

# Extension Programs in Crop Insurance: A Maryland Case Study

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Many states have crop insurance extension programs. This activity has been stimulated with the availability of funds to support extension from the Risk Management Agency (RMA) of the U.S. Department of Agriculture. Several new RMA programs were established under the Agricultural Risk Protection Act of 2000. The Targeted States Program is quite important for the Northeast. This program serves states that were traditionally underserved by crop insurance. It is available in all 12 northeastern states, plus Nevada, Utah, and Wyoming. The Targeted States Program funds one program in each state. A total of \$4.5 million in funding is available each year. Amounts for state programs range from \$157,000 in Rhode Island to \$754,000 in Pennsylvania, which is a considerable amount of funding.<sup>1</sup>

The Targeted States Programs are funded with cooperative agreements that involve substantial involvement of RMA in the activities. These cooperative agreements are with state departments of agriculture, universities, and consulting firms. The Maryland cooperative agreement is with the Maryland Department of Agriculture. The University of Maryland is a subcontractor on this project. The Maryland Department of Agriculture focuses on promotion utilizing newsletters, advertisements, postcards, a calendar, and other

methods. The University of Maryland focuses on the educational program in the state.

The purpose of this paper is to review the Maryland educational programs under the Targeted States Program. Among the extension activities are regional workshops, short presentations at other educational programs, an educational booth with handouts, and county extension activities. In addition, the University of Maryland has had multistate activities with the University of Illinois, the University of Minnesota, and the RightRisk Group. These activities are discussed below.

## Regional Workshops

The Maryland regional workshops had multi-county audiences and were held from 9:30 a.m. to 12:30 p.m. during the first two years of this educational program in the winter seasons of November through February of 2001–2002 and 2002–2003. Major extension educational events are held during these periods because farmers in Maryland are not then involved in crop field operations. The purpose of these workshops was to increase farmers' understanding of crop insurance. Local arrangements for the meetings were made by local county extension offices and were coordinated by a part-time extension associate who is a retired regional farm management extension specialist.

The 2001–2002 programs involved two workshops to orient county extension educators to crop insurance. These two workshops were preliminary to nine farmer workshops. Three of those farmer workshops were held on the Eastern Shore, one in Southern Maryland, two in Central Maryland, and three in Western Maryland. The work-

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<sup>1</sup> The 2008 call for proposals is available on the web at <http://www.rma.usda.gov/news/2008/01/targetedstates.pdf>.

shops were designed to introduce extension educators and farmers to crop insurance. Major presentations were made by RMA personnel. Premium subsidies were increasing for 2002, and that was emphasized in the presentations. Limited farmer responses were observed from this educational activity. In 2002, total number of policies increased to 4,419 from 4,231 in 2001, insured acreage increased to 687,000 acres in 2001, and total crop insurance liabilities increased to \$128 million from \$105 million in 2001.

This first year of education did have good timing. Maryland had a major summer drought in 2002 so large indemnities were paid. The total payments were \$23.4 million; the previous high was \$8 million in 1999. The farmer loss ratio, which is total indemnities divided by total premiums, was 7.7 for 2002. This outcome can be interpreted as farmers receiving \$7.70 for every \$1.00 premium paid, which is a favorable outcome.

The second year of workshops in the 2002–2003 winter season considered several topics. An overview of crop insurance was presented again. This overview focused on the favorable payoffs for insurance in 2002. A presentation on the interaction of crop insurance and grain marketing was also included. In addition, case studies of the performance of crop insurance over time were presented. These case studies were designed to overcome the typical farmer view that “I bought crop insurance this year and didn’t get a payoff so never again.” One of these case studies—with a dramatic outcome, for soybeans—is presented below.

With the combination of the 2002 drought and the additional year of educational programs, participation increased again in 2003. The total number of policies increased from 4,219 in 2002 to 4,419 in 2003. The total protection in force rose from \$128 million to \$167 million. Acres insured went from 687,000 to 708,000. The acres insured increased about 3 percent, while the protection in force increased about 30 percent. Obviously, farmers significantly increased their coverage levels as part of these experiences. Indemnities were \$11.3 million in 2003, which was not as much as the previous year. The farmer loss ratio was still 3.37. Overall, having crop insurance paid again in 2003.

### Case Study of the Performance of Crop Insurance Over Time

This case study was based on yields from a farm on the Eastern Shore of Maryland. In 2002, this farm had 605 acres of corn, 720 acres of soybeans, and 98 acres of wheat. Yield data were collected for 1992 through 2002. Premiums for 2002 were used for the case study, along with the 2002 price elections, to value losses of \$2.20 for corn, \$5.15 for soybeans, and \$3.15 for wheat. Yields are presented in Table 1. The average yield of 36 bushels per acre was assumed to be the actual production history, which is the insured yield, over this time period. This farm is very productive and has no significant losses in 2002 and 1999, the two most recent drought years in the area. A low yield did occur in 1997.

**Table 1. Case Study of Soybean Yields**

Year	Bushels per Acre
1992	30
1993	37
1994	39
1995	40
1996	45
1997	16
1998	44
1999	34
2000	38
2001	30
2002	35
Average	36

Actual production history (APH), which is a common crop insurance policy, was used in the example. The assumed APH is the average yield of 36 bushels. The yield insured for 75 percent coverage, which is 75 percent of the APH, is 27 bushels; the insured yield for 65 percent coverage is 23.4 bushels. For both coverage levels, losses occurred only in 1997. The loss for 1997 is the actual yield minus the insured yield, which is 11 bushels with 75 percent coverage and 7.4 bushels with 65 percent coverage. Total farm indemnities are obtained by multiplying these losses by the insurance price of \$5.15 and the 1997 soybean acreage of 407. The indemnity is \$23,057 for 75

percent coverage and \$15,511 for 65 percent coverage. The sum of the premiums for these eleven years is \$26,224 for 75 percent coverage and \$13,345 for 65 percent coverage. The net for 75 percent coverage is -\$3,167, and for 65 percent coverage, \$2,076.

This case study showed that the indemnity for one year can more than pay the premiums for eleven years. Farmers need to evaluate the payouts from crop insurance over time rather than for one year. On the summary slide for this presentation the following steps were identified to evaluate crop insurance for a farm: (i) estimate indemnities in previous years, (ii) estimate total premiums during this time period, (iii) subtract total indemnities from premiums, (iv) consider cash-flow benefits in drought years, and (v) try different kinds of insurance.

### **Educational Activities in Subsequent Years**

Crop insurance workshops were not held in 2003–2004 and subsequent years. County extension educators stated that the farmers were satiated with the topic after two years, which is not unusual in extension. Crop insurance presentations were included in two regional broiler risk management workshops and four regional dairy management workshops. Eleven short presentations about crop insurance were also presented at state, regional, and county farmer meetings. Short presentations were also made in the subsequent years of 2004–2005, 2005–2006, and 2006–2007. The Maryland Department of Agriculture developed a crop insurance booth. The extension associate for this project took the booth along with handouts to a number of meetings. For example, in 2006–2007 he attended 16 meetings.

An annual Crop Insurance Industry Conference has also been initiated. These meetings are typically held in late summer or early fall. The targeted audience includes employees of crop insurance companies who work in the state, extension educators, educators involved with the targeted state program in surrounding states, and other interested individuals. Presentations are included on crop insurance updates and announcements. Speakers involved with crop insurance from the U.S. Department of Agriculture and other universities are also invited to the meeting. For example, Joseph Atwood from Montana State Univer-

sity and Bruce Sherrick from the University of Illinois spoke at the 2005 conference.

County extension educators are also involved in this program. Small open-ended grants are made to interested counties. As stated earlier, the county educators made local arrangements for the workshops. They also organize county and regional meetings that include crop insurance. In addition, they include crop insurance articles and announcements in their county newsletters and give informal information and advice to farmers.

### **Crop Insurance Decision Aids**

Crop insurance decision aids were developed with the cooperation of the University of Illinois and are available on its website.<sup>2</sup> These decision aids are for corn, soybeans, and wheat. Originally developed for Midwestern states, Maryland was added to the site. For Maryland, the site includes a Premium Calculator, a Payment Simulator, and a “What If” Simulator. These decision aids for Maryland have been available for three years, 2005–2007. Postcards are mailed to farmers to inform them that these decision aids are available. They are also publicized through county extension offices.

The Premium Calculator gives insurance premiums for corn, soybeans, and wheat using an individual farm APH for all counties in Maryland. It gives premiums for all insurance products sold in that county for all coverage levels between 50 percent and 90 percent. It is very user-friendly compared to the premium calculator on the RMA’s website.

The Payment Simulator utilizes a stochastic program to evaluate available crop insurance products and coverage for all Maryland counties. The Simulator uses case study farms that produce corn and soybeans. Output includes premium costs, percentage of time that indemnity payments occur, the average indemnity payment, and the net cost of the insurance that takes into account premiums and indemnities. Risk is evaluated with Value at Risk at the 1 and 5 percent levels.

The “What If” Simulator allows Maryland farmers to evaluate a range of outcomes for prices, yields, and crop insurance products. State, county, crop, and APH are inputs to the program.

<sup>2</sup> See <http://www.farmdoc.uiuc.edu/cropins/index.asp>

Analysis is then based on the user projections for farm and county yields, harvest price, and basis. Outputs are included for all insurance products and coverage levels. The outputs include the insurance premiums, estimated insurance indemnities, and projected crop revenue plus insurance indemnity minus insurance premium. The simulator allows users to obtain these outputs for different projections on yield and price that can be inputted in a sequential manner.

### Winning the Game

“Winning the Game” is a grain marketing game that was developed by the Center for Farm Financial Management at the University of Minnesota.<sup>3</sup> The Center has a set of workshops that provide an introduction to basic marketing concepts. With this background, participants participate in a game where marketing decisions are made either before or after harvest. The game allows them to make decisions based on adaptations of actual prices during a period and then observe the outcomes at the end of the planning period. Workshops are concerned with either pre-harvest or post-harvest market decisions. Mid-Atlantic scenarios have been developed that are used in Maryland in cooperation with Delaware, New Jersey, and Pennsylvania. Groups of county extension educators lead regional workshops that are similar to those used for crop insurance. The workshops meet for two to four hours on one day. They have been very popular extension programs in Maryland.

Crop insurance is only one component of the pre-harvest game. The title of this game is Launch Your Pre-Harvest Marketing Plan. The marketing plan uses sequential marketing plus forward pricing along with cash sales at harvest. The workshops begin with a discussion of marketing plans and strategies to be used in the plans. Next, crop insurance is discussed. Then, the instructors and participants each develop a marketing plan to be used for a crop this year. The game is then played over a typical marketing season. The marketing season consists of dates and available prices beginning in the winter before planting. The prices are then revealed in a sequential manner by time, and participants implement their marketing plans as the prices are revealed. Out-

comes are determined as cash and forward prices are revealed. Participants then have an opportunity to compare the revenue from their plan with other participants.

The crop insurance component begins with an overview of the different crop insurance products. The details of APH and crop revenue coverage (CRC) are then presented, including a comparison of how they work in an actual scenario. Next, the integration of crop insurance and marketing is presented. Finally, the decision rule combining crop insurance and marketing is that the strategy of the game is to forward contract the amount of production that is protected with crop insurance. Crop insurance then can protect against yield shortfalls that drop production below the insured amount.

An example from the curriculum concerns 600 acres of soybeans with an APH of 42 bushels per acre. The crop insurance selected is 75 percent coverage of revenue insurance so that the insured production is 18,900 bushels, which is 75 percent of the product of 42 bushels and 600 acres. This amount is forward priced at \$6.00 per bushel. Suppose production is only 15,000 bushels. Because of the low yields throughout the production region, the harvest price is \$7.80. Then, the shortfall on the forward contract of 3,900 bushels costs \$30,420 to fill. If the insurance indemnity is \$31,200 and the premium is \$6,822, then the net proceeds from the insurance is \$24,378, which replaces much of the cost of the shortfall. Thus, crop insurance provides a safety net that allows one to forward contract a high percentage of the expected crop.

### RightRisk

The RightRisk organization<sup>4</sup> is a group of Western agricultural economists. They have developed a simulator, Ag Survivor Simulation Game. Currently, the game includes a number of Western ranch and farm scenarios. The game includes both production and marketing risks with stochastic prices and production. A Mid-Atlantic crop scenario is now being developed. The simulation game is played with small groups as teams in an extension scenario to demonstrate the effect

<sup>3</sup> See <http://www.cffm.umn.edu/wtg/>.

<sup>4</sup> See <http://rightrisk.org/>.

of risk management strategies on cash income in risky situations.

An example scenario is Wheatfields, which is a wheat and beef cow-calf production situation. The different sources of risk in the scenario include winter weather conditions, global production reports, a late freeze, a late hail storm, national export news, a planted wheat acres report, and global production reports. An example probability distribution for winter conditions is 20 percent for severe conditions, 60 percent for normal conditions, and 20 percent for mild conditions. Simulator decisions include to buy hay in fall, to forward price wheat, to forward price calves, and whether to sell wheat at harvest or store it. Simulator outputs are cash net income for two years and summary of repeated runs with the same decisions. In an extension workshop, presentations would be made on different sources of risk and risk management strategies. Then the groups would practice with the game. After the game is completed, a discussion would occur about different levels of income and how income level relates to decisions. The participants can then replay the game using the strategies associated with the highest incomes.

### **Conclusions**

As with most extension programs, the Maryland crop insurance program had diverse educational

activities. Some increases in policies and coverage were observed as this program evolved. Maryland is a small state with limited extension faculty and staff so the interstate cooperation with the University of Illinois, the University of Minnesota, and the RightRisk group was crucial in providing computer educational programs. Corn and soybeans comprise the major crop acreage in Maryland, which facilitated cooperation with the Corn Belt states. Other states with cooperative agreements under the Targeted States Program of the Risk Management Agency had similar and also different activities.

The funding under the Targeted States Program was very important for these educational activities in a small state with limited extension funds. The funds paid for meeting rooms, travel, handouts, and guest presenters from other states. It also provided summer salary for the author of this paper so that he could continue with the program during the summer rather than being diverted to other activities. The funds also paid for a part-time extension associate who had a key role in coordinating and delivering the educational activities and for grants to county extension educators to cooperate with the crop insurance education program. Finally, the grant provided funds for interstate cooperation that added important dimensions to the program. The crop insurance program would not have been possible without these funds.