Rice

Background for 1995 Farm Legislation

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Introduction

This report provides background for addressing policy issues facing the U.S. rice industry. It is important that policymakers engaging in the farm bill debate have an appreciation of the consequences of program changes for the aggregate U.S. rice sector, as well as for individual producing regions.

A discussion of the structure of the U.S. rice sector and the global and domestic supply and demand conditions under which it operates provides a backdrop for discussion of the pertinent policy issues. Characteristics of production, marketing, trade, and use that are peculiar to rice are identified. Program effects on farm costs and returns are presented.

Supplementing the discussion of issues and economic structure of the U.S. rice industry is a description of the pertinent features of the government rice program and the problems they have attempted to deal with.

Structure of the U.S. Rice Sector

Domestic rice acreage, production, and income have been increasing over the past decade. With this growth, the U.S. rice sector has evolved in terms of its own structure as well as its competitiveness vis-à-vis other field crops.

Production Characteristics

Rice production in the United States is small relative to other field crops. In 1993, rice acreage accounted for slightly more than 1 percent of total area planted to the major program crops (wheat, coarse grains, rice, soybeans, and cotton) and only 3 percent of their value. Rice plantings of 3.4 million acres in 1994 were the third highest on record but paled in comparison to corn, wheat, and soybeans plantings of 78.8, 70.5, and 61.8 million acres, respectively.

Over 95 percent of the U.S. rice crop is produced in five States. Rice production is concentrated in Southern States along the Mississippi River, the gulf coast, and in California. The 1992 Census of Agriculture reports rice production for eight States. The Consolidated Farm Service Agency (CFSA), the USDA agency responsible for administering farm programs, reports rice farms in 12 States.[1] The National Agricultural Statistics Service (NASS) reports current crop production data for the six major States. The six NASS reporting States account for over 99 percent of the U.S. rice crop.

Despite its small area and value relative to other field crops, U.S. rice production plays a major role in those States in which it is grown and in the international marketplace. The United States is the world's second largest rice exporter, supplying 17 percent of the world's rice exports in 1991-93. During that same period, rice accounted for 12 percent of the value of field crop production in the four primary rice-producing Southern States—Arkansas, Louisiana, Mississippi, and Texas—and 9 percent in California.

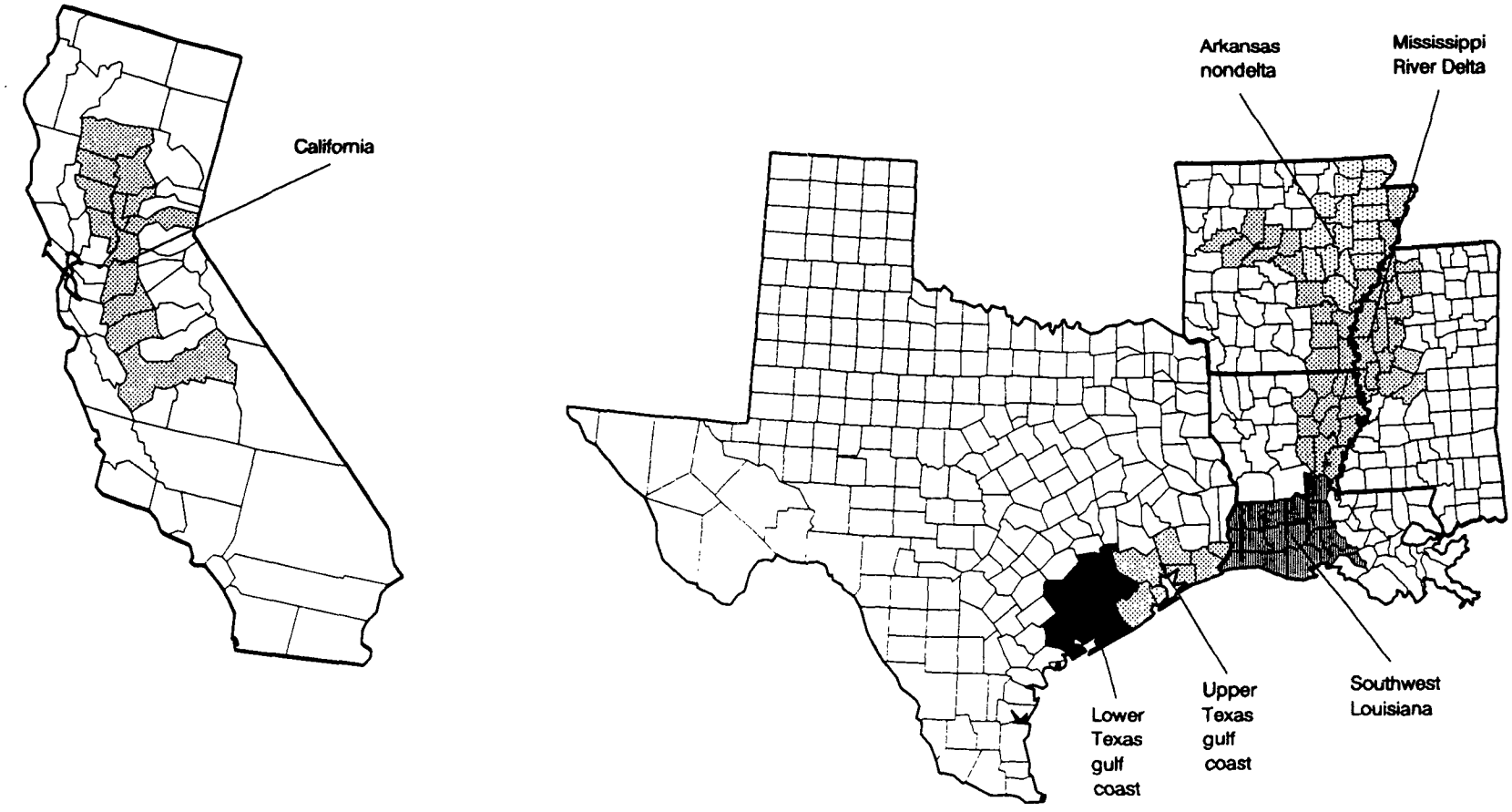
The Economic Research Service (Salassi, 1992) identifies six major U.S. rice-producing regions based upon similar production practices and soil characteristics (fig. 1). These six areas include (1) the nondelta areas of Arkansas; (2) California; (3) the Mississippi River Delta areas of Arkansas, Louisiana, Mississippi, and Missouri; (4) southwest Louisiana; (5) the upper Texas gulf coast; and (6) the lower Texas gulf coast. To simplify exposition of data, this study combines the last three areas into a single region called the gulf coast.

The U.S. rice crop is grown during the spring and summer and harvested in summer and early fall. The U.S. rice marketing year runs from August of the crop production year through July of the following year.[2]

[1]Before 1995, the Agricultural Stabilization and Conservation Service (ASCS) was responsible for administering the farm programs. Under the 1994 USDA reorganization, the ASCS was combined with several other USDA agencies into the CFSA.

[2]See Setia, Childs, Wailes, and Livezey (1994) for a glossary of technical terms related to the U.S. rice industry and government farm programs.

Figure 1
Major rice-producing areas



The majority of rice farms produce a single crop; however, farms along the gulf coast are often able to harvest a second cutting called a "ratoon" crop. This ratoon crop is often crucial to boosting yields and reducing variable costs per hundredweight (cwt) for high-cost rice farms.

Structure of Rice Farms

The 1992 Census of Agriculture reported that 11,212 farms harvested rice, a decline from 12,013 in 1987 (tables 1 and 2).[3] Farms engaged primarily in rice production totaled 6,687, also a decline from 7,396 in 1987.[4] The decline in the number of farms harvesting rice and the numbers of farms primarily engaged in rice production followed the national trend of decreasing farm numbers. From 1987 to 1992, farms with any harvested cropland decreased 9 percent.

[3]The Census of Agriculture defines a farm as having at least $1,000 in annual sales of agricultural produce. The individual farming unit may consist of several distinctly separate pieces of land that are managed by a single management team (whether an individual, a family, or a partnership). The CFSA defines a farm differently for program participation and payment purposes. At sign-up, a farm is identified as a single, independently managed entity and receives a unique farm identification (ID) number. As a result, a single farm under the Census of Agriculture may comprise several farm ID numbers for CFSA purposes. For example, if a farm crosses two counties the land in each county must have separate ID numbers. Often the parcelling of family farming units into multiple ID numbers is undertaken to avoid CFSA payment limitations on any single CFSA farm ID number. In 1993 the CFSA listed 21,877 farms in its final compliance report.

[4]A farm is defined by the Census of Agriculture as engaging primarily in rice production if rice provides at least 50 percent of the value of annual agricultural sales.

Table 1—Number of rice farms by size and share of output, 1992

Acres of rice harvested	Farms	Share of rice farms	Share of rice output	Average yield per acre
	Number	*Percent*		*Pounds*
1-99	2,620	23.4	4.3	5,287
100-249	3,772	33.6	20.4	5,729
250-499	3,296	29.4	36.3	5,579
500-999	1,232	11.0	25.8	5,585
1,000 or more	292	2.6	13.2	5,917
Total	11,212	100.0	100.0	5,643

Source: U.S. Department of Commerce, Bureau of the Census, 1992 Census of Agriculture.

Farms engaged primarily in rice production in 1992 had an average farm size of 743 acres and averaged 496 acres of harvested cropland, behind farms engaged primarily in wheat or cotton production (table 3).

The rice sector tends to be dominated by a relatively few large producers. In 1992, the largest 14 percent of rice farms produced over 39 percent of total production. Larger farms also reported higher yields than smaller farms, suggesting that factors affecting yield growth probably vary by farm size. The largest yield increases were probably captured by the implementation of new technology. Yield increases on smaller farms were probably limited by input constraints.

Profile of Rice Operators

Occupation and ownership of farms harvesting rice are different from farms harvesting other field crops. Operators of farms harvesting rice are more likely to be involved in farming as the primary occupation. In 1992, 88 percent of the 11,212 farms harvesting rice reported farming as the primary occupation. However, these same farm operators were more likely to be part-owners and tenants than full-owners. Farms producing other major field crops reported much higher rates of full ownership. Operators of rice-producing farms tend to be younger than other cash grain producers. The 1992 Census of Agriculture reported 42 percent of rice producers were less than 45 years

Table 2—Number of rice farms by State and share of output, 1992

State	Farms	Share of U.S. output	Average size[1]	Average yield/acre
	Number	*Percent*	*Acres*	*Pounds*
Arkansas	4,924	42.9	277	5,532
Louisiana	2,197	5.3	268	4,562
Mississippi	748	8.9	362	5,779
Missouri	475	2.9	216	4,893
Texas	1,276	11.4	290	5,419
South	9,620	81.3	280	5,305
California	1,575	18.1	255	7,943
Total[2]	11,212	100.0	278	5,643

[1]Average size of rice area harvested. [2]Includes some farms in minor rice-producing States: Florida and Tennessee.

Source: U.S. Department of Commerce, Bureau of the Census, 1992 Census of Agriculture.

Table 3—Enterprise and operator characteristics of selected grains, 1992

Year	Rice	Wheat	Corn	Soybeans	Cotton
			Number		
SIC farms[1]	6,687	62,144	140,252	75,068	20,447
			Percent		
Tenure:					
Full-owner	19.5	30.4	36.7	32.2	23.1
Part-owner	40.6	54.2	48.0	50.0	50.5
Tenant	39.9	15.4	15.3	17.8	26.4
Age:					
Less than 35	16.1	12.5	14.2	14.3	13.9
35-44	25.6	21.3	22.2	22.2	22.4
45-54	25.0	20.6	21.5	21.3	22.1
55-64	19.6	22.5	22.2	22.3	22.0
65 or older	13.9	23.0	19.9	19.8	19.6
			$1,000		
Per farm value of:					
Land/buildings	697	459	546	330	860
Machinery/equipment	112	79	80	51	133
			Acres		
Total, harvested acres[2]	496	551	339	298	617
Total, farm acres	743	1,152	442	228	939

[1]Based on farms for which the indicated crop is the principal crop grown, accounting for more than 50 percent of sales of agricultural products. [2]Includes all crops.

Source: U.S. Department of Commerce, Bureau of the Census, 1992 Census of Agriculture.

of age and only 14 percent were over 65. For operators of other cash grain producing farms, at most 37 percent were under 45 and at least 20 percent were over 65 years of age.

Asset values for farms engaged primarily in rice production are higher than for farms engaged primarily in the production of any other specific major field crop except cotton. In 1992, average value per farm was $697,000 for land and buildings and $112,000 for machinery and equipment. These high asset values make entry into and exit from rice farming slower and more dependent upon the long-term market outlook.

Trends in Production

Rice plantings have been on an upward trend during the last decade and production has been increasing. Since 1990, rice plantings have averaged slightly more than 3 million acres (fig. 2). Most of the increase in area has been in low-cost producing regions in the Mississippi River Delta and nondelta Arkansas (fig. 3). Very little abandonment of rice-planted acres occurs in the United States since all of the area planted is irrigated.

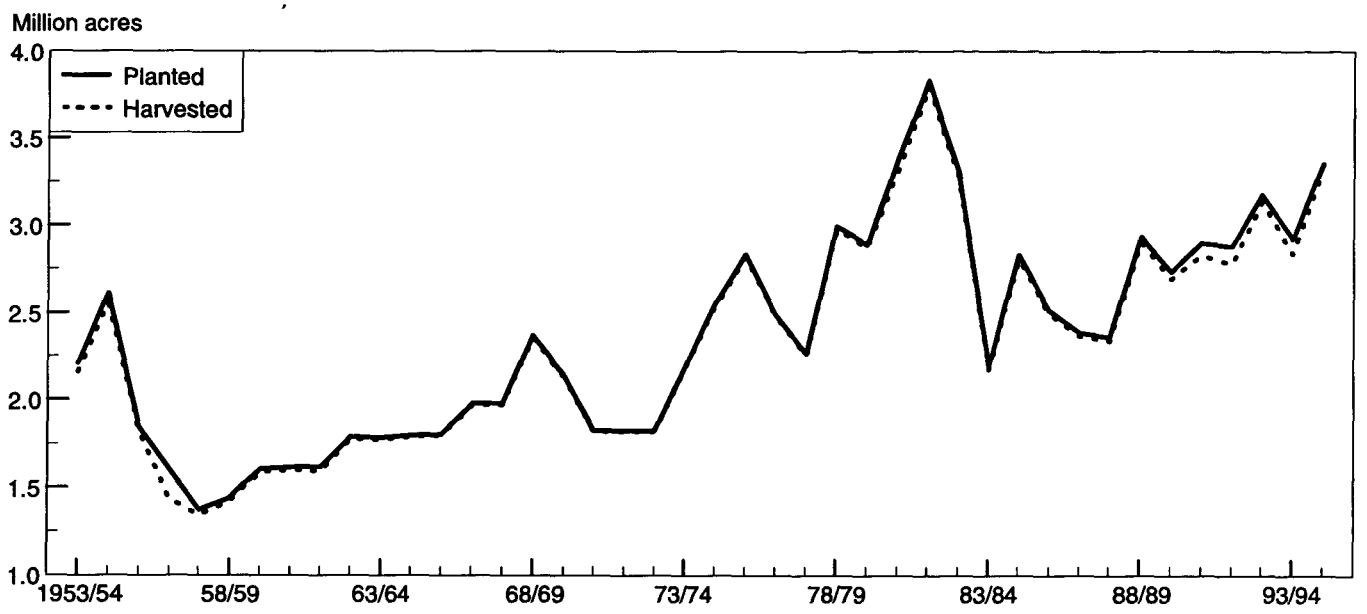
The expansion in area planted has come very gradually over time due to the nature of rice farming. Expanding production outside of the government program has inherently larger risks for rice than for other field crops due to (1) the large investments in machinery and irrigation equipment required, (2) the growing potential for further constraints placed on agricultural water uses, and (3) a dependency on export markets and their inherently volatile international prices. These factors prevent farms from easily and quickly shifting into and out of rice.

Rice Classes

In the United States, rice is referred to by length of grain: long, medium, and short grain. Long-grain rice is produced primarily in Southern States and medium- and short-grain in California. Long-grain rice has had an ever-increasing share of area and production over the past two decades. Since 1984/85, long-grain has accounted for 74 percent of area harvested and 70 percent of production (figs. 4 and 5).

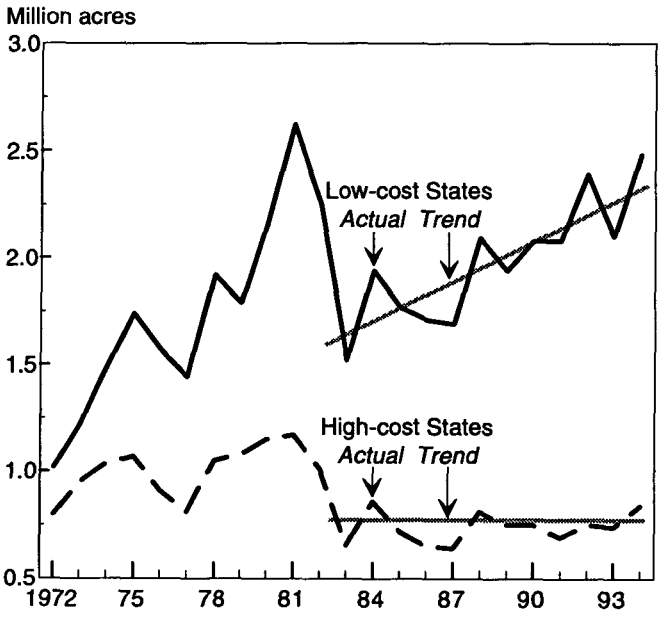
The different types of rice are considered imperfect substitutes, except by users who purchase rice for further processing. Because of class distinctions,

Figure 2
U.S. rice acres, planted vs. harvested



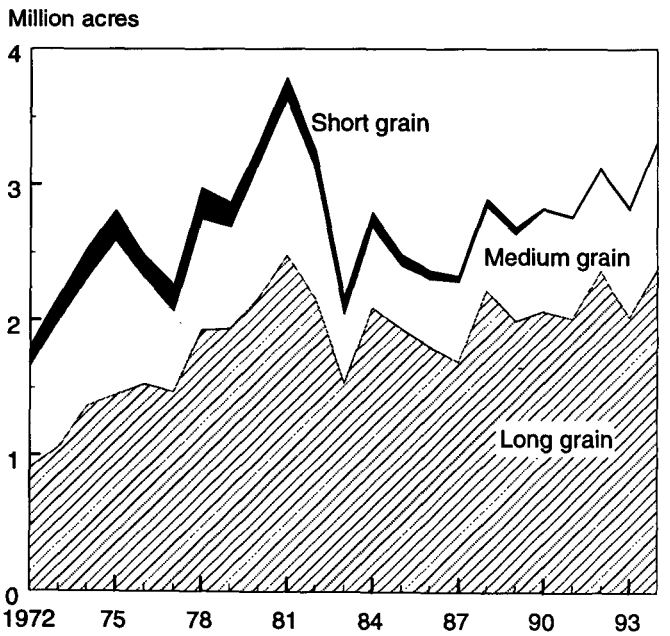
Source: USDA.

Figure 3
Harvested rice acres: high-cost and low-cost States



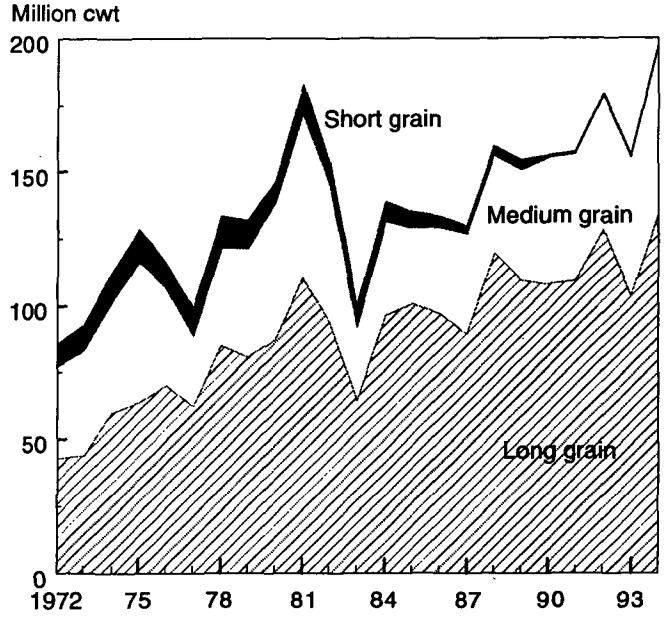
Source: USDA.

Figure 4
U.S. harvested rice acres, by type and crop year



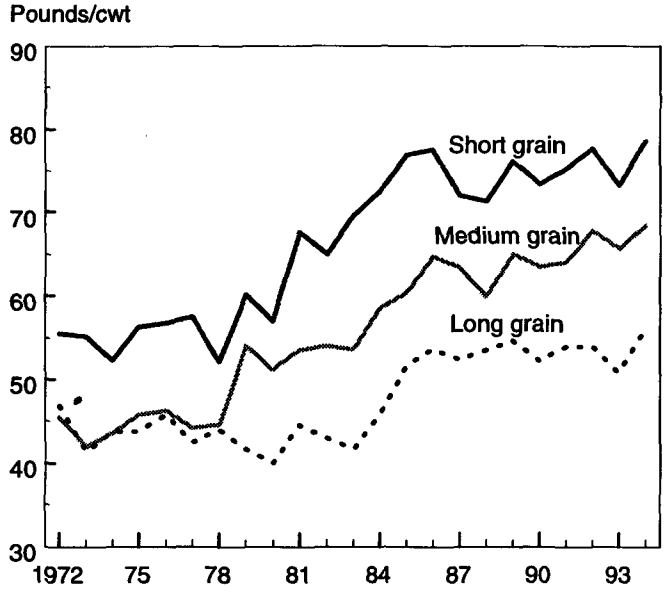
Source: USDA.

Figure 5
U.S. rice production, by type and crop year



Source: USDA.

Figure 6
U.S. rice yields, by type and crop year



Source: USDA.

supply-demand imbalances for the rice market as a whole are not necessarily good indicators of the market situation for any single class of rice. Long-grain rice traditionally commanded the premium price in the rice market and remains the dominant type found in retail outlets. The shorter grains have been lower priced and are predominantly used in processed foods and beer, where processors are more price-sensitive. However, medium- and long-grain price relations have changed dramatically in recent years. Vietnam's entrance into the world market in 1989 as a major source of long-grain rice pressured U.S. long-grain prices to a discount with medium-grain by 1992. Then, Japan's surge in medium-grain imports in 1994 sent medium-grain export prices to a 50-percent premium over long-grain.

This distinction between rice classes will become more important with the implementation of the recently completed Uruguay Round of GATT (UR-GATT) negotiations. Minimum access criteria agreed to under UR-GATT are expected to open the previously closed markets of several high-income East Asian medium-grain rice-consuming countries.

Arkansas, Louisiana, Mississippi, Missouri, and Texas produce mostly long-grain rice. California produces over 60 percent of the medium- and short-grain rice grown in the United States. Yields vary by type of rice produced, with short-grain achieving the highest yields per acre, followed by medium- and long-grain (fig. 6).

Since 1990, Arkansas has accounted for slightly more than 40 percent of total harvested acres and production. California is the next leading producer, with an average of about 400,000 acres of rice plantings, or 15 percent of the U.S. total. In 1994, 99 percent of California's rice crop was medium- and short-grain. Although rice acreage in California is relatively small, yields are the highest of any State.

Rice farms in Texas and Mississippi produce almost entirely long-grain rice, while nearly one-third of Louisiana's rice crop is medium-grain. Rice plantings average nearly 600,000 acres in Louisiana, over 300,000 acres in Texas, and slightly more than 250,000 acres in Mississippi.

Yields and production on rice farms in Texas and southern Louisiana are supplemented by a ratoon crop. This involves harvesting the secondary growth that follows the first harvest's cutting. Often an application of fertilizer is put on the fields after the first cutting to help improve ratoon yields.

Acreage Response

The relationship between rice prices and production is important in estimating the effect of policies on supply and demand equilibrium. Rice acreage changes

when expected net returns from producing rice change relative to returns from other crops. Changes in acreage also affect yields because, as prices change, less productive land is brought into rice production or withdrawn from it and adjustments are made in input use. Using 1982 data, Grant, Beach, and Lin (1984) estimated that each 100,000-acre change in rice acreage results in an opposite change in rice yields by 30-40 pounds per acre. However, this varied widely by State. They also estimated that a change in the price of rice of $1.00 per cwt adjusted for any offsetting change in cost of production will cause farmers to change harvested area in the same direction by about 44,000 acres.

Sustained high or low prices over several years would likely result in even larger acreage shifts than short-term price changes. Farmers might be able to adjust resources that could not be changed in a single season, perhaps by preparing land for irrigation or acquiring equipment (irrigation, combines, and rice dryers) or finding alternative uses for idled land and machinery. Support prices and acreage reduction programs also make producers less responsive to price changes.

The size of the acreage shift in response to a price change depends on profit opportunities with other crops. Rice has generally been competitive enough to hold on to its acreage base. In 1987, the principal alternative crops in the Delta region were wheat, soybeans, and cotton.

Alternatives in Texas and California were more limited than in the other major rice-growing States. Soil and water constraints made crop alternatives possible on only a small share of available rice acreage. For the majority of land on which rice is grown in Texas, no alternative crops are planted in the 2-3 year rotation (Texas Rice Task Force, 1993). In California, slightly over half of the rice acreage is considered "rice only" soil, very poorly suited to rotation crops. There are relatively few choices for most of the remaining acreage, the most common being wheat or safflower every third or fourth year (UC Agricultural Issues Center, 1994).

When cash receipts minus cash expenses are compared among crops, the relative economic advantage of producing rice is evident (table 4). Cash receipts (including government program payments) less expenses have been higher for rice than for other major field crops in all years since 1988. However, regional returns may vary.

The lack of perfect substitutability among crops and rice's high entry costs likely cause rice acreage response to price increases to be less than for other major field crops. And, once land is prepared for rice, sustained low prices may be required to shrink U.S. rice production capacity.

Rice Area and Yield Potential

Grant and Holder (1975) attempted to estimate the potential for further expansion of rice area in the United States under the assumption that potential new rice area should lend itself to irrigation: (1) the surface slope of the land should be relatively flat for irrigation water control, (2) internal drainage should be poor in order to hold surface water in a flood condition, (3) irrigation water is available, and (4) practical crop rotation patterns are adhered to.

They estimated that U.S. rice acreage could expand to a sustainable 4.4 million acres and to 9.7 million acres on a short-term basis (table 5). Their estimate ignored market conditions, government acreage restrictions, and competing crop net returns, and simply considered maximum potential acreage.

The long-term price signal necessary to trigger an expansion in U.S. rice area to 4.4 million acres would require farmer confidence in a sustained market price at or above the national average economic cost per cwt which was estimated to be $9.96 in 1992.[5] The

[5]See tables 8 and 9 for a description of average costs by region. The Interagency Agricultural Projections Committee of USDA projects the season average farm price for rice to increase from $6.10 per cwt in 1994/95 to $9.10 in 2005/06 under a set of normalcy conditions (WAOB 95-1, 1995). Thus, barring a dramatic change in international conditions, U.S. rice acreage would probably not expand near the estimated 4.4 million acre potential.

Table 4—U.S. average returns above cash expenses per planted acre, selected crops[1]

Year	Rice	Wheat	Corn	Soybeans	Cotton
	Dollars/planted acre				
1986	240	88	135	73	147
1987	379	92	211	105	209
1988	237	94	126	111	122
1989	290	66	163	78	130
1990	236	63	140	89	108
1991	282	69	110	78	103
1992	257	78	143	97	179

[1]Returns are cash receipts and government payments less cash expenses. See table 7 for income components for rice.

Sources: USDA, Consolidated Farm Service Agency, and USDA, ERS, *Economic Indicators of the Farm Sector,* 1994.

Table 5—Estimated acres of cropland, acres suited to rice, sustainable rice production acres, and reported planted acres in 1991-93 and 1994 for the major rice-producing States

Area	Total cropland	Potential rice area[1]		Reported rice area	
		Suitable	Sustainable	1991-93[2]	1994[3]
			1,000 acres		
Arkansas	4,340	2,749	1,359	1,327	1,440
Louisiana	2,031	1,930	965	578	625
Mississippi	2,350	1,351	675	252	315
Missouri	1,397	559	279	106	131
Texas	2,550	2,430	596	333	355
California[4]	661	661	503	396	487
Total	13,329	9,680	4,377	2,991	3,353

[1]Increased water resource and environmental constraints along with non-agricultural development have likely decreased the potential area for rice expansion in some areas. [2]Average planted acres for 1991, 1992, and 1993. [3]"Crop Production: 1994 Summary," CR PR 2-1(95), NASS, USDA. [4]Excludes data from San Joaquin Valley.

Source: Grant and Holder, Jr., 1975.

distribution of farm-level cost-of-production per cwt across and within regions would affect the actual rates at which rice area expansion would be economically justifiable.

On a regional basis, Louisiana, Mississippi, Missouri, and Texas have the largest amounts of sustainably expandable acreage above 1994 plantings. The cost structure of Texas and southern Louisiana rice farms would probably require a sustained market price above $10 per cwt to encourage acreage expansion, whereas Mississippi offers the most opportunity for expansion with a sustained market price in the $9 range. These prices compare with 1993/94's estimated season average market price of $7.98 per cwt and with the 4-year average of $7.00 for 1990/91 to 1993/94.

Tremendous productivity gains in rice have been realized over the last four decades through a combination of improvements in fertilizer, water management, and varieties. In addition, U.S. rice yields are not as subject to many of the weather-related swings that affect other U.S. field crops because the entire crop is irrigated and fertilized. Hence, rice has both higher and more stable yields than other crops.

Since the early 1950's, U.S. yields have progressed in four stages (fig. 7). From 1953/54 to 1967/68, U.S. rice yields grew at an annual average rate of 4 percent, rising from under 2,500 pounds per acre to over 4,500, principally as the result of improved production methods and irrigation infrastructure development. From 1967/68 to 1980/81, yields were stagnant at an average of 4,511 pounds per acre. Then widespread adoption of semidwarf varieties in the early 1980's moved U.S. rice yields higher at a 3.7 percent annual growth rate before again leveling off in the late 1980s. Finally, during 1986/87-1993/94, yields per acre showed marginal annual trend growth of 0.4 percent, averaging 5,654 pounds per acre.

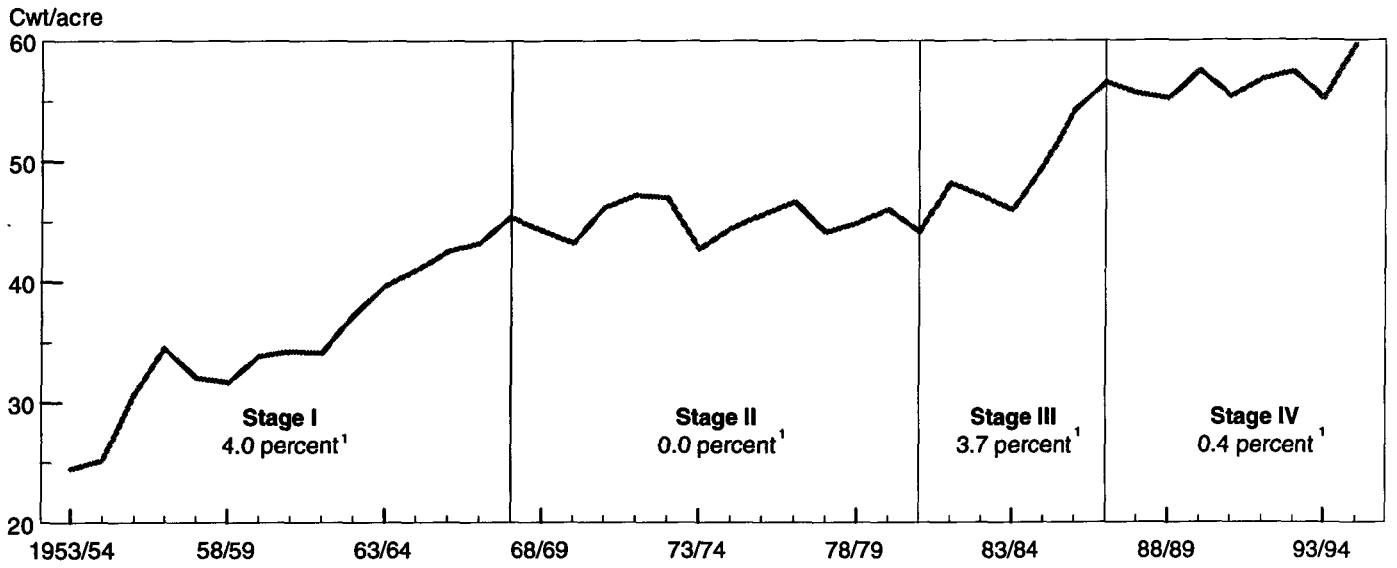
Future growth in U.S. yields depends on several factors: (1) investment in varietal research; (2) new varieties currently in research stations; (3) length of time for transmission of new varieties from the research station to the farmer's field (currently estimated at 10 years); (4) the rotation period and weed control; (5) chemical dependency; and (6) water availability, cost, and control.

The U.S. rice industry does not appear poised to move to the next "yield plateau," but rather appears likely to see yields continue to creep marginally higher at a rate that lags cost-of-production rises, thus eroding the industry's economic viability. If a major breakthrough occurred in the research station today, it is estimated that nearly 10 years would be required before the new variety would be commercially accessible.

The U.S. Rice Program

Government programs incorporate several objectives such as ensuring a stable food supply at stable prices

Figure 7
U.S. rice yields



[1] Average annual growth.
Source: USDA.

via a variety of acreage controls, supporting farm incomes with a minimum of market interference, and preserving American farmlands. This multiplicity of objectives lends to program complexity, while the income support aspect of government programs lends to their widespread use.

Program Provisions[6]

The U.S. Government's current rice program addresses six specific issues: (1) supply control; (2) price support; (3) income support; (4) planting flexibility; (5) market orientation; and (6) budgetary restrictions.

Supply Control

Supply controls have been an essential element of U.S. farm programs since their inception. The objective of supply control is to prevent an excessive buildup of total stocks. Excessive stocks cost the Federal Government in the form of direct storage costs, plus indirectly via increased deficiency payments due to the price-depressing effect of large stocks overhanging the market.

Supply controls have been implemented through acreage control programs such as the Paid Land Diversion (PLD) or Acreage Reduction Program (ARP). Acreage control programs limit production by restricting land that can be used for the commodity.

A key concept under acreage control is an individual farm's crop acreage base that is eligible for government program benefits. For rice, the crop acreage base is the average of the acreage planted and considered planted to rice for harvest on the farm in the 3 preceding crop years.

Current legislation includes authority for Acreage Reduction Programs (ARP) from base acres. An ARP is a voluntary annual land retirement program; however, compliance is required for program payment eligibility. Acres reduced under an ARP are not eligible for program payments, but are considered planted for crop acreage base purposes.

The Secretary has discretion in setting an ARP level, which can range from 0 to 35 percent.[7] However, by law the ARP must be chosen with the objective of producing a projected level of ending stocks for the next marketing year's crop that is 16.5 to 20 percent of the average total use for the 3 preceding marketing years.

[6] For a history of the U.S. rice program and the development of program provisions through 1988, see Childs and Lin (1989) and Setia, Childs, Wailes, and Livezey (1994).

[7] Authority also exists for having no ARP. Under such a program (never established for a crop) producers' plantings of rice would not be limited, although target price payments would be made only on payment acres. However, all production would be eligible for price support loans.

An ARP reduces government outlays by reducing payment acres and by reducing area, thus reducing production and increasing market prices. Because demand for rice is inelastic, the ARP-induced higher prices increase farm income.

Acreage control programs have two inherent weaknesses. First, when program participants idle land, "slippage" may occur. That is, the idling of frequently less productive land is offset by either greater use of nonland inputs in production or by increased plantings by nonprogram participants in anticipation of higher market prices. Second, inefficient uses of inputs often result (Halberg, 1992).

Price Support

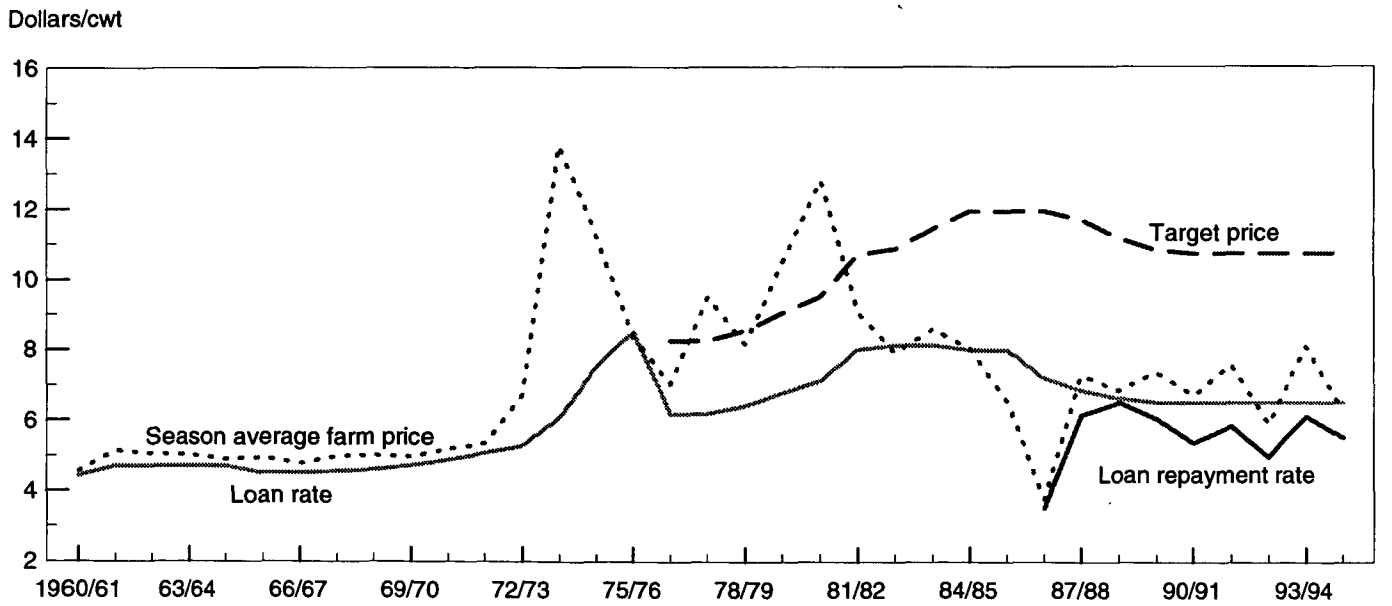
Price support is provided by loan programs which provide a guaranteed minimum farm price. Producers may place their rice under a nonrecourse government loan while waiting for improved market selling opportunities. Once they have placed their rice under loan, producers have a 9-month period in which to redeem their loans. At the end of that period they must decide whether to redeem the loan or forfeit their rice to the Commodity Credit Corporation (CCC). If a farmer forfeits her or his crop to the Government, the farmer retains the loan proceeds. Only farmers participating in farm programs are eligible for such loans. The loan is available on eligible acreage—permitted rice base that is planted and flex acres. Under a no-ARP, all plantings would be eligible. When an ARP is in effect, only acreage planted by program participants is eligible. Plantings on acreage outside the program (nonbase plantings) are not eligible.

The basic loan rate is set at 85 percent of the simple average price for the preceding 5 years, deleting the high and low price. The loan rate, however, cannot fall below $6.50 per cwt in accordance with the Food Security Act of 1985. Since 1989, the loan rate has been constant at $6.50 per cwt, rough basis (fig. 8).

Loan rates for warehouse loans are based on the actual milling quality of individual lots of rice, whereas farm-stored rates are based on historical milling qualities of the different classes of rice by State. In recent years these rates, whether warehouse or farm-stored, have been established by setting the whole-kernel loan rate for medium- and short-grain at $1.00 per cwt less than the long-grain rate.

The acreage reduction and target price provisions of the program are uniformly applied to all rice classes and much of the information available for supply, demand, and price movements focuses on the all-rice market.

Figure 8
Season average price received and government program prices, 1960/61-94/95



Source: USDA.

Income Support

Farm income support is provided by the target price deficiency payment program. When the national average price received by farmers falls below the announced target price, deficiency payments are made. The total deficiency payment is the product of the payment rate, payment acreage, and program yield.

For the 1994 crop, the payment rate is the difference between the target price and the higher of the loan rate or the lower of the 12-month calendar year average price or the average price during the first 5 months of the marketing year plus $0.27 (an adjustment factor implemented to lower program costs). Since 1990, the target price has been constant at $10.71 per cwt, rough basis.

Payment acreage is generally equal to the established rice acreage base, less normal flex acres, any acres placed in the required ARP, and nonpaid acreage under the 50/85 provision. Only producers that comply with any required ARP are eligible for income support payments.

The program yield is the level of production per acre eligible for target-price deficiency payments. Production above the program yield only receives market returns. Program yields were frozen in 1990 and have not been adjusted since then.

Planting Flexibility

Planting flexibility provisions allow program participants to plant established crop acreage base to a nonbase crop without a reduction in the established crop acreage base.

Planting flexibility is important for field crops requiring regular rotations. Rotations are used to control plant diseases and enhance soil fertility. In the past, inflexible program restrictions locked producers into certain crops to maintain payment acreage base, thus hindering efficient farming operations. The benefits of greater planting flexibility and crop rotation include improved environmental quality, reduced production costs through yield improvements and reduced input costs, and an increased revenue share from market returns.

Policymakers saw increased planting flexibility as a way to both move producers away from making production decisions in response to the program and facilitate their response to market signals.

Current program planting flexibility first became available under the Food Security Act of 1985 in the form of underplanting via the 50/92 program. The 50/92 program was only available when an ARP was in place. If a producer planted between 50 and 92 percent of maximum payment acres to rice, and devoted the remainder to a conserving use, then 92 percent of maximum payment acres were eligible to receive deficiency payments. The 50/92 program was changed to the 50/85 program in 1994 with provisions of the original 50/92 program intact except that now farmers are eligible to receive payments on only 85 percent of maximum payment acres.

Planting flexibility was increased by the concept of "triple base" under the Food, Agriculture, Conservation, and Trade Act of 1990. Triple base provisions of the legislation divide the crop acreage base into three components. First, normal flex acres (NFA) are the 15 percent of crop acreage base not eligible for payments. Second, maximum payment acreage is equal to the crop acreage base less NFA or any ARP. A program participant is eligible to plant certain crops on NFA without decreasing established base.[8] NFA receives no deficiency payments, even if the base crop is planted. Third, optional flex acres (OFA) are an additional 10 percent of maximum payment acres that can be planted to the same nonprogram crops.[9] If OFA are planted to rice, then OFA are eligible for rice program payments; if planted to another crop, they are not eligible for rice program payments; but if planted to another program crop or oilseeds, such plantings are eligible for price support loans. Planting flexibility exists on both NFA and OFA because the crop acreage base is protected for future years, even if another crop is planted.

Market Orientation

During the early 1980's, loan rates well above market prices decreased U.S. competitiveness in world markets by serving as a "floor price" for U.S. rice. Loan rates in excess of international prices isolated U.S. crops being held under loan from the market. This caused large quantities of grain to be forfeited to the Government and a large U.S. price premium in international markets. Commodity Credit Corporation inventory increased from none in 1980/81 to 44 million cwt by 1985/86, while U.S. rice exports decreased from 91 million cwt to 59 million cwt.

Three principal market-oriented features were instituted under the Food Security Act of 1985 to reduce

[8]All crops may be harvested on flex acreage except fruits and vegetables (not including adzuki, faba, and lupin beans), peanuts, tobacco, wild rice, trees, and nuts.

[9]Refer to footnote 8.

government-held stocks, to make U.S. rice more competitive in world markets, and to place more emphasis on market returns to guide planting decisions.

First, the announced loan rate (ALR) was allowed to decline from $8.14 in 1983/84 to $6.50 by 1990/91. By lowering the loan rate, farmers were forced to look more to the marketplace for selling their crop.

Second, a marketing loan program was introduced that linked loan repayment rates to the prevailing world price of rice rather than the higher announced loan rate. Rice producers could now repay loans at the lower of a USDA-calculated world price or a set percentage of the loan rate. Producers who redeem their loans, repay their loans at a rate equal to the USDA-calculated world price (loan repayment rate or LRR). Alternatively, producers can receive an equivalent loan deficiency payment with agreement to forgo placing their crop under loan. The difference between the ALR and the world price is called the marketing loan gain. If the world price is above the ALR, the LRR equals the ALR. The loan gain is based on rough rice prices.

Third, NFA receive no target price deficiency payments. Instead, producers must rely solely on the market for returns.

Budgetary Restrictions

By the mid-1980's, Congress was under increasing pressure to address the rapidly rising national budget deficit. Farm program benefits were targeted under the Food Security Act of 1985 (FSA) as part of an effort to control escalating farm program spending.

Program parameters affecting deficiency payments were changed. Both the target price and loan rate were allowed to decline from $11.90 and $8.00, respectively, in 1984/85 to $10.71 and $6.50 by 1990/91. A lower loan rate reduced the likelihood of crop forfeiture. A lower target price helped bring U.S. prices more in line with international prices.

The 1985 Act also instituted underplanting provisions under the 50/85 program (originally the 50/92 program). The 50/85 program was originally designed to reduce government stocks by permitting farmers to reduce plantings and, at the same time, receive government payments (Broussard, 1992).

In 1990, further pressure to lower program costs led to a freeze in payment yields at their 1990 level under the Food, Agriculture, Conservation, and Trade Act of 1990. The Omnibus Budget Reconciliation Act of 1990 further lowered program costs by limiting payment acres to 85 percent of crop acreage base, thus instituting the normal flex acreage concept.

Program Participation

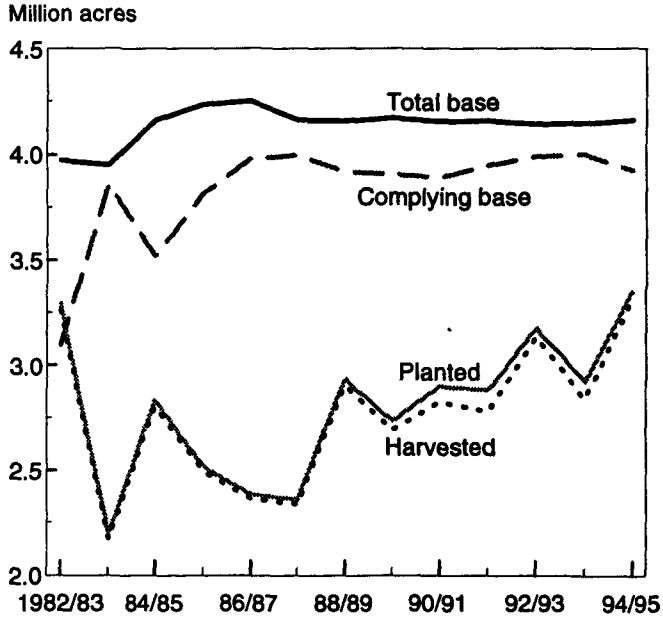
The income support provided by the government rice program has prompted high farm participation rates. Acreage base enrollment in the rice program is highest among program crops, averaging more than 95 percent since 1990/91. This is more than 10 percent higher than base enrollment for wheat or feed grains.

Base Acres

Since the current concept of crop acreage base was started in 1982, participation in the rice program has averaged over 92 percent (app. table 3). The rice base has been stable during this period averaging 4.14 million acres, ranging from a low of 3.97 million acres in 1982 to a high of 4.25 million acres in 1986 (fig. 9). Rice base acreage has averaged 4.14 million acres since 1982.

One possible reason for the high participation rate is that some rice producers have limited alternative uses for rice acreage. Also, program provisions are favorable for participation. Since 1990, the target price has averaged 35 percent higher than the season average farm price. This compares with wheat and corn target prices that have averaged 25 and 15 percent higher than their respective season average farm prices.

Figure 9
U.S. rice acreage



Source: USDA.

Normal and Optional Flex Acres

Under a combined NFA and OFA, up to 25 percent of crop acreage base can be flexed out of rice. As a result of high participation rates, eligible flex acreage has been near 1 million acres since 1986. For the crop years 1991/92-1993/94, there were nearly 600,000 normal flex acres, while almost 400,000 acres were eligible for flexing under the optional flex acreage provision (app. table 6). Although not eligible for deficiency payments, NFA can be planted to certain other crops.[10]

A rice producer is confronted with three alternatives for flex acreage: plant to rice, plant to other crops, or idle the acreage (Salassi, 1991). A decision to plant a crop other than rice suggests that rice is less competitive without government deficiency payments. A decision to idle the land suggests that high costs of production make rice unprofitable, while limited short-term crop alternatives to rice exist for the land.

During 1991/92-1993/94, 26 percent of national rice NFA was planted to rice, while another 47 percent of was flexed to other crops. Arkansas producers planted the largest percentage of rice NFA to rice, more than 33 percent. Texas producers planted less than 4 percent of NFA to rice, well under the national average. Mississippi led the way in planting NFA to other crops, averaging 73 percent.

Nationally, 26 percent of NFA was idled between 1991/92 and 1993/94. Program participants in Texas, California, and Louisiana each left large percentages of NFA idled. Texas producers idled 75 percent of NFA, California producers idled an average of 55 percent, and Louisiana producers, 35 percent. Without income support from the target price/deficiency payment program, high production costs may have resulted in the large amount of idled acres for these States. No government payments or market returns were received on these idled acres. Also, during those years when the flex provisions were in place, there was either a 0- or 5-percent ARP requirement, down significantly from the preceding 9 years when ARP's ranged from 15 to 35 percent. This may have caused some producers to idle a larger percentage of flex acres.

The 50/85 Program[11]

Initially, the 50/85 program was designed to help reduce excess U.S. supplies via reduced plantings while still allowing producers to retain their government payments. More recently, the 50/85 program has been used to satisfy different farm-level objectives. First, it offers farmers greater planting flexibility needed to respect crop rotation practices without losing rice program acreage base. Second, an increasing number of producers has cited water constraints as a reason for participating in 50/85. Finally, and perhaps most importantly, producers have cited increasing production costs relative to market returns as incentives to reduce plantings under 50/85. Being guaranteed payments for 85 percent of the maximum payment acres (MPA), while only planting 50 percent of the MPA, has provided income these producers may not have generated if the entire crop acreage base had been planted. In some areas, particularly Texas, financing without the guaranteed 50/85 payments is difficult to obtain for some producers.

Participation in the 50/85 program has increased since 1986 from 18 percent of the total effective rice base enrolled to a record 38 percent in 1993 (table 6). The 50/85 provision has been used in all the rice-producing States; however, Texas has shown the greatest reliance with an average of 76 percent of complying base acres since 1990. Mississippi at 45 percent and California at 43 percent are also aggressive users of the 50/85 provision, although much of California's prior reliance is attributable to a prolonged drought that ended in 1993 when only 24 percent of effective base was enrolled in the 50/85 program.

From 1991 to 1993, Texas idled an average of 141,000 acres (25 percent of complying base acres) under 50/85. Arkansas idled an average of 125,000 acres (only 7 percent of complying base) under 50/85.

Program Costs

Under the current Federal rice program legislation, the Government incurs program costs via program payments to rice producers and CCC market activities.[12]

Government payments include (1) target price deficiency payments, (2) marketing loan gains, (3) Conservation Reserve Program (CRP) payments, and (4) disaster payments. Payments were also made under various diversion and payment-in-kind programs.

Costs arising from CCC market activities include storage costs of rice forfeited under the loan program and resale losses (profits) incurred when CCC market sales are made below (above) the loan rate plus storage costs.

[10]See footnote 8.

[11]For further details, see Broussard (1992).

[12]The Federal costs of program administration and overhead are ignored in this report.

Deficiency payments have made up the bulk of direct payments to rice producers since 1981 (table 7). During 1991/92-1993/94, deficiency payments accounted for two-thirds of government direct payments, with marketing loan gains accounting for the remaining third. CRP payments are a minuscule share of government rice program payments because only 13,000 acres of rice base are enrolled in the CRP.

The 1977 Food and Agriculture Act imposed payment limitations on producers for the first time. Payment limits were initially set at $52,250 for one or more crops but, by 1980, payments could not exceed $50,000 per person for total payments received under the grain and cotton programs. However, there are no limits to the amount of payments that one farm can receive. As a result, the payment limitation "per person" has not proven an effective constraint on reducing government payments on a farm basis.

Table 6—50/85 program acres: Total enrolled, enrolled as a share of complying base, and acres idled, by State[1]

Year	AR	LA	MS	MO	TX	Southern States	CA	U.S.
				1,000 acres				
Acres enrolled in 50/85:								
1986/87	192	95	86	9	292	673	41	717
1987/88	253	162	119	15	332	881	47	928
1988/89	150	96	61	5	249	561	48	609
1989/90	241	143	120	11	340	854	59	914
1990/91	253	134	106	11	368	872	190	1,062
1991/92	332	182	173	21	400	1,108	337	1,443
1992/93	345	163	143	16	427	1,094	286	1,384
1993/94	432	271	166	26	479	1,374	134	1,512
1994/95	177	111	65	2	375	730	65	798
				Percent				
Acres enrolled in 50/85 as a share of complying base:								
1986/87	11	13	24	9	50	20	7	18
1987/88	15	23	33	14	59	26	8	23
1988/89	10	14	18	5	46	17	8	16
1989/90	15	20	34	10	60	26	10	23
1990/91	16	19	32	10	65	26	32	27
1991/92	21	26	49	18	70	33	58	37
1992/93	21	23	40	13	74	32	49	35
1993/94	27	38	47	21	84	40	23	38
1994/95	11	16	19	2	66	22	12	20
				1,000 acres				
Acres idled under 50/85:								
1986/87	46	21	20	3	74	164	10	174
1987/88	65	41	29	4	90	229	12	241
1988/89	34	21	13	1	60	129	9	138
1989/90	62	35	32	3	98	231	14	245
1990/91	65	34	28	3	110	240	48	287
1991/92	132	84	148	14	121	499	154	654
1992/93	93	45	41	5	141	325	119	446
1993/94	125	78	64	9	162	437	43	481
1994/95	51	32	19	1	126	229	17	247

[1]From 1986/87 to 1993/94, the program operated under the name 50/92. See text for differences. 1994/95 data based on CFSA "1994 Preliminary Compliance Report." Totals may not add due to rounding.

Source: USDA, Consolidated Farm Service Agency.

Table 7—U.S. rice sector farm-level income: Market returns and government direct payments to rice producers

Payments	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
						Million dollars							
Market returns	1,654	1,246	876	1,119	881	500	942	1,092	1,135	1,046	1,194	1,058	1,263
Gov. payments	21	267	618	380	790	902	745	611	627	696	680	929	872
Deficiency	21	267	233	380	375	495	545	549	456	555	458	613	570
Marketing loan[1]	--	--	--	--	322	407	200	62	170	141	221	315	301
CRP	--	--	--	--	--	0	0	0	0	1	1	1	1
Diversion	--	--	23	--	93	--	--	--	--	--	--	--	--
Disaster	--	--	--	--	--	--	--	--	--	--	--	--	--
Payments-in-kind	--	--	362	--	--	--	--	--	--	--	--	--	--
Total returns	1,675	1,513	1,494	1,499	1,671	1,402	1,687	1,703	1,762	1,742	1,874	1,988	2,135
						Dollars/ cwt							
Season average farm price	9.05	7.91	8.57	8.04	6.53	3.75	7.27	6.83	7.35	6.70	7.58	5.89	7.98

-- = Not available.

[1]Includes loan deficiency payments (both cash and certificates) and marketing loan gains.

Source: USDA, Consolidate Farm Service Agency.

Rice Farm Sector Returns

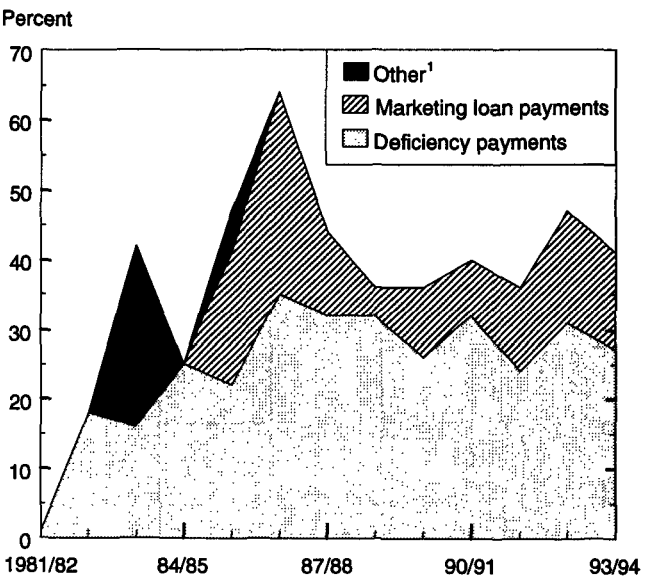
At the farm level, the two sources of rice sector income are market returns and Federal farm program payments. Rice sector income has shown steady growth in recent years, reaching $2.1 billion in 1993/94 (table 7); however, much of this increase is attributable to growth in government program outlays (fig. 10).

Market Returns

Total market returns are a function of production and market prices. Because the United States has traditionally looked to the international market for a substantial share of total use, U.S. domestic prices are closely linked to international market conditions (fig. 11). As a result, U.S. market returns are depressed by foreign agricultural trade policies that suppress import demand while exaggerating export supplies.

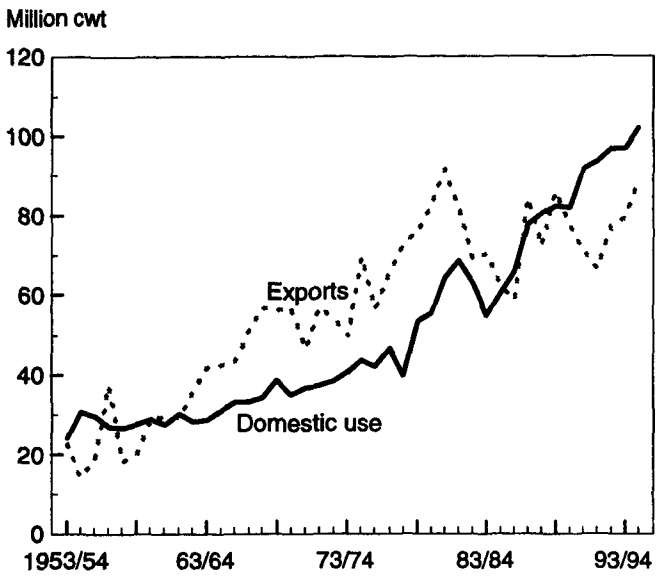
In 1981/82, market returns peaked at nearly $1.7 billion, accounting for 99 percent of total rice sector income on the strength of large, high-priced exports to South Korea. By the mid-1980's, most of the major Asian rice importing countries (including Indonesia, Japan, and South Korea) had implemented self-sufficiency policies designed to stop imports. International and U.S. market prices plummeted, while U.S. stocks rapidly accumulated to historic levels. U.S. rice producers began to depend more on government programs to make up for the deficiencies of the international marketplace. By 1986/87, the U.S. sea-

Figure 10
U.S. rice program payments as a share of sector income



[1] Diversion, disaster, CRP, and payments-in-kind.
Source: USDA.

Figure 11
U.S. rice total use, exports vs. domestic use



Source: USDA.

son average market price had fallen to $3.75 per cwt, while market returns were a meager $500 million, only 36 percent of sector returns.

Since 1986/87, the U.S. rice industry has successfully used the marketing loan program to reduce its burdensome stocks. In addition, a rapidly growing domestic market has replaced the international market as the principal source of demand for U.S. rice. The importance of the domestic market has been further supported by a tendency for excess supply, strong competition, and low prices in the international marketplace since the entrance of Vietnam in 1989 as a source of large, low-priced rice supplies.

Government Program Outlays

A high participation rate in Federal farm programs indicates the importance of program payments on rice sector income. Since 1986/87, deficiency and marketing loan payments have averaged about $726 million, or 42 percent of rice sector income. Rice sector income has been increasing over the last decade, and the components have varied with market conditions. In years of low market prices, government payments play a more important role.

Rice Farm Sector Cost Structure

A principal factor in determining the economic viability and sustainability of an individual rice farm operation is its cost structure. In the short term, a rice farming operation is concerned with profitability as measured by the difference between the gross returns from rice operations and the variable costs. Variable costs include expenses for the purchase of inputs that are consumed in one production period. Expenses for seed, fertilizer, chemicals, fuel, lubrication, machinery repairs, harvesting, drying, and custom operations are typical variable cash expenses on crop farms.

However, a rice farm's long-term viability depends on the gross returns from operations covering all of the costs associated with rice farming operations on a sustained basis. Total costs include two additional cost components: fixed cash costs and noncash costs. Fixed or overhead costs include expenses for utilities, real estate taxes, property taxes, insurance, as well as general farm business expenses such as accounting and legal fees, registration and license fees, farm office-equipment purchases, and association memberships. Noncash costs include valuations for operating capital and land as well as management and risk. Total cash costs (variable plus fixed cash costs) represent the break-even point for viable financial operations, while total economic costs (total cash costs plus total non-cash costs) represent the break-even point for optimum use of society's resources across various industries and occupations.

Background and Methodology

In 1973, Congress required USDA to produce cost estimates for the major program crops and dairy to better evaluate and regulate program support levels. USDA designed its estimates to produce costs and returns exclusive of the direct effects of government programs because the programs themselves have a strong influence on the estimates. If the direct effects of the programs were included in the estimates and then used for policy purposes to establish support levels, an escalating effect would be built into the process of setting support levels because of the effect of the program benefits on costs (Salassi, Ahearn, Ali, and Dismukes, 1990).

However, it is important to consider the direct effects of government programs to evaluate farm profitability and the trade-offs in commodity area allocation decisions faced by rice farms. These effects are especially critical for rice because program participation rates regularly exceed 90 percent and because rice-producing farms often reorganize into smaller units to avoid payment limitations.

The principal differences between including and excluding the direct effects of government programs are that (1) government payments inflate land values and rents, raising economic costs; (2) participation in government programs places restrictions on planted acres and often requires cover crops to be planted on set-aside acres, raising cash costs; (3) program deficiency payments and marketing loan-gain payments raise gross returns; (4) income from grazing or haying set-aside acres raises gross returns, and (5) because government rice program payments are larger than benefits to other commodities, a higher share of fixed costs is allocated to rice production when including the direct effects of government programs.

National Cost Structure

When direct government program effects are excluded from the cost-of-production data, the Farm Costs and Returns Surveys (FCRS) undertaken in 1978, 1984, 1988, and 1992 demonstrate a clear pattern of eroding profitability on a cash basis, falling from a U.S. average $1.85 per cwt profit after cash expenses in 1978 to a negative $0.12 in 1992 (table 8). In other words,

Table 8—Gross value of production, costs, and returns per cwt for the major rice growing regions, with and without direct government program effects[1]

	Without government programs[2]				With government programs[2]	
Region/item	1978	1984	1988	1992	1988	1992
			Dollars/cwt			
Arkansas (nondelta):						
Gross production value	7.78	8.19	6.93	6.49	10.92	10.12
Total cash costs	5.78	6.45	5.99	6.07	6.22	6.21
Net returns	1.99	1.74	0.94	0.42	4.70	3.90
Total economic costs	7.55	9.17	8.26	8.85	9.53	9.76
Net returns	0.23	-0.98	-1.33	-2.36	1.39	0.36
California:						
Gross production value	7.57	7.63	5.95	5.57	10.67	9.44
Total cash costs	6.41	6.94	6.42	6.76	6.59	6.93
Net returns	1.16	0.00	-0.47	-1.19	4.08	2.51
Total economic costs	7.37	8.48	9.07	9.18	10.20	10.01
Net returns	0.19	-0.85	-3.12	-3.61	0.47	-0.57
Delta:						
Gross production value	7.81	8.03	6.94	6.51	10.76	9.85
Total cash costs	5.66	7.25	6.84	5.93	7.08	6.11
Net returns	2.15	0.78	0.10	0.58	3.68	3.74
Total economic costs	7.24	9.17	9.29	8.65	10.44	9.23
Net returns	0.57	-1.14	-2.35	-2.14	0.32	0.62
Gulf coast:						
Gross production value	8.09	8.23	7.03	6.46	11.16	10.73
Total cash costs	6.07	8.26	7.17	7.13	7.32	7.23
Net returns	2.02	-0.03	-0.14	-0.67	3.85	3.50
Total economic costs	7.97	10.20	9.54	9.99	10.56	10.85
Net returns	0.11	-1.97	-2.51	-3.53	0.60	-0.13
U.S. average:						
Gross production value	7.82	8.05	6.82	6.32	10.91	10.09
Total cash costs	5.98	7.25	6.52	6.44	6.72	6.58
Net returns	1.85	0.79	0.30	-0.12	4.18	3.51
Total economic costs	7.57	9.30	8.90	9.16	10.07	9.96
Net returns	0.25	-1.26	-2.08	-2.84	0.84	0.12

[1]Farm Cost and Return Survey for 1978, 1984, 1988, and 1992. [2]Principal differences with government direct effects include (1) inflated land values, (2) higher gross returns, and (3) inflated cash and fixed costs.

Source: USDA, ERS, *Economic Indicators of the Farm Sector: Costs of Production—Major Field Crops and Livestock and Dairy*, various issues.

by 1992, the average U.S. rice farm was headed towards insolvency without government programs. When total economic costs are considered, while still excluding government program direct effects, net returns fall from $0.25 per cwt in 1978 to a negative $2.84 in 1992.

Salassi, Ahearn, Ali, and Dismukes (1990) calculated the direct effect of government programs using data from the 1988 and 1992 FCRS's. They found that the gross value of production, production costs, and net returns per cwt (and per planted acre) were all higher when the direct effects of government programs were included.[13]

In 1988, government direct payments on the average U.S. rice farm equalled 37 percent of the gross value of production (table 9), while government direct pay-

[13]Readers should refer to Salassi, Ahearn, Ali, and Dismukes (1990) for methodology concerning deriving production costs with and without government programs. Refer to Salassi (May 1992 and October 1992) and various issues of the *Economic Indicators of the Farm Sector: Costs of Production* annual report for details on the 1978, 1984, 1988 and 1994 FCRS's.

Table 9—Gross value of production per cwt for the major rice growing regions: Market returns and government direct payments

Item	1988/89	1989/90	1990/91	1991/92	1992/93
			Dollars/cwt		
Arkansas (nondelta):					
Market value	6.93	7.52	6.08	7.70	6.49
Government payments[1]	3.99	4.06	4.77	3.45	3.63
Total gross returns	10.92	11.58	10.85	11.15	10.12
California:					
Market value	5.95	6.61	5.35	6.69	5.57
Government payments[1]	4.72	4.25	5.06	4.19	3.87
Total gross returns	10.67	10.86	10.41	10.88	9.44
Delta:					
Market value	6.94	7.53	6.12	7.68	6.51
Government payments[1]	3.82	3.82	4.23	3.70	3.34
Total gross returns	10.76	11.35	10.35	11.38	9.85
Gulf coast:					
Market value	7.03	7.63	6.27	7.69	6.46
Government payments[1]	4.13	4.64	4.78	3.73	4.27
Total gross returns	11.16	12.27	11.05	11.42	10.73
U.S. average:					
Market value	6.82	7.45	6.06	7.52	6.32
Government payments[1]	4.09	4.16	4.69	3.71	3.77
Total gross returns	10.91	11.61	10.75	11.23	10.09
			Percent		
Government share of total gross returns:					
Arkansas (nondelta):	37	35	44	31	36
California	44	39	49	39	41
Delta	35	34	41	33	34
Gulf coast	37	38	43	33	40
U.S. average	37	36	44	33	37

[1]Target price deficiency payments plus marketing loan payments. Haying and grazing revenues are negligible on a per cwt basis.

Source: USDA, ERS, *Economic Indicators of the Farm Sector: Costs of Production—Major Field Crops and Livestock and Dairy,* various issues.

ments were responsible for changing "net returns after total cash expenses" from only $0.30 per cwt to $4.18, and for changing "net returns after total economic costs" from a loss of $2.08 per cwt to a profit of $0.84.

By 1992, the importance of government programs to the average U.S. rice farm had not diminished. Government direct payments were still 37 percent of the gross value of production, while they were responsible for changing "net returns after total cash expenses" from a loss of $0.12 per cwt to a profit of $3.51, and for changing "net returns after total economic costs" from a loss of $2.84 per cwt to a profit of $0.12.

Under the rice industries' 1992 cost structure and market conditions, government programs make the difference between profitability and loss for the average rice farm.

Total costs (both economic and cash) have shown a strong tendency to rise over time on a "per acre" basis. "Per cwt" total costs, which depend on both yields and changes in costs, have been far more variable (figs. 12 and 13). Average national yields had stagnated in the late 1970's and early 1980's, while land values and fuel prices were peaking. This produced sharp rises in both per cwt and per acre costs. In the early 1980's, land and fuel prices plummeted at the same time that U.S. rice yields moved to a higher plateau. As a result, costs per cwt fell precipitously in the mid-1980's, while per acre costs were stable. Then stagnating yields and gradually rising cost factors once again combined to drive national average economic costs per cwt to nearly $10. Record yields in 1992 reversed this trend, while costs per acre continued to rise. Increasing environmental regulations and concern for both surface and ground water quality and availability are expected to place further restrictions and costs on rice farms.

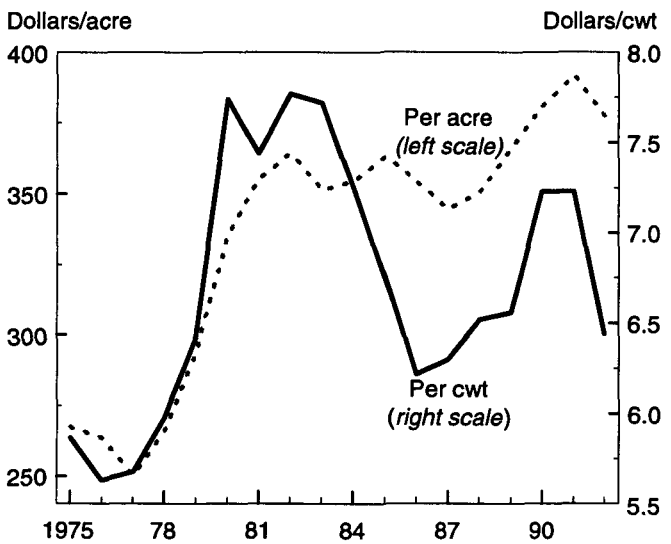
Distribution of U.S. Cost Structure

The national average cash costs of production for rice farms from 1976 to 1992 were near or above the season average farm price (SAFP) since 1984, and exceeded the loan rate in every year since 1989. National average economic costs exceeded both the SAFP and loan rate since 1981 (fig. 14).

Including government effects from 1988 to 1992, national average cash costs were near or above the SAFP and exceeded the loan rate in every year since 1989. National average economic costs were near the target price, exceeding it in 1990/91 and 1991/92 (fig. 15). The single largest difference from costs, excluding government effects, is the value of land which rises significantly under government program effects.

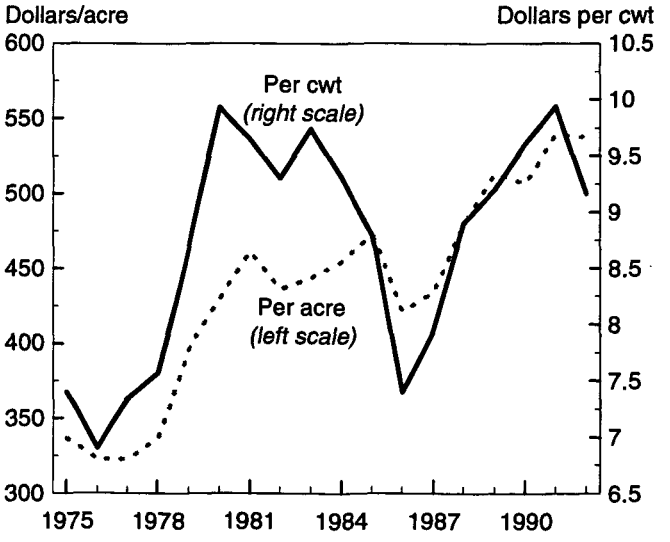
The distribution of U.S. rice farms by variable costs of production for 1992 reveals that about one-fourth had variable costs of production above the marketing

Figure 12
Average U.S. cash costs, excluding government effects



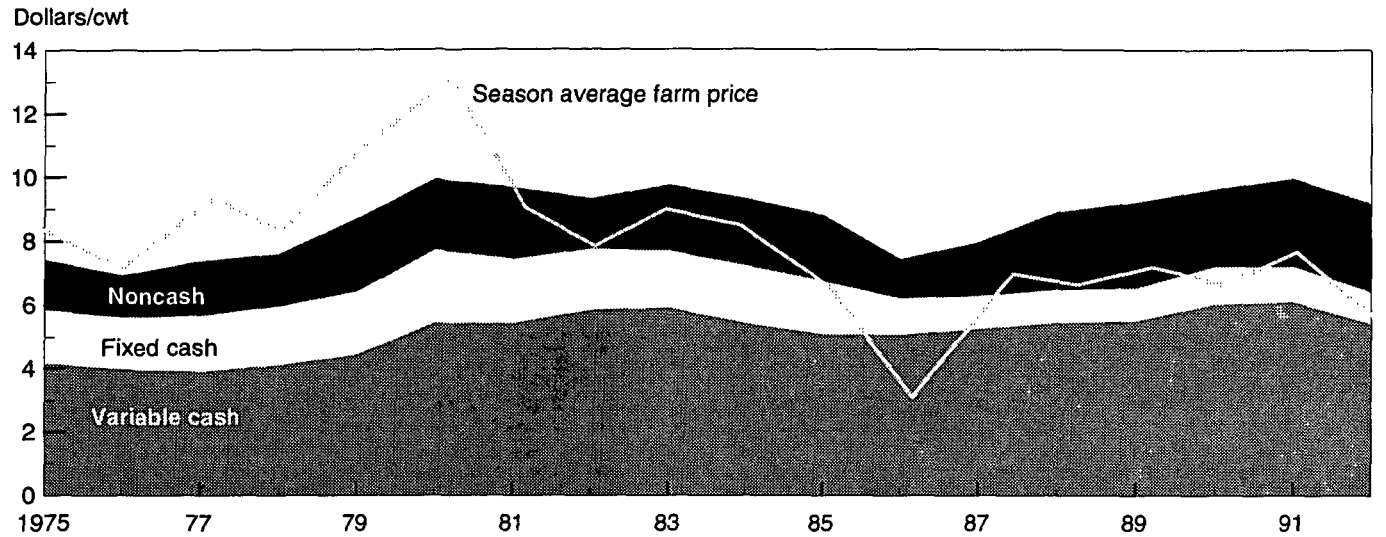
Source: USDA, ERS, 1992 Farm Costs and Returns Survey.

Figure 13
Average U.S. economic costs, excluding government effects



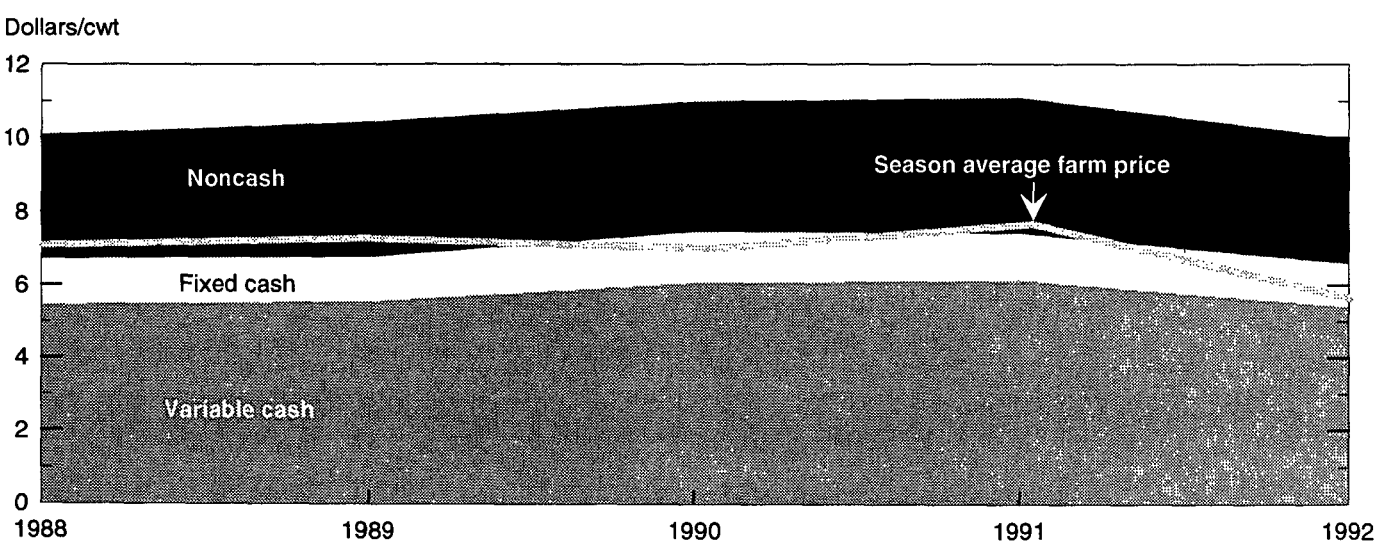
Source: USDA, ERS, 1992 Farm Costs and Returns Survey.

Figure 14
Average rice production costs, excluding government effects



Source: USDA, ERS, 1992 Farm Costs and Returns Survey.

Figure 15
Average rice production costs, including government effects



Source: USDA, ERS, Farm Costs and Returns Survey.