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Ed Young

United States Department of Agriculture

ERS

Agricultural Economic Report Number 712

An Economic Research Service Report

Wheat

Background for 1995 Farm Legislation

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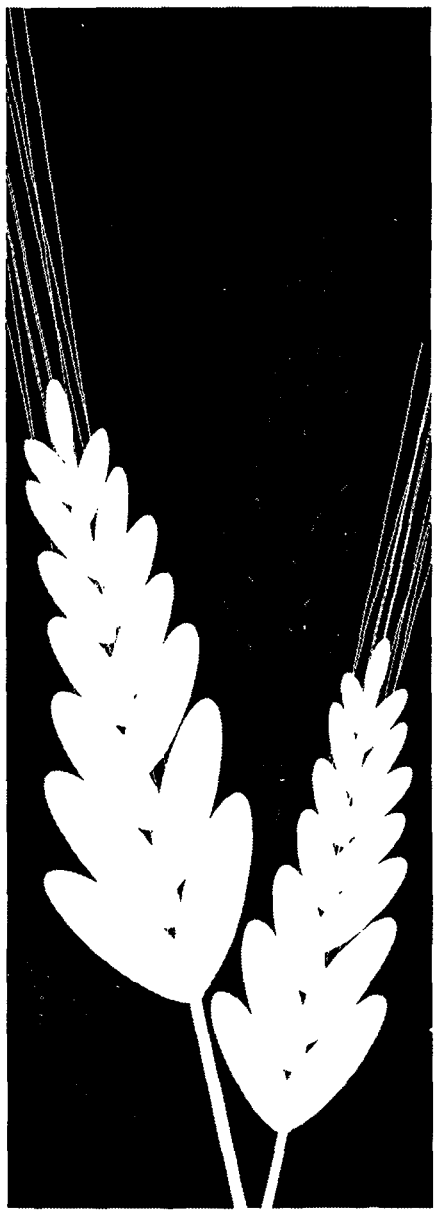

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Wheat: Background for 1995 Farm Legislation. By Linwood A. Hoffman, Sara Schwartz, and Grace V. Chomo. Commercial Agriculture Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 712.

Abstract

Surplus wheat stocks disappeared under the 1990 Food, Agriculture, Conservation, and Trade Act of 1990. The aggregate U.S. wheat sector appears in balance due, in part, to acreage reduction programs, the Conservation Reserve Program, and the Export Enhancement Program. However, some industry participants wonder whether wheat carryover levels are optimal and whether the public will approve a continuation of government expenditures near current levels, while others want to maintain low carryover stocks. Exports will likely be the largest source of demand growth for U.S. wheat for the remainder of the 1990's. Global wheat trade is expected to expand steadily through the 1990's at a rate higher than the 1980's, but well below the rate experienced in the 1970's. The U.S. market share is expected to drop slightly over the next decade to about 31 percent as competition increases in a growing world market. Issues for the 1995 farm legislation include levels of program benefits and costs, methods for calculating deficiency payments, the future of the Conservation Reserve Program, farm program cost containment, planting flexibility, wheat imports, marketing loan provisions, targeting benefits to producers, environmental quality, and the future of the Export Enhancement Program.

Keywords: Wheat, production, domestic use, world trade, prices, costs and returns, farm programs, and program effects

Foreword

Congress will soon consider new farm legislation to replace the expiring Food, Agriculture, Conservation, and Trade Act of 1990. In preparation for these deliberations, the U.S. Department of Agriculture and other groups are studying previous legislation and current situations to see what lessons can be learned that are applicable to the 1990's and beyond. This report updates *Wheat: Background for 1990 Farm Legislation* (AGES 89-56), by Joy L. Harwood and C. Edwin Young. It is one of a series of updated and new Economic Research Service background papers for farm legislation discussions. These reports summarize the experiences with various farm programs and the key characteristics of the commodities and the industries that produce them. For more information, see Additional Readings at the end of the text.

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Summary

Wheat stocks in the United States were reduced substantially under the 1990 Farm Act (officially entitled the Food, Agriculture, Conservation, and Trade Act). Whether current carryover levels are optimal will be one issue in the deliberations over new farm legislation. Factors that have helped keep stocks down include, in part, the acreage reduction program (ARP), the Conservation Reserve Program (CRP), and the Export Enhancement Program (EEP).

Exports will likely be the largest source of demand growth for U.S. wheat for the remainder of the 1990's. Global wheat trade is expected to expand steadily through the 1990's at a rate higher than the 1980's, but well below the rate experienced in the 1970's. Current projections are that the U.S. share of world trade in 2000 will about equal the 1990-94 average of 32 percent, but the share is expected to decline slightly thereafter due to increasing competition.

Wheat is the third largest U.S. field crop in terms of farm value, with annual receipts averaging more than $7 billion in recent years. This amounted to about 9 percent of total farm value of U.S. field and miscellaneous crops in crop years 1991-93. The value of wheat, flour, and wheat product exports averaged $4.4 billion in fiscal 1991-93, which was 11 percent of total U.S. farm exports. More than half of total U.S. wheat production was exported during the 1991-93 crop years.

Major wheat program issues this year include:

- What level of program cost is acceptable? What methods should be used to reduce government expenditures on the wheat program?
- How has the normal flex acres provision affected acres planted to wheat?
- Are current U.S. stock levels of wheat optimal? What are the purposes of the Food Security Wheat Reserve and the Farmer-Owned Reserve?
- What is an acceptable level of wheat imports? Should the United States import wheat that is duty-free or with minimum duties when such grain is subsidized by the exporting country?
- Should the wheat program encourage reduced use of chemical inputs to protect the environment, if yields are reduced?
- Should marketing loan provisions be continued for wheat?
- What kind of export market development, promotion, and assistance programs should be maintained for wheat, with the GATT (General Agreement on Tariffs and Trade) Uruguay Round agreement?
- Should government program benefits be targeted to certain types of farmers?
- Should a more flexible whole farm base program be implemented and, if so, what is the expected impact to the wheat sector?
- Should all classes of wheat be treated the same under government programs?

These questions must be considered in the context of the following recent developments in U.S. and world wheat markets:

- The U.S. market share in world wheat trade has averaged 32 percent in 1990-94, down from previous highs established in 1975-79 of 42 percent. The U.S. share is projected to decline slightly over the next decade, given the new CRP provisions and implementation of GATT.

- Foreign countries continue to have the potential to expand production.

- Planted acreage of U.S. wheat ranged from 70 to 72 million in 1991-94 despite reductions in ARP levels. This raises questions about U.S. production potential, especially if the CRP is extended.

- Feed use of wheat is not seen as a significant growth area for wheat consumption.

Important wheat production and marketing characteristics must also be considered in finding appropriate policies:

- Wheat is a supplementary enterprise on many farms, especially east of the Mississippi River, but in other areas wheat is the major crop grown because of land types and climatic conditions. Program needs may be different for the two situations.

- Imports exist and this factor must be considered when initiating government supply management or demand expansion policies.

Wheat production and demand have been fairly well balanced during the 1991-94 period. While the steady increase in domestic food use is expected to continue, exports are expected to provide the largest source of demand growth over the next 5 years. If growth in demand outgains yield growth by the end of the decade, higher prices may encourage additional land to enter production. However, if a large amount of wheat base remains in the CRP, the U.S.'s ability to respond to increasing wheat prices with increased plantings may be limited.

Wheat

Background for 1995 Farm Legislation

Linwood A. Hoffman, Sara Schwartz, and Grace V. Chomo

Introduction

The 1995 wheat crop will probably be the last crop produced under the 1990 Food, Agriculture, Conservation, and Trade (FACT) Act. Although this act has met many of its objectives, dialogue has begun on ways to improve the next major farm bill. Many issues are being discussed, such as protecting the environment, regulating for food safety, allowing producers to continue to be viable and competitive, implementing a crop insurance plan that is affordable and effective, lessening budget expenditures, and continuing the current legislation with minor changes.

The focus of many discussions during the summer and fall of 1994 was on distributing benefits to producers; maintaining export competitiveness through the Export Enhancement Program (EEP); maintaining the Conservation Reserve Program (CRP) and environmental issues; and planting flexibility. Some groups fear that if Federal farm programs continue to reward consolidation in agriculture by helping well-established large farms acquire control of the land, these large farms will bid moderate-sized or beginning farmers out of the land market. Other concerns expressed are that ways should be sought to further protect the environment, regulate food safety, and minimize government costs while allowing producers to be viable and competitive. One group is developing a proposal for an Environmental Reserve Program that would replace the Acreage Reserve Program. Some groups are suggesting ways to continue with an improved CRP. Others want to continue the direction of the current law, but provide more planting flexibility and "creative environmental incentives" while maintaining farm income.

This report describes major factors and developments in wheat production and marketing that must be considered in finding appropriate policies. The current and prospective economic well-being of wheat producers is likely to affect the policy debate. Economic and structural factors affecting the current cost/returns position of wheat farmers are also reviewed. Trends in domestic use, exports, and supply are examined to explain price fluctuations that have characterized the wheat industry. Many of the issues facing the sector are briefly discussed.

The report also defines the characteristics of wheat production and demand that distinguish it from other crops. There are five major classes of wheat which are grown in distinct regions and which have different uses. The economic and environmental conditions affecting wheat and accompanying trends greatly influence how wheat farmers respond to market conditions and to farm programs.

The review of recent wheat programs presented in this report, economic conditions motivating the programs, results of those programs, and a review of issues facing the sector are useful in developing future policy.

Characteristics of the Wheat Industry

Wheat is the principal food grain in the United States and, along with rice, one of the major food grains throughout much of the world. The farm value of U.S. wheat production totaled $7.7 billion in 1993, 9 percent of total U.S. crop values that year (*26*).[1] Domestic use's average share of total wheat consumption has grown since 1980. Although exports' share of total consumption has dropped, exports still accounted for about 50 percent of total use in marketing year 1993/94 (app. table 1). Wheat exports accounted for 13 percent of total U.S. agricultural exports or $6.5 billion in fiscal 1993. The characteristics, performance, and issues of the wheat sector are examined to aid evaluation of policy alternatives.

[1]Italicized numbers in parentheses refer to sources listed in Additional Readings at the end of this report.

Structure of the Production Sector

The number of U.S. farms harvesting wheat fell 17 percent from 352,237 in 1987 to 292,464 in 1992 (table 1). The number of all-grain farms fell 16 percent. Part of the decline in wheat farming may be caused by a transfer of assets into the production of other crops, especially other grains (*18*). Farms harvesting wheat averaged 202 acres in 1992, up from 151 acres reported in 1987 (*32* and *33*). Reasons for the increase in harvested acres per farm were, in part, more favorable market returns to producers, a lower acreage reduction program (ARP) requirement in 1992 (5 percent) compared with 1987 (27.5 percent), and fewer farms in 1992 compared with 1987.

Wheat production continues to be a supplementary enterprise for many farmers. The number of farms harvesting wheat by each size group declined between 1987 and 1992 with a decline in the smaller farms' share of the total number but a slight gain in the larger farms' share (table 1). Fifty-seven percent of farms harvested 1 to 99 acres of wheat during 1992. Farms in this category accounted for only 11 percent of total wheat production in 1992. Consequently, the wheat program may not be as important to these producers as to producers with larger acres harvested. In contrast, farms harvesting 100 acres or more accounted for only 43 percent of the farms harvesting wheat but 89 percent of production.

The proportion of the larger farms harvesting wheat increased between 1987 and 1992, while the proportion of the smaller farms harvesting wheat declined (table 2). Farms with 500 acres of cropland or more accounted for 51 percent of farms harvesting wheat in 1992, compared with 48 percent in 1987. Farms with less than 260 acres accounted for 31 percent in 1992, down from 32 percent in 1987. Larger farms harvesting wheat may partly reflect the general trend of increasing farm size. The average size of all U.S. farms rose from 462 acres in 1987 to 491 in 1992. Nearly 35 percent of the farms harvesting wheat had annual sales of $100,000 or more in 1992, while only 13 percent had sales of less than $10,000 (table 2). In comparison, about 27 percent of the farms had annual sales of $100,000 or more in 1987 and 16 percent had sales below $10,000.

The organization and tenure of wheat farm operators did not change very much between 1987 and 1992. The largest group of wheat farm operators, 81 percent of all operators, continues to be individual or sole proprietorships. Partnerships account for 13 percent of wheat farms; and corporations, 5 percent. The tenure of wheat farm operators continues to be controlled by part-owners accounting for 55 percent of the total, followed by full-owners with 30 percent, and tenants with 15 percent.

Table 1—Number of farms harvesting wheat by acres, production, and yield, 1987 and 1992

Year/acres harvested	Farms	Share of total	Production	Share of total	Yield/acre
	Number	*Percent*	*Bushels*	*Percent*	*Bushels*
1987:					
1-99	224,529	63.7	292,651,950	15.5	40.0
100-249	65,041	18.5	365,017,228	19.3	35.9
250-499	36,471	10.4	435,897,148	23.1	34.5
500-999	19,915	5.6	457,393,896	24.2	34.5
1,000 and over	6,281	1.8	336,143,742	17.8	34.2
Total	352,237	100.0	1,887,103,964	100.0	35.5
1992:					
1-99	167,871	57.4	245,323,241	11.1	41.7
100-249	57,625	19.7	350,663,650	15.9	39.2
250-499	33,429	11.4	433,542,602	19.6	37.2
500-999	22,703	7.8	564,956,378	25.6	36.6
1,000 and over	10,836	3.7	612,243,605	27.8	35.6
Total	292,464	100.0	2,206,729,476	100.0	37.3

Sources: (*32* and *33*).

Table 2—Number of farms harvesting wheat by farm size and sales class, 1987 and 1992

Year/cropland acres	Farms	Share of total	Gross sales	Farms	Share of total
	Number	*Percent*		*Number*	*Percent*
1987:					
1-99	39,940	11.3	Less than $2,500	13,888	3.9
100-259	75,611	21.5	$2,500-$9,999	47,850	13.6
260-499	70,836	20.1	$10,000-$39,999	108,195	30.7
500-999	76,663	21.8	$40,000-$99,999	89,920	25.5
1,000 and over	89,187	25.3	$100,000-$249,999	64,705	18.4
			$250,000-$499,999	19,510	5.6
			Greater than $500,000	8,169	2.3
Total	352,237	100.0		352,237	100.0
1992:					
1-99	32,033	10.9	Less than $2,500	7,681	2.6
100-259	59,374	20.3	$2,500-$9,999	31,901	10.9
260-499	54,612	18.7	$10,000-$39,999	80,388	27.5
500-999	62,608	21.4	$40,000-$99,999	70,569	24.1
1,000 and over	82,837	28.7	$100,000-$249,999	64,217	22.0
			$250,000-$499,999	25,099	8.6
			Greater than $500,000	12,609	4.3
Total	292,464	100.0		292,464	100.0

Sources: (*32* and *33*).

The older age categories are claiming a larger share of the wheat farm operators. Between 1987 and 1992, the largest increase occurred in the 65 years of age and older category, increasing from 19 to 23 percent of the total. The age group incurring the largest decline was 34 years of age and under, declining from 16 percent to 13 percent.

Location of Production

Wheat is produced throughout the United States under different weather and soil conditions. The Great Plains region harvests the largest share of U.S. wheat acreage followed by the North Central, Northwest, South, Southwest, and Northeast (table 3). While there were minor variations in regional shares between 1960 and 1994, the Great Plains generally lost about 3 percentage points with an offsetting gain in the South. This shift occurred, in part, because of an increase in double cropping in the South with either soybeans or sorghum.

Wheat has two distinct planting periods. Winter wheat is sown in the fall and harvested during the following spring and summer. Spring wheat is sown in the spring and harvested in late summer or early fall.

Table 3—Wheat harvested area, by region, 1960-94

Selected regions	1960	1970	1980	1993	1994[1]
			Percent[2]		
Great Plains[3]	72	73	68	68	69
North Central[4]	15	11	15	16	15
South[5]	3	3	5	6	6
Northwest[6]	7	9	9	8	7
Southwest[7]	2	3	3	2	2
Northeast[8]	2	1	1	1	1
			Million acres		
U.S. wheat acreage	51.9	43.6	71.1	62.6	62.0

[1]Projections. [2]Percentages may not sum to 100 due to rounding. [3]CO, KS, MT, NE, ND, OK, SD, TX, and WY. [4]IL, IN, IA, MI, MN, MO, OH, and WI. [5]AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, and WV. [6]ID, OR, and WA. [7]AZ, CA, NV, NM, and UT. [8]DE, MD, NJ, NY, PA, and New England States.

Sources: (*9* and *26*).

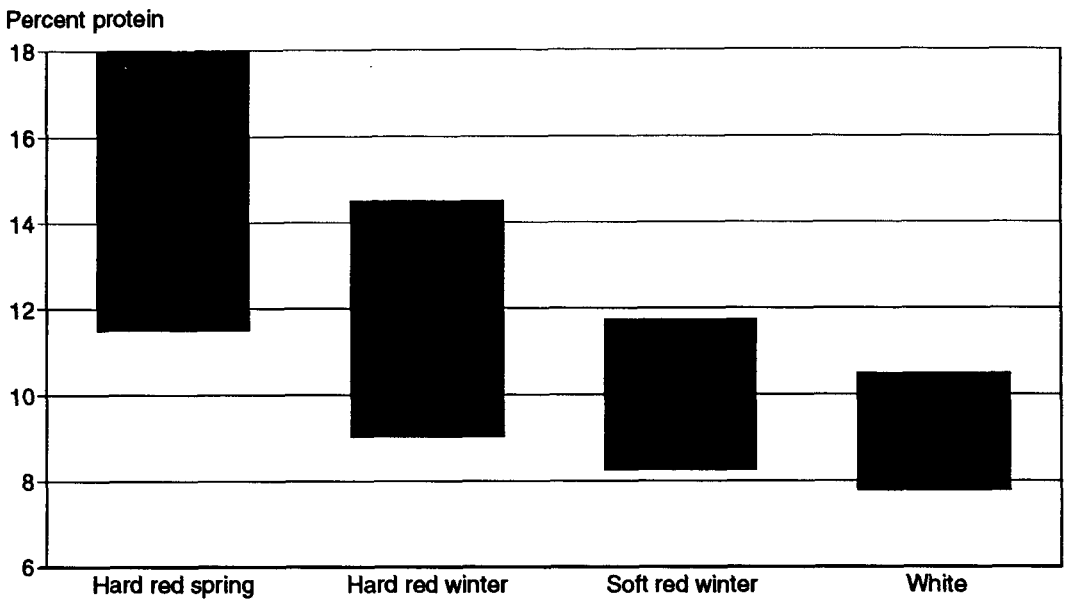
Winter wheat normally accounts for 70 to 80 percent of total production.

Wheat Classes

Five major classes of wheat are grown in the United States: hard red winter, hard red spring, soft red winter, white, and durum (table 4). The U.S. wheat program operates on a single national average farm price for wheat because of some substitutability of the different classes of wheat in end uses.

Each class of wheat has a somewhat different end use and its production tends to be region specific (figs. 1 and 2). U.S. white wheat is used primarily in noodle products, crackers, and cereal products. It is high-yielding and low in protein with production

Figure 1
Protein range and flour uses of major wheat classes[1]



Flour uses

- Used to blend with weaker wheats for bread flour.
- Whole-wheat and hearth breads.
- White bakers' bread and bakers' rolls.
- Waffles, muffins, quick yeast breads, and all-purpose flour.
- Noodles (oriental), kitchen cakes and crackers, pie crust, doughnuts, cookies, foam cakes, and very rich layer cakes.

[1]Flour uses are approximate levels of protein required for specified wheat products. Durum is not shown because it is not traded on the basis of protein content.

Table 4—Wheat production by class: Total and leading States, 1994[1]

Class	Production	Share	Leading States
	Million bushels	*Percent*	
Hard red winter	972	41	KS, OK, TX
Soft red winter	441	18	MO, IL, OH
Hard red spring	564	24	ND, MN, MT
White	311	13	WA, OR, ID
Durum	98	4	ND, CA, MT
Total	2,386	100	

[1]Projections.
Source: (*26*).

Figure 2

Distribution of the five U.S. market classes of wheat

1 Dot = 5,000 acres
Source: (*10*).

concentrated in the Pacific Northwest, Michigan, and New York. Durum wheat is used mostly in pasta products and is produced in the Northern Plains and desert Southwest. Hard red spring wheats are primarily used to make bread flour. Hard red winter wheat is used mostly for bread, while soft red winter is used largely in cakes, cookies, and crackers. Hard red winter wheat is produced from Texas to Montana and California to Missouri but is concentrated in the Central Plains whereas soft red winter wheat is concentrated in the Corn Belt and East. Generally, hard red spring wheat has the highest protein content and is produced in the Northern Plains where the climate is too cold for over-wintering of winter wheat varieties.

All five classes of wheat are exported. Between 1990 and 1994, hard red winter accounted for 37 percent of wheat exports; hard red spring, 26 percent; soft red winter, 15 percent; white, 18 percent; and durum, 4 percent.

Regional weather changes are less likely to cause fluctuations in total wheat supply than in other major field crops because wheat production is less concentrated geographically. For example, in 1991-94, U.S. average wheat yields varied by 6 percent (coefficient of variation) compared with 13 percent for corn (app. table 10).

Production by individual wheat classes is more concentrated than total wheat (fig. 2). Consequently, the supply and demand situation for a given class may differ from the supply and demand situation for all wheat. Since wheat demand is somewhat class-specific, shortfalls within a class can significantly raise the price of that class of wheat relative to other classes.

Trends in Supply

Beginning stocks, domestic production, and imports determine the total supply of wheat.

Beginning Stocks

Stocks rose to high levels in the 1980's, with more than 1 billion bushels held over between 1981 and 1987. However, stocks averaged about 522 million bushels during 1991-94, resulting in a stocks-to-use ratio near 21 percent (table 5). Both figures represent a sector reflecting a more balanced supply and use compared with earlier years.

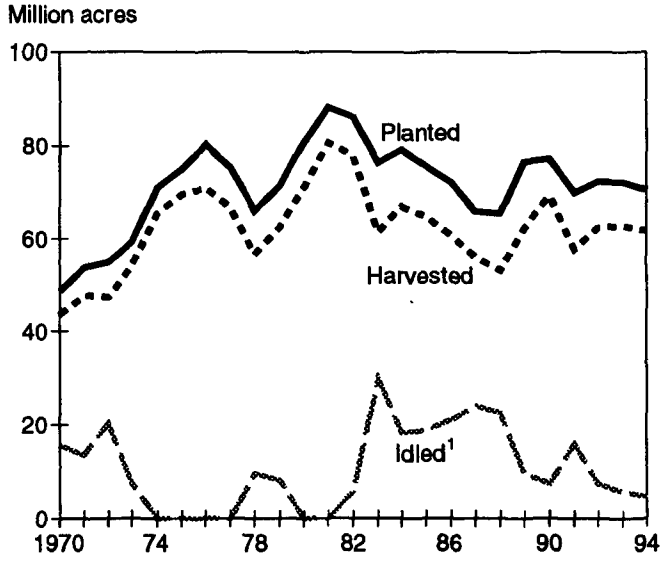
Production

U.S. wheat production is determined jointly by the area harvested for grain and average yield per acre. Farm program requirements and participation rates influence acreage harvested. Figure 3 illustrates acreage planted, harvested, and base acres idled under government programs. The relationship between area planted and harvested varies substantially by region. Producers in livestock feeding areas typically graze out some of their wheat fields, rather than harvest them for grain. Other producers allow cattle to graze wheat, but remove livestock to allow grain to form for harvest. Farmers make the decision to remove livestock from winter wheat prior to jointing depending on livestock prices relative to the value of wheat as grain, as well as on feed grain supplies and prices.

Area harvested. The relationship between planted and harvested acreage is fairly stable, except for periods of drought such as 1983 or 1988 when abandonment rates have been abnormally high (fig. 3). Between 1970 and 1981, planted area increased to a high of 88.3 million acres in 1981. Since 1981, planted area declined to a low of 65.5 million acres in 1988. Area planted to wheat was 70.5 million acres in 1994.

Sharp declines or increases in planted area are usually the result of changes in government programs requiring base acres to be idled. In an effort to control production, support farm income, and limit government costs, various acreage limitation programs have been employed. There has been some type of program provision idling base acres since 1970 with the

Figure 3
U.S. wheat acreage: Planted, harvested, and idled, 1970-94



[1]ARP, diversion, PLD, 50/92, 0/92, and 0/85. Excludes acres idled under CRP.

Table 5—Wheat supply, disappearance, area, and prices, crop years 1990/91-1994/95

Item[1]	1990/91	1991/92	1992/93	1993/94[2]	1994/95[3]
			Million bushels		
Supply:					
Beginning stocks, June 1	537	866	472	529	570
Production	2,736	1,981	2,459	2,403	2,320
Imports[4]	36	41	70	109	85
Total	3,309	2,888	3,001	3,041	2,975
Domestic disappearance:					
Food	790	790	834	869	885
Seed and industrial	93	98	98	95	97
Feed and residual[5]	491	246	186	278	225
Total	1,374	1,134	1,118	1,243	1,207
Exports:[4]	1,070	1,282	1,354	1,228	1,207
Total disappearance	2,444	2,416	2,472	2,470	2,457
Ending stocks, May 31	866	472	529	570	518
Farmer-Owned Reserve	14	50	28	6	0
Special program[6]	0	0	0	0	0
CCC inventory[7]	163	152	150	150	145
Free	689	270	351	414	373
Outstanding loans[8]	217	206	47	67	45
			Million acres		
Area:					
Planted	77.2	69.9	72.3	72.2	70.5
Harvested	69.3	57.7	62.4	62.7	61.7
Set-aside and diverted[9]	7.5	15.9	7.3	5.7	4.7
Conservation Reserve	10.3	10.4	10.6	10.8	10.8
National base acreage	90.8	89.6	89.6	89.6	89.0
			Bushels per acre		
Yield per harvested acre	39.5	34.3	39.4	38.3	37.6
			Dollars per bushel		
Prices:					
Received by farmers	2.61	3.00	3.24	3.26	3.45
Loan rate	1.95	2.04	2.21	2.45	2.58
Target	4.00	4.00	4.00	4.00	4.00

[1]Totals may not add because of rounding. [2]Estimated. [3]Projected, 11/9/94. [4]Imports and exports include flour and other products expressed in wheat equivalent. [5]Residual. Approximates feed use and includes negligible quantities used for alcoholic beverages. [6]Projected amount of free stock carryover in the Special Producer Storage Loan Program. [7]Includes about 147 million bushels in the Food Security Reserve in each year. [8]Projected amount of free stock carryover under 9-month loan. [9]Includes ARP, diverted, 50/92, and 0-85/92 acres.

Source: (*26*).

exception of the 1974-77 and the 1980-81 crop years (fig. 3 and app. table 1). Currently, acreage bases, 0/85, flexibility provisions, lower loan rates than in the early 1980's, and CRP acres provide a better balance between supply and demand.

Farmers have not been required to idle base acres under ARP provisions in 1993/94 or 1994/95 marketing years but an ARP of 15 percent was announced for 1991/92 and 5 percent for 1992/93, idling 10.1 and 3.3 million acres, respectively (table 5). During 1986-90 crop years, ARP's ranged from 5 to 27.5 percent and idled from 3.2 million to 20.2 million acres. 0-85/92 provisions idled 4 million to 5.8 million base acres between 1991 and 1994 compared with 1.3 to 5.3 million base acres during 1986-90. In addition to ARP and related annual programs, 10.8 million acres of wheat base were in the CRP program as of 1994. One reason why ARP's have been smaller in recent years is because nearly 11 million acres of wheat base acres were enrolled in CRP, thereby reducing production potential.

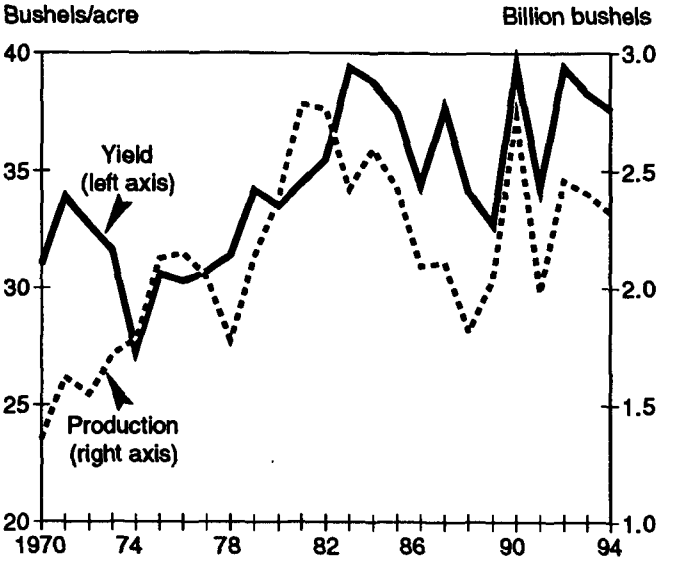
The flexibility provision of the 1990 FACT Act has also affected planted wheat acreage. Between 1991 and 1994, the net movement of flex acreage planted has been out of wheat, ranging from 1.3 to 2.3 million acres. An additional 0.7 to 2.9 million acres of wheat-base flex acres have not been planted.

Planted wheat area declined by 6.7 million acres between 1990 and 1994 despite a rebound in prices in 1993 and 1994. Net flex accounts for 1.5 million, flex not planted accounts for 2.9 million, and CRP accounts for 0.5 million for a total of 4.9 million. The remaining decline is not readily explained.

Yields. Because of growth in yields and acres harvested, U.S. wheat production rose from around 1.4 billion bushels in 1970 to nearly 2.4 billion bushels in 1994. Average U.S. wheat yields have risen from around 30 bushels per acre in the mid-1970's to an average of 38 bushels per acre in the 1990's (fig. 4). USDA's current yield trend increases 0.3 bushels per acre, per year. However, actual yield varies by wheat variety, region, and even individual farm.

Growth in U.S. yields has slowed in the last 15 years. The decline in yield growth may be due, in part, to the increased variability of yields. As newer, higher yielding varieties are adopted, average yield increases but variation also increases. Because much wheat is grown in areas with limited moisture, wheat will provide a lower yield in years of low moisture but a higher yield in years of abundant moisture.

Figure 4
U.S. wheat production and yields, 1970-94



Many factors affect U.S. average wheat yields: climatic conditions, weather, farm management practices, variety, type of soils, total acreage level, and regional distribution of acreage. U.S. wheat yields are predicted to increase about 0.7 percent annually over the next 6 years as long as marginal acreage is idled and weather is favorable (*27*). Plant breeding has created the potential for larger and more rapid improvements in yields. Average dry-land yields have reached 60 bushels per acre in some soft wheat producing States. However, moisture availability in hard wheat producing States may limit yield growth.

Growth in the U.S. yields should compete favorably with the global average. Global average wheat yields are projected to increase at a slower rate than in the 1980's (*25*). Global yield gains will be based on wider adoption of current technology. Technological breakthroughs that are cost effective and capable of boosting yield potential do not appear imminent and the gains from the Green Revolution are slowing. Yield growth will be strongest where irrigation systems are continuing to expand. Yield growth in the European Union (EU) is expected to slow in response to lower grain prices as producers reduce yield-enhancing inputs.

Imports

Wheat imports were an insignificant factor for U.S. supply for many years. Prior to 1973, imports were restricted. Wheat imports were fairly low in volume and less than 1 percent of supply between 1960 and

1989, but became an issue in the early 1990's, as imports reached 109 million bushels, including products, in the 1993 marketing year, or 4 percent of supply.[2] U.S. wheat producers became concerned over the volume of wheat imports, prompting an investigation by the International Trade Commission and later a U.S.-Canadian agreement was reached over temporary limits to U.S. wheat imports from Canada. The agreement established a joint commission to recommend solutions to the conflict (*26*).

The increase in 1993/94 imports was caused by some unusual circumstances (*26*). The reduced U.S. corn crop in 1993 happened to coincide with a poor-quality, freeze-damaged Canadian wheat crop, making it attractive for Canada to sell wheat to the United States as a feed grain. The U.S. spring wheat crop also suffered quality problems from disease and low protein, increasing U.S. millers' demand for the available good-quality Canadian spring wheat. Very tight U.S. durum supplies further increased demand for imports.

Some of the reasons for the surge in imports in 1993/94 are expected to diminish in 1994/95 (*26*). Based on the estimated U.S. corn crop for 1994, Canada has less economic incentive to sell wheat in the United States as a feed grain. U.S. and Canadian spring wheat crops have improved quality characteristics. U.S. durum production is up sharply. Despite these factors, the United States remains an attractive market for Canadian wheat producers. In addition, the recent agreement between the United States and Canada is expected to limit Canadian wheat shipments to the United States.

Trends in Total Disappearance

Total consumption of wheat is separated into domestic use (food, seed, and feed and residual) and exports. Domestic use accounted for an average 48 percent of total wheat disappearance during 1991-94 (fig. 5 and table 5). During the 1950's, domestic use of wheat was double or triple exports, but during 1975-84, exports averaged 60 percent of total disappearance (app. table 2). During 1991-94, exports averaged 52 percent of the total consumption.

Food Use

Food use has been the largest and most stable component of domestic use, characterized by a steady growth rate (table 6 and fig. 5). In 1970, food use was approximately 500 million bushels, 34 percent of total consumption or 70 percent of domestic use. Food use rose to 869 million bushels by marketing year 1993/94 and accounted for 35 percent of total consumption or 70 percent of domestic use.

The demand for wheat food use is relatively unaffected by changes in wheat prices or disposable income. However, demand is closely tied to population, tastes, and preferences. Between calendar years 1970 and 1993, food use of wheat grew 3 percent annually compared with population's annual growth of 1 percent (*15* and *16*).

While per capita consumption of wheat flour has been rising steadily, this growth rate is expected to slow. Originally, the growth in per capita consumption of wheat flour products could be attributed to the increase in consumption of fast food and prepared products. Recent acceleration in the growth of food use could be the result of healthier, grain-based, higher fiber diets. However, saturation is expected to eventually limit growth.

Feed and Residual Use

Feed and residual use is more variable and is related to corn/wheat prices and wheat crop quality. Wheat used as livestock feed is not expected to be a major source of growth in wheat consumption, if wheat prices remain strong compared with corn. Feed and residual use averaged 10 percent of total disappear-

[2]Imports include flour and other products expressed in wheat equivalent.

Figure 5
U.S. wheat disappearance, crop years 1970-94

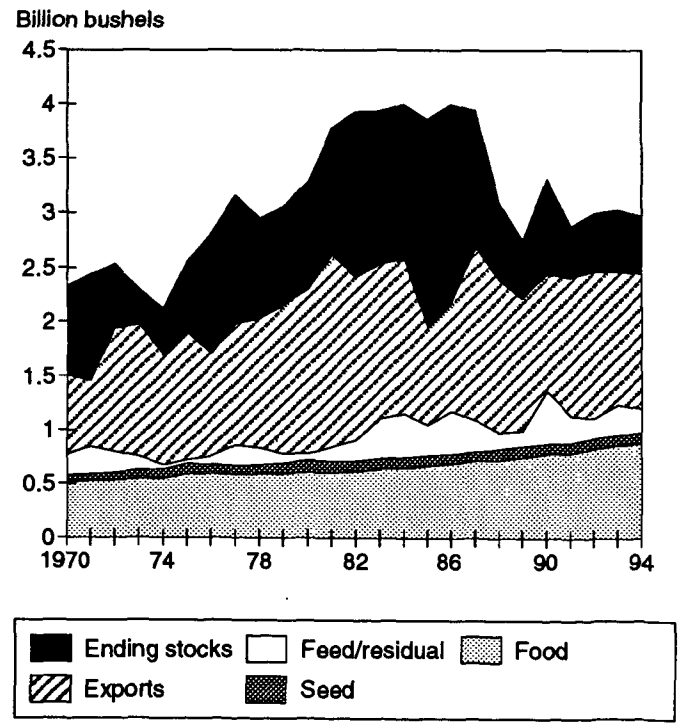


Table 6—Domestic use of wheat, selected crop years

Use	1970		1980		1990		1994[1]	
	Use	Share of total use	Use	Share of total use	Use	Share of total use	Use	Share of total use
	Mil. bu.	*Percent*	*Mil. bu.*	*Percent*	*Mil. bu.*	*Percent*	*Mil. bu.*	*Percent*
Domestic use:	772	51	783	35	1,374	56	1,207	49
Seed	62	4	114	5	93	4	97	4
Food	517	34	610	27	790	32	885	36
Feed and residual[2]	193	13	59	3	491	20	225	9

[1]Projections as of November 9, 1994. [2]Calculated as a residual.
Sources: (*9* and *26*).

ance during 1991-94, down slightly from a 12-percent average share during 1986-90 (fig. 5).

Feed and residual use changes substantially from year to year depending on relative prices of wheat, feed grains, and soybean meal; the quantity of wheat not meeting grade standards for domestic food use; and the quantity of animals on feed. Feed use of wheat is also seasonal, being most prominent right after wheat harvest when wheat prices are low, and when new-crop corn and sorghum have not yet been harvested.

Feed use is not measured directly and includes a residual component which includes negligible quantities used for alcoholic beverages.

Exports

U.S. exports averaged 57 percent of production and 53 percent of total consumption annually between 1985 and 1993 (fig. 5). While exports' share of production fluctuated throughout the 1980's and early 1990's, exports' share of use declined as the volume of exports fell and domestic use increased.

During 1982, the United States accounted for 48 percent of the world's wheat exports, about equal to 1973's 50-percent share. However, by the beginning of the 1990's, the U.S. share had fallen to about one-third. In the early 1980's, the United States began to lose market share because of high U.S. loan rates and strong competition, particularly with the EU. The EU's export share grew from about 16 percent in the early 1980's to about 20 percent by the end of the decade.

The Export Enhancement Program (EEP), a program initiated in May 1985 under a Commodity Credit Corporation (CCC) charter and later instituted as part of the 1985 farm bill, helped keep U.S. export share from falling further. Under the EEP, exporters are awarded generic commodity certificates or payments. In November 1991, wheat EEP bonuses began to be issued in cash rather than commodity certificates. The certificates were redeemable for CCC-owned commodities. The certificates or payments enable an exporter to sell certain commodities to specified countries at prices below those of the U.S. market.

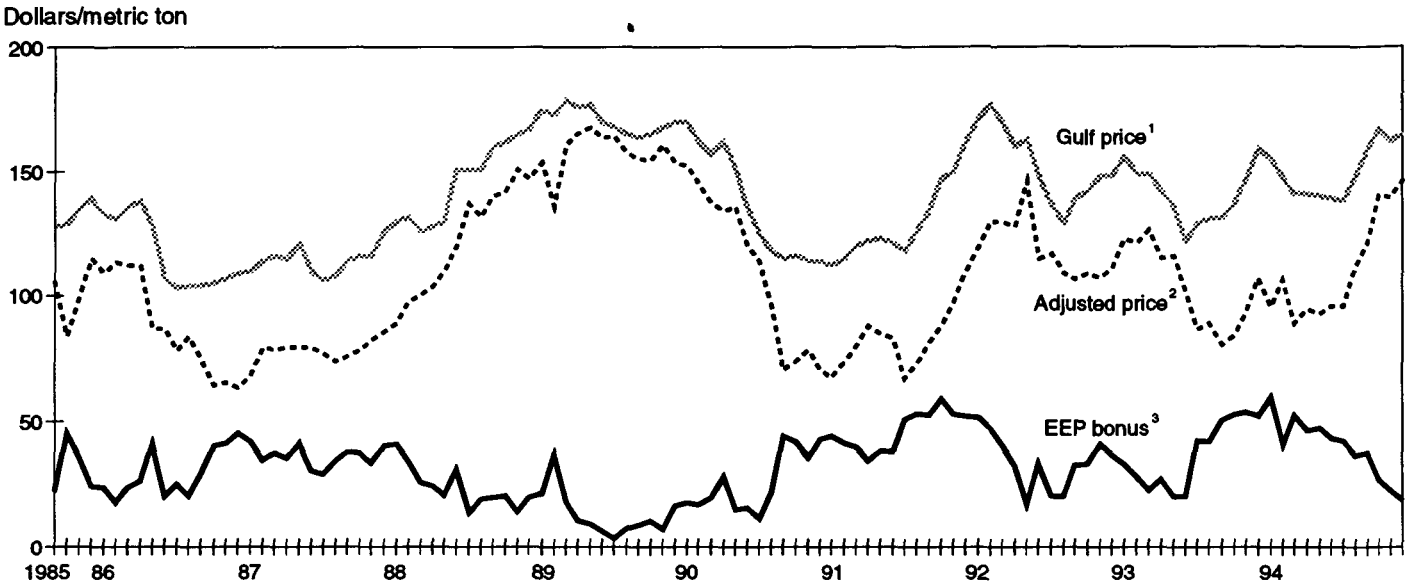
About two-thirds of U.S. wheat exports are currently receiving EEP subsidies (app. table 11). EEP subsidy levels have varied over time (fig. 6). Other programs, such as General Sales Manager (GSM) credit guarantees, are often used in conjunction with EEP to keep U.S. wheat exports competitive (app. table 11). Over the next decade, the United States is expected to maintain about one-third of the world export market. U.S. exports are also expected to rise, as the global market is forecast to grow moderately.

Trends in Global Wheat Trade With Future Prospects

Global wheat trade is expected to expand through the 1990's at a rate higher than the 1980's, but well below the rate experienced in the 1970's (table 7) (*25*). Nearly all the growth will be caused by larger imports by developing countries (fig. 7). Increased import demand is expected to lead to higher world wheat prices, stimulating moderate production and export growth, especially in Canada, Australia, and Argentina.

Production and use growth rates slowed in the early 1990's because of radical shifts in production and consumption in Eastern Europe and the Former Soviet Union (FSU). Also, drought in several parts of the world in 1993 and 1994 limited growth in yields and area. Assuming normal weather, growth trends should again turn positive, although production growth is likely to be slower than in recent decades. Some area expansion is expected, particularly in South Asia. But

Figure 6
Impact of EEP on U.S. wheat export prices, 1985-94



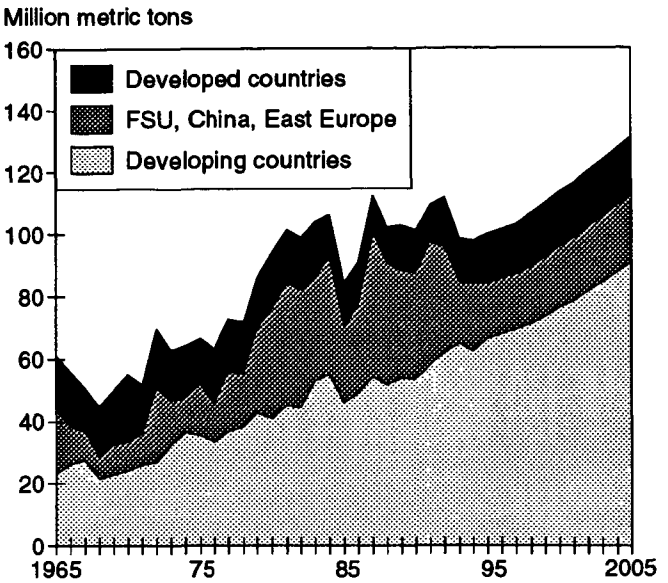
[1]HRW No. 2. [2]Adjusted by EEP bonus. [3]Weighted monthly average of all classes.

Table 7—Indicators of global change: Annual growth rates[1]

Item	1960's	1970's	1980's	1990-94	1995-99	2000-05
			Percent			
Area	0.7	1.2	-0.7	-1.5	0.4	0.5
Yield	3.1	2.0	2.9	-0.2	1.0	0.9
Production	3.7	3.2	2.2	-1.7	1.4	1.4
Total use	3.8	2.9	2.4	-0.1	1.3	1.5
Per capita use	1.7	1.1	0.6	-2.2	-0.3	0
Feed use	10.7	1.7	2.9	-6.2	0	0.6
Trade[2]	1.6	4.6	-0.4	-1.1	2.7	2.9
Ending stocks	3.3	5.2	1.2	-4.3	-1.2	-2.6
Population	2.1	1.9	1.7	1.7	1.7	1.6

[1]Exponential growth rate. Includes beginning and end of time period. [2]Excludes intra-EU and intra-FSU trade.
Source: (*25*).

Figure 7
World wheat trade: Actual 1965-93 and forecasts 1994-2005, by marketing year



Marketing year = July-June.

yield growth may decline from the 1980's because the gains provided by Green Revolution technology have largely been achieved. Additional yield increases will need to come from the expansion of current technology.

Consumption growth is also expected to decline from that of earlier decades. Food consumption of wheat is expected to continue expanding, particularly as incomes rise in developing countries. However, feed use of wheat is expected to remain low, mostly because of the drop in livestock inventories in the FSU and Eastern Europe.

Trade in the 1980's was highly variable and showed little growth throughout the decade. While developing country imports continued to expand, especially in the last half of the decade and into the 1990's, imports by the FSU and China (together accounting for a third of global trade) were highly variable.

These oscillations continued into the 1990's, with changes in the grain market resulting from market reforms in the FSU and China becoming more apparent by 1993 (table 8). Both buyers have sharply reduced their wheat imports. China is expected to expand imports during the next decade, although from a lower base. An expected low volume of FSU im-

Table 8—World wheat imports, selected countries, 1989/90-1994/95[1]

Country	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95[2]
			Million metric tons			
European Union[3]	1.6	1.5	1.2	1.3	1.7	2.0
Former Soviet Union[4]	20.4	23.2	22.2	23.7	13.4	12.4
China	12.8	9.4	15.9	6.7	4.3	9.0
East Europe	1.0	1.3	1.3	3.7	2.1	1.3
Latin America[5]	7.5	10.0	13.5	14.5	15.2	14.8
North Africa[6]	14.2	14.2	13.0	14.2	14.6	12.5
Sub-Saharan Africa[7]	3.6	6.0	4.6	5.6	5.8	5.1
Middle East	16.9	10.4	10.3	9.3	10.4	8.6
East Asia[8]	9.0	11.8	12.2	11.3	13.0	11.4
South Asia[9]	4.0	3.1	4.5	7.6	4.2	4.7
World total	102.8	101.4	109.2	111.8	99.5	95.6

[1]July-June marketing year. [2]Projections as of November 9, 1994. [3]Excludes intra-European Union trade, includes East Germany. [4]Includes intra-Former Soviet Union trade. [5]Includes Mexico. [6]Morocco, Algeria, Tunisia, Egypt, and Libya. [7]Includes South Africa. [8]Japan, Taiwan, South Korea, and Hong Kong. [9]India, Pakistan, Bangladesh, Sri Lanka, Afghanistan, Nepal, and Bhutan.

ports, however, will largely offset the increase in China's imports. Thus, developing countries will be the primary source of trade expansion. However, import growth by developing countries will continue to depend on exporter assistance.

Higher world prices will stimulate exporters to expand production to meet import demand and, in most cases, maintain current market shares. In Canada, Australia, and Argentina, wheat area is expected to rise as wheat prices increase relative to those of alternative crops. The most significant developments are expected to occur in the EU where reforms to the Common Agricultural Policy (CAP) are expected to slow wheat production growth and exports.

Prospects for U.S. Exports

Current projections are that the U.S. share of world trade in 2000 will about equal the 1990-94 average of 32 percent, but will begin to decline after 2000, falling to 31 percent by 2005 (*27*). Since 1985, the U.S. market share has fluctuated between 28 and 39 percent, with an annual average of 33 percent (table 9). Government programs, including EEP, have helped the United States maintain market share and are expected to play a significant role in the future. However, under the General Agreement on Tariffs and Trade (GATT), EEP's role will diminish.

Developing countries will take an increasing share of U.S. exports in the next decade. Between 1987/88 and 1992/93, China and the FSU together accounted for an annual average of 29 percent of U.S. wheat exports (table 10). In 1993/94, they accounted for only 12 percent. Even though some growth in U.S. exports to China is likely as China's wheat imports expand, U.S. exports to the FSU are unlikely to expand if FSU imports continue to decline. As a result, the FSU's importance as a market for U.S. wheat will

Table 9—Share of world wheat exports and ending stocks and global stocks-to-use ratio, 1970-94

Country or region	1970-74	1975-79	1980-84	1985-89	1990-94	1994[1]
			Percent			
Exports:[2]						
United States	41.6	44.0	41.3	33.8	32.4	35.6
Canada	21.1	19.3	19.3	18.7	20.4	21.4
Australia	12.7	13.4	11.2	13.5	9.4	6.8
European Union	9.1	10.5	16.5	18.2	19.8	18.3
Argentina	3.1	5.5	6.5	4.9	5.4	5.9
Others	12.4	7.3	5.2	10.9	12.6	12.0
			Million metric tons			
Total world trade[3]	60.8	72.2	100.9	98.4	103.5	95.6
			Percent			
Ending stocks:						
United States	21.1	22.6	26.4	21.8	11.7	12.1
Canada	15.6	10.2	6.9	5.3	7.4	6.2
Australia	2.3	2.5	3.6	2.4	2.5	2.2
European Union	10.3	8.4	8.9	10.4	13.4	11.7
Argentina	0.7	0.9	0.6	0.2	0.3	0.4
Others	50.0	55.5	53.6	59.9	64.7	67.4
			Million metric tons			
Total ending stocks[3]	81.7	115.8	134.3	148.3	136.8	117.0
			Percent			
Global stocks-to-use ratios	23.6	29.5	29.0	28.8	24.6	21.2

[1]Projected as of November 9, 1994. [2]Excludes intra-European Union trade, excludes intra-Former Soviet Union trade prior to 1987/88; July/June year. [3]Annual average.

Source: (*29*).

Table 10—U.S. wheat and flour exports to selected countries, June-May years 1989/90-1993/94[1]

Destination	1989/90	1990/91	1991/92	1992/93	1993/94
			1,000 metric tons		
Venezuela	675	497	335	832	652
Mexico	216	394	238	734	848
Brazil	133	0	647	151	146
Egypt	3,697	2,579	3,628	3,826	3,301
Algeria	1,442	1,716	1,419	1,175	1,301
Morocco	557	633	235	1,807	1,348
Nigeria	0	0	0	677	1,076
Japan	2,427	3,037	3,172	3,484	3,291
China	5,515	3,601	5,422	2,289	1,887
Pakistan	1,260	692	1,393	1,638	1,834
Philippines	793	1,303	1,301	1,577	1,883
South Korea	1,483	1,863	1,526	1,406	1,544
Former Soviet Union	4,313	2,816	7,051	5,557	2,667
Eastern Europe	46	156	91	508	622
European Union	890	639	552	466	397
Total wheat and wheat products	33,528	29,106	34,899	36,838	33,410

[1]Flour converted to grain-equivalent basis.
Source: (*26*).

likely diminish over time and exports to developing countries will become increasingly important.

Wheat imports are relatively price inelastic in many countries; that is, the volume of wheat imported does not change very much as prices increase or decrease. This is because food security and political stability in many developing countries depend on the ability of governments to import enough wheat to meet domestic needs. Thus, while the total volume of wheat imported by developing countries may not change very much as prices rise or as exporter assistance is increased or decreased, the source of those imports could be greatly affected.

Developing countries will likely continue to need assistance in the form of guaranteed credit, food aid, or other subsidies to buy U.S. wheat, especially as world wheat prices rise. The United States often combines EEP with GSM credit guarantees to make sales and retain market share in developing countries. Food aid is also an important component. Between fiscal 1986 and fiscal 1993, 36 percent of U.S. wheat exports to developing countries (excluding China) were financed with GSM credit guarantees, 47 percent were assisted with EEP, and 16 percent were exported under P.L. 480. Many of the sales made under the EEP were combined with GSM credit guarantees. Developing countries will likely claim an increasing percentage of assistance in the coming years.

The United States will continue to face strong competition from foreign competitors who also make broad use of assistance programs. In the USDA Baseline, the large amount of wheat base assumed to remain enrolled in the CRP will limit the area response to rising prices and constrain U.S. export supplies, particularly after 2000. As a result, U.S. market share is projected to fall slightly.

The EU's exports will be constrained by GATT, but will remain a strong competitor in FSU countries, Eastern Europe, North Africa, and the Middle East. Canada will be the strongest competitor for markets in Latin America and China. In the rest of Asia, Australia and Canada will remain the major source of

competition. Argentina will likely continue directing its exports toward Latin American countries, with Brazil its primary destination. Australia and Canada will also continue to sell to markets such as Iran, which does not buy from the United States.

Quality issues may become more important during the next decade. As governments begin liberalizing markets, the private sector will likely be more selective than centralized purchasing agencies regarding the quality and intrinsic characteristics of wheat imports. Currently, quality concerns are most evident in high-income, nonsubsidized markets (*12*).

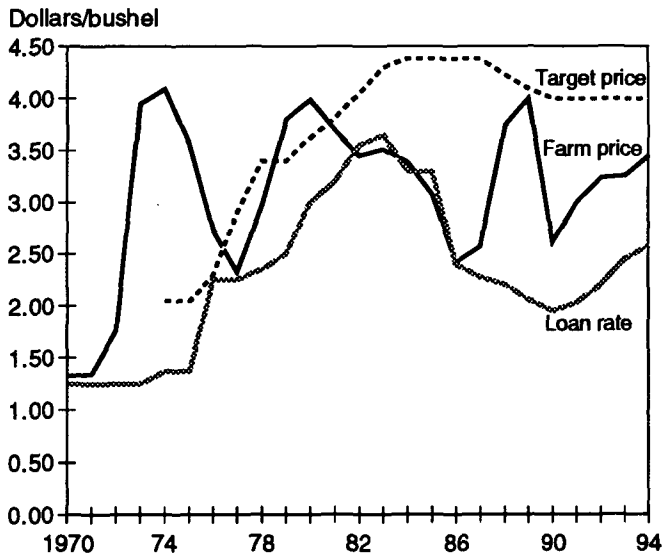
Trends in Prices, Costs, and Farm Returns

The real price (1987 = 100) of wheat continues to trend downward, but nominal prices firmed up between 1990 and 1994. Average real gross revenue per harvested acre is the lowest in 30 years. Total cash costs of production have risen slightly in the past 4 years. However, between 1991 and 1994, net returns above cash expenses have generally exceeded corresponding returns during 1980-90 due, in part, to larger market returns or larger direct government payments.

Prices and Gross Returns

The nominal price received by U.S. wheat producers fluctuated during 1980-93 (fig. 8). The average farm price for wheat was $3.17 per bushel for 1991-93, compared with an average of $3.07 per bushel in 1986-90 and $3.42 per bushel in 1981-85 when market prices were artificially supported by high loan rates. Target prices were lowered to $4.00 per bushel in 1990/91 and continued at this level between 1991 and 1995 (fig. 8). Loan rates declined to a low of $1.95 per bushel in 1990, but were raised in consecutive years to $2.58 per bushel for 1994/95.

Figure 8
U.S. wheat prices: Farm, target, and loan rate, 1970-94



The real price of wheat (1987 = 100) continues to decline, as it averaged $2.58 per bushel for 1990-94, a lower price than earlier periods (table 11). However, average yields rose by 52 percent between 1960-64 and 1990-94. Although real gross revenue per harvested acre averaged lower in 1990-94, excluding government payments, technological change enables individual producers to farm more acres and maintain income potential.

Costs

Total cash costs of production for wheat in 1994 are estimated to be $76.69 per planted acre, $55.12 per planted acre for variable expenses, and $153.79 per planted acre for total economic costs (app. table 12) (*23*). Although these estimates are slightly above 1990-93 costs, they are less than most of the early years in the 1980's. Cost of production, like yield, differs significantly depending on regional production practices, weather, insects and disease, management, and soil types.

It cost U.S. producers an average of $2.07 in variable cash costs to produce a bushel of wheat in 1989 (*8*). Individual farm costs ranged from less than $1.37 to more than $3.49 per bushel.[3] Expenses for fertilizers, chemicals, custom operations, fuel, lubrication, electricity, and hired labor varied the most among the cost groups.

About 52 percent of the wheat farms had variable cash expenses equal to or less than the average cost of $2.07 per bushel. However, 65 percent of the production was produced at or below the average variable cash expense (fig. 9). Cash expenses were converted to a per bushel basis and ranked from lowest to highest to form a weighted cumulative distribution of farms and production. Wheat farms were divided into three groups based on their level of variable cash expenses.

Differences between low- and high-cost producers in 1989 were attributed to per-acre costs, yields, and enterprise size. Low-cost producers had average variable cash expenses of $41.26 per acre compared with $50.85 per acre for high-cost producers. High-

[3]Data were obtained from Farm Costs and Returns Survey, USDA, ERS.

Table 11—Wheat farm prices, yields, and revenue, 1960-94

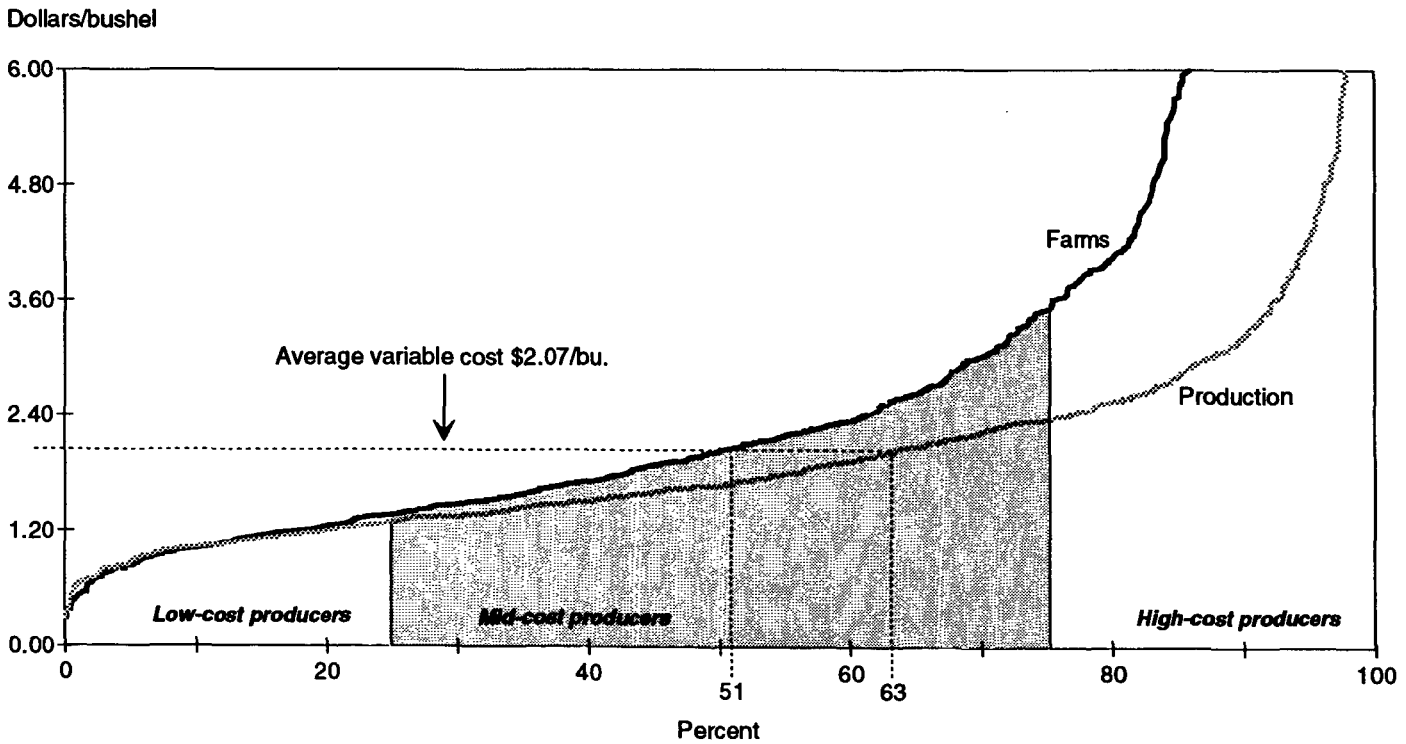
Crop year	Average farm price		Yield	Real gross revenue per harvested acre[1]
	Nominal	1987$		
	Dollars/bushel		*Bushels/acre*	*1987$*[2]
1960-64	1.77	6.60	25.2	165.91
1965-69	1.37	4.51	27.5	123.08
1970-74	2.49	6.12	31.3	187.76
1975-79	3.08	5.47	31.4	172.12
1980-84	3.61	4.42	36.3	159.41
1985-89	3.16	3.12	35.3	109.69
1990-94[3]	3.11	2.58	37.8	94.58

[1]Excludes direct government payments received by participants in the wheat program. [2]Yield times nominal price divided by the Gross Domestic Product implicit price deflator (1987 = 1.0). [3]Values for 1994 are projected as of November 9, 1994.

Sources: (*3* and *26*).

Figure 9

Cumulative distribution of variable cash expenses for U.S. wheat, 1989



Source: 1989 Farm Costs and Returns Survey.

cost producers experienced an average yield of 7 bushels per planted acre compared with low-cost producers' 38 bushels per planted acre.

Enterprise and farm size also characterized low- and high-cost wheat producers. Low-cost producers planted less acreage to wheat than high-cost producers and operated smaller farms. High-cost wheat farms in 1989 were more diversified than low-cost farms and so wheat contributed less to their total farm income (*8*). Only 44 percent of high-cost producers considered themselves as cash grain farms compared with 69 percent for low-cost producers. Half of the high-cost wheat producers considered themselves livestock producers. High-cost wheat producers grazed 35 percent of acreage, as opposed to 14 percent for mid-cost and only 4 percent for low-cost producers.

Regional growing conditions in 1989 were important factors influencing the wheat cost groups. High-cost producers were concentrated in the Central and Southern Plains (Colorado, Kansas, Nebraska, Oklahoma, and Texas), due in part to adverse weather in 1989. Low-cost producers were concentrated in selected North Central States (Illinois, Indiana, Missouri, New York, Ohio, and Pennsylvania) and Northern Plains States (North Dakota, South Dakota, Minnesota, Montana, and Wyoming) (*8*).

Net Returns

Net returns to the U.S. wheat sector improved during the 1991-94 period relative to earlier periods (table 12). Net returns, gross receipts less total cash expenses, go to pay the fixed expenses of land, capital replacement, debt, and the operator's living expenses. Returns above cash expenses averaged $1.84 per bushel in 1991-94 compared with $1.79 per bushel in 1986-90 and $1.30 per bushel in 1981-85. The gross value of farm wheat production (including government direct payments, but excluding EEP) ranged from $8.8

Table 12—Wheat sector costs and returns, 1981-94 crop years

Crop year	Aggregate market value of production[1]	Aggregate direct payments[2]	Aggregate gross income	Aggregate cash expenses[3]	Returns above cash expenses		
					Aggregate[4]	Nominal[5]	1987$[6]
	Billion dollars					*Dollars/bushel*	
1981	10.28	0.79	11.06	7.93	3.13	1.12	1.43
1982	9.54	0.77	10.31	7.71	2.59	0.94	1.12
1983	10.42	1.31	11.73	7.64	4.09	1.69	1.94
1984	9.13	1.73	10.86	7.74	3.12	1.20	1.32
1985	7.47	2.35	9.82	6.01	3.82	1.57	1.67
1986	5.06	3.90	8.96	5.10	3.86	1.84	1.91
1987	5.42	3.73	9.15	4.92	4.23	2.01	2.01
1988	6.74	2.17	8.91	4.84	4.07	2.24	2.16
1989	7.58	1.50	9.08	6.03	3.05	1.50	1.38
1990	7.14	2.95	10.09	6.35	3.75	1.37	1.21
1991	5.94	2.86	8.80	5.62	3.18	1.60	1.36
1992	7.97	2.12	10.09	5.59	4.50	1.83	1.51
1993	7.83	2.72	10.55	5.63	4.92	2.05	1.66
1994[7]	8.00	1.93	9.93	5.62	4.31	1.86	1.47

[1]Production times average farm price. Market value of production in 1983 and 1984 includes PIK entitlements valued at the season average price. [2]The sum of deficiency, diversion, disaster, reserve storage, and long-term CRP payments. [3]Total cash expenses equal the sum of planted acre, conservation, and CRP cash expenses. Planted acre cash expenses equal planted acres times total cash expenses (fixed and variable) per acre. Conservation cash expenses per acre equal conservation acres (ARP, PLD, PIK, and 0-92) times variable cash expenses per acre times 0.25. CRP cash expenses per acre equal CRP acres times variable cash expenses per acre times 0.25. [4]The difference between aggregate gross income and aggregate cash expenses. [5]The difference between aggregate gross income and aggregate cash expenses divided by the quantity produced. [6]Nominal per bushel returns above cash expenses deflated by the GDP implicit price deflator (1987 = 100). [7]Forecast as of November 9, 1994.

Sources: (*3* and *26*).

to $10.6 billion in 1991-94. Producers participating in government programs received deficiency payments, reserve storage payments, CRP payments, and disaster payments. All producers, participating or nonparticipating in government programs, received benefits from disaster payments. Between 1991 and 1994, total government payments ranged from $2 to $3 billion and averaged 24 percent of total gross income compared with 31 percent in 1986-90 and 13 percent in 1981-85 (table 12). Aggregate total cash expenses for the sector averaged $5.1 billion in 1991-94.

Much variation exists in net returns to producers and in the importance of government payments to individual wheat growers. In general, farmers with little or no debt should be financially sound, given the return levels of 1991-94. However, farm program payments are very important to those producers with heavy debt loads, especially during periods of low prices.

Recent Government Programs

Government programs for wheat date back to World War I. However, the first major U.S. laws with provisions for price support programs were enacted in the 1930's. The Agricultural Act of 1949, as amended, is the permanent legislation which authorizes current farm programs. New farm bills are passed at about 5-year intervals which amend the 1949 Act and supersede the previous act. After each interval, temporary provisions of the most recent farm bill automatically expire, unless extended, and the original provisions of the 1949 Act become effective, unless a new farm bill is passed. In recent years, other legislation—especially budget reconciliation acts—have had major impacts on commodity program provisions.

Since the 1930's, the U.S. Government's commodity programs have pursued a number of objectives: price and income support, production adjustment, subsidized financing, budget reduction, export enhancement, and environmental protection. These objectives have used different tools over time including: export quotas and fixed prices, acreage allotments, nonrecourse loans, storage payments, parity payments, marketing quotas, export subsidies, conservation incentives, a soil bank, set-asides, target prices, deficiency payments, the Farmer-Owned Reserve, the Conservation Reserve Program, the Export Enhancement Program, flex acres, and marketing loans. A more complete history of wheat programs can be found in (*2*, *7*, *9*, *11*, and *17*).

The Food Security Act of 1985

In the 1980's, world recession, an appreciating dollar, high real interest rates, and the farm financial crisis had a significant impact on U.S. agriculture and the effectiveness of agricultural policy. Market conditions deteriorated sharply and rapidly for U.S. farmers; commodity price support levels were providing a price floor for both U.S. and foreign producers. Large stocks, forfeitures of commodity loans to the Government, and escalating budget outlays resulted, as farm financial stress mounted.

The Food Security Act (FSA) of 1985 was crafted in a policy setting that demanded a change in direction for U.S. farm programs. Over 200,000 farms were considered financially vulnerable. Wheat carryover stocks equaled 97 percent of 1985/86 use, compared with an all grain stocks-to-use ratio of 69 percent for 1985/86; U.S. agricultural exports had dropped to $26 billion for fiscal 1986, compared with the record $44 billion set in 1981; and in fiscal 1986, farm program costs hit a record of almost $26 billion.

The FSA moved toward a more market-oriented farm policy that would enable farmers to respond to economic and market signals. The legislation inaugurated marketing loan provisions for cotton and rice, lowered loan rates and provided discretionary authority for their adjustment, reversed upward trends in target prices, generally froze program yields, and initiated EEP and the Targeted Export Assistance Program (TEAP) to promote agricultural exports in response to subsidized competition, especially from the European Community.

The FSA revived long-term paid land retirement by implementing the Conservation Reserve Program with a goal of retiring 40-45 million acres of highly erodible cropland from production for a period of 10 years. Farmers cultivating highly erodible land that was newly broken or cultivating newly converted wetland would be ineligible for farm program benefits.

The Food, Agriculture, Conservation, and Trade Act of 1990[4]

The Food, Agriculture, Conservation, and Trade (FACT) Act of 1990, as well as the subsequent Omnibus Budget Reconciliation Act of 1990 (OBRA), was built on the foundation laid by the FSA of 1985. When the 1990 FACT Act was being debated, the policy setting had improved considerably since 1985. For

[4]Relevant parts of the Omnibus Budget Reconciliation Act (OBRA) of 1990 are also discussed.

example, only half as many farms (100,000) were considered financially vulnerable, all grain carryover stocks fell to 30 percent of estimated 1990/91 use with wheat carryover levels equal to about 40 percent of estimated 1990/91 use, agricultural exports rebounded to $40 billion in fiscal 1990, and farm program costs fell to $6.5 billion in the same fiscal year.

The end of the 1980's saw other, broader initiatives to promote freer trade and to move U.S. agriculture toward greater market orientation. Those initiatives began with U.S. participation in the Uruguay Round of multilateral trade negotiations under the General Agreement on Tariffs and Trade (GATT) and the U.S.-Canada Free Trade Agreement (CFTA) implemented in 1989, and continued with extending a North American Free Trade Agreement (NAFTA) south to include Mexico.

Pressure to cut the Federal budget deficit played an important part in the designing of the FACT Act of 1990. Trade and conservation initiatives from 1985 were extended. EEP was continued and TEAP was replaced by the Market Promotion Program (MPP). The conservation reserve was augmented with new wetlands, water quality, and environmental easement provisions. Farmers received more planting flexibility, on up to 25 percent of program crop bases, and the Omnibus Budget Reconciliation Act of 1990 reduced the acreage on which farmers could collect deficiency payments.

The main goals of the FACT Act of 1990 were to further reduce spending, to help maintain farm income growth through expanding exports, and to enhance the environment. Major mechanisms used to accomplish reduced budget expenditures and improved agricultural competitiveness were reduced payment acres (as authorized by the Omnibus Budget Reconciliation Act) and planting flexibility. These mechanisms replaced declining target prices, lower loan rates, and a lack of planting flexibility from the Food Security Act (FSA) of 1985. Producers could begin to respond to market signals in their planting decisions because they could plant alternative crops on new nonpayment acres. The Conservation Reserve Program (CRP) of the 1985 FSA was altered to cover lands adversely affecting water quality and wetlands, and a new Water Quality Protection Program was added.

The Omnibus Budget Reconciliation Act (OBRA) of 1990 authorized a two-tier trigger mechanism requiring specific commodity and export program adjustments to be implemented or considered by the Secretary of Agriculture if an agreement on agricultural trade was not reached under the Uruguay Round (*14*).

- If a GATT agreement was not reached by June 30, 1992, the Secretary of Agriculture could waive the minimum level of any acreage limitation program for any 1993-95 program crops, must increase funding for export promotion programs by $1 billion during fiscal years 1994 and 1995, and must establish marketing loan provisions for the 1993-95 wheat and feed grain crops.

- If a GATT agreement was not reached by June 30, 1993, the Secretary of Agriculture must consider waiving all or part of the reductions in agricultural spending required by Title I of the OBRA, increasing the level of funds available for export programs, and establishing a marketing loan program for wheat and feed grains in 1993-95 crop years.

Provisions of the Food, Agriculture, Conservation, and Trade Act of 1990[5]

Among the most significant departures from farm legislation of the 1980's are the planting flexibility provisions in the 1990 FACT Act and OBRA. Normal flex acres (NFA) are not eligible for deficiency payments, regardless of the crop planted, including the original program crop. The maximum acreage eligible for payment became 85 percent of the crop acreage base established for the crop, minus acreage idled under an acreage reduction program (ARP). However, program crops and oilseeds planted on NFA are eligible for price support loans. The combination of flex acres and fixed payment yields reduces the total output eligible for deficiency payments.

The 1990 Farm Act prohibits the Secretary of Agriculture from reducing target prices below 1990 levels, which are approximately 10 percent below 1985. The Secretary lacks discretionary authority to lower target prices below minimum levels established by statute under either the 1990 or 1985 Acts. However, under the 1985 Act, the mandated minimum levels declined, while under the 1990 Act the mandated minimum levels were held constant.

[5]This discussion focuses on the major policy variables which are available for use by the Secretary of Agriculture. More details can be obtained from the Consolidated Farm Service Agency's *Farm Program Fact Sheets* or the actual legislation.

Base Acres

The computation of a farm's crop acreage base for wheat remains the same as under the 1985 FSA. The farm's base acreage is the average of the acreage planted and considered planted for the 5 preceding crop years. For farms that have an established rotation, the acreage base is the average of acreage planted and considered planted for the 3 preceding years corresponding to the rotation.

Loan Rates

A loan rate is the dollar amount per bushel at which the Federal Government will provide a loan to farmers, using the harvested wheat as collateral for the loan. Farmers are eligible for such loans only if they participate in the wheat program. These loans are nonrecourse, which means that the Government has no recourse but to take the crop as full repayment, if the farmer desires.

Loan rates are set to maintain a competitive relationship for wheat in domestic and export markets and to reflect production costs, supply and demand conditions, and world prices of wheat and feed grains. The 1990 Act establishes formulas for calculating "statutory-minimum" levels for both basic and effective loan rates (table 13). The 1990 Act changed the formulas by which statutory-minimum loan rates are calculated. In general, formulas for the 1990 Act lead to higher statutory-minimum loan rates than those calculated under the 1985 Act.

Each year two national loan rates are computed, the basic or formula loan rate and the effective or announced loan rate. Under the 1990 Act, the statutory-minimum basic loan rate is calculated as the higher of (1) 85 percent of the preceding 5-year moving average market price, dropping high and low price years, or (2) 95 percent of the preceding year's basic loan rate.

The statutory-minimum effective loan rate is determined through the use of two adjustments to the basic loan rate. The first adjustment is based on the stocks-to-use ratio. The Secretary of Agriculture may reduce the basic loan rate by up to 10 percent based on a projected year-end stocks-to-use ratio of 30 percent or more, and by up to 5 percent based on a projected stocks-to-use ratio of 15 to 30 percent, but may not reduce the rate on a projected stocks-to-use ratio of less than 15 percent. A minimum rate test is applied after

Table 13—Wheat program provisions, 1991 through 1995 crop years

Provisions	1991	1992	1993	1994	1995
			Percent of base acres		
ARP	15	5	0	0	0
Paid land diversion	0	0	0	0	0
			Dollars per bushel		
Target price	4.00	4.00	4.00	4.00	4.00
Basic loan rate	2.52	2.58	2.86	2.72	2.69
Findley loan rate	2.04	2.21	2.45	2.58	2.58
Advance deficiency payment rate	0.56/0.588[1]	0.325	0.525	0.425	0.35
Farmer-Owned Reserve	0.265	0.265	0.265	0.265	2.65

[1]Payment rate for winter wheat option = $0.56 per bushel. Payment rate for the standard program = $0.588 per bushel.
Source: (*26*).

the stocks-to-use adjustment but, so far, has not affected wheat's loan rate calculations.[6] The second adjustment can be made at the Secretary's discretion to maintain competitiveness by reducing loan rates up to an additional 10 percent. The effective wheat loan rate for crop year 1995 was announced at $2.58. The Secretary decided to keep the loan rate equal to the prior year.

Marketing Loan Provisions

The Omnibus Budget Reconciliation Act of 1990 requires that marketing loan provisions of the Agricultural Act of 1949, as amended, be implemented for the 1993-95 wheat crops. This requirement was triggered because there was no agricultural trade agreement under the GATT by June 30, 1992. While not a GATT requirement, provisions for loan deficiency payments were also implemented beginning with the 1993 wheat crop.

Under the marketing loan provisions, the Secretary may offer wheat producers the option to repay price support loans at a rate lower than the announced loan rate in order to minimize potential loan forfeitures, to minimize the accumulation of stocks, and to allow crops to be marketed freely and competitively worldwide. Producers may take out a regular wheat loan from the Commodity Credit Corporation at the county loan rate. If the posted county price (PCP), a proxy for the local market price, is less than the loan rate principal plus interest on a producer's loan, the producer can repay the loan at the PCP. The difference between the outstanding loan principal and the PCP is called a "marketing loan gain." If a marketing loan gain is earned, all of the interest otherwise owed is forgiven. If the PCP is below the outstanding loan principal plus interest but above the outstanding loan principal, a producer may still benefit by having some of the interest otherwise owed forgiven.

Loan deficiency payments are available to producers who are eligible to receive price support loans but who agree to forgo obtaining such a loan. This payment equals the difference between the announced county loan rate and the PCP on a given day times the quantity of wheat for which the loan deficiency payment is requested or otherwise eligible to be placed under loan.

Deficiency Payments and Target Prices

Deficiency payments received by producers are the product of a national payment rate, the producer's program payment yield, and the producer's payment acres.

Payment Rate

The regular deficiency payment rate is generally based on the difference between a target price and the higher of market price or the basic loan rate. Based on the 1990 Act, the Secretary of Agriculture sets the target price for wheat at the statutory minimum level of $4.00 per bushel for the 1991 through 1995 crops. The OBRA of 1990 changed the market price used for 1994 and 1995 crop years from that used for 1991-93 crop years.

The market price for 1991-93 crop years was defined to be the 5-month price received by producers for all-wheat during the first 5 months of the marketing year. The market price for 1994 and 1995 crop years was defined to be the lower of the 5-month price plus 10 cents or the 12-month price received by producers for all-wheat during the 12 months of the marketing year. The formula used for 1994 and 1995 is expected to reduce program expenditures.

The Findley deficiency payment rate, when the season average market price is less than the basic loan rate, is computed the same for all crop years, 1991 through 1995. The formula for this rate is the basic loan rate less either the higher of the 12-month price or the announced loan rate.

Program Payment Yields

Program payment yields are continued at the 1990 crop level. Program payment yields in 1990 reflected the simple average of program yields for 1981-85, except a farm's yield could not be less than 90 percent of its 1985 yield. A farm's program yields for 1981-85 reflected varying combinations of proven yields and administratively determined yields.

The 1990 Act provided discretionary authority for an alternative yield calculation. Program payment yields could have been established under the 1990 Act based on an average of the harvested yield for the preceding 5 years (dropping the years with the highest and lowest yield and any year in which a crop was not planted). This alternative was not exercised, in part, because of potential budget impacts.

[6]The minimum rate test may limit adjustments based on the stocks-to-use ratio by a statutory minimum of $2.44 per bushel. If 80 percent of the 5-year moving average, deleting high and low years, is less than the statutory minimum of $2.44 per bushel, the stocks-to-use adjustment is used. But if 80 percent of the 5-year moving average is greater than the statutory minimum, the greater of the statutory minimum or stocks-to-use adjustment is used.

Payment Acres

Generally, payment acres for a producer are the acres planted to wheat up to the producer's maximum payment acres. Maximum payment acres equal a producer's base acreage less reduced or idled acres less normal flex acres (15 percent of the base). Producers who under-plant (or plant to selected other crops) their maximum payment acres may receive deficiency payments on a portion of their under-planted acres through the 0-85/92 program.

The Secretary of Agriculture is required to advance 40-50 percent of projected deficiency payments when an acreage reduction program is in effect. Payments are made shortly after a producer signs an "intention to participate" form at the Consolidated Farm Service Agency office. If the advance payment exceeds the earned deficiency payment, the producer must repay the difference.

Acreage Reduction Programs

If excess supplies are projected by the U.S. Department of Agriculture, acreage reduction programs (ARP) are required and paid land diversion programs (PLD) are permitted. Producers must comply with the announced ARP level and other requirements in order to receive program benefits. When an ARP is in effect, producers are required to idle (or if certain optional program provisions are implemented, plant to selected minor crops) acres equal to the ARP percentage times their crop acreage bases.

The 1990 Act set the 1991 ARP level for wheat at not less than 15 percent. For 1992 through 1995, the 1990 Act established that ARP levels were to be chosen from statutory ranges based on the prior year's ending stocks-to-use ratio. If the prior-year stocks-to-use ratio was greater than 40 percent, USDA was required to announce an ARP level chosen from the range of 10 to 20 percent. If the prior-year stocks-to-use ratio was less than or equal to 40 percent, USDA was authorized, but not required, to announce an ARP level chosen from the range of 0 to 15 percent.

OBRA 1990 established minimum wheat ARP levels for 1992 through 1995 crop years of 6, 5, 7, and 5 percent, unless the prior-year stocks-to-use ratios were less than 34 percent. Under the 1992 GATT triggers of OBRA 1990, USDA was allowed to waive minimum ARP requirements. OBRA 1993 removed the authority for USDA to waive minimum ARP's. Removing this authority was not a problem because prior-year stocks-to-use ratios were less than 34 percent so the minimum ARP's of OBRA 1990 were not effective for any of the years. Announced ARP levels were 5 percent for 1992 and 0 percent for 1993 through 1995.

The Secretary of Agriculture may implement a Paid Land Diversion (PLD) whether or not an ARP is in effect, if a PLD will assist in adjusting the total national acreage to desirable goals. PLD payments may be set through bids submitted by producers or through other acceptable means approved by the Secretary. The last time a PLD was used for wheat was 1986.

Planting Flexibility Provisions

Producers may plant any eligible flex crop on up to 25 percent of any participating program crop's acreage base. This acreage is known as "flex" acreage, and the planting can be credited as "considered planted" to the program crop. The first 15 percent of the flex acreage is known as "normal flex acreage" (NFA) and the remaining 10 percent is known as "optional flex acreage" (OFA).

Normal flex acres are not eligible for deficiency payments, regardless of what crop, including the original program crop, is planted. However, program crops or oilseeds planted on NFA are eligible for price support loans. If optional flex acreage is planted to the original program crop, it is eligible for deficiency payments, but not if it is planted to another crop. However, other program crops or oilseeds planted on OFA are eligible for price support loans.

Normal flex acres are part of the calculation of maximum payment acres—the maximum acres on a farm that are eligible to receive deficiency payments. Maximum payment acres are defined as a farm's crop acreage base less acres idled under an ARP or PLD, and normal flex acres.

0-85/92

Wheat producers have the option of under-planting their maximum payment acres and receiving deficiency payments on a portion of the under-planted acres (0-85/92). Wheat producers may devote all or a portion of their maximum payment acres to conservation uses or approved nonprogram crops and receive guaranteed deficiency payments on the acres. The payment rate is guaranteed to be at least the projected deficiency payment rate.

The Omnibus Budget Reconciliation Act of 1993 provided for budget savings by changing the 0/92 provisions to 0-85/92. Producers who want to participate in the new "standard" 0/85 program have to idle or plant to selected crops at least 15 percent of their

maximum payment acres to be eligible for guaranteed deficiency payments on up to 85 percent of the maximum payment acres. Under certain conditions, producers may under-plant their wheat acres and receive payments on up to 92 percent of their maximum payment acres. These conditions include if they plant minor oilseeds, sesame, crambe, or "industrial and other crops"; if they are prevented from planting; or if they have failed acres.

Other Major Provisions

Other major provisions of the 1990 FACT Act include the Farmer-Owned Reserve, payment limitations, disaster payments, Environmental Conservation Acreage Reserve Program, and the Export Enhancement Program.

Farmer-Owned Reserve

The 1990 Act established new rules for the Farmer-Owned Reserve (FOR), which is opened when supplies are abundant and/or prices are low. Under the FOR, producers may extend a CCC 9-month loan beyond its regular term and receive storage payments for the extended period of time. Consequently, producers may store wheat when prices are low and market later when prices are higher.

Opening of the reserve program is announced each year by December 15 based on two market-based triggers: (1) the average price for the 90 days preceding the entry announcement is less than 120 percent of the national-average loan rate and (2) the projected ending stocks-to-use ratio for the marketing year is greater than 37.5 percent. If both conditions are met, USDA must open the FOR; if one condition is met, USDA may open the FOR; and if neither condition is met, USDA lacks authority to open the FOR. The maximum quantity of wheat allowed in the FOR is chosen from a range of 300 to 450 million bushels.

Entry into the reserve requires wheat to initially be under a regular 9-month loan until maturity. Producers may repay FOR loans at any time but no later than 27 months after the expiration of the original loan. One 6-month extension of the reserve period may be authorized by the Secretary of Agriculture. By statute, the FOR loan rate must be at least as high as the 9-month loan rate. Since the new rules of the 1990 Act, the FOR loan rate has been at the same rate as the 9-month loan rate.

Storage payments on wheat in the FOR are earned unless the market price reaches 95 percent of the current target price. At such time payments cease and are not reinstated until the market price is less than 95 percent of the target price for 90 days. Storage payments are made at the end of each quarter at a rate of $0.265 per bushel per year. By statute, USDA may charge (by regulation USDA will charge) interest on FOR loans when market prices equal or exceed 105 percent of the target price. Since the new rules of the 1990 Act, wheat storage payments have been stopped twice but interest has never been charged on FOR loans.

The FOR was opened for 1990-crop wheat and has not been opened for later crops. As of December 1994, the FOR does not contain any wheat for the first time since the FOR was established in 1977.

Food Security Wheat Reserve

The Food Security Wheat Reserve, created to provide a reserve of up to 4 million metric tons of wheat for emergency food needs in developing countries, was extended through 1995. If stocks are withdrawn, the Secretary of Agriculture must replenish stocks within 18 months of release to the extent that undesignated CCC inventories are available or funds are specifically appropriated for replenishment.

Payment Limitations

For each of the 1991-95 crops, the total amount of payments a person with an interest in only one farming entity may receive under one or more of the annual commodity programs (including oilseeds) may not exceed (1) $50,000 for deficiency and diversion payments; (2) $75,000 for gains realized from repaying a loan at a lower level than the original loan level, loan deficiency payments, and any Findley deficiency payments; and (3) $250,000 for the above two limits and any payment for resource adjustment (excluding diversion payments) or public access for recreation, and any inventory reduction payments. Total disaster payments are limited to $100,000.

Environmental Conservation Acreage Reserve Program (ECARP)

The ECARP is composed of the Conservation Reserve Program (CRP) and the Wetlands Reserve Program (WRP) (*13*). USDA is authorized to enroll 38 million acres into the CRP by the end of the 1995 calendar year and about 1 million acres into the WRP by 2000. This includes about 34 million acres enrolled in the CRP during 1986-90. The 1990 Act authorizes the Secretary of Agriculture to extend contracts, authorize new 10-15 year contracts, and purchase new easements during 1995-2000. In addition to CRP payments, producers may receive cost-share assistance and rental payments or tax benefits from State and other entity programs for enrolling land in the reserve programs. The objec-

tives of CRP were to reduce soil erosion, improve water quality, control supplies of excess commodities, enhance wildlife habitats, and increase recreational opportunities. As of 1994, there were 36.4 million acres enrolled in the CRP.

On December 14, 1994, the Secretary of Agriculture announced a decision to extend and target CRP contracts. The first contracts of about 2 million acres were scheduled to expire October 1, 1995, with about 22 million expiring in 1996 and 1997. During calendar year 1995, USDA will consider requests from CRP participants to be released early from their CRP contracts, to extend contracts for an additional 10 years, or to modify their current contracts to reduce the amount of acreage subject to it but with a 10-year extension. USDA will also consider bids from producers to enroll new acreage in the CRP program subject to new 10-year contracts. Producers whose contracts were to expire in 1995 but who opted to extend them another year, based on the Secretary's August 24, 1994, announcement, will be offered a 9-year extension. This authority applies to 10-year contracts entered into prior to enactment of the 1990 FACT Act on November 28, 1990. CRP participants who entered into contracts after that date can extend those contracts for 5 years.

Producers with CRP contracts receive annual rental payments for idling their acreage over a 10- to 15-year period. Rental payments will be re-evaluated before extending a CRP contract. Depending upon rental rates for comparable land, some producers will be offered higher rental payments and others less.

The new acreage will have to meet higher environmental and conservation criteria to be accepted and provide significant soil erosion, water quality, or wildlife benefits. The Department will also establish criteria to ensure that acreage released from current CRP contracts in 1995 can be properly managed for conservation purposes.

Export Enhancement Program

The Export Enhancement Program was initiated in May 1985 under the Commodity Credit Corporation (CCC) Charter Act and later formally authorized by the 1985 FSA and extended by the 1990 FACT Act (*14*). A main objective of the program is to help U.S. exporters compete against unfair trade practices used by other countries by using export bonuses to make U.S. agricultural commodities competitive in world markets. The 1990 Act provides that the CCC must make available a minimum of $500 million in CCC commodities or cash each fiscal year to carry out the EEP.

EEP expenditures for fiscal 1994 were $1.15 billion, a historic high, but Congress capped EEP spending at $800 million for fiscal 1995 (*1*). The major commodity sold with EEP bonuses is wheat, which averaged 82 percent of subsidy expenditures from 1989 through 1993 (*34*). Wheat EEP expenditures averaged $785 million for fiscal 1991-93 (*34*). EEP sales accounted for 60 percent of wheat exports during fiscal 1993. Exporters receive cash bonuses, but prior to November 1991 they received generic certificates.

Ad Hoc Disaster Assistance and Crop Insurance

Ad hoc disaster assistance has been passed to cover crop yield losses in every year since 1988 (*21*). Virtually all crops have been covered, including field crops, fruits, vegetables, ornamental crops, and spices. If producers received ad hoc disaster assistance in a given year, they were required to buy crop insurance in the following year. There have been two levels of yield loss necessary to qualify for an ad hoc payment: (1) for producers with crop insurance, losses needed to be greater than 35 percent of expected production, and (2) for producers without crop insurance, losses needed to be greater than 40 percent of expected production. Producers have not been able to collect both deficiency payments and disaster payments on the same bushels.

Payments have been calculated by determining the eligible amount of loss and multiplying it by the applicable payment rate. For program crops, the payment rate has been 65 percent of the target price for producers participating in the commodity programs, and 65 percent of the loan rate for nonparticipating producers. The amount was factored to meet the limits of the appropriation at 50.04 percent for crop year losses in 1990-92. Losses in other years (1988, 1989, 1993, and 1994) were not pro-rated.

Producers who received ad hoc disaster payments were required to purchase Federal Crop Insurance Corporation (FCIC) multiple peril crop insurance on the following year. Failure to pay the crop insurance premium meant forfeiture of disaster payments.

Federal response to yield losses for 1995 crops will change from prior years. The Federal Crop Insurance Reform Act of 1994 was passed in October 1994 (*28*). Current legal authorities for ad hoc crop disaster relief were repealed. A new revised crop insurance program will replace ad hoc disaster bills as the Federal response to emergencies involving wide-

spread crop loss. The Act repeals the authority to designate ad hoc disaster programs for crops as "emergency" spending under "pay-go" budget rules, making future programs "on-budget" as opposed to "off-budget."

The new Federal crop insurance program is supplemented with a new catastrophic coverage level (CAT) available to farmers for a nominal processing fee of $50 per crop, with a cap of $200 per farmer per county and $600 per farmer in total. The catastrophic coverage level under crop insurance reform provides 50 percent yield protection at 60 percent of the price election. Farmers may purchase additional insurance coverage providing higher yield or price protection levels. To ensure wide participation, producers must purchase crop insurance coverage at the CAT level or above if they participate in the Federal commodity support programs, obtain certain Consolidated Farm Service Agency loans, or have a new or extended Conservation Reserve Program contract. "Old" CRP contracts that have not been renegotiated are not affected by the linkage requirement.

The Act also creates the "Noninsured Assistance Program" (NAP), a standing aid program for crops not currently covered by crop insurance. This program provides coverage similar to the 50/60 protection offered by CAT, but is triggered by a 35-percent area loss. Once this area loss threshold is met, farmers will be paid for their crop losses in excess of 50 percent at 60 percent of the expected market price.

Effects of the 1990 FACT Act

Wheat programs under the 1990 FACT Act have had a major impact on both producers and taxpayers. Direct payments to producers in crop years 1991-94 averaged $2.4 billion, about 24 percent of gross returns, compared with $2.9 billion or 31 percent during 1986-90. Program costs for wheat have declined with strengthening market prices. EEP expenditures for wheat exports averaged $794 millon for fiscal 1992-93 (*34*). Participation rates for the program remain high, averaging 86 percent for crop years 1991-94, up from 84 percent for 1986-90. The 1990 FACT Act has had a minor impact on consumers.

Producers

Direct payments made to producers under the wheat program during crop years 1991-94 were similar to the mid- to late 1980's, but much higher than the early 1980's. Direct payments consisting of deficiency, FOR storage, disaster, and CRP averaged $2.4 billion during 1991-94, compared with $2.9 billion during 1986-90 (table 14). Under the 1990 FACT Act, direct payments ranged from $2.9 billion in 1991 to an estimated $1.9 billion in 1994. Deficiency payments comprise the greatest share of direct payments. During crop years 1991-94, direct payments ranged from 27 percent to 48 percent of market value of production, compared with 19 percent to 77 percent between 1986 and 1990 (table 12). While direct payments were a significant percentage of market value of production for many of the years between 1981 and 1994, they accounted for an even greater share of

Table 14—Direct payments to wheat farmers, 1986-94 crops

Item	1986	1987	1988	1989	1990	1991	1992	1993	1994
					Billion dollars				
Deficiency payments	3.46	3.29	1.23	0.57	2.42	2.25	1.37	1.93	1.13
Diversion payments	0.22	--	--	--	--	--	--	--	--
Reserve storage payments	0.17	0.11	0.05	0.01	--	0.02	0.11	0.05	--
Disaster payments	--	--	0.47	0.47	0.04	0.07	0.12	0.22	0.28
Conservation Reserve Program payments	0.05	0.33	0.42	0.45	0.49	0.52	0.52	0.52	0.52
Total direct payments	3.90	3.73	2.17	1.50	2.95	2.86	2.12	2.72	1.93
Market value of production	5.06	5.42	6.74	7.58	7.14	5.95	7.97	7.83	8.00
Total income	8.96	9.15	8.91	9.08	10.09	8.81	10.09	10.55	9.93

-- = No payments.

Sources: (*19* and *26*).

returns above cash expenses between 1981 and 1994 (table 12).

After accounting for costs and benefits, wheat program participation raised average annual real net returns per acre by 105 percent for 1991-94 and by 217 percent for 1986-90, compared with real net returns without direct payments (table 15). In addition, direct payments contribute to a lower variation in average annual net returns, as variation in returns for 1981-94 was lowered by about 30 percentage points (table 15).

Returns per acre for wheat are higher for participants in Federal farm programs than for nonparticipants. Returns during 1991-94, for example, averaged 33 percent greater for participants (table 16). However, during 1988 nonparticipants realized a greater return helped mostly by the higher prices caused by the 1988 drought and avoiding the acreage-idling requirements of a 27.5-percent ARP.

Because of the attractive financial gains, participation rates averaged about 86 percent during 1991-94, slightly above the 84 percent average for 1986-90 (table 16). Program participation is based on expected returns, while results presented in table 16 are realized net returns. This explains why a 10-percent loss to participants in 1988 was accompanied by an 88-percent participation rate but a 73-percent gain in 1990 had a lower participation rate of 83 percent. Participation rates rose slightly in 1993 and 1994 due, in part, to the 0-percent ARP requirement.

Participating base is spread mostly in the Great Plains followed by North Central and Northwest regions (table 17). Based on the 1992 wheat crop acreage base, the Great Plains accounted for 49 percent of all partici-

Table 15—Real net returns for wheat, with and without direct government payments, 1981-94 crop years

Crop year	Real net returns, 1987$[1]			
	Without direct payments		With direct payments	
	$/bu	*$/planted acre*	*$/bu*	*$/planted acre*[2]
1981	1.07	33.69	1.43	44.98
1982	0.82	26.41	1.12	35.88
1983	1.52	48.10	1.94	61.43
1984	0.70	22.83	1.32	43.30
1985	0.74	23.90	1.67	53.49
1986	0.10	3.01	1.91	55.38
1987	0.39	12.45	2.01	64.30
1988	1.18	32.69	2.16	59.74
1989	0.81	21.59	1.38	36.70
1990	0.34	11.90	1.21	42.81
1991	0.38	8.06	1.36	38.65
1992	0.88	29.95	1.51	51.49
1993	0.82	27.16	1.66	55.21
1994	0.86	29.13	1.47	48.37
Average 1981-94	0.75	23.63	1.58	49.41
Coefficient of variation 1981-94	0.50	0.50	0.20	0.19

[1]*Calculated from data in table 12 and appendix table 1. Total net returns without direct payments equal the market value of production less total (fixed and variable) cash expenses for planted acres. Total net returns with direct payments equal total income less total cash expenses. All data are deflated by the GDP implicit price deflator (1987 = 100).* [2]Per acre returns reflect total income less total cash expenses for the sum of planted, conservation, and CRP acres. Planted acre cash expenses equal planted acres times total cash expenses (fixed and variable) per acre. Conservation cash expenses per acre equal conservation acres (ARP, PLD, PIK, and 0-85/92) times variable cash expenses per acre times 0.25. CRP cash expenses per acre equal to CRP acres times variable cash expenses per acre times 0.25.

Table 16—Wheat returns above variable cash costs to program nonparticipants and participants, including participation rates[1]

Year	Nominal net returns to:		Real net returns to:		Gain to participants	Participation rate
	Nonparticipants	Participants	Nonparticipants	Participants		
	Dollars per acre				*Percent*	
1981	72.02	77.21	91.27	97.86	7	--[2]
1982	66.45	68.19	79.29	81.37	3	48
1983	81.52	84.19	93.49	96.55	3	78
1984	76.52	81.45	84.09	89.51	6	60
1985	64.40	77.16	68.22	81.74	20	73
1986	37.58	78.27	38.78	80.77	108	85
1987	51.22	80.02	51.22	80.02	56	88
1988	82.61	74.17	79.51	71.39	-10	86
1989	68.63	70.15	63.26	64.65	2	78
1990	50.46	87.44	44.53	77.18	73	83
1991	50.57	73.53	43.00	62.53	45	85
1992	74.39	92.30	61.53	76.34	24	83
1993	70.91	101.07	57.45	81.84	42	88
1994	77.71	92.43	61.52	73.18	19	87

[1]Net returns to nonparticipants equal market returns per acre less variable cash expenses. Net returns to participants equal the sum of government returns and market returns per acre less variable expenses (planted, conservation, and CRP). Government returns per acre equal the sum of deficiency payment returns (the non-ARP fraction of the acre times deficiency payment rate times program yield) plus diversion payment returns (the diverted fraction of the acre times diversion payment rate times program yield). Planted acre expenses equal the fraction of the acre planted times variable expenses per acre. Idled acre (ARP and PLD) expenses equal the fraction of the acre idled times variable expenses times 0.25. Flex acres are assumed to be planted to wheat. Only the required ARP and PLD for program participation are taken into account. [2]All producers were eligible for program benefits.

pating wheat acreage base with a participation rate of 90 percent. The North Central region claimed 6 percent of the participating base with a participation rate of 64 percent. The Northwest had 5 percent of the participating base with an 87-percent participation rate.

The Great Plains, North Central, and Northwest regions received 91 percent of total deficiency payments made for the 1992 crop. As expected, the Great Plains received the largest share (68 percent).

In November 1991, wheat EEP bonuses began to be issued in cash. Cash bonuses coupled with lower CCC wheat inventories have a price-enhancing effect. A summary of studies on EEP indicates that EEP is estimated to have increased wheat exports and raised prices to producers by 0.4 to 12 percent (*34*).

Taxpayers

Under the 1990 FACT Act, direct payments averaged $2.4 billion for crop years 1991-94, a 17-percent decline from the 1985 Act's (crop years 1986-90) average cost of $2.9 billion (table 14). Total program costs for wheat—net price support and related expenditures—have also trended down. For example, net price support and related expenditures for fiscal 1986 were $3.3 billion but dropped to $1.7 billion for fiscal 1994 (app. table 4).

Taxpayers are affected by disaster payments and expenditures for EEP. The new crop insurance program could lower payments on disaster-related events, as current legal authorities for ad hoc crop disaster relief are repealed. EEP bonuses on wheat export sales averaged $759 million in fiscal 1992-93, compared with an average $532 million in fiscal 1987-91. EEP expenditures on wheat are expected to decline, as EEP expenditures for all commodities during fiscal 1994

Table 17—Distribution of wheat acreage base and deficiency payments by region, 1992 crop year

Region	Base	Participation base	Participation rate	Deficiency payments	Share of payments
	Million acres		*Percent*	*Billion dollars*	*Percent*
Great Plains[1]	54.90	49.30	89.8	0.930	67.8
North Central[2]	10.00	6.40	64.0	0.161	11.7
South[3]	6.17	3.66	59.4	0.075	5.5
Northwest[4]	5.41	4.72	87.1	0.163	11.9
Southwest[5]	1.91	1.34	70.4	0.036	2.7
Northeast[6]	0.48	0.23	47.6	0.005	0.4
Total	78.87	65.65	83.2	1.370	100.0

[1]CO, KS, MT, NE, ND, OK, SD, TX, and WY. [2]IL, IN, IA, MI, MN, MO, OH, and WI. [3]AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, and WV. [4]AK, ID, OR, and WA. [6]CT, DE, ME, MD, MA, NJ, NY, PA, and VT.

Source: (*19*).

were $1.15 billion, a historic high, but Congress capped EEP spending at $800 million for fiscal 1995. While EEP can rise from $800 million in fiscal 1996 even with GATT limitations, total expenditures will fall significantly by 2000 because of GATT limitations.

Consumers

In recent years, the wheat program has used direct payments to support farmers' income, thereby placing most of the program costs on taxpayers rather than consumers of wheat. The U.S. wheat farm program has had little effect on retail prices of wheat products partly because of wide marketing margins. The amount of wheat used to produce a loaf of bread costs about 6 percent of the retail price (*4*). However, distribution can account for 40 percent of the retail price. Large farm price swings in wheat have small effects on retail prices of bread, pasta, and other bakery products.

The effect of the U.S. wheat program on individual consumers has also been small because the quantity of wheat consumed per capita, although rising, is relatively low. Consumers used 138 pounds of flour per capita in 1992, up from 136 pounds in 1985 and 111 pounds in 1970. The 138 pounds used in 1992 is the equivalent of 3.2 bushels of wheat.[7] The 1992 farm value of this wheat was $10.37.[8]

While the EEP may have raised the producer price of wheat, especially since November 1991 when EEP bonuses were switched from in-kind to cash, effects to the individual consumer are less pronounced. For example, if the EEP were to increase producer prices by 0.4 to 12 percent and this increase were passed on to consumers, this program could increase consumers' annual per capita costs by $0.04 to $1.24[9] or annual total costs by $10 million to $320 million (*4*).[10]

During the years under the 1990 FACT Act (crop years 1991-94), loan rates rose each year, from $2.04 per bushel in 1991/92 to $2.58 per bushel in 1994/95, a 26-percent rise. Livestock production costs appear to be unaffected by the increase in loan rates, because the price of wheat has generally remained above the loan rate. The wheat price is also free to fall below the loan rate under the marketing loan provisions for crop years 1993 and 1994.

[7]100/73 pounds of wheat per 1 lb. of flour x 138 pounds of flour = 189 pounds of wheat. 189 pounds of wheat / 60 pounds of wheat per bushel = 3.2 bushels of wheat.

[8]$3.24 per bushel x 3.2 bushels of wheat = $10.37.

[9]Annual farm value of wheat consumed per capita for 1992 = $10.37. $10.37 x 0.004 = $0.04 and $10.37 x 0.12 = $1.24.

[10]$0.04 to $1.24 per capita x 258.2 million population = $10 million to $320 million.

Supply

The decreased role of the United States as a world wheat stockholder has increased the likelihood of shortrun year-to-year variations in wheat supply. However, such a situation did not develop in 1991-94. Also, with the introduction of flex acres such a situation would usually last no longer than 1 year because of the ability to flex acres into wheat.

Indirect

Wheat programs have had some indirect effects on land values, resource use, and other crop and livestock production. Program benefits are capitalized into land values, especially those associated with a base or allotment. Consequently, production costs are higher and net returns are lower than if program benefits had not been capitalized.

Environmental quality is also affected by wheat production, but less so than for more input-intensive crops. Runoff from cropland contains pesticides and fertilizers that affect water quality. Limiting use of these inputs tends to increase production costs or restrict yields. Because of concerns about environmental quality, the conservation reserve and conservation compliance was continued with the 1990 FACT Act and a Water Quality Incentive Program and Integrated Farm Management Program were started. Additional environmentally friendly programs continue to be proposed by the public, such as an environmental reserve program.

Wheat programs also affect other agricultural sectors. Limited substitution can occur between grains, especially for livestock feed. Programs that tend to raise wheat prices may also lead to cost increases for livestock and poultry producers.

Problems and Issues To Be Addressed in 1995

Structure and Performance Issues

Levels of imports and carryover stocks are two important issues likely to be discussed in the 1995 farm bill debate.

U.S. Wheat Imports

The U.S.-Canada Free Trade Agreement went into effect on January 1, 1989, to reduce barriers and promote trade between the two countries. However, trade disputes for agriculture have continued. Wheat imports have been a prominent dispute. Is the recent surge in Canadian wheat imports an aberration or an expected norm? The equitable settlement of this dispute could remove potential impediments to trade.

Stocks

Are current U.S. stock levels of wheat optimal? With existing programs it could take a minimum of 1 year to respond to a world shortfall in wheat production. Some industry groups think that ideal wheat stocks should be above recent levels. However, larger stocks imply lower producer prices and larger government payments in a period when the public is calling for reduced budget expenditures. Other industry groups would like to see continued low carryover stock levels thereby maintaining low stocks-to-use ratios and higher producer prices. Another issue is the mix of government/public stock holding.

Impact of Trade Agreements on Sector

Congress has passed the North American Free Trade Agreement (NAFTA) and the GATT agreement. Multilateral and regional trade agreements reduce global or regional trade barriers. Proponents of these agreements stress their long-run positive effects on economic growth and employment; opponents cite sectoral adjustment costs and shortrun job losses. There is disagreement among those who favor trade agreements on whether regional preferential arrangements are building blocks or stumbling blocks to further liberalizing global trade. Trading rules in these agreements will affect U.S. agricultural interests and influence farm income.

GATT Agreement

The Uruguay Round agreement will change world wheat markets fundamentally as subsidized exports, particularly from the European Union, are reduced substantially (*31*, pp. 11-12). The reduction in exporter subsidies will increase importers' prices, dramatically for some countries, and constrain world trade in the first years of the agreement. Increased global incomes will increase world import demand significantly after 2000. While the United States might have been expected to gain market share as a result of GATT, U.S. exports are forecast to grow at a slower rate than world trade because of the amount of wheat land remaining in the CRP. Despite growing world demand and reduced competition from the EU, wheat base enrolled in the CRP is expected to prevent the United States from producing enough wheat to meet demand growth. Current projections are that the U.S. share of world trade in 2000 will about equal the 1990-94 average of 32 percent, but will begin to decline after 2000, falling to 31 percent by 2005. U.S.

prices are projected to rise significantly, increasing market returns and farm incomes and decreasing deficiency payments.

NAFTA

NAFTA is forecast to increase incomes and reduce wheat production in Mexico, thereby increasing U.S. wheat exports to Mexico (*30*, p. 6). NAFTA is expected to have small aggregate benefits for the U.S. wheat industry.

Policy Options and Alternatives for Sector

Conservation Reserve Program

USDA, in December 1994, announced that it planned to extend the CRP program for another 10 years. Many favor a strong CRP and want to promote conservation in the 1995 farm bill. If the CRP is not continued, larger annual set-asides might be necessary.

Some groups would like to see the CRP financed from noncommodity program funds. They argue that since the CRP benefits all of society, its funds should not be charged to the agriculture budget. Other groups want the CRP to have more of an environmental reserve emphasis focusing on sensitive areas and increased emphasis on water quality and tree planting. Others would like financial assistance for farmers in meeting soil and water regulations.

Revenue Insurance

Can a revenue insurance program be designed that would replace deficiency payments? Revenue assurance plans could guarantee farmers revenue from the market and government payments would be at least a certain minimum. Such a change would require more time to implement and probably require a pilot program.

Marketing Loan Provisions

Should marketing loan provisions be continued for wheat? Marketing loans for wheat and feed grains were implemented beginning with the 1993/94 crop year. Implementation had been mandated under the 1990 Omnibus Budget Reconciliation Act in the case that a new international trade accord under GATT was not concluded by June 1992. Because posted county prices of the various classes of wheat have rarely dipped below county loan rates in this period, marketing loan provisions for wheat have had minimal effect. However, if prices move dramatically lower, the marketing loan provision would allow prices to drop to market clearing levels while providing important income support, but with additional budget outlays.

Government Expenditures

Federal budgetary outlays for commodity income and price support programs are expected to be an issue in the 1995 farm bill debate. This will bring farm program spending under continuing scrutiny as Congress and the executive branch look for ways to reduce the budget deficit. Deficiency payments account for a large share of commodity program spending. Expenditure levels for the Export Enhancement Program may also receive review.

A number of options to reduce outlays for deficiency payments are being examined. The economic implications for agriculture may differ for each option. Deficiency payments could be reduced by a legislated reduction in target prices or by raising ARP levels and price supports to the higher end of their allowed ranges (*5*). Acreage eligible for deficiency payments could also be reduced legislatively by increasing the percentage of normal flex acres. Higher ARP's raise market prices through cuts in production and reduce acres eligible for deficiency payments (*6*). Higher loan rates lower deficiency payment rates when U.S. market prices are at or near loan rate levels. However, raising loan rates above world prices would make U.S. commodities less competitive, may increase CCC net loan outlays, increase costs for export promotion programs, and could lead to costly stock building in the United States. Reducing deficiency payments either by cutting target prices or by increasing the normal flex acreage percentage has fewer economic side effects than the other options discussed.

Funding for the Export Enhancement Program could be reduced or terminated. While total EEP expenditures can rise from $800 million in fiscal 1996 even with GATT limitations, total expenditures will fall significantly by 2000 because of GATT limitations. If further reductions or elimination of EEP were made, export levels would decline in the short run.

Export Competitiveness

A stated aim of the Clinton Administration is to promote U.S. trade competitiveness in a more open international trading environment. The issue for U.S. agriculture is how the sector can increase its longrun competitiveness in world markets and contribute to real growth of the national economy without incurring excessive adjustment costs. Several farm groups are suggesting aggressive use of export enhancement programs to the extent allowed under GATT and use of funds that otherwise would have been used for export

enhancement for other export promotion programs and foreign market development and export expansion. In contrast, some industry groups are advocating the elimination of the Export Enhancement Program.

Targeting Benefits

Some farm groups have discussed targeting benefits to sustain the family farm and reduce government costs. Targeting would involve limiting the volume of production for which any one person can receive deficiency payments and commodity loans. There would also be prohibitions on the artificial subdivision of a farm to avoid such limits. Initial units of production from a family farm would be protected from budget cuts. A paid land diversion would be implemented to offset any loss of large farm participation in the set-aside program.

Total Flexibility

Another option that might be considered is the extension of flexibility introduced in the 1990 FACT Act. Allow 100 percent flex on current bases and farmers would be able to switch back and forth freely between commodities. Deficiency payments could be paid based on previous farm bases. Some commodities may experience an increase in production, thereby increasing their supply and lowering prices.

Continuation of Present Policy

The FACT Act of 1990 provides the legislative authority through the 1995 marketing year for commodity programs and the Omnibus Budget Reconciliation Act of 1993 extends some program provisions through 1997. Results of the first 5 years of USDA's baseline provide an analysis of what might occur to the sector if we continued with our present policy until the year 2000 (USDA, ERS Baseline).

High wheat prices and relatively strong demand in 1994/95 are expected to result in increased wheat plantings in 1995, leading to increased production and lower U.S. and world prices. The European Union exports remain high in 1995 and 1996 because GATT constraints are not very binding until later years. Australia's exports rebound in the second half of 1995/96 from the 1994 drought. Because wheat prices rebound in later years, ARP's are kept at zero. After 1999 wheat prices rise relative to coarse grains and oilseeds and flex acres gradually shift back to wheat.

CRP contract extensions are offered and some additional wheat base enters the CRP in 1996/97, as additional sign-ups boost CRP acres to target levels. From 1998/99 through 1999/2000 wheat base enrolled in the CRP drops from 10.5 million acres to 8.7 million as some producers decide not to extend CRP contracts. The large amount of wheat base remaining in the CRP limits U.S. ability to respond to increasing wheat prices with increased plantings. There is a small increase in acres idled in the 0-85/92 program as base acres leave the CRP.

Domestic use grows during 1995-2000. Increases of 15 million bushels per year in food use imply increasing per capita food use of wheat, but at a slowing rate. Feed and residual use decline gradually after 1998 as wheat prices rise compared with other feeds.

U.S. exports are flat in 1995 and 1996 as competitor supplies rebound from 1994/95. U.S. exports increase in 1997/98, and the increase accelerates in 1998/99 as reduced competition from the EU opens market opportunities. However, the United States also reduces export subsidies and the volume of subsidized exports, slowing total export growth in 1999/2000.

Growth in demand outgains yield growth by the end of the decade and higher prices encourage additional land to enter production. Net returns to participants remain the same, about $90 per acre, as returns from rising market prices are offset by declining deficiency payments. Participation rates remain about the same at 86 percent. Net returns to nonparticipants rise from $67 to $73 per acre between 1995/96 and 1999/2000.

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Appendix table 1—Acreage, yield, and production for wheat

Year	Planted	Harvested	Idled[1]	Yield	Production
	Million acres			*Bushels/acre*	*Million bushels*
1965	57.4	49.6	7.2	26.5	1,316
1966	54.1	49.6	8.3	26.3	1,305
1967	67.3	58.4	---	25.8	1,508
1968	61.9	54.8	---	28.4	1,557
1969	53.5	47.1	11.1	30.6	1,443
1970	48.7	43.6	15.7	31.0	1,352
1971	53.8	47.7	13.5	33.9	1,619
1972	54.9	47.3	20.1	32.7	1,546
1973	59.3	54.1	7.4	31.6	1,711
1974	71.0	65.4	---	27.3	1,782
1975	74.9	69.5	---	30.6	2,127
1976	80.4	70.9	---	30.3	2,149
1977	75.4	66.7	---	30.7	2,046
1978	66.0	56.5	9.6	31.4	1,776
1979	71.4	62.5	8.2	34.2	2,134
1980	80.8	71.1	---	33.5	2,381
1981	88.3	80.6	---	34.5	2,785
1982	86.2	77.9	5.8	35.5	2,765
1983	76.4	61.4	29.8	39.4	2,420
1984	79.2	66.9	18.3	38.8	2,595
1985	75.6	64.7	18.8	37.5	2,424
1986	72.1	60.7	21.0	34.4	2,091
1987	65.8	56.0	23.9	37.7	2,108
1988	65.5	53.2	22.5	34.1	1,812
1989	76.6	62.2	9.6	32.7	2,037
1990	77.2	69.3	7.5	39.5	2,736
1991	69.9	57.7	15.9	34.3	1,981
1992	72.3	62.4	7.3	39.4	2,459
1993	72.2	62.7	5.7	38.3	2,403
1994[2]	70.5	61.7	4.7	37.6	2,320

--- = Not applicable.

[1]Acreage idled under wheat programs only: ARP, diversion, PLD, 50/92, 0/92, 0/85. Does not include acres retired under the CRP (0.6 acres in 1986; 4.2 million acres in 1987; 7.1 million acres in 1988; 8.8 million acres in 1989; 10.3 million acres in 1990; 10.4 million acres in 1991; 10.6 million acres in 1992; 10.8 million acres in 1993; and 10.8 million acres in 1994).

[2]Projected as of November 9, 1994.

Source: (*26*).

Appendix table 2--Use and ending stocks for wheat

Crop year	Food	Feed[1]	Exports[2]	Total use[3]	Ending stocks[4]	Stocks-to-use
	Million bushels					*Percent*
1965/66	518	146	852	1,577	661	41.9
1966/67	505	101	771	1,454	513	35.3
1967/68	518	37	765	1,391	630	45.3
1968/69	522	157	544	1,284	904	70.4
1969/70	520	188	603	1,367	983	71.9
1970/71	517	193	741	1,513	823	54.4
1971/72	524	262	610	1,459	983	67.4
1972/73	532	200	1,135	1,934	597	30.9
1973/74	544	125	1,217	1,970	340	17.3
1974/75	545	35	1,019	1,690	435	25.7
1975/76	589	37	1,173	1,899	666	35.1
1976/77	588	74	950	1,704	1,113	65.3
1977/78	587	193	1,124	1,983	1,178	59.4
1978/79	592	158	1,194	2,031	924	45.5
1979/80	596	86	1,375	2,158	902	41.8
1980/81	611	59	1,514	2,296	989	43.1
1981/82	602	135	1,771	2,618	1,159	44.3
1982/83	616	195	1,509	2,417	1,515	62.7
1983/84	643	371	1,426	2,540	1,399	55.1
1984/85	651	407	1,421	2,578	1,425	55.3
1985/86	674	284	909	1,961	1,905	97.1
1986/87	696	401	999	2,196	1,821	82.9
1987/88	721	290	1,588	2,684	1,261	47.0
1988/89	726	151	1,415	2,394	702	29.3
1989/90	749	140	1,232	2,225	537	24.1
1990/91	786	496	1,069	2,443	866	35.4
1991/92	789	250	1,280	2,417	472	19.5
1992/93	834	186	1,354	2,472	529	21.4
1993/94	869	278	1,228	2,470	570	23.1
1994/95[5]	885	225	1,250	2,457	518	21.1

[1]Approximates feed and residual use and includes negligible quantities used for alcoholic beverages.
[2]Exports include flour and other products expressed in wheat equivalent.
[3]Totals may not add because of rounding.
[4]Includes government-owned and privately-owned stocks.
[5]Projected 11/9/94.
Source: (*26*).

Appendix table 3—Prices and ending stocks for wheat

Crop year	Ending stocks CCC	FOR[1]	Free	Total[2]	Price received	Loan rate	Target price	Direct payment
	Million bushels				Dollars/bushel			
1965/66	299	---	361	660	1.35	1.25	---	0.75[3]
1966/67	122	---	391	513	1.63	1.25	---	1.32
1967/68	100	---	530	630	1.39	1.25	---	1.36
1968/69	140	---	765	904	1.24	1.25	---	1.38
1969/70	277	---	705	983	1.25	1.25	---	1.52
1970/71	353	---	470	823	1.33	1.25	---	1.57
1971/72	355	---	628	983	1.34	1.25	---	1.63
1972/73	6	---	591	597	1.76	1.25	---	1.34
1973/74	1	---	340	340	3.95	1.25	---	0.68
1974/75	---	---	435	435	4.09	1.37	2.05	---
1975/76	---	---	666	666	3.56	1.37	2.05	---
1976/77	---	---	1,113	1,113	2.73	2.25	2.29	---
1977/78	48	342	788	1,178	2.33	2.25	2.90	0.65
1978/79	50	393	481	924	2.97	2.35	3.40	0.52
1979/80	188	260	454	902	3.80	2.50	3.40	---
1980/81	200	360	429	989	3.99	3.00	3.63[4]	---
1981/82	190[5]	562	407	1,159	3.69	3.20	3.81	0.15[6]
1982/83	192[5]	1,061	262	1,515	3.45	3.55	4.05	0.50
1983/84	188[5]	611	600	1,399	3.51	3.65	4.30	0.65
1984/85	378[5]	654[7]	393	1,425	3.39	3.30	4.38	1.00
1985/86	602[5]	433[7]	870	1,905	3.08	3.30	4.38	1.08
1986/87	830[5]	463[7]	528	1,821	2.42	2.40	4.38	1.98
1987/88	283[5]	467	511	1,261	2.57	2.28	4.38	1.81
1988/89	190[5]	287	139	616	3.74	2.21	4.23	0.69
1989/90	117[5]	144	275	536	4.00	2.06	4.10	0.10
1990/91	163[5]	14	689	866	2.61	1.95	4.00	1.28
1991/92	152[5]	50	270	472	3.00	2.04	4.00	1.35
1992/93	150[5]	28	351	529	3.24	2.21	4.00	0.81
1993/94	150[5]	6	414	570	3.26	2.45	4.00	1.03
1994/95[8]	145	0	373	518	3.45	2.58	4.00	0.85

--- = Not applicable.
[1]Farmer-Owned Reserve.
[2]Totals may not add because of rounding.
[3]Value of domestic marketing certificate, 1964/65-1973/74.
[4]Growers who planted in excess of their normal crop acreage were eligible for a target price of $3.08 per bushel.
[5]Includes 147 million bushels in the Food Security Reserve.
[6]Deficiency payment, 1981/82 to date.
[7]Includes special producer storage loan program.
[8]Projected as of November 9, 1994.
Source: (*26*).

Appendix table 4--Program costs for wheat, fiscal years 1975-94[1]

Fiscal year	Deficiency payment	Acreage diversion[2]	Disaster	Exports[3]	Reseal loan or producer storage[4]	Loan operations		Other[5]	Net price support and related expenditures[6]
						Outlays	Repayments		
					Million dollars				
1975	0.0	0.2	101.3	0.0	0.0	42.7	48.7	-70.0	25.5
1976	0.0	0.0	52.8	0.0	0.0	64.8	44.9	-2.5	70.2
1976TQ[7]	0.0	0.0	71.3	0.0	0.0	64.8	10.6	-1.8	123.7
1977	0.0	0.0	136.9	0.0	0.4	1,940.0	181.1	2.7	1,898.9
1978	996.4	5.5	116.8	0.0	109.3	827.0	1,231.4	16.7	840.3
1979	617.6	9.7	95.6	0.0	66.5	367.9	867.3	10.2	300.2
1980	0.0	0.0	96.8	0.0	18.0	587.3	565.2	729.0	865.9
1981	0.0	0.0	320.6	0.0	110.5	1,594.5	559.4	70.3	1,536.5
1982	414.5	0.0	79.2	0.0	230.2	2,033.5	556.0	28.6	2,230.0
1983	820.8	140.8	5.9	0.0	200.9	2,583.3	402.9	61.2	3,410.0
1984	423.9	656.6	0.6	0.0	176.9	1,605.3	424.1	82.9	2,522.1
1985	1,739.5	651.6	0.0	0.0	167.6	2,277.8	216.7	25.8	4,645.6
1986	1,674.0	14.8	0.0	0.0	172.3	1,570.3	294.7	253.8	3,390.5
1987	1,547.3	-0.5	0.0	0.0	171.9	1,170.4	406.9	326.5	2,808.7
1988	757.9	0.0	0.3	0.0	113.0	670.8	839.3	-56.6	646.0
1989	619.3	0.0	0.3	0.0	47.1	187.4	622.5	-213.3	18.2
1990	722.9	0.0	0.0	0.0	24.8	504.3	259.8	-231.6	760.6
1991	2,722.1	0.0	0.0	0.0	2.6	576.1	495.2	-30.8	2,774.8
1992	1,785.1	0.0	0.0	0.0	14.0	359.3	496.4	-8.1	1,653.9
1993	1,826.3	0.0	0.0	0.0	8.6	625.1	533.4	241.6	2,168.2
1994	1,692.2	0.0	0.0	0.0	2.5	633.6	642.8	31.7	1,717.2

[1]Excludes P.L. 480 program and wheat product costs. Payments or receipts less than $50,000 are recorded as "0.0."
[2]Includes acreage diversion in 1970-71, diversion in 1978-93, and additional set-aside in 1975.
[3]Commodity export payments.
[4]Reseal storage payments ended in 1975. Producer storage payments in 1977-94.
[5]Net outlays include: storage, handling, transportation, processing and packaging costs, purchases, and other items. Receipts include cash sales proceeds and other items. Negatives indicate net receipts.
[6]Direct price support or deficiency, diversion, disaster, certificate, export, and producer storage payments plus government expenditures for storage and handling, transportation, processing and packaging, loan collateral settlements, loans, purchases, and other expenses less sales proceeds, cash loan repayments, certificates sold, and other receipts. Totals may not add because of rounding.
[7]Includes July/September 1976 to allow for shift from July/June to October/September fiscal year.
Source: (*20*).

Appendix table 5--Value comparisons for wheat

Year	Loan value per acre		Market value per acre		Gross value of production	
	Nominal[1]	Real[2]	Nominal[3]	Real[2]	Nominal[4]	Real[2]
	----------Dollars----------				---Billion dollars---	
1960	46.46	178.68	45.41	174.67	2.36	9.07
1961	42.78	162.67	43.74	166.30	2.26	8.57
1962	50.00	185.87	51.00	189.59	2.23	8.28
1963	45.86	168.62	46.62	171.40	2.12	7.80
1964	33.54	121.08	35.35	127.60	1.76	6.35
1965	33.13	116.64	35.78	125.97	1.78	6.25
1966	32.88	111.82	42.87	145.81	2.13	7.23
1967	32.25	106.44	35.86	118.36	2.10	6.92
1968	35.50	111.64	35.22	110.74	1.93	6.07
1969	38.25	114.52	38.25	114.52	1.80	5.40
1970	38.75	110.09	41.23	117.13	1.80	5.11
1971	42.38	114.22	45.43	122.44	2.17	5.85
1972	40.88	105.35	57.55	148.33	2.72	7.01
1973	39.50	95.64	124.82	302.23	6.76	16.36
1974	37.40	83.30	111.66	248.68	7.29	16.23
1975	41.92	85.21	108.94	221.41	7.57	15.39
1976	68.18	130.35	82.72	158.16	5.87	11.22
1977	69.08	123.57	71.53	127.96	4.77	8.53
1978	73.79	122.37	93.57	155.18	5.29	8.77
1979	85.50	130.53	129.96	198.41	8.11	12.38
1980	100.50	140.17	133.67	186.42	9.50	13.25
1981	110.40	139.92	127.30	161.35	10.28	13.03
1982	126.02	150.39	122.48	146.15	9.54	11.38
1983	143.81	164.92	138.29	158.59	8.49	9.74
1984	128.04	140.70	131.53	144.54	8.80	9.67
1985	123.75	131.09	115.50	122.35	7.47	7.91
1986	82.56	85.20	83.25	85.91	5.06	5.22
1987	85.96	85.96	96.89	96.89	5.42	5.42
1988	75.36	72.53	126.85	122.09	6.74	6.49
1989	67.36	62.08	121.64	112.11	7.58	6.98
1990	77.02	67.98	103.10	90.99	7.14	6.30
1991	69.97	59.50	102.90	87.50	5.94	5.05
1992	87.07	72.02	127.66	105.59	7.97	6.59
1993	93.84	75.98	124.86	101.10	7.83	6.34
1994[5]	97.01	76.81	129.72	102.71	8.00	6.34

[1]Loan rate times yield per harvested acre. Loan rate includes allowance for unredeemed loans and purchases by the Government valued at the average loan and purchase rate, by State.

[2]Nominal dollars deflated by the GDP implicit price deflator (1987 = 100).

[3]Season average price received by farmers times yield per harvested acre. Season average farm price received by farmers is obtained by weighting State prices by quantities sold.

[4]U.S. production times season average price received by farmers.

[5]Projected as of November 9, 1994.

Source: (*26*).

Appendix table 6–World production, consumption, and ending stocks for wheat, 1965-94 crop years

Crop year	Production[1]	Consumption[1]	Ending stocks[2]	Ending stocks to consumption
	Million metric tons			*Percent*
1965/66	259.3	277.1	60.7	21.9
1966/67	300.7	273.8	87.6	32.0
1967/68	291.9	281.9	97.7	34.6
1968/69	323.8	300.1	121.3	40.4
1969/70	304.0	321.8	103.5	32.2
1970/71	306.5	329.5	80.5	24.4
1971/72	344.1	335.4	89.2	26.6
1972/73	337.5	351.8	74.9	21.3
1973/74	366.1	358.3	82.7	23.1
1974/75	355.2	356.6	81.4	22.8
1975/76	352.7	347.3	86.7	25.0
1976/77	414.4	373.8	127.3	34.1
1977/78	377.9	396.0	109.2	27.6
1978/79	439.0	413.3	134.8	32.6
1979/80	418.4	432.0	121.2	28.0
1980/81	436.2	444.0	113.9	25.6
1981/82	445.1	445.2	113.7	25.5
1982/83	472.8	455.6	131.1	28.8
1983/84	484.4	468.8	146.6	31.3
1984/85	509.0	489.4	166.2	34.0
1985/86	494.9	490.4	170.6	34.8
1986/87	524.1	515.7	179.1	34.7
1987/88	496.0	525.3	149.8	28.5
1988/89	495.0	524.3	120.5	23.0
1989/90	533.2	532.2	121.5	22.8
1990/91	588.2	563.5	146.2	25.9
1991/92	542.6	558.5	130.3	23.3
1992/93	561.4	543.6	148.1	27.2
1993/94	558.8	564.3	142.5	25.3
1994/95[3]	526.5	552.0	117.0	21.2

[1]Production and consumption data are based on an aggregate of differing local marketing years. For countries for which stocks are not available (excluding the USSR), consumption estimates represent apparent utilization.

[2]Ending stocks data are based on an aggregate of differing local marketing years and should not be construed as representing world stock levels at a fixed point in time. Stock data are not available for all countries and exclude parts of Eastern Europe and parts of Asia. Stock levels have been adjusted for estimated year-to-year changes in USSR grain stocks, but do not purport to include the entire level of USSR stocks.

[3]Projected as of November 9, 1994.

Source: (*29*).

Appendix table 7–Wheat production, trade, and stocks, world and United States, 1970-94

Year	Production			Exports			Ending stocks		
	World[1]	United States	U.S. share	World[2]	United States[2]	U.S. share	World[3]	United States	U.S. share
	Million bushels		*Percent*	*Million bushels*		*Percent*	*Million bushels*		*Percent*
1970	11,263	1,352	12	2,021	732	36	2,959	823	28
1971	12,644	1,619	13	1,911	621	33	3,279	985	30
1972	12,400	1,546	12	2,561	1,167	46	2,753	597	22
1973	13,451	1,711	13	2,315	1,148	50	3,040	340	11
1974	13,052	1,782	14	2,363	1,039	44	2,989	435	15
1975	12,958	2,127	16	2,451	1,164	47	3,187	666	21
1976	15,225	2,149	14	2,326	958	41	4,678	1,113	24
1977	13,884	2,046	15	2,675	1,159	43	4,013	1,178	29
1978	16,129	1,776	11	2,646	1,187	45	4,955	924	19
1979	15,372	2,134	14	3,160	1,367	43	4,452	902	20
1980	16,029	2,381	15	3,458	1,541	45	4,183	989	24
1981	16,353	2,785	17	3,722	1,792	48	4,176	1,159	28
1982	17,372	2,765	16	3,634	1,468	40	4,816	1,515	31
1983	17,797	2,420	14	3,814	1,428	37	5,386	1,399	26
1984	18,701	2,595	14	3,902	1,400	36	6,105	1,425	23
1985	18,183	2,424	13	3,112	919	30	6,269	1,905	30
1986	19,259	2,091	11	3,333	1,044	31	6,581	1,821	28
1987	18,224	2,108	12	4,119	1,596	39	5,503	1,261	23
1988	18,189	1,812	10	3,759	1,381	37	4,429	702	16
1989	19,591	2,037	10	3,759	1,232	33	4,464	536	12
1990	21,612	2,736	13	3,718	1,041	28	5,372	866	16
1991	19,937	1,981	10	4,016	1,290	32	4,788	472	10
1992	20,627	2,459	12	4,134	1,365	33	5,442	529	10
1993	20,532	2,403	12	3,656	1,216	33	5,225	571	11
1994	19,346	2,320	12	3,513	1,249	36	4,299	518	12

[1]World production data aggregated from different countries which have different marketing years.
[2]World export data based on a July/June year and excludes intra-EC trade. U.S. export data based on a July/June trade year.
[3]Stocks data are based on an aggregate of differing local marketing years and should not be construed as representing world stock levels at a fixed point in time.
[4]Projected as of November 9, 1994.
Source: (*29*).

Appendix table 8–World wheat trade as a share of production; world stocks as a share of consumption; U.S. exports as a share of foreign consumption, 1960-94

Year	World trade[1] to world production[2]	World stocks to world consumption[2]	U.S. exports to foreign consumption[3]
		Percent	
1960	18	36	8
1961	21	30	9
1962	18	32	8
1963	25	30	10
1964	19	31	8
1965	24	22	9
1966	19	32	8
1967	17	35	8
1968	14	40	5
1969	16	32	5
1970	18	24	6
1971	15	27	5
1972	21	21	10
1973	17	23	9
1974	18	23	8
1975	19	25	10
1976	15	34	7
1977	19	28	8
1978	16	33	8
1979	21	28	9
1980	22	26	10
1981	23	26	12
1982	21	29	9
1983	21	31	9
1984	21	34	8
1985	17	35	5
1986	17	35	6
1987	23	29	9
1988	21	23	8
1989	19	23	7
1990	17	26	5
1991	20	23	7
1992	20	27	7
1993	18	25	6
1994[4]	18	21	6

[1]Trade data excludes intra-EC trade and represents July/June year.
[2]Production, consumption, and stock data represents a summation of each country's different marketing year.
[3]U.S. exports represent July/June marketing year.
[4]Projected as of November 9, 1994.
Source: (*29*).

Appendix table 9—Wheat production and exports, major foreign exporters, and total foreign, 1965-94[1]

Year	Australia[2]		Canada[2]		Argentina[2]		EC-12[2]		Foreign[3]	
	Production	Exports	Production	Exports	Production	Exports	Production	Exports	Production	Exports
					Million bushels					
1965	260	172	649	585	223	205	1,641	252	8,245	1,392
1966	467	312	827	515	230	82	1,441	215	9,732	1,375
1967	277	208	593	336	269	81	1,698	271	9,220	1,203
1968	544	234	650	306	211	92	1,718	341	10,340	1,303
1969	387	296	671	346	258	85	1,635	383	9,728	1,448
1970	290	336	332	435	181	36	1,595	220	9,911	1,334
1971	316	286	530	504	209	60	1,867	337	11,026	1,461
1972	242	157	533	577	254	117	1,879	446	10,854	1,515
1973	440	258	594	419	241	58	1,857	436	11,740	1,465
1974	417	315	489	395	219	66	2,053	454	11,270	1,496
1975	440	318	628	450	315	116	1,757	536	10,831	1,545
1976	434	349	867	494	404	217	1,811	404	13,076	1,652
1977	344	298	730	588	209	65	1,742	467	11,838	1,651
1978	665	430	777	480	298	150	2,148	566	14,353	1,893
1979	595	485	631	584	298	175	2,068	658	13,237	2,053
1980	399	352	709	598	286	141	2,375	798	13,649	2,047
1981	601	404	911	678	305	134	2,243	823	13,567	2,190
1982	326	295	982	785	551	363	2,476	807	14,607	2,451
1983	809	501	972	800	468	288	2,474	824	15,377	2,623
1984	686	516	779	645	485	346	3,198	1,046	16,107	2,809
1985	594	589	891	650	312	158	2,776	1,023	15,759	2,616
1986	592	572	1,152	764	328	163	2,801	1,028	17,168	2,759
1987	454	362	953	864	323	136	2,774	1,076	16,116	2,941
1988	517	415	585	457	309	148	2,880	1,185	16,377	2,800
1989	522	396	911	620	373	223	3,015	1,247	17,554	2,995
1990	554	432	1,179	798	401	205	3,113	1,250	18,875	3,248
1991	388	261	1,174	900	363	212	3,322	1,312	17,955	3,198
1992	595	362	1,098	724	360	215	3,115	1,391	18,173	3,200
1993	621	503	1,001	702	345	169	2,950	1,263	18,129	3,056
1994[4]	305	184	852	753	386	209	3,038	1,196	17,027	2,765

[1]Includes intra-EC trade.
[2]Data reflect country's crop year.
[3]Aggregate of differing local marketing years.
[4]Projected as of November 9, 1994.
Source: (*29*).

Appendix table 10—Coefficients of variation for U.S. wheat, 1951-94[1]

Period[2]	Harvested acres	Yield	Production	Exports	Price received[3]	Value of production
			Percent			
1951-55	16.1	7.8	14.5	31.5	2.8	15.3
1956-60	7.4	13.5	18.6	17.9	6.0	13.9
1961-65	6.8	3.8	7.7	11.7	18.4	12.0
1966-70	11.7	8.4	7.3	15.2	11.6	8.0
1971-75	17.9	8.1	12.8	23.9	44.0	50.0
1976-80	9.4	5.4	10.4	17.8	22.4	30.0
1981-85	12.0	5.7	6.8	22.2	6.5	11.9
1986-90	10.3	7.9	16.0	19.3	21.7	17.2
1991-94[4]	3.8	5.9	9.4	4.3	5.7	13.4

[1]Coefficient of variation, a measure of variability, equals the standard deviation divided by the mean.
[2]June/May year.
[3]Season average price received by farmers.
[4]Values for 1994 were projected as of November 9, 1994.
Source: (*26*).

Appendix table 11—U.S. wheat exports by selected export programs

Fiscal year	P.L. 480	Section 416	Total aid	CCC credit[1]	EEP[2]	Total U.S. exports	P.L. 480, CCC credit, and EEP divided by total exports[3]
	1,000 metric tons						Percent
1955	2,325	0	2,325	0	0	6,184	38
1956	4,730	0	4,730	26	0	8,032	59
1957	8,126	0	8,126	0	0	12,934	63
1958	5,407	0	5,407	0	0	8,793	61
1959	6,883	0	6,883	76	0	9,839	71
1960	8,585	0	8,585	8	0	11,386	75
1961	10,112	0	10,112	129	0	15,273	67
1962	11,379	0	11,379	140	0	16,549	70
1963	11,210	0	11,210	260	0	14,557	79
1964	11,213	0	11,213	398	0	20,538	57
1965	13,415	0	13,415	94	0	17,300	78
1966	12,779	0	12,779	533	0	21,379	62
1967	7,074	0	7,074	1,529	0	18,120	47
1968	9,369	0	9,369	846	0	17,193	59
1969	5,216	0	5,216	324	0	12,501	44
1970	5,776	0	5,776	802	0	15,688	42
1971	5,067	0	5,067	2,113	0	18,227	39
1972	5,178	0	5,178	1,966	0	17,070	42
1973	2,947	0	2,947	8,748	0	35,867	33
1974	859	0	859	1,483	0	26,756	9
1975	2,795	0	2,795	155	0	29,272	10
1976	2,690	0	2,690	1,455	0	29,874	14
1977	3,495	0	3,495	2,252	0	23,766	24
1978	3,002	0	3,002	3,813	0	31,813	21
1979	3,234	0	3,234	2,684	0	31,340	19
1980	2,785	0	2,785	1,945	0	36,066	13
1981	2,537	0	2,537	3,261	0	42,246	14
1982	2,978	0	2,978	3,725	0	44,607	15
1983	3,340	0	3,340	8,597	0	36,701	33
1984	3,442	0	3,442	11,406	0	41,699	36
1985	4,392	0	4,392	8,221	0	28,524	44
1986	4,685	76	4,761	7,740	4,916	24,626	59
1987	3,927	406	4,333	8,125	12,214	28,204	68
1988	3,321	1,186	4,507	9,273	26,679	40,523	82
1989	3,020	137	3,157	8,897	17,906	37,660	68
1990	2,985	0	2,985	7,759	12,806	28,064	70
1991	3,067	0	3,067	8,339	15,150	26,792	78
1992	2,820	0	2,820	13,334	21,111	34,322	78
1993	2,818	868	3,686	8,537	21,806	36,078	78

[1]Source: FAS/USDA.
[2]Unofficial ERS/FAS estimates of shipments.
[3]Adjusted for overlap between CCC export credit and EEP shipments.

Appendix table 12--U.S. wheat production costs and returns, 1980-94

Item	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993F	1994F
							Dollars per planted acre								
Production cash costs and returns:															
Gross value of production (excluding direct government payments):															
Wheat	112.41	114.35	110.32	128.52	113.97	93.52	66.06	76.21	95.89	99.90	94.27	72.68	112.08	NA	NA
Wheat straw[1]	4.07	4.61	4.37	4.45	4.48	2.48	2.06	2.18	3.78	3.45	1.52	1.21	1.37	NA	NA
Total, gross value of production	116.48	118.96	114.69	132.97	118.45	96.00	68.12	78.39	99.67	103.35	95.79	73.89	113.49	NA	NA
Cash expenses:															
Seed	6.51	7.19	6.65	6.37	6.48	7.59	7.29	6.62	6.69	7.68	7.69	5.87	6.67	NA	NA
Fertilizer, lime, and gypsum	13.86	17.61	17.56	18.36	18.37	15.91	14.53	13.07	15.34	16.70	14.59	15.30	14.46	NA	NA
Chemicals	2.23	2.41	3.16	3.27	3.19	4.26	4.06	3.82	3.82	5.02	5.45	5.73	6.15	NA	NA
Custom operations[2]	2.94	4.54	5.86	6.02	6.04	4.17	4.12	4.12	3.89	4.11	4.56	4.25	4.24	NA	NA
Fuel, lube, and electricity	10.62	12.33	11.77	11.06	9.54	9.93	6.74	7.56	7.37	7.96	8.72	8.96	8.81	NA	NA
Repairs	7.23	7.80	7.18	7.77	7.49	6.56	6.17	6.32	6.41	6.39	6.51	6.70	7.22	NA	NA
Hired labor	2.88	3.00	3.02	3.21	3.15	2.43	2.54	2.53	2.59	4.95	4.92	5.34	5.52	NA	NA
Other variable cash expenses[3]	0.49	0.41	0.82	0.71	0.75	0.25	0.22	0.20	0.20	0.20	0.20	0.18	0.20	NA	NA
Total, variable cash expenses	46.76	55.29	56.03	56.77	55.01	51.10	45.67	45.67	44.24	53.01	52.64	52.33	53.27	53.91	55.12
General farm overhead	7.08	7.39	7.11	8.05	8.62	5.10	4.69	6.01	6.89	5.01	6.47	5.15	4.97	NA	NA
Taxes and insurance	7.33	7.39	6.90	7.69	7.86	7.44	7.92	8.11	8.19	8.72	10.28	8.88	8.07	NA	NA
Interest	14.58	19.81	18.45	21.86	22.98	12.69	9.08	10.09	9.57	8.77	9.56	9.12	7.77	NA	NA
Total, fixed cash expenses	28.99	34.59	32.46	37.60	39.46	25.23	21.69	24.21	24.65	22.50	26.31	23.15	20.81	20.99	21.56
Total, cash expenses	75.75	89.88	88.49	94.37	94.47	76.33	67.36	69.88	68.89	75.51	78.95	75.48	74.08	74.90	76.69
Gross value of production less cash expenses	40.73	29.08	26.20	38.60	23.98	19.67	0.76	8.51	30.78	27.84	16.84	-1.59	39.41	NA	NA
							Dollars per bushel								
Harvest-period price	3.76	3.63	3.38	3.48	3.37	2.98	2.29	2.39	3.50	3.81	2.78	2.57	3.32	NA	NA
							Bushels per planted acre								
Yield	29.87	31.47	32.64	36.89	33.79	31.41	28.79	31.87	27.42	26.22	33.91	28.28	33.77	NA	NA

See footnotes at end of table

Continued--

Appendix table 12--U.S. wheat production costs and returns, 1980-94--Continued

Item	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993F	1994F
							Dollars per planted acre								
Production returns and economic costs:															
Gross value of production (excluding direct government payments):															
Wheat	112.41	114.35	110.32	128.52	113.97	93.52	66.06	76.21	95.89	99.90	94.27	72.68	112.12	NA	NA
Wheat straw	4.07	4.61	4.37	4.45	4.48	2.48	2.06	2.18	3.78	3.45	1.52	1.21	1.37	NA	NA
Total, gross value of production	116.48	118.96	114.69	132.97	118.45	96.00	68.12	78.39	99.67	103.35	95.79	73.89	113.49	NA	NA
Economic (full ownership) costs:															
Variable cash expenses	46.76	55.29	56.03	56.77	55.01	51.10	45.67	45.67	44.24	53.01	52.64	52.33	53.27	53.91	55.12
General farm overhead	7.08	7.39	7.11	8.05	8.62	5.10	4.69	6.01	6.89	5.01	6.47	5.15	4.97	NA	NA
Taxes and insurance	7.33	7.39	6.90	7.69	7.86	7.44	7.92	8.11	8.19	8.72	10.28	8.88	8.07	NA	NA
Capital replacement	18.15	19.30	19.41	21.02	20.48	19.63	19.90	20.33	20.67	9.66	9.89	10.60	10.93	NA	NA
Operating capital	2.83	3.91	3.09	2.51	2.72	2.11	1.38	1.46	1.78	2.12	1.97	1.42	0.95	NA	NA
Other nonland capital	3.64	3.46	3.24	3.19	3.84	3.67	3.66	3.69	4.33	9.67	10.67	12.18	13.30	NA	NA
Land	30.06	29.44	29.75	34.41	29.78	30.81	23.30	24.87	31.38	47.57	46.33	33.92	49.18	NA	NA
Unpaid labor	6.40	6.67	6.72	7.14	7.01	5.40	5.66	5.63	5.77	8.67	11.24	9.48	10.00	NA	NA
Total, economic (full ownership) costs	122.25	132.85	132.25	140.78	135.31	125.26	112.18	115.77	123.25	144.43	149.49	133.96	150.67	149.80	153.79
Residual returns to management and risk	-5.77	-13.89	-17.56	-7.81	-16.86	-29.26	-44.06	-37.38	-23.58	-41.08	-53.70	-60.07	-37.18	NA	NA
							Dollars per bushel								
Harvest-period price	3.76	3.63	3.38	3.48	3.37	2.98	2.29	2.39	3.50	3.81	2.78	2.57	3.32	NA	NA
							Bushels per planted acre								
Yield	29.87	31.47	32.64	36.89	33.79	31.41	28.79	31.87	27.42	26.22	33.91	28.28	33.77	NA	NA

F = Forecasts as of fall of 1994. (Contact Mir Ali, 202-219-0802).
NA = Not available.
[1]Includes value of wheat grazing in Southern Plains before 1985.
[2]Includes cost of technical services.
[3]Includes cost of purchased irrigation water.
Source: (*23*).

U.S. Department of Agriculture
Economic Research Service

SUMMARY OF REPORT #AER-714

The 1995 Farm Bill

Planting Flexibility and Acreage Idling Are Key Issues for Feed Grains

April 1995

Contact: William Lin (202) 219-0848

Key issues to be addressed in the feed grains portion of this year's farm legislation deliberations include planting flexibility and acreage idling under both the Conservation Reserve Program (CRP) and the Acreage Reduction Program (ARP). These and other policy matters are discussed in detail in ***Feed Grains: Background for 1995 Farm Legislation***, a new report from USDA's Economic Research Service.

Policy options in regard to the planting flexibility issue include (1) expanding the normal flex acreage beyond the current 15 percent, (2) combining all crop acreage base into a farm program base and allowing complete planting flexibility within the base, and (3) implementing a normal crop acreage concept, such as the one under the 1977 Farm Act.

Options for the CRP include extending the current program for another 10-15 years but under more critical criteria to reduce soil and wind erosion and to preserve water quality and other environmental benefits.

Policy decisions that continue to hold land out of production will be critical given expectations for continued growth in both domestic use and exports. However, the program cost is likely to be the dominant criterion for legislation.

Producers benefit from participating in the government feed grains program directly through support prices and direct payments and indirectly through higher market prices. U.S. feed grain farmers have received program payments since 1961. During 1991-93, direct payments as a percentage of annual gross income were in ranges of 12-17 percent for corn, 19-22 percent for sorghum, 24-31 percent for barley, and 18-25 percent for oats. These percentages were well under those much of the 1980's. In 1986-88, for example, direct payments were 25-37 percent of annual gross income from corn production. Deficiency payments averaged $5.5 billion for feed grain producers during that late-1980's period, compared with $2.8 billion during 1991-93.

During 1991-93, returns over cash expenses for corn producers averaged $0.66 per bushel (in 1987 dollars), compared with $0.71 in 1985 and $0.86 in 1990. However, returns over cash expenses for corn producers were still the highest among feed grain producers on a per acre basis. Overall, returns over cash expenses are expected to improve considerably in 1994/95 because of record yields, greater domestic and export demands, and higher deficiency payments.

The U.S. Feed Grain Industry. U.S. feed grain production has trended upward since the 1930's, reaching a record 285 million metric tons in 1994/95. Much of the increase was due to yield improvements, especially for corn. Corn production increased from 5.8 billion bushels in 1975 to 10.1 billion bushels in 1994. However, acres planted to sorghum, barley, and oats have declined.

To Order This Report...

The information presented here is excerpted from ***Feed Grains: Background for 1995 Farm Legislation,*** AER-714, by William Lin, Peter Riley, and Sam Evans. The cost is $12.00.

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