



Risk Management May 2006

I. Introduction

This paper is the first in a series of briefing papers that assess general themes advanced at the 2007 Farm Bill Forums held during 2005 by Secretary Mike Johanns as well as additional related policy ideas that have emerged in recent months. This paper describes the risks agricultural producers face, describes and evaluates current key risk management programs and tools available to producers through the private sector and government, and concludes with a discussion of general policy alternatives. The alternatives represent generalized approaches to addressing some of the key concerns that have been raised with regard to current programs.

II. Background: Risks and U.S. Agriculture Today

U.S. agriculture today continues to face a series of forces that transformed the general economy during the 20th century. These forces include globalization of markets, rapid technological change, global population growth, expansion of regulations, and environmental pressures. These forces and other factors create a variety of risks for farmers and ranchers in the operation of their farm and ranch businesses.

Risks Facing Agriculture. Key agricultural risks are generally organized into five categories.

- **Price risk.** Because agricultural prices are mainly determined in global markets, unanticipated changes in global demand or supply of a commodity can lead to unexpected changes in the prices received by farmers for their products.
- **Production risk.** Production risk is usually associated with inability to plant or harvest acreage or changes in crop yields or animal production due to environmental variables such as weather, pests, or disease.
- **Income risk.** Income risk can be caused by unexpected changes in production or prices received by producers as well as by swings in prices producers pay for inputs such as fuel, fertilizer, or electricity.
- **Financial risk.** Farm financial cash flows and net worth can be seriously affected by access to and the cost of debt and by the value of capital, which all can be affected by changes in interest rates and other factors, thus creating financial risk.
- **Institutional risk.** Federal and State governments can change laws or regulations producers count on, such as environmental and tax laws or changes in farm commodity programs, creating institutional risks.

Options for Managing Risks. Agricultural producers have a variety of options available to help them manage risks. Ideally, risk management would involve utilizing tools or approaches that: (1) *avoid or limit potential risks*, (2) *mitigate the effects of unavoidable risks*, and (3) *enable recovery from the effects of risk events* to ensure the continued sustainability of the farming operation.

While individual producers may be able to do little to change institutional risks, they can manage price, production, income, and financial risks by: diversifying production; adopting better crop varieties; adopting other technologies, including precision agriculture and information technology; conserving resources; altering the financial structure of the farm; using insurance, forward pricing and other hedging tools; and using off-farm earnings to stabilize farm earnings. However, not all of these options are available to all producers. For example, climate in some parts of the country may limit what some producers grow, off-farm employment may not be an option for some producers or their family members, and some risk management tools may not be available for all commodities or regions.

In addition to differing environmental characteristics and opportunities, it is also important to understand that, financially, agriculture is a very diverse sector. There are a small number of farms that account for much of U.S. farm production. There are a large number of small farms that account for a small share of production, and farming is not the principal occupation of these operators. Due to the wide diversity in producers' individual situations, there is not a single risk management strategy that will be best suited for everyone. Producers face different risks and need different risk management tools at their disposal.

Appropriate Level of Risk Reduction for Federal Programs. An issue in program design is the proper role of the Federal government in helping agricultural producers manage risk. In a market-oriented economy, business owners face risks associated with their sector and manage those risks using tools provided by the private sector. That is, the Federal government does not try to eliminate risks for most types of businesses, because doing so would result in overinvestment in risky behavior and cause decisions on resource use that would be inconsistent with market incentives. Attempts to create a risk-free environment could also thwart innovation and investment that would foster greater global competitiveness.

However, risk management tools may be inadequately provided by the private sector, and in such cases, Federal action may be appropriate. In addition, Federal intervention has been based on special risks, such as weather in agriculture which can cause widespread losses affecting a large number of producers, and on the desire to offset undesirable market outcomes, such as low income for some groups, despite the economic inefficiencies that may result.

III. Private Sector Approaches to Agricultural Risk Management

There are many private sector approaches to managing risk in agriculture, including diversifying the enterprise, integrating vertically, engaging in production and marketing contracts, joining cooperatives, hedging in futures markets and futures options contracts, maintaining financial reserves, and working off the farm. Federal programs that help producers manage risks can sometimes complement these private sector approaches, but they may also discourage their use, or even displace them.

Deciding what and how to produce can help producers avoid or limit risk. For example, diversification means producing a mix of commodities so that low prices or yields for one commodity may be offset by higher prices or yields for a different commodity in that year. Over 50 percent of all farms in the United States produce more than one commodity in a year, with over 20 percent of farms producing three or more commodities. Smaller and non-family farms tend to have the least diversified agricultural enterprises. Choosing crops resilient to drought in

dry years, managing irrigation water, reducing energy use, and employing new technology are additional ways producers may be able to reduce exposure to risk.

Vertical integration can be an effective risk management tool. Combining two or more successive production stages may provide better overall management of the production process, reduce overhead, improve efficiency, and result in outputs better tailored to meet the specific characteristics desired by consumers. Vertical integration, common in poultry and pork production, has not been common in grains and oilseeds, although farmer cooperatives have helped spur an increase in biofuels production and have been a mainstay in the collection and processing of milk.

Production and marketing contracts enable producers to mitigate risk. Contracts are agreements between producers and buyers before the harvest of a crop or the completion of a livestock production stage. Under a production contract, the producer's payment is based on the costs of producer-provided inputs, the quantity of production, or both, and may include a fee paid for the specific services provided. Under a marketing contract, the focus is on the commodity as it is delivered to the contractor, rather than on the services provided, and usually specifies a price and an amount to be delivered, but not how to produce the product. Producers usually bear all yield risk and frequently all input price risk.

From 1991 to 2003, the percentage of farms that used contracts as a risk management tool remained stable at about 10 percent, however, the value of agricultural production covered by contracts increased from 28 percent to 39 percent. For farms that used contracts, those contracts covered 20 percent of production on small farms and just over half of all production on farms with \$500,000 or more in sales.

Hedging uses futures or options contracts traded on an exchange to reduce the risk of adverse price changes prior to an anticipated cash sale or purchase of a commodity. Hedging allows a producer to diversify the farm operation without actually changing the mix of agricultural products on the farm. A futures contract is an agreement priced and entered into at a point in time to trade a commodity at some time in the future. Because hedging focuses only on price in a certain market, hedging can reduce, but not completely eliminate, price risk. With options, the holder buys the right, but not the obligation, to take a futures position at a specified price before a specified date. Options provide protection against adverse price movements, while allowing the option holder to gain from favorable movements in the cash price. In this sense, options provide protection against unfavorable events similar to that provided by insurance policies.

Financial reserves can be used to smooth year-to-year fluctuations in income. In 2004, the median net worth of farm operator households was \$460,000, a 35-percent increase from 2001. In comparison, median non-farm household and self-employed non-farm household net worth was \$93,100 and \$336,000, respectively, in 2004. While the data show that farm households, on average, hold more financial reserves than the rest of the public, almost 80 percent of farm household assets in 2004 could be attributed to farmland, buildings and equipment, and the operator's dwelling. These types of assets are far more difficult to use to smooth out annual changes in income compared to more liquid assets such as cash reserves, savings accounts, and stocks and bonds, but they can be used to provide collateral for loans.

Working off the farm is very common among farm households, especially small farms. Off-farm earnings can supplement farm earnings and thereby reduce the income variability for farm households. Across all farm operator households, only about 10 percent of household income

was from farm sources in 2004, while 90 percent was from off-farm sources. For large farms (sales of \$250,000 to \$500,000), about 60 percent of total household income was from farm earnings, and 80 percent was from farm earnings for very large farms (at least \$500,000 in sales). The ability to work off the farm depends on the amount of time available to work off farm and the number of off-farm opportunities. Farm enterprises which are management intensive, such as dairy and hogs, reduce farmers' ability to manage risk by working off the farm, although other household members may be able to do so. Off-farm employment can also reduce health care cost risks by providing affordable health insurance for farm families.

IV. Federal Government Approaches to Agricultural Risk Management

A. Farm Program Overview

This section focuses on key Federal programs that help reduce farmers' price, production and income risks. Government benefits to producers made under the Agricultural Act of 1949, as amended by the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill), include payments for commodity programs, largely direct payments, counter-cyclical payments, and marketing assistance loan benefits, and payments for conservation programs, such as the Conservation Reserve Program, Environmental Quality Incentives Program, and the Conservation Security Program. Crop insurance is made available under the Federal Crop Insurance Act, as amended by the Agricultural Risk Protection Act of 2000. In addition, ad hoc disaster and market loss assistance has been authorized by Congress in a series of laws for most years since 1988.

Commodity price and income support programs authorized by the 2002 Farm Bill and funded through the Commodity Credit Corporation (CCC) cover feed grains (corn, sorghum, barley, and oats), wheat, oilseeds (soybeans, sunflower seed, canola, flaxseed, mustard, rapeseed, safflower, crambe, and sesame), upland cotton, rice, and peanuts. Under the 2002 Farm Bill, participating farmers with base acres of these commodities are eligible for direct and counter-cyclical payments. In addition, these commodities and a number of other crops (including pulses, extra-long staple (ELS) cotton, honey, and wool and mohair) have marketing assistance loan programs. Ad hoc disaster programs, when authorized, cover nearly all major crops, including horticulture, livestock, aquaculture, and trees. Programs that support market prices by restricting marketable supplies are authorized for milk and sugar, and depending on the level of milk prices, milk producers are also eligible for payments.

Many of the commodity programs described above have been in effect, in one form or another, since the 1930s. In a more global market environment, programs are changing in several ways. Within the past decade, farm-sector benefits from payments that do not distort production and trade have increased, mainly through initiation of decoupled, production flexibility contract (PFC) payments under the 1996 Farm Bill and direct payments and counter-cyclical payments under the 2002 Farm Bill. Planting flexibility has allowed production decisions to better reflect market factors. Marketing loan provisions have worked to ensure that loan rates do not act as price floors and the government does not own large surplus stocks. In addition, two past program structures that relied upon supply controls and market price supports have been eliminated (tobacco) or restructured (peanuts).

Direct Payments. The quantity of a crop eligible for a direct payment is 85 percent of the crop's base acreage (a producer's historical acreage) *times* the direct payment yield per acre (a historical yield). The direct payment for each commodity is the direct payment quantity *times* the direct

payment rate, which is set by the 2002 Farm Bill for the 2002-07 crops. Because they are based on a fixed quantity and payment rate, direct payments are decoupled from production and are considered minimally production and trade distorting. Producers are free to plant most crops on base acreage, with some limitations on planting fruits, vegetables and wild rice, or can elect to leave base acres idle and still receive direct payments.

Counter-Cyclical Payments. The quantity of a crop eligible for a counter-cyclical payment is 85 percent of the crop's base acreage *times* the counter-cyclical payment yield (a historical yield) *times* the counter-cyclical payment rate. The counter-cyclical payment rate is based on a statutory target price for each commodity, and the counter-cyclical payment rate increases when the commodity's season-average farm price falls, reaching a maximum when the farm price is at or below, the commodity's statutory loan rate. Since payments are based on historical acreage and yields, these payments do not depend on current production, and as such, are less distorting than payments tied to actual production. As with direct payments, producers are free to plant most crops on base acres or leave base acres idle and still receive counter-cyclical payments.

Marketing Assistance Loans. Farmers are eligible for marketing assistance loans when they harvest the eligible commodities. To participate, farmers decide how much of their current year's production they want a loan on and pledge that amount as collateral. Marketing assistance loans have a 9-month maturity and accrue interest. These loans are "non-recourse loans," meaning that the government must accept the collateral as full payment of the loan at loan maturity if a producer so chooses. Because marketing assistance loan benefits depend on current market prices and current production, marketing assistance loans are considered be the most production and trade distorting forms of domestic support.

Producers can receive benefits from marketing assistance loans in four ways. First, a producer may repay a marketing assistance loan anytime before loan maturity at the alternative loan repayment rate announced by USDA, if the alternative repayment rate is less than the loan rate plus accrued interest (marketing loan gain). Second, a producer may elect to forego taking out a loan and receive the difference between the loan rate and alternative loan repayment rate (loan deficiency payment). Third, the producer may take out a loan, turn the collateral over to the CCC, purchase commodity certificates from the CCC, and use the certificates to purchase the commodity at the alternative repayment rate (certificate gain). Fourth, the producer may settle the loan by forfeiting the commodity to the CCC (forfeiture gain). ELS cotton is eligible for only the fourth type of benefit.

Programs that Support Market Prices—Sugar and Milk. The sugar and dairy programs support producers chiefly through restricting marketable supplies to consumers. The prices of raw cane and refined beet sugar are supported through nonrecourse loans to processors. If the market price for raw cane or refined sugar falls below the price support level, processors may settle the loan by forfeiting the sugar placed under loan to the CCC. The 2002 Farm Bill authorizes domestic marketing allotments for sugar, unless imports of sugar exceed 1.532 million tons, and such imports are not needed to fulfill a shortfall in U.S. production. When established, marketing allotments restrict the amount of raw cane and refined beet sugar that may be marketed by sugar processors. In addition, sugar imports are subject to a tariff rate quota, which restricts the amount of sugar that can be imported into the United States at a low tariff, to prevent the price support program from supporting the world price of sugar.

During FY 2002-05, the sugar price support program has operated at no net cost to the government, as restrictions on domestic marketings and imports along with hurricane-related

production losses have allowed the CCC to sell-back any forfeitures of sugar in prior years. However, under the North American Free Trade Agreement (NAFTA), the import tariff on Mexican sugar falls to 1.5 cents per pound on January 1, 2007, and to zero on January 1, 2008. The decline in the import tariff on Mexican sugar could push imports above 1.532 million tons and prevent implementation of marketing allotments. Under this scenario, substantial forfeitures of price support loans could occur, leading to a sharp increase in the cost of the sugar price support program.

The price of milk is supported through CCC purchases of butter, cheese, and nonfat dry milk. During 2002 and 2003, higher milk production led to a sharp increase in CCC purchases of nonfat dry milk. On October 1, 2003, the CCC held over 1.4 billion pounds of nonfat dry milk in storage. In 2004 and 2005, purchases declined sharply as milk prices rebounded and CCC inventories of nonfat dry milk were liquidated through domestic and international donation programs, including assistance to livestock producers affected by drought.

A new direct payment program for milk, the Milk Income Loss Contract (MILC) program, was authorized by the 2002 Farm Bill through September 30, 2005. Under the program, producers are eligible for monthly payments if the price of fluid milk for beverage use falls below an established level. Payments are made to a producer on the amount of milk marketed not to exceed 2.4 million pounds in a fiscal year. The Agricultural Reconciliation Act of 2005 extended the MILC program through August 31, 2007, but lowered the payment rate. Under the MILC Program, \$2 billion have been paid to dairy producers.

The Agricultural Marketing Agreement Act of 1937 authorizes the establishment of marketing agreements and orders for a wide range of commodities. Under this legislation, Federal marketing orders have been established for milk. Federal milk marketing orders provide for the establishment of minimum prices of raw milk according to use and the pooling of receipts across all the uses of raw milk. Within a Federal milk marketing order, producers receive a blend price for milk reflecting the weighted-average price for the various end uses for milk marketed within the boundaries of a Federal order. Generally, farm bills have not addressed Federal milk marketing orders. However, the 1996 Farm Bill mandated that the Secretary of Agriculture reform and consolidate Federal milk marketing orders and the 1985 Farm Bill addressed minimum Class I differentials.

Payment limits. Under the 2002 Farm Bill, direct payments are subject to a \$40,000 per person payment limitation and counter-cyclical payments are subject to a separate \$65,000 limit. Loan deficiency payments and marketing assistance loan gains under the marketing assistance loan program are limited to \$75,000 per person, while forfeiture gains and certificate gains are not limited. In addition, an individual or entity whose average adjusted gross income for the three preceding years exceeds \$2.5 million is ineligible for direct, counter-cyclical, and loan deficiency payments; marketing assistance loan gains; and payments under any conservation program, unless at least 75 percent of the average adjusted gross income is derived from farming, ranching or forestry operations.

Payment limits apply to “persons,” that is each “person” has a separate payment limit. A person may be an individual (human being) or it may be an entity used by a producer as a way to organize the farm business, such as a corporation. The 2002 Farm Bill continued the 3-entity rule. Under this rule, a person who receives payments as an individual can also receive payments through two additional entities in which the individual has up to a 50 percent ownership share in each, effectively doubling the payment limit.

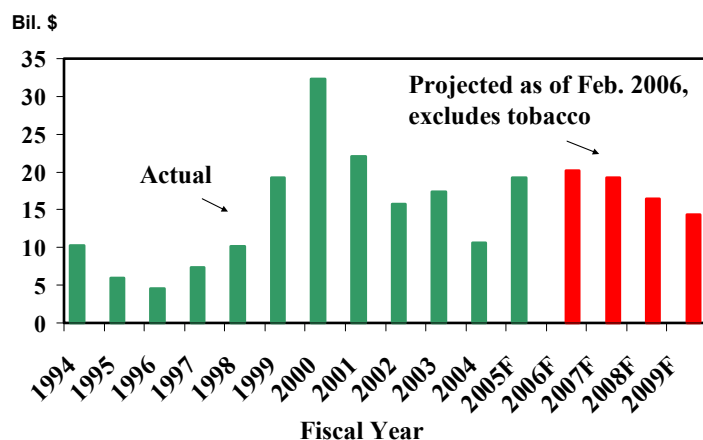
B. Distribution of Payments under Farm Programs

This section examines the overall outlays on farm programs and the distribution of farm program payments, answering the question of “to whom” and “where” government payments to producers go and the level of support the payments provide. First, data on commodity program payments made in total, by type and by crop are examined. Then, payments received by farms and farm households are addressed, which allow payments to be compared to income and other characteristics of the farm and the farm household. These farm household data are only available on a calendar year basis.

Commodity Credit Corporation Expenditures. Commodity programs are administered through the CCC. CCC outlays include commodity price and income support program payments, expenses incurred under several of USDA’s trade and conservation programs, and outlays for ad hoc and emergency assistance. Crop insurance is not included in CCC outlays.

Total CCC outlays peaked in fiscal year (FY) 2000 at \$32.6 billion as declining market prices for major crops caused Congress to supplement production flexibility contract payments authorized under the 1996 Farm Bill with economic loss assistance payments (Figure 1). By FY 2004, CCC outlays dropped to \$10.6 billion as prices for major crops recovered, but prices then reversed and outlays nearly doubled to over \$20 billion in FY 2005. CCC outlays are forecast to remain above \$20 billion in FY 2006 and FY 2007, as large production has continued to pressure prices for major crops, increasing counter-cyclical payments and marketing loan benefits.

Figure 1. Commodity Credit Corporation Net Outlays, FY 1994-2009F

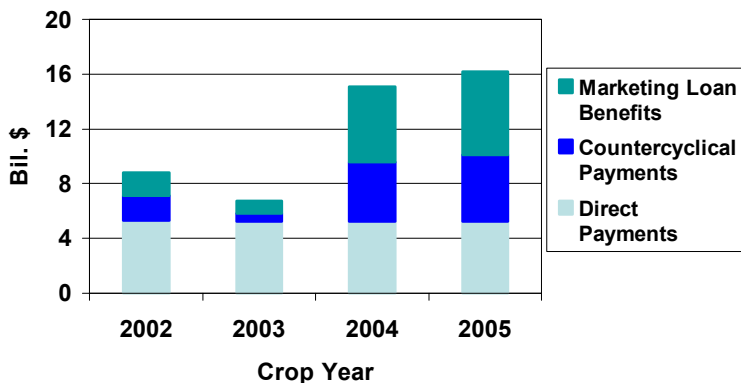


Following enactment of the 2002 Farm Bill, the Congressional Budget Office (CBO) projected spending under the 2002 Farm Bill. During FY 2002-04, actual spending under the 2002 Farm Bill, including ad hoc and emergency assistance, was well below CBO’s forecast. However, actual spending moved above CBO’s forecast in FY 2005, and annual spending is projected through the end of the 2002 Farm Bill to remain \$1-2 billion above CBO’s forecast made at the time the 2002 Farm Bill was enacted.

Total Payments by Type of Payment. For the 2002-05 crop years, commodity program payments, defined as direct payments, counter-cyclical payments and marketing assistance loan benefits, are estimated to average \$11.7 billion per year (Figure 2). Total payments fell from

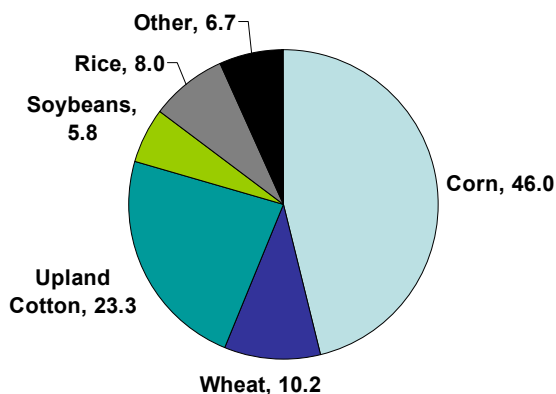
\$8.8 billion for the 2002 crops to \$6.7 billion for the 2003 crops as crop prices strengthened, but payments are forecast to increase to \$16 billion for the 2005 crops as crop prices have generally declined in the face of record or near-record large crop production. Direct payments have been constant at about \$5.3 billion per year. Counter-cyclical payments have ranged from a low of about \$0.5 billion for the 2003 crop year to nearly \$5 billion expected for the 2005 crop year. Marketing loan benefits have ranged from less than \$1 billion for the 2003 crop year to over \$6 billion expected for the 2005 crop year

Figure 2. Commodity Program Payments, 2002-2005 Crop Years



Payments by Crop. Of total commodity program payments during 2002-05, 93 percent are estimated to go to wheat, rice, corn, soybean and upland cotton producers. These 5 crops accounted for an estimated 21 percent of total farm cash receipts in 2005. Commodity program payments to corn producers are estimated to average \$5.4 billion per year and account for 46 percent of total payments made for the 2002-05 crops (Figure 3). Over this period, 23 percent of payments went to upland cotton producers; soybean, wheat, and rice producers each received 6-10 percent of the total. Other feed grain, other oilseed and peanut producers combined received about 7 percent.

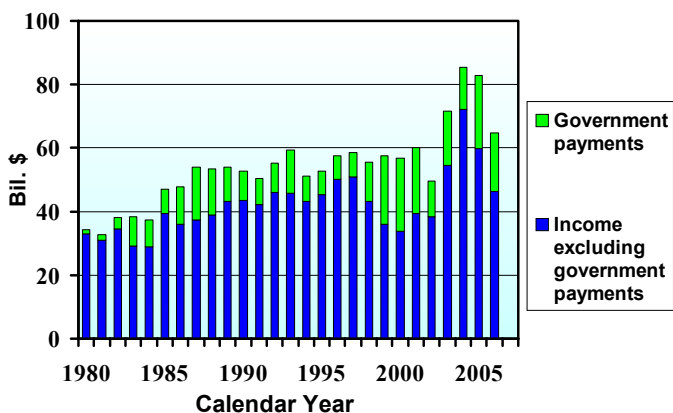
Figure 3. Distribution of Payments, 2002-2005 Crops, Percent Share



Payments in Relation to U.S. Net Farm Income. During calendar years 2002-2005, government payments to farmers and ranchers for commodity programs, conservation programs, and emergency assistance averaged \$16.2 billion per year, but declining market prices and

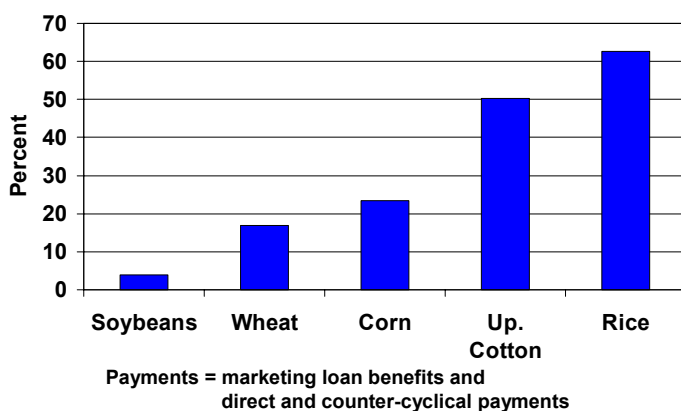
increased emergency assistance authorized by Congress in the form of ad hoc disaster payments caused farm program payments to reach a record \$23.0 billion in calendar year 2005 (Figure 4). Compared with the late 1990s, commodity payments have declined as a percentage of U.S. net cash farm income, primarily because livestock sector returns have increased sharply.

Figure 4. U.S. Net Cash Farm Income, 1980-2006



Payments in Relation to Crop Production Value. In addition to varying in dollar terms by crop, payments vary substantially as a share of the market value of production (Figure 5). Measuring support in terms of market value for the 5 major crops that account for most payments, support ranged from a low of an estimated 4 percent for soybeans, to 17 percent for wheat, 23 percent for corn, 50 percent for cotton, and a high of 63 percent for rice over the 2002-2005 crop years.

Figure 5. Farm Program Payments as a Share of Production Value, 2002-2005 Crop Years



Farms Receiving Government Payments. The 2004 Agricultural Resource Management Survey (ARMS) provides calendar year information on the role of government payments (including commodity program, conservation and disaster payments) from the perspective of the farm business and the farm operator household. ARMS data indicate that 39 percent of all farms received government payments in 2004 (See Appendix Table 1). For farms that received a payment, the average payment per farm was \$12,517. Among farms receiving payments, this

payment represented an average of 7.4 percent of the farm's gross cash income or 26 percent of the farm's net cash income.

Gross cash income of farms receiving government payments averaged \$170,166 in 2004, more than three times that of farms not receiving government payments. Direct payments comprised over one-third of total government payments, and more farms received direct payments than other program payments.

A farm's commodity specialization is determined by the one commodity or group of commodities that makes up at least 50 percent of the farm's total value of production. Using this definition, about half of all U.S. farms can be classified as a particular type. Farms specializing in *rice* received an average of \$53,660 in 2004, the highest for any commodity farm type. The next highest payments per farm were reported by *cotton* farms, which averaged \$49,327. *Cash grain and soybean* farms averaged \$19,008 per farm, but these farms accounted for 53 percent of payments made. More farms—35 percent of all farms—are classified as *beef cattle* farms than for other categories. These farms, which represent 23 percent of farms receiving payments, received \$6,687 per farm, or 12 percent of all payments. *Dairy* farms averaged \$10,417 and accounted for 5 percent of payments made. Livestock farms receive support because they produce crops that are eligible for payments.

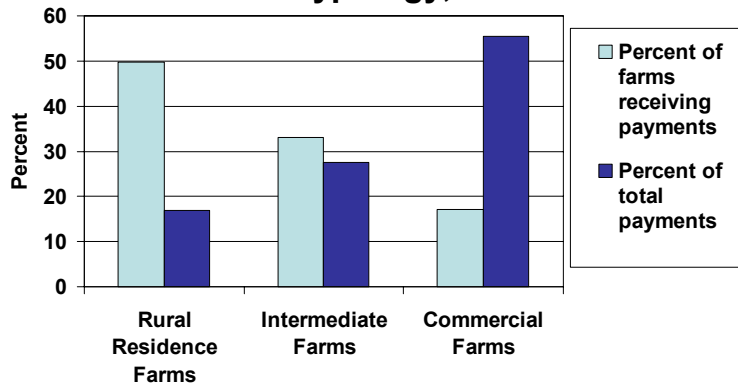
Distribution by Farm Typology. One typology often used with ARMS data groups farms into three categories: *commercial farms*, farms with sales of \$250,000 or more and the farm operator reports farming as the major occupation (less than 10 percent of all farms); *intermediate farms*, farms with sales under \$250,000 and the farm operator reports farming as the major occupation (25 percent of all farms); and *rural residence farms*, farms in which the farm operator's major occupation is not farming or the farm is a limited resource farm (65 percent of all farms).

A much higher share of commercial farms, 69 percent, received payments relative to other types of farms. Fifty-one percent of intermediate farms and only 30 percent of rural residence farms received government payments. Commercial farms accounted for nearly 17 percent of the farms receiving government payments, but received 50 percent of total government payments, reflecting the fact that payments are based on the level of current and historical production (Figure 6).

Because there are so many more rural residence farms, they accounted for most of the farms receiving payments. They accounted for 56 percent of the farms receiving payments but only 17 percent of total payments. However, rural residence farms accounted for 58 percent of conservation program payments (Conservation Reserve Program, Wetlands Reserve Program and Environmental Quality Improvement Program).

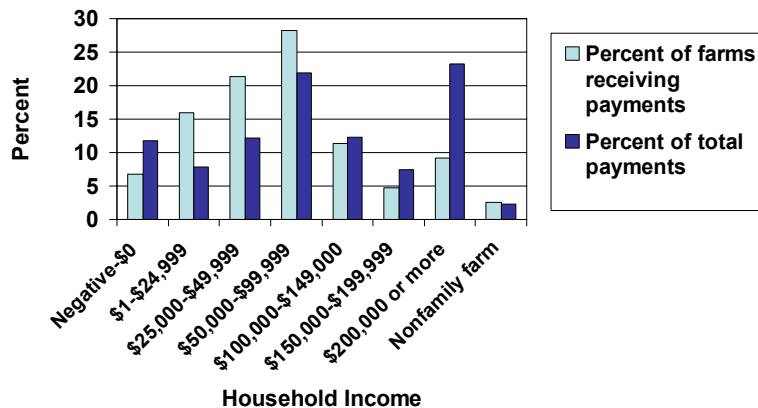
Although most of the payments went to larger operations, government program payments contributed a larger share of gross cash income for smaller farms. The average payment for rural residence farms was \$4,266, which was 15 percent of gross cash income. The average payment for commercial farms was \$40,453, nearly 6 percent of gross cash income.

Figure 6. Farms Receiving Government Payments and Payments Received by Farm Typology, 2004



Distribution by Farm and Operator Household Income. Farm households with household incomes of \$200,000 or more, over 7 percent of all farm households, received 23 percent of all government payments in 2004 (Figure 7). About 84 percent of their payments were direct, counter-cyclical, and loan deficiency payments. Nearly one-third of all farms receiving government payments had household incomes of \$50,000-\$99,999. About 44 percent of all farm households receiving payments had incomes of less than \$50,000 and received 32 percent of all farm payments. Over 12 percent of farms receiving payments had net cash farm incomes over \$100,000 and received 42 percent of payments. About 55 percent of farms receiving payments had net cash farm incomes below \$10,000 and received 26 percent of the payments.

Figure 7. Farms Receiving Government Payments and Payments Received by Household Income, 2004



D. Crop Insurance and Ad Hoc Disaster Assistance

Under the Federal crop insurance program, insurance companies approved by the Risk Management Agency (RMA) market and manage the delivery of crop insurance policies to producers. The Federal government provides reinsurance and administrative and operating expense reimbursement to the companies and premium subsidies to producers. Crop insurance provides coverage for a loss in yield or a loss in revenue (yield and price) for over 350

commodities in all 50 States and Puerto Rico. In addition to addressing yield and revenue risks, there are whole-farm gross revenue insurance policies available in some States.

The Federal Crop Insurance Act was amended by the Agricultural Risk Protection Act of 2000 (ARPA) to increase participation in crop insurance through expanded crop and livestock coverage and increased subsidies. For the 2005 crop year, there were 1.2 million Federal crop insurance policies in force covering 246 million acres with a liability of \$44.3 billion. Acres covered in 2005 were up 20 percent from 2000, the year prior to implementation of ARPA, and liability was up 30 percent from 2000. About one-third of insured crop value is covered by a basic catastrophic policy whose premium is completely subsidized by the Federal government. More comprehensive ‘buy-up’ policies cover the remaining two-thirds of the insured crop value at an average coverage level of 70 percent (or a 30-percent deductible). The Federal government subsidizes an average of 57 percent of the producers’ premium. Since ARPA, buy-up coverage of 70 percent or above has increased sharply, rising from 22 percent of insured crop acreage in 2000 to 57 percent in 2005 (excluding area yield and revenue plans of insurance). About 60 percent of crop insurance coverage provides revenue protection, the fastest growing plan of insurance in recent years.

Crop insurance policies were in place on about two-thirds of total U.S. crop value and 85 percent of the value of the major crops covered by commodity programs during 2004 (Table 1). However, because policies have a deductible portion, liability is equal to 39 percent of total U.S. crop value and 57 percent for the major crops covered by commodity programs. Seven crops accounted for 80 percent of the total crop insurance liability in 2005, although participation in a range of specialty crops is growing. Two crops, corn and soybeans, accounted for just over half of total insured liability. The grain belt States of the Midwest, plus California and Florida, account for half of insured liability. Under ARPA, a pilot program for price insurance for cattle and hogs was created, with livestock insurance costs limited to \$20 million per year. Participation has been low to date.

Crop	Percent of Crop Value Insured	Liability as a Percent of Crop Value
Barley	63	42
Corn	92	64
Cotton	99	61
Sorghum	99	65
Peanuts	78	46
Potatoes	70	34
Rice	58	25
Soybeans	80	56
Sugar Beets	90	58
Sugarcane	71	23
Tobacco	73	50
Wheat	82	54
Average	85	57

The total cost to the government of the Federal crop insurance program averaged \$3.1 billion for 2002-2005. Premium subsidies account for about three-fourths of the total cost. Compensation to private crop insurance companies accounts for the remaining one-fourth of the program cost. Program costs have increased as subsidies were raised through legislated program reforms in 1994 and 2000 to increase participation and buy-up coverage.

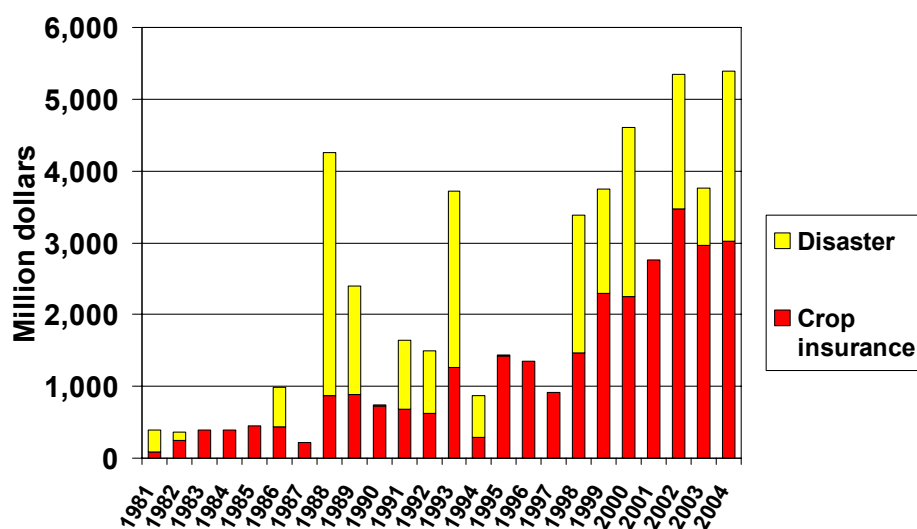
The actuarial performance of Federal crop insurance has steadily improved over the years (Table 2). During 1981-1990, the loss ratio, which is total indemnities divided by total premiums (including premium subsidies), averaged 1.53. During 1991-2000, the loss ratio declined to an average of 1.07. And during 2001-2005, the estimated loss ratio has averaged an even lower 0.93. Actuarial performance has improved due to the continuing assessment of historical experience and adjustment of premium rates by RMA to better cover expected losses, increases in participation and buy-up coverage, and increased purchases of revenue policies.

Year	Premium (\$ Millions)	Indemnity (\$ Millions)	Loss Ratio (Indemnity/Premium)	Government Cost of Program (\$ Millions)
1994	949.4	601.1	0.63	367
1995	1,543.3	1,567.7	1.02	1,523
1996	1,838.6	1,492.7	0.81	1,430
1997	1,775.4	993.6	0.56	971
1998	1,875.9	1,677.5	0.89	1,590
1999	2,310.1	2,434.7	1.05	2,318
2000	2,540.2	2,594.8	1.02	2,268
2001	2,961.8	2,960.1	1.00	2,777
2002	2,915.9	4,066.7	1.39	3,529
2003	3,431.2	3,257.7	0.95	3,098
2004	4,185.4	3,205.0	0.77	3,162
2005 1/	3,947.8	2,334.0	0.59	2,640

1/ Indemnity, loss ratio, and cost are projected.

Despite the increase in participation and purchase of buyup coverage levels since the mid 1990s, Congress has continued to provide ad hoc disaster assistance to producers (Figure 9). Since 1998 over \$14 billion has been provided in disaster assistance to livestock and crop producers. Factors used to explain Congressional action on disaster assistance include: low participation or coverage levels in some areas; unavailability of insurance for some commodities; limited coverage for livestock, pasture, and rangeland; and deductibles that are perceived by some as too large.

Figure 9. Crop Insurance Indemnity & Delivery Costs and Disaster Assistance



E. Conservation

Natural resource conservation and environmental protection will be examined in a subsequent theme paper. The theme is discussed here because there are a range of conservation activities that farmers, ranchers, and communities may undertake to reduce their risks. Under USDA conservation programs, production and yield risks may be reduced by financial assistance, technical assistance, and stewardship programs. Many of the conservation related approaches to risk management are particularly effective because they not only reduce risks to producers they also reduce the future costs of Federal risk mitigation. For example, grazing land that is well managed and is productive under good conditions, enables ranchers to sustain production during short-term droughts and recover more quickly from severe droughts. In addition, conservation programs address environmental risks beyond the producer by helping to improve water quality, air quality, and wildlife habitat.

Risks from floods, drought, and invasive species, for example, are directly addressed through cost share, incentive payments, easement purchases, stewardship payments, rental payments, and technical assistance provided by USDA's Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) (Table 3). One NRCS program, the Snow Survey program, plays a major role in addressing the water supply risks in the West. Price and market risk are also addressed by financial and technical assistance and stewardship programs through payments which affect income support directly and through the potential for decreased input costs due to adoption of improved management practices. Institutional risk is addressed through programs that reduce the cost of complying with existing State and Federal regulations. In addition, the risks of having to comply with future regulations are reduced through voluntary installation of conservation measures. Financial risk is also reduced due to direct capital investment in farm infrastructure and payments to program participants.

Type of Program	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Technical Assistance 1/	1,068.3	1,243.2	1,370.0	1,432.1	1,364.9
Financial Assistance 2/	493.6	631.0	987.3	1,362.5	1,358.2
Easements 3/	345.7	394.7	420.5	421.2	330.0
Stewardship Contracts 4/	0	0	35.2	172.0	220.2
Rental Contracts 5/	1,777.4	1,783.6	1,822.8	1,833.6	1,899.5
Total	3,685.0	4,052.4	4,635.4	5,221.5	5,172.6

1/Includes Conservation Technical Assistance, Soil Survey, Snow Survey, Plant Materials Center, Resource Conservation and Development, and technical assistance for the CCC funded Farm Bill conservation programs, Emergency Watershed Program, and Watershed Surveys and Planning Programs.

2/ Includes financial assistance for the Wildlife Habitat Incentives Program, Environmental Quality Incentives Program (EQIP), EQIP-Klamath Basin, EQIP-Ground and Surface Water Conservation, Agricultural Management Assistance, Forestry Incentives Program, Watershed Rehabilitation, Emergency Watershed Program, Flood Prevention Operations, EQIP FY-2002 educational assistance, and Watershed Operations programs.

3/ Includes easement payments for the Grassland Reserve Program (estimated at 40 percent of Grassland Reserve Program financial assistance), Wetland Reserve Program, Farm and Ranch Lands Protection Program, and Healthy Forests Reserve Program.

4/ Includes all payments associated with the Conservation Security Program.

5/ Includes all payments from the Conservation Reserve Program and the rental payments from the Grassland Reserve Program (estimated at 60 percent of the Grassland Reserve Program financial assistance).

6/ Does not include Emergency Conservation Program funding.

Environmentally vulnerable lands often are more susceptible to production risks, such as drought. The Conservation Reserve Program (CRP), administered by FSA, compensates landowners with annual rental payments when they agree to place environmentally vulnerable cropland into conservation covers such as grass, trees, and wetlands. CRP payments are guaranteed in 10 to 15 year contracts assuring landowners a revenue stream from their cropland. CRP can thus be used by landowners to reduce exposure to production risk on marginal cropland, helping maintain financial risk on farms at an acceptable level. In addition, voluntary conservation under CRP, as do all USDA conservation programs, reduces the risk of unanticipated expenditures from future environmental regulations.

V. Economic and Policy Issues for Federal Agricultural Risk Management Programs

This section provides a general assessment of the support provided by current programs using several evaluation criteria: reduction of income risk, the level and comprehensiveness of benefits, resource and structural effects, program cost, and implications for U.S. commitments under the World Trade Organization (WTO). Conservation programs will be addressed in a future theme paper.

Income Risk Reduction. The program descriptions and data presented to this point indicate that current price and income support, crop insurance, disaster, and conservation programs comprise substantial resources directed at income risk reduction for U.S. agriculture, particularly for the principal program crops (food grains, feed grains, upland cotton and soybeans) and sugar and dairy. The regular provision of ad hoc disaster assistance has reduced risks even further, but assistance is highly variable in terms of available dollars. Non-program crops and livestock are only eligible for ad hoc disaster and conservation programs and limited insurance programs. The

risk reduction capacity of crop insurance and conservation has expanded sharply under ARPA and the 2002 Farm Bill, respectively. Conservation financial assistance remains small compared with the other support mechanisms but has the benefit of reducing future Federal and private risk management costs.

Corn can be used as an example for discussing the income risk reduction of current programs. During the 2002 and 2003 crop years, the price received by producers for corn averaged \$2.37 per bushel, about equal to the average of the 1990s, and corn program payments (direct and counter-cyclical and marketing loan benefits) averaged \$2.2 billion. For the 2004 and 2005 crop years, the corn price is estimated to average only \$2.03 per bushel, 14 percent below 2002-2003. Corn program payments for 2004-2005 are estimated to be up 290 percent, to an average of \$8.6 billion. In addition to corn program payments, corn producers received an estimated average of about \$550 million in crop insurance indemnities during 2004-2005, compared with \$1 billion averaged during 2002-2003. In the aggregate, both gross and net income from corn production, including government payments, increased during 2004-2005, compared with 2002-2003, despite the sharp decline in market prices.

Farm program payments provide producers with substantial protection in the event of price and yield shortfalls. However, the sharp increase in payments and income relative to the drop in price suggest that government price and income support programs may be a blunt mechanism to reduce income variability or risk. The basic reason is that stabilizing price or yield alone may do little to stabilize revenue. In the absence of government price intervention, when aggregate yield falls, prices rise, and vice versa. This correlation provides a moderating “natural hedge” against the revenue shortfalls that might otherwise result from yield shortfalls. Thus, the following effects of payments can be observed:

- First, direct payments are fixed and therefore do not offset variability. They solely provide income enhancement, which may be used to offset business risks.
- Second, while counter-cyclical payments are negatively correlated with price, they ignore production effects and can thus negate the risk reducing aspect of the natural hedge. For example, large yield increases can reduce prices, triggering a counter-cyclical payment but the higher yields also help offset the effect of lower prices on income. Because counter-cyclical payments do not take the increased income effect of higher yields into account, while mitigating income risk, they can more than compensate for a revenue decline and even add to income variability. Conversely, in the event of a crop loss, prices may rise thus reducing the counter-cyclical payment. Lastly, because counter cyclical payments are made on historical production, like direct payments, their role may be more income enhancement than stabilization.
- Third, marketing loan benefits, while triggered by low prices, are based on a loan rate relative to a local spot market price, not the price the producer actually receives from the sale of the product. A producer can sell at the market price that is used to lock in the loan benefit, or lock in the benefit at a time of weak prices and sell later at a higher price. Thus, the loan program may overcompensate for a drop in market prices. In addition, loan benefits are based on current production. A producer who has a crop loss would not receive the loan benefit on lost production, in which case, the loan program fails to reduce income risk. Moreover, a large national crop loss that results in a higher market price may greatly reduce a producer’s production eligible for loan benefits and may also reduce the counter-cyclical payment. In this case, a producer who loses a crop receives no marketing loan benefits or counter-cyclical payments.

Crop insurance has seen large increases in participation and buyup coverage and sound actuarial performance in recent years. However, crop insurance has a number of issues. Subsidies are rising and disaster assistance continues to be regularly provided. Crop insurance is in place for 66 percent of total U.S. crop value but the liability of those policies is only equal to 39 percent of total U.S. crop value. With an average premium subsidy of nearly 60 percent, further increases in premium subsidies to address the coverage deficiency are likely to increase participation and coverage levels only modestly, with a large increase in total program costs for each additional acre insured. While livestock price insurance has been initiated on a pilot basis, questions remain as to whether such insurance displaces the sale of available futures and options contracts or discourages private sector development of alternative tools. Whole farm revenue insurance has been offered in recent years, but participation remains low. The policy is complex to sell and administer. Coverage for some specialty crops and livestock forage remains limited.

Level and Comprehensiveness of Support. Government payments are not distributed evenly across the country or by size or type of farm. This fact raises questions about the equity of program benefits. Payments under the price and income support programs are heavily concentrated in the central and southern parts of the United States, reflecting production of program crops, with a large proportion of the payments going to the largest farms with the highest net farm incomes (Appendix Figures). Crop insurance premium subsidies are also more heavily concentrated in the central and southern parts of the United States, similar to the pattern of the price and income support programs. Conservation payments are somewhat more evenly distributed, reflecting acreage in farming and ranching.

The data presented earlier indicated 39 percent of farms received government payments in 2004, with a larger portion of commercial farms receiving payments than small farms. Commercial farms, the largest 10 percent of farms, received 56 percent of all payments. On average, commercial farms that received government payments received over \$40,000 and had average net cash farm income of \$217,000. In addition, payments are highly concentrated by commodity, with 93 percent of commodity program payments estimated to have gone to wheat, rice, corn, soybeans, and upland cotton producers during 2002-2005.

Resource and Structural Effects. Farm programs have become more market-oriented over time. Beginning in the 1980s, loan rates were reduced, payments were eliminated on a portion of base acres, annual acreage control programs were eliminated, counter-cyclical payments were based on fixed yields, and direct payments were based on fixed yields and fixed payment rates. Counter-cyclical and direct payments are generally thought to have minimal effects on production. As historical yield data were obtained, crop insurance premium rates were adjusted to better reflect loss history. Collectively, these changes reduced the effects of farm and insurance programs on resource decisions by producers.

Even so, today's programs contain elements that provide incentives for resource use that may be inconsistent with market signals. For example, the marketing assistance loan program assures a per unit return at least equal to the loan rate regardless of how low market prices fall. This return is assured on all current production. Thus, when market prices are near or below loan rates, the risk reduction and assured return of the loan program provide an incentive to plant more acreage and apply more inputs, such as fertilizer, and thus produce more than would be the case in the absence of the program. For example, studies conducted around the time of enactment of the 2002 Farm Bill concluded that the increase in loan rates under the 2002 Farm Bill would increase area planted to principal crops by about 2 million acres, or 1 percent. Studies of crop insurance

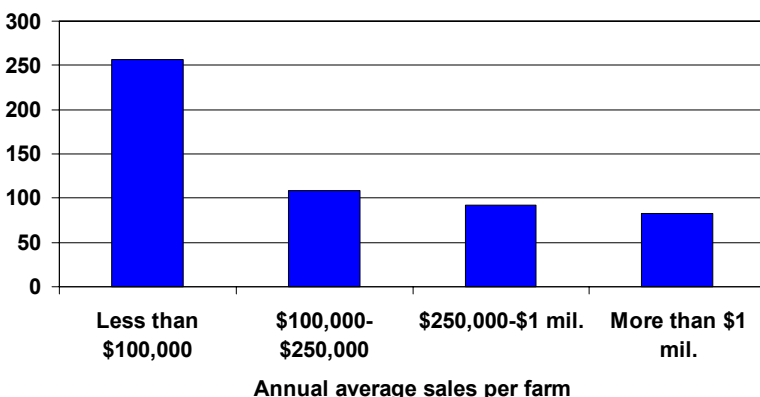
have also indicated that premium subsidies and the risk reduction provided by the program have increased planted acreage, although the size of the effect is debatable.

The experience of dry peas and lentils indicates the potential effects of a marketing loan program. Under the 2002 Farm Bill and the Consolidated Appropriations Resolution (2003), Congress established loan and loan repayment rates for dry peas and lentils that created incentives for significant acreage expansion. For example, when using loan rates as the planting incentive for producers, expected returns above variable costs in 2005 for dry peas and lentils were well above wheat. Dry pea and lentil area has tripled in the last four years, from 0.4 million acres in 2001 to 1.3 million in 2005, and is expected to exceed 1.6 million this year. Statutory provisions require that loan repayment rates be based on lower-valued product (feed or no. 3 grade), increasing marketing loan benefits that nullify market price signals.

Similarly, the sugar and dairy programs, during times of abundant U.S. and world supplies, provide incentives to produce more than otherwise by maintaining market prices above where they would be in the absence of the programs. To the extent that the supported prices for sugar and milk and dairy products exceed the market prices that would prevail in the absence of the programs, consumers of those products pay more, in effect transferring income to producers. In addition, payments under the MILC program are tied both to current production and prices, mitigating income risk but creating incentives to maintain production in the face of declining prices.

Another effect of commodity programs may be on the size of farming operations. While program payments may help some producers remain in business in the short term by augmenting income, program payments may provide a means for other producers to outbid competitors for farmland and expand their operations. The latter effect may follow from the economies of scale associated with large farms compared with small farms. Data indicate that, on average, large farms have a lower per unit cost of production than small farms and that the ratio of costs to revenues is much lower (Figure 10). Consequently, the expected net return per added acre for a large farm would exceed that for a small farm, causing the large farm to be able to pay more for additional acres. That would be true with or without commodity programs. To the extent that large farms have more capital to invest and as a result are more productive per acre, they may receive more program payments per acre, which could help finance their further expansion.

Figure 10. Ratio of Total Costs of Production to Total Revenues by Farm Size



Another effect of commodity programs is their impact on farmland values. Farmland values depend on many factors, including income generated from the products produced on the land; other income, such as commodity program payments; the value of the land in nonagricultural uses; the presence of environmental amenities; and interest rates. Many studies have concluded that commodity payments are capitalized into farmland values with the effect dependent on the degree of competition for land, crop productivity, costs of production, size of payments, and the potential for nonagricultural uses. While varying by region, some studies suggest U.S. farmland values are 15-25 percent higher due to commodity programs. Increased farmland values and associated higher rents may accrue to individuals not involved in production, as 40 percent of farmland is rented. Higher farmland values have several effects: they benefit farm operators who own and invest in farmland; they may improve access to credit, making land purchases easier; they may deter new entrants from farming and constrain expansion by more limited resource farms; they increase costs of production; they increase investment in farmland by nonfarmers; and they may increase taxes to landowners.

Program Cost. Commodity program costs have increased sharply, expected to about double in FY 2006 compared with FY 2004. Costs are expected to remain well above the average of the 1990s. Government crop insurance costs have steadily increased under statutory increases in subsidy levels and increased participation, rising from about \$1 billion per year in the mid 1990s to an expected level of \$4.3 billion for the 2006 crop year. Ad hoc disaster assistance has been consistently provided in recent years with costs of nearly \$3 billion in calendar 2005. Conservation program costs have increased from \$3.7 billion in FY 2002 to an expected \$5.2 billion in FY 2006. High costs are an issue in the current Federal budget environment where deficits are large and persistent. In addition, the dairy and sugar price support programs add to consumer costs and can result in stock accumulation by the government which can be difficult and costly to manage.

The 2002 Farm Bill was developed under a budget that permitted spending to increase by about \$8 billion per year above the levels projected under a continuation of the 1996 Farm Bill. If the 2007 Farm Bill is developed under a budget target that is below spending under a continuation of the 2002 Farm Bill, similar to the situations for the 1996 and 1990 Farm Bills, program costs will become even more of an issue as spending has to be reduced to meet the budget target. High costs also have an implication for WTO obligations, as discussed in the next section.

WTO Implications. Domestic farm support policies were recognized as one source of market and trade distortions when the Uruguay Round Agreement on Agriculture (URAA) was negotiated. Under the URAA, which went into effect in 1995, countries agreed to limit subsidies from domestic policies that were presumed to be the most trade distorting but were allowed to exempt other policies from any limitations. The different categories of domestic subsidies are commonly referred to as the “boxes”—amber box, blue box, and green box. The colors of the boxes represent the level of trade distortion.

Amber box policies are the most production and trade distorting and generally are payments based on prices or production and price support programs. Amber box policies are measured by the Aggregate Measurement of Support (AMS), which is a dollar value of the support provided each year, calculated using specific rules. The annual limit for the U.S. AMS is \$19.1 billion.

Amber box policies are further classified into two groups: *commodity specific* or *non-commodity specific*. The main commodity-specific amber box policies are payments under the marketing loan programs (loan deficiency payments, marketing loan gains, and certificate gains) and the

benefits of the price support programs for dairy and sugar. Commodity-specific amber box support is counted as part of the AMS only if it equals more than 5 percent of value of production for each commodity (e.g., wheat specific support must exceed 5 percent of the annual value of wheat production). Since 1995, commodity-specific amber box support, as measured by the AMS, has ranged from a low of \$5.9 billion to a high of \$16.9 billion. Dairy has accounted for about \$5 billion annually and sugar another \$1 billion. Marketing loan benefits have been highly variable because they are based on market prices which have fluctuated.

Non-commodity specific amber box support cannot be attributed to a specific commodity. Such support includes crop insurance; input subsidies, such as irrigation; and the Market Loss Assistance (MLA) payments made from 1998-2001 under ad hoc disaster assistance legislation.

As with commodity specific support, there is a *de minimis* rule for non-commodity-specific support. To be included in the AMS, total non-commodity-specific support must exceed 5 percent of the value of total U.S. agricultural output. The total non-commodity-specific support has been less than 5 percent of the total value of U.S. agricultural production, and to date, such support has not been notified to the WTO as part of the AMS. *De minimis* support has increased over time, reflecting the MLA payments and increased indemnities under crop insurance programs. Counter-cyclical payments have not been notified to date, but under current criteria would be considered non-product specific amber because payments are price-linked although decoupled from current production.

Blue box policies were originally envisioned as transition policies that would help pave the way for further reforms over time, and are exempt from the AMS reduction commitments. Blue box policies are program payments received under production limiting programs, and must be based on fixed area and yields, a fixed number of head of livestock, or made on 85 percent or less of a historical level of production. Deficiency payments (made prior to the 1996 farm bill) were notified as blue box, since payments met the specific requirements. The U.S. has not notified any blue box programs since the 1996 farm bill eliminated the deficiency payment program.

Green box policies are not subject to reduction commitments under the URAA because these policies are assumed to affect trade minimally. The main U.S. green box programs are USDA food assistance programs, the Conservation Reserve Program and other conservation programs, and most disaster payments. Direct payments under the 2002 Farm Act have not been notified but would be considered green box.

The United States has been under considerable international pressure to reform its domestic farm programs in the Doha negotiations. To that end, the United States put forward a WTO proposal in October 2005 that called for substantial cuts in trade-distorting domestic support. The United States proposed to cut its amber box limit by 60 percent over a five-year period. The United States also proposed reducing allowed levels in the blue box and the *de minimis* categories from the 5-percent level (based on value of agricultural production) by half, to 2.5 percent of the value of production. Under a framework agreement reached in July 2004, WTO members agreed to a new blue box category, which would provide for programs that may be price-linked but decoupled from production (that is, no requirement to produce to receive payments) to be considered as blue box, such as counter-cyclical payments.

If the U.S. proposals are adopted in the WTO, domestic policy reform is likely to be needed so as to not exceed the new limits. This is especially the case for the marketing assistance loan program and the dairy and sugar price support programs, key amber box programs.

A 60-percent reduction cuts the AMS ceiling to \$7.6 billion. An estimate for the 2005/06 marketing year suggests an AMS of around \$13 billion, so the U.S. proposal implies a real and substantial reduction in amber box support. Blue box spending is currently unconstrained. Based on an historical estimate of the value of production of around \$200 billion, U.S. blue box spending would be limited to around \$5 billion. The United States would be able to place counter-cyclical payments in the blue box, which are estimated for the 2005/06 marketing year at about \$5 billion, and could reach a theoretical maximum of \$7.6 billion. So again, the U.S. proposal would constrain such spending in some years. Allowed *de minimis* support would similarly fall by half; U.S. outlays have been as high as \$7 billion in this category (mainly non-product specific). There is also a current product specific *de minimis* level of 5 percent but the United States has notified very little in that category.

Brazil's successful challenge to U.S. cotton programs has significant direct and indirect implications for farm programs. In response to the WTO panel findings on prohibited subsidies, the United States has already made changes to one trade program, and legislation in place will eliminate the Step 2 program for upland cotton as of August 1, 2006. More importantly for domestic farm programs, however, is the panel finding on serious prejudice. The panel found that "price-based" U.S. domestic support measures—marketing loan payments, Step 2 payments, market loss assistance payments (no longer used), and counter-cyclical payments—caused serious prejudice in the sense of significant price suppression or depression in world cotton markets in 1999-2002.

To comply with the panel ruling, the U.S. was required to withdraw the subsidies or remove the adverse effects of the subsidies by September 21, 2005. The Step 2 program will be eliminated as of August 1, 2006, but the United States has taken no direct action concerning marketing loan benefits or counter-cyclical payments.

The WTO findings raise a host of indirect issues for other commodities and farm programs. The most obvious is that the marketing loan and counter-cyclical programs apply to other commodities. The panel also concluded that direct payments are not in fact green box payments because of planting restrictions on fruits and vegetables. Although the United States is not required to directly address this finding, many other commodities also receive direct payments and this finding could have wide ramifications.

VI. Alternative Approaches to Agricultural Risk Management

This section considers several alternatives to current risk management programs. The alternatives presented are not meant to be exhaustive, nor are they meant to represent specific farm bill proposals. No alternative is being advocated. Rather, the alternatives represent generalized approaches to addressing the concerns that have been raised with regard to current programs. They are presented as candidates for further public discussion to help inform the 2007 Farm Bill debate.

Alternative 1: Use the existing structure of farm programs, but make them more WTO consistent, reduce their effects on resource use and structure, and better target them to producers with the greatest need for assistance.

Participants at the USDA 2007 Farm Bill Forums and others have indicated support for the current mix of programs but were concerned about their vulnerability to challenge under WTO,

particularly given the outcome of the recent WTO cotton case. Many also thought program benefits should be targeted towards small and mid-sized farms that are potentially more vulnerable to income variability. In addition, some have argued current programs encourage farm consolidation, since larger farms receive more assistance than small farms.

To address WTO and resource concerns about the production and trade distorting effects of current programs, marketing assistance loan rates could be reduced to minimize the probability of U.S. amber box support exceeding WTO limits. Producers could be compensated through a commensurate increase in direct payment rates. As counter-cyclical payments are subject to discipline in the WTO, counter-cyclical payment rates could also be reduced. In addition, stricter payment limitations could be put in place that would target payments towards smaller and mid-sized farms.

WTO implications. Amber box support (marketing assistance loan benefits and counter-cyclical payments) would be reduced significantly, but could be offset by increases in green box support (direct payments). Because of the WTO cotton ruling on direct payments, modifying the prohibition on planting fruits, vegetables and wild rice to ensure direct payments would continue to be exempt from discipline in the WTO would be prudent. Exceeding WTO limits on domestic support would continue to be a vulnerability, but that probability would be greatly reduced by the decline in marketing assistance loan benefits and counter-cyclical payments.

Effects on income risk. Marketing assistance loans would continue to provide a safety net in the event of large price declines, but would lessen the extent to which producers of program crops are insulated from market signals and thus lessen the possibility that commodity programs distort planting decisions. Increased direct payments would ensure that the current level of support is largely maintained for program crops. With less reliance on government support through marketing assistance loans, there would likely be increased demand for privately offered risk management tools, such as forward contracts, and futures and options. Demand for revenue insurance coverage would also likely increase.

Effects on budget, distribution of payments across commodities, and resources. Lowering marketing loan rates and the maximum counter-cyclical payment rates would reduce budget outlays; however, the level of savings would be determined by how much of the decrease in marketing loan benefits and counter-cyclical payments was offset by increased direct payments. Under this option, program benefits would continue to flow to those crops and producers that traditionally have benefited from commodity programs. As a result, land values and values of other assets of producers of traditional program crops would largely be maintained. However, benefits could shift marginally among program crops as more payments would be based on historical rather than actual plantings.

Effects of payment limitations. With a shift to direct payments in the 1960s as a means of supporting farmers, the size of payments to individuals came under scrutiny. Current payment limitations trace to 1970 when legislation established three separate payment limits of \$55,000 for wheat, feed grains, and upland cotton. Since then, limits were changed several times, with the focus being on a dollar cap on various types of payments and some attempts to tighten eligibility requirements. The Commission on the Application of Payment Limitations in Agriculture concluded in 2003 that current payment limits reduce payments by 1-2 percent or \$100-\$200 million annually. The modest reduction in payments indicates that producers can reorganize their farm businesses to reduce the effectiveness of payment limits. Any new payment limit regime that addressed the dollar limits would also have to address the issue of who

and what types of entities are eligible for payments. Assuming stricter or more effective limits could be implemented, they would most adversely affect cotton and rice producers, but every State would have some producers who would have payments and incomes reduced. The effect of stricter payment limitations on land values, while expected to have little effect nationally, are likely to vary considerably from region to region, reflecting regional differences in land markets and the number of producers affected. Tighter payment limits would likely have negligible effects on planted area, supply, demand, and prices, due to the shift of support from marketing assistance loans and counter-cyclical payments to direct payments.

Alternative 2: Replace marketing assistance loans and counter-cyclical payments with a program that pays producers based on revenue shortfalls.

A common theme expressed in many of the Farm Bill Forums was the desire to stabilize revenue. Programs that attempt to stabilize price or yield are not as efficient at stabilizing producer revenue as programs based on a target level of revenue. For example, a producer whose crop is affected by drought has less production and will receive less in marketing assistance loan benefits. Also, counter-cyclical payments do not compensate producers whose crops are affected by drought, since payment yields are fixed and they might not even be planting the base crop.

Under this option, marketing loans and counter-cyclical payment would be replaced with a program paying producers whenever farm revenue fell below a target revenue level. In designing such a program, several questions arise. These include:

- Should target revenue be based on individual commodities or whole farm revenue?
- At what level of aggregation should the revenue level be determined?
- What should be the level of the revenue guarantee?
- Would a revenue-based program replace or complement the current crop insurance program?

The first issue is whether the target revenue is based on individual commodities or on whole farm revenue. Commodity-specific target revenue programs most closely mirror current crop-specific programs, while whole farm revenue guarantees would address aggregate farm revenue shortfalls more efficiently and cheaply because they would take into account potentially offsetting effects among commodities. Whole farm revenue would include crops and livestock not currently covered by current commodity programs. However, record keeping needs for a whole farm revenue program may be quite large compared to single crop revenues, particularly for those producers who produce multiple commodities.

The second issue concerns the level of aggregation used to determine both the target revenue and the revenue shortfall. Programs that are based on individual farm-level revenue would most effectively mitigate revenue shortfalls; however, they would require extensive record keeping and oversight to prevent fraud and abuse. Moreover, if the revenue guarantee is set too high, producers may have little incentive to produce or market a crop in the most efficient and timely manner, similar to the “moral hazard” problem that occurs when insurance guarantees are set above the market value of the insured commodity. The more farm-specific the calculation of the revenue shortfall, the lower the incentive would be for a farmer to use private sector risk management tools.

Alternatively, a target revenue program could be based on an area-based revenue (e.g., county revenue), where every producer within the area would receive the same payment rate. Basing program payments on area-based revenue would provide sufficient incentives to produce and market crops efficiently and would minimize record keeping requirements. However, such a program would less effectively mitigate risk than an individual-based program, since area-based revenue is less correlated with an individual producer's revenue.

The third issue relates to the level of the target revenue guarantee. One option would base the target revenue guarantee at 70 percent of expected market revenue. Such a program would be generally consistent with WTO criteria for green box programs. Savings from such a program could be provided to producers in the form of direct payments (also green box) or redirected to other types of programs, such as rural development, conservation, or research. Alternatively, a target revenue program could be based on current target price levels. Such a program would give producers similar levels of protection as under current programs, but would be more effectively targeted to shortfalls in revenue, rather than simply price. Because the level of benefits would be similar to current programs, vulnerability to WTO challenges, while potentially lower than under current programs, would remain, particularly if revenue payments were based on planted area rather than historical area. A third alternative would be to provide an overall revenue guarantee by basing a portion of the guarantee on an individual-based program and a portion on an area-based program, designed to fit within current or future WTO constraints. The higher the level of the guarantee, the more the program objective moves beyond revenue stabilization and toward revenue enhancement.

The fourth issue concerns whether a revenue-based program substitutes for the current Federal crop insurance program or whether the two programs operate together. For example, since a revenue-based program would protect production that is adversely affected by weather, it could be argued that a revenue-based program would eliminate the need for Federal crop insurance. In fact, many Federal crop insurance policies are already revenue based. Alternatively, a revenue-based program could be developed that completely substitutes for the current Federal crop insurance program in terms of commodity coverage and the variety of risk management products currently available. Under the current crop insurance program, a revenue-based program with a guarantee set above expected market revenue (revenue enhancement) would be viewed as "over insurance" and inconsistent with the current actuarially sound crop insurance program.

WTO implications. In general, the less a target revenue program is tied to actual farm revenue, the less likely the program is considered amber box and subject to potential reduction commitments under the WTO. However, current WTO green box criteria for income safety net programs would require target revenue guarantees to be set based on a maximum of 70 percent of the average farm revenue of the preceding three years (or five years, excluding the high and low years). These criteria apply to both individual and area-based revenue guarantee programs. In comparison, a target revenue program based on current target price levels would establish a target revenue guarantee of well in excess of average market revenue for program crops.

Effects on income risk. Target revenue programs are generally more effective in stabilizing farm income the closer they are targeted to an individual producer's whole farm revenue. As mentioned above, this must be balanced with other concerns, such as ensuring appropriate market incentives for producers to produce and market their crops efficiently, providing incentives for producers to use private sector tools for managing risk, and avoiding excessive record keeping.

Effects on budget, distribution of payments across commodities, and resources. Replacing current marketing loans and counter-cyclical programs with commodity-specific target revenue programs would likely result in cost savings if the level of the revenue guarantee were set to provide protection similar to current programs. This is because price and yield tend to move in opposite directions, providing a partial offset in the calculation of a producer's actual revenue. The distribution of benefits among producers would remain roughly similar as under current programs, although payments to areas and crops where revenue variability is higher (e.g., Northern and Southern Plains) would be somewhat greater. For a revenue-based program, payments are determined by both price and yield movements, which can vary significantly depending on crop and region. The cost savings could be used to address needs of the non-program and livestock sectors or fund other programs that would support agriculture and rural areas.

The costs of basing target revenue on a whole farm concept and extending coverage to non-program commodity producers would depend on the level of coverage and the extent of eligibility. Such a program, if extended to non-program commodities, could result in a significant relative shift in benefits from producers of traditional program crops to producers of non-program crops and livestock, and would likely result in commensurate increases in land values for newly-covered commodities and potential shifts in land use. Effects on current program crop producers could be mitigated by increasing direct payments for program crops, but this would increase program costs, unless offset by lowering the revenue guarantee for all producers.

Alternative 3: Phase out marketing assistance loans, direct payments, and counter-cyclical payments, and use savings to expand crop insurance coverage, fund farm savings accounts and/or expand conservation, rural development, or other programs.

Many Farm Bill Forum participants supported expansion of conservation and rural development programs. Conservation and rural development programs help all farmers, not just traditional program crop producers. In addition, farm savings accounts have been promoted as an alternative to help stabilize incomes.

Increased funding for conservation programs in the 2007 Farm Bill has been a topic of interest. While conservation and environmental programs will be discussed in a subsequent theme paper, it is important to note that conservation programs can aid in risk mitigation through improved soil and water management, technical assistance, and stewardship programs. In addition to reducing risk and addressing conservation goals, conservation-based payments can also be viewed as payments for ecosystem services that producers provide, in addition to their commodity production. If designed properly, conservation programs have the added benefit of being green box programs under the WTO and hence exempt from reduction commitments. Shifting payments to meet conservation goals could result in a significant shift of program benefits from current program crop producers to areas and practices that yield larger environmental benefits.

Funding for counter-cyclical payments and marketing assistance loans could also be redirected to meet broader agricultural and rural development needs, such as providing improved agricultural and rural infrastructure or stimulating rural economic development through the development of new markets and other opportunities. Such funding would largely be WTO-consistent and could potentially provide risk management for farm households through greater off-farm employment opportunities. For example, funds could be provided to States in the form of block grants based

on the current distribution of commodity payments; however, shifting funds to meet broader rural development goals could shift benefits away from producers to rural residents in general. Rural development programs will also be the focus of a subsequent theme paper.

In recent years, several proposals have been put forward for a whole-farm revenue safety-net program not linked to production of particular commodities and potentially available to all farms. Prominent among these proposals are farm income stabilization or savings accounts. Farm income stabilization or savings accounts are designed to encourage farmers to manage risk by making deposits to special accounts in high-income years and making withdrawals, when needed, in low-income years. The government would provide incentives, such as tax deferrals and/or matching contributions, to encourage farmer participation and to help farmers accumulate reserves.

Income stabilization accounts have the potential to overcome some of the disadvantages of current farm safety net programs, since they could be applied to a wide variety of farming situations and could be decoupled from individual crop production decisions. However, risk protection under income stabilization accounts would depend upon the reserves in individual accounts, which could vary with the level of participation, the generation of new savings, and the distribution or concentration of program benefits. While USDA analyses of three prominent farm savings account proposals suggests that some farmers could build balances over time, the use of a tax-based net or gross income measure to determine eligibility and the limited capacity of some farmers to make eligible deposits suggests that the distribution of program benefits could be even more concentrated than under current programs. Farm savings accounts may not provide sufficient coverage for many farmers, especially in the early years of the program or when successive disasters deplete funds. At the same time, depending upon the structure of the program, some farmers may be allowed to build subsidized balances beyond the levels necessary to satisfy risk management goals.

WTO implications. Phasing out commodity programs would eliminate amber box support programs. WTO implications would depend on how the savings were redirected in other areas. For example, increased spending on conservation and other programs would have to be consistent with WTO green box criteria for such programs to avoid simply shifting amber box support from one type of program to another.

Under current WTO criteria, income stabilization accounts would not be considered green box unless the trigger for withdrawal was set at 70 percent of the average income level over the previous three years (or previous five years, excluding the high and low). Other countries' experience with stabilization accounts (e.g., Canada's Net Income Stabilization Account and its successor, Canadian Agricultural Income Stabilization program) set trigger levels at 85 percent of net farm income.

Effects on income risk. This option would shift program benefits from traditional program crop producers to broader participation based on other goals, such as conservation, rural development and agricultural infrastructure, such as research. Income risk protection would decline for traditional program crop producers but likely increase for other commodity producers. The alternative would leave in place the Federal crop insurance program to provide a safety net for producers. In addition, producers would have another tool for managing risk, farm savings accounts. In general, as current program support is phased down, producers of traditional program crops would be expected to expand their use of private sector risk management tools,

since the level of government-provided risk protection would decline relative to current programs.

Effects on budget, distribution of payments across commodities, and resources. Eliminating direct and counter-cyclical payments and marketing assistance loans over time would eventually reduce Federal spending substantially. Part or the entire savings would be used to improve crop insurance and expand conservation, rural development, or other programs to meet the broad needs of all producers. The reduction in payments to traditional program crops and expansion in crop insurance, conservation, rural development, and other programs, along with the authorization for farm savings accounts, would result in a significant shift in benefits from producers of traditional program crops to producers of non-program crops and livestock. Due to potential adverse effects on the land and asset values of program crop producers from such a proposal, program implementation would be gradual over a number of years. The phasing out of current programs would eliminate the income enhancement of current programs, focus on income stabilization, lead to a more market-oriented agricultural sector by increasing producer responsibility for risk management and removing the negative aspects of current programs to expand production and plant certain crops.

VII. Suggestions for Further Reading

The following is a list of selected USDA publications related to the issues raised in this paper.

Claasen, Roger and Mitch Morehart. *Greening Income Support and Supporting Green*, Economic Research Service, USDA, Economic Brief No. (EB1) 6 pp, March 2006.
<http://www.ers.usda.gov/Publications/EB1/>

Dismukes, Robert and Joseph Glauber. "Why Hasn't Crop Insurance Eliminated Disaster Assistance?" *Amber Waves*, Economic Research Service, USDA, June 2005.
<http://www.ers.usda.gov/AmberWaves/June05/Features/WhyHasntCropInsurance.htm>

Farm Business and Household Survey Data: Customized Data Summaries from the Agricultural Resource Management Survey (ARMS). USDA, March 2006.
<http://www.ers.usda.gov/Data/ARMS/>

Hamrick, Karen (Editor). *Rural America At A Glance, 2005*. Economic Research Service, USDA, Economic Information Bulletin No. (EIB4) 6 pp, September 2005.
<http://www.ers.usda.gov/Publications/EIB4/>

Harwood, Joy, Richard Heifner, Keith Coble, Janet Perry, and Agapi Somwaru. *Managing Risk in Farming: Concepts, Research, and Analysis*. Economic Research Service, USDA, Agricultural Economics Report No. (AER774) 136 pp, March 1999

Jones, Carol A., Hisham El-Osta, and Robert Green. *Economic Well-Being of Farm Households*. Economic Research Service, USDA, Economic Brief No. (EB7) 6 pp, March 2006.
<http://www.ers.usda.gov/Publications/EB7/>

Lambert, Dayton, Patrick Sullivan, Roger Claassen, and Linda Foreman. *Conservation-Compatible Practices and Programs: Who Participates?* Economic Research Service, USDA, Economic Research Report No. (ERR14) 48 pp, February 2006.
<http://www.ers.usda.gov/Publications/err14/>

MacDonald, James, Janet Perry, Mary Ahearn, David Banker, William Chambers, Carolyn Dimitri, Nigel Key, Kenneth Nelson, and Leland Southard. *Contracts, Markets, and Prices: Organizing the Production and Use of Agricultural Commodities*. Economic Research Service, USDA, Agricultural Economic Report No. (AER837) 81 pp, November 2004.
<http://www.ers.usda.gov/Publications/aer837/>

MacDonald, James, Robert Hoppe, and David Banker. *Growing Farm Size and the Distribution of Farm Payments*. Economic Research Service, USDA, Economic Brief No. (EB6) 6 pp, March 2006. <http://www.ers.usda.gov/Publications/EB6/>

Report of the Commission on the Application of Payment Limitations for Agriculture, Submitted in Response to Section 1605, Farm Security and Rural Investment Act of 2002. Office of the Chief Economist, USDA, 168 pp, August 2003.
http://www.usda.gov/oce/reports/payment_limits/index.htm

U.S. Department of Agriculture. Economic Research Service. "Trade Issues and Agreements: U.S. WTO Domestic Support Reduction Commitments and Notifications."
<http://www.ers.usda.gov/briefing/farmpolicy/usnotify.htm>

Westcott, Paul C., C. Edwin Young, and J. Michael Price. *The 2002 Farm Act: Provisions and Implications for Commodity Markets*. Economic Research Service, USDA, Agriculture Information Bulletin No. (AIB778) 67 pp, November 2002.
<http://www.ers.usda.gov/Publications/aib778/>

Young, Edwin. "Government payments and the farm sector: Who benefits and how much?" Farm and Commodity Policy Briefing Room, Economic Research Service, USDA, March 2005, 12 pp. <http://www.ers.usda.gov/briefing/FarmPolicy/gov-pay.htm>

Appendix Table 1. Distribution of Government Payments to Producers by Various Characteristics, 2004

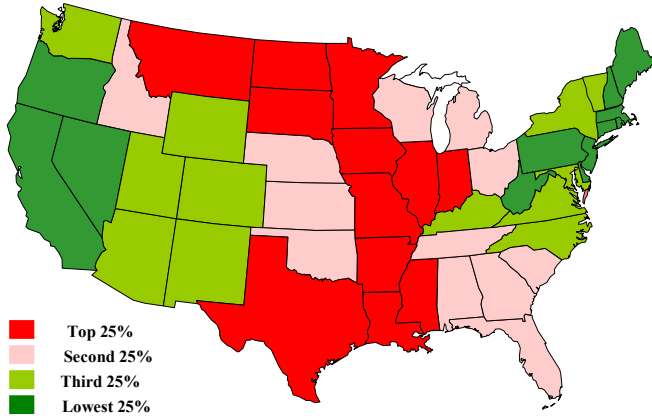
	Number of Farms	Number of Farms Receiving Payments	Percent of Farms Receiving Payments	Government Payments Thousand \$	Share of Government Payments %
Farm Typology					
Rural residence farms	1,373,956	406,901	49.8	1,735,839	16.9
Intermediate farms	529,071	270,386	33.1	2,821,207	27.6
Commercial farms	204,898	140,338	17.2	5,677,093	55.5
Farm Type					
Cash grain and soybean	315,728	287,583	35.2	5,489,384	53.5
Other field crops	419,393	215,923	26.4	1,509,302	14.7
Cotton	16,230	15,980	2.0	788,245	7.7
High valued crops	139,052	*13,778	*1.7	207,483	1.9
Beef cattle	734,305	187,194	22.9	1,251,766	12.3
Hogs	33,579	14,640	1.8	280,341	2.7
Poultry	#34,434	#5,885	#.7	66,971	0.7
Dairy	60,461	47,312	5.8	492,849	4.8
General livestock	*354,743	@29,330	#3.6	170,554	1.7
Operator Household Income					
Negative or no income	102,794	55,012	6.7	1,199,592	11.7
Positive but less than \$25,000	373,343	129,727	15.9	808,848	7.9
\$25,000 to \$49,999	486,498	174,373	21.3	1,243,461	12.2
\$50,000 to \$99,999	625,995	230,318	28.2	2,238,461	21.9
\$100,000 to \$149,999	*218,849	92,712	11.3	1,263,016	12.3
\$150,000 to \$199,999	96,570	38,503	4.7	772,024	7.5
\$200,000 or more	156,772	75,371	9.2	2,372,754	23.2
Nonfamily farm	47,103	21,610	2.6	335,560	3.3
Size of Payment					
Positive but less than \$25,000	707,909	707,909	86.6	3,757,581	36.7
\$25,000 to \$49,999	64,369	64,369	7.9	2,293,660	22.4
\$50,000 to \$74,999	22,514	22,514	2.8	1,342,059	13.1
\$75,000 to \$99,999	12,086	12,086	1.5	1,036,833	10.1
\$100,000 to \$149,999	5,727	5,727	0.7	684,772	6.7
\$150,000 or more	5,020	5,020	0.6	1,119,430	10.9
Sales Class					
Less than \$10,000	1,201,417	267,292	32.7	582,162	5.7
\$10,000 to \$49,999	400,288	183,643	22.5	941,170	9.2
\$50,000 to \$99,999	170,201	112,485	13.8	1,052,860	10.3
\$100,000 to \$249,999	167,948	131,182	16.0	2,101,798	20.5
\$250,000 to \$499,999	88,863	70,526	8.6	2,256,761	22.1
\$500,000 to \$999,999	44,728	30,761	3.8	1,648,759	16.1
\$1,000,000 or more	34,480	21,736	2.7	1,650,501	16.1
Net Cash Income					
-\$40,000 or less	*61,878	27,919	3.4	901,560	8.8
-\$39,999 to	*272,050	78,285	9.6	429,941	4.2
-\$9,999 to \$0	788,187	161,103	19.7	480,892	4.7
Positive but less than \$10,000	444,854	184,873	22.6	840,063	8.2
\$10,000 to \$39,999	267,506	161,418	19.7	1,473,746	14.4
\$40,000 to \$99,999	143,959	103,336	12.6	1,789,366	17.4
\$100,000 or more	129,491	100,691	12.3	4,318,737	42.1
Acres Operated					
Less than 100 acres	1,053,565	190,685	23.3	405,206	4
100 to 249 acres	464,248	212,145	25.9	838,397	8.2
250 - 499 acres	255,007	153,542	18.8	1,217,127	11.9
500 - 999 acres	154,247	113,797	13.9	1,978,588	19.3
1,000 to 1,999 acres	101,048	82,191	10.1	2,629,537	25.7
2,000 acres or more	79,811	65,264	8.0	3,165,174	30.9

* indicates that the standard error of the estimate is greater than 25 percent and less than or equal to 50 percent. # indicates that standard error is greater than 50 percent and less than or equal to 75 percent. @ indicates that the standard error of the estimate is greater than 75 percent.

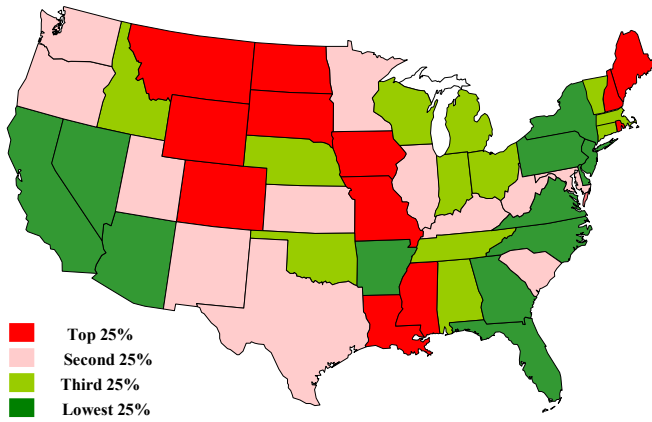
Source: Economic Research Service, Agricultural Resource Management Survey, 2004

Appendix Figures

**Commodity Payments as a Percent of Gross Cash Receipts,
State Rankings, 2004**



**Conservation Payments as a Percent of Gross Cash Receipts,
State Rankings, 2004**



**Crop Insurance Premium Subsidies
as a Percent of Gross Cash Receipts,
State Rankings, 2004**

