containing catechol and Dowicide A. Approximately 33 percent of the cut surfaces of this seed had not suberized.

Pyrophylite was used as the dilutent for the two dust treatments and each was applied at the rate of 1.5 pounds per 100 pounds of cut seed. Each of the nine dip treatments was for one minute. Seed cut May 18 was treated in the morning and planted the same day along with seed cut Apr. 25.

The emergence counts taken on July 5 indicated no treatment caused a delay in growth. Blackleg readings were made July 5 and 17, Aug. 6 and 24, and Sept. 4. The results indicated the three treatments containing mercury were the most effective in reducing this disease, followed by the two materials containing streptomycin nitrate.

Summary

Eleven potato seed treatments were used on cut Sebago seed in 1956 to evaluate their effectiveness in reducing blackleg. Acidulated mercuric chloride, mercuric chloride, Semesan Bel and a material containing catechol and streptomycin nitrate were the most effective dip treatments. The most effective dust contained streptomycin nitrate and Captan.

Costs and Returns

FROM BARLEY AND FLAX

In the Red River Valley

By Norman Ulsaker[1] and Theo H. Ellis[2]

Farmers in the Red River Valley face many new problems. Mechanization of production has been adopted rapidly. Weed sprays and commercial fertilizer are becoming important in crop production. Institutional factors such as acreage allotments and the Soil Bank have entered the picture. As a result of these and other changes, the farmer must make adjustments and must constantly examine alternative methods of production in the attempt to attain a higher and more stable income.

A serious obstacle to adequate farm planning is the lack of information on labor and material requirements for different crop enterprises and the uncertainity in arriving at the best combination of enterprises.

As part of a research project conducted by the agricultural economics department, farmers were

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surveyed in the summer of 1956 to gather basic input-output data for crops grown in the Red River Valley. Information was gathered from seven sampling areas throughout the valley that were selected on the basis of soil type.

A comparison of the costs and returns from two crops will be presented by applying current prices to the physical input and output items. Malting barley and flax are compared since they tend to be the most competing crops in replacing acreage taken out of wheat due to allotments.

The input-output data presented are based on weighted averages for these crops grown on silty clay loam and clay soil. Combined data for these two soil types are considered representative since they comprise the largest proportion of Red River Valley soil. Sandy loam is the only other soil type for which data were obtained. This type had lower labor and tractor requirements due to the common practice of spring plowing, packing and seeding in one combined operation.

Table I gives the typical field operations, implement used and time required for performing these operations in the production of barley and flax. As shown in this table, flax had slightly higher labor and tractor requirements than barley. This can largely be attributed to two major factors. One is the need for a more carefully worked and firmer seedbed for the small seeded flax. The other is the need to eliminate more of the early weeds, since the young flax plant does not compete as vigorously against these weeds as do other small grains.

Material requirements shown in table II are for barley and flax grown in 1955. The majority of farmers reported seeding rates very close to the usual rates.

Fertilizer was not used by the majority of farmers for either crop. However, barley was fertilized in more cases than was flax.

Table III shows the variable costs

TABLE I.—**Normal Labor and Tractor Requirements Per Acre, Sequence of Operations, and Size of Implement Most Frequently Used in the Production of Malting Barley and Flax in the Red River Valley.**

	Barley—101 Farms				Flax—77 Farms			
	Size of implement	Times over	Hours per acre		Size of implement	Times over	Hours per acre	
			Man	Tractor			Man	Tractor
Fall plow	3–14"	1	.7	.7	3–14"	1	.7	.7
Spring work:								
Cultivate[1]	12'	1	.2	.2	12'	2	.4	.4
Harrow	36'	1	.1	.1	36'	2	.2	.2
Seed	12'	1	.2	.2	12'	1	.2	.2
Harrow	12'	1	.1	.1	----	----	----	----
Total spring work	----	----	.6	.6	----	----	.8	.8
Harvest:								
Swath	12'	1	.2	.2	12'	1	.2	.2
Combine	12'	1	.4	.4	12'	1	.2	.2
Total harvest	----	----	.6	.6	----	----	.6	.6
Total hours[2]	----	----	2.0	1.9	----	----	2.2	2.1

[1]Disking was frequently done in place of cultivating with slightly reduced labor and tractor requirements.
[2]Man labor increased by 5 percent to allow for servicing tractor and equipment.

TABLE II.—**Material Requirements Per Acre Used in the Production of Malting Barley and Flax in the Red River Valley, 1955.**

	Barley	Flax
Number of farms	101	77
Seed		
Rate per acre:		
Range	5–8 pecks	2–6 pecks
Usual	7 pecks	3 pecks
Fertilizer:		
Percent of farmers reporting:	48	13
Usual analysis	11–48–0	11–48–0
Application rate per acre:		
Range	35–100 lbs.	35–60 lbs.
Usual	50 lbs.	50 lbs.

of producing the two crops. Labor is generally considered a fixed cost and is not included. As can be seen in the table, flax had a higher total variable cost than did barley.

Table IV gives the comparative returns from the two crops based on 1956 prices. Both the net return per acre and the return to labor and investment were higher for flax It must be kept in mind however, that there are other factors the farmer must consider in measuring the advantage of one crop over the other. Risk, variability in yield, soil condition, prevalence of weeds and weather conditions are some of these factors.

On the basis of the input, output and price data used, flax was the most profitable crop. Although the variable cost of producing flax was 40 cents per acre higher than barley the return to labor and investment was higher by $5.86 per acre or $1.60 per hour of labor.

TABLE III.—**Variable Costs Per Acre of Producing Barley and Flax.**

	TRACTOR			SEED			Total variable cost per acre
	Normal requirements per acre	Cost per hour	Total cost	Usual requirements per acre	Cost per bushel	Total cost	
Barley	1.9 hrs.	$1.10	$2.09	1¾ bu.	$1.70	$2.97	$5.06
Flax	2.1 hrs.	1.10	2.31	¾ bu.	4.20	3.15	5.46

TABLE IV.—**Returns Per Acre and Per Hour Above Variable Costs for Barley and Flax.**

	Normal yield per acre (bu.)	Price per bu.[1]	Gross return per acre	Variable cost per acre	Return to labor and investment per acre	Return to labor and investment per hour
Barley	32.8	$ .87	$28.54	$5.06	$23.48	$11.74
Flax	11.3	3.08	34.80	5.46	29.34	13.34

[1]Average market prices received by farmers in North Dakota from Jan. 1, to Oct. 31, 1956, as reported by the USDA Crop Reporting Service.