

IMPACT OF THE 2008 FLOODS ON CROP INSURANCE

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EDITOR'S NOTE: Extreme precipitation in late April and May caused severe flooding across significant portions of the Midwest in June. Perhaps hardest hit from the point of view of crop insurers and reinsurers was Iowa. In the article, Jack Seaquest and Dr. Oscar Vergara offer an estimate of insured losses as generated by the AIR Multiperil Crop Insurance Model and enhanced with AIR's CropAlert Growing Conditions Report and yield forecasts.

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AIR produces a weekly CropAlert™ Growing Conditions Report during the growing season to update the marketplace on expected per-harvested-acre yields of the two most important insured crops: corn and soybeans. The update is based on the observed growing conditions during the previous week. In the same weekly e-Report, AIR also provides an enhanced yield forecast by incorporating weather projections from AIR's seasonal forecast model for the next month forward. These forecasts are provided for selected states and for the U.S. as a whole.

This year there has been an increased interest in the weekly reports due to the volatility in the grain futures market, partly caused by the extreme precipitation and resultant flooding that has occurred in parts of the Corn Belt. Crop insurers and reinsurers are particularly interested in potential losses. This report extends the information provided in the most recent weekly report to provide an estimate of the potential insured losses in the most heavily impacted state—Iowa.

The Department of Agriculture provides for Multiple Peril Crop Insurance (MPCI) through the Risk Management Agency (RMA) and its Federal Crop Insurance Corporation (FCIC). MPCI protects against low yields or low quality due to adverse weather and damage from insects and disease. Farmers have choices among many policy types and coverages, including limits, covered crops, policies based on group versus individual results and on revenue versus yield. The government subsidizes the farmers' premiums. The government also provides a complex reinsurance structure to the participating private crop insurers. Under the Standard Reinsurance Agreement (SRA), the government both shares and limits losses, and shares underwriting gains. Crop insurers also assign individual policies to one of three funds: the Assigned Risk Fund, where most of the risk and the premiums are transferred to the government; the Commercial Fund, where most of the risk and premiums are retained; and the Developmental Fund, which is in between. Insurers' retention percentages, maximum loss, and maximum gain in each of these funds vary by state. There is also a cap—which also varies by state—on the percentage of a book allowed to be placed in the Assigned Risk Fund.



Crop insurers are left with the risk from the retained portion of their business, subject to the SRA participation in losses and gains.

AIR MULTI PERIL CROP INSURANCE MODEL

Crop insurance modeling is of most relevance during the critical points in the crop insurance cycle, all before actual planting occurs. As shown in the figure below the AIR MPC model uses long-term historical yield information and the corresponding detailed historical weather observations over the course of each growing season, as captured by the AIR Weather Index (AWI), to isolate the technology trend and develop a detrended crop yield probability distribution for each modeled crop in each county—all projected to the upcoming crop season. At that point in time there are still no projections of actual weather conditions for the upcoming season.

A crop insurance “event” as defined in the AIR model is the set of yields and the price obtained by the producers at the time of harvest. The model generates a catalog of 10,000 potential year-end outcomes, including the yield in each county and the overall year-end price. The AIR crop event catalog captures the yield correlations between crops and between neighboring counties in order to capture the effects of widespread weather events. The model also includes a model of changes in price between the commodities futures price at planting time and the ultimate price at harvesting time. This is largely driven by the outcome of the total production determined at harvest. Of course, it is also subject to other market forces represented by stochastic variability.

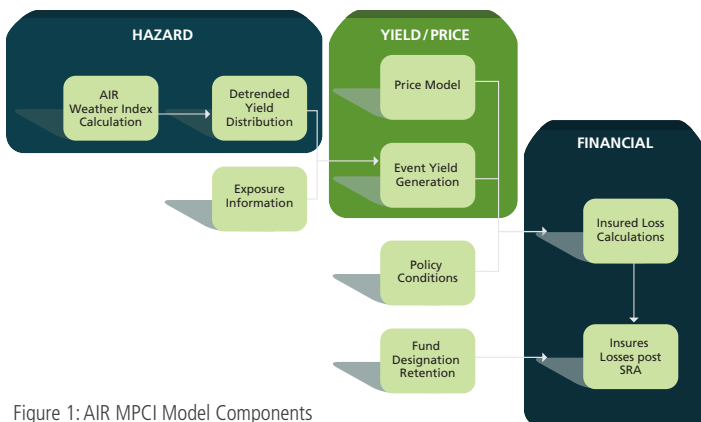


Figure 1: AIR MPC Model Components

In the financial component of the model, the crop insurance policy conditions are applied to the modeled yield and price scenarios on a county-by-county basis to calculate the potential indemnities. These are aggregated at the state

level in order to quantify the gross insured losses from a book of business. Because the insurance market is mostly interested in the retained company losses, the portfolio losses are primarily reported on a post-SRA basis once the reinsurance protection offered to the industry by the SRA has been accounted for. The insured loss calculation output provides a range of potential losses on the crop insurance portfolio and the corresponding probability that each level of loss will occur. The information is presented as exceedance probability curves and as average annual losses. In the crop insurance industry, loss ratio post-SRA is the primary standard measure of profitability (retained losses divided by retained premium). A loss ratio less than 100% is a profit; above 100% is a loss.

IOWA CORN

The State of Iowa has taken the brunt of the excess precipitation experienced in the Corn Belt so far this year. The following maps show the progression of the crop moisture index over the past 6 weeks. By mid-June, nearly the entire state was excessively wet. However, the most recent two weeks show a return to normal conditions. This improvement coincided with the final opportunities for replanting corn or planting soybeans in Iowa.

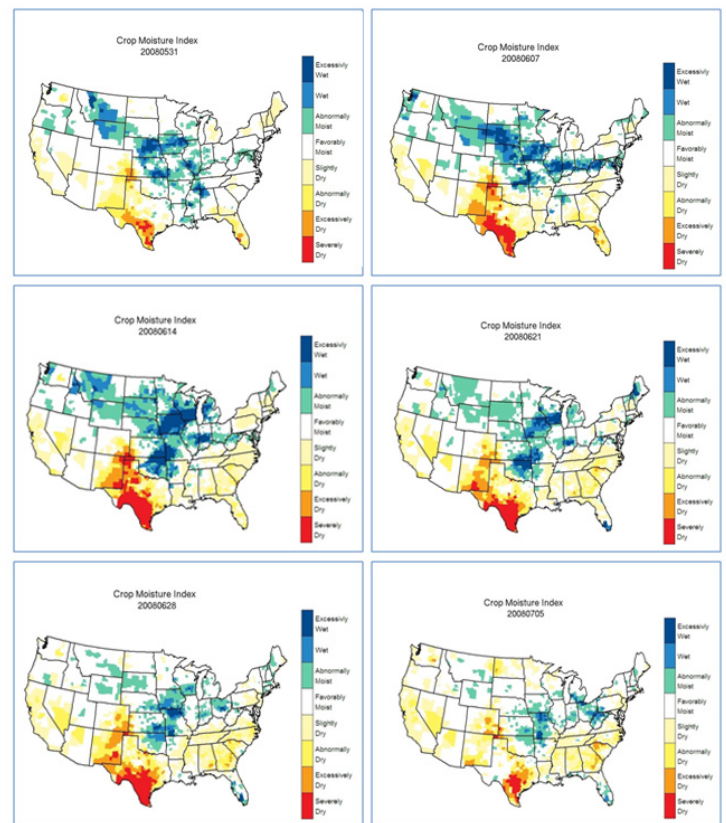


Figure 2: Crop Moisture Index, Week Ending 5/31/2008 to Week Ending 7/5/2008 (Source: AIR)

As a result of this improvement, AIR's current forecast, which was 170.5 bushels per harvested acre prior to the planting season, bottomed at 125.8 at the end of June, but rebounded to 130.4 bushels per harvested acre as of July 5. Taking into account the AIR long term seasonal weather forecast, the enhanced yield forecast is now at 157.5, a still low but closer to normal result, indicating significant opportunity for improvement if the weather in July is as forecasted by AIR.

**AIR Corn Yield Estimates for Iowa
 (bushels per harvested acre)**

As of date	Current yield forecast (based on observed growing conditions to date of report)	Enhanced yield forecast (considers weather projections from AIR seasonal forecast for the next month forward)
June 7	155.2	143.9
June 14	130.5	149.9
June 21	126.3	150.0
June 28	125.8	151.2
July 5	130.4	157.5

Source: AIR

The potential losses for insurers depend on the types of coverages chosen by the farmers on the policies retained by those insurers. In recent years there has been a trend to revenue-based policies, which extend exposure to the price fluctuations. Revenue-based policies can be based on either the harvest price or the planting price, but most producers choose the harvest price option. With the harvest price option, a deficiency in yield causes a proportionately higher loss with any increase in price. With the planting price option, a higher price at harvest can make up for yield deficiencies as the revenue guarantee is a fixed quantity; however, a lower price together with a lower yield may increase a claim substantially. The AIR MPC1 model accounts for price changes and the current mix of policy types in the marketplace.

In Iowa, the AIR model, using the most recent observed conditions as of July 5, anticipates a loss ratio of 129% post SRA. However, looking solely at scenarios with price increases within the range of this season's price fluctuations, the expected loss ratio is increased to 132% due to the harvest price guarantees in those policies. In dollar amounts, a loss ratio in this range represents industry losses of approximately \$1.1 billion in Iowa. As noted above, the forecast trend in weather conditions should increase the yields and effect a decreased loss ratio.

HISTORICAL COMPARISON

How does the loss potential for this year compare to 1993, when floods caused such extensive damage that the entire state of Iowa was declared a disaster area? Of course they were different events, affecting different areas, and occurring at different stages of the growing season, and also the MPC1 program was different then. The policy conditions were different and the choices made by the producers were different. For comparison purposes, AIR has recast the industry losses as if the yield reduction and relative price outcome of 1993 were to occur under the current program conditions, premium volume, and fund allocations. The result for Iowa would be a loss ratio of 277% on a gross (pre-SRA) basis and 167% on a post-SRA basis. This compares to the actual gross (pre-SRA) loss ratio for 1993 of 465%. The difference is due to changes in policy conditions and premium rates since 1993.

Thus the current situation, though forecasting a loss in Iowa, is not anticipating a loss as severe as would be a recurrence of the 1993 floods.

AIR will continue to provide yield estimates for corn and soybeans on a weekly basis through the growing season and distribute them via the CropAlert Growing Conditions Report.

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