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PUBLIC POLICY FOR CATASTROPHIC YIELD RISK:

An Alternative Crop Insurance Program

by G. A. Barnaby and Jerry Skees



As Congress debates the 1990 Farm Bill, one area that will receive continued attention is disaster assistance and crop insurance for U.S. farmers. In January of this year, Secretary of Agriculture Clayton Yeutter went so far as to recommend elimination of the Federal Crop Insurance Corporation and replacing it with a standing disaster assistance program.

The issues are not new. In the late 1970s, the debate focused on the use of direct disaster assistance versus federally subsidized crop insurance. At that time, Congress was discouraged with the performance of the direct, fully subsidized disaster assistance provided during the 1970s. The program was judged to be both excessively costly and inefficient in that it had encouraged production of crops in certain regions that were not suited to production of those crops and on land only marginally suited to crop production.

The debate of the 1970s resulted in passage of the Federal Crop Insurance Act of 1980. This legislation made significant changes in what had been an experimental program since 1938. Among the most significant changes was a premium subsidy of up to 30 percent and a transition to the private sector for delivery of Federally subsidized crop insurance. Congress envisioned that changes made in conjunction with the 1980 legislation would lead to participation rates in excess of 50 percent of the eligible acres. Under these

➤ U.S. farmers have for years relied on the financial support of both federally funded crop insurance and direct disaster assistance. Limits on availability of federal funds dictate that programs less costly to the government than disaster programs but more effective than past crop insurance programs be devised. An insurance program that pays according to losses in areas such as a county is one alternative. With such a plan farmers would pay less for protection. Its administrative cost would be less than typical crop insurance programs. Quality county yield data would be required.

circumstances, it was believed that farmers would be protected from natural disaster and there would be no need to provide direct disaster assistance.

During the 1980s, the United States experienced several years with substantial crop disasters. Participation in Federal crop insurance

did not reach the anticipated 50 percent levels by the 1988 disaster year as only 25 percent of the eligible crop acres were insured. Congress provided ad hoc disaster assistance in 1983, 1986, 1988, and 1989. This was done despite rhetoric from both the Congress and the Administration that those who could purchase crop insurance would not be provided disaster assistance.

Once again the debate has centered upon the question of Federal crop insurance versus direct disaster assistance. Neither the Congress nor the Administration are satisfied with the current approach of providing both Federally subsidized crop insurance and ad hoc disaster assistance.

The Case for Crop Insurance

In principle, a strong case can be made for the use of Federally subsidized crop insurance as the appropriate disaster program.

Federally subsidized crop insurance is appealing because it provides for more efficient allocation of society's resources than does free disaster assistance. Farmers pay for risk protection in a fashion that is related to the risk they face. Thus, to the extent that the subsidy is not too high, farmers in high risk areas will be reluctant to produce crops.

Crop insurance has the potential to be more equitable in that

G. A. Barnaby is Associate Professor, Extension Agricultural Economist, Kansas State University and Jerry Skees is Professor, Agricultural Economics, University of Kentucky.

farmers pay premiums based on the risk they face. Depending on the structure of the subsidy, the program should be less costly than a disaster assistance program. Finally, crop insurance can provide both disaster assistance and risk management assistance. With crop insurance, the individual farmer can receive protection even when the county or region has not been declared a disaster area. As U.S. agriculture decouples from price and income support programs and expands into international markets, risk management at the farm level will be increasingly important.

Federally funded crop insurance is also more appealing when considering the inherent flaws in direct disaster assistance. Providing free disaster assistance encourages farming practices that will

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ultimately increase crop losses. In particular, free disaster assistance encourages production in risky regions that may have marginal soils. Society's resources are allocated inefficiently when disaster assistance is free. Fully subsidized disaster assistance is inequitable in that some farmers in certain regions receive more benefits than others. Ad hoc disaster assistance is even more troublesome when considering that regions with sufficient political power must suffer a disaster before assistance is provided. Finally, free disaster assistance can be costly.

Problems With Crop Insurance

Despite the advantage of crop insurance relative to disaster insurance, the crop insurance program of the past few years is fraught with problems. Participation levels have been low for some very sound reasons. In addition to the detailed problems associated with program design, there are some fundamental inconsistencies between crop insurance and other government programs that must be addressed.

Current crop insurance payments are based on individual losses. To the extent that the insurance company offers yield coverage that is consistent with the actual potential of the individual farm, such a program can be effective. When individual yields are not accurately assessed, then coverage offered can be too high for some and too low for others. Under such conditions, farmers (who are better assessors of their yield potential than the insurance company) can select to their advantage (adverse selection). In other words, farmers who recognize that they are being offered a yield that is higher than their expected yield will buy crop insurance and those who believe that the offer is less than their yield potential will choose not to buy the insurance. Over time, such a program is doomed. Crop losses will be higher than the insurance company anticipated and these losses will need to be reflected in increased rates. Such rate increases will drive more farmers out of the crop insurance market.

In addition to the adverse selection problem, farmers also tend to change their farming practices once they purchase individualized coverage. These changes increase the likelihood that they will suffer a loss. Such practices are known as moral hazard. As with adverse selection, these practices will result in larger losses than anticipated and, ultimately, higher insurance rates.

The combined effects of moral hazard and adverse selection are, in large part, responsible for the losses suffered by the FCIC during the 1980s. From 1981 through 1988, losses averaged over \$200 million per year.

Finally, individual protection requires an elaborate delivery system to make assessments regarding the potential of each individual and to assess losses when a farmer has a claim. In fact, the administrative and delivery cost for the current crop insurance program exceeds the direct premium subsidy. These costs are also subsidized. From 1981-88 USDA premium subsidies averaged \$86 million annually. The administrative and delivery costs averaged \$162 million each year. Excess losses, the amount that indemnities exceeded premiums, averaged \$216 million. These amounts relate to a program involving total premiums (producer paid and subsidized) of \$430 million.

The advantage of an individualized coverage is clear. Farmers will receive payments for losses that actually occur—presumably when they need them the most.

Improving Crop Insurance

An alternative to the individual offer would be to pay farmers when yields within an area drop below some specified level. Professor Harold Halcrow developed one version of this idea in his Ph. D. dissertation in 1947. Under such a plan, farmers would receive payments whenever the area yield is less than some proportion of the average. One model proposes to allow farmers to purchase a dollar liability per acre and then to collect a percentage of that liability that matches the percentage of a yield shortfall in the area.

Farmers could select any dollar liability they desired. The FCIC would place an upper limit on this selection. There could also be a system to underwrite individual farmers when there is some question about the liability selected. However, under this plan, the underwriting is not a serious problem because obtaining accurate yield levels for individual farmers is no longer an issue. In other words, farmers could only purchase a policy for actual planted acres.

Farmers would be paid based on the percentage yield loss within a county. That percentage yield loss would be multiplied by the liability selected by the individual farmer to calculate an indemnity payment. The FCIC would develop trend adjusted yields for each county using historical yield data from the National Agricultural Statistical Service (NASS). This analysis would use as many years of data as were available. Any deductible could be selected by the producer. If a zero deductible were selected, payments would be made anytime the actual county yield was lower than the expected county yield. In contrast, a ten percent deductible would mean payments would only be made when the actual yield

The crop insurance program of the past few years is fraught with problems.

falls below ninety percent of the expected yield for the county.

Premium rates would be developed based on the historical county yields. As with the current structure, rates would be tied to the deductible chosen (i.e., they would be higher for a zero deductible than for a twenty-five percent deductible). The premium payment would be the product of the rate and the liability selected. For example, if a farmer selected a \$200 liability and ten percent deductible (that had a corresponding rate of \$6 per \$100 of coverage) then he would pay \$12 per acre in premiums. The area may be the county with an expected yield of 100 bushels. The deductible may be established at 10 percent so that the farmer would be paid any time the county yield dropped below 90 bushels. If the county yield were 70 bushels this would represent a 22 percent loss. The farmer would receive a payment equal to 22 percent times the \$200 liability or \$44 per acre. This payment

would be made regardless of whether the farmer had a total crop loss or a crop that was above average.

Since there is no farm level loss adjustment, the area loss approach is a "yield hedge" for the individual farmer. As long as the farm yield and the county yield move together, farmers could still obtain farm-level risk protection. In addition, when widespread catastrophic losses occur, both farmers and the community would be protected.

What is needed is a system that will provide farmers the opportunity to purchase similar levels of protection, as are currently available, without the set of problems associated with the current program. This alternative meets the second need as it significantly reduces adverse selection and moral hazard problems. The farmer has every incentive to produce since his crop does not influence the payment. In addition, since every farmer is paid based on the same coverage, the problem of adverse selection is reduced.

Implications and Variations

There are questions as to how well such a plan would perform with regard to meeting individual farm needs. One fact is clear, however, it would be easier to provide for lower deductibles since moral hazard and adverse selection are no longer major issues. Thus, the maximum protection may be 90 percent of county yields as opposed to the current system that offers 75 percent of a measure of farm yield. Under such conditions, it is likely that there are some markets where the majority of farmers would have equal or greater protection than they can now purchase. In other words, even though the individual farm yield will not track perfectly with county yields, offering higher coverage than under the current program increases the odds that the farmer will collect. Further, since the rates could be based on county yields and not on a pool of high risk farmers, farmers could pay less for more protection.

The county loss plan is also appealing because it reduces the administrative cost of Federal crop insurance significantly.

The county loss plan is also appealing because it reduces the administrative cost of Federal crop insurance significantly. Underwriting for coverage would no longer be important. Farmers would not have to keep records nor be subjected to paperwork requirements. This should make the option very appealing to farmers. There would be no need for claims adjustments on individual farms. Underwriting would only be needed when there were questions regarding the level of liability selected by a farmer. Compliance needs would be greatly reduced and rate-making would be much simpler and less expensive than the current system.

The savings on administration could be passed on to farmers in terms of subsidies. In fact, providing a subsidy for this option above the administrative subsidy would ensure every farmer an expected long-term return that is greater than the premium costs. The current program does not do this. Some farmers gain more than others, while some farmers cannot expect to get back what they put into subsidies. The fact that the county loss plan would return more than any farmer puts into premiums is extremely significant. This factor alone could improve participation significantly.

The information needs for this plan are clear—quality county yield data. The current set of resources used by the FCIC for loss adjustments may need to be diverted to NASS in order to improve their ability to estimate county yields. It may be necessary to have resources standing by to make quick assessments when county yields may be below the deductible levels. This would be neces-



Many farmers do not carry insurance against natural disasters—such as the hail damage to this cornfield.

sary in order to provide for timely payments. Further, in some regions of the country, the county may not be an appropriate unit.

Farmers and the industry are most concerned about how well the area loss plan would protect individual farmers. The area loss plan could be offered in conjunction with hail policies and/or a 50 percent deductible policy adjusted at the farm level. A true test for an area loss plan would involve providing farmers a choice between the current program and an area loss plan. Such a market test would demonstrate the palatability of an area loss plan. It may be that there are markets where both plans could succeed.

Markets that have very low participation (i.e., under 10 percent of the eligible acres) should be considered first for a test of the area loss plan. While attempts to redesign the individual protection offered for these basic crops are under way, it may be appropriate to offer a county or area loss plan simultaneously. When participation is very low it can be safely assumed that adverse selection and moral hazard have resulted in prices that are significantly higher than the majority of farmers may be willing to pay. Southeastern soybeans provide a good example. In some of these markets, it is possible that the area loss plan would offer more protection at a lower cost.

There are circumstances where an area loss model may be successful without offering an individual loss program. For example, the current approach to the crop insurance program has not been adaptable to provide protection to livestock farmers. It is nearly impossible to design an effective individual insurance coverage for non-cash crops such as forage and pasture. Loss adjustments for individual forage or pasture crops is most problematic. However, sample plots could be established so that when an area suffered a loss, livestock farmers would be compensated. Further, since farmers can choose any liability, the area loss plan for forage and pasture could represent a kind of business interruption insurance that would allow for replacement feed when prices were very high due to the crop losses in the area. **C**