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THE POLITICAL ECONOMY OF A CROP INSURANCE EXPERIMENT

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William I. Myers (1891-1976) was one of the early agricultural economists who worked on problems of agricultural finance. He was appointed a full professor of farm finance at Cornell University in 1920. In 1932, Professor Myers was asked to prepare recommendations for a legislative program to solve the agricultural finance problems of those times. His proposals found approval from President-elect Roosevelt, and his ideas formed the foundation for the creation of the Farm Credit Administration and the present Federal Cooperative Farm Credit System. Then, at the request of President Roosevelt, he was granted a leave of absence from Comell in March 1933 to serve as assistant to Henry Morgenthau, then chairman of the Federal Farm Board. Morgenthau was appointed the first governor of FCA, and Myers became Deputy Governor. Then, when Morgenthau became Secretary of the Treasury in September 1933, Myers was appointed governor of the Farm Credit Administration. He served in that capacity until 1938 when he returned to Cornell University as head of the Department of Agricultural Economics. In 1943, he became Dean of the College of Agriculture serving until 1959.

The purpose of the W. I. Myers Memorial Lecture is to bring to this campus an outstanding agricultural finance economist to lecture on a timely topic. The lecture is sponsored by the Cornell University Department of Agricultural Economics as a part of its continuing emphasis in agricultural finance.

Abstract

A new crop insurance alternative will be available for eight major crops in 1994. This paper provides background on the development and potential for the new Group Risk Plan (GRP). The policy issues surrounding the Federal Crop Insurance Program are reviewed with an emphasis on the micro-level problems. Recognition of the micro-level problems of adverse selection and moral hazard led to the development of a pilot test of GRP in 1993. Limited Federal funding and the political demands for improving the actuarial performance of the Federal Crop Insurance Program led to the rapid expansion of GRP for crop year 1994. ideas for using GRP to improve the mixture of government and private initiatives to assist U.S. farmers in managing risk are introduced.

The Political Economy of a Crop Insurance Experiment

Jerry R. Skees[1]

In 1994, the Federal Crop Insurance Program will include a new product never before tried in the United States. The objective of this paper is to provide background on that new insurance program and perspective on the political economy of its development.[2]

An early version of the President's fiscal year 1994 budget recommended replacing the current crop insurance program with an "area-yield" program as designed in the 1993 Soybean Pilot project known as the Group Risk Plan (GRP). The final version of the President's budget states:

> "...It is proposed that the program be changed to provide coverage on an area-yield basis in most areas. The phase-in of such coverage would begin with the 1994 crop. Individual coverage will be continued in 1994 for programs in counties that have a loss ratio [indemnities/premiums] of no more than 1.1 . . . "

While the President's budget recommendation did not prevail, the Congress recommended that the GRP be expanded to the extent practicable. I am the director of a University of Kentucky contract with the Federal Crop Insurance Corporation to contribute to that task. It has been an extremely rewarding and educational experience. For over a decade, I have been teaching agricultural policy with a focus on institutions and implementation. My belief that implementation is a key to policy effectiveness has only been strengthened by my experience with crop insurance over the past five years.

In 1994, GRP will be available for eight major crops in the U.S. -- corn, soybeans, wheat, forage, grain sorghum, barley, cotton, and peanuts. Significant questions are unanswered. Important segments of agriculture are uncertain about GRP in part because they are understandably concerned about losing Multiple Peril Crop Insurance (MPCI). In addition, much confusion and misinformation have contributed to some negative views regarding GRP. In short, the politics have moved ahead of the education. I hope that this paper can contribute to the educational effort in a balanced fashion.

Policy Issues and a Brief Description of GRP

Risk has been identified as one justification for government intervention in agriculture for well over half a century. It is argued that agricultural production is uniquely exposed to natural elements. The U.S. has tried a variety of policies designed to mitigate hardships created by natural disasters. Though the issues are not new, in recent years, the debate has intensified. The history of disaster assistance dates to the 1930s. More recently, Congress has provided considerable support for alternatives that require farmer contributions for risk management (e.g., Federal Crop Insurance), while also providing ad hoc disaster assistance for each crop year since 1988.

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[1] Professor of agricultural economics at the University of Kentucky. This paper was presented as the W.I. Myers Lecture delivered at Cornell University on October 14, 1993.

[2] As I have been heavily involved in the development of this new product, it will be necessary for me to relate some personal experiences. Furthermore, I will use first person pronouns in this paper. I am requesting your indulgence as I am not accustomed to this type of writing.

Ad hoc disaster assistance has averaged $1 billion per year since 1988 (this does not include crop disaster assistance for the floods and drought of 1993). Simultaneously, the annual cost of the Federal Crop Insurance (FCI) program is averaging three-quarters of a billion dollars (GAO, RCED 1992). The concerns over Federal cost have caused many policy makers to question whether these two types of assistance programs can continue side-by-side.

Since the Federal Crop Insurance Act of 1980, there has been tension within the policy process regarding alternatives for U.S. disaster assistance policy. Tensions peaked after the 1988 drought as Congress created The Congressional Commission for the Improvement of the FCI Program. Events leading to the 1990 Farm Bill clearly displayed the nature of the problem as the dual problems of high costs and low participation became catch phrases for those working on the issues. The debate continues as policy makers express frustration that the crop insurance program has been inadequate in preventing ad hoc disaster assistance. The budget process has forced Congress to consider new alternatives to deliver crop failure assistance. Searching for a proper mix of disaster assistance or crop insurance or modified crop insurance will continue to challenge policy makers.

If efficiency and equity are major performance criteria then a case can be made for insurance alternatives. "Fixes" have been tried with varying degrees of success. Differences in regions and crops have created new thinking about alternate approaches to providing crop insurance to farmers. The Group Risk Plan can easily be classified as the most dramatic departure from traditional approaches.

The most attractive feature of the GRP is that it solves most of the adverse selection and moral hazard problems associated with farm-level crop insurance. Farmers have incentives to produce their crops because they are paid based on the area yield -- not their individual yield. Under GRP farmers receive payments any time the county yield drops below a trigger yield that individual farmers choose. The trigger yield is established as the coverage level of 90, 85, 80, 75, 70, or 65 percent of the expected county yield. For example, if the expected county yield is 30 bushels and a farmer chooses a coverage of 90 percent, then the trigger yield is 27 bushels. Anytime the county yield was below 27 bushels, the farmer would receive a payment.

Farmers can select any protection level per acre up to a maximum that is established as 50 percent more than the expected county yield times the expected price. This is done to attract farmers with yields above the county average. With the 30-bushel yield and $5 expected price for soybeans the maximum protection level would be 30 x 1.5 x $5 = $225. If the county yield drops to 20 bushels, that represents a 26 percent shortfall (27-20/27). The percentage shortfall is multiplied by the protection to learn the payment (e.g., .26 x $225 = $58). Each farmer with this contract would receive a payment of $58.

Why Insurance Alternatives?[3]

Throughout the world traditional approaches at supporting agriculture are being challenged. Supporting domestic farm income can carry very large price tags either to consumers or taxpayers. The search for a proper mix between markets and government in farm economies has been fraught with false starts and, at times, shortsighted performance goals. In large part, I am motivated by work on crop insurance because I believe it can fit many of the performance goals that I hear expressed by policy makers.

Many policies designed to protect the domestic farm economy are being questioned. For example, if farm income is supported too high, it will diminish opportunities to expand exports. In

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[3] The following three sections were written with Barry Barnett for a paper to be published in Taiwan. Barry and I are writing a policy book on crop insurance.

economies with established land markets, higher incomes are simply bid into land values. This process not only creates a system under which landowners are the primary beneficiaries, it also causes higher food prices and restricts trade. A major problem occurs when countries try to reduce these types of programs. Farmers who have borrowed money to purchase land at higher prices will be harmed when asset values decline due to the policy change. This dilemma has created a major barrier to change. Policy makers have limited choices because of the hardships that accompany change. This is precisely what is happening in the United States -- policy makers are reluctant to reduce support levels too rapidly for fear that it will harm the large number of farmers who own the land that they farm. It is not easy to "decouple" income support policies from farmers' resource allocation decisions.

Besides production-based income support programs, governments often also provide farmers with free disaster assistance when production falls significantly due to some unusual natural occurrence. These free disaster assistance programs also influence farmers' resource allocation decisions. With free disaster assistance programs farmers can effectively externalize part of their risk-induced production costs. A farmer's private marginal cost of production is significantly less than the marginal cost to society. Therefore, free disaster assistance programs encourage an inefficient allocation of resources by encouraging agricultural production in high-risk areas.

If governments wish to adopt agricultural policies that do not generate significant inefficiencies due to resource misallocation, agricultural insurance alternatives merit consideration. The risk-pooling aspect of agricultural insurance allows risk-averse individuals to engage in production activities that promise both higher expected marginal productivity and more willingness to adopt risky enterprises. At the margin, higher productivity implies more total output and increased social welfare (Ahsan, et al.). Simultaneously, in contrast to free government risk-reduction programs, purchasing insurance forces farmers to internalize many of their risk-induced production costs.

It should be explicitly recognized, however, that if governments wish to retain the objective of income enhancement, agricultural insurance alternatives become significantly less attractive as an alternative to current policies. With insurance alternatives, large subsidies are required to generate income enhancement. Thus income enhancement can be achieved only with a consequent tradeoff in efficiency. Agricultural insurance alternatives often require government involvement. Since crop losses are generally correlated across space the loss exposure within any given year is extensive. The private sector is unable or unwilling to take on the risk associated with a major widespread drought such as occurred in the United States in 1988. Even the international reinsurance industry does not appear to be willing to accept this risk. It is argued that the "deep pockets" of government are needed to protect against such widespread losses.

Farm-Level Crop Insurance

Before turning to GRP, it is useful to provide background on farm-level insurance. Recognition of these problems was a major reason that I became interested in the GRP. Since 1939 the United States has provided farm-level insurance to crop producers through the Federal Crop Insurance Corporation (FCIC) an agency of the Department of Agriculture. The primary product offered by the FCIC is known as multiple peril crop insurance (MPCI). This insurance product provides protection against crop yield losses due to any number of natural causes such as drought, flood, wind, hurricane, tornado, lightning, earthquake, wildlife, insect infestation, and plant disease.[4] Farmers present their yield history to be used in developing their average farm yield (the Actual Production History or APH). They can insure for losses up to 75 percent of the average

[4] An MPCI purchaser may choose to include coverage for hail and fire as well, or, if such coverage is purchased from a private insurance company, the participant can receive a discount on the cost of the MPCI policy.

In 1980 the Federal Crop Insurance Program was changed to allow for the private marketing of MPCI policies. Private insurance companies sell the policies and conduct all claims adjustment activities. The FCIC functions as a reinsurer providing coverage against the loss risk that is incurred by the companies and sharing in any gains or losses with the companies. The FCIC also provides the insurance companies with compensation for administrative and operating expenses (32.5 percent of total premium). Changes in 1980 also introduced a subsidy on premiums paid for MPCI purchases. From 1980-90 this subsidy averaged about 23 percent of total premiums (data from GAO/RCED-92-25). It was hoped that the subsidy would attract sufficient participation in the Federal Crop Insurance Program so that the government would no longer have to provide free disaster assistance.

Many other countries offer crop insurance programs to their producers (e.g., Brazil, Canada, Costa Rica, India, Japan, Mexico, Philippines, and South Africa). Generally, the programs are similar to the one described above for the U.S. but there are some unique attributes as well (see Industries Assistance Commission and Hazell, et al.).

Problems With Farm-Level Crop Insurance

Farm-level crop insurance programs typically suffer from problems of information asymmetry. In short, farmers will generally know far more about their production risks than will an insurer. This situation creates an environment conducive to the twin problems of moral hazard and adverse selection. Moral hazard occurs when a producer purchases an insurance policy and as a result changes his/her production or management practices causing an increase in the potential loss or the probability of a potential loss. Due to the high cost involved, the insurer cannot effectively monitor the producer's changing behavior so the producer's actual expected value of loss (magnitude of potential loss x probability of potential loss) is higher than what the insurer initially believes.

Adverse selection occurs when a producer accurately compares his/her degree of risk exposure to the degree of risk exposure assumed by the actuary when developing the premium rate. Those producers who perceive that they have a high probability of collecting insurance indemnities in an amount exceeding premiums paid (i.e., producers with the highest risk) will be inclined to purchase insurance. Those who perceive that they have a low probability of collecting insurance indemnities over premiums paid (i.e., producers with the lowest risk) will be disinclined to purchase insurance. Since the insurance program is attracting primarily those who expect to collect more in indemnities than they have paid in premiums, the financial performance of the insurance program will suffer. If the insurer responds by raising premium rates, the problem may be only further compounded leading to a more adversely selected group of insurance purchasers.

As an example of the problems created by adverse selection consider the experience of the U.S. Federal Crop Insurance Program on soybeans produced in the Southern United States. For the initial years of the individualized yield MPCI program, many Southern soybean farmers were offered insurance yields that exceeded expected yields. This happened because in the Southern U.S., soybean yields (and yield risk) are determined in large part by the quality of production management employed. Yet, the FCIC could not accurately discriminate between better and poorer farm managers so adverse selection occurred. As a result, soybeans in Arkansas, Georgia, Louisiana, and Mississippi accounted for almost 20 percent of total MPCI excess losses (indemnities that are greater than premiums) during the 1980s. This bad experience has been loaded into premium rates for Southern soybeans to the extent that some farmers would now have to pay $20 per acre or more for MPCI. Participation is low and those who participate are now a subset of the highest risk farmers.

Farm-level crop insurance programs also typically suffer from high administrative (transactions) costs. In the U.S., administrative costs account for almost 40 percent of the total net cost of the crop insurance program (data from GAO/RCED-92-25). These costs escalate in areas that are characterized by a preponderance of small scale producers. For example, the crop insurance programs in both Japan and the Philippines suffer from very high administrative costs. Hazell reports that the Philippine program paid 5.74 pesos for each peso of premium collected.

Most government crop insurance programs are subsidized so as to encourage participation. Yet despite the subsidies, participation in voluntary crop insurance programs is generally low. In the U.S., for example, only 30 to 35 percent of the eligible acreage is insured. There are at least four possible reasons for low rates of participation in voluntary crop insurance programs. The first reason is that moral hazard and adverse selection problems often lead to premium rate increases so that premiums become prohibitively high for many producers -- despite the premium subsidy. The second possible explanation for low rates of participation in voluntary crop insurance programs is that producers have come to expect generous government disaster assistance in case of widespread crop losses. Why pay for *ex ante* crop insurance when you can get it free *ex post*? The third possible explanation for low rates of participation in voluntary crop insurance programs is that people are typically unable or unwilling to imagine the potential devastation that could be caused by low probability events (Tversky and Kahneman). Kunreuther and Slovic explain that unless individuals ignore many low probability threats they would become so burdened that any type of productive life would become impossible. Unwillingness to insure against low probability events has been documented both in the laboratory (Slovic, et al.; and Schoemaker and Kunreuther) and in studies of real life insurance decisions (Kunreuther). The forth reason for low participation may be that some farmers may simply be willing to accept the risk -- they decide to self-insure.

Use of farm-level insurance in the U.S. has led to other concerns. Private sector marketing of MPCI has met with mixed success. On the positive side, there has been a substantial increase in acres insured under MPCI since the introduction of private marketing. On the negative side, it is unclear that the previous reinsurance agreements between the U.S. government and the private companies provided proper underwriting incentives. In particular, private companies were required to take only a small portion of the risk inherent in any MPCI policy that they sold. Furthermore, the private companies could identify specific policies on which they did not wish to accept any of the risk so that all of the risk was passed on the government.

These concerns were particularly troubling because the insurance yield determination process seemed to lack appropriate accountability. As a result, insurance agents had an incentive to increase farmers' insurance yields beyond the level of a true expected yield to make a sale. Agents can help farmers determine what mix of yield data will provide them the highest level of crop insurance coverage. The U.S. crop insurance program is currently undergoing major changes aimed at these problems. The reinsurance agreement will be restructured so that the private companies must absorb a larger share of the losses when large indemnity payments are made.

Still, given the political dynamics, the question of an appropriate reinsurance agreement is not simple. If they are made to bear an increasing share of the risk, private companies will likely stop marketing crop insurance in areas with historically high excess losses. Due to the resulting unavailability of crop insurance, it is almost certain that in case of natural disaster, Congress would authorize free disaster assistance in those areas. Thus, we would be back again to a situation where free disaster assistance is encouraging production in the riskiest areas.

Another reform has been the use of a nonstandard classification system by the FCIC. This system identifies farmers who have been the most serious abusers of the current program and surcharges their premium rates.

The U.S. crop insurance program is not inexpensive. Current cost of the program are around three quarters of a billion dollars. The distribution of these Federal cost have average 40 percent for excess losses, 39 percent for administrative and delivery costs, and 21 percent for premium subsidies. Furthermore, voluntary crop insurance, was unable to forestall ad hoc free disaster assistance. The 1980-90 average cost of crop insurance ($489 million per year) is only 24 percent of the total net cost of U.S. government disaster assistance programs over that period. The remaining 76 percent was for free disaster payments and low interest emergency loan programs (data from GAO/RCED-92-25).

Given the related problems of adverse selection, low participation, and human insensitivity to low probability events, some have suggested that crop insurance be made mandatory. But this option has serious problems as well. Though on average during the 1980s farmers received about $1.50 in indemnities for every $1.00 paid in premiums (American Association of Crop Insurers), the benefits were not distributed equally. Moral hazard and adverse selection problems for some areas and crops have resulted in increased rates so that many low risk farmers could expect to receive far less than a dollar in indemnity payments for each dollar of premiums. Under such conditions, requiring crop insurance for farmers with high debt loads can reduce their odds of economic survival (Skees and Nutt, 1988).

Background on GRP

The GRP concept resurfaced in 1989 when I was research director of the Commission for the Improvement of the FCI Program. During the six months that I served, many different ideas were presented. Most of the ideas did not address the farm-level problems associated with MPCI. Although my first reaction to insuring based on yields in a geographic area was negative, I was intrigued by the idea because it address these problems.[5] In looking through the literature, I learned that the idea of insuring farmers based on the risk in the surrounding area was developed over 40 years ago. Professor Halcrow of the University of Illinois first researched this idea for his Ph.D dissertation in 1947. In the Canadian Province of Quebec, a program like the Group Risk Plan has been successfully in place since 1977 (see Appendix A). As the idea was developed, the Commission adopted the following recommendation:

> "Enact legislation that requires the Federal Crop Insurance Corporation (FCIC) to implement a pilot program to determine the feasibility of a Federal crop insurance program that bases indemnity payments on a county's loss of production, rather than on an individual's loss of production." (p. 23, Recommendations and Findings To Improve the Federal Crop Insurance Program.)

The 1990 Farm Bill also included language to support a pilot test on what was being called the area yield program. Importantly, this language cleared the way to allow for lower deductibles than are allowed under the MPCI program[6].

In 1990 and 1991, the University of Kentucky obtained special funding from FCIC to investigate the feasibility of this type of insurance. This project involved a visit to Quebec to learn about their program (see Appendix A for a memorandum to the FCIC manager on that program). By January of 1992, the Director of the Research Division of FCIC informed me that FCIC wanted to pilot test this new insurance for the 1993 crop year. Much of that development was completed at the University of Kentucky.

Soybeans presented a good crop for the first test of GRP. Soybean contracts have presented a serious problem for FCIC during the 1980s. If only seven Southern states had a loss ratio of 1.0 on soybeans during the 1980s, FCIC would have had an overall loss ratio of 1.17 instead of 1.56. This alone would have significantly changed the nature of recent debates. Bad experience has also resulted in rate increases and downward adjustments in coverage levels that have all but eliminated participation by soybean growers in several states.

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[5] This idea was first presented to me by Dr. Art Barnaby of Kansas State University.

[6] MPCI can not be offered at levels that exceed 75 percent of the estimate for a farmer's average yield (that is a 25 percent deductible). Such a restriction on a county-yield program would have been a major problem as county yields are less variable than farm yields.

By the spring of 1992, the new insurance was being called the Group Risk Plan. The design of the pilot test had to be presented and approved by the Board of Directors for the FCIC. By this time, opposition was developing. Ninety percent of the Federal MPCI is sold and serviced by private reinsured companies. As early as 1989, analysts in the Office of Management and Budget had been writing about the potential budget savings associated with having GRP-type insurance as the only offer provided by the FCIC. Thus, even a pilot test of the GRP was considered a threat by the private reinsured companies. Despite the opposition, the FCIC Board approved the pilot test as proposed on September 17, 1992 (see Skees, 1992).

The initial pilot test on soybeans was restricted to well-defined markets. Thirty groupings of counties were identified with from 2-6 counties and at least 100,000 acres of soybeans. Besides the Southern states where MPCI has performed poorly, several other states were included because of low participation and problems similar to those in the South. In total, thirteen states were identified. Markets were selected to represent the type of diversity needed to provide the most learning opportunity from a limited pilot test.

The first year of experience with the soybean pilot was quite mixed. In 1993, 322 policies were sold at an average of 280 acres each. The timing of the President's budget proposal was not good for GRP sales. The reinsured companies were already concerned about the threat of GRP to the MPCI program. When the President proposed that GRP would be the only offer in 1994, this intensified their concerns. They were compelled to fight this proposal in Washington and in the countryside. It is possible that one strategy that the industry adopted on the pilot was simply to pull back -- reducing their effort to market GRP. Further, we learned that companies did not like the idea of having limited market opportunities in thirteen states. This simply did not represent the volume of business required to offset start-up cost in various states. Without training conducted by the companies, it was unlikely that sales agents would have known about the GRP. A large share of the soybean GRP contracts were sold in Kentucky. Two insurance sales agents were exposed to intensive training on GRP in Kentucky. Training sales agents so that they fully understand GRP is important.

The President's proposal to replace the current MPCI program with GRP was a major diversion for the pilot program. From an experimental design perspective, it was unfortunate that the pilot experiment received such national attention. Clearly, we had very little opportunity to learn based on the abbreviated experience with the pilot. I found myself in the awkward position of having to defend the experiment while being asked to testify about the President's proposal. In testimony before the House Appropriations Subcommittee on Agriculture, I expressed concern about expanding GRP to the extent that was being recommended. GRP was designed for areas with quality county yield data. Therefore, significant areas would be excluded with an expanded GRP. Quality data for minor crops now covered under MPCI are limited. In addition, we knew nothing about how farmers and lenders would view GRP. We did know that considerable misinformation existed about how GRP worked.

As the summer progressed, the Mississippi river flooding complicated the questions about how to fix crop insurance. By August, the Congress had adopted language in the appropriations process to amend the Federal Crop Insurance Act.

> The Corporation shall take such actions as are necessary to improve actuarial soundness...including...establishing in counties, the extent practicable, a crop insurance option based on area yields in a manner that allows an insured producer to qualify for an indemnity if a loss has occurred in a specified area in which the farm of the insured producer is located.

In the spring of 1993, a pilot test for wheat was approved. There are 175 counties in the wheat test. The criteria for selection were different in the wheat pilot. Counties with large expected MPCI losses were selected. In part, this was done to help alleviate anticipated problems as FCIC modified the current MPCI program. More specifically, the major change in MPCI was to place more emphasis on actual farm data to establish the Actual Production History (APH) for establishing coverage. Farmers with less than four years of yield data will be penalized. Thus, GRP was established to

provide an alternative for those farmers as they build their yield history. After they have a yield history, they can decide if MPCI or GRP works best.[7]

In 1994, the FCIC will expand pilot testing of GRP into five other crops: 1) corn, 2) grain sorghum, 3) cotton, 4) barley, and 5) peanuts (the number of soybean counties will also be greatly expanded). When soybeans and wheat are added, these crops are the major U.S. crops in terms of planted acres (240 million). These seven crops are clearly dominant for crop insurance as they accounted for $600 million dollars of the total FCIC premium in 1992 and 75 million insured acres. This is roughly three-fourths of FCIC's total business. In 1994, GRP will be available as follows:

	Number of Counties	Percent of All U.S. Acres
Cotton	92	55
Corn	672	76
Sorghum	81	37
Peanuts	43	49
Soybeans	741	87
Barley	54	39
Wheat	175	33
Forage	17	NA

When forage is excluded, this represents nearly 70 percent of all U.S. acres for the major seven crops.

GRP: Policy Issues

For many farmers, GRP can provide affordable risk protection that is superior to the current MPCI for some farmers (Miranda and Hourigan). GRP has a major weakness in that an individual farmer can have a loss and not receive a payment if the county yield is not low. There are three ways to fix this problem: 1) private-sector supplemental products, 2) combined low-level MPCI and GRP, and 3) rezoning so that farmers with similar yields are grouped together (each of these are discussed below). GRP effectiveness can be enhanced with private sector initiatives that offer supplementals.

In many ways, GRP is a compromise between free disaster assistance and the current MPCI. Unlike MPCI, it does not pay based on individual losses. Similar to free disaster assistance, it pays when an area (the county for now) has a loss. Like MPCI, farmers can count on the GRP when there is a widespread-pervasive loss (farmers do not have to wait for Congressional action). Also, like MPCI, the GRP is priced according to relative risk reducing the chances of benefits being bid into land prices or that it will alter production practices in a negative fashion.

However, unlike MPCI, the GRP does not have many problems associated with farm-level crop insurance. Since farmers have no incentives to lose a crop when they are insured under GRP, there should be no excess losses under a sustained GRP program. This cost savings was a major motivation for OMB endorsement. The fundamental problems of adverse selection and moral hazard are major reasons for bad loss experience and low participation in MPCI. GRP is designed to significantly reduce adverse selection and moral hazard. With GRP, farmers no longer know more than the FCIC about the risk of the contract or the probability that they will collect. This balance of information should mean that farmers will not choose to participate simply because they know that they are being offered a moneymaking contract. In short, GRP should be cost effective -- excess losses should not be a long run problem. Timing of sales closing dates may be an issue in some areas as farmers may be able to select the years to purchase GRP based on weather forecast.

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[7] A smaller pilot for forages is also in place for 17 counties in Minnesota and Wisconsin.

The GRP is also appealing because it reduces the administrative cost of Federal crop insurance significantly. Underwriting for coverage would not be needed. Farmers would not have to keep records nor be subjected to the same paper work requirements. This should make the GRP more appealing to farmers. There would be no need for claims adjustments on individual farms. The primary underwriting needs would be when there were questions regarding the level of protection selected by a farmer. Compliance needs would be greatly reduced and rate-making could be simpler and less expensive than the current system.

Providing a premium subsidy for the GRP above the administrative subsidy will very likely provide 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 premium payments. This factor alone could improve participation significantly compared with MPCI. Since total premiums are likely lower, total cost of the premium subsidy should also be less under a GRP than for MPCI.

The information needs for this plan are clear -- quality county yield data. Resources will be needed for the National Agricultural Statistical Service (NASS) 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 necessary to provide for timely payments. Further, in some regions of the country, the county is likely an inappropriate unit. If this plan were widely accepted, many procedures used by NASS would have to be reviewed. The most serious problems may be in areas where there is small acreage or only a few farmers in the county who could influence the outcomes. In addition, time tables on the availability of NASS data will need to be moved up to make payments at or shortly after harvest.

In summary, GRP has potential to score well on all three components of cost: 1) there should be no excess losses, 2) the administrative cost should be less, and 3) premium subsidies may be lower. These are the reasons OMB was attracted to GRP. There are good reasons not to expand GRP nationally at this time. The primary reasons center on the availability of NASS data and uncertainty as to the degree of risk protection GRP will provide for farmers in some regions. Long series of county NASS data are needed. These data are not available for minor crops and for areas with limited production of major crops. Further, it is important that the educational effort be developed to help growers and lenders understand how to use GRP.

Besides the very attractive feature of cost effectiveness, GRP can also offer risk management protection for many farmers (Miranda; Hourigan):

- In research that compares the current design of GRP with the current MPCI program, over 60 percent of nearly 3,000 soybean farms would have received superior risk protection from GRP during the 1980s. These data were taken from 10 years of FCIC records for soybean farms (Hourigan).

- Farmers who have never purchased crop insurance should also find GRP attractive. Many of these low-risk farmers have not purchased MPCI because it is priced at levels that exceed their risk. Current mandates to improve the actuarial performance of MPCI will only exacerbate this problem.

- Farmers who are concerned about widespread catastrophic risk will be attracted to GRP. It is relatively inexpensive and it can protect them against events such as drought and hurricanes.

GRP will not work for all farmers. A precondition for GRP is that the farm yield must be positively correlated to the county yield. For those farmers who farm in a part of the county where soils are different or those who are exposed to flooding, GRP will be less effective. Again, there are ways to fix these problems (see below).

The other problem is that some farmers will receive benefits when they don't have a loss. There are several things to focus on concerning this important problem. First, the event is rare. In the research with 3,000 case farms, this occurred less than 5 percent of the time for the 90 percent coverage level. Second, farmers have paid a premium based on the county yield -- they are entitled to collect. There are many contingent markets (e.g., futures options) that have this feature. Finally, the simple fact that farmers can collect when they don't have a loss is fundamental in providing incentives for farmers to continue to try to grow a crop during bad conditions -- moral hazard is eliminated.

Risk Management Issues for the GRP Index

When growers understand that county yields are used to establish the payment for GRP, the next questions should focus on the history of those yields. To the extent that GRP does not change the procedures used by NASS to develop county yields (and it should not at this point), then that history is useful information for growers who are trying to protect their farm income. If farmers can compare their yield history to the history of payments that they would have received with various GRP policies, they will have a better understanding of how well GRP may help offset losses. When farm crop losses match GRP payments then GRP can offset lower incomes due to crop failure.

We have learned that farmers understand that the GRP is an index that can protect more than potential shortfalls for the specific crop being insured. A farmer who examines the history of payouts under GRP may find that GRP paid when his soybean yields were not that low. However, in reflecting on the farm operation for that year, he may also realize that, due to the rotation pattern for that year, soybeans were in the low land and corn was on the high ground. If this is the case and the GRP payments are due to dry conditions, then it is likely that the farmer needed some compensation to offset corn losses. It may also be that the farmer uses irrigation for soybeans. If this is the case, soybean yields may be okay in a year that the soybean GRP pays. However, if the GRP payment is due to dry conditions, irrigation costs are very likely high. A GRP payment may be needed to offset the high irrigation cost.

In short, GRP can protect against crop losses for other crops besides the GRP crop; GRP can protect against increased cost of production due to farm management strategies (e.g., irrigation) that are used to offset crop losses; and GRP can protect against livestock losses due to stress that may be created due to adverse weather. Growers need to discover the relationship between historic GRP payments and their farm income to fully appreciate the degree of risk protection offered by the GRP index.

Considerations for Fixing the Problem of Individual Protection

Despite the potential whole-farm protection that may be offered by GRP, it may be useful to provide farmers some type of protection for individual losses. Everyone has been careful in pointing out that the biggest shortcoming of GRP is that an individual farmer can have a loss when the county yield does not trigger a GRP payment. Possibly the biggest reason to be concerned about this issue is that creditors may be reluctant to allow farmers to use GRP as collateral for production loans. There are three possible ways to minimize this problem: 1) combine a low level of MPCI coverage with GRP as a combined Federal product, 2) begin the process of developing geographic zones with homogeneous soils and climates instead of using county boundaries, and 3) encourage private sector development of companion products.

A Combined Federal Product

One solution is to package a 50 percent coverage MPCI with GRP. Actuarial performance of this coverage level has been superior to higher levels. In most areas, loss ratios for 50 percent coverage are below one. The advantage of selling 50 percent coverage with GRP is that there would be some minimum protection should a grower have a near total loss when the county does not suffer a loss or when the county loss is very low. Additionally, this policy could replace the need for making an early payment on GRP since any losses below 50 percent would be paid earlier than GRP payments.

Several objectives should be in place for such a combination: 1) the 50 percent coverage should be simple, 2) the package should be affordable, and 3) opportunities for double payments should be low. A simple four-year APH may be the best alternative for establishing yield coverage for the 50 percent coverage portion of this package. However, given all of the battles over APH and establishing yield levels, a return to area-yield may work for these purposes. To make the package affordable new considerations for rating may be in order. Finally, it should be possible to reduce the combined payments to control overpayments. A concern would be adverse selection in that farmers who had yields that did not track the county yield would be more attracted to the combined policy.

Alternative One

Coverage at 50 percent could be sold with GRP allowing for early payments when the grower had a loss below 50 percent. Again, this may replace the need for a preliminary GRP payment. If the grower receives a 50 percent coverage payment, the payment would be deducted from any GRP payment that is due in the spring. If this were done, there may be no need to subsidize the 50 percent coverage since the GRP subsidy would remain. A combined package of GRP at 90 percent with GRP protection levels lower than the maximum could be quite affordable.

Alternative Two

This combined GRP and 50 percent farm-level coverage package would work the same except the payments would be handled differently. Combined payments would be capped at twice the protection level provided by the 50 percent coverage policy. The advantage of this alternative over number 1 is that it would provide more protection. Since county yields should never go to zero, growers would still have incentives to purchase high GRP protection levels. The disadvantage is that both rates would need a cat load making the policy more expensive. The other concern is that once you cap the payments based on the coverage yield you have increased the importance of that number. This opens a whole set of issues about APH, etc., that make this alternative less attractive.

Rezoning by NASS

Another important aspect of the GRP is that county boundaries are political. In larger counties it is unlikely that the county is homogeneous in soils and climate. In other countries that have used this type of insurance, the most dynamic aspect of the program is a continual redrawing of zone boundaries. Zones represent the area used to establish the loss bases. Zones are to reflect a homogeneous production area. In Quebec, an average size zone appears to include between 300 and 400 square miles. The average size county in the midwest is around 500 square miles. The Farmer's Union in Quebec has been active in helping change zone boundaries as farmers learned what zone their farm should be in. Zones are different for different crops.

It is possible to begin a similar rezoning process in the U.S. This would require several pieces. First, priority should be given to regions that have the largest counties and/or to regions that have risks that are clearly not widespread (i.e., where major cause of loss is from a spot loss event). In both cases the intent is to focus limited resources where they have the potential to do the most good.

A good start for rezoning is FCIC's old area maps that were used when coverage levels were established based on the section of the county where the farm was located. These maps should still be around as this program was in place as recently as ten years ago. Once the zones are established the trick would be to develop coverage and rates. There may be some methods for allocating NASS yields to the zones. Plant growth simulation models could contribute (e.g., SCS uses EPIC) to these efforts. Setting initial rates and coverage would be largely based on good judgment. Both rates and coverage could be changed over time. I am not sure how the Canadians phased in their zone program. It may be worth some time to investigate this point as the Quebec program had to deal with these questions in 1977.

Finally, major breakthroughs in mathematical modeling that uses the spatial auto-correlation features that are present in crop yields could contribute greatly to efforts to zone GRP. Not only can these methods provide needed information for rating and establishing expected yields, when they are coupled with good satellite imagery they can be used to develop zones, make timely payments, and offer contracts as the growing season progresses. These types of information systems could greatly improve GRP in the future.

Encourage Private Sector Development of Companion Products

A more volatile issue regarding the Group Risk Plan (GRP) is the question of what delivery system is appropriate. Many reinsured companies have been concerned that the GRP could be delivered by the public sector. Given the current concerns over the budget cost of the Federal Crop Insurance program, policy makers may decide that public sector delivery could be less costly to taxpayers. The strongest argument for private sector delivery is the need for supplemental products that can be coupled with the GRP. Private company selling of GRP will enhance introduction of private supplemental products. It is also probable that private initiatives will evolve to offer tailored products for the region and crop that would backstop GRP. The major weakness of GRP is that an individual farmer can have a loss when there is no GRP payment. Private companies can put products with GRP to remove this weakness. Consequently, private companies should be allowed to sell GRP and develop and market other forms of insurance to supplement GRP.

Private sector delivery of Multiple Peril Crop Insurance (MPCI) has been moderately successful. Many growers and bankers like the private sector delivery. Sales agents should be more inclined to service a contract. Insurance sales agents have greater incentives to market and sell than a government agent would. Private companies should have incentives and opportunities to tailor products. Many argue that allowing private sector delivery of MPCI was important to development of private sector supplemental insurance products. These add-on products are designed to cover special risk that may not be covered by the MPCI contract. Although there are several supplemental products offered by the private companies, the rate of their development has been slow. There are several reasons for this. The most significant reason is that any private product that is sold with government subsidized MPCI must be neutral in the risk effects on MPCI. In short, it would be inappropriate for a private company to sell a supplemental product that was coupled with MPCI in such a fashion that the risk of the MPCI product would increase. The approval process has been a constraint for introduction of supplementals. Many of these issues would not be important for add-on products that would be coupled with GRP. GRP is designed so that individual farmers cannot influence payments.

Private MPCI products that would be sold with GRP would still have the potential for adverse selection. However, the incentives for fixing these problems would be with the private companies that contract with the agents. These incentives would very likely lead to a different system that would place more responsibility with agents.

Many questions regarding shared risk between the private reinsured companies and the government center on the structure of the reinsurance agreement. Companies can identify high risk farmers and place them in a high risk pool. The government then shares nearly all of the risk for this set of growers. Risk-sharing is essential for private sector involvement. Multiple Peril Crop Insurance is a risky proposition for private sector companies because of the highly correlated losses that can occur due to widespread events such as the 1988 drought in the Mid-west. The international reinsurance sector does not have the capacity to cover these types of risk. If MPCI were more actuarially sound, GRP could serve as reinsurance as well as ease reinsurance from international markets.

Private sector efforts to insure the individual when the county does not have a loss can be important for effective risk management under GRP. For growers who have yields that do not track well with county yields this is even more important. In areas where hail is a major cause of loss, private hail insurance is an excellent example. Major thunder storms that have hail would increase the odds of

a hail loss and decrease the odds of drought losses. Therefore, it is likely that farmers can suffer a hail loss when the county yield is high. Hail insurance will very likely have higher losses when there is no GRP payment. In others words, hail insurance should be highly complementary with GRP. This is particularly true if most widespread losses are due to drought.

There is an argument that GRP may substitute for reinsurance. A major justification for government involvement with MPCI is that there is market failure -- the private sector is not able to take the widespread and correlated risk associated with MPCI because of the difficulty in building adequate reserves to cover large losses. GRP protects against widespread and correlated risk by offering insurance based on what happens to yields in the county. There is some concern among private companies that GRP may not offer enough protection to substitute for or facilitate private reinsurance activity. Part of that discussion is likely influenced by the very conservative position that private reinsures are taking due to recent heavy losses in the U.S. and around the world. To address some of these concerns, it may be necessary to offer GRP at 95 percent of the expected county yields.

To fix the problem of farm losses when GRP does not pay, a private product could be structured just as alternative one presented above. These alternatives could use a private MPCI product by allowing the company to claim the GRP payment after MPCI payment have been made. This would also simplify early payments when the grower had a loss. If the grower receives a payment, the payment would be deducted from any GRP payment that is due in the spring. Since the GRP has a cat load, the cat load for the private MPCI policy could be removed. A combined package of private MPCI and GRP could be quite affordable. The company could have first claim to the GRP payment. They would structure their own private MPCI policy that would make the timely payment. Companies would pay the grower any excess funds when the GRP payment is greater than the private MPCI payment.

The real advantage of a combined GRP/Private MPCI is that it places the burden for fixing MPCI problems with the private sector. This combination would mean that companies could begin new rating in areas where the current problem is beyond fixing. FCIC will never reduce rates in areas with bad loss experience. Private companies could do this with a private MPCI product. They would simply set their own rates and their own underwriting standards. Further, unlike a Federal product, companies could set different coverage levels based on the risk in the region (i.e., it would be unlikely that Congress would allow FCIC to differentiate the deductible based on relative risk).

Companies would have much more freedom to fix the problems that they have been concerned with. Companies could use economics to establish charges for administrative costs. Companies could be innovative in making the combination work. Only certain perils may be covered in an MPCI policy (e.g., drought, freeze, excess moisture). In short, I believe that the opportunities are very good. There are those who argue that farmers will not buy a private MPCI policy that is not subsidized. If this is true, then that is a market decision and those growers should consider other forms of risk protection (in some areas this may mean less risky enterprises like livestock). Further, with a GRP that has a cat load, it is likely that the add-on MPCI could be affordable.

For some time, there has been a search for the proper mixture between private and public involvement in risk sharing for crop losses. GRP has the potential for improving this mixture. GRP is well-designed for those who believe an appropriate role of government is to handle pervasive and widespread losses. GRP leaves individuals at risk when they have isolated losses. Many would argue that government should not be involved in fixing the problems associated with isolated losses. GRP can motivate private sector initiatives that will handle isolated losses. Private companies need to have the opportunity to sell GRP to make that happen.

A Look to the Future

In addition to attempts at fixing the Federal crop insurance program, U.S. policy makers are examining alternatives to the commodity programs that have been in place for over 60 years. The

restrictions on Federal budget dollars are forcing policy makers to consider alternatives that will be less costly. Revenue insurance alternatives are being discussed.

The Canadians are now combining their stabilization and crop insurance programs into a Gross Revenue Insurance Program (GRIP). This policy change has been touted as the most significant change in Canadian agricultural policy in over fifty years. Though it is a move to market oriented alternatives there are two important features that make the Canadian GRIP less than market oriented: 1) the level of the subsidy is significant (farmers share is only 33 percent), and 2) the degree of price protection offered is higher than prices that may be expected in the market. The GRIP has come under considerable fire. The opportunities for moral hazard and adverse selection problems are serious. Further, there are concerns that this policy has been more favorable to some crops than others.

Still, the Canadian experiment with GRIP merits watching by agricultural policy enthusiasts throughout the world. The simple fact that each province has a great deal of leeway in how the GRIP is implemented provides a very fascinating opportunity to try alternative designs. The Ontario program may hold the most promise. In Ontario, they have chosen to separate the crop and price insurance. To the extend that they are able to hold the line on the level price insurance, that alternative is attractive.

The design and implementation of an individual revenue insurance program is critical. Individual revenue insurance programs are susceptible to considerable moral hazard and adverse selection problems. Thus, an alternative that may offer needed protection to a large number of farmers would be area revenue insurance based on the GRP concept. Two types of programs can be considered; 1) area revenue for an individual crop, or 2) area revenue based on the portfolio of crops grown on the farm.

For area revenue on an individual crop, a homogenous production zone would be identified. The combined expected zone price and yield would trigger the payment. Farmers would purchase protection for revenue shortfalls. Such a policy would be less expensive in major production regions where price and yields are negatively correlated (i.e., move in opposite directions).

Area revenue insurance based on the portfolio of crops would be more complex. The Swedish crop insurance program prior to 1988 basically provided such insurance. In that program, the Swedish government collected farm-level statistics on the acres planted to various crops. They also had established production zones with expected yields and prices. When the yields dropped below a threshold level, calculations were made to determine if the farm would receive a payment. By using portfolio theory the Swedes established revenue thresholds based on the farm's individual crop mix and the correlation among crops within the zone. Thus, area's that had high risk and little crop diversification received less benefits from this program.

Such a program could be developed in the U.S. However, several factors are critical: 1) some successful experience with the GRP, 2) a commitment to develop information systems that would facilitate development of homogenous zones, and 3) an improved understanding of how such a program works by lenders and farms.

Insurance alternatives have the potential to play a major role in future U.S. agricultural policy for commercial farmers. As the U.S. reduces the level of income and price supports, risk management will be more important for U.S. farmers. The GRP expansion could be an important milestone for future agricultural policy since this alternative has the potential to solve many of the problems associated with the current crop insurance program. The ability to develop information system capable to make timely payments and homogenous production zones will be important in improving GRP as a risk management alternative. Private sector initiatives in offering supplemental insurance products will also be important. In addition, their is an educational challenge in helping farmers realize the conditions that must exists for them to receive risk protection from this alternative. Should GRP succeed, area or zone revenue insurance alternatives may provide the next frontier for U.S. agricultural policy.

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APPENDIX A: Memorandum On Quebec Insurance Program

October 4, 1991

TO: Jim Cason, Manager, FCIC
Buel Lanpher, Federal Extension Service

FROM: Jerry Skees, University of Kentucky
Roy Black, Michigan State University

SUBJECT: Trip to Quebec and Ottawa to Review the Quebec Area Loss Program, Particularly with Respect to Forages

We are writing to keep you up-to-date on our new project on Area Loss. The project included a trip to Quebec and Ottawa to obtain an overview of the Canadian provincial experiences in the use of Area Loss schemes and other schemes they may have tried with forages. We believe the trip was well worth our time. The overwhelming theme from every provincial program was that it is nearly impossible to effectively implement an individual forage program. There has been considerable experience at attempts to do this in several provinces. All have been classified as failures.

We began our trip with the provincial designers and managers in Quebec and included a visit to middle management in the Quebec "Farmers Union." Our second day was spent with the personnel responsible for administering the program in the Quebec city area, including a field visit to a dairy farm to illustrate the field measurement procedures and to the associated regional laboratory. Following those discussions, we spent a day in Ottawa with Mike Ellis and in particular, his staff responsible for the federal overview of provincial programs. It perhaps is not a quite apt description, but a role somewhat akin to powerful bank examiners who provide subsidies.

Motivation for U.S. Interest

The Area Loss program has been proposed for crop/climate areas in which the current individual program is not working. It has been proposed, specifically, for the forages. The U.S. has:

-- 65 million acres of hay, of which less than 3 million are currently insured

-- Individual programs have serious flaws

-- Farmers have concerns about both quantity of forage and quality of forage as well as establishment and winter kill problems

-- Multiple cuttings for most hay crops, within the same year have caused administrative difficulties

What Did We Learn From the Quebec Area Loss Feed Security Program

Quebec has what they perceive to be a successful forage program to insure feed requirements for the animal units that a farmer owns. The focus is principally on dairy farms. The following results appear to support their view:

-- 70 percent of the farmers with sales of over $10,000 participate

-- Loss experience is good (i.e., loss ratio less than 1.00) -- administrative costs were hard to gage, although we obtained some preliminary estimates, but they appear to be substantially less than they would be with an individual program.

The program has been in place since 1977. It has undergone significant changes. Among the most dynamic aspects of the program is a continual redrawing of zone boundaries. Zones represent the area used to establish the loss bases. Zones are to reflect a homogenous production area. An average size zone appears to include between 300 and 400 square miles. The average size county in the lake states is around 500 square miles. The Farmer's Union in Quebec has been active in helping change zone boundaries as farmers learned what zone their farm was most similar to. Zones are different for different crops.

Our impressions are that the area (the Canadians call it collective) plan is less expensive to administer than the individual plan for other crops. We are still trying to develop estimates on the administrative costs as a percent of premiums. There would be considerable expense associated with the measurement requirements for the area and the estimates of the quality. In addition, the start up costs of a similar plan in the U.S. would likely be expensive and difficult as we have no good standards (average zone yield) to begin this type of program.

Basic features of Quebec program

* Forage needs for animals units are insured
  example -- 100 animal units would require 454 tons of hay per year

* Value is insured at costs of production
  example -- $110 /ton * 454 tons = $49,940 of liability

* Liability is insured at 80 percent of the area/zone yield
  example -- zone average yield is 3 tons per hectare, actual yield is 2.1 tons, a 30 percent loss less the 20 percent deductible for a 10 percent payment.

* Indemnities are paid on the liability
  example -- 10 percent * 49,940 = 4,940 payment

* Average yields are developed by taking field samples of approximately 25 percent of the farmers within the zone

* Quality is factored into losses by using an indexing program to adjust area yield. Quality values are samples for a region (regions include several zones) and every zone within the region receives the same adjustment.

* Farmers are also insured against spot losses for hail, freeze, tornados, and floods. When 5 percent within a zone have a loss, a new zone is created for the loss only.

Additional Comments on the Quebec Area Loss Program for Field Security:

-- The sampling method appears to have been developed much like we would expect under Bureau of Census or NASS in the U.S. That is, the method is based on the relative variability and the number of samples required to achieve an estimate that's within a stipulated percent of the true, but unknown average yearly yields. The 25 percent sample strikes us as more extensive than necessary and relatively expensive. We also need to recognize that the farms in Quebec tend to be small.

-- The quality issue is addressed, but the adjustment is made with substantially less precision than is true for the estimates of yield. They base their estimates of yield on the standing crop

in the field, not the harvested crop. This does not cause particular difficulties since losses are based on a percent, not on the actual amount. The quality adjustment is based on a number of somewhat subjective factors, including the experience of sampling laboratories in the area receiving feed samples.

-- The Farmers Union clearly played an important role in selling this program initially, it was an offer of last resort when initiated in 1977, and the FU has contributed to the design of the zones. Discussions with farmers since we have returned suggest that if a program were implemented somewhat along these lines in the U.S., it would begin with high value alfalfa in the lake states area -- Minnesota, Wisconsin, Michigan, New York, Pennsylvania, perhaps with a portion of Iowa. The program implementors should work with the dairy cooperative leadership to get the program off the ground if it is worth doing.

Other Discussion Points

The forage program throughout Canada has been one of their difficult programs over the years. The Ottawa staff indicated that individual programs were essentially a failure anywhere they had been tried. The programs that are now in place are some variant of an area program, with some of these being very new.

Ontario is experimenting with a program in which a computer model, using weather station data, is used to estimate an index of yields for calculating percentage area losses. It remains problematic whether growers can be convinced that a computer model can be used to simulate yields well enough to be believable versus actual samples. Participation in this program is very low.

The Quebec staff have also considered the computer model approach for some issues. In our experience using models somewhat like these individuals have used, the approach probably will work for some areas for which they have been calibrated for drought such as the 1988 drought. They will not respond to excess moisture, however, nor do they deal with winter kill. They probably provide a good method of getting an index of quality in a relatively inexpensive way, and one that may be more accurate than the current Quebec program. Our review of the Quebec winter kill policy is in a very early stage. However, in discussions with U.S. agronomists there are a large number of management factors including fertility and cutting system management that have a very large impact upon the risk of winter kill. The prospective of both moral hazard problems and adverse selection are significant for these policies; we did not get a good reading from the Quebec people as to the extent of these problems there.

In summary, we learned a good deal from our trip that we will be attempting to apply to the U.S. needs. In addition to the Quebec program we learned about forage programs from other provinces. At this point, we are considering a trip for Black to Alberta and for Skees to Sweden to learn more about these types of programs. We have material from Alberta and are waiting for material from Sweden to make the final decision.

OTHER AGRICULTURAL ECONOMICS RESEARCH PUBLICATIONS

No. 93-04	Price Transmission Processes: A Study of Price Lags and Asymmetric Price Response Behavior for New York Red Delicious and McIntosh Apples	Michelle R. Hansmire Lois Schertz Willett
No. 93-05	A Survey of Recruitment & Selection Practices in Florist Crop Production Firms	Thomas R. Maloney Robert A. Milligan Kristine T. Petracek
No. 93-06	Agricultural Diversity and Cash Receipt Variability for Individual States	Loren W.Tauer Tebogo Seleka
No. 93-07	Valuation of Plant Variety Protection Certificates	William Lesser
No. 93-08	Evaluating U.S. Generic Milk Advertising Effectiveness Using an Imperfect Competition Model	Nobuhiro Suzuki Harry M. Kaiser John E. Lenz Olan D. Forker
No. 93-09	An Analysis of Alternatives to the Dairy Price Support Program	Harry M. Kaiser
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No. 93-11	Dairy Farm Management Business Summary New York State 1992	Stuart F. Smith Wayne A. Knoblauch Linda D. Putnam
No. 93-12	Supermarket Prices Redux	R. Chi W. Lesser
No. 93-13	The Structure of the Milk Hauling Industry in New York and Pennsylvania	Eric Erba James Pratt Walter Wasserman