Table 10--Ratios of U.S. feed barley price to prices for corn, wheat, and oats; ratio of malting barley to feed barley price, 1960-88

Crop year	Barley/ corn 1/	Barley/ wheat 2/	Barley/ oats 2/	Malting/ feed price
		Ratio		
1960-69	0.82	0.61	1.53	1.16
1970-74	.81	.65	1.74	1.35
1975-79	.90	.69	1.60	1.37
1980-83	.86	.68	1.47	1.34
1985	.85	.62	1.54	1.12
1986	1.01	.63	1.26	1.18
1987	.85	.64	1.05	1.23
1988	.89	.61	.87	1.44

1/ U.S. average farm prices per bushel, June-September.
2/ U.S. average farm prices per bushel, crop year.

the fixed expenses associated with land, capital replacement, debt, and family living expenses. Regional returns to management have been highest in the Northwest and lowest in Southwest (due to high custom operations and irrigation costs). In addition, returns are higher for northern malting barley producers than for western feed barley producers due to the price premiums. In 1989, total cash expenses were expected to rise by 7 percent due to higher fertilizer prices.

Barley farmers' returns, while affected by prevailing economic conditions, also are influenced by the size of operation. Data from a special tabulation of the 1982 Census of Agriculture for the leading barley-producing States suggest that large barley farms are more cost efficient than small farms, although economies of scale are achieved once farms reach 500-999 acres. Total costs (including land, machinery depreciation and interest, production expenses, and operator's and family labor) per dollar of receipts declined as farm size increased up to the 500- to 999-acre size. Above 1,000 acres, total costs per dollar of receipts increased slightly. National aggregate barley returns are reported in table 12.

Table 11--U.S. barley production costs, 1984-88

Item	1984	1985	1986	1987	1988 1/
	Dollars per planted acre				
Variable cash expenses:					
Seed	6.48	6.08	4.41	4.09	4.15
Fertilizer	16.27	15.63	13.39	12.56	13.84
Lime and gypsum	.04	.03	.03	.04	.04
Chemicals	6.04	6.03	5.87	5.60	5.69
Custom operations	3.48	2.88	2.86	2.34	2.31
Fuel, lube, and electricity	10.18	10.88	7.27	7.66	7.76
Repairs	9.56	9.00	8.90	8.64	8.84
Hired labor	1.37	4.91	5.21	4.97	5.06
Purchased irrigation water	1.65	1.63	1.57	1.64	1.65
Miscellaneous	.70	.70	.67	.70	.73
Technical services	.12	.12	.13	.13	.14
Total variable cash expenses	55.89	57.89	50.31	48.37	50.21
Fixed cash expenses:					
General farm overhead	9.35	5.49	5.39	6.95	7.11
Taxes and insurance	8.91	9.00	9.31	9.41	10.24
Interest on operating loans	11.71	5.53	3.90	3.58	4.24
Interest on real estate	13.20	8.03	6.45	8.87	9.26
Total fixed cash expenses	43.17	28.05	25.05	28.81	30.84
Total cash expenses	99.06	85.94	75.36	77.18	81.05
Capital replacement	24.94	24.06	24.41	24.29	22.07
Economic (full ownership) costs:					
Variable cash expenses	55.89	57.89	50.31	48.37	50.21
General farm overhead	9.35	5.49	5.39	6.95	7.11
Taxes and insurance	8.91	9.00	9.31	9.41	10.24
Capital replacement	24.94	24.06	24.41	24.29	25.31
Allocated returns to owned inputs:					
Return to operator capital	1.65	1.30	.79	.83	.99
Return to other nonland capital	4.89	4.47	4.65	5.32	5.54
Net land return	30.77	21.15	18.59	20.31	25.77
Unpaid labor	9.15	5.54	5.88	5.60	5.80
Total economic costs	145.55	128.90	119.33	121.08	130.96

1/ Projected.

Source: Economic Indicators of the Farm Sector, Costs of Production, 1987 and Agricultural Outlook, AO-148, U.S. Department of Agriculture, Economic Research Service.

Table 12--Returns above cash expenses in U.S. barley production, selected crop years

Crop year	Farm value 1/	Direct payments 2/	Total income	Total cash expenses 3/	Returns above cash expenses 4/ Total	Per bushel Nominal	Per bushel $1982
	Million dollars					Dollars	
1975	918	16	934	480	454	1.17	1.97
1980	1,033	25	1,058	710	348	.98	1.14
1984	1,360	57	1,417	683	734	1.22	1.14
1985	1,133	140	1,273	782	491	.83	.75
1986	994	213	1,207	704	503	.82	.72
1987	982	207	1,189	605	584	1.10	.94
1988	790	89	879	557	322	1.11	.91

1/ Barley production times all barley season average price received by farmers. 2/ The sum of deficiency, diversion, disaster, and storage payments. 3/ Costs per planted acre times acreage planted; costs of maintaining conserving use acreage is $20 an acre before 1981 and $25 afterwards times the acreage. 4/ The difference between total gross income and total variable costs; this difference was divided by quantity produced and deflated by the implicit price deflator (1982=1.0).

History of Barley Programs

The Nation's first agricultural policies were not commodity-specific but, rather, general legislation meant to assist farmers in settling the West. Disposal of public lands, development and regulation of the transportation and credit infrastructures, and grants to new agricultural research institutions were intended to encourage more food for a swelling population. The expansion of exports was necessary to pay for industrialization and for imports. The first plans to support specific commodities emerged after the collapse in farm prices following World War I.

Legislation and Programs, 1933-60

Prior to 1960, farm legislation and programs imposed no production controls on barley. However, because barley is a close substitute for other feed grains, periodic surplus stocks of corn weakened barley prices. To stabilize barley prices and to enhance farm income for barley growers, legislation provided price support for barley producers. However, barley price support levels as a percentage of the parity price were not as high as those of the basic commodities, such as corn. The Agricultural Adjustment Act of 1933 did not designate barley as a basic commodity. But in April 1934, the Jones-Connally Act expanded the list of basic commodities to include barley.

In response to drought in the summer of 1936 and to supplement the Soil Conservation and Domestic Allotment Act of 1936, the Agricultural Adjustment Act of 1938 sought to provide parity

prices and parity income for producers of cotton, wheat, corn, tobacco, and rice through acreage allotments and marketing quotas. Relief payments, financed by a tax levied on processors, assisted many farmers with their debts. However, these programs were relatively ineffective in supporting prices because acreage diverted from one crop were left free to be planted to others and price support was offered without production controls. The 1938 Agricultural Adjustment Act required farmers to hold acreage out of production to conserve soil as a condition to receive nonrecourse loans. Funding was to be from the U.S. Treasury, since the Supreme Court ruled in 1936 that the tax on processors was unconstitutional.

During 1938-40, price support through Commodity Credit Corporation (CCC) nonrecourse loans was extended to cover barley--one of the commodities for which loans were authorized--but use was left to the Secretary's discretion.

Price support was authorized in 1956 in response to a near doubling in barley carryover stocks in the early 1950's. Prices declined by 28 cents per bushel between 1952/53 and 1954/55. Support was at 76 percent of parity for the 1956 crop and no less than 70 percent of parity in 1957. Parity is the price per bushel necessary to purchase the same quantity of goods as in the 1910-14 period. The volume of barley placed under CCC loan reached a record 142 million bushels in the 1957 crop year. The high stocks levels continued into the 1960's.

The Agricultural Act of 1958 required that, beginning with the 1959 crop, support would be made available for oats, barley, rye, and sorghum at a price level determined to be fair and reasonable in relation to the level of support made available to corn. In effect, this requirement finally made support mandatory for barley.

Voluntary Feed Grain Programs in the 1960's

During the 1960's, barley was generally included in feed grain programs that included price support at no less than 65 percent of parity. Price support was extended to barley and, during this period, carryover stocks remained high. In the 1969/70 marketing year, carryover stocks reached a record 269 million bushels, 68 percent of total barley use. As was the case for other feed grain producers, participation in the voluntary acreage diversion program was a condition of eligibility for barley price support.

Price support payments and diversion payments were available to barley producers who participated in the voluntary feed grain programs, except in the 1967 and 1968 crop years when the Government wanted to slow the decline in production. For example, in 1965, barley producers participating in the program received a total price support of $0.96 per bushel: $0.16 per bushel price support payments and $0.80 loan rate. At the same time, corn producers participating in the voluntary feed grain program received a total price support of $1.25 per bushel: $0.20 per bushel price support payments and $1.05 loan rate. The

relationship between barley and corn price supports has generally been set according to the feed energy value of barley relative to corn, which on a bushel-for-bushel basis is considered to be 77 percent across all livestock classes.

During the 1960's, a payment-in-kind (PIK) from CCC stocks was authorized as a means to pay feed grain producers who participated in the diversion program. Most farmers in that PIK program authorized CCC to market their PIK certificates rather than take delivery of the commodity. The PIK was implemented because there was not sufficient market demand to absorb the increasing barley supply.

The quantity of barley placed under CCC loan was significantly larger in 1969 than in 1967 and 1968 when diversion and price support payments were not made available to barley producers since barley was not included in the feed grain programs. In 1969, 47 million bushels of barley were placed under CCC loan, the highest subsequent to the 54 million bushels placed under CCC loan in 1957.

Feed Grain Programs in the 1970's

The Agricultural Act of 1970 introduced set-asides that required farmers to take a specific percentage of cropland out of production and place it in conserving uses in order to qualify for price support. Participants were permitted to grow whatever they wished on the remaining land, except for the crops under marketing quotas.

The set-aside concept was designed to address farmer concerns about increased production of uncontrolled crops on land with allotments for controlled crops (corn, wheat, cotton, rice, peanuts, and tobacco). Increases in barley acreage occurred, for example, in the Midwest and Western States land idled from wheat production.

In addition, the 1970 Act imposed a $55,000 payment limitation per person, per crop. The limitation applied to all direct payments, but not CCC loans or purchases. The payment limit applied to total payments associated with corn, sorghum, and barley, if designated as a program crop. This stipulation limited the budgetary cost of the program.

Barley was a program crop under the set-asides of the 1970's, except in 1971. There were no set-asides from 1974-76. Barley price-supports (including loan rates) were set in relation to corn. The 1970 Act provided a total price support (including price support payments and loan rates) to corn farmers on one-half of their feed grain base. The price support was the higher of (1) $1.35 per bushel, or (2) 70 percent of the parity price for corn and the average market price for the first 5 months of the marketing year.

By the early 1970's, export demand for barley and many grain commodities was high because of worldwide crop shortages and

devaluation of the U.S. dollar. Barley stocks in Government warehouses were liquidated. As a result, barley farm prices reached a record in 1974/75 and remained relatively high in 1975/76.

The Agriculture and Consumer Protection Act of 1973 introduced target prices to protect farmers from sudden decreases in prices. The concept essentially shifted the focus of Federal farm programs from price support to income support. These payments are referred to as deficiency payments. Farmers received deficiency payments equal to the amount by which market prices fell below target prices. The per-unit payment rate equals the difference between the target price and either the national weighted average market price between June 1 and October 31 or the announced loan rate, whichever is higher. This payment rate is multiplied by individual farmers' program acreage times their program payment yields, excluding the years with the highest and lowest yields. Deficiency payments were not made to barley producers during 1974-76 since market prices exceeded the target levels.

Another feature in the 1973 Act introduced a disaster payments program which provided direct payments to producers unable to plant or who suffered low yields because of natural disaster. This program recognized that farmers' incomes depended on both price and yield per acre.

At this time, there was a great deal of concern about rising costs of producing farm commodities. While use of cost of production became controversial in the mid-1970's, the method was adopted in the Food and Agriculture Act of 1977. As a result, a national average cost of production was used as the basis for setting target prices. The annual adjustment was based on changes in the 2-year moving average per unit variable costs, machinery ownership costs, and general farm overhead costs.

Congress called for setting "fair and reasonable" target prices for other feed grains (including barley) in relation to corn. The same cost of production components for corn were used to set the target prices for other feed grains. As a result, the target prices for barley were higher than the target price for corn under the 1977 Act. This cost-based formula continued through 1981 and then reverted to the conventional feeding value relationship under the 1981 Act.

Replacement of the longstanding acreage allotments (derived from production patterns dating back to the 1950's) by a current planting concept represented a major change in the 1977 Act. Under the 1973 Act, barley farmers received deficiency payments based on their allotments, regardless of acres planted in barley. Under the 1977 Act, deficiency payments were to be based on the production from current plantings, adjusted by the program allocation factor.

Barley stocks were on the rise during the last year of the 1973 Act which raised the possibility that the CCC might end up

holding forfeited grain again. Recognizing the growing importance of exports to U.S. coarse grains and the need to protect livestock producers from unstable grain prices, Congress established the farmer-owned reserve (FOR) program under the 1977 Act. The FOR was designed to reduce price instability and control the cost of holding CCC inventories.

The FOR permits farmers who comply with any set-aside requirement to place grain into the reserve, normally after CCC loans mature. Under the program, farmers agree to store their grain in certified onfarm or commercial storage for 3 years or until the market triggers a specified release price. In return, they receive an advance payment for storing their grain (presently 26.5 cents a bushel for barley). Interest is waived on the loans after the first year of the contract. The FOR keeps barley stocks under the control of farmers and provides them an opportunity to reap gains from price increases. In addition, low-interest government loans were made available to cover construction costs of onfarm storage facilities.

Agriculture and Food Act of 1981

The Agriculture and Food Act of 1981 was a response to problems stemming from provisions of the 1977 Act. Use of cost of production to set and annually adjust target prices was discontinued. Changing yields introduced instability into the adjustment formula results. The adjustments lagged actual cost conditions during a period of rapid inflation.

To address these issues, the 1981 Act mandated specific loan and target price minimums for the 1982-85 corn crops, with minimum annual increases of nearly 6 percent to reflect anticipated inflation rates. The act further required that support rates for grain sorghum, oats, and, if designated by the Secretary, barley, be set in relation to corn.

Acreage controls via set-aside were not effective in achieving crop-specific acreage reduction. Therefore, the 1981 Act introduced acreage reduction programs (ARP) requiring a portion of a specific crop acreage base be diverted from production.

Strong export markets were expected to support farm prices while rapid inflation would continue to exert strong pressure on production costs. But, by the time the 1981 Act was signed, the feed grain market was weakening and it did not rebound again until after the 1983 PIK program for corn and sorghum was announced. Acreage reduction programs and a paid land diversion removed 1.1 million acres of cropland from barley production in 1983. Barley was not included in the PIK program. However, barley prices rose in response to tight supplies and strong prices of corn.

Food Security Act of 1985

The Food Security Act of 1985 addressed conditions created by the 1981 Act, which set high and rigid price supports without regard

for market conditions. As a result, many U.S. farm commodities lost their competitiveness in world markets. Major objectives for the 1985 Act were to expand exports, protect farm income, and eventually to reduce outlays for farm programs and Government intervention in the agricultural sector.

The 1985 Act lowered loan rates for wheat and corn at levels intended to encourage exports, not create excessive stocks. The rates were set to reflect production costs, supply and demand conditions, and world prices of wheat and feed grains. Loan levels for sorghum, barley, oats, and rye were to be set "fair and reasonable" in relation to corn and reflect relative feed values. Announced loan rates for barley declined 5 percent yearly from $1.56 per bushel in 1986 to $1.34 in 1989 (table 13).

The metabolizable energy feed values used by USDA in establishing support prices per bushel are presented below. These values are for major grains relative to corn, averaged across all livestock classes. Energy values on a bushel-for-bushel basis differ from those on a pound-for-pound basis because of the differences in bushel weights (for example, 48 pounds of barley per bushel and 56 pounds of corn per bushel). Actual test weight and nutrient values may vary from year-to-year from the tabular averages depending on geographic location and type of animal fed.

	Energy value	
	Pound for pound	Bushel for bushel
	Percent of corn	
Corn	100	100
Sorghum	95	95
Barley	95	81
Oats	90	51
Rye	85	85

Table 13--Barley program provisions, 1987-90

Provision	1987	1988	1989	1990
	Percent of base acres			
Acreage reduction program	20	20	10	10
Paid land diversion	15	10	0	0
	Dollars per bushel			
Target price	2.60	2.51	2.43	2.36
Basic loan rate	1.86	1.80	1.67	1.60
Announced loan rate	1.49	1.44	1.34	1.28
Deficiency payment rate	.79	0	.23 1/	--
Diversion payment rate	1.60	1.40	0	0

-- = Not available. 1/ Projected.

The statutory (basic) nonrecourse loan rate was set between 75-85 percent of the 5-year moving average of the market price, excluding the low- and high-price years. The law specified a maximum reduction of 5 percent in the basic loan rate for successive crop years. The Secretary of Agriculture has exercised his authority to further reduce the basic loan rate by up to 20 percent (Findley loan rates) to preserve U.S. competitiveness in international grain markets.

The 1985 Act and amendments by the 1987 Budget Reconciliation Act kept target prices frozen at the 1985 level for the first 2 years at $2.60 per bushel. They declined by 3 percent in 1988 and 5 percent in 1989 and 1990 to $2.36. Partial advance payments may be made at program sign-up with cash or with negotiable generic commodity certificates granting the holder title to any Government-owned stocks.

Participating producers are required to comply with acreage restrictions and soil conservation practices in exchange for deficiency payments. Under the ARP, feed grain producers uniformly may be required to reduce their crop acreage by up to 12.5 percent if the level of feed grain stocks exceeds 2 billion bushels. If stock levels exceed 2 billion bushels, USDA must announce an ARP between 12.5-20 percent for the 1987-90 crops.

The Secretary of Agriculture is permitted to offer additional payments to farmers who voluntarily set aside acreage in excess of the required level. For 1988, farmers could idle an additional 10 percent of their barley acreage and receive $1.40 per bushel for the production foregone on the diverted acreage. There was no paid land diversion for 1989 and there will be none for 1990.

Higher market prices in 1989 will push program participation below the 78 percent level of 1988. Participation rates have been much higher in malting barley States. The 1985 Act allows malting barley growers to be exempt from acreage reduction programs because the market is so different from feed barley. However, malting barley producers have not been exempt to date.

In previous years when acreage reduction programs were in effect for corn or wheat, acreage planted in barley tended to increase, particularly in the Northern Plains. After 1987, feed grain program participants may not plant barley acreage in excess of a given farm's barley base (limited cross compliance). However, producers with multiple farms will not be required to comply with planting restrictions on their other units to be eligible for program benefits (offsetting compliance).

Deficiency and diversion payments (with certain exemptions) to any person may not exceed $50,000 and total overall payments (excluding nonrecourse loans) may not exceed $250,000 per person. After 1988, no foreigner may receive payments unless they are actively engaged in the day-to-day operation of their farm.

After 1985, farmers were permitted to divert any portion, up to 50 percent, of their remaining acreage (after complying with set-aside requirements for barley) to conservation uses or specified nonprogram crops and still receive 92 percent of their barley deficiency payments on the underplanted acreage. This provision (known as 0/92) was expanded for 1988-90 by the 1987 Budget Reconciliation Act so that all of the permitted acreage is eligible. Farmers idled 4.6 percent of the 12.46-million-acre barley base under this provision in 1988.

The 1985 Act also established the conservation reserve program (CRP) in which producers may contract to retire highly erodible cropland for at least 10 years into approved conserving uses such as grassland or trees. In return, producers receive annual rental payments, in cash or commodity certificates, determined by USDA acceptance of bids on the land. Through 1989, 2.2 million acres of barley base have been enrolled in the CRP.

The Food Security Act modified the farmer-owned reserve. Experience with the FOR in the early 1980's indicated that using grain reserves to support farm income in the face of excess productive capacity resulted in large stock accumulation. This was especially true when market forces and other program provisions tended to encourage increased production and progressively lower real prices. In order to maintain the price stabilization feature of the FOR, release prices were realigned with long-term market prices to avoid excessive accumulation of grain reserves.

Trigger-release levels were previously established by the Secretary. Now, farmers may not redeem the loan until a 5-day average market price attains the higher of the target price or 140 percent of the loan rate. As of June 1987, the trigger-release price was lowered to equal the target price. When in release status, producers may redeem the grain using generic commodity certificates, leave the grain in the reserve and pay the interest charges, or forfeit the loan and surrender the grain.

The storage contract previously matured in 3-5 years but was changed to "not less than 3 years, with extensions as warranted by market conditions." A maximum of 15 percent and minimum of 7 percent of the estimated domestic and export use of barley was established for the FOR, although the Secretary of Agriculture has some discretion in raising the reserve levels. The Budget Reconciliation Act changed the trigger level to 450 million bushels of feed grain (instead of 7 percent of expected use). Entry of grain into the FOR is not permitted above this level.

Government-owned stocks are provided to exporters under the export enhancement program (EEP) to offset foreign subsidies. The 1985 Act designed EEP to help U.S. exporters compete in world markets, to confront subsidized exports of competitors, and to encourage trade negotiations. Exporters bid competitively to receive export bonuses in the form of generic certificates that can be exchanged for Government stocks in order to compete in

selected markets. Nearly all barley exports were shipped under EEP in 1986/87 and 1987/88.

Other Legislation

Current price-support programs protect producers against low prices but not against low yields and losses in market revenue. The 1981 Act specified that disaster payments would normally be made only when Federal crop insurance for reduced yields and prevented plantings is not available. However, if Federal crop insurance indemnity payments were insufficient to alleviate economic emergencies caused by natural disasters, additional disaster payments may be authorized. Crop insurance is available in nearly all areas but high premiums relative to benefits and the perceived risk of weather-related disasters have kept purchases of crop insurance low. Federal crop insurance covered 4.1 million acres of barley in 1988 or 42 percent of insurable acreage.

Severe losses associated with the 1988 drought, coupled with low crop insurance coverage, prompted Congress to pass the largest disaster relief measure in U.S. history. The Disaster Assistance Act of 1988 gave assistance payments to drought-stricken producers with losses in excess of 35 percent of historical yields.

Congress addressed uninsured revenue losses of the 1988 drought by varying direct payment rates based on the comparison of actual and program yields. Payment rates differed depending on the amount of crop loss and whether producers participated in the 1988 Federal commodity programs. Program participants who applied for assistance for losses between 35 and 75 percent of their crop received 65 percent of the 1988 target price on their payment yield minus the actual yield. Nonparticipants received 65 percent of the basic county loan rate. Farmers with losses above 75 percent receive 90 percent of the target price (participants) or loan rate (nonparticipants). Yields below 4 bushels per acre were declared complete losses.

The Disaster Assistance Act also provided that once the release price for the farmer-owned reserve was reached, producers could repay loans without penalty for the rest of 1988 even if market prices later drop below the release price. Donations or sales of up to 20 million bushels of discounted CCC-owned barley to affected livestock producers were also authorized.

The Disaster Assistance Act provided the first means test for Federal farm programs, making all persons with gross revenues above $2 million ineligible for disaster relief. All crop disaster payments were limited to $100,000 per person. Producers must obtain crop insurance for the 1989 crop to receive disaster payments if their losses exceeded 65 percent.

In response to foreign complaints about the low quality of U.S. grain and loss of export markets, Congress passed the Grain Quality Improvement Act (PL 99-641) in November 1986. The intent

of the legislation was to improve the quality of grain being exported and promote the marketing of U.S. grain to both domestic and foreign buyers. It amended the U.S. Grain Standards Act to better define descriptive terms to facilitate trade; provide more information to assist in determining grain storability; offer end-users means to measure end product yield and quality; and create market incentives for quality improvement. The most significant change prohibited the reintroduction of dust or foreign material into the grain stream once it has been removed. Grade standard changes for barley include revised reporting of dockage to the nearest 0.1 percent; elimination or replacement of some special grades; lowered tolerances for insects and animal filth; and availability (on request) of barley protein content data.

Effects of Barley Programs

Although directed at crop producers, farm programs also affect the incomes of livestock producers, processors and input suppliers, consumers, and taxpayers.

Crop Producers

Commodity programs are designed to maintain farm income and compensate farmers for the low grain prices they may sometimes receive from the market. However, by supporting farm incomes, the Government creates incentives for surplus production. These grain surpluses can be stored or sold to foreign buyers at below-market prices. Accumulated stocks may be expensive to store for long periods and may need to be released to hold down market prices and discourage overproduction. Excessive stocks can be minimized by restricting crop acreage through use of acreage reduction and paid land diversion programs or with exports.

The export enhancement program is targeted at competitors which subsidize and may help to increase farm prices, reduce deficiency and paid land diversion payments, and cut Government-owned surpluses and storage and interest costs. Other objectives of EEP include pressuring trading partners to engage in negotiations on the elimination of trade-distorting subsidies.

Whether additional exports have been stimulated above the level of commercial sales in the absence of EEP is fundamental in determining the cost-effectiveness of the program. The 1985 Act requires that reasonable precautions be taken to prevent resale of commodities and the displacement of usual U.S. marketings. The program is constrained to no-net-increase in budget outlays. If EEP exports merely displace commercial exports ton for ton, then release of bonus CCC stocks to the market would depress farm prices and increase farm program costs. When world grain stocks are low and prices are high, without additional exports, the cost of export bonuses may be more than the budgetary savings from lower deficiency, storage, and interest costs.

Generic commodity certificates have been used as a means to free up stocks under nonrecourse and reserve loans or owned by CCC. Stocks that would have remained off the market and accumulate storage expenses could be released, instead. Depending on local market conditions, farmers gain flexibility in marketing plus avoid the interest and storage costs normally incurred by crops under loan. The Government reduces budget outlays through fewer loan forfeitures, but the savings are offset by a lower market price, which increases deficiency payments.

An issue regarding the objective of the FOR is whether it is to be purely a price stability program or a price support tool as well. Studies of the farmer-owned reserve program suggest that release of FOR stocks has improved grain price stability only a little, but it has helped support market prices. The trigger release is currently fixed at the target price. When market price is near the FOR loan price, entry of stocks into the reserve is steady. However, when free stocks are low and market price approaches the target price, few FOR stocks will be released onto the market.

Thus, the target price acts as a price-support mechanism. Grain stocks are kept off the market and seldom returned when they are in greatest demand. Although farmers may exchange reserve stocks with generic certificates (PIK and roll), there is no incentive to redeem when cash prices are well above loan repayment levels. Farmers continue to receive interest waivers and storage payments on reserve stocks, which creates a constant expense to the Government. If grain stocks policy is to effectively stabilize market prices, a lower release price (or one that better adjusts to market conditions) for the FOR and CCC sales is necessary.

Size of Program Payments

Direct payments made under the barley program have been a significant portion of growers' net returns (table 14). Higher deficiency and diversion payments and lower market prices over the last several years have increased participation in the barley program. Participating base acreage rose from 44 percent in the 1984/85 marketing year to 84 percent in 1987/88. Idled acreage climbed from 0.5 million to 2.6 million during the same period. Greater enrollment increased Government payments for barley from $50 million in 1984/85 to $333 million in 1987/88. Government payments now account for as much as one-fourth of barley producers' farm income.

Export sales of barley under the export enhancement program through the 1988/89 marketing year totaled 6.5 million metric tons. EEP shipments accounted for almost all barley exports in the 1986/87 and 1987/88 marketing years and raised the U.S. share of world barley trade. In fact, barley accounts for almost all of the feed grain sales made under EEP. Offers have been made to 13 nations. The largest single purchaser of barley under the EEP has been Saudi Arabia, although Algeria, Israel, Poland, and Tunisia have also been major purchasers. EEP sales are forecast to decline.

Table 14--Market receipts and program payments received by barley farmers, crop years, 1983-88

Item	1983	1984	1985	1986	1987	1988 1/
			Million dollars			
Sales receipts 2/	1,257	1,356	1,133	994	982	790
Program payments:						
Deficiency payments	88	15	113	184	157	61
Diversion payments	14	16	0	19	8	--
Reserve storage payments	25	26	27	30	43	28
Disaster payments	0	0	0	1	0	0
Total	127	57	140	234	208	89
			Dollars			
Per bushel sales receipts:						
Nominal	2.47	2.29	1.98	1.61	1.81	2.79
Real 3/	2.38	2.13	1.79	1.41	1.54	2.30
Per bushel program payments:						
Nominal	.25	.10	.24	.38	.39	.31
Real 3/	.24	.09	.05	.07	.08	.25
			Ratio			
Ratio of program payments to sales receipts	.10	.04	.12	.24	.21	.11
Ratio of program payments to net returns 4/	.31	.08	.29	.42	.35	.28

-- = Not available.
1/ Preliminary.
2/ Barley production times season average price received by farmers.
3/ In 1982 dollars.
4/ Calculated from data in table 12; direct payments divided by total returns above cash expenses.

Table 15--Percentage distribution of 1982/83 barley deficiency and disaster payments, by size of farm

Total cropland acres	Participating producers		Participating acreage		Payments	
	Pct.	Cum. pct.	Pct.	Cum. pct.	Pct.	Cum. pct.
Less than 70	12.9	12.9	1.5	1.5	1.7	1.7
70-139	12.6	25.5	3.2	4.7	3.4	5.1
140-219	10.7	36.2	4.1	8.8	4.5	9.6
220-259	4.3	40.5	2.1	10.9	2.2	11.8
260-499	19.9	60.4	14.5	25.4	15.4	27.2
500-999	22.2	82.6	26.9	52.3	27.8	55.0
1,000-1,499	8.9	91.5	16.7	69.0	16.8	71.8
1,500-1,999	3.9	95.4	9.6	78.6	9.3	81.1
2,000-2,499	1.8	97.2	5.7	84.3	5.6	86.7
2,500 and over	2.8	100.0	15.7	100.0	13.3	100.0

Source: U.S. Senate Committee on the Budget. 1982 Farm Program Benefits: Participants Reap What They Sow.

Distribution of Program Payments

Since deficiency and diversion payments are made on a per-bushel basis, most barley program benefits go to the farms with the most

production. Larger farms, although fewer in number, received a larger share of the 1982 barley program benefits because they had the largest production (table 15).

The distribution of barley program payments by farm size, as measured by total cropland acres, shows that:

- o Half the participants, those with the smallest farms, received only 16 percent of total payments.
- o The largest 10 percent of the farms received 40 percent of total payments.
- o Large barley producers--cropland of over 1,500 acres--accounted for only 8.5 percent of participating producers but received 28 percent of total payments.
- o Small barley producers, with cropland of less than 500 acres (the average size of farms growing barley), accounted for 60 percent of participating producers but received only 27 percent of total payments.

Regions with a larger participation base received a larger share of program payments. Barley deficiency and disaster payments in 1987 were concentrated in the Plains (62 percent), the Northwest (20 percent), and the North Central region (12 percent) (table 16).

Barley producers participate in the Government feed grains program when they expect program payments, less the net revenue foregone by reducing acreage, to exceed the net receipts they would obtain solely from selling the grain on the market. This decision depends on the productivity of farmland, the fixed and variable costs of production, the target price, the percentage of acreage required to be idled, the expected return from the market, and each farmer's attitude toward accepting direct Government payments.

Table 16--Distribution of barley acreage base, and deficiency payments by region, 1987

Region	Farms	Base	Partici-pation base	Share of national partici-pation base	Partici-pation rate	Deficiency payments	Share of payments
	Thousand	--1,000 acres--		----Percent----		Mil. dols.	Percent
North Central	37.8	1,242.2	1,061.7	9.8	85.5	37.1	12.1
Plains	117.0	7,686.3	6,933.6	61.5	90.2	189.5	61.6
Northwest	29.3	2,293.3	1,936.4	18.5	84.1	62.8	20.4
Southwest	12.4	823.5	443.3	6.6	53.8	13.6	4.4
South	26.4	276.4	136.2	2.2	49.3	2.9	.9
Northeast	16.0	173.1	69.0	1.4	39.8	1.8	.6
Total	237.8	12,504.9	10,580.1	100.0	84.6	307.9	100.0

Source: U.S. Department of Agriculture. News: Final Compliance Figures for 1987 Acreage Reduction Program, March 10, 1988.

The implication of the distribution of payments is that in order to achieve higher market prices through acreage reduction, payments must be made to the largest producers to induce their participation in the program. Given current program provisions, attempts to limit payments to the largest producers will curtail their participation and further reduce the effectiveness of supply management.

Effects on Barley Production and Price

Since passage of the Agricultural Act of 1961, the Federal Government has attempted to reduce surplus production of feed grains by offering voluntary diversion, set-aside, or acreage reduction programs. The 1961 Act originally covered only corn and sorghum; barley was added to the voluntary diversion program in 1962. The programs have continued since, except for 1967-68, 1971, 1974-77, and 1980-81.

Acreage restrictions are not as effective in reducing production as desired. Farmers' fixed costs are spread out over fewer acres which increases their cost of production. They typically idle their least productive farmland to satisfy program requirements. Farmers may then apply more inputs to the land they plant to maximize production on their permitted acreage. As a result, crop yields (and expenses) are larger and this partly offsets the decline in acreage (program slippage). The 1985 Food Security Act minimizes the yield effect since it has held the program yield constant.

Also, because the feed grain programs effectively set a price floor in the domestic market, those who do not participate in the program receive the same higher market price as program participants and they are free to expand their plantings. So limiting crop acreage and production has become progressively more expensive for the Government. Commodity programs also raise the market value of production assets, with land being the major farm asset.

While various acreage reduction programs have been used to discourage barley production, other parts of the farm program may encourage production. The disaster payments program offers free insurance against production risk for program participants. The program may have induced larger production of barley in less efficient areas. The disaster program was abolished in 1981 and is not available in areas where the Federal crop insurance program is offered. However, Congress has passed several successive comprehensive disaster assistance acts in this decade to protect farmers from yield losses.

The loan program protects participating farmers from downside price risk because the loan rate sets a floor to market prices. Thus, the program not only reduces price risk but raises expected prices to participants. The higher reserve loan rates set for 1980-82 offered even greater price protection. For example, participants in the farmer-owned reserve were eligible for a

$2.37-a-bushel reserve loan rate in 1982, which was 29 cents higher than the regular CCC loan rate. The high reserve loan provided the greatest incentive to participate in the acreage reduction program and to produce barley for the FOR program, not necessarily for the market. Stocks of barley in the FOR increased fourfold during the 1982/83 crop year (app. table 2). The reserve loan rate has been set at the regular loan rate since 1983 and, consequently, no stocks have been placed in the reserve since the 1985 crop. Since maturing reserve loans will not be extended, by the end of 1989/90 all outstanding FOR barley will probably be forfeited to the CCC.

Acreage reduction programs, coupled with operation of the FOR and the regular CCC loan programs, tend to keep prices higher than they would otherwise be in times of large barley stocks, such as 1982 and 1983. In 1978, set-aside and paid diversion increased U.S. barley prices by 8 percent. Considerably higher price effects of the acreage reduction and loan programs were reported for 1982 because of the larger volume of barley going into CCC and FOR stocks.

Livestock Producers

Government programs may strengthen farm prices for barley. However, the higher prices mean increased costs for the livestock sector which has been the primary outlet for barley and other feed grains. Consumers of red meat, poultry, milk, and eggs are also affected by farm programs.

Higher barley prices directly affect livestock producers by raising feed costs. This effect, however, is much less pronounced than that of corn programs since barley accounts for a much smaller portion of the feed grain ration.

The effects of barley programs on retail prices of red meat, poultry, milk, and eggs depend on farm-retail price spreads and the importance of barley in livestock and poultry production. In the Great Plains, for example, barley can replace sorghum as part of the feed grain ration in cattle feeding. In 1983, barley feed costs accounted for about 10 percent of total expenses of cattle feeding. A 10-percent increase in barley prices means expenses of custom feeding would be increased by only 1 percent. By the time cattle are marketed, the price effect would be even smaller. Given that the farmers' share of the retail price of beef was 57 percent in 1983, the retail price of beef would be about 0.6 percent higher as a result of a program which boosted barley prices by 10 percent.

Lower loan rates for barley and other feed grains under the 1985 Act have differently affected livestock feeders depending on their type of livestock. For example, it takes 7-8 weeks to produce a broiler chicken for slaughter. But, it requires 20 months before a feeder calf is ready for market. In the short run, all livestock feeders benefited because net returns increased as feed grain prices dropped. Beef, dairy, and hog producers will benefit more than poultry and cow-calf operators

in the long run because producer prices drop more slowly for animals with longer biological cycles. Expansion of livestock production will ultimately lower livestock producer returns to offset the benefit of lower feed grain prices.

Consumers

The relatively narrow farm-retail price spreads for beef, pork, and other livestock products suggest that more stable feed grain prices contribute to more stable retail prices for livestock products. During the early to mid-1970's, for example, livestock producers experienced fluctuating feed grain prices which made planning for short-term production decisions difficult and posed difficulties for long-term investment decisions. The growth in export demand in the early 1970's essentially emptied CCC stocks. Barley prices rose from $1.21 per bushel in 1972/73 to $2.14 in 1973/74, and then reached $2.81 in 1974/75 (app. table 2). Due to the inelastic demand for meat and poultry products and biological constraints on livestock supply response, livestock producers experienced a great deal of instability in feed costs which necessitated rapid adjustments in feeding volume during the period.

Consumers are better off under the lower barley price supports of the 1985 Act because retailers are able to keep retail prices for meats, dairy products, and malt beverages and food products from rising as much. The level of savings depends on the degree to which barley accounts for the total cost of a food product. For example, although beer uses barley malt as a primary ingredient, the cost of barley has a minor effect on the retail price of beer when all other manufacturing and marketing costs are considered.

After the reduction in feed grain loan rates, retail meat prices rose as farmers held back animals they would normally have marketed to enlarge beef and hog breeding herds. Retail poultry prices dropped much sooner because of their shorter production period. Dairy feeders also benefited from lower feed costs and higher returns, but because of the Government price support program for milk, retail prices for dairy products are unlikely to be affected. However, the 1988 drought strengthened feed grain prices. Consequently, higher retail beef and pork prices are expected in 1989.

Processors and Input Suppliers

The farm program for barley producers has generally contributed to an adequate supply of barley for processors, such as makers of commercial feed and malt. Stocks-to-use ratios (a relative measure of supply conditions) have ranged from 25 to 68 percent for many years. If supplies become tight (a low ratio), as in 1952 and 1974, barley prices will rise, meaning processors will have to pay more. However, if stocks steadily accumulate, such as in 1968-69 and 1985-87, prices will fall, benefiting processors. Under certain conditions, shortages of malting barley may occur when feed barley is in adequate supply,

resulting in substantial price differentials between the two uses.

The 1985 Act cut barley loan rates and permitted producers to redeem their nonrecourse loans with generic certificates. Processors and handlers benefited in two ways. First, the certificates moved barley from Government stocks to commercial channels, allowing a greater supply of grain in the market. Grain elevators, shippers, and grain exporting companies profit from higher volumes of grain marketed. Second, lower loan rates and larger supplies reduced input costs to processors. Merchants of retail food products also benefit from low commodity prices because they may sell more food.

Policies to reduce barley acreage also affect a wide spectrum of farm input suppliers. Fewer acres planted means less seed, fertilizer, chemicals, and fuel are needed. To limit the economic impact of acreage reduction on farm communities, the 1985 legislation specifies that no more than 50 percent of the base acreage in any county may be set aside and no more than 25 percent may be placed in the long-term conservation reserve.

Taxpayers

Federal price and income support outlays for all program commodities rose from $7 billion to $26 billion from fiscal years 1984 to 1986. These outlays were a consequence of the widened gap between target prices and the lower loan rates. However, total farm program costs have declined to an estimated $12 billion in fiscal 1990 because of higher market prices and falling target prices. The net CCC outlays for barley in fiscal year 1987 accounted for about 1.5 percent of total CCC outlays for all crops. An analysis of direct Government payments to barley producers is presented in table 14.

Deficiency and diversion payments to barley producers grew from $31 million in 1984/85 marketing year to $162 million in 1987/88. Taxpayer costs in the future will depend on the size of subsequent barley crops and market demand, both of which may be affected by weather conditions and the effectiveness of policies to reduce acreage and stocks. Costs to taxpayers of these income supports are expected to drop from their high of $203 million in 1986/87 as target prices continue to decline.

Net expenditures for the CCC nonrecourse loan program for barley were $394.3 million in fiscal 1987 (app. table 3). This expense includes $36.7 million in storage and handling costs and $42.6 million in FOR storage payments.

Taxpayers also bear the cost of the export enhancement program and the conservation reserve. EEP sales of barley totalled 6.5 million metric tons from April 1986 through May 1989. The average bonus over the same period was $36.08 per metric ton, or $0.84 per bushel of barley sold under EEP. Average bonuses have fallen more recently to $11-12 per metric ton. Rental payments for the conservation reserve are distributed over a 10-year

period. By 1989, farmers had signed up 2.3 million acres of barley base.

Indirect Effects

Feed grain programs and subsidized credit have had some indirect effects on land values, resource use, and trade competition. Program benefits, particularly those associated with a base or allotment, are capitalized into the value of land. Landowners originally allocated a base or allotment benefit from an increase in both current income and wealth. Renters or tenants, who account for more than two-thirds of farmers growing barley, receive a share of the current income, but they also face increased rents because of higher land values. Subsequent landowners have to pay a higher price for land. This dilutes the program benefits, particularly in the longer run, and also increases the subsequent cost of entry for new farmers. The above effect became less pronounced when program participation was no longer tied to the historical allotment. Farmers with 2 years of production records can now request USDA to certify their base acreage for program participation. Barley producers expanded their base acreage from 7.5 million in 1978 to 10.5 million in 1982. Nevertheless, if loan rates are set above market prices, they support land prices to some extent.

Prior to 1986, price supports raised domestic prices above world market prices, which affected world trade by both lowering import demand and increasing export supplies. Direct payments to farmers stimulate domestic production and result in larger supplies of exportable commodities. These surpluses may be sold at subsidized rates to compete with nations following similar policies. Market distortions have multiplied as exporters act to offset rival governments' intervention.

Issues for the 1990's

Policymakers will be looking for ways to reduce budgetary costs of the agricultural programs. Reforms such as targeting deficiency payments and limiting other payments are likely subjects of debate. Decoupling is one alternative to using across-the-board cuts in target prices to achieve budget savings. The plan would eliminate the production requirement from income support payments in exchange for a set Federal payment.

Changes in the acreage reduction program to a general cropland set-aside will be sought to better balance the level of support among competing commodities. The triple base proposal will be discussed as a way to improve the flexibility of farmers to plant crops in high demand by the market but are discouraged because of the loss of base acreage. An equitable realignment of feed grain target prices would also become necessary. Should the barley-oats base acreage be permanently expanded into a feed grain base? Some groups have proposed a barley program separate from other feed grains because of the significant proportion of the crop used for malt.