operator was assumed to have gained control of all the tillable acres he would farm for the remainder of the 10-year period, 150 owned and 225 rented. With this ceiling on land, farm growth had to come through the hog enterprise (table 2). To expand this enterprise, improved and larger facilities were needed. The consultants judged that credit would be available to remodel existing buildings to a solid floor farrowing unit and a partial slot finishing unit and to buy a portable mixer in the 5th year. By the 7th year, the operator could get money to add a full slot farrowing unit.

Through the 4th year, existing facilities would permit hog production to proceed as under the land expansion alterna-

tive but, with remodeling of the hog facilities, the operator could farrow 24 sows twice per year in year 5, 24 sows three times per year in year 6, and 38 sows three times per year from year 8 on. Thus, hogs raised would increase from 385 in the 5th year to 970 in the 9th.

Because of the large amount of capital going into hogs in this alternative, we figured that the operator could not buy his own corn drier as soon as in the expanded land alternative. However, he could add bin space in years 5-8, buy one-half share in a new combine by year 7, and buy a drier in year 8. In the 9th and 10th years, he could replace some crop equipment.

We considered it desirable for this farmer to operate his rented land under a crop-share lease for the first 8 years, at which time the consultants considered his business strong enough financially to change to cash rent.

We expected the excellent manager to do as well in crop yields for this alternative as he would under the expanded land alternative, particularly since he would have fewer acres. At the same time, we expected him to do somewhat better with hogs, since he would devote more time to them. We assumed he could increase pigs saved per litter from 7.5 at the beginning to 8.5 by the 9th year.

Growth in total farm assets or capital managed and in gross income and net worth was slightly less for this than for the expanded land alternative. With family consumption at the same levels for both alternatives and with other outlays at about the same levels, the net balances (repayment capacity balances, table 2) remaining after inventory adjustments and after farm and household operating expenses, income taxes, and scheduled debt payments were somewhat smaller with the limited land alternative. Hence, there was somewhat less of a cushion to overcome a bad year. Likewise, 10 percent lower product prices would place this business in a shaky financial position.

GOOD MANAGEMENT

The good manager would be expected to expand cropping operations at a slightly slower rate than the excellent manager with limited land. He would start with the same crop acreage (225) in year 1, but would add 75 crop acres in year 3 instead of year 2 and buy a 160-acre tract on a contract for deed in year 5 instead of in year 4. At that point, the 75 crop acres rented since year 3 would be dropped to make the remaining 375 crop acres the maximum acreage operated for the balance of the 10-year period (table 2). This limit was set primarily by the quality and size of equipment that most likely would be at the disposal of the good manager. Any additional acreage would require a major change in size of equipment, for which intermediate credit probably would not be available.

The hog operation could be expected to grow at about the same rate as for the excellent manager during the first 4

years. However, because of the year's delay in the purchase of the farm, the remodeling of the farrowing and finishing units would be delayed until year 6, compared with year 5 for the excellent manager (table 2). Here again, we expected that the good manager would have to exercise extreme care in making intermediate debt commitments. Thus, we limited the hog facility remodeling to a solid floor arrangement. This, in turn, limited hog numbers to a maximum of around 500 head at the end of the first 10 years, compared with the excellent manager's 970 head maximum under the limited land alternative. Any further hog expansion would require additional new farrowing and finishing facilities, for which financing probably would not be available. Similarly, the purchase of a 2-row combine and a bin-batch drier for drying corn for the hogs was delayed until the 9th year to avoid placing an excessive financial burden on his ability to repay.

Besides managing the acres and hog numbers shown in table 2, we considered the good manager capable of increasing his corn yields from 80 to 105 bushels and beans from 25 to 33 bushels over the 10-year period. Also, we considered him to have the ability to increase hogs raised per litter from 7.2 to 7.8 and to decrease bushels of corn fed per hog from 15.5 to 14.0 and pounds of protein fed from 200 to 175.

In terms of financial outcome, the smaller, less efficient business developed by the good manager would attain yearly gross incomes and profits considerably below those of the excellent manager (table 2). Annual net worth increases were about \$1,900, compared with \$3,600 for the excellent manager. Likewise, family consumption levels would be \$800-\$2,000 per year below those of the excellent manager. The projected balances and financial ratios appeared to be quite adequate.

An increase in off-farm earnings from \$1,000 to \$3,000 annually during the first 2 years would increase net worth by about \$4,300 over the period. A reduction in family consumption from average to low levels would increase net worth by almost \$13,000. A 10 percent reduction in product prices would place the farmer in a weak financial position and permit net worth to increase by only \$6,400 over the 10-year period, even after adjusting consumption to low levels. This increase is about one-third of what would be expected with average prices.

AVERAGE MANAGEMENT

Similar projections were made for the average manager, but farming opportunities for such a person appear less bright.

Because of his inability to use existing resources as effectively as better managers, the average manager most likely would experience difficulty in renting additional land and in acquiring credit capital. As a result, the crop acreage operated was expected to peak at about 290 acres and hog numbers at about 215 head. The

per acre corn yields assumed ranged from 70 bushels in year 1 to 85 bushels in year 10 and per acre bean yields from 23 bushels in year 1 to 28 bushels in year 10. Hogs raised per litter were expected to increase from 7.0 to 7.2, bushels of corn fed per hog were expected to decrease from 16 to 15, and protein per hog raised was expected to decrease from 220 to 190 pounds. Capital assets (excluding rented land) under his control thus would range from only about \$8,000 to \$10,000 and liabilities from \$4,000 to \$7,000.

The resultant gross income was expected to range between \$12,000 and \$17,000 per year. Even with relatively favorable profit margins and with family consumption held to low levels (\$3,000 in year 1 to \$4,700 in year 10), such a volume would result in net worth increases of only \$80 per year.

If off-farm earnings were increased from \$1,000 to \$3,000 annually during the first 2 years, total net worth would increase by \$5,300. A 10-percent reduction in product prices would cause the farmer to go bankrupt in a few years. Increasing family consumption levels from low (\$3,000-\$4,700) to so-called average (\$3,200-\$6,600) levels also would cause him to go bankrupt in a few years, even with average product prices.

IMPLICATIONS

The findings of this study strongly suggest that the **prospective farmer** should emphasize the development of production and financial management skills and that he should develop other salable skills whenever possible, since much can happen in 30-40 years of farming. It also suggests that the opportunities in farming look relatively bright for the excellent manager, whereas the average operator should attempt to improve his management skills or plan to augment farm earnings with some type of off-farm employment.

For the **extension worker and other educators**, the study suggests that more effort needs to be expended in informing young farmers about the requirements and range of farming opportunities, as well as in assisting them in appraising their alternative opportunities. Because management is so critical to the success of beginning operators, development of management associations for them should be considered seriously.

For **credit agencies**, this study shows the effects of considering management capacity in lending practices. This consideration should be encouraged, and borrowers should be encouraged to project plans over several years.

The results of the study should cause **policymakers** to give greater recognition to the fact that not all young farm boys have the ability to operate modern-day farm businesses. Similarly, greater emphasis should be placed on supplying managerial help. Generally, the finances are available if the ability is apparent. ■

IN PERSPECTIVE



Seasonal Fluctuations and Farm Finance

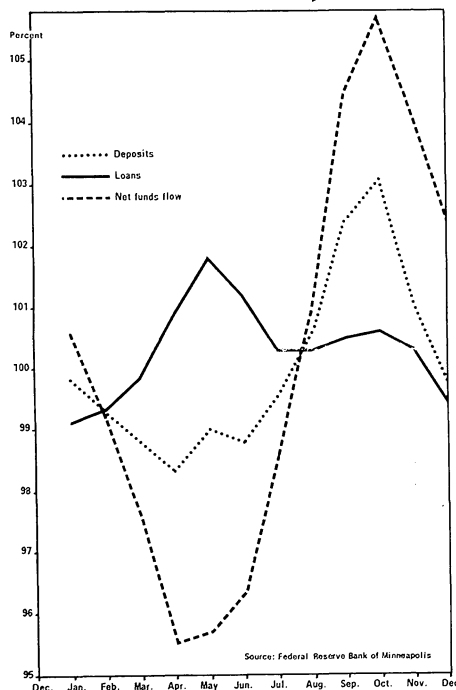
Richard J. Herder*

In July, a Federal Reserve report was released describing a series of proposed changes in the general provisions under which member banks can borrow funds from Federal Reserve Banks. One of the proposals deals specifically with the borrowing provisions for meeting shortrun periodic and predictable swings in bank fund flows.

The seasonality pattern in the flow of funds through an agricultural bank is, in general, a direct reflection of the income flows of farmers. As shown in the graph, which measures relative seasonal changes about an average adjusted for long term growth, deposits held by country banks decline during the first few months of the year, reaching a low point in April. From that point, deposits begin to build, reaching a peak during the fall.

The seasonal pattern of country bank credit extension is almost the opposite of deposit flows, with a couple of minor variations. The extension of bank credit begins to build in the early months of the year, peaking in May, reflecting a heavy credit use during the spring planting season. Loans then drop off for a few months before building to another smaller peak in the fall, as farmers borrow for feeder livestock and other fall operations. The full effect of these seasonal deposit-loan flows is indicated by the dashed line, which depicts the net funds flow or the effect on bank resources of simultaneous movement of both deposits and loans. This latter measure most clearly reflects the sharp seasonal shift in resources that occurs in country banks. It particularly points up the pressure that occurs in the first half of the year.

The experience of individual banks varies in terms of timing and amplitude of fluctuations. The type of agricultural enterprise that dominates a bank's market



Seasonal index of loans and deposits, Minnesota country banks.

area probably is the most significant determinant. Banks located in cash grain areas, for example, are perhaps most affected, while those in predominantly dairy or other areas of continuous production and income are less affected by seasonal fluctuations. Generally, the smaller banks that draw a significant portion of their business from the agricultural economy are most affected. The degree of fluctuation tends to diminish with increased bank size and the ability to draw banking business from a wider area and/or the diversification of the economy of a bank's market area. By and large, the

Minnesota banking community, which is characterized by many relatively small banks with strong agricultural orientation, is subject to the problems associated with seasonality and could be a major beneficiary of the borrowing provisions.

The variability of deposit flow is largely beyond the control of the individual bank and is a major limiting factor on lending policy. Banks can do little more than remain competitive for the deposit funds generated within their market areas.

The bank's loan flow is more controllable by the bank, and bankers have adopted a variety of loan portfolio strategies in their attempts to offset the seasonal shifts in deposits. In many cases, banks maintain excess liquidity in the off-seasons to meet seasonal loan and deposit movements, resulting in a reduction in the total amount of funds that otherwise would be available to borrowers. Where such liquidity is not maintained, seasonal pressures may exceed available resources at certain times of the year, resulting in a reduction of credit availability to some deserving bank customers or the diversion of customers to other financial institutions.

Of course, banks need not meet all of their loan demands through their own resources. They can obtain loan funds from other sources such as from correspondent banks or through the Federal Funds market. For a variety of reasons, such sources are not well developed and frequently are not readily available. Moreover, such outside funds constitute an uncertain source for the small country bank to draw upon and place the rural area in the position of a residual claimant on excess funds in larger financial markets.

In summary, the purpose of the proposed change in the discounting or borrowing procedures is to allow agricultural banks to better manage their flow of funds with respect to seasonal movements by borrowing from the Federal Reserve Bank during periods of outflows against the predictable later inflow of deposits. It is an important step in the direction of maintaining an adequate and consistent flow of credit into rural areas. ■

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