

Livestock as Income Stabilizer¹

by Rainer Schickele²

The July crop report of the U. S. Department of Agriculture indicated a wheat crop of 95 million bushels for North Dakota. This would mean 25 per cent less wheat than the last 10 year average of 127 million bushels. Many farms will have only a half-crop or even less. How will farmers be able to stand such a reduction?

Many of the larger farmers probably can take it. It is particularly the smaller farmer who will feel the pinch. Let us do a little figuring.

Two Model Farms

Most of the family farms in the spring wheat area of central North Dakota range between one-half section and two sections in size. It would not be too difficult to find two farms, alike in soil type, close enough together to have the same weather, and operated by competent farmers with families of similar size. Let us compare one farm of 320 acres with another of 1,280 acres, and assume that each farmer owns his farm free of debt. The average wheat yield over the last 20 to 30 years was, say, 12 bushels on both farms.

Based on various recent studies, we can construct a simplified budget³, in rough estimates, that shows the average net incomes that could be expected from these farms from wheat and other grains, at the general price level prevailing in 1949. Wheat is used to represent all grains grown on the farm, and a farm price of \$1.80, a little lower than the average farm price for North Dakota in 1949, has been assumed for that reason. For the time being, let us set up our farms without any livestock for sale—as strictly grain farms. A simple budget for these two farms, presented in Table 1, shows a net income from grains of \$2,000 for the small and \$9,000 for the large farm.

The necessities for family living, in addition to what the farm furnishes in food, fuel and housing, would require around \$2,000. These simple living requirements would, at average yields, absorb the total net farm income of the small farm, and would leave \$7,000 on the large farm available for paying income taxes, any debts or other obligations, expansion in the farm business, better living and housing facilities and savings. It is clear that, as long as yields do not fall below average, both families can make a reasonably decent living on grain farming alone.

¹This is the second of a series of articles on weather risk and stabilization of North Dakota farm incomes. The first was "Variability of North Dakota Farm Income" in the Bimonthly Bulletin of July-August, 1949. The study is carried on under Project Purnell 143, with the Bureau of Agricultural Economics, U.S.D.A., cooperating.

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³The rounded estimates that follow have been derived, with some modifications, from Wylie D. Goodsell and others, "Typical Family-Operated Farms, 1930-45", Bureau of Agr. Econ., U. S. D. A., F. M. 55, April, 1946, and subsequent supplements (mimeo.), and unpublished Exp. Station material.

Table 1. AVERAGE INCOME FROM GRAINS ON SMALL AND LARGE FAMILY FARM IN CENTRAL NORTH DAKOTA (at 1949 prices)

	Small Farm	Large Farm
Acres in farm.....	320	1,280
Acres in wheat and other grains.....	200	800
Gross income from grains at \$1.80 per bu. wheat and average yield of 12 bu.....	\$4,320	\$17,280
Production expenses.....	2,000	7,000
Property taxes (\$1 per acre).....	320	1,280
Net income from grains.....	2,000	9,000
Necessary family living expenses.....	2,000	2,000
Income available for debt payments, expansion of business and living, and savings.....		7,000

Table 2. EFFECT OF YIELD VARIATION ON NET INCOME OF SMALL AND LARGE FAMILY FARM¹

Net Incomes from grains at \$1.80 wheat price and yield of:	Net Income		Income after Necessary Living Expenses	
	Small Farm	Large Farm	Small Farm	Large Farm
40% of average: 5 bu.	—\$ 520	—\$ 1,080	—\$2,520	—\$ 3,080
50% of average: 6 bu.	160	360	— 2,160	— 1,640
60% of average: 7 bu.	200	1,800	— 1,800	— 200
75% of average: 9 bu.	920	4,680	1,080	+ 2,680
100% of average: 12 bu.	2,000	9,000	0	+ 7,000
125% of average: 15 bu.	3,080	13,320	+ 1,080	+ 11,320
“Stop-loss limit” of yield:				
bu. per acre.....	6.5	5.7
“Survival limit” of yield:				
bu. per acre.....	12.0	7.1

¹The positive incomes after necessary living expenses are available for debt payments, expansion of business and living, and savings.

Effect of Yield Variation on Income from Grains

Now let us see what happens in poor crop years. For practical purposes, it costs about the same to prepare, seed, and harvest an acre of wheat whether the yield turns out to be five or 20 bushels. Hence, we leave the production expenses the same for various yields and study their effect upon net income, as shown in Table 2.

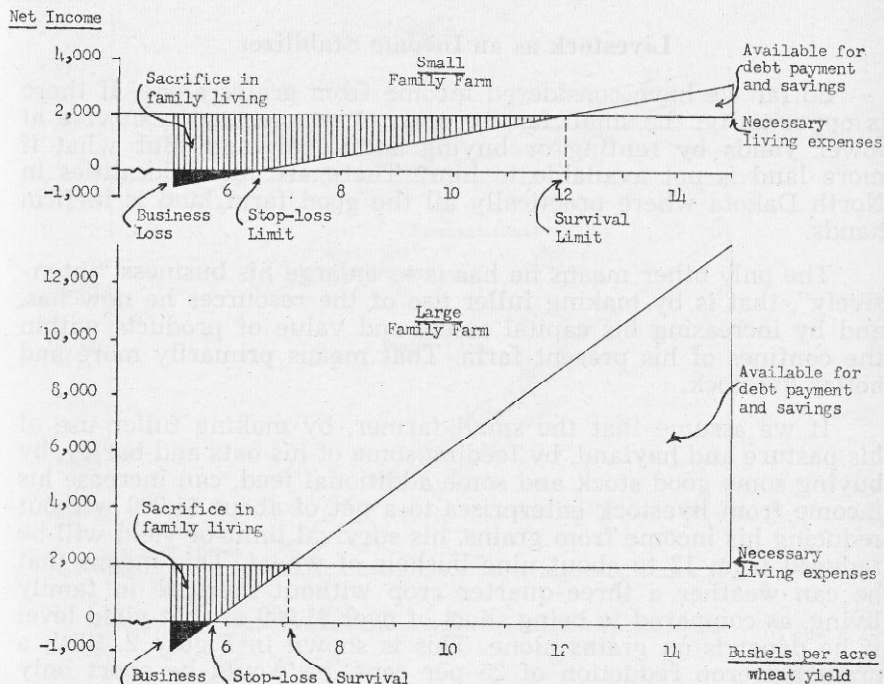
With a five-bushel crop, both farms are in the red, the large one twice as deeply as the small one. At six-bushel yields, the small farm does not quite recover production costs; the large one has \$360 left to apply to living needs—a pittance that will barely reach over two months. At the cost and prices assumed, the “stop-loss” limit for the small farm is 6.5 bushels, for the large one, 5.7 bushels. At those yields, the farm business just breaks even, leaving nothing for family living or anything else. (See Fig. 1)

Still—the family **must** live. So sacrifices are made, and debts pile up. If a series of poor years fall in a row, the survival of the family is threatened. Figure 1 indicates that sacrifice in living and

consumption debts will begin as soon as yields drop below 12 bushels for the small farm, and 7.1 bushels for the large one. These we shall call the "survival limits" of yield.¹

Note that, regarding the survival limit, the large farm has a much greater advantage over the small one than on the stop-loss

Figure 1. Effect of Yield Variation on Net Income from Grains on Small and Large Family Farm



limit. The large farm can stand a 40 per cent below average yield without making the family suffer, while on the small one, if it depends upon grain farming alone, deprivation begins as soon as yields drop below average—which can be expected to occur in more than half of the years over a 25 to 30 year period.²

At a three-quarter crop (nine bushels), the small farm lacks over \$1,000 to meet family needs; the large one has nearly \$2,700 to spare.

At the beginning, we quoted a crop estimate of 25 per cent below average for 1950. For our model farms, this would mean a yield of approximately nine bushels. The large farm can well sur-

¹If these were encumbered farms with fixed annual mortgage debt payments, their respective survival limits of yield would be correspondingly higher. This illustration shows the very weak debt carrying capacity of a small grain farm.

²See W. L. Cavert, "Long-term Wheat Yields on Six North Dakota Farms", *Bimonthly Bul.*, May-June, 1949, and Walster and Nystuen, "North Dakota Wheat Yields", *Bul.* 350, May, 1948. During a similar period the large farms would fail to meet living expenses in only one-fourth to one-third of the years.

vive at that yield, the family on the small farm must sacrifice or go into consumption debts to the tune of nearly \$1,100. These relationships are pictured in Figure 1.

This is a partial explanation of why especially the larger farms, but also many of the smaller ones, have reduced their livestock enterprises during the good years of the forties. They could afford it. Will they be able to afford it much longer?

Livestock as an Income Stabilizer

So far we have considered income from grains alone. If there is opportunity, the small farmer may, of course, try to survive at lower yields by renting or buying additional land. But what if more land is not available to him? There are many localities in North Dakota where practically all the good farm land is in firm hands.

The only other means he has is to enlarge his business "intensively", that is by making fuller use of the resources he now has, and by increasing his capital assets and value of products within the confines of his present farm. That means primarily more and better livestock.

If we assume that the small farmer, by making fuller use of his pasture and hayland, by feeding some of his oats and barley, by buying some good stock and some additional feed, can increase his income from livestock enterprises to a net of about \$1,000 without reducing his income from grains, his survival limit of yield will be reduced from 12 to about nine bushels of wheat. This means that he can weather a three-quarter crop without sacrifice in family living, as compared to being short of over \$1,000 at that yield level if he depends on grains alone. This is shown in Figure 2. With a predicted crop reduction of 25 per cent, he would be short only around \$80 instead of \$1,080. As families live on so narrow a margin, any little addition to income means a lot, while it may not look very important to a family on a larger farm that provides a more ample income even at yields substantially below average.

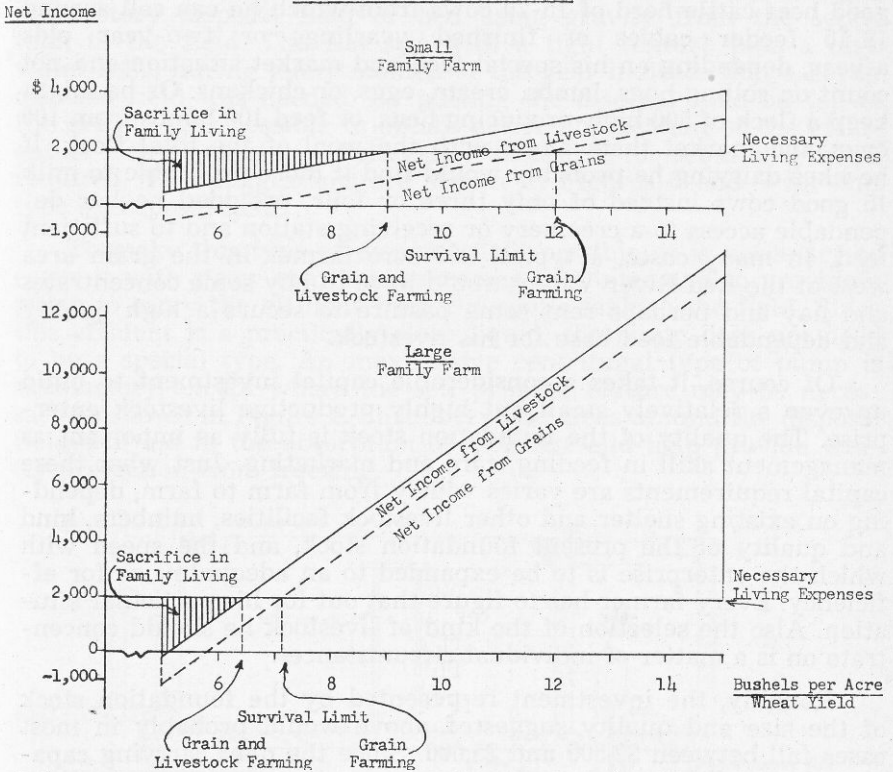
Figure 2 also shows that a similar addition of net income from livestock on the large farm has a much smaller effect on the survival limit of yield than on the small farm; it reduces from 7.1 to 6.4 bushels, as compared with from 12.0 to 9.2 bushels on the small one. This further emphasizes the much greater importance, with respect to survival at a decent level of family living, of livestock on the smaller farms.

To achieve a net livestock income of, say, \$1,000 regardless of crop yields, it will be necessary to buy more hay and concentrates during poor years than in good ones, since hay and pasture yields usually vary along with grain yields. This requires managerial care and effort in expanded market operations. Barring extreme and prolonged drought periods, however, a farmer has considerably

more management flexibility in keeping his livestock production at a certain level than in crop production.

Another income stabilizing element is characteristic of many livestock enterprises. Not only does their volume of output vary much less from year to year than does crop output, but livestock

Figure 2. Effect of Livestock Income on Survival Limits of Yield on Small and Large Family Farm



and livestock product prices also have a lower variability over the years, perhaps with the exception of hogs. These two factors make for substantially smaller fluctuations in incomes from livestock. In North Dakota, for instance, gross income from crops dropped from \$496 to \$296 million, or 40 per cent, between 1947 and 1949, while income from livestock dropped only from \$199 to \$169 million, or 15 per cent.¹ This is the main reason why the percentage of farm income from livestock usually is greater in low than in high income years.

Efficiency in Small Livestock Enterprises

To net \$1,000 in income from livestock is often not so easy, especially on farms located in a predominantly grain farming area.

¹The Farm Income Situation, BAE, USDA, Jan., 1950. See also T. W. Schultz, Production and Welfare of Agriculture, Macmillan, N. Y., 1949, Ch. 8, pp. 64-82.

Perhaps too frequently efforts are dispersed over a few hogs, cows, sheep, and chickens, with the result that only irregular deliveries of low-quality products reach the market. In most cases it is probably wiser to concentrate on one livestock enterprise—in addition to what is needed for direct family consumption.

For instance, a farmer might do better to build up a small but good beef cattle herd of 15-20 cows from which he can sell around 12-15 feeder calves or finished yearlings or two-year olds a year, depending on his special feed and market situation and not count on selling hogs, lambs, cream, eggs, or chickens. Or he might keep a flock of 500 high-producing hens, or feed 100 lambs from 100 ewes and market them along with the wool of the total flock. If he likes dairying he probably would find it more profitable to milk 15 good cows instead of only three or four, provided he has dependable access to a creamery or receiving station and to sufficient feed. In many cases, a typical 320-acre farmer in the grain area west of the Red River Valley would have to buy some concentrates and hay and perhaps rent some pasture to secure a high quality and dependable feed base for his livestock.

Of course, it takes a considerable capital investment to build up even a relatively small but highly productive livestock enterprise. The quality of the foundation stock is fully as important as management skill in feeding, care and marketing. Just what these capital requirements are varies widely from farm to farm, depending on existing shelter and other livestock facilities, numbers, kind and quality of the present foundation stock, and the speed with which the enterprise is to be expanded to an adequate size for efficiency. Every farmer has to figure that out for his particular situation. Also the selection of the kind of livestock he should concentrate on is a matter of individual circumstances.

Roughly, the investment represented by the foundation stock of the size and quality suggested above would probably in most cases fall between \$2,500 and \$5,000. Since the debt carrying capacity of a small farm is not any too great in view of wide fluctuations in crop yields, a farmer will find it much safer to expand the enterprise of his choice to an efficient size over a 3 to 5 year period, **and then keep it there**, rather than to liquidate in good years and assume a heavy debt load for expansion in bad years.

These are all merely examples to illustrate the principle: even on farms depending on grains as the main source of income, the development of an efficient supplementary livestock enterprise may be essential for surviving poor crop years, and may be much more effective than trying to produce a bit of everything for the market. "Specialization within diversification" sounds like a paradox, but might turn out to be the best of common sense.¹

¹Professor Haver of the Department of Agricultural Economics is studying these problems in detail and some of his findings will be published soon in the Bi-monthly Bulletin.