

Figure 1. Eight Regions of North Dakota for which cost and yield data are available.

How To Compare Competing Crops at Any Price

David W. Cobia

With traditional cost and return relationships between competing crops destroyed it has become difficult to visualize their relative profitability. Information in this report introduces a method to overcome this difficulty. The approach is to prepare crop budgets (costs and yields) and then look at the impact of alternative crop prices on net income.¹ Projected costs and yields for the 1975 growing season for eight North Dakota regions are used to illustrate this approach.

Net income or profit is the result of yield times the selling price less the cost of inputs (land, labor, fertilizer, etc.). Even though these factors vary from farm to farm and from region to region, averages are used because we are interested in the overall impact of the relative profitability of crops.

Costs and yields were prepared for eight North Dakota regions as shown in Figure 1 for

¹For a more detailed description of this approach and supporting cost and yield data for each of the eight North Dakota regions see Cobia, David W., *COMPARING INCOME POTENTIAL FROM COMPETING CROPS AT ANY PRICE*, Agr. Econ. Report No. 102, Dept. of Agr. Econ., NDSU, Fargo, N.D., Jan., 1975.

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hard red spring (HRS) wheat, flax, durum wheat, barley, oats, and sunflowers. These data illustrate what can be expected, on the average, on non-fallow land, except for the southwest and northwest regions which are for crops produced on summer fallow. The costs and yields are averages for each region rather than what would be experienced with top management. The basic yield and cost data were taken from NDSU's **Farm Management Planning Guide**.²

The yields are a one-year extension of a five-year trend line of average yields computed from planted acres. Production expenses given in the **Farm Management Planning Guide** were inflated to represent expected cost increases for the 1975 crop year. Marketing costs include elevator margins and winter rail rates from a central point in each region to Minneapolis.

All costs and commodity prices were put on a Minneapolis base rather than that at the farm because Minneapolis prices are readily available. This approach also makes direct interregional comparisons possible.

²Rice, Billy, L. W. Schaffner and Roger G. Johnson, *FARM MANAGEMENT PLANNING GUIDE: YIELD AND PRODUCTION COSTS*, Revised Section VI, Cooperative Extension Service, North Dakota State University, Fargo, North Dakota, March, 1974.

MINNEAPOLIS PRICE/BUSHEL

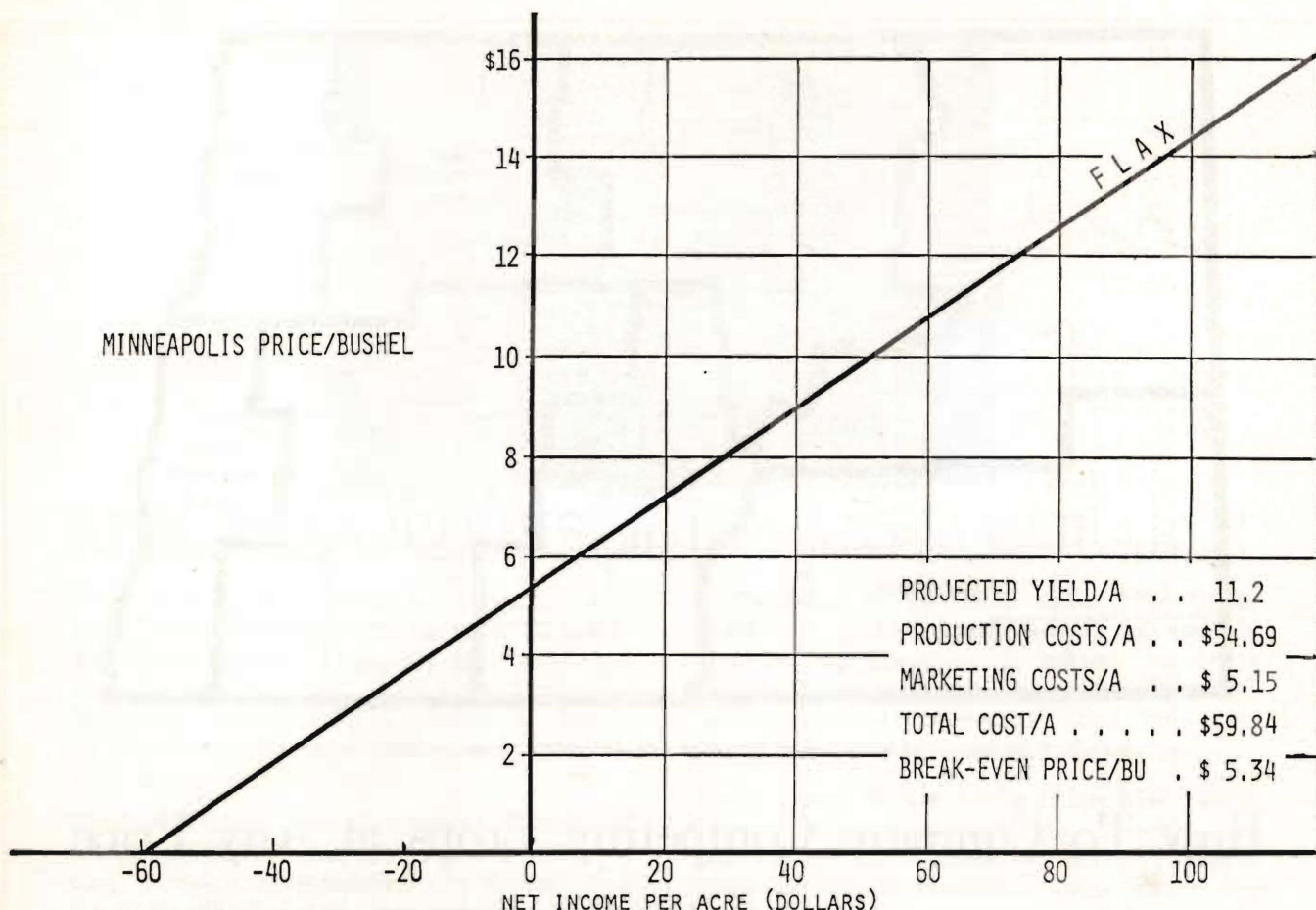


Figure 2. Estimated 1975 Price-Profit Chart for Flax in Southeast Central North Dakota.

A chart (Figure 2) is presented to visualize costs, commodity prices, and resultant profits. Flax in the southeast central region is used as an example. The horizontal axis in Figure 2 measures the net profit (or loss) per acre. Profit here means net returns above all costs including land, labor, and interest. The vertical axis is the price per bushel required to achieve a given level of

profit per acre. At the extreme left-hand side (at zero price), the cost per acre to grow and deliver flax to Minneapolis from southeast central North Dakota is indicated as \$59.84 for a projected yield of 11.2 bushels per acre. This amount includes \$54.69 to grow the crop, \$1.68 (15¢/bu.) elevator margin, and \$3.47 (31¢/bu.) transportation expense. The zero profit break-even price is \$5.34 per bushel.

Table 1. Range in Estimated Average Net Profit Per Acre From Selected Crops for Eight North Dakota Regions with December 2, 1974, Minneapolis Prices.

Crop	Dec. 2, 1974 Price \$/Bu.	Net Profit Per Acre	
		Low \$ Region	High \$ Region
HRS Wheat	5.50	45 (NWC)	90 (SRRV)
Durum	7.10	77 (NWC)	105 (NW)
Barley	4.50	78 (NWC)	102 (NW)
Oats	1.80	-8 (NW)	17 (SEC)
Flax	11.35	55 (SWC)	78 (NRRV)
Sunflowers*	19.50/cwt.	112 (NRRV)	133 (SRRV)

* Sunflower yield and production cost estimates are not available for five regions.

In Figure 3, net profit-price lines for HRS wheat, durum, barley, oats, flax, and sunflowers are shown on the chart. The relative profitability of each crop to the farmer for any price mix is apparent. For example, on December 2, 1974 Minneapolis per bushel prices were in the neighborhood of \$11.35 for flax, \$5.50 for HRS wheat, \$7.10 for durum, \$4.50 for barley, \$1.80 for oats, and \$19.50 per cwt. for sunflowers. These prices would yield the following net profit per acre in the southeast central region of: flax—\$67, HRS—\$74, durum—\$89, barley—\$102, oats—\$17, and sunflowers—\$116 (see Figure 3).

Another approach is to determine the prices of competing crops required to obtain the same profit per acre at average costs and yields as the current

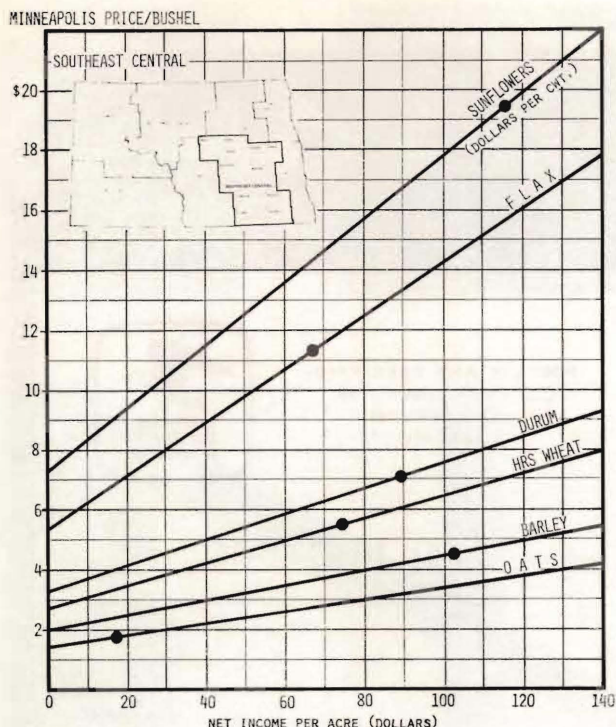


Figure 3. Estimated 1975 Price-Profit Chart for Selected Crops for the Southeast Central Region of North Dakota.

or expected price of flax. Using the southeast central region, HRS would provide the same profit as \$11.35 flax (\$67 per acre) if it were priced at \$5.26, durum at \$6.17, barley at \$3.65, oats at \$2.79, and sunflowers at \$14.39. Ranges in these prices for eight North Dakota Regions are given in Table 2.

Table 2. Range in Estimated Prices of Specified Crops Required to Provide the Same Average Net Profit Per Acre as \$11.35 Per Bushel Flax for Eight North Dakota Regions.

Crop	Prices to Yield the Same Profit as \$11.35 Flax	
	Low \$/Bu. Region	High \$/Bu. Region
HRS Wheat	4.78 (SRRV)	6.59 (NWC)
Durum	5.42 (NW)	6.45 (NWC)
Barley	3.64 (SEC)	4.16 (NWC)
Oats	2.67 (SRRV)	3.19 (NW)
Sunflowers \$/cwt.	13.53 (SRRV)	16.19 (NRRV)

A third way to view the situation is to determine the price required for a crop to provide the same profit as from other crops at their expected prices. Using December 2 prices as expected prices and the southeast central region as an example flax would have to be priced at \$11.93

to compete with HRS, \$13.29 to compete with durum, \$14.47 to compete with barley, \$6.83 to compete with oats, and \$15.69 to compete with sunflowers. Ranges in equivalent prices for this comparison for eight North Dakota regions are given in Table 3.

Table 3. Range in Estimated Flax Prices to Yield the Same Profit as From Other Crops at Their December 2, 1974, Prices for Eight North Dakota Regions.

Other Crop	Flax Prices to Yield Same Profit as From Other Crops	
	Low \$/Bu. Region	High \$/Bu. Region
HRS Wheat at \$5.50/bu.	9.31 (NWC)	13.76 (NRRV)
Durum at \$7.10/bu.	12.64 (NWC)	15.20 (NW)
Barley at \$4.50/bu.	12.45 (NWC)	14.45 (SEC)
Oats at \$1.80/bu.	6.18 (NW)	7.12 (SRRV)
Sunflowers at \$19.50/cwt.	15.70 (SEC)	16.88 (SRRV)

A Summary Comparison for Flax

With comparisons made on the basis of prices existing on December 2, 1974 the competitive position of flax in relation to other crops statewide in North Dakota was:

1. Cash HRS wheat prices were on a par with flax. The September futures price for HRS wheat closed at \$4.87 on December 5. To be on a par with this HRS price, the flax price could fall 12 per cent to \$10.50.

2. Durum prices would have to decline 16 per cent to \$5.98 or flax prices increase 22 per cent to \$13.81 for these crops to be on a par. No trading in September futures for durum had been reported as of December 5, 1974.

3. Barley prices could decline 26 per cent to \$3.80 and still compete with \$11.35 flax or flax would have to increase 21 per cent to \$13.77 to compete with the December 2 price of \$4.50 for barley.

4. Oat prices would have to increase to \$2.97 from the December 2 price of \$1.80 to compete with \$11.35 flax or the flax price could drop to \$6.38.

5. For the eastern part of the state, sunflower prices could fall 24 per cent to \$14.85 per cwt. to be on a par with \$11.35 per bushel flax or flax would have to increase to \$15.50 per bushel to compete with \$19.50 sunflowers.

On a regional basis, break-even prices for flax are lowest in the NRRV and NEC regions; and highest in the NW and SW regions. However, at

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AGRICULTURE
AGR 101



BULK THIRD-CLASS

today's prices, flax is in the best competitive position in the NWC, NRRV, and NEC. Flax is least competitive in the SRRV, SEC, and NW regions. Given that farmers grow the most profitable crops and make decisions on current prices, we will see a substantial reduction in flax acreage. It should be noted that relative profitability of crops is one of several criteria farmers may use in their decision-making process.

Any statement regarding the most profitable crops based on current prices will certainly be invalid by the time farmers make their decisions as those prices will not persist. The data and charts presented in this paper can aid in estimating the impact of any given set of prices.

The procedure outlined above may be followed by farmers to select the most profitable crops as long as their own yields and production costs are used. Though the **Planning Guide** budgets are helpful in establishing general trends, they are not intended to represent any particular farm.

(From the Director . . . from page 2)

visual means for researchers to recognize and identify potentially noxious species that could accidentally be introduced to North Dakota. Additional specimens come from foreign lands as donations from former foreign graduate students.

Mr. Ross Mutchler, Mutchler Farms, Northwood, donated the loan of a three-acre strip of land beginning in 1970 to permit degradation studies and residual analyses of soil applications of the persistent chlorinated hydrocarbon insecticides.

To these dozens of donors who might be listed but are not, we offer our sincere gratitude and appreciation for their support of the program in agriculture at NDSU. Gifts which can be incorporated into the program and made useful in the research and teaching efforts also add a dimension of pride to the researcher and teacher as it is a very effective way of letting him know he is appreciated and respected.