Will Freedom to Farm Harm the Environment?

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corn price was higher than the February price, the price gain helped offset some yield losses enough to drop IP indemnities below those for MPCI. This illustrates that an IP type of revenue insurance may pay lower or higher indemnities than yield insurance, depending on market conditions and intra-year price movements. A CRC insurance, with replacement cost coverage and a two-tiered price structure, generally pays at or above MPCI.

This article provides an historically based examination of the indemnity performance of the two new revenue insurance products, Crop Revenue Coverage and Income Protection. The study poses the question: if these products had existed in the recent past, how would they have performed? Their likely performance was also compared to that of traditional yield insurance. The results are that the indemnity structure for these packages varies from year to year, but distinct patterns can be discerned coinciding with realized yields. Even though this analysis is based on historical data, the patterns displayed should shed light on the future performance of these products. It is hoped that this information, along with a farmer's knowledge about his/her risk structure and insurance premium information, can provide guidance in selecting the most appropriate crop insurance product.

Special Articles

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While the effects of the new farm program vary dramatically by location, overall environmental effects from the new legislation are small (primarily because key environmental provisions were continued in the new farm bill). This conclusion appeared in a recent study (RAPS 1996: Agricultural and Environmental Outlook) conducted by researchers at the Center for Agricultural and Rural Development (CARD), Iowa State University. Researchers who examined the likely environmental impacts of the new farm legislation believe their conclusions will help dispel the worry that increased farmer freedom might lead to increased environmental degradation.

The first task for researchers was to evaluate how farming practices will change with the new farm legislation. Farming strategies, including how farmers till their land, rotate their crops, and use soil conservation practices, have a large impact on indicators of environmental quality. The CARD environmental outlook study examines the likely effects of the new farm program on five indicators of environmental quality in a 12-state region of the Upper Midwest, ranging from Kansas in the southwest to North Dakota in the north, and Ohio in the east. The five indicators are: wind and water erosion rates, nitrate-nitrogen lost to surface runoff and leaching, and the level of soil organic carbon, which serves as a broad indicator of soil health.

Under the 1996 farm legislation, we should expect farmers to plant fewer acres in crops that received large subsidies from the old program, and more acres in crops, such as soybeans, that did not. But the old farm program also restricted how much of these crops a farmer could plant. So the government was encouraging production with its subsidies and discouraging production with the accompanying planting restrictions.

Under the old program, the government further restricted production with the Conservation Reserve Program (CRP), which pays farmers to not plant crops on environmentally sensitive acreage. The new program allows many farmers to take their land out of the CRP and grow crops on it. The projected net effect of removing planting restrictions, allowing farmers to plant their CRP land, and eliminating crop subsidies is that farmers in the Upper Midwest will plant more corn, wheat, and soybeans, but less barley and oats.

Logically, increased acreage of corn, wheat and soybeans should lead to increased use of fertilizer, higher levels of soil erosion and, because of the conversion of CRP land, lower rates of soil organic carbon. That is, environmental damage from agriculture should increase under the new farm program. However, there are certain countervailing forces at work which will help reduce the environmental damage.

For example, farmers who receive the fixed government payments must continue to follow their Conservation Compliance plans, and these plans can substantially reduce soil erosion rates on susceptible lands while simultaneously lowering farmers' costs. Moreover, all land removed from CRP must be cropped according to an approved plan. These provisions should help limit increases in soil erosion rates.

Farmer decisions play a role as well. Now that they no longer have an incentive to grow crops that receive heavy subsidies, farmers should respond to the new farm program by increasing their use of crop rotations.
In general, crop rotation reduces average chemical use, increases yield, and can reduce soil erosion rates. For example, corn acreage is projected to increase, but so too is the proportion of corn planted in a corn-soybean rotation. Such a rotation actually reduces nitrogen fertilizer applications, and a corn-soybean rotation encourages adoption of no-till systems, which also reduces soil erosion. Thus, the net environmental effects of the new farm program are not easy to estimate.

Results from the CARD study indicate large regional and intra-regional differences in the net environmental impact of the new farm legislation. For example, water erosion rates are projected to increase modestly by an average of about 4 percent over 1992 rates in the 12-state region. But in the Cornbelt states of Illinois, Indiana, Iowa and Missouri (which contain most of the highly erodible land), erosion rates are projected to increase by an average of less than 2 percent.

These averages mask large projected changes within the states. Erosion rates in parts of southern and western Iowa, southeastern Wisconsin, and northwestern Missouri — areas that are prone to high erosion rates — are projected to increase by 10 to 40 percent. These increases are countered by significant decreases in erosion rates in some major crop producing areas of northern Iowa and southern Missouri, southern Kansas, eastern Illinois, and Indiana. The geographical disparity in erosion rates illustrates the different forces at work in determining soil erosion rates.

Tillage practices are projected to move towards soil-saving, reduced, and no-till practices, and away from traditional fall and spring tillage in all regions. In areas that are not prone to high erosion rates, such as the major production areas just mentioned, this movement more than offsets the soil erosion increases from reduced CRP land and increased crop acreage. In other areas, the movement toward reduced tillage is not enough to counter the forces that increase soil erosion.

Changes in the other environmental indicators also show large regional and intra-regional differences. Average wind erosion rates are projected to decrease by more than 3 percent across the 12-state region. But, much of the decrease in average rates is a result of increased adoption of conservation practices and greater use of high-residue management in the Cornbelt and Lake States, two regions that are not susceptible to wind erosion. The average wind erosion rates in North and South Dakota, Nebraska, and Kansas, are projected to increase by about 2 percent, in part because of the increased use of summer fallow in some wheat-growing areas.

Nitrogen fertilizer use is projected to increase by 15 percent in the 12-state region because of additional corn and wheat acreage. But, because of projected increases in soybean-based rotations, the projected increase is smaller than what might be expected given the increased corn and wheat acreage. Will increased nitrogen use lead to more nitrate runoff and leaching? The relationship between nitrogen applications and nitrogen loss is too complex to make such an unqualified conclusion. Management and land conditions both play a critical role in determining nitrate losses.

The CARD study projects a small decrease in per-acre loads even with the increase in nitrogen fertilizer applications. Average nitrate runoff rates meanwhile, are projected to decrease by about 14 percent below the 1992 level. These surprising results are due to two factors. First, projected changes in crops and crop locations are favorable in terms of matching high fertilizer-using crops to areas where runoff and leaching are less of a problem. Second, continued enforcement of Conservation Compliance results in reduced nitrate runoff that is associated with high water erosion rates.

Continuation of Conservation Compliance under the new program is also responsible for a projected decline in the rate at which other chemicals are used. Under a continuation of 1992 practices, 14.8 tons per acre of herbicides, 14.8 tons per acre of fungicides, and 14.8 tons per acre of insecticides would be used annually. Under the new farm bill, projected annual losses are reduced by about 30 percent in the Cornbelt, 26 percent in the Lake States, and by about 7 percent in the Northern Plains.

CARD's findings support the idea that agriculture's impact on the environment depends upon complex interactions between government policy, farmer decisions, and land and climate characteristics. Good estimates of the environmental effects of the major change in agricultural policy that occurred this past spring can only be obtained by carefully tracking farmer decisions and the resulting environmental changes at many locations in the region.

RAPS 1996: Agricultural and Environmental Outlook, which includes many full-color maps showing the location of environmental changes, can be viewed on the World Wide Web at this address: http://www.ag.iastate.edu/card/RAPS