Crop Insurance, Disaster Assistance, and the Role of the Federal Government in Providing Catastrophic Risk Protection

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Abstract

Since 1980, the principal form of crop loss assistance in the United States has been provided through the Federal Crop Insurance Program. The Federal Crop Insurance Act of 1980 was intended to replace disaster programs with a subsidized insurance program that farmers could depend on in the event of crop losses. Crop insurance was seen as preferable to disaster assistance because it was less costly and hence could be provided to more producers, was less likely to encourage moral hazard, and less likely to encourage producers to plant crops on marginal lands. Despite substantial growth in the program, the crop insurance program has failed to replace other disaster programs as the sole form of assistance. Over the past 20 years, producers received an estimated $15 billion in supplemental disaster payments in addition to $22 billion in crop insurance indemnities.

Key words: catastrophic risk protection, crop insurance, disaster assistance

One of the key characteristics of agriculture is the inherent production risks facing producers from adverse weather, pests, and diseases. These risks have been used to justify government intervention in the form of disaster assistance payments, emergency loans, livestock feed assistance programs, crop insurance, and other subsidized assistance schemes. Yet, while government intervention to provide assistance has been widely supported in the United States, the form of assistance has been much debated.

Since 1980, the principal form of crop loss assistance in the United States has been provided through the Federal Crop Insurance Program. The Federal Crop Insurance Act of 1980 was intended to replace disaster programs with a subsidized insurance program farmers could depend on in the event of crop losses. Crop insurance was seen as preferable to disaster assistance because it was less costly and hence could be provided to more producers, was less likely to encourage moral hazard, and less likely to encourage producers to plant crops on marginal lands [U.S. General Accounting Office (GAO), 1989].

Over the past 20 years, the program has grown from a pilot program insuring 28 crops in 4,651 county crop programs in 1980 to over 110 crops in 38,462 county crop programs in 2001. In 2001, over 210 million acres were enrolled in the program, compared with only 26 million in 1980.
The enrolled acres accounted for almost 80% of eligible acreage in 2001. Total liability of the program in 2001 was $36.7 billion, almost 10 times the level of liability insured in 1980.

Despite this growth, the crop insurance program has failed to replace other disaster programs as the sole form of assistance. Over the past 20 years, producers received an estimated $15 billion in supplemental disaster payments in addition to $22 billion in crop insurance indemnities.

Citing failures of the crop insurance program to attract adequate participation at sufficiently high coverage levels, Congress has passed two crop insurance reform bills since 1980, in 1994 and 2000, that have increased the scope of the program and the size of government costs. The Agricultural Risk Protection Act of 2000 provides $8.2 billion in subsidies over five years to encourage the purchase of federal crop insurance. Projected annual costs of the program under this legislation are estimated at $3 billion, almost double the annual costs under the previous program and a ten-fold increase over spending levels of the early 1980s.

As the costs of the program have grown, criticisms have arisen that the high level of subsidies may affect producers' planting decisions and input use. To the degree these subsidies increase crop production, their benefit to producers may be offset by lower market revenues.

In this paper we examine the history and performance of the Federal Crop Insurance Program. We first consider whether there is an inherent market failure which justifies government intervention. The experience of the Federal Crop Insurance Program is then reviewed, in particular, over the past 20 years since passage of the Federal Crop Insurance Act of 1980. We examine the underlying goals of the 1980 Act and assess how the program has met these goals. Finally, the costs of the program are considered, and whether the program has had significant effects on production and crop prices.

**The Insurability of Crop Yields and the Rationale for Government Intervention**

A primary justification for government intervention has been the failure of private agricultural insurance markets (see, for example, Appel, Lord, and Harrington, 1999; Hazell, Pomerada, and Valdez, 1986; Goodwin and Smith, 1995). In a 1922 U.S. Department of Agriculture (USDA) bulletin, Valgren describes the disastrous experiences of fire insurance companies that offered crop insurance in the Dakotas and Montana in 1917 and the early 1920s. Severe droughts caused widespread crop losses in those states. The insurance companies had not protected themselves from such large losses and were unable to indemnify the insured farmers. As Valgren concluded, “the outcome of this first attempt to provide a general crop coverage is much to be regretted.” Other private ventures to establish multiple-peril crop insurance prior to 1938 met with similar results (Kramer, 1983).

Arguably, private crop insurance markets today are crowded out by subsidized crop insurance and other agricultural support programs. However, whether a viable market for agricultural insurance could exist today in the absence of government programs is not clear.

There has been substantial development in financing catastrophic risks, particularly over the past 10 years (see, for example, Froot, 1999; Cutler and Zeckhauser, 1999; Kleindorfer and Kunreuther, 1999), and there has been much interest in developing private crop insurance products outside of the United States (Skees, Hazell, and Miranda, 1999; European Commission, 2001; Meuwissen, 2000). Yet, apart from similarly subsidized crop insurance programs in other countries (e.g., Canada, Japan), no large-scale private crop insurance markets have emerged to date.
One of the reasons private crop insurance markets have not developed is the relatively low demand for crop insurance. Despite large subsidies in the United States, crop insurance participation historically has been relatively low. Farmers and ranchers use a variety of risk management strategies to mitigate the risks they face (Harwood, Heifner, Coble, Perry, and Somwaru, 1999; U.S. GAO, 1999), many of which compete with crop insurance. These include futures and options markets, contracting, cultural practices that reduce crop loss (e.g., irrigation, pesticide use), crop and livestock diversification, nonfarm income, savings and borrowing, leasing, federal price and income support programs, and federal disaster assistance payments.

A number of studies have estimated the demand for crop insurance (for a survey of this literature, see Knight and Coble, 1997; Goodwin and Smith, 1995). Most have concluded that the demand for crop insurance is inelastic, ranging from \( 0.2 \) to \( 0.9 \) (Goodwin and Smith, 1995).

A recent study by Just, Calvin, and Quiggin (1999) found that for producers participating in the Federal Crop Insurance Program, risk aversion was a minor part of their incentive to participate. Rather, their decision to participate was driven by the size of the expected benefit (due to premium subsidies).

On the supply side, researchers have questioned the viability of private crop insurance markets because of the presence of moral hazard and adverse selection problems (Ahsan, Ali, and Kurian, 1982; Chambers, 1989; Nelson and Loehman, 1987; Goodwin and Smith, 1995). Moral hazard occurs when an insured producer can increase his or her expected indemnity by actions taken after buying insurance.

To combat moral hazard, insurance contracts typically include deductibles, co-payment provisions, or other mechanisms where losses are shared between the insurer and the insured. However, because of the high costs of monitoring agricultural production, private crop insurance would require relatively high deductibles or high premium costs. Either of these reduce producer demand for insurance (Goodwin and Smith, 1995).

Adverse selection occurs when a producer has more information about the risk of loss than does the insurer, and is better able to determine the fairness of premium rates (Harwood et al., 1999). As a result, those who are overcharged are less likely to purchase insurance, while those who are undercharged are more likely to over-purchase insurance. Over time, indemnities will exceed premiums in such markets, and raising premium rates for all insureds will potentially create an even more adversely selected market as the less-risky participants drop out of the program.

More accurate risk classification reduces adverse selection problems, but risk classification, like monitoring for moral hazard, is potentially costly. Compulsory insurance coverage can mitigate adverse selection by forcing lower risk buyers to buy coverage, but, as pointed out by Appel, Lord, and Harrington (1999), mandatory coverage generally reduces the welfare of these buyers, and therefore can be politically unpopular.

Another factor often cited to explain why there is no significant private market for crop insurance is the fact that yield losses tend to be positively correlated across farmers (Bardsley, Abey, and Davenport, 1984; Miranda and Glauber, 1997; Duncan and Myers, 2000). Because of this, insurers cannot easily diversify their risks across space and, in the absence of reinsurance, would have to hold large reserves in the event of a large crop loss. As a result, a higher premium loading would be necessary to cover the insurer’s opportunity cost of capital (Appel, Lord,
and Harrington, 1999). In practice, however, insurance companies can diversify their risks through the use of reinsurance. Crop liabilities, while large, are small relative to the size of the global reinsurance market. Nonetheless, reinsurance comes at some cost to the insurance company, and will be reflected in higher premium costs for producers.

The problems of adverse selection, moral hazard, and correlated risks are certainly not unique to crop insurance. Other lines of insurance face similar problems, yet private markets exist. The costs of addressing these problems for crop insurance are possibly high enough to make the costs of crop insurance too high for most producers to support a viable market, except perhaps in limited markets and regions. Crop insurance would likely be unaffordable for most producers in high-risk areas.

This potential disparity in availability of private insurance between regions and crops is sometimes cited as a reason for government intervention (U.S. GAO, 1980; Appel, Lord, and Harrington, 1999), but here again, crop insurance is not unique. Many risk management tools used by farmers are available only in certain regions. For example, cash forward contracting is widely available for corn and soybean producers in the Midwest, although the same is not necessarily true for producers in regions where basis risk is high. But there is little impetus for government intervention in those markets.

While the conclusions drawn from the above studies would argue that the case for government intervention in crop insurance markets is weak on economic efficiency and equity grounds, Congress has come to a different conclusion. For the past 70 years, Congress has provided assistance to farmers and ranchers for crop and livestock losses (Dyson, 1988). The debate over the past 70 years has focused not on whether Congress should provide assistance, but rather on the form such assistance should take.

**Crop Insurance and Federal Disaster Assistance Policy**

Prior to the 1930s, there was little federal role in providing disaster assistance to farmers and ranchers. In 1886, Congress appropriated $10,000 for the Department of Agriculture to purchase seed for drought-stricken farmers in Texas, but President Grover Cleveland vetoed the act with the message, “Federal aid in such cases encourages the expectation of paternal care on the part of government and weakens the sturdiness of our national character” (Porter, 1988).

With the New Deal legislation in the 1930s, this sentiment changed considerably as Congress and the Roosevelt Administration came to the aid of Dust Bowl farmers. Since the 1930s, federal disaster assistance to farmers has been provided through three programs: (a) crop insurance, (b) emergency loans, and (c) direct disaster payments.

Federal crop insurance was first authorized in Title V of the Agricultural Adjustment Act of 1938 (Benedict, 1953). The program was offered on a pilot basis and initially covered wheat only. In 1939, about 165,000 wheat policies were issued on approximately 7 million acres in 31 states (Rowe and Smith, 1940). As first envisioned as part of Secretary Wallace’s concept of an “ever-normal granary,” crop insurance premiums and indemnities were to be made in-kind, but by 1940, these payments were largely made in cash. Premiums were established to equal indemnities over a period of years, although the government absorbed all delivery and operating costs.

For its first 40 years, the Federal Crop Insurance Program was run as a pilot program, offered for a limited number of crops and in a limited number of counties. County crop programs were often withdrawn if heavy losses were experienced, and coverage levels were adjusted to limit loss exposure. By 1980, only about half of the
nation’s counties and 26 crops were eligible for insurance coverage (Chite, 1988).

Established in 1949, the Farmers Home Administration’s (FmHA) emergency loan program provided emergency loans at subsidized interest rates to eligible producers who had sustained actual losses as a result of natural disasters. In the mid-1970s, the program was expanded to include loans for purposes other than actual losses, such as expanding farm operations. By 1980, the costs of the FmHA emergency loan program exceeded $245 million (U.S. GAO, 1989).

The disaster payments program was authorized by the Agriculture and Consumer Protection Act of 1973 and the Rice Production Act of 1975. The program paid producers of program crops (corn, barley, oats, sorghum, wheat, cotton, and rice) who had been prevented from planting a crop or who experienced lower yields because of natural disasters.

Producers received payments for crop losses in excess of one-third of their program yields. Payment rates were equal to the higher of the deficiency payment rate or one-third of the target price. The program offered essentially free insurance to those producers who complied with production adjustment requirements of the price and income support programs.

Effective coverage levels were increased in the Food and Agriculture Act of 1977. Under the 1977 Act, wheat and feed grain producers received yield loss disaster payments if their yields fell below 60% of the farm program yield. Payment rates were set equal to 50% of the target price. Rice and cotton producers received payments when yields fell below 75% of their program yield, but their payment rate was set equal to only one-third of the target price (Johnson, 1980).

Between 1974 and 1980, the government paid an average of $436 million per year in disaster payments (Chite, 1988). The disaster program was popular with program crop producers because it provided disaster protection with no premium costs and coverage in high-risk areas where crop insurance was not available (Gardner and Kramer, 1986).

However, by the late 1970s, the program had come under heavy criticism for its cost and for encouraging production in high-risk areas. Critics maintained that the disaster program encouraged moral hazard and that the prevented planting provisions provided incentives to expand production in arid areas for the sole purpose of collecting payments (Miller and Walter, 1977).

In 1978, the Carter Administration proposed replacing the disaster payments program with a greatly expanded crop insurance program. Two years later, Congress passed the Federal Crop Insurance Act of 1980.

The 1980 Act made crop insurance the primary form of disaster protection. Disaster assistance remained available only for producers of program crops in counties where crop insurance was not available. Producers could purchase yield coverage at 50%, 65%, and 75% of their normal yields.

To encourage participation, crop insurance premiums were subsidized 30% for 50% and 65% coverage. Producers who insured at 75% received the same dollar subsidy as for 65% coverage. Crop insurance coverage for program crops was rapidly expanded to all counties where program crops were grown and to major producing areas for many other crops.

Proponents of crop insurance recognized that high participation in the program was key to eliminating disaster assistance. As Secretary Bergland argued when testifying before the Senate Committee on Agriculture, Nutrition, and Forestry in 1978:
If less than 60 to 70 percent of the farmers are protected, it is likely that a sense of sympathy will prompt the system to provide protection for those who did not participate. Reaching the target level of participation would require both a well developed program and the termination of other programs that would provide protection and thereby compete with the new system (quoted in Wright and Hewitt, 1994, p. 101).

When the 1980 Act was passed, Congress envisioned a participation rate approaching 50% of eligible acres by the end of the decade (Chite, 1988).

Despite the premium subsidies and expanded coverage, participation in the program grew slowly during the 1980s. By 1986, fewer than 56 million acres were insured, almost double the 1980 level, but only 20% of eligible acres (refer to Table 1 for an overview of the program for the years 1981-2001). A drought in the Southeast prompted Congress to pass supplemental disaster payment legislation (PL 99-500 and PL 99-591), which applied only to crops of that year. Producers who were unable to plant their crops or who had low yields could apply for disaster payments. Unlike the disaster payments program of the 1970s, which had been limited to program crops, the 1986 disaster legislation opened payments to producers of all crops. The 1986 program cost $634 million.

In 1988, a major drought struck the Midwest. Crop insurance participation had grown to only 25% of eligible acreage, and was even lower still in many of the states adversely affected by the drought. For example, less than 13% of eligible corn acreage and 10% of eligible soybean acreage was insured in Illinois and Indiana in 1988 (Chite, 1988).

In response to the drought, Congress again passed disaster legislation. Under the Disaster Assistance Act of 1988, about $3.5 billion was provided to producers who suffered crop losses. Widespread crop losses in the Southern Plains prompted Congress to pass disaster legislation in 1989 as well, which totaled almost $1.5 billion.

To promote crop insurance, Congress required those who received disaster payments in 1988 and 1989 to purchase crop insurance in the following year. However, this requirement could be waived for a broad number of reasons. In the 1989 program, producers who had purchased crop insurance received higher coverage under the disaster program than those who had not purchased insurance (65% of yields compared with 60%). Participation grew to 40% of eligible area in 1990 and 1991, but fell back again in 1992.

With the large expenses for disaster aid, coupled with a perceived failure of the crop insurance program, debate between disaster assistance and crop insurance began anew. In 1989, the U.S. General Accounting Office (GAO) examined disaster payments, crop insurance, and emergency loans, and concluded that crop insurance was the preferable form of providing protection because it was less likely to encourage moral hazard and encourage production on marginal lands. At the same time, the GAO acknowledged the problems associated with the crop insurance program, including poor actuarial performance and low participation (U.S. GAO, 1989).

In late 1988, Congress enacted the Federal Crop Insurance Commission Act of 1988 (Chite, 1989). The Act authorized the formation of a 25-member Commission to identify the major problems with the crop insurance program and to make recommendations for “such changes as needed to improve the program so as to lessen, if not eliminate, the need for additional disaster payment programs ...” (P.L. 100-546).

The Commission’s report was released in July 1989, and included both administrative recommendations and proposed legislative changes to improve
<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Policies (000s)</th>
<th>No. of Acres (mil.)</th>
<th>Participation Rate a</th>
<th>Total Premium ($ mil.)</th>
<th>Producer Premium ($ mil.)</th>
<th>Liability ($ mil.)</th>
<th>Indemnity ($ mil.)</th>
<th>Loss Ratio (total)</th>
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*Participation rate calculated as acres insured as percent of eligible acres. For 1995–2001, the first number represents buy-up enrollment, and the second number represents buy-up plus catastrophic risk protection (CAT).
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participation rates. The Commission proposed that subsidy levels for 75% coverage be increased from 13% to 30%, and additional subsidies for 65% coverage be temporarily increased from 30% to 50%. For areas where participation was low, the Commission recommended coverage levels be increased to 80% of yield. The Commission contended that higher coverage levels and greater premium subsidies would increase participation and hence greatly lessen, if not preclude, the need for supplemental disaster assistance.

Congress and the Bush Administration rejected these recommendations as too costly. In its 1990 farm bill and fiscal year (FY) 1991 budget proposals, the Bush Administration proposed eliminating the Federal Crop Insurance Program altogether and replacing it with a standing disaster program which would be triggered by area losses (Gardner, 1994). However, the proposal received little interest in Congress. Likewise, other crop insurance reform bills fared poorly. Congressman Glenn English proposed offering producers free 50% yield coverage, but his proposal was rejected as too costly. In the end, the 1990 farm bill included a number of minor changes to the crop insurance program, but no major reforms.

There was no disaster legislation in 1990, but supplemental appropriation legislation enacted in November 1991 authorized a total of $995 million for crop losses in either 1990 or 1991. Because claims exceeded funding, a factor of 50% was used to prorate payments. The supplemental appropriation also authorized $775 million for crop losses in any one of the three years 1990, 1991, or 1992, for which producers had not already requested assistance. As reported by the GAO, of the payments that went to producers growing insurable crops, about half went to those who had not purchased insurance (U.S. GAO, 1994).

During the spring of 1993, floods throughout most of the Midwest caused extensive crop damage. In response, Congress enacted legislation that provided $2.5 billion in disaster payments in FY 1994. Pressure mounted again for crop insurance reform.

In August 1993, Secretary Espy convened a forum to discuss possible changes to the crop insurance program, and in its FY 1995 budget, the Clinton Administration proposed additional subsidies to increase participation. During previous years, such proposals were rejected because of the tight budget constraints on agricultural spending.

The Clinton Administration proposed the budget baseline be increased to reflect the reality that disaster payments had been provided through supplemental appropriations for every crop year since 1988. The Senate Budget Committee agreed. The FY 1995 budget baseline, in the absence of crop insurance reform, assumed disaster payments averaging $1 billion per year would continue for the 1994 and subsequent crops. With an additional $1 billion to fund reforms, Congress debated and passed the Crop Insurance Reform Act of 1994.

Under the 1994 Act, producers of insurable crops were eligible to receive a basic level of coverage, catastrophic risk protection (CAT), which initially covered 50% of a producer’s approved yield at 60% of the expected market price. Producers who elected coverage levels of at least 65% of the approved yield at 100% of the expected market price were eligible for a subsidy equal to the premium rate for a policy guaranteeing 50% of the approved yield at 75% of the expected market price.

CAT coverage was required for producers who participated in the commodity price support and production adjustment programs, farm credit, or certain other farm programs (so-called linkage). While the premium cost of CAT coverage was fully subsidized by the government,
producers were required to pay a sign-up fee equal to $50 per crop per county.

At the time of enactment, about 80% of the eligible acreage was expected to enroll in the program (USDA, 1995). While most of the initial increase in participation was expected to be at the CAT level, more purchases of higher coverage levels were anticipated as producers became familiar with the program and realized that the government intended to rely on crop insurance as a substitute for the ad hoc assistance provided for free in the past.

A record 220 million acres were enrolled in the program in 1995 (Table 1), over 80% of eligible acres, with over half of these at the CAT level. More than 105 million acres were enrolled at the buy-up coverage levels, also a record high. The CAT program proved unpopular among many producers who believed the value of the CAT coverage was not worth the nominal administrative fee. As a result, Congress modified the linkage requirement in the Federal Agriculture Improvement and Reform Act of 1996. For the 1996 and subsequent crop years, producers could forego CAT coverage by waiving their eligibility for any other emergency crop loss assistance.

Participation in the CAT program dropped sharply. In 1996, there were 87 million acres enrolled in CAT coverage, a drop of almost 25%. By 1998, acreage enrolled in CAT had fallen to less than 60 million acres, a decline of 49% from 1995. Acres insured at the buy-up levels increased to 120 million acres, but not enough to offset the decline in CAT acres.

But the dam burst again in 1998, following a wet spring in California and a drought in Texas and much of the Southeast. In late 1997, prices for many field crops declined significantly, causing a drop in farm income for many producers. Crop insurance was criticized by many as providing an inadequate safety net (Chite, 2000).

Supplemental legislation enacted in late 1998 provided $5.8 billion in emergency spending for producer assistance, including $2.4 billion for emergency financial assistance to farmers who suffered crop losses due to natural disasters in 1998 or who suffered crop losses in three of the previous five years. Despite signing waivers indicating they would be ineligible for disaster payments, producers who had declined insurance coverage were made eligible for disaster assistance.

Of the total disaster payments, $400 million was provided as incentive payments to farmers who purchased buy-up coverage for their 1999 crops. The subsidy reduced farmer premiums by an estimated 30%. Reduced costs for buy-up insurance led to widespread increases in participation in 1999. Buy-up acreage increased in nearly every state, and climbed nationwide from 120 million acres in 1998 to 143 million in 1999 (Dismukes and Glauber, 2000). For the first time since the 1980 Act, participation in higher coverage levels exceeded 50%. Almost three-quarters of all eligible acreage was enrolled in either CAT or buy-up coverage.

The 1994 Act was temporarily successful in preventing disaster legislation. No disaster aid was provided for the 1994–97 crops. Market prices were high and crop conditions generally favorable over the period, with the exception of quality problems experienced by Northern Plains wheat producers and a drought in 1995 affecting Southern Plains winter wheat producers.

The increased participation did not stop Congress from passing supplemental disaster legislation again in 1999. The Agriculture Appropriations Act of October 22, 1999 included $1.2 billion for disaster relief and $400 million for additional crop insurance subsidies for the 2000 crop year. One month later, Congress passed the Consolidated Appropriations Act, adding another $576 million for assistance to repair and replace crops, buildings, and land damaged by Hurricane Floyd.
After spending nearly $4 billion in disaster assistance over the previous two years, Congress and the Administration again decided the crop insurance program was in need of further reform and larger subsidies. CAT policies were criticized as providing inadequate coverage. By 1999, the maximum CAT indemnity that would be paid out in the event of a total crop failure was only 28% of the producer’s expected revenue. Because the premium subsidies were fixed dollar amounts, the subsidy share of total premiums declined as coverage increased beyond 65%.

For example, under the 1994 Act, premiums for 65% coverage were subsidized at 42%; for 75% coverage, 24%; and for 85% coverage, 13%. Because the increases in out-of-pocket costs for higher coverage levels were so large, most producers who purchased buy-up coverage chose 65% coverage.

In 1997, less than 10% of the acres enrolled in buy-up coverage were enrolled at coverage levels higher than 65%. With the higher subsidies following the 1998 disaster legislation, producers increased coverage levels. In 1999, almost 25% of the area was at coverage levels higher than 65%. To encourage participation at higher levels of coverage, several reform proposals emerged in the Senate and House which would continue the increased subsidies at higher coverage levels that had been made available by the 1998 and 1999 disaster legislation. Some critics voiced concern over new crop insurance spending, since the 1994 reforms had not prevented ad hoc disaster assistance (Chite, 2000).

Despite these concerns, Congress adopted in its FY 2000 budget resolution a reserve fund of $6 billion over a multi-year period to fund the added costs of reforms. The FY 2001 budget resolution increased the amount available for new crop insurance spending from $6 billion over four years to $8.2 billion over five years. The Agricultural Risk Protection Act was signed by the President on June 20, 2000.

As shown in Table 2, the Agricultural Risk Protection Act increased the size of premium subsidies for most buy-up levels. For example, premium subsidies for 75% coverage increased from 23.5% under the 1994 Act to 55% under the 2000 Act. Similarly, subsidies for 85% coverage rose from 13% to 38%.

In addition to increased subsidy rates, the new legislation authorized a pilot livestock insurance program, allowed producers to improve their yield guarantees despite multi-year losses, and encouraged private-sector development of new types of insurance products.

Largely as a result of increased subsidies, enrollment in the crop insurance program rose from 182 million acres insured in 1998 to almost 212 million in 2001 (Table 1), a 17% increase. Almost 80% of eligible acreage was estimated to be enrolled in the program in 2001. Along with an increase in participation, producers also purchased insurance at higher coverage levels.

For example, the average coverage level among North Dakota wheat producers jumped from 62% in 1998 to almost 70% in 2001. Over 22% of wheat acreage was insured at 75% coverage levels or higher in 2001, compared with less than 2% in 1998. Reflecting the increase in participation and average coverage level, total U.S. crop insurance liability increased by 32% over the same period to $36.7 billion. Premiums increased from $1.9 billion in 1998 to almost $3 billion in 2001 (Table 1), an increase of approximately 58%.

Yet, despite higher participation, it remains problematic whether the additional subsidies will prevent Congress from passing future ad hoc disaster legislation. Four months after Congress passed the Agricultural Risk Protection Act, the FY 2001 Agricultural Appropriations Act provided about $1.7 billion for crop disaster losses during crop year 2000.
Table 2. Premium Subsidy Rates, Multiple-Peril Crop Insurance

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>55%</td>
<td>30.0</td>
<td>46.1</td>
<td>64.0</td>
</tr>
<tr>
<td>65%</td>
<td>30.0</td>
<td>41.7</td>
<td>59.0</td>
</tr>
<tr>
<td>75%</td>
<td>16.9</td>
<td>23.5</td>
<td>55.0</td>
</tr>
<tr>
<td>85%</td>
<td>—</td>
<td>13.0</td>
<td>38.0</td>
</tr>
</tbody>
</table>

Crop losses in Montana and Wyoming in 2001 saw renewed calls for disaster assistance in Congress, despite increased participation in crop insurance programs.

During 1998–2001, producers received over $5.2 billion in ad hoc disaster payments and $9.6 billion in crop insurance indemnity payments. Under the provisions of the supplemental disaster assistance legislation, producers who had purchased crop insurance policies not only were eligible for crop disaster payments, but were indemnified at higher payment rates than producers who had not purchased crop insurance.

While such provisions were intended to reward producers who had purchased insurance, the double indemnity payments introduced perverse incentives through which producers who had insured at higher coverage levels could potentially receive more income by losing the crop than by harvesting it.

Growth of New Products and the Expanding Role of the Private Sector in Product Development

Along with the increased subsidies and subsequent growth in participation that has occurred since 1994, crop insurance has also seen the broadening of policy coverage to include losses based on revenue, and expansion to include horticultural crops, tree crops, aquaculture, and livestock.

In 1993, acres insured under the Actual Production History/Multiple-Peril Crop Insurance (APH/MPCI), the Federal Crop Insurance Corporation’s (FCIC’s) traditional yield insurance product, accounted for almost 100% of area insured. By 2001, APH/MPCI policies accounted for about 52% of total acreage and less than 43% of total liability insured in the program (Table 3).

Group Risk Plan

The first major development of nontraditional insurance products began in 1993, with the introduction of area yield insurance. The concept of area yield insurance was first developed by Halcrow (1949), and more recently has been considered by Miranda (1991) and Mahul (1999).

Under area yield insurance, producers receive indemnity payments based on shortfalls in county yields rather than their individual yields. Because the indemnity is based on county yields, moral hazard and adverse selection problems are largely mitigated. However, the effectiveness of the area yield contract in reducing crop risks is principally related to how well the insured’s yield is correlated with the county yield.

The recent interest in area yield insurance arose in the late 1980s when the concept was touted as a potential alternative to individual-based insurance programs (see, for example, Barnaby and Skees, 1990). The Commission for the Improvement of the Federal Crop Insurance Program...
The Role of the Federal Government in Providing Risk Protection

Table 3. Acres Insured, by Type of Insurance Plan (million acres)

<table>
<thead>
<tr>
<th>Crop Year</th>
<th>APH</th>
<th>CRC</th>
<th>RA</th>
<th>IP</th>
<th>GRP</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>81.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>1.9</td>
<td>83.7</td>
</tr>
<tr>
<td>1994</td>
<td>95.8</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>3.2</td>
<td>99.4</td>
</tr>
<tr>
<td>1995</td>
<td>216.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.5</td>
<td>3.1</td>
<td>220.5</td>
</tr>
<tr>
<td>1996</td>
<td>188.2</td>
<td>11.3</td>
<td>0.0</td>
<td>0.3</td>
<td>1.9</td>
<td>3.1</td>
<td>204.9</td>
</tr>
<tr>
<td>1997</td>
<td>152.1</td>
<td>23.7</td>
<td>1.3</td>
<td>0.4</td>
<td>1.4</td>
<td>3.2</td>
<td>182.2</td>
</tr>
<tr>
<td>1998</td>
<td>149.6</td>
<td>25.2</td>
<td>1.5</td>
<td>0.4</td>
<td>1.8</td>
<td>3.2</td>
<td>181.8</td>
</tr>
<tr>
<td>1999</td>
<td>136.2</td>
<td>49.6</td>
<td>2.1</td>
<td>1.2</td>
<td>4.5</td>
<td>3.4</td>
<td>196.9</td>
</tr>
<tr>
<td>2000</td>
<td>131.5</td>
<td>60.0</td>
<td>3.8</td>
<td>1.5</td>
<td>5.9</td>
<td>3.6</td>
<td>206.3</td>
</tr>
<tr>
<td>2001</td>
<td>110.5</td>
<td>75.6</td>
<td>11.0</td>
<td>2.1</td>
<td>8.9</td>
<td>3.5</td>
<td>211.6</td>
</tr>
</tbody>
</table>


included a discussion of area yield insurance in its final report (Chite, 1989; Skees, Black, and Barnett, 1997).

The first Bush Administration considered replacing individual crop insurance with area yield insurance as a means to lower administrative costs of the program. Congress authorized area yield insurance as a pilot program in the 1990 farm bill, and FCIC began offering an area yield product, the Group Risk Plan (GRP), to soybean producers in 1993.

GRP received a large boost from the Clinton Administration in its FY 1994 budget proposal when the Administration endorsed replacing individual crop insurance with GRP in counties where the loss ratio was greater than 110%. The crop insurance industry opposed the proposal, some likening GRP to “socialism” (Gantz, 1994).

Most critics cited the lack of demand for area yield insurance, but the industry was also concerned that the proposal was a backdoor way of phasing out the private insurance industry. While Congress rejected the proposal, it recommended GRP be expanded “to the maximum extent practicable” (Skees, Black, and Barnett, 1997). In 1994, GRP was expanded to 1,875 county-crop programs for wheat, corn, soybeans, grain sorghum, cotton, barley, forage, and peanuts.

With passage of the Federal Crop Insurance Reform Act, interest in the Group Risk Plan as a policy alternative to individual crop insurance waned. Despite the lower premiums offered under GRP, field crop producers tended to prefer individual-based insurance policies. About 1.9 million acres were insured under the plan by 1996, less than 1% of all acreage insured.

Once GRP was no longer seen as a replacement to individual-based crop insurance, opposition on the part of the crop insurance industry abated. In 1999, a private company introduced an area-based revenue insurance plan, the Group Revenue Insurance Plan (GRIP). GRP remains largely a niche market concentrated among corn and soybean producers in the Midwest—areas where individual crop yields are more highly correlated with area yields.

In recent years, acres insured under GRP have increased significantly, largely due to the expansion of GRP to rangeland. Almost 8.9 million acres were insured under GRP in 2001 (Table 3); of the total,
5.6 million acres were insured in rangeland policies. An additional 724,000 acres were insured under GRIP in 2001.

**Revenue Products**

The Crop Insurance Reform Act of 1994 introduced new pilot authorities under Section 508(h) that enabled private companies to develop crop insurance policies which, if approved by the FCIC Board of Directors, would be eligible for premium subsidies, expense reimbursements, and government reinsurance. Once a new plan was approved for reinsurance, it could be sold by any participating company.

In 1996, the FCIC Board approved Crop Revenue Coverage (CRC), a revenue insurance policy offered by Redland Insurance Company, for sale to corn and soybean growers in Iowa and Nebraska. The policy combined protection against drops in farm revenue (as measured by the producer’s yield and the futures price for that commodity) with a replacement coverage feature indemnifying producers for yield losses at the harvest price if it were greater than the futures price at planting.

In the first year, over 92,000 CRC policies were sold on 11.3 million acres. By 2001, CRC coverage had expanded to include cotton, grain sorghum, rice, and wheat, and was offered in 47 states. Almost 76 million acres were insured in 2001 (Table 3).

A second revenue product, Revenue Assurance (RA), was brought to the FCIC Board of Directors for approval by Farm Bureau Mutual Insurance Company. Unlike CRC, RA did not offer a harvest price option, but guaranteed producers against declines in farm revenue (measured by the crop insurance yield times the futures price at planting times the coverage level). Sales began to Iowa corn and soybean producers in 1997. A Harvest Price Option which indemnified yield losses at the harvest price was added to the policy in 2000. By 2001, RA was available to producers of wheat, corn, grain sorghum, barley, canola, and sunflowers in 16 states. Almost 11 million acres were enrolled in RA in 2001 (Table 3).

A third revenue product, Income Protection (IP), was developed by the USDA’s Risk Management Agency under a mandate of the 1994 Federal Crop Insurance Reform Act to create a pilot cost-of-production plan (Goodwin and Ker, 1998). IP provides producers with an income guarantee based on a futures price and the individual farm yield. Introduced in 1996, IP was piloted initially on a far more limited basis than either CRC or RA. By 2001, 2.1 million acres were enrolled in 15 states (Table 3).

**Other Products**

The Agricultural Risk Protection Act (ARPA) of 2000 gave further impetus to new product development by private companies in a number of areas. Under the 1994 Act, subsidies for revenue insurance were capped at the dollar level of the APH/MPCI policy, even though revenue premiums were 10% to 20% higher than yield policies at the same coverage level. Under ARPA, the new premium subsidies were extended to other crop insurance products at the same level as the yield products.

A major criticism of the private industry was that while the FCIC spent funds developing products with limited appeal [see, for example, Gantz’s (1994) discussion of GRP], private products submitted for Board approval often met long delays as the products went through FCIC review. Congress addressed these concerns by prohibiting the FCIC from conducting research and development for any new policy and by establishing a statutory timetable for product approval. A further impetus for product development was ARPA’s provisions allowing for reimbursements for research and development expenses for companies whose policies are approved by the Board.
The Role of the Federal Government in Providing Risk Protection

Since passage of ARPA, a number of products have been brought by private companies before the FCIC Board for approval, including two price insurance products for hog producers, and nutrient management insurance that would provide income protection for producers who adapt best nutrient management practices.

Rating Concerns

The development of distinct insurance products by private companies has raised questions concerning rating methodologies. In a 1998 study, the U.S. General Accounting Office raised concerns regarding the adequacy of rates of Crop Revenue Coverage, Revenue Assurance, and Income Protection. However, the empirical evidence does not support this view. During the relatively short period in which they have been offered, indemnity payments have been roughly equal to total premium.

Research by the USDA’s Economic Research Service suggests that in those counties where both revenue and yield insurance have been sold, the loss ratio for the most popular product, CRC, has been below the loss ratio for APH/MPCI buy-up coverage (Dismukes and Vandevree, 2001).

Of more serious concern is, with the development of similar private products, unique rating structures may encourage adverse selection among products. For example, the two most popular revenue products, CRC and RA, are sold in many of the same counties. Initially, the products were fairly distinct, but with modifications in contract design they have become much more similar. RA currently offers producers a harvest-time price option similar to CRC; CRC offers coverage on basic and optional units like RA. Yet, premium rates for these products may differ significantly in some counties, particularly at high coverage levels. Barnaby (2002) points to the lower rates for RA as a major factor contributing to a 70% increase in RA policies and a 15% decrease in CRC policies in 2002.

Costs of Crop Insurance

From 1981–2001, the costs of the Federal Crop Insurance Program totaled more than $19.9 billion (Table 4). Total disaster payments were $17.6 billion over the same period. Crop insurance costs have grown proportionately with increased premium subsidies and higher program participation.

Over the period 1990–94, crop insurance costs averaged $711 million per year. The 1994 Act roughly doubled the costs of the program to $1.5 billion, on average, over 1995–99. With passage of the Agricultural Risk Protection Act of 2000, the annual program costs are estimated to double again to $3.1 billion in 2003 (USDA, 2002).

In addition to premium subsidies, the costs of crop insurance include total excess losses (indemnities minus total premium costs, i.e., including premium subsidies) and delivery expenses (reimbursement to the reinsured companies plus net underwriting gains through the Standard Reinsurance Agreement).

During the 1980s, rapid program expansion and widespread droughts in the Midwest led to an annual average of almost $500 million in excess losses. During the 1990s, the actuarial performance of the program improved considerably. Total premiums (including premium subsidies) exceeded total indemnities over the period 1990–99. Delivery expenses accounted for less than 25% of total program costs during the 1980s. Companies received cost reimbursements for delivering crop insurance but shared in very little of the underwriting risks with the government.

At the prodding of Congress and GAO, the USDA increased the risk sharing in the 1992 Standard Reinsurance Agreement (SRA). Favorable actuarial performance led to large underwriting gains through the SRA.
Table 4. Federal Costs for the Crop Insurance Program and Disaster Programs, 1981–2001 (million dollars)

<table>
<thead>
<tr>
<th>Crop Year</th>
<th>Premium Subsidy</th>
<th>Excess Losses a</th>
<th>Delivery Costs b</th>
<th>Underwriting Gains c</th>
<th>Total Crop Insurance Costs</th>
<th>Total Crop Disaster Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>47.0</td>
<td>30.5</td>
<td>4.2</td>
<td>0.3</td>
<td>82.0</td>
<td>1,030</td>
</tr>
<tr>
<td>1982</td>
<td>90.7</td>
<td>133.5</td>
<td>23.7</td>
<td>2.6</td>
<td>250.5</td>
<td>306</td>
</tr>
<tr>
<td>1983</td>
<td>64.0</td>
<td>296.8</td>
<td>34.5</td>
<td>(2.4)</td>
<td>392.9</td>
<td>115</td>
</tr>
<tr>
<td>1984</td>
<td>98.6</td>
<td>203.4</td>
<td>84.5</td>
<td>(0.4)</td>
<td>386.1</td>
<td>1</td>
</tr>
<tr>
<td>1985</td>
<td>100.3</td>
<td>242.9</td>
<td>100.8</td>
<td>3.4</td>
<td>447.4</td>
<td>0</td>
</tr>
<tr>
<td>1986</td>
<td>88.4</td>
<td>234.7</td>
<td>102.6</td>
<td>8.0</td>
<td>433.7</td>
<td>0</td>
</tr>
<tr>
<td>1987</td>
<td>87.9</td>
<td>3.4</td>
<td>105.6</td>
<td>16.7</td>
<td>213.6</td>
<td>556</td>
</tr>
<tr>
<td>1988</td>
<td>108.3</td>
<td>630.9</td>
<td>137.5</td>
<td>(8.0)</td>
<td>868.7</td>
<td>16</td>
</tr>
<tr>
<td>1989</td>
<td>206.6</td>
<td>402.9</td>
<td>262.4</td>
<td>28.1</td>
<td>900.0</td>
<td>3,408</td>
</tr>
<tr>
<td>1990</td>
<td>215.6</td>
<td>133.6</td>
<td>268.2</td>
<td>52.2</td>
<td>669.6</td>
<td>1,461</td>
</tr>
<tr>
<td>1991</td>
<td>190.3</td>
<td>216.4</td>
<td>234.7</td>
<td>42.0</td>
<td>683.4</td>
<td>9</td>
</tr>
<tr>
<td>1992</td>
<td>197.0</td>
<td>158.0</td>
<td>240.0</td>
<td>22.6</td>
<td>617.6</td>
<td>959</td>
</tr>
<tr>
<td>1993</td>
<td>200.3</td>
<td>898.0</td>
<td>242.7</td>
<td>(82.5)</td>
<td>1,258.5</td>
<td>872</td>
</tr>
<tr>
<td>1994</td>
<td>255.0</td>
<td>(349.6)</td>
<td>281.6</td>
<td>104.4</td>
<td>291.4</td>
<td>2,461</td>
</tr>
<tr>
<td>1995</td>
<td>889.6</td>
<td>29.7</td>
<td>377.5</td>
<td>130.9</td>
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<td>577</td>
</tr>
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<td>1996</td>
<td>983.6</td>
<td>(321.7)</td>
<td>468.2</td>
<td>245.8</td>
<td>1,375.9</td>
<td>14</td>
</tr>
<tr>
<td>1997</td>
<td>902.8</td>
<td>(785.8)</td>
<td>437.8</td>
<td>352.5</td>
<td>911.3</td>
<td>2</td>
</tr>
<tr>
<td>1998</td>
<td>946.3</td>
<td>(198.4)</td>
<td>442.9</td>
<td>279.5</td>
<td>1,470.3</td>
<td>(2)</td>
</tr>
<tr>
<td>1999</td>
<td>1,391.6</td>
<td>122.2</td>
<td>499.4</td>
<td>271.8</td>
<td>2,285.0</td>
<td>1,913</td>
</tr>
<tr>
<td>2000</td>
<td>1,344.2</td>
<td>48.1</td>
<td>550.4</td>
<td>285.2</td>
<td>2,227.9</td>
<td>1,251</td>
</tr>
<tr>
<td>2001</td>
<td>1,770.2</td>
<td>(55.8)</td>
<td>642.3</td>
<td>368.0</td>
<td>2,724.7</td>
<td>1,848</td>
</tr>
</tbody>
</table>


Note: Parentheses denote cost savings.

a Excess losses equal indemnities minus total premium (including premium subsidies).
b Delivery costs include expense reimbursements to reinsured companies only.
c Net gains (losses) paid to reinsured companies under the Standard Reinsurance Agreement.
d Total crop disaster costs are computed based on fiscal year.

By the late 1990s, companies were earning on average over $250 million annually in underwriting gains. These gains plus expense reimbursements averaged almost 50% of total program costs from 1990-99.

Because the demand for crop insurance is generally inelastic with respect to premium (Goodwin, 1993; Knight and Coble, 1997), the marginal per acre costs of enrolling additional acres into the program are high. Consider the current market for crop insurance. In 1999, roughly 143 million acres out of 270 million eligible acres were enrolled at buy-up levels of coverage, for a participation rate of about 53%. The average premium for buy-up acres in 1999 was $14.01 per acre, with an average producer payment of $6.43 per acre and an average premium subsidy of $7.58.

To increase the buy-up participation rate to 65%, 31.5 million additional acres would need to be enrolled, an increase of 22%. Assuming a demand elasticity of ! 0.6, the premium paid by producers would have to decline by roughly 37%, to $4.08 per acre. The per acre subsidy would increase to $9.93 per acre, an increase of $2.35 per acre. However, since
the additional premium subsidies would apply to all buy-up acres, total additional premium subsidy costs would increase by $650 million ($2.35 \times 143.4 \text{ million acres} + 9.93 \times 31.5 \text{ million acres}). The marginal cost per additional acre would be $20.65.

Marginal cost would increase the more inelastic the demand or the higher the target level of participation. For example, assuming a demand elasticity of 1.0 and assuming an increase in buy-up participation to 75%, additional program costs would likely exceed $2.2 billion, with a marginal per acre cost of $37.74. While some of these costs would be offset by decreases in CAT participation, delivery costs (expense reimbursements and underwriting gains) would increase the marginal costs to $45 per acre.

The Effects of Crop Insurance on Production

Proponents of federal crop insurance argued crop insurance was a less costly means of providing crop loss protection than disaster assistance. As has been shown in previous sections, however, it is clear that crop insurance has been costly—both from the standpoint of the high marginal costs to encourage additional participation in the program, and because, despite large subsidies and participation rates above 50%, Congress has continued to pass supplemental disaster assistance.

However, the growth in the level of crop insurance subsidies raises additional concerns. At time of passage of the Federal Crop Insurance Act of 1980, proponents of crop insurance asserted crop insurance was less likely than disaster assistance to encourage moral hazard problems and to encourage production of riskier crops on marginal lands—criticisms of the disaster payment program of the 1970s.

Per acre crop insurance premium subsidies have grown from an average $2 per acre in the mid-1980s to over $8 per acre in 2001. At the same time, deductibles have been lowered. In 1999, the USDA introduced 85% yield coverage for many crops and regions. Under the 2000 Act, policies at 85% yield or revenue coverage receive a 38% premium subsidy. The sharp increase in total subsidy costs has raised concerns that crop insurance may be distorting production decisions.

Over the past few years, there has been some anecdotal evidence to suggest the crop insurance program has increased production of certain crops. For example, in 1999, North Dakota durum wheat producers were offered a revenue insurance policy which was based on a biased formula for establishing the revenue guarantee. As a result, sales of the contract increased significantly, and it is estimated that durum wheat area increased by as much as 1 million acres (25%) over what would have been planted in the absence of the policy (Glauber, 1999).

After the 1999 crop year, watermelon producers asked the USDA to terminate a pilot insurance program for watermelons after a large increase in watermelon area (USDA/RMA, 1999). Concerns about the effects of revenue insurance on plantings prompted the potato growers to lobby successfully to have potatoes excluded from revenue coverage under the 2000 Act (Thompson, 2000). Cotton growers have expressed concerns that the added lands provisions of the crop insurance program combined with increased subsidies have caused cotton producers in the Mid-South to increase 2001 crop cotton plantings (Robinson, 2001).

Soule, Nimon, and Mullarkey (2000) provide a review of the empirical literature on the effects of crop insurance on production. For a risk-averse producer, the literature suggests insurance causes lower use of risk-reducing production inputs. Although this result is supported in a number of studies, there is not a consensus, as results depend on the
Table 5. Change in Corn Market Price Due to Subsidized Crop Insurance ($/bushel)

<table>
<thead>
<tr>
<th>Assumed Production Increase (%)</th>
<th>Source (description)</th>
<th>Assumed Elasticity of Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.28</td>
<td>Orden, 2001 [low end]</td>
<td>0.02</td>
</tr>
<tr>
<td>2.20</td>
<td>Goodwin and Vandeveer, 2000 [low end]</td>
<td>0.14</td>
</tr>
<tr>
<td>3.30</td>
<td>Goodwin and Vandeveer, 2000 [high end]</td>
<td>0.22</td>
</tr>
<tr>
<td>4.10</td>
<td>Orden, 2001 [high end]</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Note: The change in market price is calculated using the 2001/02 average corn farm price of $1.97/bushel.

extent to which farmers are risk averse and whether inputs are risk reducing. However, many inputs known to reduce risk, such as pesticides and fertilizer, are probably output increasing over a wide range of likely conditions. Thus, by reducing such inputs, crop insurance would usually be output reducing. Many of the studies from the literature examining input use are theoretical, or, if empirical, apply to narrow geographic regions and specific crops.

Other analyses, mostly empirical, have examined the effects of insurance on the mix and level of crops planted (see Wu, 1999; Young, Schenpf, Skees, and Lin, 1999; Keeton, Skees, and Long, 1999; Goodwin and Vandeveer, 2000). The general conclusion is that more, higher risk acreage is brought into production, although studies differ on the magnitude of the expansion. Orden (2001) summarized several studies, concluding the effect on overall crop production of crop insurance subsidies during 1998–2000 was to increase output by 0.28% to 4.1%.

In broad terms, the upshot of these and a number of other studies is that seeking to determine whether to use crop insurance premium subsidies as a key part of the farm safety net is much like evaluating price and income support subsidies that are tied to production. Insurance subsidies distort farmer planting decisions, causing more production of the subsidized crops. The result is a reduction in market prices which offsets the income benefits of insurance subsidies, reducing the efficiency of insurance subsidies as a means of supporting income.

The extent to which subsidy premiums are offset by lower market prices is an empirical issue. Table 5 provides a general indication of the price effects derived using Orden’s (2001) range of the general crop production effects due to insurance and the acreage effects of Goodwin and Vandeveer (2000) under their scenario of a 50% decrease in premium cost for corn and soybeans and a consequent increase in the loss ratio. Two alternative price elasticities of demand are used for corn, 0.3 and 0.6. The market price declines range from 1¢ to 27¢ per bushel, depending on elasticity assumptions. This range is roughly similar to an example reported by Babcock and Hart (2000) who found price changes due to elimination of crop insurance subsidies for corn ranging from $0.02 to $0.16 per bushel.

For the 1999 corn crop for participants in crop insurance, the premium subsidy for all types of policies averaged $0.05 per bushel (assuming a yield of 125 bushels per acre on insured acres). This was 54% of the total premium. Hence, one can conclude that the price effect may well fully offset the income benefit of the premium subsidy for insured producers. In addition, 77.4 million acres of corn were planted in 1999, but only 52.4 million acres were insured. Therefore, production on 25 million acres likely faced a reduced price due to insurance without receiving any benefit of premium subsidies.
Conclusions

More than 20 years after passage of the Federal Crop Insurance Act of 1980, the debate continues over whether crop insurance will ever become the sole means of providing crop loss protection to U.S. producers. Participation in the crop insurance program has grown to a point where more than three-quarters of eligible acres are enrolled in the program. In addition, more than half of the acreage is insured at higher coverage levels greater than 65% (Davidson, 2002).

Yet, despite the steady increase in participation, Congress continues to pass supplemental disaster legislation to aid producers suffering from crop losses. Moreover, the marginal costs of enrolling more acreage in the program are high and increasing, suggesting the costs of increasing buy-up participation rates from 50% to 75% will be far higher than increasing participation from 25% to 50%.

As subsidies increase and deductibles are lowered, the effects of crop insurance on acreage planting decisions become a greater concern. During the debates in the late 1970s and 1980s, proponents of crop insurance, such as the GAO, argued crop insurance was preferable to disaster assistance because disaster assistance provided essentially free coverage to producers.

It is an empirical issue whether a fully subsidized policy at 60% yield coverage causes more or fewer distortions than a partially subsidized policy which provides higher levels of protection. There is concern on the part of some farmers that crop insurance subsidies are too high and are resulting in increased acreage and lower crop prices. Whether these concerns will result in future legislation to reverse the level of these subsidies seems unlikely; nonetheless, the effects of these subsidies on acreage and program costs will likely draw increased scrutiny from Congress and farmers.

References


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Skees, J. R., P. Hazell, and M. Miranda. “New Approaches to Crop Yield Insurance in Developing Countries.”


