

## Risk Management



Risk Management Agency

## Recent Developments in Crop Yield & Revenue Insurance

As policymakers consider strengthening the farm safety net, crop insurance is once again in the spotlight. Among the questions being asked: How well does the current array of crop insurance products and coverage levels match the risk management needs of producers? How much does insurance help producers in extended periods of low prices or with multiple-year crop losses? How can the government work effectively with the private sector to develop and deliver insurance?

Although overall participation has declined from its peak in 1995 and questions remain about the adequacy of coverage, crop insurance, which includes yield-based as well as revenue insurance products, is used by many growers. In 1998, growers paid about \$900 million in crop insurance premiums for about \$28 billion in guarantees on about 180 million acres of crops. About two-thirds of planted acreage of corn, soybeans, and wheat was covered by crop insurance.

Crop insurance provides protection from a broad range of perils that can lead to yield or revenue shortfalls. The type of protection depends on the type of insurance. For instance, multiple-peril crop insurance (MPCI) protects against yield shortfalls

that are due to drought, flooding, frost, plant disease, insect infestation, and other natural hazards beyond a grower's control. Revenue insurance provides a degree of price protection—not just yield protection as under MPCI—covering sharp drops in expected revenue, which may result from yield or price declines or a combination of the two.

Although growers obtain insurance through private companies and their agents, the Federal government plays a prominent role in the provision of crop insurance. During 1995-98, USDA's Risk Management Agency (RMA), which administers programs of the Federal Crop Insurance Corporation (FCIC), has spent about \$1.2 billion per year, on average, for premium subsidies, administrative and operating subsidies, and net underwriting losses. RMA promotes crop insurance participation through educational and other outreach activities and—along with the insurance companies—develops new products. FCIC and RMA also oversee the provision of crop insurance, setting and approving premium rates and policy provisions, ensuring that companies can cover potential underwriting losses, and approving privately developed insurance products for subsidies and underwriting protection.

### *Crop Insurance: A Widening Array of Coverage*

Since the early 1990's, the variety of insurance products, guarantee levels, and crops included in the Federal crop insurance program has grown substantially. Insurance product choices have expanded from a single offering—individual-farm yield insurance called Actual Production History-Multiple Peril Crop Insurance (APH-MPCI)—to include area-yield insurance and a variety of crop revenue insurance products. The range of guarantee levels has been enhanced by pilot programs to increase maximum guarantees available in some areas of the country and by the provision, at low cost to producers, of a minimum level of insurance coverage called CAT (short for catastrophic). The list of crops for which insurance is available has grown from about 50 in the early 1990's to more than 70 currently, including several types of fruit and nut trees, grapes, nursery stock, and rangeland.

In addition to the growing array of coverage options available under the Federal programs, private insurance companies, agents, and brokers have developed a variety of supplemental insurance products and have bundled crop insurance with other risk management products. Examples of supplemental products, for which producers pay additional premiums, include those that increase the price at which insurance indemnities would be paid. Purely private insurance against hail and fire damage continues to be widely available. In 1998, producers in 46 states paid about \$550 million in crop-hail premium. About 60 percent of the crop-hail coverage was for corn and soybeans.

While traditional APH-MPCI still accounts for the bulk of the Federal crop insurance business, new types of insurance, particularly revenue insurance, have attracted considerable interest. Revenue insurance products—*Income Protection* and *Crop Revenue Coverage*—first became available for a few crops in selected areas in the 1996 crop year. *Revenue Assurance* was added in the 1997

This article continues *Agricultural Outlook's* series on risk management.

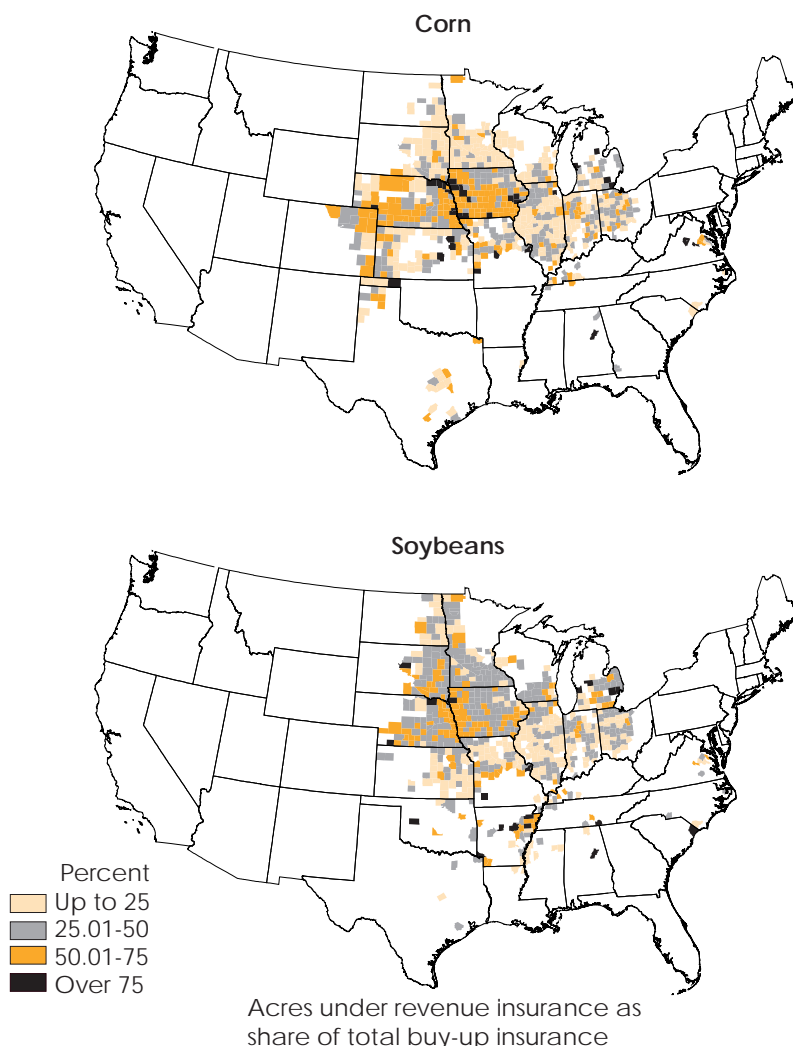
crop year and *Group Risk Income Protection* and *Adjusted Gross Revenue* were added for the 1999 crop year. Since the introduction of revenue insurance, more crops and more areas have been added, and revenue insurance has come to cover a substantial portion of insured acreage in some areas. Not all insurance products, however, are available in all areas.

Revenue insurance has been especially popular for corn and soybeans, crops that were the initial focus of the privately developed Revenue Assurance and Crop Revenue Coverage. In 1998, revenue insurance products accounted for about one-third of the corn and soybean acreage insured above the CAT level. Revenue insurance covered more than 50 percent of corn acreage insured above the CAT level in Iowa and 45 percent in Nebraska, and reached nearly 50 percent of the above-CAT insured acreage for soybeans in these two states. Although wheat accounts for a smaller portion of the overall crop revenue insurance business than corn or soybeans, revenue insurance policies cover a considerable share of wheat acreage in several states. In Kansas, Michigan, Nebraska, and Texas, more than one-quarter of wheat acreage insured above the CAT level was covered by revenue insurance in 1998.

Revenue insurance choices continue to expand, with two new products being introduced in 1999. Group Risk Income Protection (GRIP) adds a revenue component to the Group Risk Plan (GRP) area-yield insurance. Coverage is based on county-level revenue, calculated as the product of the county yield and the harvest-time futures market price. GRIP is available for corn and soybeans under a pilot program in selected counties in Iowa, Illinois, and Indiana where GRP is offered.

Adjusted Gross Revenue (AGR), the second new revenue insurance product, offers coverage on a whole-farm rather than on a crop-by-crop basis. AGR bases insurance coverage on income from agricultural commodities reported on Schedule F of the grower's Federal income tax return. AGR targets producers of crops—particularly specialty crops—for which individual crop insurance programs are not presently available. Producers who

**In Many Counties, Revenue Insurance Accounts for More Than A Quarter of the Area Insured at Buy-Up Level**



Total includes all yield and revenue insurance above the basic or catastrophic level. Shaded areas are counties with at least 1,000 acres of the crop covered by buy-up insurance in 1998 (revenue and yield). Source: Estimated by ERS from USDA Risk Management Agency data.

Economic Research Service, USDA

obtain AGR must obtain crop-by-crop coverage to insure crops for which such individual plans are available. In these cases the AGR whole-farm liability and premium are adjusted. AGR is being offered as a pilot program in selected counties in Florida, Maine, Massachusetts, Michigan and New Hampshire.

In addition to the growth in variety of insurance plans, the range of insurance guarantees, which are calculated as the

product of expected yield or revenue and percentage coverage level, has been expanded. Crop insurance coverage levels—percentages of expected yield—generally range from 50 percent for CAT to a maximum of 75 percent, increasing at 5-percent intervals. Under 75-percent coverage, for example, the grower would absorb up to a 25-percent loss in expected yield or revenue, while the insurer would pay for losses above 25 percent.

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### A Brief Legislative History of Crop Insurance

#### 1980—*Federal Crop Insurance Act*

- \* Crop insurance intended to replace disaster payments as primary form of crop yield risk protection
- \* Insurable crops and areas greatly expanded
- \* Premium subsidy instituted, at up to 30 percent of total premium
- \* Private insurance companies and agents may sell and service crop insurance

#### 1988-94—*ad hoc disaster assistance*

- \* Enacted each year partly in response to low insurance participation.
- \* Disaster assistance recipients were required to obtain crop insurance in the subsequent year.

#### 1990—*Food, Agriculture, Conservation, and Trade Act (1990 Farm Act)*

- \* Premium rate increases mandated to reduce excess losses
- \* Target loss ratio established for all crop insurance
- \* Actions to control fraud are mandated
- \* Private insurance companies to bear increased share of underwriting risk
- \* FCIC authorized to reinsure and subsidize privately developed products

#### 1994—*Crop Insurance Reform Act*

- \* Restrictive legislative procedures instituted for enacting disaster assistance
- \* Participants in farm programs must obtain crop insurance
- \* Catastrophic coverage level (CAT) introduced
- \* Premium subsidies for coverage levels above CAT are increased
- \* Non-insured Assistance Program (NAP) created for crops not covered by insurance

#### 1996—*Federal Agriculture Improvement and Reform Act (1996 Farm Act)*

- \* Requirement that participants in farm programs obtain crop insurance is ended
- \* Pilot revenue insurance program is mandated

#### 1998—*Emergency assistance, included in 1999 Agricultural Appropriations Act*

- \* Crop-loss disaster assistance payments to producers authorized for single-year (1998) or multiple-year (3 or more years between 1994 and 1998) crop losses; payments slightly higher for those who had obtained crop insurance
- \* Additional premium subsidies authorized for buy-up coverage in 1999, limited to total of \$400 million
- \* Recipients of emergency assistance who did not have 1998 crop insurance must obtain crop insurance, where available, for 1999 and 2000 crop years

At the high end, FCIC/RMA has increased the maximum coverage level available for some crops in some areas, giving growers the option of purchasing insurance at higher coverage levels, at higher premium costs. At the low end, the provision of low-cost CAT coverage has already increased insurance participation.

Under pilot programs in 1999, FCIC/RMA increased the maximum coverage level available for selected crops in selected areas from the current 75 percent to 85 percent. One pilot targeted areas where many growers have historically insured at the maximum level and where losses have been infrequent; another focused on areas

where recent low yields may have reduced the yield or revenue history on which guarantees are calculated. The maximum coverage level for individual yield and revenue coverage was raised to 85 percent in pilot programs for corn and soybean growers in 66 counties in Illinois, Indiana, and Iowa and for wheat growers in 20 counties in Idaho, Oregon, and Washington. In addition, the maximum coverage was increased to 85 percent for spring wheat and barley in Minnesota, North Dakota, and South Dakota. Higher coverage levels are more costly; the premium rate for 85 percent coverage is generally about 60 percent higher than the premium rate for 75 percent coverage, and the additional premium is unsubsidized.

While maximum coverage level has been a concern of some growers, others have focused on the effectiveness of the CAT coverage level. CAT is a low coverage level—50 percent of expected yield indemnified at 55 percent of expected price—for which producers pay a flat fee of \$60 per crop. Despite the low cost of CAT to producers, many have questioned whether it provides valuable insurance coverage. The yield trigger, 50 percent of expected yield, has been criticized as too low to provide a benefit except in rare cases, and the maximum possible indemnity, less than 30 percent of the expected value of a crop, has been criticized as inadequate. However, CAT was never intended to provide substantive coverage, just benefits roughly the same as those under previous ad hoc disaster programs.

CAT is a basic coverage level that was introduced under the Federal Crop Insurance Reform Act of 1994. The crop insurance reform, which required participants in farm programs to obtain crop insurance and which raised premium subsidies for coverages above CAT, was designed to increase crop insurance participation and reduce the need for ad hoc disaster assistance. In 1995, the first year of reform, total insured acreage doubled to about 80 percent of eligible acres, and CAT accounted for the bulk of the expansion.

Since implementation of the 1996 Farm Act, which significantly changed farm programs and eliminated the crop insurance requirement, CAT participation has dropped dramatically. While overall

insured acres have declined about 15 percent (average net acres insured for 1997 and 1998, compared with 1995 and 1996) and acres insured above the CAT level have increased by about 7 percent, CAT acres have dropped about 40 percent.

### The Value of Crop Insurance

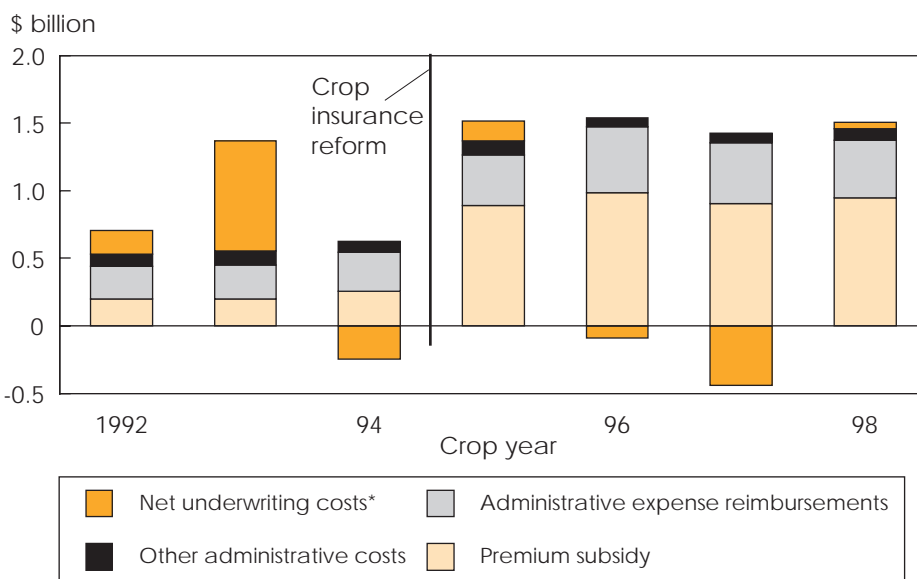
The current array of crop insurance products is designed to protect against shortfalls in yields or revenues that occur during a single growing season. Insurance guarantees are set at planting, based on expectations about the eventual levels of yields or revenues. By reducing or eliminating the chances of sharply lower income as a result of losses from a particular commodity, crop insurance can be a valuable risk management tool. The risk protection that it provides can, for example, facilitate access to operating loans by offering some financial security to a lender.

For insurance purposes, expected yields are based on yield histories, and for individual farm coverage, the annual expected yield for a crop is usually calculated as the average yield over the previous 4-10 years, depending on data availability. While in most cases these actual production histories provide reliable indications of the likely yield under normal conditions, they can produce distorted pictures.

If yields for a farm over a 4- to 10-year period differ significantly from yields based on a longer history, premiums will not be consistent with long-term expected losses. If yields are too high due to a few good years, the premium will be lower than needed over the long term and vice versa. By the same token, if recent historical yields differ from current expectations of the grower, he or she may consider the guarantees too high or too low.

Under crop insurance rules, expected yield, and hence insurance guarantee, can fall if a producer's yield declines over time. This potential for declining guarantees has led to questions about the effects of repeated crop losses. In the Northern Plains, for instance, several years of poor weather and plant diseases have hampered crop production for some but not all producers, reducing the historic yield and leading to complaints that insurance based

### Government Costs of Federal Crop Insurance Increased Following 1994 Reform



\*Appears as a negative value if premiums received exceed indemnities paid (i.e., a gain rather than an expense). Other administrative costs include Risk Management Agency salaries and operating expenses.  
Source: Risk Management Agency, USDA.

Economic Research Service, USDA

on actual production history no longer offers effective yield guarantees.

FCIC/RMA authorized a pilot program in early 1999 that may help some growers overcome the declining guarantee problem. In exchange for a higher premium, growers can choose to use 90 or 100 percent of a transitional or T-yield instead of the recent actual yields on the farm as the basis for the insurance guarantee. (T-yields are based on Farm Service Agency program or county-level yields and other data and are usually used in the Federal crop insurance program to set insurance guarantees when a producer is unable to provide records of farm-level actual production history.) This "Yield Floor Option" is available in 1999 for barley and spring wheat in Minnesota and North and South Dakota.

In addition, provisions for multiple-year crop loss payments are included in the Crop Loss Disaster Assistance Program, implemented under the 1999 Agricultural Appropriations Act. Under the disaster program, producers may apply for payments from USDA in addition to crop

insurance indemnities they may have received. The program allows producers to file for payments based on either a single loss in 1998 or on multiple crop losses between 1994 and 1998. Although producers who did not have crop insurance may also receive benefits, those with crop insurance would receive greater payments. And all producers receiving benefits who did not have crop insurance in 1998 must obtain crop insurance, where available, in 1999 and 2000.

Crop insurance, particularly revenue insurance, provides protection from sharp drops in prices over each growing season. The products provide little protection against declines in prices that occur between growing seasons and over several seasons. Prices, or formulas for establishing prices, are determined when insurance guarantees are set at planting. In the case of MPCY yield coverage, RMA estimates an expected price. Revenue coverage uses prices of futures contracts with delivery dates near harvest time. Both of these procedures keep the value of insurance consistent with the expected value of the crop.

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### How Federal Crop Insurance Is Delivered

USDA's Risk Management Agency (RMA) is charged with the administration of crop insurance programs for the Federal Crop Insurance Corporation (FCIC). FCIC/RMA regulates and promotes insurance program coverage, sets standard terms—including premium rates—of insurance contracts, ensures contract compliance, and provides premium and operating subsidies. Crop insurance policies are delivered—sold, serviced, and underwritten—by private insurance companies. Insurance companies also develop new insurance products that are approved for subsidies and reinsurance by FCIC and offer private coverages (without FCIC support) that supplement Federal crop insurance.

About 18 insurance companies currently deliver crop insurance. The companies' insurance portfolios vary in size and scope. The four companies with the largest amounts of crop insurance account for about two-thirds of the volume of total premium, and each delivers insurance in about 40 states. While these companies have large and widely spread portfolios, other companies deliver smaller amounts of crop insurance over smaller areas. Most of the companies with small crop insurance portfolios deliver in five or fewer states, and tend to operate in low-risk states.

Companies compete for crop insurance business through insurance agents who sell and service the policies. Most of the nation's 18,000 crop insurance agents are independent agents who may sell insurance for more than one company. Others are captive agents, selling for only one company. An agent is usually paid a sales commission by a company proportional to the premium of the policy sold. Loss adjusters for claims are employees or contractors of the insurance companies.

Insurance underwriting gains or losses arise as total premiums (producer premiums and premium subsidies) are used to offset indemnities paid. In the crop insurance program, private companies share the underwriting risk with FCIC by designating their crop insurance policies to risk-sharing categories, called reinsurance funds. Because each of the funds allows different levels of risk sharing—potential underwriting losses when indemnities exceed premiums and gains when premiums exceed indemnities, the proportion of losses paid or gains earned varies by government fund.

Companies that qualify to deliver crop insurance must annually submit plans of operation for approval by FCIC/RMA. A plan of operation provides information on the ability of the company to pay potential underwriting losses and on the allocation of the company's crop insurance business to the various risk sharing categories or reinsurance funds.

Based on the policies designated to each reinsurance fund, companies retain or cede to FCIC portions of premiums and associated liability (potential indemnities). FCIC assumes all the underwriting risk on the company-ceded business and various shares of the underwriting risk on the retained business, determined by the particular category and level of losses. Companies can further reduce their underwriting risk on retained business through private reinsurance markets.

In addition to underwriting returns, the companies are paid a subsidy by FCIC for administrative, operating, and loss adjustment costs. The rates of administrative and operating subsidy vary by the type of crop insurance and level of coverage and are applied to the total premium of each type of insurance sold. The levels of administrative and operating subsidy and the terms of the underwriting risk-sharing are specified in the Standard Reinsurance Agreement (SRA), which applies to all companies delivering FCIC-reinsured policies. The current SRA (1998) specifies the subsidy for APH-MPCI at the CAT level at 11 percent (for loss adjustment). For buy-up APH-MPCI and similar coverages, the administrative and operating subsidy is 24.5 percent of total premium; 22.7 percent for GRP; and 21.1 percent for most crop revenue products.

Multiple-year insurance contracts may offer a means of moderating the drops in insurance coverage that can follow from several losses or from declines in prices. But guarantees fixed for several years at a time would have the potential to distort production if they exceed the market value of the crops and undermine the actuarial integrity of the insurance program. Multiple-year contracts could also be much more costly than annual crop insurance contracts.

### *The Government-Private Crop Insurance Partnership*

Expansion in the Federal crop insurance program since the early 1990's has been accompanied by expansion in the role of private insurance companies. The companies have developed new products, notably Revenue Assurance and Crop Revenue Coverage, and have borne an increasing amount of underwriting risk. Still, the Federal government provides substantial support and direction to the program. In products approved by the FCIC board of directors, it provides premium subsidies to producers in order to encourage participation, expense reimbursements to the companies to cover costs of selling and servicing policies, and underwriting risk protection to the companies.

Government involvement in providing crop insurance is explained in part by several "market failure" arguments. One such argument is that natural disasters associated with crop production tend to affect many producers in an area at the same time, so pooling risk on a sufficient scale is difficult for most private insurers. Another argument suggests that purely private markets for crop insurance would fail because other producer responses to risk—diversification, borrowing, drawing on savings—reduce the value of the additional protection provided by insurance, making insurance unattractive when offered at competitive market prices.

In order to encourage participation in crop insurance, RMA provides subsidies to reduce producer premiums. The amount of the subsidy depends on the type of insurance and the coverage level. For CAT coverage, the premium is entirely subsidized. For what has been the most

popular “buy-up” (above CAT) coverage level—65 percent of yield at 100 percent of price—the subsidy has been about 42 percent of the total premium. As a further incentive to purchase crop insurance, the Secretary of Agriculture authorized up to an additional \$400 million in premium subsidies for 1999 buy-up coverage. The additional funds, part of the emergency assistance package passed by Congress in 1998, are expected to reduce producer-paid premiums by about 30 percent.

Under most private insurance, the premiums include administrative costs as well as the costs of expected indemnities. Under the crop insurance program, total premiums—producer-paid plus government subsidies—are designed to cover only expected indemnities. For this reason, FCIC/RMA provides administrative subsidies to insurance companies to cover the costs of selling and underwriting policies, adjusting losses, and processing policy data. Because administrative costs vary by type of insurance, the subsidy amount is designed to match reimbursement to differing workloads.

The administrative subsidy, like the producer premium subsidy, is generally highest (in dollar amount) for individual farm APH-MPCI buy-up coverage and lowest for GRP area-yield insurance. The APH-MPCI subsidy is high because of the costs of establishing individual farm yield histories and guarantees and adjusting losses on an individual basis. The GRP subsidy

is low because it requires no fieldwork to adjust losses.

The underwriting exposure—potential gains or losses—of private crop insurance companies has grown considerably. Underwriting gains or losses arise as premiums are used to offset indemnities paid. In the crop insurance program, private companies share the underwriting risk with FCIC. The companies’ crop insurance business is reinsured by FCIC under the Standard Reinsurance Agreement (SRA). The companies can obtain additional reinsurance in commercial markets. In 1992, the companies’ total capital at risk—maximum possible losses after FCIC reinsurance—was about \$227 million. Since then, as risk-sharing provisions of the SRA have been renegotiated and the size of the crop insurance business has grown, the companies’ total capital at risk has grown to about \$1.5 billion.

With the exception of 1993, growing conditions have been generally favorable since 1992 and company underwriting gains have been sizable. Underwriting gains totaled approximately \$1.1 billion over 1992-98, an average of about \$155 million per year. The average, however, masks wide variation among areas, companies, and years. For instance, net underwriting gains in 1997 were \$352 million, while yield losses due to floods in 1993 were responsible for net underwriting losses of \$84 million. While the potential for underwriting gains is large, the private

companies are also exposed to large potential losses. For example, had the 1988 drought occurred in 1998, when more acres were insured and the companies’ risk exposure was larger, it is estimated that net underwriting losses would have exceeded \$450 million.

Since the early 1990’s, the Federal crop insurance program has expanded in the scope and variety of risk protection offered to producers. A major reform added a low level of coverage, and combined with premium subsidies and linkage to other farm programs dramatically increased insurance coverage. Maximum coverage levels that producers can purchase have been raised under pilot programs for some crops in some areas of the country. Revenue insurance products have been developed and have captured significant shares of the crop insurance business.

At the same time, private insurance companies have played a larger role in delivering crop insurance, developing new products, and sharing underwriting risk. Nonetheless, questions remain about the effectiveness of the coverage available under the crop insurance program in assisting producers in managing the economic risks in farming, and crop yield and revenue insurance are likely to be the focus of policy decisions about strengthening the farm safety net. **AO**

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