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Situation and Outlook Report

ALBERT R. MANN
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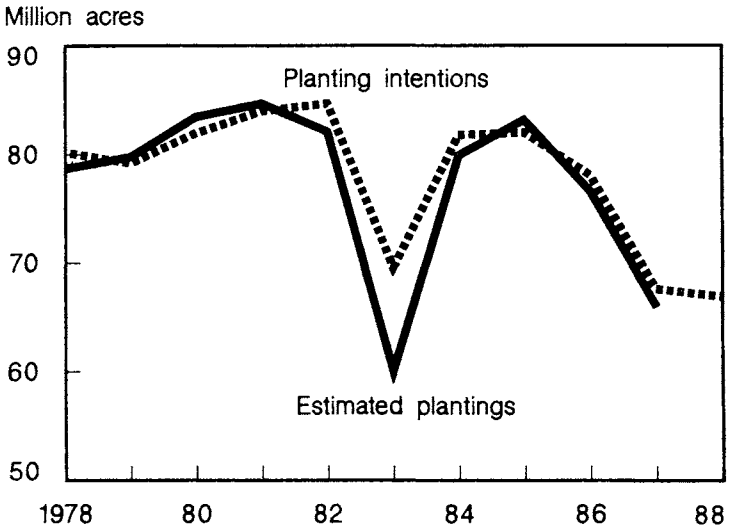
Corn Intentions Exceed Last Year's Plantings



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Farmers reported intentions to plant 104.3 million acres to feed grains in 1988/89, 2 percent less than last year. Production of feed grains is forecast at 219 million metric tons, 2 percent above 1987's 215 million. In addition to normal trend growth, this year's feed grains yield will likely be enhanced by a larger proportion of feed grain area planted to corn, and an increased share of corn planted in higher-yielding States.

Domestic use and exports of feed grains in 1988/89 are forecast at 241 million tons, 1 percent larger than expected disappearance for this year. Lower forecast carryin stocks and higher projected use should lower ending stocks by 20.5 million to 109 million, the smallest since 1985.

Foreign production of coarse grains is projected to increase nearly 3 percent in 1988/89 to a record 584 million tons. With an expected increase in U.S. production, world output is forecast at 804 million tons, up 2.5 percent from 1987/88. The global increase of about 20 million tons consists mostly of corn. World consumption of coarse grains is expected to grow 1 percent and surpass production for the second consecutive year.

World trade (excluding intra-EC trade) is projected up 3 percent in 1988/89. Exports from a number of important competitors should recover from estimated 1987/88 lows, and total foreign exports are likely to rise 7 percent. Thus, the U.S. share of the coarse grain market could drop slightly, although U.S. exports are projected to be largely unchanged from the 1987/88 forecast. World ending stocks are expected to fall 10 percent, mainly due to a drop in the United States.

Corn disappearance for the December-February quarter of 1987/88 was 2.1 billion bushels, 80 million above the corresponding quarter a year earlier. Exports and food and industrial use were 29 percent and 4 percent, respectively, above year-earlier use, and feed and residual use was down slightly. Generic certificate exchanges were estimated to equal 69 percent of disappearance for December-February this year compared with 36 percent a year earlier.

The supply of sorghum for 1988/89 was forecast at 1,332 million bushels, down 10 percent from this year's supply. Forecast lower carryin stocks and a smaller crop account for the expected drop. Farmers reported intentions to plant 10.7 million acres to sorghum this year, 9 percent less than 1987.

Barley supply for 1988/89 is projected at 813 million bushels, down 7 percent from 1987/88. Beginning stocks (June 1, 1988) are expected to tighten to 298 million bushels from 336 million a year earlier. Production is projected to decline 5 percent in 1988, reflecting a 7-percent drop in planting intentions.

Oat supply is projected up 10 percent from 1987/88 to 596 million bushels. Oat planting intentions of 16.3 million acres are 9 percent below last year, but producers in the four leading oat-producing States reported an increase of 8.5 percent. A large portion of oat seedings in recent years has been as a cover crop on idled acreage, which is expected to decline in 1988. Use for 1988/89 is forecast up 8 percent from this year, but ending stocks are forecast to rise to 135 million bushels.

May 1 hay stocks were reported at 27.3 million tons. Disappearance for the 1987/88 crop year (May-April) was 154.2 million tons, up 3 percent from 1986/87. Fewer roughage-consuming animal units (RCAU) were on hand, but consumption per unit rose to 1.97 tons from 1.86 in 1986/87. Farmers reported intentions to harvest 61.1 million acres of hay in 1988 compared with 60.7 million harvested last year. However, lower carryin stocks will more than offset any gain in production, so smaller supplies are in prospect for 1988/89.

Grain-consuming animal units (GCAU) are expected to total 77 million in 1987/88 (September-August), up 2 million from last year. The forecast increase results from more cattle fed, and increased hog, broiler, and turkey production. Feed and residual use of feed grains in 1988/89 is expected to rise from this year's total, but by a smaller margin than the forecast for last year.

Food, seed, and industrial use of corn (FSI) is estimated to be 1,236 million bushels for 1987/88, a 4-percent increase over last year. High fructose corn syrup and ethanol use of corn is expected to increase by 5 percent over last year. A number of new corn products are appearing on the horizon, but it is far too early to assess their impact on FSI corn use.

Program Participation Down in 1988

On May 19, the Department of Agriculture announced the preliminary results of the 1988 feed grain program signup. Farmers enrolled 98.6 million acres in the feed grain program for 1988, 81.5 percent of the aggregate base of 121 million acres. Last year 102.2 million acres were signed up, 85.3 percent of a base of 119.8 million acres.

Compliance with the program for 1988 requires farmers to reduce their plantings from their established base at least 20 percent for corn, sorghum, and barley, and by 5 percent for oats. Also, corn, sorghum and barley producers enrolled in the program had the option of idling an additional 10 percent of their base in a paid land diversion program, and producers also had the option of idling all of their base in return for deficiency payments on 92 percent of their base.

The area of idled base totals 28.2 million acres out of the 98.6 million acres of base enrolled. Thus, plantings on farms enrolled could be approximately 70.4 million acres. Total plantings will also include area of base not enrolled and land not in the base.

Corn signup for 1988 was 72.5 million acres, 86.9 percent of the base of 83.4 million. Area idled for all options totaled 20.9 million, leaving about 51.6 million acres of enrolled base as potential plantings. In 1987, farmers complied on 73.2 million acres of a base of 81.5 million. Idled area totaled about 23 million acres and farmers planted 50.8 million.

Sorghum signup amounted to 13.8 million acres, 81.3 percent of the base of 17 million acres. Farmers will idle about 4.1 million acres, leaving about 9.7 million of enrolled base to plant. Last year, 14.7 million acres were in compliance out of a base of 17.4 million. Farmers idled 4.0 million acres and planted 8.3 million.

Barley producers enrolled 9.9 million acres in 1988, 78.3 percent of the base of 12.6 million acres. Idled barley base amounts to 2.9 million acres, so 7 million acres of enrolled base could be planted. In 1987, 84.3 percent of the 12.5-million-acre base was in compliance. Idled base was 2.9 million acres and 7.6 million acres of base were planted.

Oats producers signed contracts to place 2.4 million acres into 1988 acreage limitation programs, 30 percent of the 8-million-acre base. Oat area idled for all options was 0.3 million acres, leaving 2.1 million acres of enrolled base available to plant. In 1987, 44.6 percent of base was in compliance, about 3.8 million acres.

FEED GRAIN SUPPLY AND USE

Foreign Supply and Use Revised Down for 1987/88

The February *Feed Situation and Outlook* was based on an early-February assessment of U.S. and international supply and demand for coarse grains. This report is based on an early-May update. The estimate of foreign supply of coarse grains (not including trade) has been reduced 10.5 million metric tons to 647.9 million. Production was pulled down 7.4 million tons and carryin stocks were reduced 3 million. The most significant changes in forecast production were in the corn crops of South Africa, Zimbabwe, Argentina, and China; the sorghum crop in Sudan; and China's barley crop. Brazil's corn crop was increased by 500,000 tons.

Foreign use (excluding exports) was estimated at 626.1 million tons, down 6.9 million from the February estimate. Expected foreign imports were reduced 4.7 million tons, and foreign ending stocks are now forecast at 72.6 million tons, 3.7 million less than the February outlook.

The U.S. feed grain supply for 1987/88 is estimated at 367.9 million metric tons, down 11.4 million from 1986/87. Production of 215.2 million tons was 37.1 million below year-earlier output, but carryin stocks and imports were up 25.5 million and 200,000 tons, respectively.

Domestic use of feed grains for 1987/88 is expected to total 237.9 million tons. Exports are forecast at 51.7 million, food, seed, and industrial (FSI) use at 36.7, and feed and residual disappearance at 149.5 million. Through February, exports totaled 25.3 million tons, almost 22 percent above year-earlier shipments. Partial data on FSI use indicates disappearance through February is about 3 percent above year-earlier use.

U.S. and World Production and Use Forecast Up for 1988/89

With the barley and oat crop years almost completed and three-fourths of the corn and sorghum crop year behind us, interest is beginning to focus on the 1988/89 marketing year. Based on a survey in early March, farmers reported intentions to plant 104.3 million acres to feed grains this year, compared with actual plantings of 106.5 million acres last year. Planting intentions for corn are up 1.9 percent (1.2 million acres) but intentions for sorghum, barley, and oats are down 8.5 percent (3.5 million acres). Thus, corn represents 64.2 percent of intended area planted to feed grains, compared with 61.7 percent of actual plantings last year.

Based on trend yields, adjusted for the large area idled in recent years by the feed grain programs and the Conservation Reserve Program (CRP), and assuming normal weather, 1988/89 production of feed grains is projected to be 219.4 million metric tons, 2 percent

World coarse grain and U.S. feed grain supply and use

	Supply			Use		Ending stocks
	Beginning Stocks	Production	Imports	Feed	Total	
	Million metric tons					
Foreign coarse grains 1/						
1986/87	79.5	581.0	95.1	393.9	627.3	80.8
1987/88						
February	81.7	576.6	101.4	392.4	633.0	76.3
May	78.7	569.2	96.7	390.4	626.1	72.6
U.S. feed grains						
1986/87	126.3	252.3	0.7	145.7	227.5	151.8
1987/88						
February	151.8	215.2	0.7	149.5	237.5	130.1
May	151.8	215.2	0.9	149.5	237.9	129.9

1/ Foreign coarse grain data include rye and millet.

above last year's harvest of 215.2 million tons. Two factors point toward an increase in yield per acre this year.

- In 1987, the yield for corn was 3.03 metric tons per acre, compared with 1.3 tons for sorghum, barley, and oats. The larger proportion of corn in total plantings, everything else equal, would increase yield of total feed grains 1.7 percent this year.

- The intentions report indicates a larger share of the corn planted will be in the higher yielding States this year. This factor could increase the national corn yield 1/2 bushel per acre.

Carryin stocks for 1988/89 are forecast to be 129.9 million tons, down 21.9 million from year-earlier stocks. Thus, total supply for the next crop year is expected to be 350.1 million tons, 5 percent less than on hand for 1987/88.

Total use of feed grains in 1988/89 is projected at 241 million tons, 1 percent larger than expected disappearance for this year. Feed and residual use is expected to be up 1 percent, FSI 3 percent, and exports only slightly higher. Projected use will drop ending stocks by 20.5 million tons to 109.4 million, the lowest since 1985.

Foreign production of coarse grains is projected to total 584.5 million tons in 1988/89, up almost 3 percent from this year's preliminary estimate of 569.2 million. The biggest increases are in Eastern and Western Europe, India, Thailand, Nigeria, Australia, and South Africa. Partly offsetting are expected decreases in the USSR, Canada, Brazil, and China. Much of the gain in foreign production will be in corn.

Foreign use in 1988/89 is projected to increase more than 8 million metric tons to 634 million. Foreign imports are expected to increase slightly, and ending stocks should increase about 1 million tons.

Corn

Disappearance of corn for the December-February quarter amounted to a little over 2.1 billion bushels, 40 million less than September-November but 80 million more than the corresponding quarter of 1986/87. Exports of 408 million bushels exceeded year-earlier exports by 93 million. Food processing and industrial products used 282 million bushels, 12 million more than in December-February last year, but feed and residual use of a little over 1.4 billion bushels was down about 25 million. While down slightly from 1986-87, December-February feed and residual use was 11 percent above 1985/86.

Corn supply, disappearance, and stocks, December - March

Item	1986/87	1987/88
	Million bushels	
Supply		
Beginning stocks Dec. 1		
CCC	968.2	1,683.4
FOR 1/	1,105.5	1,494.2
Loan	2,878.3	2,841.5
Free	5,353.5	3,749.4
Total	10,305.5	9,768.5
Imports (Dec.-Feb.)	.3	.9
Total supply	10,305.8	9,769.4
Use		
Food, seed, and industrial	270	282
Exports	315.4	408.3
Feed and residual	1,472.2	1,447.6
Total	2,057.6	2,137.9
Stocks March 1		
CCC	1,362.2	1,767.7
FOR 1/	1,339.8	1,481.3
Loan	4,289.0	2,963.7
Free	1,257.2	1,418.8
Total	8,248.2	7,631.5

1/ Includes special producer storage loans.

Reduced Supplies and Larger Use

Use during December-February left stocks on hand March 1 at slightly over 7.6 billion bushels -- 617 million less than a year earlier. The CCC inventory and FOR loans comprised more than 3.2 billion bushels of March 1 stocks. Almost 3.0 billion were collateral for 9-month loans, leaving free stocks of 1.4 billion bushels.

Four billion bushels of March 1 stocks were from 1986 and prior crops, leaving 3.6 billion bushels of stocks from the 1987 crop. However, 2.2 billion bushels of 1987-crop corn were collateral for 9-month loans, leaving 1.4 billion as free stocks. Consequently, the free portion of March 1 stocks is entirely from the 1987 crop. Uncommitted stocks of 1987-crop corn on hand December 1 amounted to a little over 3.7 billion bushels, but 1.7 billion of these were placed under loan during the

December–March quarter, leaving 2.0 billion bushels to be accounted for. With little over 1.4 billion bushels still on hand in free stocks March 1, about 620 million bushels were used during December–February.

Increased Role for Certificate Exchanges

Generic certificate exchanges have played a more important role in the supply of corn to markets so far in 1987/88 than in 1986/87. In the first half of this crop year (September–February), about 2.6 billion bushels of corn were removed from loans and CCC inventory with certificate exchanges, 60 percent of total disappearance. For the corresponding period of 1986/87, certificate exchanges freed up almost 1.1 billion bushels of corn -- about 27 percent of disappearance.

For the 1986/87 crop year, the value of certificates exchanged for corn amounted to 77 percent of the total value of all certificate exchanges. For September–November 1987/88, corn exchanges represented 73 percent of the value of all exchanges, but for December–February the value of corn exchanges decreased to 64 percent of the total certificates exchanged. This decline reflects the increased demand for certificates for use in wheat exchanges, resulting from the weekly auction of CCC-cataloged wheat initiated last November.

Corn use for March–August is expected to total 3.5 billion bushels, compared with 4.3 billion used for September–February. Exports and FSI use will require about 895 million and 660 million bushels, respectively, and feed and residual disappearance will be a little under 2 billion bushels. Buying pressure for old-crop corn will be a little lighter the rest of the crop year compared with weekly procurement to date. Based on *Export Sales*, exports through April plus outstanding sales for 1987/88 shipments total 1,499 million bushels. If 1987/88 export sales carried into 1988/89 are 25 million bushels -- the same as carryover of 1986/87 sales -- the weekly rate of new sales for May–August would be about 13 million bushels compared with a rate of slightly over 35 million for September–April. Similarly, the expected weekly rate of feed and residual disappearance for March–August is 75.6 million bushels, compared with 112.9 million for September–February.

Issue and use of generic certificates

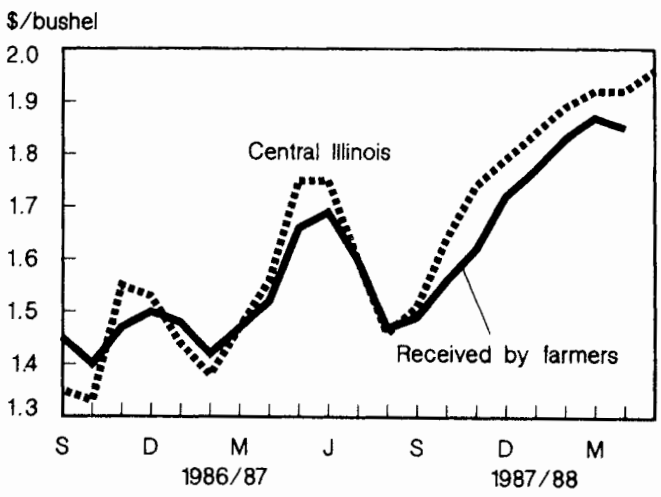
Crop year	Value issued	Value exchanged	Value used for corn	Bushels of corn
	- - - Billion dollars - - -			Million
1985/86				
April-Aug	1.5	.87	.47	252.6
1986/87				
Sep-Nov	1.1	.81	.52	343.8
Dec-Feb	3.2	1.51	1.21	750.9
Mar-May	2.3	3.52	2.70	1,641.0
June-Aug	1.4	.96	.78	436.1
1987/88				
Sep-Nov	4.4 1/	2.81	2.04	1,334.1
Dec-Feb	3.4	3.29 2/	2.12 2/	1,268.1 2/
Mar-May	4.3 3/			

1/ Through December 16.
2/ Partly prorated from report for 3/22/88.
3/ Potential

About $3.5 billion of generic certificates were outstanding at the end of February, and an additional $4.3 billion likely will be issued during March–May. If as little as 54 percent of these were used for corn exchanges during March–August, market supplies likely would be adequate to meet needs. However, there is some question surrounding the exchange of certificates this spring and summer. In the Corn Belt, prices in early May were about the same as the county loan rates. Only modest additional strength in prices is needed to push prices sufficiently above the loan rate to cover accumulated interest on the CCC loan and permit cash redemptions. However, if prices are high enough to permit cash redemption, the farmer no longer has to PIK–and–roll to have access to his corn.

Prices received by farmers have been strengthening during the 1987/88 crop year. During September–November, the average

Monthly Average Corn Prices



price received by farmers was $1.56 a bushel, 12 cents above the year-earlier price. For December-February, the farm price averaged $1.77 a bushel, 30 cents above the average for the same quarter last year. By mid May, prices had increased about 15 cents a bushel from the December-February average.

Market prices through mid-to-late July will depend largely on weather conditions. Through mid May, corn plantings were estimated to be 88 percent completed in the 17 major producing States, the same as last year but above the 5-year average of 66 percent. Thus, plantings are proceeding ahead of schedule. However, if weather turns hot and dry during the key growing season, yield could be significantly reduced. Prices through mid-July will include a weather risk factor. For example, the December contract for corn futures is currently fluctuating above $2.30 a bushel.

Farmers are bullish on corn prices, and threats of weather problems during the growing season will send prices higher. If drought conditions develop, and yields are significantly reduced, prices likely would hold strong into the harvest season. However, if normal growing conditions are realized, and normal yields are in prospect, prices likely will decline from late July through the peak of harvest.

Planting Intentions Up

Based on reported intentions in early March, farmers intended to plant 66.9 million acres to corn this year, 1.2 million more than last year. Farmers in 24 States reported intentions to plant the same or more acres than last year, and intentions in 23 States (Alaska, Hawaii, and Nevada were not surveyed) were to decrease planting.

Planting intentions in the Corn Belt totaled 31.1 million acres, 4.2 percent above last year's actual plantings of 29.8 million. The Northern Plains are up 1.7 percent at 11.9 million acres, and the Lake States are down slightly at 11.4 million, compared with 11.5 million planted last year.

In general, yields are higher in the States in which farmers intended to hold or increase plantings than in the States reflecting lower intentions. Everything else constant, this shift in location of plantings would increase average yield about 1/2 bushel this year.

Based on trend yield, adjusted for the large idled area and normal relationships between area planted and area harvested, the corn crop for 1988 is projected to total 7.3 billion bushels. Adding carryin stocks of 4.1 billion, total supply for the 1988/89 crop year would be 11.4 billion bushels, more than 500 million bushels less than the 1987/88 supply.

Use during 1988/89 is projected to total about 8.0 billion bushels, 200 million more than expected use during 1987/88. Exports and food, seed, and industrial use are forecast to increase about 3 percent to 1.75 billion and 1.28 million bushels, respectively. A modest increase in grain-consuming animal units (GCAU's) is also expected to push feed and residual use up 100 million to 5.0 billion bushels. Expected use exceeds production by about 700 million bushels, and ending stocks could drop to a little under 3.4 billion. Although the loan rate is 5 cents a bushel lower in 1988/89 than for this year, the average farm price likely will equal or exceed the 1987/88 average price. Prices in 1988/89 will hinge on many of the same factors as in 1987/88.

Sorghum

The sorghum supply for 1987/88 is 1,472 million bushels, comprised of 732 million bushels of carryin stocks and production of 741 million bushels. Carryin stocks were completely tied up in CCC inventory, FOR, and 9-month crop loans. Thus, market supplies depended on free stocks from the 1987 harvest and generic certificate exchanges.

As of May 4, 1988, 356.6 million bushels of 1987-crop sorghum had been placed under loan, but 245.9 million were redeemed, leaving outstanding loans of 113.6 million bushels. Generic certificate exchanges from September to April 27 totaled 333.1 million bushels--272.4 million from 9-month loan, 53.5 million from CCC stocks, and 5.4 million from the FOR.

Quarterly farm and off-farm stocks have not been tabulated for sorghum since 1966. Consequently, it is impossible to determine the rate of feed and residual use during the

year, or the status of free stocks. By early May, combined stocks of CCC inventory, FOR, and 9-month loans amounted to about 800 million bushels. Exports for September-February totaled 108.3 million bushels, 4 percent above exports for the comparable period last year. Food, seed, and industrial use was 7.3 million bushels, down 1 million from year-earlier use.

Sorghum prices have averaged somewhat higher this year in response to higher corn prices, but apparently market supplies of sorghum have not become tight enough to push sorghum prices up relative to corn prices. For the September-April period, #2 yellow sorghum at Kansas City averaged $3.00 per cwt., compared with $2.61 for the corresponding period a year earlier, an increase of 15 percent. No. 2 yellow corn at Kansas City has averaged $1.87 a bushel for September-April this year, 17.6 percent above the corresponding price a year earlier. Consequently, sorghum prices this year are averaging slightly lower relative to corn than last year.

Planting Intentions Down

Farmers indicated intentions in early March to plant 10.7 million acres to sorghum this year, compared with 11.8 million acres planted in 1987. If farmers follow their intentions, the area planted to sorghum this year would be the lowest since 1931.

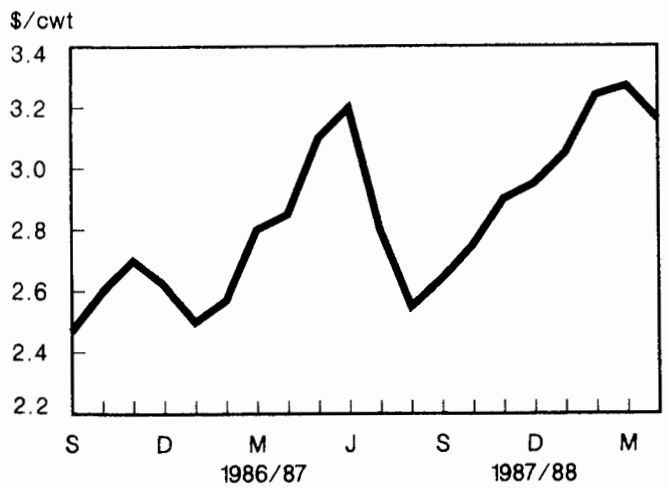
North Carolina was the only State in which farmers reported intentions to increase area planted this year. Farmers in Georgia and Louisiana intended to hold plantings level with last year, and farmers in the other 17 sorghum-producing States all reported intentions to decrease area this year. The five major producing States (Kansas, Texas, Nebraska, Missouri, and Oklahoma) will plant 8 percent fewer acres according to the intentions report.

Based on trend yields, adjusted for the large area idled to conservation use, the sorghum crop is projected to be 650 million bushels this year. Carryin stocks are forecast at 682 million bushels, which would put the total supply of sorghum for 1988/89 at 1,332 million bushels, 10 percent less than the 1987/88 supply of 1,472 million. However, almost all of the carryover stocks will be tied up in CCC inventory, FOR, or 9-month loans. Consequently, free stocks will remain tight. With corn prices expected to average higher in 1988/89, sorghum prices also probably will average higher, and because of the tight supply, may approach their normal relationship to corn prices.

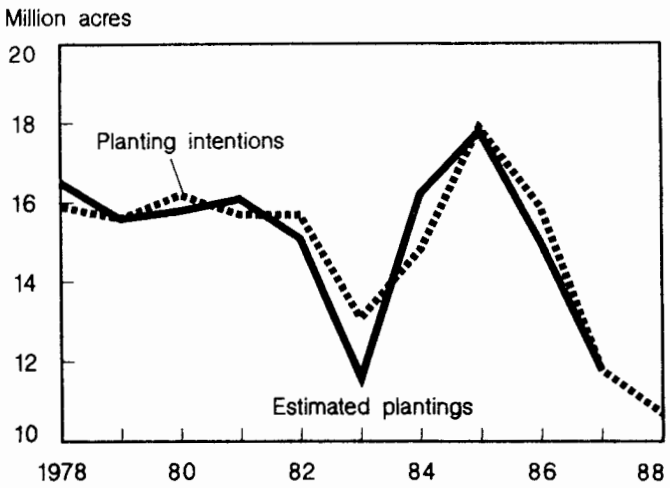
Barley

Total barley supply for 1987/88 is estimated at 878 million bushels. Production was 527 million bushels, beginning stocks were 336 million, and imports are estimated at 15 million bushels. Imports are estimated at 10 million above those expected in February, due in part to increased imports of feed barley from Canada. Year-to-date imports through

Sorghum Prices at Kansas City



Sorghum Plantings vs. Intentions



February are 10.4 million bushels, compared with 5.4 million a year earlier. Imports for January and February 1988 were more than twice the level of the first 2 months of 1987.

Total use is projected at 580 million bushels, 4 percent below 1986/87. Exports are forecast to increase to 130 million bushels, 7 million less than exported in 1986/87. Year-to-date exports through the end of April were 111.0 million bushels, with 11.6 million bushels in outstanding sales as reported in *U.S. Export Sales*. Exports through the end of April for 1986/87 were 134.8 million bushels.

Ending stocks for 1987/88 are expected to be 298 million bushels, down 11 percent from 1986/87. Interim stock reports were not available for 1987/88, but quarterly reports will be reinstated for 1988/89.

A total of 122.4 million bushels of 1987-crop barley--about 23 percent of production--had been placed under loan through May 1. Also, 57.5 million bushels had been redeemed by May 1, leaving 64.9 million bushels of 1987 barley outstanding under loan. Outstanding loans on earlier crops bring total loans to 100.8 million bushels. CCC-owned inventory stood at 52.8 million bushels on May 1, down about 22 million bushels from a year ago. FOR barley stocks are 112.1 million bushels, compared to 121.7 million a year earlier.

Generic certificate exchanges for the marketing year through the end of April totaled 67.4 million bushels. Exchanges from CCC inventory accounted for 39.6 million bushels, 9-month loan exchanges amounted to 23.1 million bushels, and FOR/Special Producer Storage exchanges totaled 4.7 million bushels. A total of 187.1 million bushels have been exchanged for certificates since April 1986.

The preliminary average price received by farmers for all barley for the 1987/88 marketing year was $1.80 a bushel at the end of April. The April preliminary average price in 1987 was 2 cents below the final average for the 1986/87 marketing year. The final average price for 1987/88 is projected between $1.80 and $1.85. An average price of $1.80 would be 31 cents below the average for the previous 5 years.

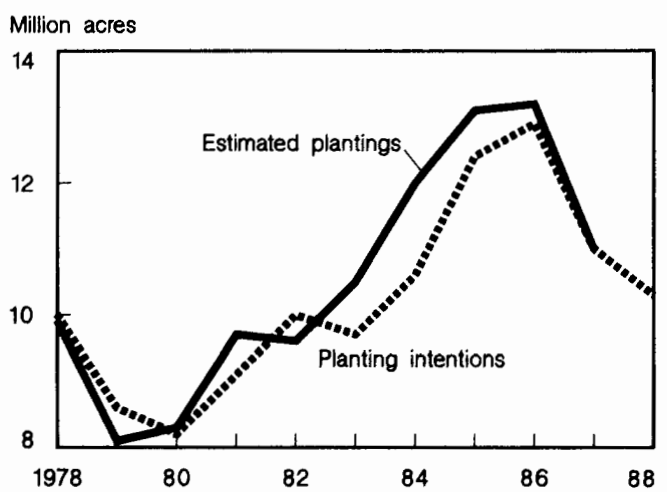
The feed barley prices received by farmers for the 1987/88 marketing year averaged $1.63 through April. Although this is 41 cents below the previous 5 years' average, the relation between the national average feed barley and corn price is 0.93--still above the energy-value ratio of 0.8.

Planting Intentions Down

The March *Planting Intentions Report* indicates barley producers expect to plant 10.3 million acres, down 7 percent from last year. Using data from the last 10 years, a correlation coefficient of 0.95 was calculated between barley producers' planting intentions and the July crop estimate. This suggests that spring planting intentions provide a good indication of the actual barley acreage for the year.

North Dakota, South Dakota, Montana, Idaho, and Minnesota planted the most acreage to barley in 1987, accounting for 74 percent of planted acreage. Producers in North Dakota, Minnesota, Montana, and South Dakota intend to cut back acreage 6.4 percent from 1987, with Montana showing an 11-percent drop and South Dakota intending a 20-percent reduction in planted acreage. Idaho producers expect to increase acreage planted by 4.8 percent. Collectively, these 5 States' producers intend to plant 5.2 percent fewer acres in 1988 than in 1987.

Barley Plantings vs. Intentions



First Projections of 1988/89 Supply and Demand

Total barley supply is projected to be 813 million bushels, a 7-percent decline from 1987/88. Beginning stocks are forecast at 298 million bushels, compared to 336 million last year. Production is projected to decline 5 percent to 500 million bushels. Imports are forecast unchanged at 15 million bushels.

Dry weather in the Northern Plains has allowed for early planting. In North Dakota, 77 percent of seedings were complete through the first week in May compared with an average 52 percent. Minnesota, Montana, and South Dakota were also ahead of normal. However, dry weather has contributed to deteriorating soil moisture. Through early May, 14 percent of topsoil in South Dakota was critically short of moisture, and 44 percent was short. Similar moisture shortages are being experienced in Minnesota, Montana, and North Dakota. Idaho soil moisture conditions were 35 percent short. However, irrigation water supplies were fair to good.

Feed and residual use is projected at 265 million bushels, down 10 million from 1987/88. Food, seed, and industrial use of barley remains unchanged from last year at 175 million bushels. Barley exports are forecast to decrease from 130 million bushels in 1987/88 to 100 million in 1988/89. As in the last 2 years, barley exports will depend largely on EEP sales. Total use of 540 million bushels would be 40 million below projected 1987/88 use. However, use is again projected to exceed production, causing ending stocks for the new marketing year to tighten to 273 million bushels.

Oats

Total oats supply for 1987/88 is projected to be 542 million bushels. Beginning stocks were 133 million, production was 374 million, and as of May 1 imports were expected to total 35 million. Through February, 31.3 million bushels had been imported. Domestic use of oats is projected at 425 million bushels for 1987/88.

Ending stocks for 1987/88 are projected to be 116 million bushels, down from 133 million last year and 184 million in 1986. A total of 2.9 million bushels of 1987-crop oats were placed under loan through May 1, 1988. In addition, 2 million bushels had been redeemed, leaving 0.9 million bushels of 1987-crop oats outstanding under loan. Total outstanding oats loans amount to 1.8 million bushels. CCC-owned inventory stood at 3.5 million bushels on May 1, unchanged from a year ago. FOR oats loans were 2.3 million bushels.

Oats were in reserve release status from November 1987 through April 1988. During that period, FOR stocks declined 1.1 million bushels. Generic certificate exchanges of FOR oats amounted to 0.2 million bushels, so approximately 0.9 million bushels were redeemed from the reserve or defaulted to the CCC during the release period. For the marketing year through May 1, 1988, generic certificate exchanges totaled 0.41 million bushels. A total of 2.6 million bushels of oats have been exchanged for generic certificates since April 1986.

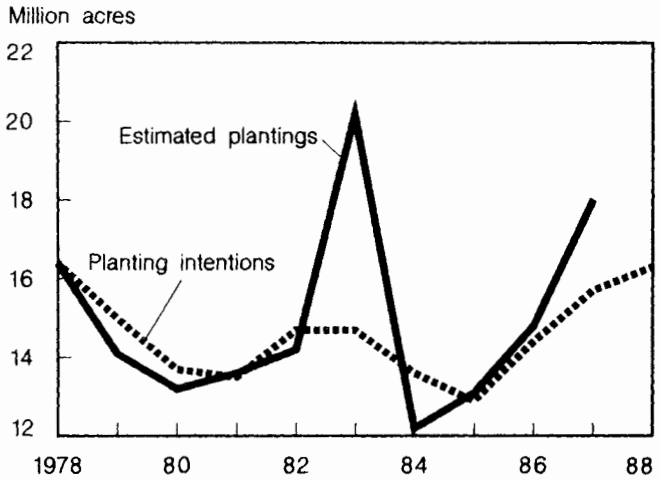
Oat prices for the 1987/88 marketing year through April averaged $1.57. The final season-average price received by farmers is expected to be between $1.55 and $1.60. The April 1987 average price received for the 1986/87 marketing year was $1.18, while the final average price received for 1986/87 was $1.21. With corn prices expected to average between $1.65 and 1.85 for the 1987/88 marketing year, the oat/corn price ratio is expected to be between 0.84 and 0.97--above the normal 0.50 to 0.55 range indicated by comparing feed energy values of the two grains.

South Dakota, Minnesota, Wisconsin, North Dakota, and Iowa were the 5 major oat-producing States in 1987, accounting for 57 percent of total production. The preliminary average price received by farmers reported in April for the 1987/88 marketing year was $1.50 in Minnesota and Wisconsin, $1.60 in South Dakota and Iowa, and $1.55 in North Dakota.

Planting Intentions Down

Oat producers expect to plant 16.3 million acres in 1988, down 9 percent from 1987 plantings. Last year's reported intentions were 2.3 million acres below the July planting estimate. The correlation coefficient between planting intentions and the July crop estimate

Oat Plantings vs. Intentions



was calculated to be 0.63. However, during 1983, oats were used as a cover crop in excess of expectations due to the PIK program. The crop estimate was almost 50 percent higher than the spring intentions. Excluding 1983, the estimated correlation between intentions and estimated acreage is 0.84.

Of the top 4 producing States in 1987, South Dakota, Minnesota, and Wisconsin each anticipate increasing acreage in 1988 by 100,000 acres, and North Dakota producers expect to increase acreage 200,000 acres, for a combined increase of 8.5 percent for the group. Iowa, the fifth largest producing State, is expected to decrease planted acreage by 1.2 million acres. Much of the decrease in Iowa may be due to reduced use of oats as a cover crop. In 1987, Iowa harvested only 650,000 acres of oats out of 4.2 million acres planted to oats. Thus, 85 percent of the area planted to oats in Iowa apparently was planted as a cover crop on conservation use acreage.

1988/89 Supply and Demand Estimates

Oats supply for 1988/89 is projected to be 596 million bushels, up 10 percent from 1987/88. Production is projected up about 20 percent from last year to 450 million bushels. Beginning stocks are projected down 17 million bushels from last year to 116 million. The projected stocks-to-use ratio is 29 percent compared with 27 percent in 1987/88. Production is projected to be 11 million bushels below total use for the 1988/89 marketing year.

Dry conditions in the major oats region have permitted early planting. Planting progress and topsoil moisture conditions as reported through the first week in May for major producing States reflect these conditions. The Iowa crop is 88 percent emerged compared with a 65-percent average. Topsoil moisture is 86 percent short. Spring planting in South Dakota was nearing completion. Topsoil moisture was 14 percent critically short and 44 percent short. Minnesota planting was 95 percent complete compared with a 74-percent average. Oats were 72 percent emerged, 32 points ahead of average. Wisconsin was 93 percent planted compared with a 74-percent average, and North Dakota was 72 percent planted, with a 51-percent average.

Total use for 1988/89 is projected to increase 8 percent from 1987/88 to 461 million bushels. Feed and residual use is projected up 30 million bushels to 380 million. FSI use is expected to increase to 80 million bushels from 75 million last year. Prices are projected to decline to a $1.25-$1.45 range from about $1.57 in 1987/88.

HAY

Hay stocks May 1 were reported at 27.3 million tons, down 16 percent from a year earlier. Thus disappearance of hay for the December-April period totaled 92.4 million tons, up 3.5 percent from use of 89.3 million tons for the comparable period last year. For the 1987/88 crop year (May-April) use was 154.2 million tons, 2.9 percent above 1986/87 disappearance of 149.8 million.

Roughage-consuming animal units (RCAU's) for 1987/88 (September-August) totaled 78.4 million units, compared with 80.7 million a year earlier. Smaller beef and dairy herds are responsible for the decline. Consumption per RCAU in 1987/88 was 1.97 tons, compared with 1.86 in 1987/87.

The rise in hay disappearance per RCAU reflects deteriorating pasture and range conditions relative to a year earlier during the crop year. In May 1987, the U.S. pasture and range condition was reported at 81 percent, 5 points above May 1986. In September the condition was reported at 76 percent, 3 points below a year earlier, and in November it was

71 percent, 14 points below a year earlier. This May, at 73 percent, conditions reflect seasonal improvement but are 6 points below a year ago.

Prices received by farmers for hay averaged about $65.80 in 1987/88, over 10 percent above the year-earlier average of $59.70. However, prices strengthened relative to a year earlier during the year. For the May-November period, prices were 7.9 percent higher, but for December-April they averaged 14.2 percent above year-earlier prices.

Farmers reported intentions in early March to harvest 61.1 million acres of hay this year, an increase of less than 1 percent from the 60.7 million acres harvested last year. If average yield for recent years is realized, the hay crop would total about 150 million tons, assuming harvested area equals intentions. However with the smaller carryin stocks of 27.3 million tons, a supply for 1988/89 of 177.6 million would be about 2 percent less than on hand for 1987/88. Slightly fewer RCAU's will be on hand for 1988/89, so supply per RCAU will be less than in 1987/88.

FEED DEMAND

The expected feed and residual use of the four feed grains plus wheat in 1987/88 is likely to be slightly higher than last year. Corn and sorghum use in 1987/88 are projected to be higher, but wheat, barley, and oats for feed and residual use may be lower. Feed and residual use of the four feed grains in 1988/89 will likely be slightly higher than in 1987/88, with most of the increase in corn.

Grain-consuming animal units (GCAU's) in 1987/88 are expected to total 77 million units, up 2 million from last year. The increase in animal units resulted from increases in the number of cattle on feed, and in numbers of hogs, broilers, and turkeys.

The quantity of processed feeds used in 1988/89 may show a slight gain from 1987/88. Additional livestock on feed will create a need for additional quantities of high protein feeds, but reduced feeding profitability may cut into use per animal. Production and use of grain protein feeds will likely be up again, mainly from continued modest increases in HFCS and ethanol production, while animal-protein meal production may be up slightly as slaughter increases. High relative prices for oilseed meals are likely to result in a small use retrenchment in the coming marketing year.

Grain consuming animals units and High protein animal units, September-August, 1984/85-1987/88

Livestock group	1984/85	1985/86	1986/87	1987/88
	Million units			
GCAU's				
Dairy	12.2	12.5	11.8	11.5
Fed beef	19.1	17.6	16.8	17.7
Other beef	4.5	4.3	4.2	4.0
Hogs	19.8	19.3	19.3	20.5
Poultry	19.0	19.7	21.0	21.8
Other	1.9	1.9	2.0	2.0
Total	76.5	75.4	75.0	77.4
HPAU's				
Dairy	12.4	12.8	12.0	11.7
Fed beef	11.1	10.2	9.7	17.7
Other beef	7.7	7.3	7.2	4.0
Hogs	25.2	24.5	24.6	26.0
Poultry	48.6	51.1	55.1	57.3
Other	1.0	1.0	1.0	1.0
Total	106.0	106.9	109.5	113.2

A weaker dollar relative to many foreign currencies has strengthened exports and may further reduce domestic supplies of grain protein feeds. By the same token, imports of feed ingredients can be priced higher depending on the exchange rates. However, most imported feeds, mainly fishmeal, come from countries that keep their currency exchange rates closely tied to the dollar, to minimize price fluctuation.

Use of other concentrates, such as wheat mill feed, rice mill feed, fats and oils, and other byproduct feeds, has tended to grow slowly over time, mainly because many of these feeds are byproducts of milling for human consumption. The growth in population implies millfeeds will likely continue to grow. Inedible fats and oils for feed use also may increase. Production of inedible fats and oils has increased thus far in 1987/88, and usually is greater in the summer months.

Revisions in Animal Unit Calculations

Changes were made in the data series incorporating numbers of layers and chickens raised to calculate GCAU's and high-protein

animal units. The number of layers used is the average of the months, not the number on hand December 1.

The number of layers is typically highest from December through February, and is seasonally low in June through August. Since the National Agricultural Statistics Service (NASS) stopped reporting chickens raised, the replacement hens have been calculated using half of the egg-type chick hatch plus the pullets placed in the broiler hatchery supply flocks. These two changes have resulted in slight declines in the number of GCAU's from earlier years for layers and pullets raised for flock replacement.

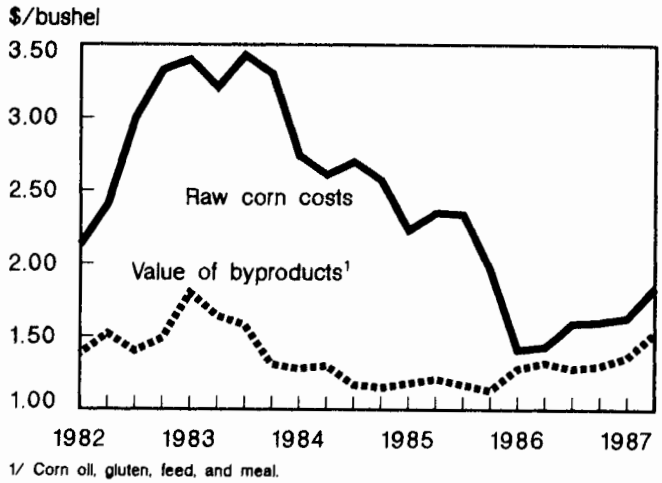
The number of GCAU's from March through May 1988 is estimated to be 3.3 percent above last year. Cattle on feed, hogs, and broilers were up. The remaining animals in quarterly GCAU's are considered fixed, and this component during March-May was down from last year, mainly due to a drop in dairy cow numbers. During June through August 1988 the quarterly GCAU's will likely be up nearly 1 percent from last year. The number of cattle on feed may be down, but hogs and broilers will be above last year.

FOOD, SEED, AND INDUSTRIAL USE OF CORN

Food, seed, and industrial use of corn (FSI) was more than 4 percent over last year for the first two quarters of the 1987/88 crop year. Because of the heavy summertime FSI use in 1986/87, it is unlikely that overall growth for the 1987/88 crop year will exceed 4 percent. Under projections for this crop year, FSI use of corn would account for 20 percent of domestic and 16 percent of overall disappearance.

To project the trends of the wet-milling industry, it is important to understand that their corn costs involve more than raw corn prices. Wet millers are able to sell the byproducts from the starch-making process to partially offset those corn costs. The wet-milling process produces approximately 13 pounds of gluten feed, 2.75 pounds of gluten meal, and 1.6 pounds of oil as byproducts from a bushel of corn. These byproducts can then be credited against the cost of the bushel of

Wet Milling Corn Costs



1/ Corn oil, gluten, feed, and meal.

corn, in some cases dramatically reducing the net corn cost.

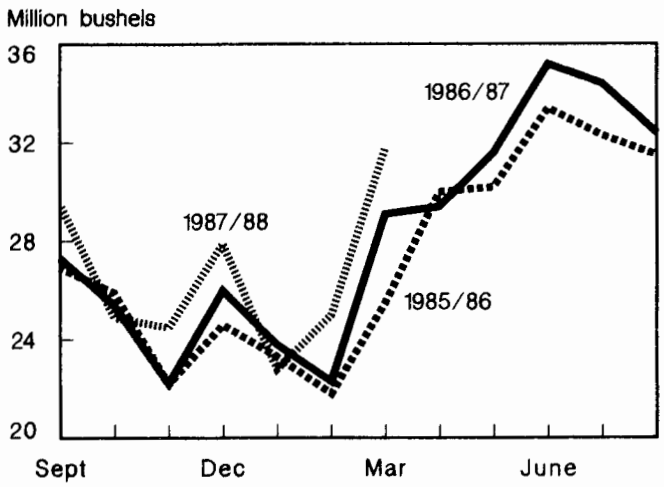
Average quarterly Midwest corn prices and the wet-milling byproduct values appear in the figure. The distance between the two lines represents the net cost to the wet miller. Net costs from the 1982 through 1985 crop years were relatively high, ranging from $.74 to $1.99 a bushel. However, since 1985, the net costs have dropped sharply, ranging from $.11 to $.31 a bushel.

The byproduct credits over the last 5 years have ranged from $1.17 to $1.80 a bushel. During the same time period, raw corn prices have fallen from $3.40 a bushel in first-quarter 1983 to a low of $1.41 in first-quarter 1986. Thus, the net-cost gap has narrowed dramatically. As long as the lower net corn costs continue, wet millers will be able to produce starch-based products at competitive prices.

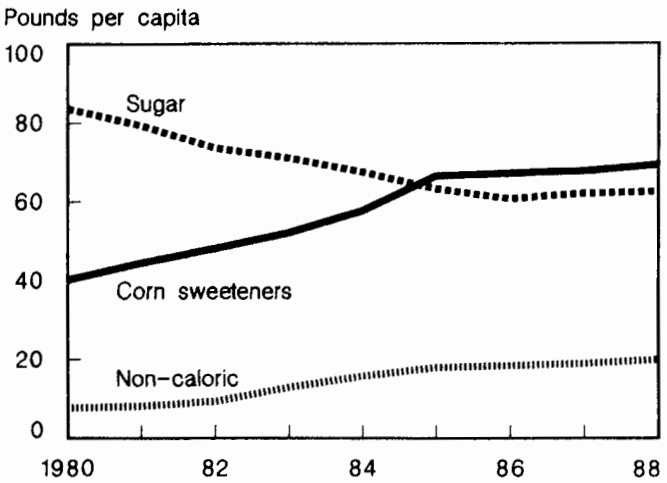
High fructose corn syrup (HFCS) disappearance is 5 percent over last year in the first two quarters of the crop year. Corn use for HFCS production is projected to reach 355 million bushels for 1987/88, 16 million over last year's total. HFCS prices have increased from the low levels of February when the HFCS-42 average price (wet) fell to 7.85 cents a pound and HFCS-55 dropped below 11 cents a pound.

Some stockpiling of HFCS occurred as producers chose to store their product rather

Corn Use in HFCS Production



U.S. Corn Sweetener Consumption



than sell it at the lower prices. During the period of lower prices, some sweetener capacity was temporarily switched to ethanol production. Monthly use of corn for HFCS slipped slightly below 1985 and 1986 levels last October and in January, but reached new monthly records in December and February. Corn use for HFCS will likely move to much higher levels during the summer months because of the expected high demand from soft drink producers.

It is estimated that 75 percent of all HFCS production is used for the sweetening of soft drinks, or approximately 9 billion pounds (dry basis) annually. This compares with 1980, when less than 2 billion pounds of HFCS were used to sweeten soft drinks.

Per capita U.S. corn sweetener consumption (HFCS, glucose, and dextrose) has virtually leveled off since 1985. However, the decline in per capita sugar consumption has been halted since it bottomed out in 1985 at 60.8 pounds per capita. Corn sweetener use has now surpassed sugar on an annual basis by 5.8 pounds.

Starch production is projected to use 163 million bushels, 5 percent more than last year. Starch production has climbed by over 28 percent since 1982. The strong economy has accelerated demand for products that use corn starch, such as corrugated paper, building products, and textiles. Glucose and dextrose production continues relatively flat, virtually unchanged since 1980.

Ethanol production has leveled off from the fast growth of the early 1980's. Corn use for ethanol is projected to reach approximately 310 million bushels for the 1987/88 crop year, a 5-percent increase from last year.

The first year of Colorado's mandated wintertime use of oxygenated fuels proved to be disappointing to those who predicted ethanol use would expand sharply in the State. Ethanol accounted for only 5 percent of the oxygenated fuel sales, while MTBE, a petroleum-based additive, accounted for 95 percent. Next winter could see some improvement in ethanol sales with changes in the requirements of the oxygenated fuel blends, but it is no certainty.

Several new corn products have received attention in the past year. The fact that corn starch could be used to create plastic has been known for some time, but the possibility that it might be considered on a commercial basis is relatively new. In recent months, several companies have announced the development of technology to use corn starch to produce biodegradable plastic bags and containers. It's too early to speculate on the possible impact that corn starch for biodegradeable plastic might have on the FSI use of corn.

Another new possible FSI use of corn came from the announcement that USDA scientists have developed a bread which uses corn flour. Fine-ground corn flour is combined in equal portions with wheat flour to

Corn: Food, seed, and industrial use 1/

Year beginning September 1	Wet-milled products				Dry-milled alcohol	Dry-milled and alkaline cooked products	Seed	Total
	HFCS	Glucose and dextrose	Starch	Alcohol				
	Million bushels							
1975	45	162	116	5	20	154	20	522
1976	62	164	116	10	15	155	20	542
1977	80	170	124	10	20	158	20	582
1978	105	170	124	15	20	155	20	609
1979	127	170	120	25	20	158	20	640
1980	165	183	120	35	35	160	20	718
1981	185	183	130	83	35	162	19	797
1982	215	188	127	130	50	170	15	895
1983	256	189	147	150	50	164	19	975
1984	310	187	143	170	100	160	21	1,091
1985	328	188	152	185	127	161	19	1,160
1986 2/	339	185	155	200	135	161	16	1,191
1987 3/	355	186	163	207	145	163	17	1,236

1/ Data in this table are estimates based on production and sales figures obtained from various Government and private industry publications as well as on unpublished information provided by numerous industry sources. 2/ Preliminary. 3/ Projected.

produce a new sandwich-type bread. Time and economics will determine the long-term success of corn as a bread flour.

As has been discussed in previous Feed Situations, the granulated corn sweetener, crystalline fructose (CF), is produced on a commercial basis by the Staley Company. Archer- Daniels-Midland Company has also announced intentions to start producting CF. This may signal a change in the original wait-and-see approach by other wet millers and might indicate that the industry's perceptions about the size of the CF market have increased in the past year.

These new products give some possibility of renewed growth for FSI corn use. However, the possibility also exists of new types of competition being developed for existing corn-derived products. New types of artificial sweeteners, legislative or regulatory changes, and changes in the fuel markets can all affect the corn sweetener or ethanol markets. Because of all these uncertainties, short-term FSI growth projections will remain in the moderate range of 3-4 percent.

WORLD COARSE GRAIN SITUATION

Foreign production of coarse grains is projected to increase nearly 3 percent in 1988/89 to a record 584 million tons. Coupled with a forecast increase of 4.2 million tons in U.S. production, world output is likely to rise by 2.5 percent from 1987/88. The global total for 1988/89 is forecast at 804.4 million tons, up about 20 million. Most of this increase is expected in corn, with smaller increases for oats and sorghum. Barley and rye are projected to decline slightly, with the USSR accounting for much of the drop.

In 1988/89, for the second consecutive year, world consumption of coarse grains is expected to surpass production. However, only a small pickup in trade is expected for 1988/89, despite the likelihood of continued attractive prices. 1/ The forecast rise in world coarse grain trade, to 86.4 million tons, represents only a 3-percent gain, but compares favorably with almost stagnant trade in 1986/87 and 1987/88. However, the rise in world trade is not projected to lead to larger U.S. coarse grain exports. Exports from a number of important competitors should recover from the forecast lower levels in 1987/88, and total foreign exports are likely to rise 7 percent in 1988/89. U.S. coarse grain

1/ All trade years referred to in this section are October-September and exclude intra-EC trade unless otherwise specified.

exports are forecast at about the same level as 1987/88.

The world ratio of stocks to use in 1988/89 is projected to decline again, to 22.3 percent from 25 percent forecast for 1987/88. This would be the lowest since 1984/85. World ending stocks are expected to fall 10 percent, all due to a drop in the United States. Foreign stocks are likely to show little change. While there is a good possibility that wheat prices will rise significantly in the next year, coarse grain prices will probably be more stable. Relative price adjustments among coarse grains may occur, particularly if corn supplies increase as much as forecast.

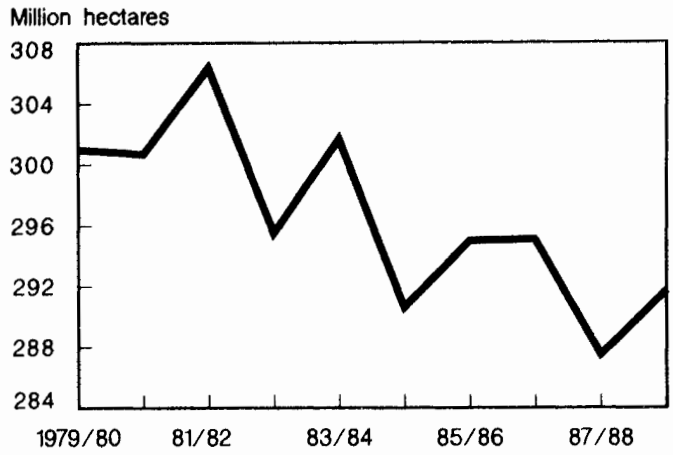
Production Recovery Forecast For Much of Europe and Asia

Major production changes forecast in 1988/89 include recovery from poor crops in India, Thailand, and Eastern Europe, where adverse weather reduced output in 1987/88, and declines for the Soviet Union and Canada, which both had excellent harvests in the previous year. Foreign coarse grain area is forecast up a little over 1.5 percent. This increase is not expected to be large enough to suggest a reversal of a longer-term area decline. (see graphs) However, the declining trend in area has been more than offset in recent years by yield growth, which is expected to continue in 1988/89.

This is USDA's first forecast of global production for 1988/89. Much of the 1988/89 crop has yet to be planted and is many months away in the Southern Hemisphere. The initial forecast of 1987/88 foreign production made in May 1987 was 4 percent higher than the current estimate.

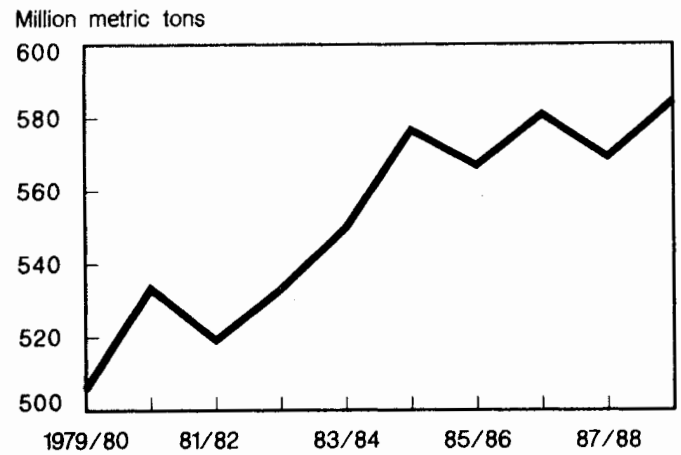
The largest increase in world coarse grain production in 1988/89 is expected in Eastern Europe. Eastern Europe's corn crop is forecast up 6.1 million tons and barley up 1.1 million. Much of the increase in the corn crop assumes recovery of yields in the Southern Balkans region. An increase in area is also expected to boost output in Yugoslavia, where free market corn prices have been strong because of tight supplies. However, 1988/89 corn production in Eastern Europe in forecast 8 percent below 1986/87.

Foreign Coarse Grains: Area Harvested



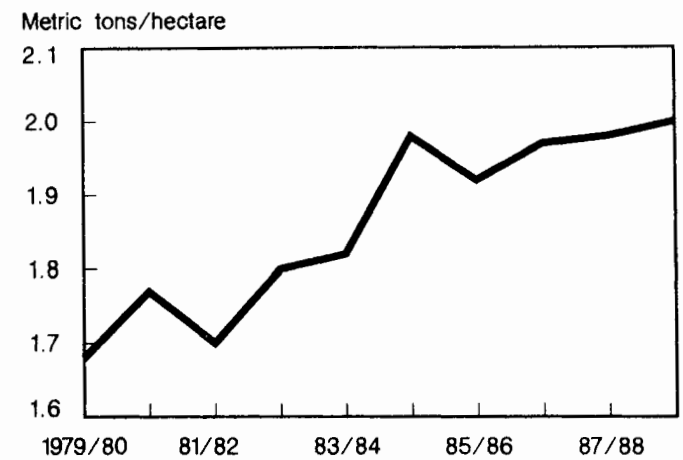
1987/88 and 1988/89 forecast.

Foreign Coarse Grains: Production



1987/88 and 1988/89 forecast.

Foreign Coarse Grains: Average Yields



1987/88 and 1988/89 forecast.

India's production is also anticipated to rebound in 1988/89, assuming normal weather. A 20-percent increase in production--nearly 5 million tons--- is forecast because of greater harvested area and improved yields. The failure of the monsoon in 1987 was responsible for a large drop in area harvested, aggravated by flooding in other areas. Sorghum is India's major coarse grain, followed by millet, corn, and barley. With the exception of barley, most production is rainfed and largely subsistence oriented, marked by low yields and large weather-related fluctuations. World price movements play little role in planting decisions.

Production in non-EC Western Europe should rebound in 1988/89 from a drop in Scandinavia the previous year caused by excessively wet and cold conditions. Output for non-EC Western Europe is projected to increase 14 percent. While area is increasing, the rise has been restrained by a fallow program in Sweden and a shortage of seed oats in Finland.

The single largest decline in coarse grain production is projected in the Soviet Union, where output could fall 4 percent from the near-record outturn of 113.7 million tons in 1987/88. Total coarse grain area is projected to decrease 1 million hectares. While corn stays close to the previous year, barley area and production will drop. Extensive replanting of winterkill wheat area with spring barley was reported last year, but will not be necessary this year.

Competitor Outlook is Mixed

Total coarse grain production in 1988/89 for the major foreign exporters is forecast to stay close to the 1987/88 outturn. However, the aggregate overshadows substantial individual changes such as a sharp drop in Canada and a dramatic rebound in Thailand. On a smaller scale, continued expansion in South Africa and Australia is expected.

Canada's coarse grain crops are likely to fall significantly because of a reduction in barley area, and an assumed drop to average yields for barley and corn. Exceptional weather in 1987 accounted for record corn yields and production. Grower intentions indicate a considerable shift--some 15 percent--of barley area to rapeseed due to expectations of more attractive prices. Barley output is forecast to fall 3 million tons to 11.3 million. Corn is forecast down 1 million tons to 6 million, while some gains are likely for oats and rye.

One of the most dramatic recoveries from low production could take place in Thailand, where a poor monsoon hurt the 1987/88 crops. In addition to the lack of rain, area planted was also down due to low relative prices. In the face of reduced production and strong local demand for corn by the feed industry,

World coarse grain trade: Major exporters and importers, by commodity, 1985/86-1988/89

Country	1985/86*	1986/87	1987/88 (forecast)	1988/89 (Projected)
	Million metric tons			
CORN				
Exporters				
U.S.	31.5	39.4	43.2	44.5
Argentina	7.4	4.0	4.2	4.2
China	6.4	3.8	3.0	3.0
Thailand	3.8	2.5	0.9	2.6
South Africa	1.5	2.6	1.5	1.5
Others	3.9	4.1	3.1	3.1
Total	54.5	56.2	55.9	58.9
Importers				
Japan	14.6	16.1	17.1	17.6
USSR	10.3	7.6	7.2	7.3
EC-12	4.8	2.8	3.0	3.0
Korea, Rep.	3.6	4.6	5.1	5.6
Taiwan	3.1	3.5	3.6	3.6
Mexico	1.7	3.4	3.5	3.8
China	0.4	1.6	1.0	1.5
Eastern Europe	2.2	1.7	2.4	1.5
Brazil	1.9	1.4	0.2	0.8
Egypt	1.9	2.4	1.7	2.2
Others	10.1	11.2	11.2	12.1
Total	54.5	56.2	55.9	58.9
SORGHUM				
Exporters				
U.S.	4.1	5.1	5.8	5.3
Argentina	1.1	0.6	0.9	1.0
Australia	1.1	0.6	0.9	1.0
Others	1.3	1.3	0.5	0.5
Total	8.7	8.0	8.2	7.9
Importers				
Japan	5.1	4.2	4.0	3.9
Mexico	0.6	0.8	0.8	1.9
Taiwan	0.8	0.8	0.6	0.7
Venezuela	0.8	0.8	1.4	1.4
Israel	0.5	0.2	0.4	0.4
Others	0.9	1.2	1.0	0.6
Total	8.7	8.0	8.2	7.9
BARLEY				
Exporters				
EC-12	7.3	5.7	7.0	7.0
Canada	4.8	6.0	4.8	4.4
Australia	3.7	2.2	2.1	2.5
U.S.	0.8	3.0	3.3	2.7
Others	1.9	1.2	0.6	0.9
Total	18.4	18.0	17.8	17.6
Importers				
Saudi Arabia	6.6	8.5	5.5	6.0
USSR	2.9	3.0	2.7	2.5
Eastern Europe	3.3	1.3	1.6	1.2
Japan	1.5	1.2	1.2	1.2
Others	4.1	4.0	6.8	6.7
Total	18.4	18.0	17.8	17.6
TOTAL COARSE GRAINS TRADE	83.2	84.4	83.9	86.4

*October-September year.

Thai prices have soared in the last few months. This is likely to bring some shift back to corn from cassava and soybeans, and stimulate more input use. Thai corn production is projected to jump by more than 75 percent to 4.8 million tons.

The European Community is projected to increase coarse grain production over 2 million tons in 1988/89 to 84.4 million tons. Most of this gain is attributed to continued strong growth in yields and better barley crops in the U.K. and Denmark. Virtually no change is anticipated in corn. Early in 1988, the EC passed a policy reform package that included a limited system of price "stabilizers". These are designed to cut cereal support prices by up to 3 percent in the next marketing year if production exceeds a threshold level. Also included in the package was a set-aside scheme. But no immediate impact on output seems likely from these measures.

Farmers in Australia are realizing better prices for oats and sorghum. This is expected to boost planting and production of these crops. However, for Australia's major coarse grain, barley, only a slight increase in area is forecast. Prices for malting and feed barley have exhibited some improvement. Average yields could boost barley output by over 10 percent. Australia's total coarse grain production is projected to grow 11 percent.

Argentina's coarse grain output is projected at about the same level as 1987/88, although area may rise 4 percent. There is much uncertainty in the Argentina outlook since planting is still several months away. One of the critical issues will be the prevailing price relationship between soybeans and corn. In 1987/88, expected better returns for soybeans led to some shift of prime land in the central corn belt into soybeans. Another major question is the difference between planted and harvested corn area. In 1987/88, given excellent growing conditions and good yields, there has been below average abandonment. An average season could mean more abandonment in 1988/89, offsetting some of the likely increase in plantings. Nevertheless, yields are not expected to match 1987/88 levels.

Despite South Africa's stated policy of diversifying away from corn exports in the face of low world prices, area and production are forecast to increase in 1988/89. Corn area in 1987 was at the lowest in recent decades. The drop in 1987/88 area was related to poor planting conditions, the diversification program, and high wheat prices. Although wheat is grown in the winter months in South Africa, and corn in the summer, wheat production for feeding has recently made inroads into traditional corn area in the Orange Free State.

In China, free-market corn prices have stagnated and in some places declined in recent months, following a bumper crop in 1987 and slowing feed demand. Unlike a year earlier, when farmers actively sought to plant more corn, area for 1988/89 is forecast to drop. However, production is projected at 76 million tons, equal to 1987/88. Supplies of hybrid corn seed should be better this year. A small decline in sorghum output and a small rise in barley are also forecast.

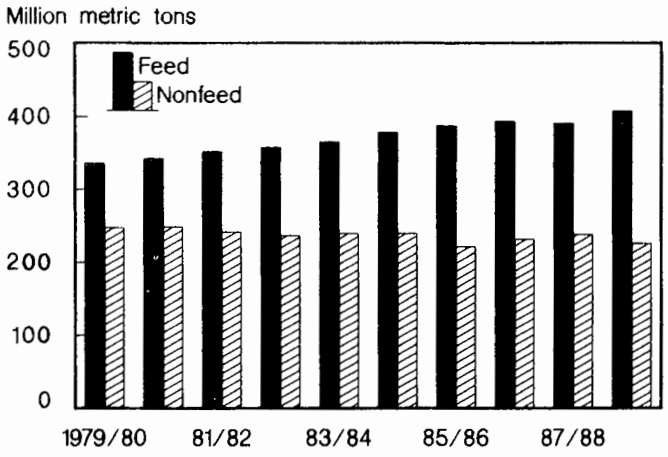
World Trade Remains Sluggish in 1987/88

Since the 1985/86 low of 83.2 million tons, world coarse grain trade has made only a limited recovery. In 1986/87, trade remained virtually flat, rising only 220,000 tons or 0.3 percent. In 1987/88, with about two-thirds of the year gone, trade is forecast at 83.9 million tons, up less than 1 percent from 1986/87 and 1985/86.

By contrast, trade in wheat rose 7 percent in 1986/87 from the depressed level of 1985/86, and is forecast up another 15 percent in 1987/88. This leaves trade only about 2 million tons beneath the 1984/85 record of 107 million tons. Compared to its peak year in 1980/81 (108 million tons), trade in coarse grains in 1987/88 is projected down more than 24 million tons.

Among the factors contributing to stagnant coarse grain trade are high foreign production, financial constraints, slow expansion of livestock production in many countries, and some substitution of alternative feedstuffs, particularly feed wheat. Foreign consumption of coarse grains set a record in 1986/87 and is forecast to decline only slightly in 1987/88 despite low imports--an indication that domestic output is accounting for a greater share of utilization than in the past.

Foreign Utilization of Coarse Grains



1987/88 and 1988/89 forecast.

For the 1987/88 trade year, the major forecast increases in imports are occurring in Eastern Europe, Japan, Venezuela, and Korea. Lesser gains are projected in the EC, Algeria, Iraq, Tunisia, and other Western Europe. Korea's buoyant import demand stems from very strong income growth pushing up the demand for meat. The increases in Eastern Europe result from poor domestic harvests, but imports are running below earlier expectations due to financial constraints. Japan's increase in imports is fairly consistent with trend growth.

Imports by the EC (from sources outside the Community) are up for the first time after 8 years of striking declines. This increase is explained by Spain's mandated imports of corn and sorghum under the EC/U.S. Compensation Agreement, along with a surge in sorghum imports from Sudan. These imports are attractive because they qualify for a reduction in EC protective tariffs based on Sudan's developing-country status.

On the other hand, import demand for a number of big markets--including Saudi Arabia, Brazil, China, and the Soviet Union--is falling. With the exception of Saudi Arabia, these declines are at least partially related to bumper crops. The dramatic fall in Saudi Arabia's barley imports follows the accumulation of large stocks and a cut in import subsidies. A significant drop in Egypt's 1987/88 corn imports is forecast, despite strong demand for meat and poultry. Shortages of foreign exchange and possibly some hesitation by private importers, due to uncertainty about government privatization actions, account for this decrease.

Small Gain Projected for World Trade In 1988/89

The first forecast of global coarse grain trade for 1988/89 is for an increase of almost 3 percent to 86.4 million tons. Increases are expected for trade in corn, while barley and sorghum decline.

In the face of high production, a projected rise in foreign coarse grain consumption of 1 percent is not sufficient to stimulate a sharp rebound in trade. However, many factors could change this outlook (in either direction), since the onset of the new trade year is still months away (October 1988).

Economic conditions in the developing countries--the main growth markets for coarse grains in the 1970's--are not forecast to improve markedly. Except for the newly industrialized countries of East Asia, economic growth for the remainder of 1988 and in 1989 should remain sluggish. The continuation of debt problems weighs heavily on the outlook for many countries, particularly in Latin America and Africa. Important implications of the slow economic growth are continued constraints on the ability to import, and slow expansion in livestock production.

Historically, much of the variation in world trade lies with the Soviet Union, depending on the size of its own grain crops and policy decisions about livestock feed and imports. For the fourth straight year, Soviet coarse grain imports are forecast to remain relatively low, projected at 10 million tons in 1988/89. This is based on expectations of another good harvest. In addition to questions about the volume of grains imported by the USSR, the mix of imports could vary. If priced low enough, for example, feed-quality wheat could continue to displace some corn or barley.

Import demand by Saudi Arabia, the world's largest barley market, could also vary considerably. This outlook revolves almost entirely around policy decisions concerning prices, subsidies, and stocks since domestic production is relatively unimportant. Saudi

coarse grain imports for 1988/89 are forecast at 6.7 million tons, up 8 percent.

Although much less volatile, import decisions by Japan, the world's largest coarse grain buyer, will also heavily shape world trade. The key variable may be how much additional meat is imported, as opposed to importing additional feed for domestic meat production. This involves political decisions because of quotas and trade policies, as well as prices and underlying demand for meat by the Japanese consumer. Another potential issue in Japan is the question of diversifying purchases of feedgrains by possibly buying less from the United States, the leading supplier. Despite some talk, no big shifts in purchasing patterns are anticipated at this point.

China should continue as a net exporter of corn, but the margin of exports over imports is very uncertain. Variables include the rate of growth in feed demand, the size of the 1988 corn crop, world price levels, and foreign exchange availability. Because of stagnant production and rising industrial demand, China's sorghum exports will stay low, while imports of barley will go up again, spurred by rapidly increasing beer production.

U.S. Market Share Could Shrink Marginally in 1988/89

After a striking gain in the U.S. share of coarse grain trade forecast for 1987/88, to 62 percent from 57 the previous year, a slight dip is predicted for 1988/89. This assumes a limited recovery among competitors' exportable supplies. Total coarse grain exports by the United States are projected largely unchanged at 52.5 million tons, but the composition will change. U.S. corn exports are forecast to rise 3 percent to 44.5 million tons as world import demand expands 3 million tons. However, with sorghum imports down and competitor supplies up, sorghum shipments are projected down 9 percent to 5.3 million tons. Barley exports are forecast down 18 percent to 2.7 million, for much of the same reasons as sorghum. Most U.S. barley exports will be under the Export Enhancement Program.

The most significant change among the other major exporters is expected in Thailand if crop conditions return to normal. Thailand can expect to recapture its traditional corn markets in Malaysia and Singapore, but its sales to other potential buyers such as Japan, China, and non-Asian countries will be more dependent on competitive pricing. Thai export prices could be influenced by strong domestic demand for corn from its fast-growing poultry sector.

EC barley exports are expected to remain high, forecast at 7 million tons to non-EC destinations, as EC supplies will be ample. Likewise, little change in EC corn exports is anticipated, with about 1 million tons likely to be exported outside the community. The EC Commission has recently proposed subsidizing the use of grain for feeding. Enactment of such a subsidy would probably cut the use of some non-grain feeds, particularly imported ones. This could potentially affect the supply of grain for export, but passage of this proposal is far from certain.

Some rebound in Eastern Europe's coarse grain exports is projected, primarily in corn

Foreign coarse grain production: Selected countries and regions, 1985/86 - 1988/89

Country	1985/86	1986/87	1987/88 (Forecast)	1988/89 (Projected)
	Million metric tons			
CORN				
Argentina	12.4	9.3	9.0	9.0
Brazil	21.0	26.5	23.0	22.0
China	63.8	70.9	76.0	76.0
Eastern Europe	30.6	38.9	29.7	35.8
EC-12	25.7	25.1	25.7	25.7
India	6.6	7.5	5.5	7.5
Mexico	10.5	10.0	9.9	10.3
South Africa	8.1	7.2	7.5	8.0
Thailand	5.4	4.3	2.7	4.8
USSR	14.4	12.5	14.8	15.0
Total foreign	254.3	267.1	260.1	271.0
SORGHUM				
Argentina	4.2	3.1	3.2	3.1
Australia	1.4	1.2	1.7	1.8
China	5.6	5.4	5.8	5.4
India	10.2	8.9	8.6	10.5
Mexico	3.7	4.3	4.0	4.0
Sudan	3.6	3.4	1.6	2.2
Thailand	0.3	0.3	0.2	0.3
Total foreign	42.1	40.5	37.2	40.9
BARLEY				
Australia	4.9	3.6	3.3	3.7
Canada	12.4	14.6	14.4	11.3
Eastern Europe	16.4	16.9	16.0	17.1
EC-12	50.8	46.5	46.8	49.1
Other Western Europe	6.6	6.2	5.0	6.1
Turkey	6.5	6.3	6.0	6.2
USSR	46.5	53.9	58.4	54.5
Total foreign	164.4	168.7	169.1	168.5
TOTAL COARSE GRAINS 1/				
Argentina	17.4	13.0	13.2	13.2
Australia	7.9	6.6	7.0	7.8
Canada	23.9	25.5	26.0	22.2
China	82.3	88.4	93.8	93.2
Eastern Europe	15.5	73.9	64.3	71.1
EC-12	88.3	81.3	82.2	84.4
India	25.8	26.6	23.0	27.7
South Africa	8.9	7.9	8.3	8.9
Thailand	5.7	4.6	3.0	5.1
USSR	100.0	105.9	113.7	109.0
Total foreign	566.9	581.0	569.2	584.5

1/ Also includes oats, rye, millet, and mixed grains.

exports from Yugoslavia and Romania. A drop is likely for Canada's coarse grain sales, but with sizeable stocks, Canada's barley exports could increase if there is strong demand and/or aggresive marketing by Canada.

Australia's coarse grain exports for 1988/89 are forecast to increase by 12 percent because of larger production. Most of the increase is expected in barley, which could rise 400,000 tons. A smaller increase is likely in sorghum shipments.

No big changes from 1987/88 are anticipated for the Southern Hemisphere corn exporters, Argentina and South Africa. Since planting is still a few months away, changes in prices or policies could change these forecasts.

FARMERS' RESPONSE TO PROGRAM INCENTIVES

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ABSTRACT: The percentage of base enrolled in farm programs for corn, sorghum, barley, and oats bears a significant statistical relationship to the percent increase in net returns above variable cost for program participation relative to nonparticipation. In 1988, the expected net returns for feed grain program participants relative to nonparticipants are substantially reduced from 1987. Lower gains in net returns suggest a somewhat reduced level of 1988 program participation for each of the feed grains according to the statistical relationships estimated in this study.

KEYWORDS: Feed grain program, participation rates, net returns.

Farmers' response to program parameters is important to a wide range of interests. Individuals responsible for administering agricultural policy must anticipate response if announced programs are to be successful in achieving program objectives. The agribusiness community must also anticipate farm program response in order to plan investment, production, marketing, and inventory activity. Farmers need to understand their collective response to programs to better manage their marketing of current stocks of program commodities.

For many years, farm programs for corn, sorghum, and barley have been used to adjust production through price protection incentives. However, since 1978, both income assistance and price protection have been used to achieve production adjustment through the use of crop-specific incentives--deficiency, diversion, and in-kind payments, in addition to nonrecourse loans. The feed grain program was extended to include oats in 1982. Between 1978 and 1987, many incentive and price protection alternatives were used. As a result, data are now available to analyze farmers' response to program incentives.

Farm program announcements each year specify what is required of the farmer to be eligible for program benefits for the next crop. The program announcement also may include additional options. However, the first decision the farmer faces is whether or not to participate in the program, and this decision is based on weighing the costs and benefits of meeting minimum program participation requirements against the costs and benefits from nonparticipation. If the farmer decides that it is in his interest to participate, additional program options are considered. Aggregate response in terms of proportion of base signed up for the basic program is analyzed in this study.

Analytical Procedures

The decision to participate in income and price support programs is based in part on a

comparison of a producer's expected net returns (total revenue less total variable cost) in the program with expected net returns as a nonparticipant. If the expected net return for entering the program is higher than for staying out, the producer likely will enroll. If the expected net return is lower in the program, the producer would likely stay out of the program, but may still choose to enroll depending on the perceived level of income risk associated with nonparticipation.

A general model of the overall participation rate for a program crop is given by:

$$P_i = f(NRI_i, NRO_i),$$

where:

P_i = program participation rate, defined as the portion of the U.S. base acreage for crop i enrolled in the commodity program,

NRI_i = average expected net returns for crop i for a producer enrolled in the program,

NRO_i = average expected net returns for crop i for a producer not enrolled in the program.

The two net return variables can be further defined as:

(1) $NRI_i = (1 - (a+b))\ A_i\ YP_i\ DP_i$
revenue from deficiency payments

$+ b\ A_i\ YP_i\ PLD_i$
revenue from paid land diversion

$+ (1 - (a+b))\ PF_i\ Y_i\ A_i$
revenue from crop production

$- (1 - (a+b))\ A_i\ C_i$
variable cost on planted acres

$- (a+b)\ A_i\ CI_i$
variable cost on conserving use acres

(2) $NRO_i = PF_i\ Y_i\ A_i$
revenue from crop production

$- C_i\ A_i$
variable cost on planted acres

where, for program crop i:

a = required acreage reduction rate,

b = paid land diversion rate,

A_i = eligible base acreage,

PF_i = expected price received by farmers,

PLD_i = expected payment rate per bushel for paid land diversion,

DP_i = expected deficiency payment rate per bushel,

Y_i = expected yield,

YP_i = program yield,

C_i = variable cost of production per acre,

CI_i = cost per acre for acres idled under program requirements.

According to program provisions, farmers face a $50,000 payment limitation. For large farms facing the limitation, the income from deficiency and diversion payments would be $\$50{,}000/A_i$.

A measure of the gain in net returns associated with program participation relative to nonparticipation is given by:

(3) $G_i = (NRI_i - NRO_i) / NRO_i$.

Estimating Equation

The following exponential functional form can be used as an estimating equation for the participation rate:

$$P_i = K - \exp(a + b\ G_i^{\beta})$$

where K is an upper bound on the participation rate, P_i and G_i are as defined earlier, exp is

the exponential operator, and a, b, and g are parameters to be estimated. The expected sign on the b coefficient is negative, implying increases in G_i are associated with higher participation rates.

This functional form permits incorporation of an asymptote for the upper bound of the dependent variable. While the theoretical upper bound on program participation would be 100 percent, structural and institutional characteristics lead to lower maxima. The above equation can be rearranged as follows:

$$(4) \quad \ln(K - P_i) = a + b\, G_i^{g}.$$

Nonlinear regression methods would permit estimation of parameters a, b, and g. In this study, linear least squares estimates of a and b were obtained for a range of values of g. The set of parameters that maximized R^2 was then used to estimate participation rates.

Data

Net returns for crop production both in and out of the basic commodity program are calculated from data appearing in table 5. These data are substituted into equations 1, 2, and 3 to derive the independent variable used in the estimation of equation 4. All net returns are calculated for 100 acres. Each producer may have several program alternatives to evaluate in a given year. Because the objective of this study is to estimate the participation rate in the basic program, only two alternatives are compared--net returns expected if not participating and net returns expected for the minimum level of requirements for program compliance.

With the exception of 1983 and 1986, program compliance simply included meeting the acreage reduction requirement. For 1983 and 1986, compliance required participation in the paid land diversion in addition to the acreage reduction program. Net return calculations for a program participant reflect these basic requirements.

Loan rates, diversion payment rates, program crop yield, and program parameters are all quantities known by producers during the signup period. However, the producer also must form price and yield expectations and estimates of deficiency payments to determine whether to enroll in the program.

Expected Price and Yield

The expected market price at the time of sale for most years was assumed to be a function of recent past prices received by farmers. The October–January average price received by farmers is used to reflect producers' expectations for corn and sorghum. The 8-month average price received (June–January) is used for barley and oats.

These averages are used because they are based on the current marketing year supply and demand conditions and because farmers are thought to base planting decisions on prices that are current during the signup period. In years when this naive price expectations approach was inadequate to account for unusual market or institutional factors, adjustments to expectations were made. These years were 1984 and 1986, and the changes are explained in the "Results" section below.

Expected deficiency payments also must be determined by the farmer. Deficiency payments are based on the difference between the target price and the loan rate or the target price and the market price, whichever difference is smaller. The relevant market price is not known when the participation decision must be made, so it is assumed that the farmer calculates an expected deficiency payment using the target price, the known loan rate, and the expected market price.

The expected yield for each of the feed grains is assumed to be the average of the previous 3 years' crops. If one of those 3 years had extremely high or low yields, that observation was omitted and the yield expectation was based on the other 2 values. Program yields used in this study are the yields announced at the time of signup. These vary slightly in some years from the final published program yield.

Production Costs

Net returns for producers staying out of the program are determined from cost-of-production data for each crop. These data were obtained from published production cost estimates (1). Variable cash expenses for

the principal producing region for each crop were used in the net return calculations.

Under commodity program requirements, idled acreage must be devoted to conservation use. The publication *Practices and Costs on Land Placed in Crop Reduction Programs* (2) was used to calculate production costs on land placed in conservation use. The costs for idled wheat acreage in the Northern Plains in 1983 were assumed to approximate those for barley and oats. For each variable cost element involved in conservation use, the ratio of idled cost to production cost in 1983 was applied to production costs for each respective year to obtain conservation cost estimates for the other years. Similar methodology was used for corn and sorghum, except cost elements for corn were for the Lake States and Corn Belt regions, and for sorghum, the Central Plains region.

Results

Equation 4, relating participation rates to the gain variable, was estimated for each of the feed grains. Data used for each of the estimations are presented in tables 1 through 4. Data for 1980 and 1981 were omitted because there was no program in those years. The oats program runs from 1982 to the present. In each case, 1988 data were not used in the estimation process so appropriate forecasts of 1988 program participation could be made.

Corn

The basic requirement for participation in the feed grain program has been to idle a portion of the farm base acreage. The idled acreage has been required to be placed into conservation use or the Acreage Reduction Program (ARP). The ARP was 10 percent for 1978–79 and for 1982–85, 17.5 percent for 1986, and 20 percent for 1987 and 1988. Compliance also required a paid land diversion (PLD) program of 10 percent of base in 1983 and 2.5 percent in 1986. Compliance with the program entitles farmers to price protection through nonrecourse loans and income assistance, through deficiency payments and PLD payments when applicable.

Loan rates varied from a high of $2.65 a bushel in 1983 to $1.82 in 1987, and deficiency payments varied from 10 cents a bushel in 1978 to a preliminary estimate of $1.21 in 1987. Program participation ranged from 21 percent in 1979 to almost 90 percent in 1987. Participation was generally low in 1978, 1979, and 1982, reflecting low net gains (less than 20 percent) from program enrollment. Prices received by farmers were near the loan rate during the 1978 and 1979 harvest seasons and recovered to above the loan rate following harvest. Consequently, price risk was not a major reason to participate, and with the low deficiency payment rates, income assistance also was relatively unattractive.

Enrollment jumped from 29 percent in 1982 to 71 percent in 1983. The expected deficiency payment rate for 1983 was only 21 cents a bushel at the time of enrollment, but experience in 1982 demonstrated to farmers that the price could drop well below the loan rate. The price received by farmers in

Figure 1
Corn Program Participation Response

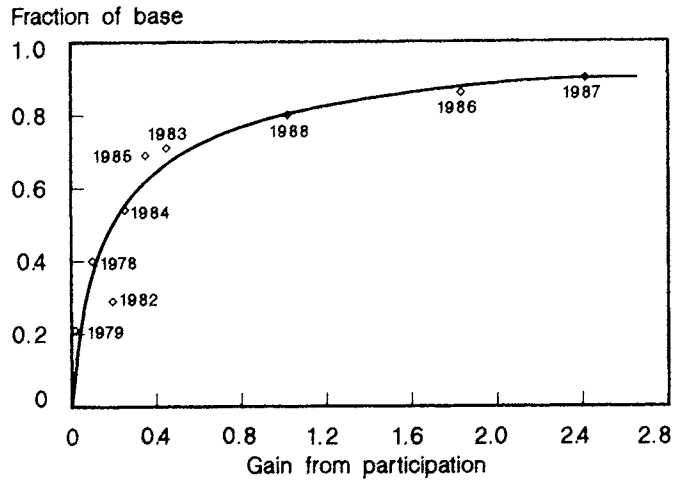

Table 1.—Corn net returns and participation rates

Year	Part. rate	Net returns In	Out	Ratio	Net gain
	Percent	$/100 acres			Percent
1978	40	8955	8149	1.099	9.9
1979	21	9596	9446	1.016	1.6
1982	29	14432	12079	1.195	19.5
1983	71	14894	10281	1.449	44.9
1984	54	16355	13042	1.254	25.4
1985	69	17889	12136	1.351	35.1
1986	86	15797	5579	2.832	183.2
1987	90	17178	5033	3.413	241.3
1988		16714	8279	2.019	101.9

October and November 1982 averaged $2.05 a bushel, 50 cents under the loan rate, and it took until February before prices recovered to the loan rate. Thus, price risk apparently became a more important factor in the decision to participate in 1983. The Payment-in-Kind (PIK) Program, particularly the "whole farm" PIK, may also have been an important program incentive.

The combination of the PIK program and a severe drought in 1983 drove farm prices well above the loan rate during the 1983/84 crop year. However, from experience, farmers knew that they could not expect to receive prices equal to the October 1983-January 1984 average for the 1984 crop. Consequently, the loan rate was used as the expected price for both the compliance and the noncompliance alternatives.

Program emphasis shifted to increased income assistance and decreased price risk protection in 1986. Consequently, the gain in net return from the feed grain program increased dramatically, and so did program participation. The shift in program also required an adjustment to the price expectations methodology used in this study for 1986. The loan rate was lowered from $2.55 to $1.92, less a one-time 4.3-percent Gramm-Rudman-Hollings (GRH) budget adjustment in 1986. The price received by farmers for October 1985-January 1986 averaged $2.24 or 31 cents below the 1985 loan rate of $2.55. It was assumed that farmers would adjust their expectations of the 1986 market price to reflect the reduction rather than simply continue forming price expectations on the October-January average price. Thus, the expected price was set at $1.55 for 1986, 29 cents below the GRH adjusted loan rate of $1.84.

In 1987, the expected gain in net return for being in the program was 241 percent, and almost 90 percent of the corn base was enrolled in the program. Consequently, 95 percent was specified as the upper bound for participation. A value of g (the curvature parameter) of 0.5 maximized the R^2 value for the functional relationship between participation and the gain variable. The estimated equation for corn is:

$$(5)\quad P_c = 0.95 - \exp(0.02 - 1.89\, G_c^{0.5}).$$

P_c is the corn participation rate and G_c is the expected gain in net return for participating in the feed grain program. The R^2 value for the equation is 0.96, with a standard error of 0.16 for the gain coefficient.

The expected gain for participation compared with nonparticipation in 1988 is 102 percent (1.02). Based on equation 5, the forecast participation rate for 1988 would be 80 percent, with a probability of 90 percent that participation would fall in the range of 76 to 83 percent. The estimated curve and the actual data points used in the regression appear in figure 1.

Sorghum

Sorghum program requirements have been identical to the corn requirements since 1978. Sorghum program participation rates have ranged from 42 percent in 1984 to 84 percent in 1987. The high rate of participation in 1987 reflects a 251-percent gain on average over expected returns for nonparticipation. In 1984, the gain on average for participating compared to not participating was 18 percent.

An upper bound of 95-percent participation was assumed for sorghum producers based on the experience in 1987, a year in which the expected gain from participating was relatively high. The curvature parameter was set to 1 for the

Figure 2
Sorghum Program Participation Response

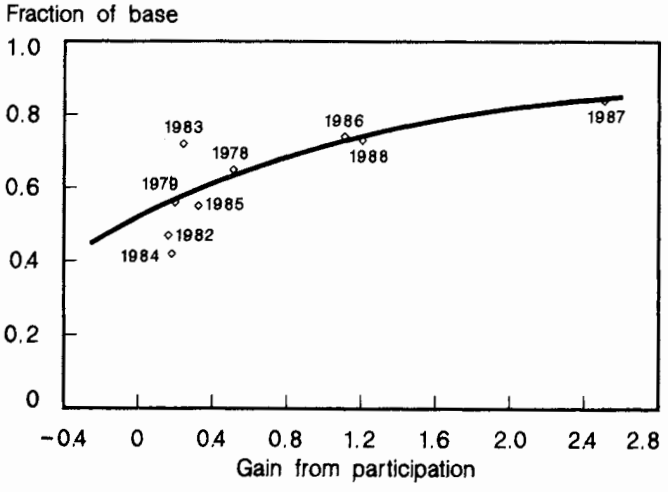

Table 2.--Sorghum net returns and participation rates

Year	Part. rate	Net returns In	Out	Ratio	Net gain
	Percent	$/100 acres			Percent
1978	65	6848	4534	1.510	51.0
1979	56	6589	5498	1.198	19.8
1982	47	8550	7356	1.162	16.2
1983	72	8724	7016	1.243	24.3
1984	42	9211	7796	1.182	18.2
1985	55	9110	6887	1.323	32.3
1986	74	8559	4054	2.111	111.1
1987	84	9345	2665	3.507	250.7
1988		9353	4237	2.208	120.8

sorghum equation. The estimated equation for sorghum is:

(6) $P_S = 0.95 - \exp(-0.84 - 0.57\ G_S)$.

The participation rate is given by P_S, and G_S is the gain in net return expected from compliance with the feed grain program. The R^2 for the equation is 0.79 and the standard error for the estimate for the gain coefficient is 0.12. The estimated curve and the actual data points used in the regression appear in figure 2.

The expected gain from participating in the 1988 sorghum program is 121 percent (1.21). The forecast participation rate for sorghum producers in 1988 is 73 percent based on equation 6. There is a 90-percent likelihood that the observed participation rate will be between 67 and 78 percent.

Barley

The barley program has been identical to corn and sorghum in its basic requirements except in 1979, when the barley ARP was set at 20 percent. Participation rates for barley producers have ranged from a low of 42 percent of the base in 1979 to 84 percent in 1987 (table 3). The high rate of participation in 1987 corresponds to an 81-percent gain on average over expected returns in that year for the nonparticipant. In 1982 and 1984, relatively low participation rates corresponded to small negative gains expected on average for program participation. Some program participation still occurred in those years because individual producers may have had positive expected gains for their farms, even though the national average expected gain is negative.

An upper bound of 95 percent for barley participation was chosen for the estimation based on the 1987 rate--a year in which net gains from the program were relatively high. The curvature parameter (g from equation 4) was set to 1 for the barley estimation. As for corn, an adjustment was made for 1986 net return calculations to reflect changes in farm legislation. Although the expected 1986 market price at signup based on the previous 8-month average was $2.03, the farmers knew that loan rates would be dropped and adjusted their expectations accordingly. The estimated equation for barley is:

(7) $P_b = 0.95 - \exp(-0.70 - 1.18\ G_b)$.

P_b is the barley program participation rate and G_b is the gain in net returns from participating in the barley program. An R^2 of

Figure 3
Barley Program Participation Response

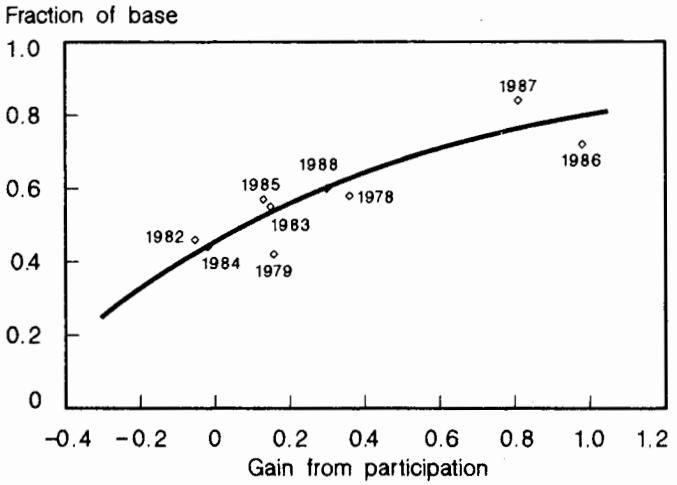

Table 3.--Barley net returns and participation rates

Year	Part. rate	Net returns In	Out	Ratio	Net gain
	Percent	$/100 acres			Percent
1978	58	5506	3981	1.362	36.2
1979	42	5018	4332	1.158	15.8
1982	46	6390	6745	0.947	-5.3
1983	55	6799	5919	1.149	14.9
1984	44	7454	7587	0.982	-1.8
1985	57	7813	6912	1.130	13.0
1986	72	6723	3400	1.977	97.7
1987	84	6831	3782	1.806	80.6
1988		6430	4949	1.299	29.9

.72 was obtained for the barley equation and the standard error of the gain coefficient was 0.30.

The net gain for program participation for 1988 is 30 percent (0.30). Barley program participation is predicted to be 60 percent for 1988 based on the calculated gain for the basic program. The 90-percent confidence range for the forecast is 48- to 69-percent participation. The estimated curve and the actual data points for the regression appear in figure 3.

Much of the barley is produced for malting, and this barley typically sells at a premium. Producers of malt-quality barley may be less attracted to programs than producers of feed-quality barley.

Oats

From 1982 through 1987, the oat program requirements were similar to the other feed grains. In 1988, the oat ARP is 5 percent. There was no oat program from 1978 through 1981.

Program participation for oats has ranged from 14 to 45 percent. The highest rate occurred in 1987, when the gain in net returns from the program was 23 percent. The low participation rates for 1982, 1984, and 1985 corresponded to average gain in net returns of about -12 percent. Participation in the oats program has been low compared with the other feed grains because, for many producers, there has not been a clear advantage to being in the program. Not until 1986 and 1987 were deficiency payments a significant part of expected returns for oats program participants. From 1982 through 1985, gain in net returns was negative for the average producer (table 4). Low participation rates for oats also may be due to high rates of on-farm feeding to livestock.

An upper bound of 60 percent was chosen for estimating oats producers' participation rate. This level was based on participation in 1987, when the gain in net returns for the commodity programs was relatively high. A curvature parameter of 1 was used for oats. The estimated equation for oats is:

(8) $P_O = 0.6 - \exp(-1.13 - 2.99\ G_O)$.

Figure 4
Oats Program Participation Response

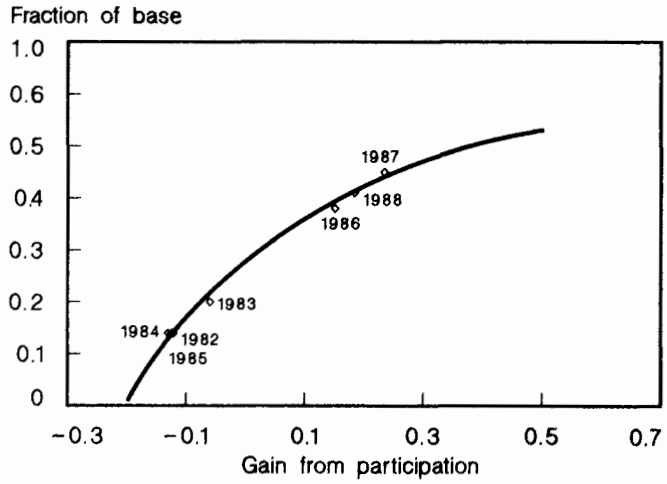

Table 4.--Oats net returns and participation rates

Year	Part. rate	Net returns In	Net returns Out	Ratio	Net gain
	Percent	$/100 acres			Percent
1982	14	4769	5446	0.876	-12.4
1983	20	3749	3983	0.941	-5.9
1984	14	3728	4287	0.870	-13.0
1985	14	4851	5519	0.879	-12.1
1986	38	4540	3946	1.151	15.1
1987	45	4609	3734	1.234	23.4
1988		6982	5897	1.184	18.4

P_O is the oats program participation rate and G_O is gain in net returns from entering the oat program compared with staying out. An R^2 of 0.99 was obtained and the standard error of the gain coefficient was 0.14. However, only six observations were available for the estimation, since the oat program was not begun until 1982.

The expected gain in net returns for program participation for 1988 is 18 percent (table 4). This level is lower than the 23-percent gain for 1987, which reflects changes in program parameters and in market conditions. The 1988 expected gain results in a projected program participation rate of 41 percent. The 90-percent confidence interval for the forecast is 40 to 42 percent. The point estimate compares to an observed rate of 45 percent for 1987, when the expected gain in net returns was 5 percentage points higher. The estimated curve and the data points for the regression appear in figure 4.

Summary

A model of feed grain producers' program participation decisions was developed based on analysis of expected net returns. Variation in participation rates was explained by comparing expected net returns above variable costs for program participation and returns for nonparticipation. Statistically significant results were obtained for each of the feed grains.

The estimated results were used to forecast feed grain program participation rates for 1988. Based on calculated expected net returns for enrolled producers compared with net returns for nonparticipants, the model predicts 81 percent enrollment for corn, 73 percent for sorghum, 59 percent for barley, and 40 percent for oats. Confidence intervals for the forecasts were also calculated. Model performance appears to improve as the potential for gain from program participation increases.

Net return analysis provides a simple but effective means of analyzing feed grain program participation decisions. Alternatives to the naive approach for determining expected prices and yields used in calculating net returns could improve the statistical properties and the forecasting results. The

Table 5.--Data for net return analysis

	Unit	1978	1979	1982	1983	1984	1985	1986	1987	1988
CORN										
Program*		10/0	10/0	10/0	10/10	10/0	10/0	17.5/2.5	20/0	20/0
Target price	$/bu.	2.10	2.20	2.70	2.86	3.03	3.03	3.03	3.03	2.93
Loan rate	$/bu.	2.00	2.10	2.55	2.65	2.55	2.55	1.92	1.82	1.77
Program yield	bu./ac.	90.0	94.0	95.5	100.0	101.3	110.0	105.0	105.5	105.5
Expected yield	bu./ac.	98.4	93.3	103.1	104.4	104.4	109.6	112.6	114.6	118.9
Exp. def. pmt.	$/bu.	0.10	0.10	0.15	0.21	0.48	0.43	1.06	1.21	1.16
Diversion pmt.	$/bu.				1.50			0.73		
Expected price	$/bu.	1.88	2.05	2.43	2.18	2.50	2.40	1.55	1.45	1.69
Production cost	$/ac.	84.70	96.81	129.74	124.78	130.58	130.72	118.74	115.84	118.15
Idled prod. cost	$/ac.	14.37	17.08	23.20	21.84	22.85	22.88	20.06	20.27	20.68
SORGHUM										
Program*		10/0	10/0	10/0	10/10	10/0	10/0	17.5/2.5	20/0	20/0
Target price	$/bu.	2.28	2.34	2.60	2.72	2.88	2.88	2.88	2.88	2.78
Loan rate	$/bu.	1.90	2.00	2.42	2.52	2.42	2.42	1.74	1.74	1.68
Program yield	bu./ac.	51.4	50.9	57.9	58.7	56.8	60.0	60.0	60.0	60.0
Expected yield	bu./ac.	51.4	53.4	63.3	61.6	58.7	57.8	61.6	63.6	68.1
Exp. def. pmt.	$/bu.	0.38	0.34	0.18	0.20	0.46	0.46	1.01	1.14	1.10
Diversion pmt.	$/bu.				1.50			0.65		
Expected price	$/bu.	1.68	1.95	2.21	2.18	2.42	2.30	1.62	1.33	1.49
Production cost	$/ac.	41.01	49.15	66.33	64.13	64.09	64.07	59.25	57.94	59.10
Idled prod. cost	$/ac.	13.09	15.69	20.50	19.23	20.14	19.72	17.43	17.25	17.60
BARLEY										
Program*		10/0	20/0	10/0	10/10	10/0	10/0	17.5/2.5	20/0	20/0
Target price	$/bu.	2.25	2.40	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Loan rate	$/bu.	1.63	1.71	2.08	2.16	2.08	2.08	1.56	1.49	1.44
Program yield	bu./ac.	42.8	44.5	49.9	51.0	51.9	52.7	49.0	49.0	49.0
Expected yield	bu./ac.	44.2	45.7	50.8	53.0	54.0	54.4	52.3	51.7	51.5
Exp. def. pmt.	$/bu.	0.52	0.49	0.10	0.44	0.16	0.36	0.57	1.02	0.68
Expected price	$/bu.	1.73	1.91	2.50	2.16	2.44	2.24	2.03	1.58	1.83
Diversion pmt.	$/bu.				1.00			0.57		
Production cost	$/ac.	36.66	43.97	59.55	55.29	55.89	52.74	44.97	43.87	44.75
Idled prod. cost	$/ac.	8.00	9.60	13.00	12.07	12.20	11.51	9.82	9.58	9.77
OATS										
Program*				10/0	10/10	10/0	10/0	17.5/2.5	20/0	5/0
Target price	$/bu.			1.50	1.60	1.60	1.60	1.60	1.60	1.55
Loan rate	$/bu.	1.03	1.08	1.31	1.36	1.31	1.31	0.99	0.94	0.90
Program yield	bu./ac.			45.0	47.0	53.0	49.0	50.0	50.0	50.0
Expected yield	bu./ac.	50.1	51.2	53.8	55.1	55.0	56.3	58.1	59.2	57.9
Exp. def. pmt.	$/bu.			0.00	0.12	0.00	0.00	0.38	0.45	0.30
Diversion pmt.	$/bu.				0.75			0.36		
Expected price	$/bu.	1.08	1.12	1.86	1.48	1.60	1.69	1.22	1.15	1.56
Production cost	$/ac.	26.62	31.21	45.61	41.72	45.13	39.96	31.42	30.74	31.35
Idled prod. cost	$/ac.	7.70	9.03	13.20	12.07	13.06	11.56	9.09	8.89	9.07

* Minimum ARP/PLD program requirements as percent of base.

strength of the relationship between participation and returns should be retested as more data become available.

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(1) *Economic Indicators of the Farm Sector.* Costs of Production, 1986. ECIFS 6–1, ERS, USDA.

(2) *Practices and Costs on Land Placed in Crop Reduction Programs.* AE No. 8527, Agricultural Economics Department, Agricultural Experiment Station, Oklahoma State University, February 1985.

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Table 1.--Feed grains: Marketing year supply, disappearance, area, and prices, 1983/84-1988/89 1/

Year 2/	Supply				Disappearance								
	Beginning stocks	Production	Imports	Total	Domestic use: Food, alcohol, and industrial	Domestic use: Seed	Domestic use: Feed and residual	Domestic use: Total	Exports	Total disappearance	Ending stocks: Govt. owned	Ending stocks: Privately owned 3/	Ending stocks: Total
	Million metric tons												
1983/84	108.6	136.4	0.7	245.7	28.3	1.5	119.7	149.5	56.6	206.1	8.0	31.6	39.6
1984/85	39.6	236.9	0.8	277.3	30.6	1.5	131.1	163.2	56.6	219.8	8.9	48.6	57.5
1985/86	57.5	274.4	0.9	332.8	33.5	1.5	134.9	169.9	36.6	206.5	20.4	105.9	126.3
1986/87	126.4	252.3	0.7	379.3	34.3	1.2	145.8	181.3	46.3	227.6	48.8	103.1	151.9
1987/88 4/	151.8	215.2	0.9	367.9	-- 36.7 --		149.5	186.2	51.7	237.9	48.4	81.5	129.9
1988/89 4/	129.9	219.4	0.8	350.1	-- 37.7 --		151.0	188.7	52.0	240.7			109.4

	Area			Yield per harvested hectare	Index: Average price received by farmers 5/	Government-support program: Total payments to participants
	Set-aside and diverted	Planted	Harvested for grain			
	Million hectares			Metric tons	1977=100	Million dollars
1983/84	15.9	41.6	32.5	4.20	156	1,103 6/
1984/85	2.1	49.5	43.2	5.48	130	1,860 7/
1985/86	2.9	51.8	45.1	6.07	108	2,785 7/
1986/87	7.3	48.5	41.3	6.11	78	7,343 6/
1987/88	11.7	43.2	35.2	6.18		8,830 6/

1/ Aggregated data on corn, sorghum, barley, and oats. 2/ Marketing year beginning September 1 for corn and sorghum; June 1 for oats and barley. 3/ Includes total Government loans (original and reseal). 4/ Projected. 5/ Excludes support payments. 6/ Deficiency and diversion payments. 7/ Deficiency payments.

Table 2.--Foreign coarse grains: Supply and disappearance, 1980/81 - 1988/89 1/

Year	Beginning stocks	Production	Disappearance Feed	Disappearance Total	Imports	Adjusted Imports 2/	Ending stocks
CORN			Million metric tons				
1980/81	45.8	239.9	168.5	291.7	79.1	78.1	48.9
1981/82	48.9	235.0	175.9	295.6	77.6	67.3	43.8
1982/83	43.8	230.3	174.6	289.4	73.2	63.3	38.6
1983/84	38.6	241.5	167.7	286.1	64.8	61.1	39.4
1984/85	39.4	263.8	183.9	303.3	72.5	66.6	46.7
1985/86	46.7	254.3	186.1	292.1	62.0	54.5	40.3
1986/87	40.3	267.1	192.9	308.1	61.2	56.2	36.2
1987/88 3/	36.2	260.1	189.0	309.1	65.9	55.9	32.6
1988/89 4/	32.6	271.0	195.6	313.4	66.1	58.9	34.4
SORGHUM							
1980/81	6.9	44.6	23.3	49.4	12.8	14.1	8.1
1981/82	8.1	48.2	28.5	55.7	14.3	13.7	7.4
1982/83	7.4	44.0	25.2	51.2	12.3	11.6	6.1
1983/84	6.1	46.5	25.8	52.9	13.1	13.0	6.5
1984/85	6.5	44.1	26.1	51.9	12.9	13.1	6.1
1985/86	6.1	42.1	25.0	48.4	9.6	8.7	5.1
1986/87	5.1	40.5	23.2	46.1	8.1	8.0	4.6
1987/88 3/	4.6	37.2	23.0	44.9	9.1	8.2	3.3
1988/89 4/	3.3	40.9	33.4	47.6	8.8	7.9	2.8
BARLEY							
1980/81	16.9	155.4	107.5	156.0	16.3	14.0	17.1
1981/82	17.1	144.9	105.4	149.6	20.4	14.1	14.4
1982/83	14.4	155.6	107.8	152.9	17.2	13.3	17.9
1983/84	17.9	153.6	115.4	159.3	20.3	16.5	12.9
1984/85	12.9	161.7	115.8	157.7	23.1	18.0	18.7
1985/86	18.7	164.4	120.3	162.0	22.2	18.4	22.1
1986/87	22.1	168.7	125.5	168.8	24.2	18.0	24.9
1987/88 3/	24.9	169.1	126.7	172.2	20.0	17.8	23.6
1988/89 4/	23.6	168.5	125.4	168.7	20.5	17.6	22.8
TOTAL COARSE GRAINS 5/							
1980/81	77.4	533.4	342.3	591.0	110.3	108.3	81.5
1981/82	81.5	519.7	351.7	593.0	114.6	97.8	72.8
1982/83	72.8	533.2	357.2	593.5	104.0	90.0	72.7
1983/84	72.7	550.1	364.6	604.3	100.1	93.3	70.4
1984/85	70.4	576.4	377.7	617.2	111.1	100.4	85.1
1985/86	85.1	566.9	387.4	609.7	95.8	83.2	79.5
1986/87	79.5	580.9	393.9	626.1	95.1	83.4	78.7
1987/88 4/	78.7	569.2	390.4	628.2	96.7	83.9	72.6
1988/89 4/	72.6	584.5	406.7	632.5	97.4	86.4	73.8

NA = not available.
1/ Aggregated on basis of local marketing years, except for adjusted imports. 2/ Based on Oct/Sept. trade year and excludes intra-EC trade. 3/ Forecast. 4/ Projected. 5/ Also includes oats, rye, millet, and mixed grains.

Source: Compiled from World Grain Situation and Outlook, FAS and USDA data.

Table 3.--Corn: Marketing year supply and disappearance, area, and prices, 1983/84-1988/89

Year beginning September 1	Supply				Disappearance						Ending stocks Aug. 30		
					Domestic use								
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
	Million bushels												
1983/84	3,523.1	4,174.7	2.7	7,700.5	956.0	19.1	3,817.6	4,792.7	1,901.5	6,694.2	201.5	804.8	1,006.3
1984/85	1,006.3	7,674.0	3.5	8,683.8	1,070.0	21.2	4,079.0	5,170.2	1,865.4	7,035.6	224.9	1,423.3	1,648.2
1985/86	1,648.2	8,876.7	10.6	10,535.5	1,140.0	19.5	4,095.3	5,254.8	1,241.2	6,496.0	545.7	3,493.8	4,039.5
1986/87	4,039.5	8,249.9	2.1	12,291.5	1,175.0	15.6	4,717.3	5,907.9	1,504.4	7,412.3	1,443.2	3,43805	4,881.7
1987/88 2/	4,881.7	7,064.1	2.0	11,947.8	1,219.0	17.0	4,900.0	6,136.0	1,700.0	7,836.0	1,350.0	2,762.0	4,112.0
1988/89 2/	4,112.0	7,300.0	2.0	11,414.0	---1,275.0---		5,000.0	6,275.0	1,750.0	8,025.0			3,389.0

Year beginning September 1	Area			Yield per harvested acre	Average prices				Government-support program		
	Set-aside and diverted	Planted	Harvested for grain		Received by farmers 3/	St. Louis No. 2 Yellow	Omaha No. 2 Yellow	Gulf Ports No. 2 Yellow	National average loan rate	Target price	Total payments to participants
	Million acres			Bushels	Dollars per bushel						Mil. dol.
1983/84	32.2	60.2	51.5	81.1	3.21	3.49	3.23	3.67	2.65	2.86	5/ 904
1984/85	4.0	80.5	71.9	106.7	2.63	2.81	2.65	3.00	2.55	3.03	6/ 1,654
1985/86	5.4	83.4	75.2	118.0	2.23	2.37	2.25	2.52	2.55	3.03	6/ 2,470
1986/87	13.6	76.7	69.2	119.3	1.50	1.68	1.53	1.83	1.92	3.03	7/ 6,355
1987/88	21.1	66.0	59.6	120.3	1.65-1.85	1.93 4/	1.71 4/	2.13 4/	1.82	3.03	7/ 7,690

1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Excludes support payments. 4/ September 1987-March 1988 average. 5/ Diversion payments. 6/ Deficiency payments. 7/ Deficiency and diversion payments.

Table 4.--Sorghum: Marketing year supply and disappearance, area, and prices, 1983/84-1988/89

Year beginning September 1	Supply: Beginning stocks	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Domestic use: Food, alcohol, and industrial	Disappearance: Domestic use: Seed	Disappearance: Domestic use: Feed and residual	Disappearance: Domestic use: Total	Disappearance: Exports	Disappearance: Total disappearance	Ending stocks Aug. 30: Govt. owned	Ending stocks Aug. 30: Privately owned 1/	Ending stocks Aug. 30: Total
	Million bushels												
1983/84	439.1	487.5	0.1	926.7	7.7	2.3	384.7	394.7	244.6	639.3	102.8	184.6	287.4
1984/85	287.4	866.2	0.1	1,153.7	15.3	2.0	539.3	556.6	296.9	853.5	112.1	188.1	300.2
1985/86	300.2	1,120.3	---	1,420.5	26.0	1.7	663.8	691.5	178.0	869.5	207.2	343.8	551.0
1986/87	551.0	938.1	---	1,489.1	13.0	1.6	545.0	559.6	198.3	757.9	409.0	322.5	731.5
1987/88 2/	731.5	740.9	---	1,472.4	13.4	-1.6	550.0	565.0	225.0	790.0	535.0	147.1	682.1
1988/89 2/	682.0	650.0	---	1,332.0	- - 15.0 - -		500.0	515.0	210.0	725.0			607.0

Year beginning September 1	Area: Set-aside and diverted	Area: Planted	Area: Harvested for grain	Yield per harvested acre	Average prices: Received by farmers 3/	Average prices: Kansas City No. 2 Yellow	Average prices: Texas No. 2 Yellow	Average prices: Gulf ports No. 2 Yellow	Government support program: National average loan rate	Government support program: Target price	Government support program: Total payments to participants
	Million acres			Bushels	Dollars per cwt.						Mil.dol.
1983/84	5.7	11.9	10.0	48.7	4.89	5.22	5.53	5.77	4.50	4.86	5/ 114
1984/85	0.6	17.3	15.4	56.4	4.15	4.46	5.04	4.90	4.32	5.14	6/ 158
1985/86	0.9	18.3	16.8	66.8	3.45	3.72	4.33	4.07	4.32	5.14	6/ 228
1986/87	2.3	15.3	13.9	67.7	2.45	2.73	3.24	3.21	3.25	5.14	7/ 598
1987/88	3.9	11.8	10.5	70.5	1.50-1.70	2.97 4/	3.37 4/	3.55 4/	3.11	5.14	7/ 725

1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Excludes support payments. 4/ September 1987-March 1988 average. 5/ Diversion payments. 6/ Deficiency payments. 7/ Deficiency and diversion payments.

Table 5.--Barley: Marketing year supply and disappearance, area, and prices, 1983/84-1988/89

Year beginning June 1	Supply				Disappearance						Ending stocks May 31		
					Domestic use								
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
	Million bushels												
1983/84	216.7	508.9	7.1	732.7	149.5	19.5	282.8	451.8	91.4	543.3	11.9	177.5	189.4
1984/85	189.4	599.2	10.1	798.7	149.0	21.6	303.9	474.5	76.8	551.3	14.6	232.8	247.4
1985/86	247.4	591.4	9.0	847.8	147.2	21.4	332.6	501.2	21.8	523.0	57.4	267.4	324.8
1986/87	324.8	610.5	7.0	942.3	156.1	17.9	296.0	470.0	136.7	606.7	75.5	260.9	336.4
1987/88 2/	336.0	527.0	15.0	878.0	157.1	-17.9	275.0	450.0	130.0	580.0	65.0	233.0	298.0
1988/89 2/	298.0	500.0	15.0	813.0	-- 175.0 --		265.0	440.0	100.0	540.0			273.0

Year beginning June 1	Area			Yield	Average prices				Government-support program		
	Set-aside and diverted	Planted	Harvested for grain	per harvested acre	Received by farmers 3/	Minneapolis No. 2 or better feed 4/	Minneapolis No. 3 or better malting	Portland No. 2	National average loan rate	Target price	Total payments to participants
	Million acres			Bushels	Dollars per bushel						Mil. dol.
1983/84	1.1	10.4	9.7	52.3	2.47	2.48	2.84	2.91	2.16	2.60	7/ 72
1984/85	0.5	12.0	11.2	53.4	2.29	2.09	2.55	2.59	2.08	2.60	6/ 50
1985/86	0.7	13.2	11.6	51.0	1.98	1.53	2.24	2.23	2.08	2.60	6/ 160
1986/87	1.8	13.1	12.0	50.8	1.61	1.44	1.89	1.96	1.56	2.60	7/ 356
1987/88	2.9	11.0	10.0	51.7	1.80-1.85	1.74 5/	2.01 5/	2.09 5/	1.49	2.60	7/392

1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Excludes support payments. 4/Starting March 1987, shifted to Duluth. 5/ June 1987 - March 1988 average. 6/ Deficiency payments. 7/ Deficiency and diversion payments.

Table 6.--Oats: Marketing year supply and disappearance, area, and prices, 1983/84-1988/89

Year beginning June 1	Supply: Beginning stocks	Supply: Production	Supply: Imports	Supply: Total	Disappearance: Domestic use: Food and industrial	Disappearance: Domestic use: Seed	Disappearance: Domestic use: Feed and residual	Disappearance: Domestic use: Total	Disappearance: Exports	Disappearance: Total disappearance	Ending stocks May 31: Govt. owned	Ending stocks May 31: Privately owned 1/	Ending stocks May 31: Total
	Million bushels												
1983/84	219.8	477.0	30.1	726.9	40.9	31.9	470.9	543.7	2.1	545.8	1.5	179.6	181.1
1984/85	181.1	473.7	34.0	688.8	41.0	34.6	432.0	507.6	1.3	508.9	1.4	178.5	179.9
1985/86	179.9	520.8	27.5	728.2	44.0	38.4	459.9	542.3	2.2	544.5	1.9	181.8	183.7
1986/87	183.7	386.4	33.3	603.4	45.0	31.5	392.4	467.9	2.8	470.7	3.5	129.2	132.7
1987/88 2/	132.7	373.8	35.0	542.0	-48.3	36.7	340.0	425.0	1.0	425.9	3.0	113.0	116.0
1988/89 2/	116.0	450.0	30.0	596.0	-85.0-		375.0	460.0	1.0	461.0			135.0

Year beginning June 1	Area: Set-aside and diverted	Area: Planted	Area: Harvested for grain	Yield per harvested acre	Average prices: Received by farmers 3/	Average prices: Minneapolis No. 2 white, heavy	Average prices: Portland No. 2 white, heavy	Average prices: Toledo No. 2	Government-support program: National average loan rate	Government-support program: Target price	Government-support program: Total payments to participants
	Million acres			Bushels	Dollars per bushel						Mil. dol.
1983/84	0.3	20.3	9.1	52.6	1.62	1.87	1.95	2.01	1.36	1.60	5/ 13
1984/85	0.1	12.4	8.2	58.0	1.67	1.81	2.12	1.92	1.31	1.60	---
1985/86	0.1	13.3	8.2	63.7	1.23	1.31	1.60	1.08	1.31	1.60	6/ 8
1986/87	0.4	14.7	6.9	56.3	1.21	1.46	1.53	1.20	.99	1.60	5/ 34
1987/88	0.9	18.0	6.9	53.3	1.50-1.55	1.90 4/		1.67 4/	.94	1.60	5/ 23

1/ Includes quantity under loan and farmer-owned reserve. 2/ Projected. 3/ Excludes support payments. 4/ June 1987 - March 1988 average. 5/ Deficiency and diversion payments. 6/ Deficiency payments.

Table 7.--Corn: Marketing year supply and disappearance, specified periods, 1983/84 to date

Year beginning September 1	Supply				Disappearance						Ending stocks		
					Domestic use								
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	Privately owned 1/	Total
	Million bushels												
1983/84													
Sept.-Nov.	3,523.1	4,174.7	0.5	7,698.3	238.6	---	1,311.0	1,549.6	497.0	2,046.6	1,227.0	4,424.7	5,651.7
Dec.-Feb.	5,651.7	---	0.6	5,652.3	222.8	---	1,056.0	1,278.8	508.5	1,787.3	1,214.0	2,651.0	3,865.0
Mar.-May	3,865.0	---	1.0	3,866.0	247.3	16.8	939.5	1,203.6	517.3	1,720.9	195.0	1,950.1	2,145.1
June-Aug.	2,145.1	---	0.6	2,145.7	247.3	2.3	511.1	760.7	378.7	1,139.4	201.5	804.8	1,006.3
Mkt. year	3,523.1	4,174.7	2.7	7,700.5	956.0	19.1	3,817.6	4,792.7	1,901.5	6,694.2	201.5	804.8	1,006.3
1984/85													
Sept.-Nov.	1,006.3	7,674.0	0.9	8,681.2	249.7	---	1,294.2	1,543.9	506.2	2,050.1	206.7	6,424.4	6,631.1
Dec.-Feb.	6,631.1	---	0.4	6,631.5	241.5	---	1,182.9	1,424.4	583.9	2,008.3	209.7	4,413.5	4,623.2
Mar.-May	4,623.2	---	1.1	4,624.3	283.8	17.0	1,009.1	1,309.9	478.9	1,788.8	221.7	2,613.8	2,835.5
June-Aug.	2,835.5	---	1.1	2,836.6	295.0	4.2	592.8	892.0	296.4	1,188.4	224.9	1,423.3	1,648.2
Mkt. year	1,006.3	7,674.0	3.5	8,683.8	1,070.0	21.2	4,079.0	5,170.2	1,865.4	7,035.6	224.9	1,423.3	1,648.2
1985/86													
Sept.-Nov.	1,648.2	8,876.7	1.0	10,525.9	278.0	---	1,215.5	1,493.5	417.7	1,911.2	388.6	8,226.1	8,614.7
Dec.-Feb.	8,614.7	---	1.3	8,616.0	264.0	---	1,299.6	1,563.6	465.3	2,028.9	509.4	6,077.7	6,587.1
Mar.-May	6,587.1	---	2.3	6,589.4	293.0	16.1	1,085.9	1,395.0	204.4	1,599.4	550.9	4,439.1	4,990.0
June-Aug.	4,990.0	---	6.0	4,996.0	305.0	3.4	494.3	802.7	153.8	956.5	545.7	3,493.8	4,039.5
Mkt. year	1,648.2	8,876.7	10.6	10,535.5	1,140.0	19.5	4,095.3	5,254.8	1,241.2	6,496.0	545.7	3,493.8	4,039.5
1986/87													
Sept.-Nov.	4,039.5	8,249.9	0.8	12,290.2	280.0	---	1,383.6	1,663.6	321.1	1,984.7	968.2	9,337.3	10,305.5
Dec.-Feb.	10,305.5	---	0.3	10,305.8	270.0	---	1,472.2	1,742.2	315.4	2,057.6	1,362.2	6,884.6	8,248.2
Mar.-May	8,248.2		.5	8,248.7	310.0	15.4	1,090.9	1,416.3	500.2	1,916.5	1,491.5	4,840.7	6,332.2
June-Aug.	6,332.2		.5	6,332.7	315.0	.2	768.1	1,083.0	367.7	1,451.0	1,443.2	3,438.5	4,881.7
Mkt. year 2/	4,039.5	8,249.9	2.1	12,291.5	1,175.0	15.6	4,717.3	5,907.9	1,504.4	7,412.3	1,443.2	3,438.5	4,881.7
1987/88													
Sept.-Nov.	4,881.7	7,064.1	0.6	11,946.4	292.0	---	1,487.9	1,779.9	398.0	2,177.9	1,683.4	8,085.1	9,768.5
Dec.-Feb.	9,768.5	---	0.9	9,769.4	282.0	---	1,447.6	1,729.6	408.0	2,137.9	1,767.7	5,863.8	7,431.5
Mar.-May 3/	7,631.5	---	0.5	7,632.0	320.0	14.0	1,159.0	1,493.0	555.5	2,048.5	---	---	5,583.5
June-Aug.3/	5,583.5	---	0.3	5,583.8	325.0	3.0	805.5	1,133.5	338.2	1,471.7	---	---	4,111.8
Mkt. year 2/	4,881.7	7,064.1	2.3	11,948.1	1,219.0	17.0	4,900.0	6,136.0	1,700.0	7,836.0	1,350.0	2,761.8	4,111.8
1988/89													
Mkt. year 3/	4,111.8	7,300.0	2.0	11,413.8	- - 1,275.0 - -		5,000.0	6,275.0	1,750.0	8,025.0			3,389.0

1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Projected.

Table 8.--Sorghum: Marketing year supply and disappearance, specified periods, 1982/83 to date

Year beginning September 1	Supply				Disappearance						Ending stocks		
					Domestic use							Privately	
	Beginning stocks	Production	Imports	Total	Food, alcohol, and industrial	Seed	Feed and residual	Total	Exports	Total disappearance	Govt. owned	owned 1/	Total
	Million bushels												
1982/83													
Sept.-May	318.6	835.1	0	1,153.7	6.0	0.9	453.5	460.4	164.2	642.6	54.0	475.1	529.1
June-Aug.	529.1	0	0	529.1	1.9	0.9	41.3	44.1	45.9	90.0	171.5	267.6	439.1
Mkt. year	318.6	835.1	0	1,153.7	7.9	1.8	494.8	504.5	210.1	714.6	171.5	267.6	439.1
1983/84													
Sept.-May	439.1	487.5	0	926.6	5.7	1.1	356.5	363.3	194.4	557.7	78.0	290.9	368.9
June-Aug.	368.9	0	0.1	369.0	2.0	1.2	28.2	31.4	50.2	81.6	102.8	184.6	287.4
Mkt. year	439.1	487.5	0.1	926.7	7.7	2.3	384.7	394.7	244.6	639.3	102.8	184.6	287.4
1984/85													
Sept.-May	287.4	866.2	0.1	1,153.7	12.4	1.5	542.2	556.1	236.8	792.9	111.1	249.7	360.8
June-Aug.	360.8	0	0	360.8	2.9	0.5	-2.9	0.5	60.1	60.6	112.1	188.1	300.2
Mkt. year	287.4	866.2	0.1	1,153.7	15.3	2.0	539.3	556.6	296.9	853.5	112.1	188.1	300.2
1985/86													
Sept.-May	300.2	1,120.3	0	1,420.5	22.1	1.2	626.9	650.2	140.3	790.5	181.4	447.5	630.0
June-Aug.	630.0	0	0	630.0	3.9	0.5	36.9	41.3	37.7	79.0	207.2	343.8	551.0
Mkt. year	300.2	1,120.3	0	1,420.5	26.0	1.7	663.8	691.5	178.0	869.5	207.2	343.8	551.0
1986/87													
Sept.-May	551.0	938.1	0	1,489.1	11.0	1.0	502.1	514.1	154.8	668.9	400.4	423.3	823.7
June-Aug.	823.7	0	0	823.7	2.0	.6	42.9	45.5	43.5	89.0	409.0	322.5	731.5
Mkt. year 2/	551.0	938.1	0	1,489.1	13.0	1.6	545.0	559.6	198.3	757.9	409.0	322.5	731.5
1987/88													
Mkt. year 3/	731.5	740.9	0	1,472.4	13.4	1.6	550.0	565.0	225.0	790.0	535.0	147.1	682.1
1988/89													
Mkt. year 3/	682.0	650.0	0	1,332.0	- -15.0 - -		500.0	515.0	210.0	725.0			607.0

1/ Includes quantity under loan and farmer-owned reserve. 2/ Preliminary. 3/ Projected.

Table 9.--Average prices received by farmers, United States, by months, 1982-87 1/

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average 2/
						Dollars per bushel							
Corn													
1982	2.15	1.98	2.13	2.26	2.36	2.56	2.71	2.95	3.03	3.04	3.13	3.35	2.55
1983	3.32	3.15	3.17	3.15	3.15	3.11	3.21	3.32	3.34	3.36	3.30	3.12	3.21
1984	2.90	2.65	2.55	2.56	2.64	2.62	2.67	2.70	2.68	2.64	2.60	2.44	2.63
1985	2.29	2.11	2.21	2.29	2.33	2.32	2.29	2.30	2.39	2.32	2.00	1.73	2.23
1986	1.45	1.40	1.47	1.50	1.48	1.42	1.47	1.52	1.66	1.69	1.60	1.47	1.50
1987	1.49	1.56	1.62	1.72	1.77	1.83	1.86	1.85*					
						Dollars per cwt							
Sorghum													
1982	3.80	3.70	3.78	3.97	4.09	4.42	4.67	4.92	5.05	5.05	5.03	5.29	4.41
1983	5.26	5.01	4.98	4.93	4.92	4.74	4.85	5.00	5.08	4.94	4.64	4.58	4.89
1984	4.24	4.05	4.05	4.15	4.16	4.10	4.24	4.46	4.54	4.52	4.04	3.74	4.15
1985	3.27	3.30	3.47	3.76	3.69	3.55	3.67	3.80	3.99	3.43	3.06	2.66	3.45
1986	2.36	2.34	2.38	2.41	2.37	2.36	2.44	2.58	2.69	2.80	2.68	2.52	2.45
1987	2.43	2.48	2.69	2.73	2.75	2.88	2.92	2.84*					

Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average 2/
						Dollars per bushel							
Oats													
1982	1.88	1.57	1.39	1.35	1.32	1.40	1.44	1.46	1.48	1.49	1.54	1.54	1.49
1983	1.51	1.46	1.45	1.55	1.62	1.67	1.73	1.81	1.88	1.81	1.82	1.84	1.62
1984	1.80	1.68	1.62	1.60	1.69	1.64	1.72	1.74	1.69	1.68	1.68	1.60	1.67
1985	1.59	1.31	1.16	1.10	1.08	1.17	1.20	1.18	1.16	1.14	1.13	1.21	1.23
1986	1.10	.90	.86	.99	1.11	1.32	1.44	1.46	1.47	1.45	1.49	1.57	1.21
1987	1.51	1.29	1.41	1.48	1.61	1.62	1.76	1.78	1.85	1.78	1.66*		
Barley													
1982	2.39	2.16	2.20	2.17	1.98	2.06	2.19	2.16	2.00	2.09	2.22	2.36	2.18
1983	2.32	2.20	2.34	2.46	2.53	2.55	2.55	2.55	2.47	2.50	2.54	2.78	2.47
1984	2.61	2.54	2.26	2.25	2.29	2.25	2.19	2.24	2.21	2.18	2.16	2.22	2.29
1985	2.14	2.08	1.98	1.88	1.96	2.05	2.07	2.05	1.95	1.88	1.85	1.73	1.98
1986	1.57	1.67	1.51	1.45	1.58	1.69	1.61	1.60	1.63	1.69	1.69	1.76	1.61
1987	1.75	1.84	2.00	1.87	1.74	1.89	1.83	1.77	1.74	1.64	1.58*		
Malting Barley													
1982	2.26	2.10	2.38	2.58	2.22	2.26	2.39	2.32	2.00	2.09	2.13	2.18	2.24
1983	2.05	2.06	2.50	2.69	2.72	2.61	2.61	2.50	2.47	2.46	2.54	2.53	2.48
1984	2.52	2.48	2.50	2.52	2.52	2.39	2.18	2.29	2.11	2.17	2.17	2.10	2.33
1985	2.02	2.13	2.49	2.33	2.24	2.32	2.19	2.13	1.99	1.93	1.85	1.66	2.11
1986	1.52	2.07	2.23	1.85	1.83	1.80	1.65	1.70	1.69	1.69	1.65	1.67	1.78
1987	1.70	2.02	2.55	2.38	1.90	2.08	2.01	2.11	1.80	1.68	1.60*		
Feed Barley													
1982	2.52	2.23	1.98	1.91	1.87	1.94	1.98	2.07	1.99	2.08	2.26	2.43	2.11
1983	2.52	2.31	2.23	2.41	2.45	2.51	2.52	2.58	2.47	2.54	2.55	2.86	2.50
1984	2.72	2.60	2.10	2.13	2.19	2.19	2.20	2.22	2.27	2.19	2.16	2.30	2.27
1985	2.26	2.05	1.75	1.74	1.85	1.90	2.03	.2	1.90	1.83	1.85	1.81	1.76
1986	1.61	1.44	1.21	1.33	1.49	1.62	1.59	1.56	1.61	1.69	1.71	1.84	1.56
1987	1.80	1.68	1.54	1.57	1.66	1.68	1.63	1.64	1.68	1.59	1.57*		

1/ Prices do not include an allowance for loans outstanding and government purchases. 2/ U.S. average prices based on U.S. monthly prices weighted by monthly marketings. *Preliminary.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

Table 10.--Cash prices at principal markets, 1982-1987

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
						Dollars per bushel							
CORN No. 2 Yellow, Central Illinois													
1982	2.55	1.94	2.24	2.28	2.35	2.62	2.82	3.08	3.09	3.14	3.26	3.58	2.75
1983	3.46	3.36	3.37	3.27	3.21	3.15	3.37	3.45	3.44	3.44	3.28	3.16	3.33
1984	2.92	2.66	2.61	2.56	2.64	2.64	2.68	2.72	2.69	2.64	2.60	2.42	2.65
1985	2.28	2.10	2.32	2.38	2.36	2.33	2.29	2.31	2.42	2.41	1.93	1.52	2.22
1986	1.34	1.34	1.55	1.52	1.44	1.38	1.46	1.56	1.75	1.74	1.60	1.46	1.51
1987	1.51	1.64	1.74	1.78	1.85	1.89	1.92	1.92					
CORN No. 2 Yellow, St. Louis													
1982	2.32	2.12	2.43	2.49	2.52	2.79	2.99	3.24	3.24	3.27	3.39	3.68	2.87
1983	3.60	3.50	3.53	3.45	3.41	3.31	3.55	3.61	3.58	3.57	3.43	3.33	3.49
1984	3.09	2.84	2.77	2.75	2.86	2.84	2.86	2.88	2.81	2.79	2.72	2.47	2.81
1985	2.38	2.27	2.50	2.59	2.55	2.50	2.42	2.46	2.56	2.52	2.01	1.67	2.37
1986	1.47	1.46	1.68	1.69	1.61	1.57	1.65	1.74	1.93	1.92	1.79	1.65	1.68
1987	1.65	1.78	1.91	1.97	2.05	2.07	2.09	2.10					
CORN No. 2 Yellow, Gulf													
1982	2.55	2.33	2.62	2.68	2.74	2.98	3.18	3.39	3.40	3.43	3.57	3.38	3.02
1983	3.76	3.70	3.74	3.64	3.60	3.48	3.74	3.76	3.71	3.73	3.62	3.52	3.67
1984	3.31	3.08	2.98	2.90	3.03	3.04	3.05	3.05	2.96	2.95	2.92	2.67	3.00
1985	2.59	2.50	2.69	2.75	2.72	2.63	2.56	2.57	2.68	2.63	2.12	1.85	2.52
1986	1.68	1.66	1.83	1.81	1.72	1.70	1.82	1.89	2.06	2.05	1.93	1.81	1.83
1987	1.86	2.00	2.08	2.11	2.32	2.23	2.30	2.28					
CORN No. 2 Yellow, Omaha													
1982	2.23	2.12	2.35	2.37	2.42	2.62	2.82	3.09	3.10	3.11	3.18	3.39	2.73
1983	3.32	3.23	3.24	3.17	3.11	3.03	3.25	3.33	3.35	3.37	3.22	3.11	3.23
1984	2.94	2.71	2.61	2.55	2.60	2.61	2.68	2.73	2.68	2.70	2.61	2.39	2.65
1985	2.35	2.26	2.28	2.36	2.33	2.31	2.31	2.34	2.43	2.42	2.01	1.61	2.25
1986	1.41	1.40	1.55	1.54	1.44	1.39	1.47	1.57	1.76	1.77	1.59	1.47	1.53
1987	1.51	1.57	1.68	1.75	1.79	1.84	1.86	1.87					
SORGHUM No. 2 Yellow, Kansas City						Dollars per cwt							
1982	4.06	3.85	4.25	4.37	4.37	4.54	5.08	5.30	5.37	5.37	5.32	5.69	4.80
1983	5.55	5.37	5.25	5.16	5.09	5.03	5.40	5.36	5.39	5.40	4.95	4.74	5.22
1984	4.46	4.25	4.28	4.32	4.48	4.33	4.58	4.76	4.74	4.74	4.50	4.06	4.46
1985	3.56	3.62	3.75	3.97	3.95	3.80	3.82	4.00	4.25	4.00	3.20	2.71	3.72
1986	2.47	2.60	2.70	2.62	2.50	2.57	2.80	2.85	3.10	3.20	2.80	2.55	2.73
1987	2.64	2.75	2.90	2.95	3.05	3.24	3.27	3.16					
SORGHUM No. 2 Yellow, Texas High Plans													
1982	4.39	4.08	4.38	4.65	4.82	5.19	5.52	5.94	5.76	5.81	5.86	5.85	5.19
1983	5.77	5.56	5.49	5.43	5.35	5..14	5.33	5.68	5.67	5.77	5.72	5.46	5.53
1984	5.22	4.95	4.86	4.90	4.84	9.86	4.98	5.14	5.22	5.25	5.24	--	5.04
1985	4.19	4.38	4.30	4.49	4.47	4.36	4.33	4.48	4.77	4.84	3.93	3.36	4.33
1986	3.35	3.24	2.97	3.06	2.94	2.89	3.06	3.32	3.56	3.60	3.58	3.30	3.24
1987	3.19	3.27	3.27	3.39	3.40	3.53	3.56	3.54					

Continued--

Table 10.--Cash prices at principal markets, 1982-1987

Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Average
						Dollars per bushel							
OATS No. 2 Heavy, Minneapolis													
1982	2.12	1.87	1.53	1.51	1.51	1.67	1.67	1.67	1.63	1.63	1.73	1.71	1.69
1983	1.67	1.60	1.79	1.94	2.00	1.97	1.94	1.98	1.82	1.88	1.89	1.96	1.87
1984	1.92	1.84	1.77	1.79	1.84	1.92	1.87	1.81	1.82	1.79	1.73	1.65	1.81
1985	1.59	1.44	1.23	1.24	1.19	1.32	1.39	1.37	1.30	1.27	1.16	1.22	1.31
1986	1.18	1.05	1.12	1.29	1.39	1.72	1.66	1.64	1.56	1.46	1.59	1.83	1.46
1987	1.64	1.61	1.77	1.85	1.97	2.05	2.02	2.10	2.06	1.93	1.94		
BARLEY No. 2 or Better Feed, Minneapolis 1/													
1982	2.12	1.85	1.72	1.69	1.54	1.58	1.59	1.63	1.72	1.73	2.01	1.95	1.76
1983	1.96	1.95	2.42	2.61	2.60	2.53	2.39	2.55	2.56	2.65	2.74	2.77	2.48
1984	2.59	2.18	2.13	2.05	2.10	2.06	1.88	1.98	1.99	1.97	2.05	2.05	2.09
1985	1.90	1.66	1.46	1.40	1.41	1.49	1.60	1.57	---	---	---	1.31	1.53
1986	1.23	1.16	1.13	1.27	1.50	1.63	1.23	---	---2/	1.64	1.76	1.86	1.44
1987	1.73	1.59	1.60	1.76	1.78	1.82	1.74	1.72	1.77	1.88	1.94		
BARLEY No. 3 or Better Malting, 65% or Better Plump, Minneapolis													
1982	2.93	2.63	2.48	2.37	2.42	2.45	2.37	2.38	2.42	2.45	2.68	2.76	2.53
1983	2.60	2.54	2.76	2.90	2.96	2.95	2.77	2.85	2.76	2.91	3.04	3.06	2.84
1984	3.04	2.86	2.48	2.44	2.43	2.43	2.36	2.46	2.47	2.51	2.52	2.55	2.55
1985	2.46	2.25	2.03	2.15	2.10	2.27	2.29	2.28	2.20	2.34	2.40	2.07	2.24
1986	1.84	1.75	1.61	1.76	1.93	2.02	1.88	1.81	1.92	2.01	2.05	2.12	1.89
1987	2.07	1.93	1.73	1.98	2.08	2.05	2.01	2.02	2.15	2.08	2.11		

--- =No Quotes. 1/ Prior to June 1977 reported as barley, no. 3 or better. 2/ Reporting point changed from Minneapolis #2 feed to Duluth #2 feed beginning March 1987.

Source: Grain and Feed Market News, AMS, USDA.

Table 11.--Feed-price ratios for livestock, poultry, and milk, by months, 1982-1987

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
HOG/CORN, U.S. basis 1/													
1982	28.5	28.2	24.6	23.7	23.4	21.9	18.6	15.9	15.1	14.4	13.9	13.9	20.2
1983	13.3	12.8	11.8	14.0	15.4	14.6	14.3	14.3	14.1	14.6	15.8	16.2	14.3
1984	16.0	16.5	18.4	19.0	18.2	18.4	16.3	15.3	15.4	16.9	17.6	17.4	17.1
1985	17.3	20.4	19.5	19.8	19.0	18.4	17.6	17.3	19.2	22.7	29.5	35.9	21.4
1986	40.2	37.9	35.9	33.7	32.1	33.9	32.2	33.4	31.9	34.7	37.3	39.9	35.3
1987 2/	36.4	31.3	25.1	23.4	24.1	25.0	22.7	22.6					
BEEF-STEER/CORN, Omaha 3/													
1982	27.5	27.7	25.1	25.2	24.5	23.4	22.7	21.9	21.8	21.2	19.6	18.1	23.2
1983	17.8	18.4	18.3	19.8	21.6	22.1	21.1	20.4	19.7	19.1	20.4	20.7	20.0
1984	21.3	22.4	24.6	25.6	24.8	24.1	22.2	21.5	21.5	21.0	20.4	21.7	22.6
1985	21.8	25.7	27.8	26.7	25.6	24.4	24.0	22.9	23.0	22.3	28.9	36.7	25.8
1986	42.1	42.7	39.7	38.8	40.8	43.9	41.9	42.2	40.2	38.9	41.4	43.9	41.4
1987 2/	42.1	41.4	38.4	36.7	36.4	37.4	38.2	39.4					
MILK/FEED, U.S. basis 4/													
1982	1.57	1.61	1.62	1.60	1.59	1.56	1.55	1.49	1.45	1.43	1.45	1.41	1.53
1983	1.36	1.39	1.36	1.34	1.33	1.33	1.34	1.32	1.32	1.32	1.35	1.40	1.35
1984	1.48	1.56	1.62	1.59	1.57	1.57	1.55	1.51	1.47	1.45	1.44	1.47	1.52
1985	1.51	1.56	1.55	1.53	1.48	1.50	1.48	1.48	1.46	1.45	1.51	1.55	1.51
1986	1.61	1.75	1.77	1.77	1.74	1.69	1.63	1.62	1.58	1.55	1.56	1.60	1.66
1987 2/	1.65	1.65	1.65	1.63	1.52	1.48	1.43	1.41					
EGG/FEED, U.S. basis 5/													
1982	6.0	6.3	6.3	6.0	5.7	5.8	6.1	5.8	6.0	5.8	5.7	6.1	6.0
1983	6.0	6.2	6.9	7.7	8.8	8.5	7.4	8.5	6.5	5.8	5.8	5.8	7.0
1984	5.9	5.7	6.5	6.3	5.4	5.6	6.3	5.7	5.5	5.9	5.8	6.5	5.9
1985	7.1	7.3	7.5	7.4	7.2	6.9	7.6	6.4	6.4	5.7	6.9	7.3	7.0
1986	7.3	7.0	8.0	7.9	7.2	7.1	6.6	6.7	6.0	6.1	5.8	5.7	6.8
1987 2/	6.7	6.1	6.6	5.8	5.6	5.3	5.8	5.2					
BROILER/FEED, U.S. basis 6/													
1982	2.6	2.5	2.5	2.5	2.6	2.7	2.4	2.3	2.4	2.6	2.8	2.8	2.6
1983	2.7	2.5	2.8	2.9	3.1	3.1	3.1	2.7	2.7	2.7	3.0	2.7	2.8
1984	2.8	2.6	2.8	2.7	2.9	2.9	2.8	2.8	3.1	3.2	3.1	3.1	2.9
1985	3.2	3.1	3.5	3.2	3.2	3.1	3.1	3.1	3.4	3.7	4.5	4.6	3.5
1986	3.8	4.4	3.9	3.5	3.6	3.5	3.3	3.2	3.3	3.0	2.9	3.3	3.5
1987 2/	3.0	2.6	2.7	2.5	2.8	2.6	2.8	3.1					
TURKEY/FEED, U.S. basis 7/													
1982	3.8	3.9	3.9	3.0	2.9	2.9	2.9	2.7	2.9	3.0	2.8	2.8	3.1
1983	3.0	3.0	3.1	3.5	3.6	3.2	3.3	3.3	3.3	3.3	3.6	3.8	3.3
1984	3.9	4.4	5.0	5.5	4.7	3.8	3.7	3.7	3.7	3.8	4.2	4.5	4.2
1985	5.0	5.5	5.5	5.5	3.4	3.4	3.5	3.5	3.8	4.3	4.5	4.6	4.4
1986	4.7	4.9	4.8	4.0	3.3	3.4	3.6	3.5	3.3	3.3	3.1	2.9	3.7
1987 2/	2.8	2.8	3.1	3.5	2.8	2.6	2.5	2.7					

1/ Bushels of corn equal in value to 100 pounds of hog, live weight. 2/ Preliminary. 3/ Based on price of Choice beef-steers, 900-1,100 pounds. 4/ Pounds of 16-percent mixed dairy feed equal in value to 1 pound whole milk. 5/ Pounds of laying feed equal in value to 1 dozen eggs. 6/ Pounds of broiler grower feed equal in value to 1 pound broiler, live weight. 7/ Pounds of turkey grower feed equal in value to 1 pound of turkey, live weight.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

Table 12.—Price trends, selected feeds, and corn products

Item	Unit	Sept.-Aug. 1986/87 1/	1987 Sept.	1987 Oct.	1987 Nov.	1987 Dec.	1988 Jan.	1988 Feb.	1988 Mar.	1988 Apr.
WHOLESALE, MOSTLY BULK 2/										
Soybean meal, 44% solvent, Decatur	$/ton	162	177	186	207	215	194	183	192	200
Soybean meal, high protein, Decatur	"	176	195	202	225	232	212	200	208	218
Cottonseed meal, 41% solvent, Memphis	"	150	142	151	195	195	188	160	141	143
Linseed meal, 34% solvent, Minneapolis	"	112	116	125	155	162	146	126	121	130
Meat and bone meal, Kansas City	"	196	213	221	233	243	239	229	237	244
Fishmeal, 65% protein, East Coast	"	276	364	373	401	449	449	421	--	426
Corn Gluten feed, Illinois pts.	"	98	97	99	106	110	118	121	119	118
Corn Gluten meal, 60% protein, Illinois pts.	"	231	260	279	306	314	309	284	287	276
Brewers' dried grains, Milwaukee	"	80	85	92	106	113	119	101	86	89
Distillers' dried grain, Lawrenceburg, Ky.	"	107	118	118	123	128	139	140	136	129
Feather meal, Arkansas Pts.	"	159	187	203	221	286	265	230	225	219
Wheat bran, Kansas City	"	45	56	67	70	89	91	70	75	59
Wheat middlings, Kansas City	"	45	56	67	70	89	91	70	75	59
Rice bran, f.o.b. mills, Arkansas	"	31	34	41	57	58	67	56	56	64
Hominy feed, Illinois pts.	"	64	65	66	71	80	80	78	79	80
Alfalfa meal, dehy., Kansas City	"	92	94	100	102	104	105	107	106	105
Cane molasses, New Orleans	"	59	45	45	47	53	60	62	61	57
Molasses beet pulp, Los Angeles	"	94	90	90	92	96	100	--	--	--
Animal fat, Kansas City	¢/lb.	10.0	10.6	10.6	10.1	9.6	11.4	12.5	12.6	12.4
Urea, 42% N., Fort Worth	$/ton	225	225	225	225	225	225	225	225	225
Corn, No. 2 white, Kansas City	$/bu.	3.82	2.20	2.20	2.20	2.25	2.25	2.28	2.30	2.30
PRICES PAID, U.S. BASIS 3/ 4/										
Soybean meal, 44%	$/cwt	11.70	—	12.60	—	--	13.90	--	--	13.70
Cottonseed meal, 41%	"	12.67	--	13.10	--	--	14.00	--	--	13.70
Wheat bran	"	8.85	—	8.63	--	—	9.16	--	--	9.54
Wheat middlings	"	7.58	--	7.62	--	--	8.36	--	--	8.42
Broiler grower feed	$/ton	182	--	193	--	--	195	--	--	181
Laying feed	"	169	--	168	--	--	176	--	--	176
Turkey grower feed	"	213	--	216	--	--	226	--	--	214
Chick starter	"	189	--	187	—	--	197	--	--	189
Dairy feed, 16%	"	153	--	156	--	--	166	--	--	166
Beef cattle concentrate, 32-36% protein 5/	$/cwt.	217	--	221	--	--	239	--	--	232
Hog concentrate, 38-42% protein 5/	"	271	--	289	--	—	312	--	--	308
Stock salt 5/	"	3.28	--	3.28	--	--	3.27	—	--	3.28
CORN PRODUCTS, WHOLESALE 6/										
Corn meal, New York Yellow	$/cwt.	11.35	11.03	11.21	11.26	11.21	11.35	11.45	11.48	11.51
Grits (brewers'), Chicago	"	8.37	8.02	8.19	8.24	8.20	8.34	8.44	8.43	8.42
Syrup, Midwest/West	c/lb.	8.16	8.16	8.11	7.91	7.91	7.91	7.91	7.91	7.91
Sugar (dextrose), Midwest	"	21.35	20.88	22.00	22.00	22.00	22.50	22.50	22.50	22.50
High-fructose (dried weight in tank cars), Midwest	"	12.22	12.50	12.50	12.50	10.05	7.85	7.85	8.44	11.22
Corn starch, f.o.b. Midwest	$/cwt.	9.70	10.00	10.20	10.37	10.67	10.75	10.75	11.08	11.23

1/ Preliminary. 2/ Grain and Feed Market News, AMS, USDA, except urea which is from Feedstuffs, Miller Publishing Co., Minneapolis, Minnesota. 3/ Agricultural Prices, Agricultural Statistics Board, USDA. 4/ Prices paid data is available on a quarterly basis only. 5/ Price previously published in cwt. 6/ Milling and Baking News, Kansas City, Missouri, except starch which is from industry sources.

Table 13.--Corn, sorghum, barley, and oats exports, 1985/86 to date

Year and month	CORN			SORGHUM	Year and month	BARLEY		OATS	
	Grain only	Total process	Grand total	GRAIN		Grain only	Total	Grain only	Total
	Bushels					Bushels			
1985/86					1985/86				
Sept	79,897,274	833,679	80,730,953	29,172,725	June	1,487,412	1,649,817	44,678	87,396
Oct	124,900,086	917,870	125,817,956	23,654,139	July	3,731,241	3,860,606	23,529	69,692
Nov	210,005,197	1,173,603	211,178,800	17,378,277	Aug	5,179,203	5,303,587	33,906	163,983
					Sept	831,326	937,470	52,866	89,470
1st Qtr	414,802,197	2,925,152	417,727,709	70,205,141	1st Qtr	11,229,182	11,751,480	154,979	410,541
Dec	175,971,674	2,540,388	178,512,062	11,858,105	Oct	2,652,026	2,799,218	120,219	153,203
Jan	164,709,634	1,351,663	166,061,297	17,264,657	Nov	3,768,477	3,869,960	111,195	350,174
Feb	119,524,523	1,157,729	120,682,252	13,994,213	Dec	112,702	237,932	23,556	37,750
2nd Qtr	460,205,831	5,049,780	465,255,611	43,116,975	2nd Qtr	6,533,205	6,907,110	254,970	541,127
Mar	97,479,313	922,855	98,402,168	6,723,066	Jan	1,119,603	1,546,100	8,934	69,750
Apr	57,426,414	786,654	58,213,068	8,597,402	Feb	49,160	116,456	43,584	96,515
May	46,520,450	1,254,677	47,775,127	11,610,994	Mar	1,148	192,476	250,397	288,260
3rd Qtr	201,426,177	2,964,186	204,390,363	26,931,462	3rd Qtr	1,169,911	1,855,032	302,915	454,525
June	55,802,755	1,016,137	56,818,892	10,467,071					
July	44,609,875	871,083	45,480,958	17,830,311	Apr	720,309	816,587	49,085	93,425
Aug	50,484,684	1,068,258	51,552,942	9,436,885	May	57,584	472,599	473,733	693,272
4th Qtr	150,897,314	2,955,478	153,852,792	37,734,267	4th Qtr	777,893	1,289,186	522,818	786,697
Total	1,227,331,879	13,894,596	1,241,226,475	177,987,845	Total	19,710,191	21,802,808	1,235,682	2,192,890
					1986/87				
1986/87					June	2,000	276,815	79,108	128,492
Sept	80,082,655	1,181,307	81,263,962	14,227,263	July	1,164,620	1,597,139	81,504	217,421
Oct	124,025,138	818,619	124,843,757	18,547,828	Aug	12,319,164	12,514,711	73,364	335,437
Nov	114,104,314	848,497	114,952,811	14,680,456	Sept	12,772,707	12,912,177	121,288	327,625
1st Qtr	318,212,107	2,848,423	321,060,530	47,455,547	1st Qtr	26,258,491	27,300,842	355,264	1,008,975
Dec	109,759,488	925,574	110,685,062	19,954,747	Oct	16,480,986	16,559,353	167,403	411,976
Jan	104,283,400	990,714	105,274,114	15,484,239	Nov	14,292,746	14,363,851	32,293	167,870
Feb	98,787,906	657,881	99,445,787	20,749,712	Dec	14,532,134	14,661,828	17,314	315,049
2nd Qtr	312,830,794	2,574,169	315,404,963	56,188,698	2nd Qtr	45,305,866	45,585,032	217,010	894,895
Mar	143,717,211	1,658,289	145,375,500	24,415,530	Jan	1,205,709	1,262,335	30,960	75,145
Apr	183,288,269	992,304	184,280,573	12,956,519	Feb	16,084,544	16,522,282	30,776	178,452
May	169,091,351	1,485,054	170,576,405	13,788,332	Mar	17,639,725	18,150,611	115,234	277,846
3rd Qtr	496,096,831	4,135,647	500,232,478	51,160,381	3rd Qtr	34,929,978	35,935,228	176,970	531,443
June	120,026,244	791,997	120,818,241	12,940,287					
July	133,984,531	916,175	134,900,706	22,883,734	Apr	16,599,968	17,153,570	105,251	191,418
Aug	111,320,100	688,763	112,008,863	7,698,710	May	10,522,937	10,726,481	67,436	168,607
4th Qtr	365,330,875	2,396,935	367,727,810	43,522,731	4th Qtr	27,122,905	27,880,051	172,687	360,025
TOTAL	1,492,470,607	11,955,174	1,504,425,781	198,327,357	TOTAL	133,617,240	136,701,153	921,931	2,795,338
1987/88					1987/88				
					June	517,681	754,738	104,217	187,886
Sept	135,403,937	727,001	136,130,948	17,832,854	July	7,421,463	7,675,576	50,113	92,430
Oct	137,693,604	1,091,494	138,785,098	16,734,001	Aug	8,893,825	9,257,652	18,135	153,171
Nov	122,468,369	671,935	123,086,304	10,296,951	Sept	10,014,514	10,217,330	24,184	62,343
1st Qtr	395,565,910	2,436,440	398,002,350	44,863,811	1st Qtr	26,847,483	27,905,299	196,649	495,830
Dec	148,189,862	1,096,722	149,286,584	21,462,657	Oct	16,474,137	17,099,495	62,220	144,789
Jan	133,442,601	859,133	134,301,734	19,428,923	Nov	17,914,754	18,114,982	38,617	99,130
Feb	123,706,547	981,138	124,687,685	22,498,453	Dec	15,583,102	16,123,445	5,680	36,703
2nd Qtr	405,339,010	2,936,993	408,276,003	63,390,033	2nd Qtr	49,971,993	51,337,922	106,517	280,622
Mar	164,120,347	1,169,869	165,290,216	24,662,618	Jan	9,595,582	9,833,000	96,376	147,370
					Feb	6,764,525	7,239,765	29,937	148,578
					Mar	15,349,596	15,756,273	24,173	49,618
					3rd Qtr	31,709,703	32,829,238	150,486	345,566

Total corn exports include grain only (white, yellow, seed, relief), dry process (cornmeal for relief, as grain, grits), and wet process (corn starch, sugar dextrose, glucose, high fructose). Sorghum includes seed and unmilled. Barley includes grain only (grain for malting purposes, other) and barley malt. Oats include grain and oatmeal (bulk and packaged).

Source: Bureau of the Census, U.S. Department of Commerce.

Table 14.--Corn, sorghum, barley, and oats imports, 1985/86 to date

Year and month	CORN Grain only	CORN Total	SORGHUM Total	Year and month	BARLEY Grain only	BARLEY Total	OATS Grain only	OATS Total
	Bushels				Bushels			
1985/86				1985/86				
Sept	8,086	33,974	0	June	340,425	588,237	1,728,933	1,757,614
Oct	314,654	350,199	0	July	251,910	478,428	1,889,404	1,931,401
Nov	540,018	600,046	1,429	Aug	61,653	345,756	825,818	834,833
				Sept	109,312	347,927	1,288,425	1,304,864
1st Qtr	862,758	984,219	1,429	1st Qtr	763,300	1,760,348	5,732,580	5,828,712
Dec	121,966	258,092	0	Oct	872,324	1,087,159	1,256,991	1,264,610
Jan	374,481	483,279	0	Nov	339,674	591,311	1,672,252	1,678,864
Feb	456,976	540,101	0	Dec	592,242	689,112	3,210,457	3,232,191
2nd Qtr	953,423	1,281,472	0	2nd Qtr	1,804,240	2,367,582	6,139,700	6,175,665
Mar	369,991	416,011	0	Jan	528,661	935,239	3,264,356	3,284,460
Apr	623,207	662,745	630	Feb	1,413,559	1,589,598	2,394,906	2,418,051
May	1,212,047	1,240,983	0	Mar	261,745	443,882	2,336,953	2,366,047
3rd Qtr	2,205,245	2,319,739	630	3rd Qtr	2,203,965	2,968,719	7,996,215	8,068,558
June	1,765,143	1,774,942	0	Apr	385,235	616,253	3,574,782	3,591,060
July	2,994,897	3,082,335	797	May	1,088,551	1,276,845	3,795,409	3,822,076
Aug	1,116,694	1,139,076	0					
				4th Qtr	1,473,786	1,893,098	7,370,191	7,413,136
4th Qtr	5,876,734	5,996,353	797					
				TOTAL	6,245,291	8,989,747	27,238,686	27,486,071
TOTAL	9,898,160	10,581,783	2,856					
				1986/87				
1986/87				June	1,296,495	1,501,548	5,325,371	5,345,316
Sept	311,213	332,783	6,329	July	15,140	223,046	1,841,943	1,868,602
Oct	66,792	107,949	0	Aug	19,469	210,558	1,537,423	1,559,704
Nov	333,201	353,750	33	Sept	75,927	307,474	846,095	879,869
1st Qtr	711,206	794,482	6,362	1st Qtr	1,407,031	2,242,626	9,550,832	9,653,491
Dec	66,353	131,009	0	Oct	31,578	207,980	1,262,426	1,292,827
Jan REV.	85,979	134,935	0	Nov	926,059	1,193,914	2,695,161	3,342,153
Feb	14,207	52,622	86	Dec	173,536	310,750	1,241,736	1,261,139
2nd Qtr	166,539	318,566	86	2nd Qtr	1,131,173	1,712,644	5,199,323	5,896,119
Mar	29,812	63,602	0	Jan	392,962	681,307	3,981,067	4,020,146
Apr	400,056	428,391	0	Feb	625,953	772,737	3,994,932	4,027,553
May	19,009	30,652	0	Mar	1,808,103	1,888,079	2,277,619	2,300,061
3rd Qtr	448,877	522,645	0	3rd Qtr	2,827,018	3,342,123	10,253,618	10,347,760
June	326,401	339,131	0	Apr	508,133	591,606	3,401,071	3,434,844
July	32,223	48,591	197	May	792,379	849,842	3,951,545	3,988,454
Aug	71,486	83,860	0					
				4th Qtr	1,300,512	1,441,448	7,352,616	7,423,298
4th Qtr	430,110	471,582	197					
				TOTAL	6,665,734	8,738,841	32,356,389	33,320,668
TOTAL	1,756,732	2,107,275	6,645					
				1987/88				
1987/88				June	683,655	895,760	3,730,421	3,760,272
Sept	130,361	151,725	-0-	July	195,998	212,386	1,717,932	1,735,424
Oct	354,333	373,790	24	Aug	220,222	434,659	1,541,932	1,582,781
Nov	77,145	101,481	15	Sept	1,061,243	1,396,495	1,712,779	1,744,204
1st Qtr	561,839	626,996	39	1st Qtr	2,161,118	2,939,300	8,703,064	8,822,641
Dec	246,126	298,521	-0-	Oct	926,329	1,222,581	1,270,484	1,372,822
Jan	126,012	167,032	-0-	Nov	876,498	1,209,707	5,106,952	5,148,944
Feb	332,569	388,773	19	Dec	1,146,248	1,384,778	2,537,116	2,566,988
2nd Qtr	704,707	854,326	19	2nd Qtr	2,949,075	3,817,067	8,914,552	9,088,754
Mar	593,592	683,203	12	Jan	1,846,528	2,038,574	4,086,315	4,154,507
				Feb	1,318,218	1,605,421	9,167,026	9,213,156
				Mar	1,163,560	1,280,709	6,426,933	6,482,646
				3rd Qtr	4,328,306	4,924,704	19,680,274	19,850,309

Corn includes grain only (yellow dent corn, other), seed, and cornmeal. Sorghum is grain only. Barley includes grain only (barley for malting, other), pearl barley, milled and malting. Oats include grain (hulled or unhulled, unhull oats fit and unfit for human consumption, and oatmeal fit for human consumption.

Source: Bureau of the Census, U.S. Department of Commerce.

Table 15.--Hay (all); acreage, supply, disappearance, and prices received, 1983-1988

Item	Unit	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89
Acreage harvested	Mil. acres	59.7	61.4	60.4	62.4	60.8	61.1
Yield per acre	Tons	2.36	2.45	2.46	2.49	2.46	
Carryover (May 1)	Mil. short tons	28.1	20.1	26.9	26.7	32.4	27.3
Production	"	140.8	150.6	148.6	155.5	149.1	150.3 1/
Supply	"	168.9	170.7	175.5	182.2	181.5	177.6
Disappearance	"	148.8	143.8	148.8	149.8	154.2	N.A.
Roughage-consuming animal units (RCAU)	Mil. units	89.3	85.7	83.1	80.7	78.4	N.A.
Supply per RCAU	Tons	1.89	1.99	2.11	2.26	2.32	N.A.
Disappearance per RCAU	"	1.67	1.68	1.79	1.86	1.97	N.A

1/ March 1988 planting intentions. N.A=Not available.

Year	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Average 2/
						Dollars per ton							
Hay (mid-month)													
1983	78.10	72.70	71.20	71.20	74.70	76.80	75.10	76.70	76.60	78.70	79.40	79.80	75.80
1984	82.50	76.10	72.40	70.40	70.70	73.10	71.40	73.40	73.00	73.10	72.20	72.50	72.70
1985	80.80	70.20	67.90	65.20	67.10	67.50	64.30	65.40	65.80	66.70	67.10	66.20	67.60
1986	70.30	61.50	58.40	58.10	57.80	56.90	56.00	56.80	55.40	58.10	57.90	62.90	60.10
1987	73.30	63.20	61.60	61.80	65.10	65.10	62.10	65.00	62.80	65.50	66.20	72.90*	

1/ Prices reported for mid month. 2/ U.S. average prices based on u.S. monthly prices weighted by monthly marketings. *Preliminary.

Source: Agricultural Prices, Agricultural Statistics Board, USDA.

*U.S. GOVERNMENT PRINTING OFFICE:1988-201-025:60720/ERS

Table 16 - Processed feeds: Quantity fed, 1986/87 to date 1/

	1986/87												1987/88				
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
	----1,000 metric tons----												----1,000 metric tons----				
HIGH PROTEIN																	
Oilseed meal																	
Soybean 2/	2,281	2,171	2,426	2,285	2,217	2,296	2,040	1,967	1,992	1,954	1,760	1,768	2,188	2,380	2,418	2,232	2,233
Cottonseed	102	94	114	103	89	94	94	82	75	64	66	65	112	133	157	138	134
Peanut	3	7	6	6	8	13	7	12	13	9	8	3	4	7	11	12	7
Sunflower	21	43	42	28	25	26	17	15	27	23	2	15	23	46	55	35	47
Total	2,408	2,314	2,588	2,422	2,339	2,428	2,158	2,075	2,106	2,050	1,836	1,850	2,328	2,566	2,641	2,417	2,421
Animal proteins																	
Tankage and meat meal	221	196	204	204	185	199	205	188	193	201	197	207	221	206	23	203	0
Fishmeal and solubles	33	17	8	10	22	15	33	79	59	104	66	71	30	17	12	14	12
Total	253	213	212	214	207	214	238	267	251	305	263	278	251	223	225	217	12
Grain protein feeds																	
Gluten feed and meal	49	112	74	-34	-42	77	-36	36	61	123	134	197	40	-19	17	22	95
Brewers' dried grains	11	9	11	12	11	13	12	14	15	15	13	10	8	11	11	11	12
Distillers' dried grains	65	62	67	79	52	79	83	69	69	57	45	91	81	70	90	87	87
Total	125	183	152	57	21	168	59	118	144	195	193	298	129	62	118	119	194
OTHER																	
Wheat millfeeds	513	495	481	461	471	473	463	492	488	470	496	474	523	498	464	427	439
Alfalfa meal	54	65	39	42	50	48	45	28	62	46	49	62	53	51	49	51	51
Fats and oils	66	59	60	64	59	64	69	61	67	68	65	68	68	62	67	67	69
Total	632	619	580	567	580	585	576	582	616	585	609	604	645	612	580	544	559
Grand Total	3,419	3,329	3,533	3,260	3,147	3,395	3,032	3,043	3,118	3,134	2,901	3,031	3,354	3,463	3,565	3,297	3,186

1/ Adjusted for stocks, productions, foreign trade, and nonfeed uses where applicable. 2/ Includes use in edible soy products and shipments to U.S. territories.

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