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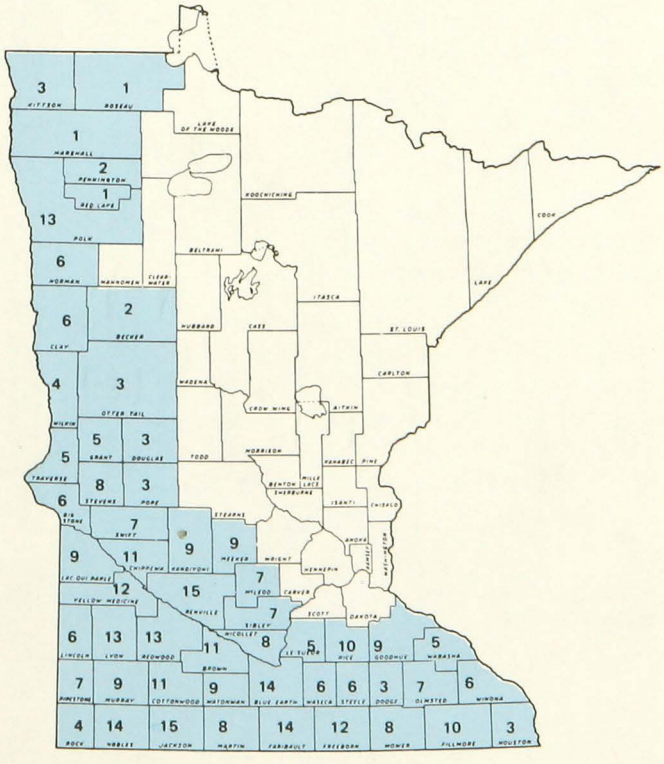
How Minnesota Farmers Market Their Grain

By Reynold Dahl and Maggie Liu*

MINNESOTA FARMERS in recent years have changed many grain marketing practices. New marketing systems and channels are challenging traditional institutions and methods.

The country elevator has a strategic position in this marketing system. It's the local farm market and principal outlet through which farmers sell grain. In recent years, however, some farmers have bypassed country elevators. They have sold grain directly to terminal elevators, processors, and others.

Figure 1. Area surveyed and number of farmers from which grain marketing information was obtained in each county, 1971.



How much grain bypasses local country elevators? To find out, the Department of Agricultural and Applied Economics made a survey in spring 1972. The results can help farmers and marketing firms adjust to changing marketing patterns and practices.

A mail survey was sent to a random sample of 500 farmers in Minnesota's principal grain producing region. Those not responding were personally interviewed. Information was obtained from 404 farmers. The results should represent grain marketing practices of all Minnesota farmers.

The area surveyed accounts for over 90 percent of Minnesota's grain production. The number of farmers surveyed in each county is shown in figure 1.

Where farmers sell grain

Corn comprised 55 percent of grain sold by the surveyed farmers. Twenty percent was soybeans, and the rest was wheat, barley, oats, and other grains.

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Table 1. Where Minnesota farmers sold their grain; percent of grain sold, January-December 1971.

Type of Grain	Country Elevator	Other Farmers	Truckers	Terminal or Sub-Terminal Elevator	Grain Processor	Feed Dealer	Others	Total
				Percent				
Corn	89.9	0.4	0.1	2.7	0	0.8	6.1	100
Soybeans	94.1	0	0.4	0.6	0.4	0.2	4.3	100
Wheat	91.2	0	0	6.5	0.9	0	1.4	100
Barley	78.8	0	0	1.3	0	0.7	19.2	100
Oats	74.5	2.9	0	11.8	0	0.5	10.3	100
Other grain	88.3	0	0	0	10.4	0	1.3	100
Total grain	88.7	0.5	0.2	3.2	0.5	0.6	6.3	100

Table 1 shows where farmers sold their grain in 1971. The country elevator is still by far the most used outlet. Country elevators purchased nearly 90 percent of grain farmers sold in 1971. These elevators' importance varied for different grains, however. The range was from 94 percent of all soybeans to 75 percent of all oats sold by farmers.

The second most important outlet was "others" (table 1). This includes seed dealers, turkey producers, and through farmers' organizations such as Minnesota Farm Bureau and the National Farmers Organization. Sales to terminal and subterminal elevators accounted for only 3.2 percent of 1971 grain sales by Minnesota farmers. Sales to other farmers, truckers, grain processors, and feed dealers were small. Collectively, these accounted for only 1.8 percent of total grain sales.

Grain sold at harvest and from storage

Figure 2 shows that 32 percent of grain sold by farmers in 1971 was sold at harvest. Fifty-nine percent was sold from farm storage; 9 percent was sold from nonfarm storage.

The sizeable percentage sold at harvest indicates considerable pressure on country elevators during a short time. Fifty-nine percent of wheat sales were made at harvest, but only 25 percent of corn sales were at harvest.

Corn is Minnesota's most important grain. Changes in its harvest have affected marketing practices. In recent years, there has been a substantial increase in field shelling. A Minnesota Crop and Livestock Reporting Service survey shows that 65 percent of Minnesota's 1971 corn was field-shelled. Cornhead combines were used on 57 percent of the crop. Field picker-shellers harvested 9 percent. Mechanical pickers were used on only 34 percent of the 1971 crop.

Table 2. Grain harvested, farm storage capacity, and planned additions in next 5 years, Minnesota farms, 1971.

	Percent
Grain Harvested, 1971	100.0
Farm Storage Capacity:	
Percent of 1971 production	93.4
Planned Additions to Farm Storage in Next 5 years:	
Percent of 1971 production	16.6
Percent of 1971 storage capacity	17.8

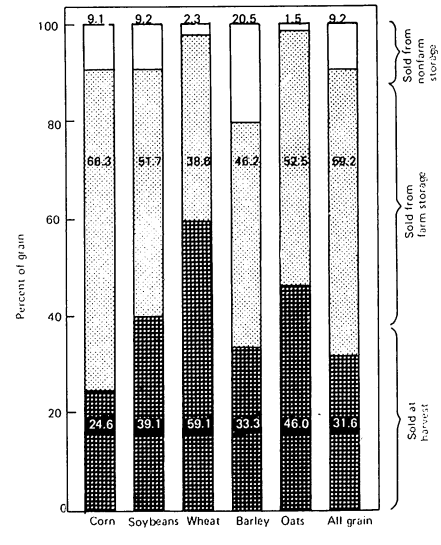
Most field-shelled corn is harvested wet. It must be dried before storage. In 1971, 57 percent of farm-stored corn was dried artificially on the farm. Six percent was dried artificially off the farm, and 37 percent was dried naturally in the field or in storage.[1]

Since over half of the farm-stored corn is dried on the farm, farmers have invested greatly in grain drying equipment and storage bins. This continues a trend toward more and better farm grain storage than was begun during the 1950's surplus grain buildup. Then low interest federal loans were available to encourage expansion of farm storage facilities.

Farm storage

Storage capacity on surveyed farms was 93 percent of their 1971 grain production (table 2). These farm-

Figure 2. Grain sold by Minnesota farmers at harvest and from farm and nonfarm storage, January-December 1971.



[1]Minnesota Crop and Livestock Reporting Service, "Corn Harvesting and Drying Methods," Minnesota Department of Agriculture, March 6, 1972.

ers also reported plans to increase storage capacity 18 percent during the next 5 years. Part of the planned additions probably represents replacement of present storage with new and better facilities. Examples may be replacing ear-corn cribs with metal bins. The latter are desirable for field-shelled corn.

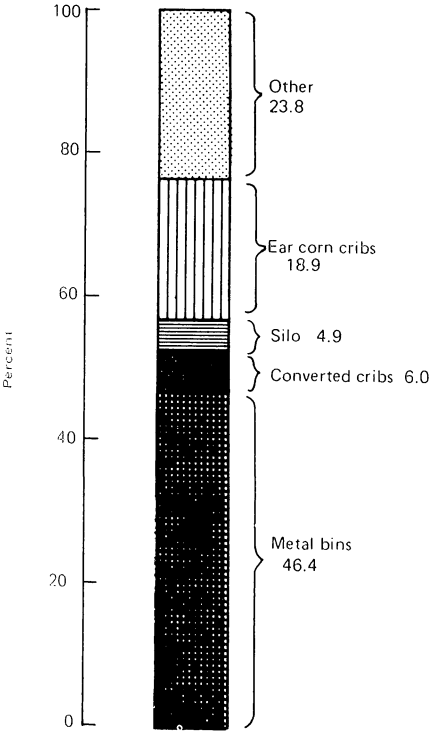
Fifty-six percent of the farmers answered whether or not their present metal bin capacity was adequate. Of those responding, 48 percent indicated inadequate capacity.

Only 25 percent responded concerning plans to add storage within the next 5 years. Over 80 percent of the respondents indicated plans to add metal bins.

Figure 3 shows metal bins comprise 46 percent of the 1971 grain storage capacity on Minnesota farms. Consequently, a substantial percentage of storage is in permanent facilities. This together with many farmers' plans to add more metal bins shows a continuing trend toward more and better farm grain storage.

Farm storage gives farmers more flexibility in timing grain sales. They don't have to sell at harvest. As discussed in the June, 1973, Minnesota Agricultural Economist, in years of large crops, local cash prices at harvest are frequently depressed relative to futures prices. In such periods, farmers can often earn storage returns through hedging corn in the futures market.

Figure 3. Type of grain storage facilities on Minnesota farms, 1971.



How farmers move grain to market

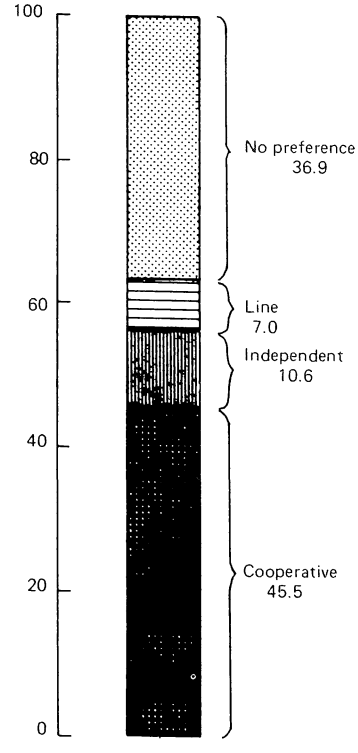
Seventy percent of the farmers reported they moved grain to market by truck. Twenty-six percent reported moving their off-farm grain sales by tractor and wagon.

More than half reported they owned one or more farm trucks. Forty-seven percent reported no farmer-owned truck. Table 3 shows 46 percent of trucks owned by farmers were from 1 to 3 tons capacity. The remaining 54 percent of farmers owned trucks ranging from 4 to 21 tons. Farmers owning larger trucks can more cheaply move grain greater distances.

Type of local elevator preferred

Farmers were asked what type of local elevator they preferred to market their grain. Ninety percent responded. Figure 4 shows 46 percent of those responding preferred cooperatives. Cooperative elevators are more numerous than Minnesota's other local elevators. In 1970, Minnesota had 209 cooperative elevators.

Figure 4. Type of local elevator through which Minnesota farmers prefer to sell grain, 1971.



Thirty-seven percent of the farmers reported no preference. Independent elevators were preferred by 11 percent. Line elevators were preferred by 7 percent of the farmers.

Even though over 60 percent of those responding indicated a preference, most farmers indicated they checked prices at more than one outlet before selling. Farmers checked an average of two elevators.

Price premiums

Farmers were asked whether or not they could obtain price premiums for various marketing practices. Table 4 shows only a small percentage said they could obtain these. It's significant that 20 percent of the respondents said they could get price premiums through their local elevators. This was the most frequently indicated means to obtain price premiums. It was followed closely by uniform quality listed by 18 percent.

Only 7.4 percent indicated they could obtain price premiums through large volume selling. Slightly over 5 percent of responding farmers said selling to another farmer or dealing with a terminal elevator or grain processor were possible sources of price premiums.

Local elevator services

Table 5 shows most farmers said they are receiving favorable services from their local elevators. Grain unloading efficiency was the service farmers said was poorest. While 63 percent of respondents indicated efficient grain unloading, the other 37 percent reported frequent waiting lines.

As reported earlier, the survey indicated over 30 percent of farmers' grain sales are at harvest. So elevators are under considerable pressure during that time. Further, with improved grain harvesting technology, harvest has been compressed into a shorter period.

One-fourth the farmers said storage capacity of their local elevator was inadequate. A similar percentage indicated drying charges were too high. But three-fourths the farmers felt that storage capacity of their local elevator was adequate and drying charges were reasonable.

Eighty-five percent reported fair prices and grades at their local elevator.

Only 15 percent were dissatisfied with prices and grades.

Choice of market

What factors influence farmers' choice of marketing outlet? More than half, 53 percent, said higher price was the most important factor (table 6). Convenience was listed most important by 20 percent. Other considerations, such as loyalty to the elevator, availability of farm supplies, and credit on purchases were listed most important by 8, 7, and 5 percent respectively.

Farmers were also asked the second most important factor influencing their choice of outlet. Convenience was second most important for 23 percent. Lenient grading and availability of farm supplies were second to 15 and 14 percent, respectively.

Summary and conclusions

The study results indicate a significant amount of farmers' grain bypassing country elevators. However, the amount is small relative to total farm grain sales. Nearly 90 percent of farmers' 1971 grain sales were to country elevators.

Most farmers seemed pleased with the services of their local elevators. Inefficient grain unloading facilities and inadequate storage were most frequent complaints. While most farmers said they received fair prices and grades at their local elevator, they also check prices with an average of two elevators before selling. More than half the farmers said higher price is most important in their choice of outlet.

Country elevators that perform grain handling and transportation functions efficiently have an advantage over others. They can pay higher prices to farmers. To keep operating costs at a minimum, they must be large enough to take advantage of economies of large volumes in both grain handling and transportation.

The trend toward more and better farm grain storage is continuing. Nearly half the farm grain storage facilities were metal bins. Almost half the farmers reported their present metal bins were inadequate. They also reported plans to increase their farm storage capacity by nearly 20 percent in the next 5 years. Farm storage gives farmers more flexibility in timing grain sales.

Table 3. Farmers reporting owning trucks and distribution by truck size, Minnesota, 1971.

Size of Truck (tons)	Number of Trucks*	Percent of Trucks
1-3	124	46.4
4-6	52	19.5
7-9	39	14.6
10-12	39	14.6
13-15	7	2.6
16-18	2	.8
19-21	4	1.5
Total	267	100.0

* 214 farmers reporting.

Table 4. Farmers reporting price premiums for various grain marketing practices, Minnesota, 1971.

Marketing Practice	Number of Farmers Reporting yes	no	Percent Reporting yes
Selling in large volume	22	274	7.4
Dealing with terminal elevator	11	270	4.1
Dealing with processor	10	267	3.6
Dealing with local elevator	60	244	19.7
Providing uniform quality	50	236	17.5
Delivering to purchaser	10	268	3.6
Selling at harvest	3	275	1.1
Selling to another farmer	14	263	5.1

Table 5. Farmers reporting favorable and unfavorable services at Minnesota local elevators, 1971.

Type of Service	Number of Farmers Reporting yes	no	Percent Reporting yes
Reasonable drying charges	127	41	75.6
Friendly, helpful personnel	314	4	98.7
Fair prices, grades, and discounts	263	48	84.6
Grain handling ability satisfactory	244	33	88.1
Storage capacity adequate	194	62	75.8
Grain unloading efficient	187	111	62.8
Modern, up-to-date facility	243	28	89.7
Pays for grain on time	285	0	100.0
Provides needed services	244	8	96.8
Pays premium on large lot	26	4	86.7
Provides credit for feed, fertilizer, etc.	244	5	98.0
Has farm supplies available	300	---	---

Table 6. Most important factor influencing choice of grain marketing outlet, Minnesota farmers, 1971.

Most Important Factor Influencing Choice of Market Outlet	Number of Farmers	Percent of Farmers
Higher prices	177	53.5
Convenience	69	20.8
Loyalty to elevator or manager	26	7.9
Availability of farm supplies	23	6.9
Credit provided for purchases	16	4.8
Lenient grading	14	4.2
Other factors	6	1.8
Total	331	100.0

How Government Programs Affect The Acreage Of Oats And Barley

By Mary E. Ryan and Martin E. Abel*

OATS, BARLEY, corn, and sorghum account for about 95 percent of the grain fed to U.S. livestock. In addition the past 2 years, these crops have brought U.S. farmers more than $1 billion in yearly export sales. This demand has been accompanied by advances in feed grain technology. These advances have more than doubled per-acre yields since World War II.

In recent years, supply has exceeded demand. This has led to downward pressure on prices and producers' incomes. To partially counteract this, the government supports feed grain prices. It also operates programs to limit surpluses.

This report on oats and barley completes a series of investigations. In the series, supply relationships were explored for the four major feed grains.[1]

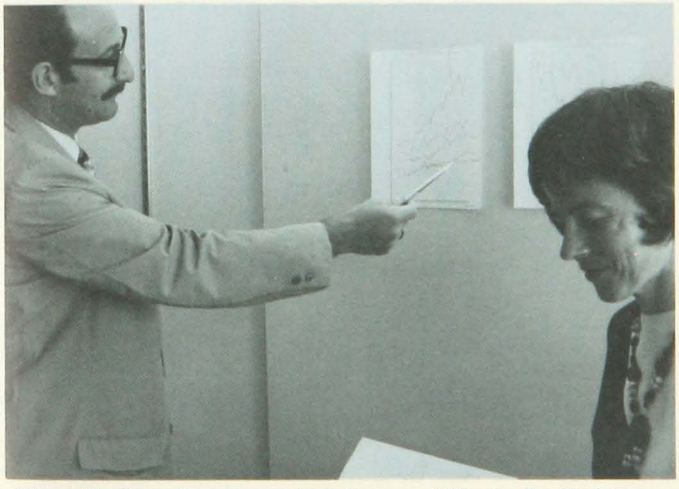
Special emphasis was devoted to the effect of government programs on each crop's acreage.

Government programs had great impact the past 2 decades. They are likely to continue their influence in the future.

The report describes production and use of oats and barley from 1949 to 1972. It also shows how to predict the impact of government programs on acreage.

Acreage, yield, and production

Figure 1 illustrates acreage changes of oats and barley and their competing crops. The most marked trends are the decrease in oats acreage after 1955 and the continuous increase of soybeans. Although corn and wheat averages declined during the 1950's, no trends are evident since then. Barley acreage is now about the same as at the beginning of the study period. However from 1954 until the early 1960's, considerably more acreage was

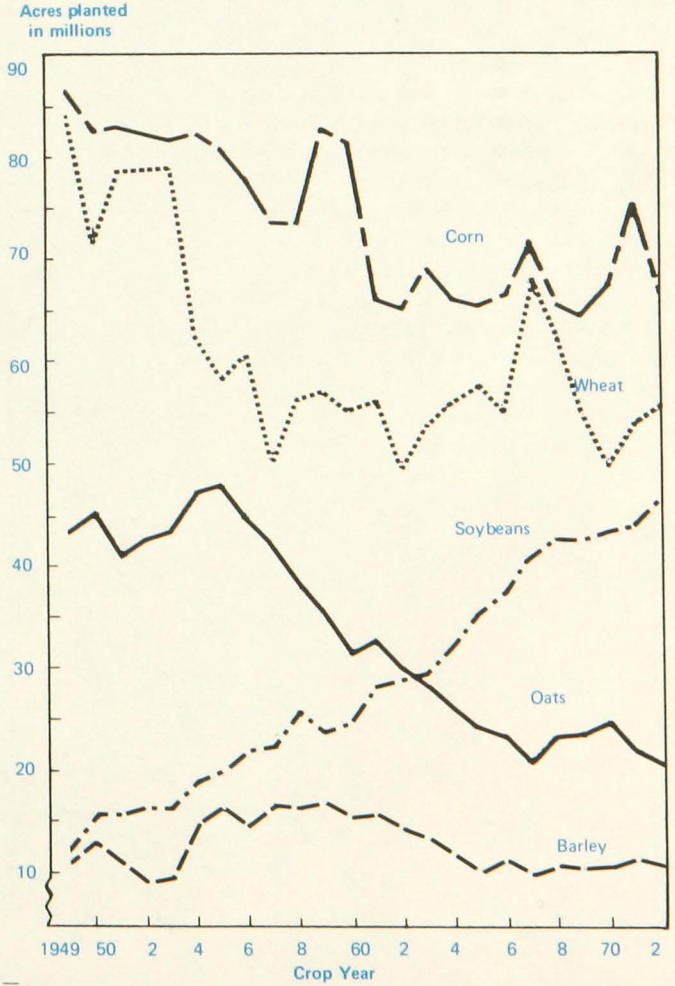


*Mary E. Ryan is a research fellow and Martin E. Abel is professor in the Department of Agricultural and Applied Economics.

*This article is based on M.E. Ryan and M.E. Abel, "Oat and Barley Acreage Supply Functions," Staff Paper, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota 55101. Copies are available on request. The research upon which this article is based was done cooperatively with the Economic Research Service, U.S. Department of Agriculture.

[1]Previous work has been reported in: James P. Houck, Mary E. Ryan, and Martin E. Abel, "How Government Programs Affect the Supply of Corn," and Mary E. Ryan and Martin E. Abel, "The Set-Aside Feed Grain Program," Minnesota Agricultural Economist, Agricultural Extension Service, University of Minnesota, No. 545, May 30, 1972. Mary E. Ryan and Martin E. Abel, "Supply Response of U.S. Sorghum Acreage to Government Programs," Staff Paper P72-20, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota 55101.

Figure 1. U.S. acreage planted to oats, barley, corn, wheat, and soybeans, 1949-1972.



devoted to barley. During many of these years, planting restrictions were imposed on wheat and corn but not on barley. Acreage was withdrawn from barley when government land-rental programs were established in the early 1960's.

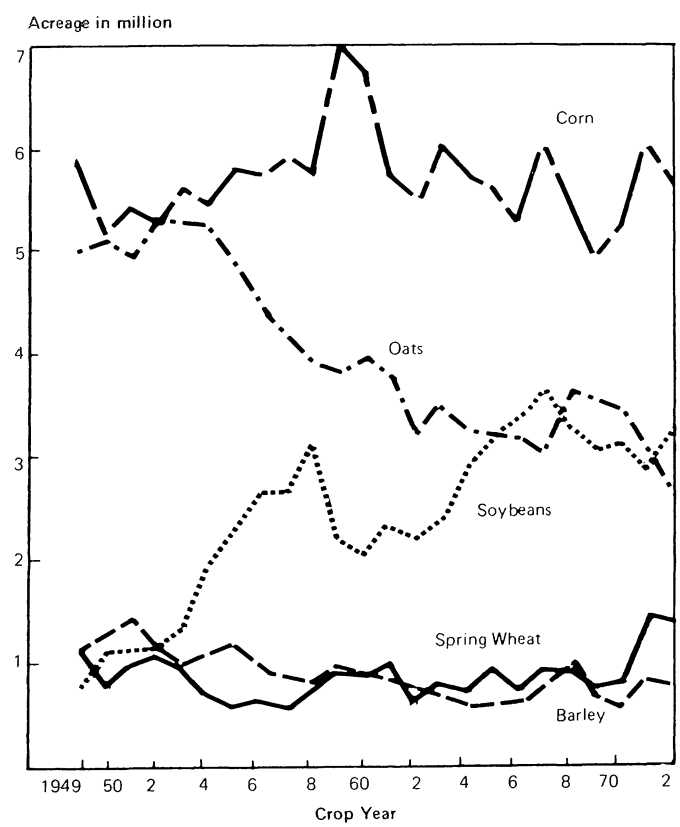
Minnesota acreage trends are shown in figure 2. Oats and barley throughout the study period and corn since 1958 followed national patterns. However, acreage of other crops is somewhat different.

National average yields of oats, barley, corn, wheat, and soybeans are given in figure 3. The yield increases for corn are most prominent. Barley yields have risen slightly faster than those for oats. Both lag far behind corn and wheat.

The tabulation below indicates the relative importance of oats and barley as feed grains. These data show that oats has decreased in importance. Barley has retained its share of acreage and production.

	Oats		Barley	
	1949-53	1969-72	1949-53	1969-72
Percentage of feed grain	---------- percent ----------			
Production	18	8	6	6
Acreage	29	19	7	8

Figure 2. Minnesota acreage planted to oats, barley, corn, wheat, and soybeans, 1949-1972.



Factors related to production and use

Plantings of both crops are widely scattered throughout the United States. However, barley acreage is more concentrated. About three-fourths the nation's barley is grown in the northwestern states from western Minnesota to the Pacific. Barley and oats areas overlap in the Upper Midwest. The remaining principal oats acreage is in the South and East.

Minnesota, Iowa, and the Dakotas are the leading producers of oats.

Livestock farmers raise oats for straw as well as for grain and forage. In addition, oats is widely planted as a cover crop for alfalfa. Oats in crop rotation can help control weeds.

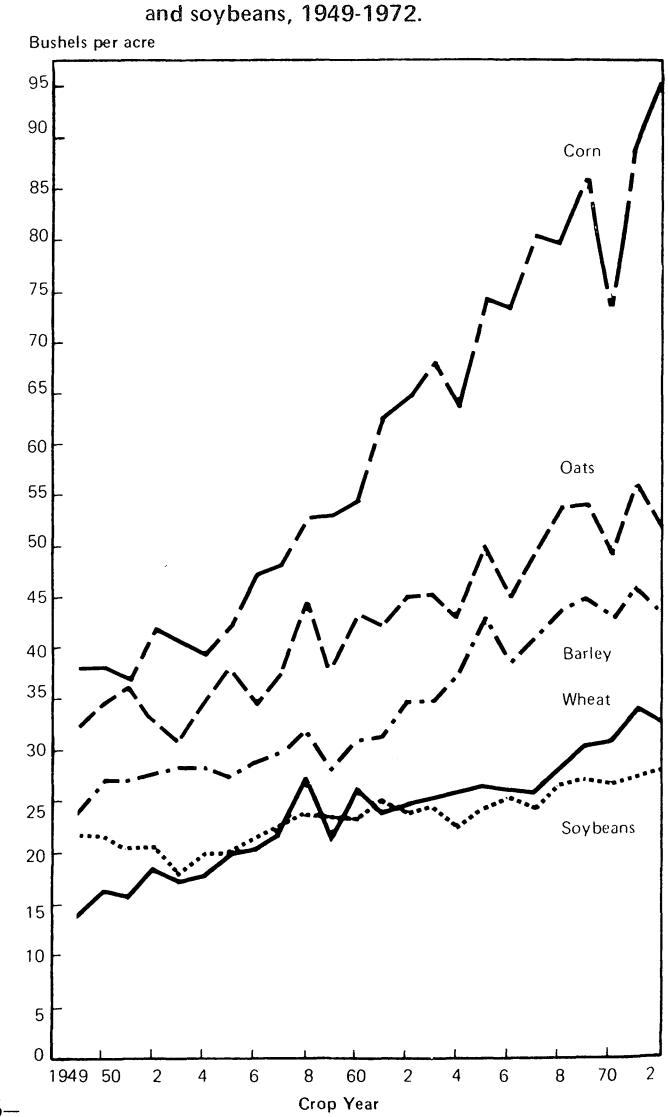
Farmers feed nearly two-thirds their oats. They feed about one-fourth their barley. Producers' use of oats is one reason oats is planted throughout a wider geographic area in the nation.

Oats in crop rotations began to taper off when herbicides became available for corn and soybeans. Oats' decrease since 1955 coincides with the adoption of chemical weed control and the resulting expansion in soybean acreage. This is particularly the case in the Corn Belt. Much national decrease of oats between 1955 and 1967 occurred there. Technically, corn could also be grown on land previously planted to oats. However, supply-control programs for corn limited its spread.

The early 1950's expansion of oats can be traced to the introduction of new varieties in the south central states. These did not prove successful, and producers shifted to other crops. A reversal in the downward trend from 1967 to 1970 reflects slower substitution of corn and soybeans for oats. There were also sharp cutbacks in wheat acreage.

In most barley areas, wheat is the major alternative. The main variation in barley acreage occurred when wheat planting was curtailed by government programs. This began in 1954. From 1953 to 1954, wheat planting dropped

Figure 3. U.S. average yields for oats, barley, corn, wheat, and soybeans, 1949-1972.



16 million acres while barley acreage climbed about 5 million (figure 1). Besides its use as feed, about one-fourth of barley production is now used for alcoholic beverages. This is approximately the same as at the beginning of the study period. This non-feed demand exerts a distinct influence on the barley market. However, the study assumed a reasonably constant proportion of acreage.

Government programs for oats and barley

Government acreage restriction has never applied to oats. Restrictions were first imposed on barley in 1962. Since then, barley restrictions applied in all years except 1967, 1968, and 1971. Payments for idling land were made whenever planting was curtailed. Acreage diversion programs for feed grains and wheat permitted seeding oats to conserve idled land. This provision probably caused the slight oats acreage increase in 1961 (figure 1). That was the first year of such a program. Harvesting oats from diverted acres was not permitted. Statistics for harvested acres show a decrease of 2.7 million acres from 1960 to 1961.

Oats and barley prices have been supported by loans throughout the study period. The loan rate levels are tied to the corn loan rate by law. This reflects feeding values of oats and barley relative to corn. For 1973 the national average loan rates per bushel are 54 cents, 86 cents, and $1.08 respectively for oats, barley, and corn. Moreover, the wheat loan rate has been close to its feed value since 1964. This makes wheat more competitive with coarse grains. Similarly, these grains' market prices are closely linked.

Measuring the influence of government programs

With no government programs to limit acreage, we would expect farmers to decide how much of a crop to plant on the basis of its expected profitability compared with land and labor alternatives. To estimate profitability, a farmer could depend on the government support price as the minimum price. But under the feed grain programs that prevailed many years since 1949, only farmers who restricted planting were eligible for price supports. The restricted production would equal an unrestricted production level at a price lower than the support rate. We have developed a measure which reflects the extent of the restriction on production. We call it the effective support rate.

The 1949-71 programs also offered the option of diverting land from production. This was in return for a government rental payment. The amount of land diverted would depend on the profitability of diversion payments compared with production returns. We have also developed a measure for this rental payment. We call it the diversion payment rate.

The announced support rates, the calculated effective support rates, and the diversion payment rates for oats and barley are presented in table 1. These values can be obtained, or they can be calculated directly from the program provisions announced by the government prior to planting time. We would expect that the lower the effective support rate, the less acreage would be planted. Farmers would find a particular feed grain less profitable than at higher rates. Alternatively, the lower the diversion payment rate, the more acreage would be planted. This is because acreage diversion is less attractive than production of a particular crop at lower payment rates.

Unlike corn and sorghums where planting restrictions and land diversion have been important since the late 1950's, oats and barley production have been subject to few restrictions or

Table 1. Announced support prices, calculated effective support rates, and diversion payment rates for oats and barley, dollars per bushel, 1949-71.

Year	Oats	Barley		
	Announced support price	Announced support price	Effective support rate	Diversion payment rate
		dollars per bushel		
1949	0.69	1.09	1.09	0
1950	0.71	1.10	1.10	0
1951	0.72	1.11	1.11	0
1952	0.78	1.22	1.22	0
1953	0.80	1.24	1.24	0
1954	0.75	1.15	1.15	0
1955	0.61	0.95	0.95	0
1956	0.65	1.02	1.02	0
1957	0.61	0.94	0.94	0
1958	0.61	0.93	0.93	0
1959	0.50	0.77	0.77	0
1960	0.50	0.77	0.77	0
1961	0.62	0.93	0.93	0
1962	0.62	0.93	0.65	0.149
1963	0.65	0.82	0.67	0.086
1964	0.65	0.84	0.62	0.139
1965	0.60	0.80	0.62	0.139
1966	0.60	0.80	0.52	0.175
1967	0.63	0.90	0.90	0
1968	0.63	0.90	0.90	0
1969	0.63	0.83	0.54	0.170
1970	0.63	0.83	0.54	0.162
1971	0.54	0.81	0.81	0

diversion programs.[2] Farmers were not required to restrict oats to be eligible for price supports. Thus, the announced price support has been the effective support rate. Further, no acreage diversion programs operated for oats. For barley, eligibility for price supports depended upon planting restrictions in 1962-66 and 1969-70. Acreage diversion programs were operative during these times.

Estimating acreage planted to oats and barley

Variables measuring the influence of government programs on oats and barley together with variables measuring the influence of competing crops (including government programs where appropriate) were used to estimate oats and barley acreage. Oats analysis starts in 1956. This was when corn and soybean herbicides led to a decline of oats for crop rotations.

Results of our analyses are presented in figures 4 and 5. The solid lines represent actual plantings; the dashed lines represent estimated plantings. Our analyses represent the actual planting situations well.

To further test the models' usefulness, they were used to predict acreage planted in 1972. The results follow:

Figure 4. U.S. oats acreage planted, actual and estimated, 1956-1971.

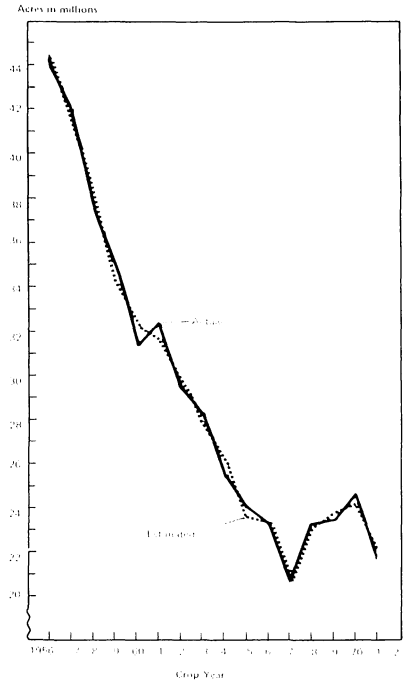
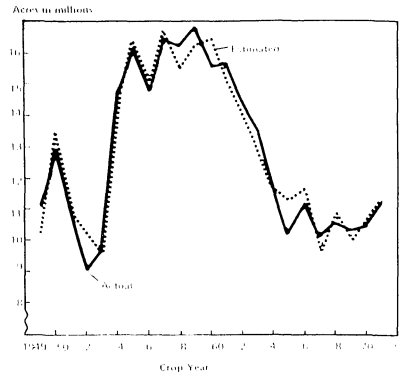


Figure 5. U.S. barley acreage planted, actual and estimated, 1949-1971.



	1972	
	Actual acreage planted	Predicted acreage planted
	1000 acres	
Oats	20,495	20,614
Barley	10,548	10,000

The close correspondence between actual and predicted 1972 acreages lends further support to the accuracy and usefulness of this analytical framework for oats and barley.

Conclusion

The equations for estimating acreages planted to oats and barley explain historical planting variations well. As with previous analyses for corn and sorghum, the government policy variables employed for oats and barley are significantly related to planted acreage. The acreage estimating equations for oats and barley should prove useful in evaluating acreage implications of alternative values of policy variables.

[2]See references in footnote 1 for details of corn and sorghum programs.

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