Seeding Cropland to Grass in Southwestern North Dakota

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Adjustments in resource use are continually being studied to determine possible solutions to some of the problems of agriculture. Seeding cropland to grass has been the objective of several federal government agricultural programs designed to reduce production of crops that have been in surplus. Also, the long-range outlook for red meat is for the demand to about double by the turn of the century. If this forecast becomes a reality one can expect increased demands for range cattle and hence for forage.

A study was made in southwestern North Dakota to determine if and under what conditions it would be profitable to seed cropland to grass. One-hundred sixteen farmers who had seeded some cropland to grass were interviewed to obtain data on their costs and experience with grass seeding. This information was the basis of the study.

Optimal farm plans were determined for a number of combinations of product prices, yields, interest rates, and farm sizes. Crop alternatives considered included wheat, barley, oats, flax, and corn silage. Also included in the land use alternatives were hay and pasture enterprises for tame hay, tame pasture, native hay, and native pasture. Six livestock alternatives were considered: five consisted of beef cows with different feeding programs for calves and one alternative was buying yearlings for summer pasturing.

Table 1 shows an optimum farm plan for three levels of beef prices for a 1,251-acre farm of which 718 acres are cropland. The three levels of prices for beef calves were \$20, \$25, and \$30 per hundredweight. Beef prices were the only prices that were changed among the three plans. Wheat was assumed to be \$1.70 per bushel (total with certificates).

The full wheat allotment of 219 acres was grown under all three beef prices. At the low beef price (\$20 per hundredweight) all wheat was grown on summer fallow. With beef prices at \$25 and \$30 not all of the wheat was grown on summer fallow because it was more profitable to expand acreages of feed crops and reduce the acreage of summer fallow.

With beef prices at \$20, the cropping plan included 219 acres of wheat on summer fallow and 219 acres of flax as cash

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Table 1. Optimal farm plans for a 1,251-acre farm in Southwestern North Dakota with 718 acres of cropland for three levels of beef prices.

Item	Unit	Beef calf prices at — $20	$25	$30
Crops:				
Wheat	Acre	219	219	219
Barley	Acre	21	105	99
Oats	Acre	—	33	77
Flax	Acre	219	79	—
Corn silage	Acre	7	26	32
Summer fallow	Acre	225	194	165
Tame hay	Acre	27	62	78
Tame pasture	Acre	—	—	48
Native hay	Acre	—	25	25
Native pasture	Acre	473	473	473
Livestock:				
Buy yearlings	Head	28	—	—
Beef cow-calf fattened	Head	—	36	45
Beef cow-yearling fattened	Head	10	—	—
Labor required	Hour	1,384	2,209	2,486
Monetary measures:				
Capital requirement	Dol.	20,753	31,864	36,785
Return to land, labor, and management	Dol.	4,274	5,126	6,415

crops. These crops were more profitable than was grass. The acreage of feed crops for the livestock enterprise included 27 acres of tame hay, 7 acres of corn silage, and 21 acres of barley. Native pasture was utilized for 10 beef cows from which the calves were wintered on a high-roughage ration, pastured during the summer, and then fattened in the feedlot, Also, 28 yearlings were purchased, put on pasture in the spring and sold off the pasture in the fall at 700 pounds.

When the beef price level was increased to $25, the livestock enterprise was changed to include only a 36-head beef cow enterprise with the calves fattened as above. At this price level, the returns from grass for hay were higher than from flax as long as native pasture was available for spring and summer grazing. At this price level the beef cow-calf fattening enterprise gave a higher return to land, labor, and capital than the other livestock enterprises. The expanded beef enterprise required increasing tame hay to 62 acres, corn silage to 26 acres, and feed grains to 138 acres. These crops were expanded at the expense of flax and summer fallow.

The same beef enterprise was increased to 45 cows when the price of beef was at the $30 level. This required seeding 48 acres of cropland to pasture to provide spring grazing. The land use in the optimum plan at the $30 level included 78 acres of tame hay, 48 acres of pasture, 32 acres of corn silage, 176 acres of feed grain, and 219 acres of wheat. The increased acres of hay, pasture, corn silage, and feed grains again were taken from flax and summer fallow. Seeding grass for pasture did not become competitive with cash crops until the price of beef approached the $30 level. At this beef price, wheat remains the only cash crop with the remainder of the farm income coming from the beef enterprise.

Other changes in use of resources which also should be noted are shown in table 1. The demand for labor increases as the beef enterprise is expanded. Only 1,384 hours of labor are required at the $20 price level. This increases to 2,209 and 2,486 hours at the $25 and $30 price levels, respectively.

Demand for capital increases also. The major changes in capital are the result of increased numbers of livestock at increased price levels. Capital requirement increased from $20,753 at the $20 level to $36,785 at the $30 level.

The return to land, labor, and management was $4,274 at the $20 level, $5,126 at the $25 level, and $6,415 at the $30 level of beef prices. The capital invested was required to earn a return of at least 6 per cent.

Some general conclusions on seeding cropland to grass include:

1. Seeding of cropland to grass for production is profitable if native pasture is available for livestock.

2. At about the $30 level of calf prices, seeding of grass for early spring pasture will give returns similar to that from barley, oats, or flax but less than returns from wheat. (This assumes the price of wheat is $1.30 per bushel or higher.)

3. Optimal livestock programs usually call for fattening calves or feeding out yearlings.

4. In some situations, government cost-share payments for grass seeding would increase the optimal acreage seeded. The resulting increases in income, however, would not be large.

5. Size of farm has little influence on the optimal amount of grass seeding. More important is the ratio of cropland to native grass and the quantities of labor and other resources available.

This study indicates that the margin between grass seeding for pasture and cash grains such as flax or oats is small. It should be noted that the income and investment problems associated with the period of transition from cash grain to grass and livestock and the stability of income among the various alternative uses of the land was not considered. This problem is part of another phase of the study and will be reported later. Planting cropland to grass requires foregoing income for a period of time while the grass is becoming established. Also, there needs to be additional investment in livestock to utilize the grass.