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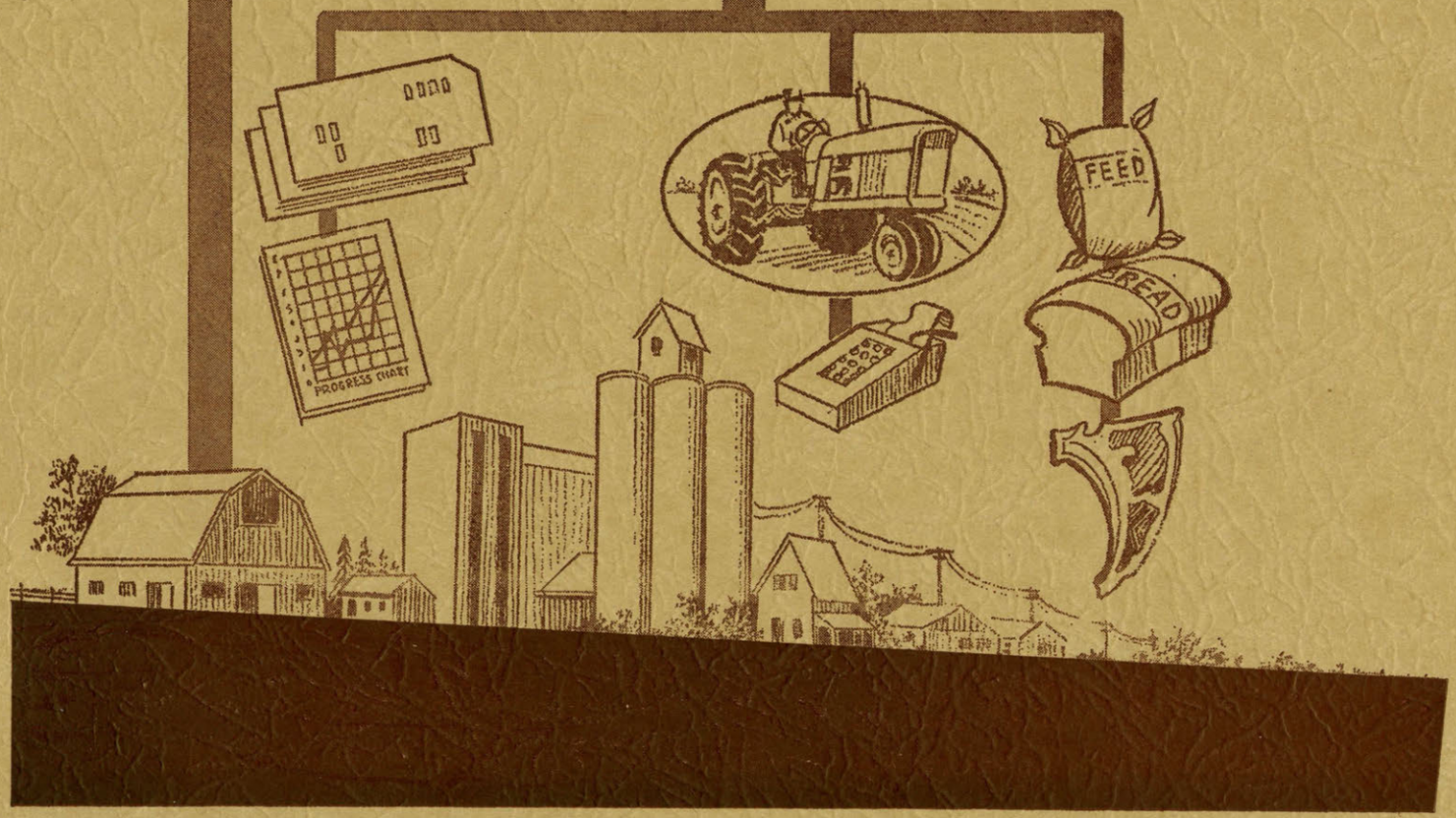

COLLEGE OF AGRICULTURE AND HOME ECONOMICS
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Thomas L. Frey

The market impacts and the production implications of the Southern Corn Leaf Blight are evaluated in this paper. Since the outlook for next year is highly conditioned by the production and use of the 1970 crop, the first relevant question is how will the blight affect the total supply of corn and the general price level.

Feed Grain Situation, 1970-71

The November 1 corn crop estimate of 4,104 million bushels was 299 million bushels below the month-earlier forecast. This is the smallest crop since 1966. The July 1 prospects for a record production of 4,800 million bushels were upset by southern corn leaf blight in Southeast and Eastern Cornbelt States and by drought in Western Cornbelt States. Irrigated areas in Nebraska are in a favorable position as to yields, quality and demand. Nebraska's 1970 production of 350 million bushels is second only to its 1969 record crop of 434 million bushels.

The corn price outlook for the 1970-71 marketing year was not changed much by the lower output forecasts as the corn harvest progressed. The market adjusted to the smaller corn crop in August, declined seasonally in late September, and remained quite steady when revised estimates were released. The net effect of the recent reduced forecasts is added strength for prices of corn, grain sorghum, and wheat this marketing year. Those needing to buy feed grains should watch relationships among prices of corn, milo and wheat in order to minimize feed costs The grain sorghum crop estimates was boosted to 708 million bushels on November 1, thanks to late summer rains.

1/ Submitted to College of Agriculture Task Force on Southern Corn Leaf Blight, University of Nebraska, November 1970. The section "Feed Grain Situation 1970-71" is a partially revised and updated version of Department of Agricultural Economics staff paper #17 by Everett E. Peterson; Michael S. Turner contributed the section on Supply, Quality and Price; Phillip A. Henderson assisted in preparation of the crop budgets.

The feed grain supply will be ample for the 1970-71 feeding season but prices will be higher than in the past three years. Corn prices are likely to average 25-30 cents above last year with other grains up by comparable amounts. Protein supplement will also cost more as soybean demand exceeds production and draws down carryover.

Corn supply and use in recent years is summarized in Table 1. Carryover October 1, 1971 will approach 300 million bushels, or less than half that of the "famine scare" years of 1965 and 1966. Feed use may be less than the indicated 3.8 billion bushels if wheat, milo and roughage are substituted for corn to a greater extent than these figures assume.

Table 1. Corn Supply and Utilization--1964-68 Average and the 1967-70 Marketing Years

Supply and Use	1964-68 Average	1967	1968	1969	1970
Supply:					
Carryover (Oct.1)	1,102	823	1,162	1,113	950
Production (Annual)	4,169	4,761	4,394	4,579	4,104
Total	5,271	5,584	5,556	5,692	5,054
Use:					
Feed	3,302	3,412	3,522	3,774	3,800
Food, seed, ind.	368	377	385	393	390
Exports	583	633	536	575	550
Total	4,253	4,422	4,443	4,742	4,740
Carry Over (Oct.1)	1,018	1,162	1,113	950	314

While corn is the most important feed grain, other grains are also available--especially milo and wheat in the Plains States (see Tables 2 and 3). The total feed grain supply and use, excluding wheat, is given in Table 4; wheat carryover will be 700-750 million bushels. Assuming a 3 percent increase in feeding for 1970-71, carryover of feed grains a year from now would be near 25 million tons, or one-fifth of a year's feed requirement and one-half the 1964-68 average.

Table 2. Grain Sorghum Supply and Use--1964-68 Average and the yearly 1967-70 Marketing Years

Supply and Use	1964-68 Average	1967	1968	1969	1970
			(million bushels)		
Supply:					
Carryover (Oct.1)	428	244	289	288	250
Production (Annual)	675	756	740	743	708
Total	1,103	1,000	1,029	1,031	958
Use:					
Feed	547	532	622	653	700
Food, seed, ind.	13	13	13	13	13
Exports	187	166	106	115	100
Total	747	711	741	781	813
Carryover (Oct.1)	356	289	288	250	145

Table 3. Wheat Supply and Use--1964-68 Average and the 1966-70 Marketing Years

Supply and Use	1964-66	1966	1967	1968	1969	1970
			(Million bushels)			
Supply:						
Carryover (Oct.1)	751.3	535.2	425.0	539.4	819	880
Production (Annual)	1,303.5	1,311.7	1,522.4	1,576.2	1,459	1,349
Imports	1.3	1.7	.9	1.1	2	1
Total	2,056.1	1,848.6	1,948.3	2,116.7	2,280	2,230
Use:						
Food	508.8	501.9	519.2	519.8	525	530
Seed, Ind.	68.7	78.5	71.6	61.4	55	55
Feed	107.2	98.9	57.0	172.8	210	260
Export	778.9	744.3	761.1	544.1	610	650
Total	1,463.6	1,423.6	1,408.9	1,298.1	1,400	1,495
Carryover (Oct.1)	592.5	425.0	539.4	818.6	880	735

Table 4. Feed Grain Supply and Utilization--1964-68 Average, and the 1967-70 Marketing Years

Supply and Use	1964-68 Average	1967	1968	1969	1970
			(million tons)		
Supply:					
Carryover (Oct.1)	50.3	37.1	48.3	50.0	47.0
Production (Annual)	158.8	176.0	168.9	174.2	158.3
Imports	.3	.3	.3	.4	.3
Total	209.4	213.4	217.5	224.6	205.6
Use:					
Feed	124.7	126.1	133.1	141.3	145.0
Food, seed, ind.	15.4	15.7	16.0	16.5	16.0
Exports	22.9	23.3	18.4	19.8	18.5
Total	163.0	165.1	167.5	177.6	179.5
Carryover (Oct.1)	46.4	48.3	50.0	47.0	26.1

Higher feed costs in 1970-71 will cause marketing of cattle and hogs at lighter weights, probably lower prices for feeder cattle this winter, less poultry and hog expansion in 1971, and higher livestock and poultry prices by summer of 1971.

With carryover of feed grains at such low levels, widespread crop failure in 1971 would be very serious. The blight-resistant corn seed supply for 1971 planting will not meet demand. Blight spores are now spread over a larger area. Weather conditions favoring such diseases occur nearly every year east of the Missouri River. In 1971 it is likely that soybeans will be substituted for corn in Eastern States and grain sorghum and soybeans substituted for corn in the Western Cornbelt.

As of November 15, 1970, government feed grain and wheat programs for 1971 are still not established. Current thinking strongly suggests that the programs will be designed to encourage less set-aside of feed grain acreage than acreage diversion in 1968-70, due to the drastically lower expected feed grain carryover October 1, 1971. Since wheat is already planted, the only way the government could now encourage increased wheat production would be to "legalize" traditional overplanting.

Another important question being asked by farmers is how will the blight affect the quality and respective value of infected grain?

Supply and Price

The release of government controlled stocks of feedgrains and wheat for cash market sales will tend to establish a ceiling on feed grain prices. In Nebraska, government corn stored in CCC bin sites will be available for cash bids when cash market prices exceed the county loan rate by 19 1/4 cents per bushel. In localities where government stocks are available it is unlikely that cash market prices will remain substantially above $1.25 to $1.30 per bushel for any appreciable length of time.

Quality and Price

Fortunately the incidence of Southern Corn Blight in Nebraska was very small during the 1970 crop year. As a result the question of quality and value of infected corn is not of particular concern to Nebraskans this year.

Blight may result in both lower test weights and increased kernel damage. Blight damaged kernels will be graded as damaged kernels as any other disease damage. Grade specifications for test weight and kernel damage are as follows:

Grade	Test weight at least (pounds)	Damage not over (pounds)
No. 1 corn	56	3
No. 2 corn	54	5
No. 3 corn	52	7
No. 4 corn	49	10
No. 5 corn	46	15

Price discounts for test weights are usually one cent for each pound under 54. Discounts for damage are usually one cent for each one percent over five percent. Musty, moldy or otherwise distinctly low quality corn will be sample grade and will take a negotiated market discount. A significant increase in low test weight and high damage would likely result in higher price discounts than those shown above.

Production Strategies

At this point, no one can predict with accuracy, the probability of a given Nebraska farmer suffering a reduction in 1971 corn yields due to the Southern Corn Leaf Blight. It is known, however, that substantial losses were incurred in various states in 1970. It seems likely that the areas hit hardest in 1970 will get a proportionately larger share of the resistant seed in 1971. Also, it is believed the disease can be transmitted by wind borne spores. Therefore, each farmer will have to decide whether to accept this uncertain possibility of blight if he produces corn or whether to seek alternative uses of the land.

His decision should include consideration of all alternatives and the expected profitability of each, along with possible risk reducing alternatives if corn is grown. As a basis for decision making, budgeted costs and returns for five different cropping systems have been developed--three for dryland and two for irrigated production (in some cases, there may be viable alternative crops other than those shown by these budgets, e.g., irrigated soybeans.) Caution is advised in use of these budgets. They represent average production practices and are adaptable in rather specific circumstances. Each farmer is urged to modify the budgets to fit his particular cost and return figures. The dryland budgets are applicable only in Eastern Nebraska--for an approximate area lying east of a line through Norfolk and Lincoln. Moving west of this line and south of the Sandhills, grain sorghum would gain in relative advantage to corn. Other assumptions underlying the budgets include: 1) 400 acres of tillable land in both the dryland farm and in the irrigated farm; 2) the main power source is a 70-79 H.P. diesel tractor with 800 hours of annual use; 3) use of six row equipment and 30" rows for irrigated crops and dryland soybeans, with 40" rows on dryland corn and sorghum; 4) 16" effective water on the irrigated crops; 5) risk of crop loss is carried by the farmer and not through insurance; and 6) the two crop price levels used represent upper and lower boundaries on price expectations for 1971. If there is a substantial shift to soybeans in the corn

belt and lower corn production, corn prices should be strong, while soybeans would tend to be lower. On the other hand if an abnormal acreage is not diverted from corn, and in fact there is high corn production, we would expect stronger soybean prices to accompany the lower corn prices. The budgets reflect grain sorghum prices at 85% of corn prices. Whether this relationship will hold in a period of exceptionally short corn supplies is untested. With an apparent preference for corn by many cattle feeders, it seems possible that under such conditions sorghum prices might fall below the more normal 85 percent level.

The budgets appear as tables 5 and 6. While fixed costs are shown to make possible calculation of net management returns, only variable costs need to be considered for short run production decisions. A farmer will incur fixed costs regardless of how the land is used. Therefore, his goal for the next year is to obtain maximum returns above variable costs. For example, refer to table 5 and the budgets for irrigated corn and sorghum. With corn at $1.50 per bushel and sorghum at $2.28 per cwt., corn yields $48.71 more above variable costs than sorghum. This means corn yields could drop about 23 percent or 32.5 bushels before the returns above variable costs would drop to the level of grain sorghum (this assumes of course that sorghum yields remain constant.) At the lower price level, corn becomes equal to grain sorghum at a 20 percent yield drop.

The same type of analysis can be used with dryland crops. Here corn has a much less relative advantage over alternative crops, and only a modest loss due to blight might make corn less profitable than beans or sorghum. For example, (see table 6), at the lower price levels, corn yields $7.90 more above variable costs than sorghum does, and $14.14 more at the higher levels. Quite likely many Eastern Nebraska dryland farmers will find their margin of advantage so small with corn under normal conditions, that with the risk of blight in 1971, it will be advantageous to grow an alternative crop.

Table 5. Budgeted Costs and Returns for Irrigated Corn and Sorghum Production (per acre)

Item	Corn	Sorghum	
Fixed Costs	140 bu. yield	115 bu. yield	
Machinery and equipment	$ 27.69	$ 27.69	
Land tax	6.13	6.13	
Interest on land investment (6%)	32.40	32.40	
Risk (10% of variable cost)	5.71	4.30	
Operator labor ($2/hr.)	9.60	9.60	
General Farm Expense	4.00	4.00	
Total Fixed Costs	$ 85.53	$ 84.12	
Variable Costs			
Seed	$ 6.25	$ 1.76	
Fertilizer	12.66	10.13	
Herbicides	4.16	4.16	
Insecticides	7.35	2.75	
Fuel, lubricants, and repairs	13.73	13.73	
Interest on preharvest costs (8%-6 mo.)	1.77	1.30	
Haul and elevate (2¢/bu.)	2.80	2.30	
Drying (6¢/bu.)	8.40	6.90	
Total Variable Costs	$ 57.12	$ 43.03	
All Costs	$142.65	$127.15	
Returns			
If grain price is (per bu.)	$ 1.50	$ 1.28	($2.28 cwt.)
Gross returns (per acre)	210.00	147.20	
Returns above variable costs	152.88	104.17	
If grain price is (per bu.)	$ 1.00	$ .85	($1.52 cwt.)
Gross returns (per acre)	140.00	97.75	
Returns above variable costs	82.88	54.72	

Table 6. Budgeted Costs and Returns for Dryland Corn, Sorghum, and Soybean Production (per acre)

Item	Corn	Grain Sorghum	Soybeans
Fixed Costs	90 bu. yield	90 bu. yield	35 bu. yield
Machinery and equipment	$ 11.27	$ 11.27	$ 11.27
Land taxes	5.00	5.00	5.00
Interest on land investment (6%)	24.00	24.00	24.00
Risk (10% of variable costs)	3.36	2.79	1.76
Operator labor ($2.00/hr.)	5.50	5.50	5.50
General farm expense	4.00	4.00	4.00
Total Fixed Costs	$ 53.13	$ 52.56	$ 51.53
Variable Costs			
Seed	3.00	1.15	4.75
Fertilizer	7.31	7.31	-0-
Herbicides	3.20	3.20	-0-
Insecticides	6.35	2.75	6.00
Fuel, lubrication, and repairs	5.51	5.51	5.51
Interest on preharvest cost (8%-6 mo.)	1.01	.80	.65
Haul and elevate (2¢/bu.)	1.80	1.80	.70
Drying (6¢/bu.)	5.40	5.40	-0-
Total Variable Costs	$ 33.58	$ 27.92	$ 17.61
All Costs	$ 86.71	$ 80.48	$ 69.14
Returns			
If grain price is (per bu.)	$ 1.00	$ .85 ($1.52 cwt.)	$ 2.50
Gross returns (per acre)	90.00	76.50	87.50
Returns above variable costs	56.42	48.52	69.89
If grain price is (per bu.)	$ 1.50	$ 1.28 ($2.28 cwt.)	$ 2.25
Gross returns (per acre)	135.00	115.20	78.75
Returns above variable costs	101.42	87.28	61.14

Risk Reducing Possibilities with Corn Production

Aerial spray application to prevent blight infestation is an alternative. Limited evidence exists as to how many applications are needed for effective control. Reports from various experiment stations indicate two to four applications may be required. To determine costs of spraying, five Nebraska aerial applicators were contacted and asked to report their charge for applying two pounds of either zineb or maneb in five gallons of water. Four replys were received. Charges quoted for one application varied between $1.80 and $2.50 per acre, plus material. One operator reported the latest quotations on spray at 82 cents per pound or $1.64 per acre. If we assume a $3.60 per acre cost per application, control would cost the following: two applications, $7.20; three applications, $10.80; and four applications, $14.40.

Federal all-risk crop insurance does cover loss from blight, and is available in 26 Nebraska dryland counties and six irrigated counties. Yield guarantees range from 18 to 42 bushels per acre in the dryland counties and from 66 to 70 bushels in the irrigation area. At the $1.00 per bushel payment level, insurance costs range from $2.00 to $2.90 in Nebraska counties. Due to the low yield gurantees, other strategies are superior as a hedge against blight infestation.

Another alternative which we can no recommend is the use of home grown corn for seed. Experiment stations report such seed would virtually guarantee yield reduction of 10 to 30 percent, which means other strategies would assure more profit. In addition to this built in loss, there is no evidence to suggest that such seed would be totally blight resistant.

Since 1971 government feed grain programs are not yet announced, no attempt will be made to evaluate the extent to which increased land diversion might become desirable to offset the risk of blight. We do suggest farmers carefully consider acreage diversion as an alternative, when details of the program become available.