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## Modest Crop Insurance Payments Likely in Illinois for 2014: Calculation of Break-even Yields

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Harvest prices used in calculating revenue on corn and soybean crop insurance policies will be much lower than projected prices used in calculating crop insurance guarantees. Lower prices decrease revenues potentially causing crop insurance payments. However, yields will be above average over much of Illinois. Even with high yields, revenue crop insurance payments will occur for some farmers insuring at high coverage levels. Overall, crop insurance payments likely will be low in Illinois. In contrast, payments in the western corn-belt will be higher than in Illinois as yields in the western corn-belt are not expected to be as high as in Illinois.

### Projected and Harvest Prices

Projected prices used to set crop insurance guarantees equal the average of settlement prices of Chicago Mercantile Exchange contracts during the month of February. The December contract is used for corn, and the November contract is used for soybeans. The 2014 projected prices are \$4.62 for corn and \$11.36 for soybeans.

Harvest prices equal the average of settlement prices during the month of October. The same contract months used to set projected prices are used to set harvest prices. Since October is not over, harvest prices are not known with certainty. Current price levels of future contract provide fairly accurate estimates of harvest prices.

The December corn contract is trading near \$3.20 per bushel, 69% of the \$4.62 projected price. If actual yield equals the Trend Adjusted Actual Production History (TA-APH) yield, revenue products at 70% and higher coverage levels will make payments when the harvest price is \$3.20.

The November soybean contract is trading near \$9.10 per bushel, 80% of the \$11.36 projected price. If harvest yield equals the TA-APH yield, revenue products will make payments at the 85% coverage level when the harvest price is \$9.10.

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## Break-even Yields

Yields in 2014 will be higher than average, countering falling harvest prices. Table 1 shows break-even yields, below which revenue crop insurance products will make payments (see appendix for the formula for calculating break-even yields). For corn, break-even yields are calculated for an 185 bushel TA-APH yield, near the average TA-APH yield for farms located in east-central Illinois. The break-even yield is 227 bushels per acre for a \$3.20 harvest price given an 85% coverage level. Yield below 227 bushels per acre will trigger payments. Break-even yields decrease with lower coverage levels. The break-even yield is 200 bushels at an 80% coverage level, and 186 bushels at a 75% coverage level.

**Table 1. Projected 2014 Break-even Yields Below Which Crop Insurance Will Make Payments, Revenue Policies.<sup>1</sup>**

Coverage Level	Corn <sup>2</sup>	Soybeans <sup>3</sup>
	Bu./Acre	Bu./Acre
50%	134	36
55%	147	39
60%	160	43
65%	174	46
70%	187	50
75%	200	53
80%	214	57
85%	227	60

<sup>1</sup> Break-even yields = Projected price x TA-APH yield x coverage level / harvest price.

<sup>2</sup> Based on a \$4.62 projected price, a 185 bushels per acre TA-APH yield, and a \$3.20 harvest price.

<sup>3</sup> Based on a \$11.36 projected price, a 57 bushels per acre TA-APH yield, and a \$9.10 harvest price.

For soybeans, break-even yields are calculated for a 57 bushel TA-APH yield, again near the average for east-central Illinois farms. The harvest price used in calculations is \$9.10. At an 85% coverage level, the break-even soybean yield is 60 bushels per acre (see Table 1). The break-even yield is 57 bushels per acre at an 80% coverage level, and 53 bushels at a 75% coverage level.

## Break-even Yields Relative to Harvested Yields

Yields will be exceptional in Illinois. Recent corn surveys indicate an average yield of 223 bushels per acre yield in McLean County, 221 bushels per acre in Champaign County, and 210 bushels per acre in Piatt County ([farmdoc daily, August 26, 2014](#)). All these counties are located in east-central Illinois.

The 210 to 223 projected yields are below the 227 break-even yield at the 85% coverage level. The 210 to 223 projected yields are near the 214 break-even yield for the 80% coverage level, and slightly above the 200 bushel break-even yield for the 75% coverage level (see Table 1). Overall these comparisons suggest that some farmers who insured at high coverage levels will receive corn payments. These payments likely will be modest, as actual yields likely will be near break-even levels.

### Payments outside Central Illinois

Other states likely will not have as good as yields as Illinois. In particular, areas in the western corn-belt could trigger payments. Insurance payments will be higher in those areas. The formula in the appendix can be used to calculate break-even yields.

### Area Crop Insurance Plans

The Area Risk Plan (ARP) bases its payments on county revenue. Most individuals purchase ARP at a 90% coverage level. At a 90% coverage level, many counties could trigger payments. Take McLean County Illinois as an example. McLean County has a 183.3 expected yield. The break-even yield is 240 bushels per acre for a \$3.20 harvest price at a 90% coverage level. The McLean County yield survey projected a 220 bushels per acre yield, 20 bushels below the 240 bushel break-even yield. Sizable payments could occur on ARP policies.

### Summary

The October averaging period for determining harvest prices has just begun. As a result, the break-even levels shown above will change. Break-even yields will increase with lower prices and vice versa. Currently, crop insurance payments at high coverage levels seem likely, but those payments likely will be modest in Illinois. Lower yielding areas will have higher crop insurance payments.

### Appendix: Formula for Calculating break-even Yields

Formula (1) below is appropriate for calculating break-even yields in all situations for Revenue Protection with the Harvest Price Exclusion policies. Formula (1) works for RP policies when the harvest price is below the break-even price. The formula is derived by setting the guarantee equal to revenue and solving for yield. The guarantee equals the projected price times the TA-APH yield times the coverage level. Revenue equals yield time price. The formula is:

$$(1) \quad \text{Break-even yield} = \frac{\text{projected price} \times \text{TA-APH yield} \times \text{coverage level}}{\text{harvest price}}$$

For corn, the projected price in 2014 is \$4.62 per bushel. The average Trend Adjusted Actual Production History (TA-APH) yield across east-central Illinois counties is 185 bushels per acre. The harvest price will be equal \$3.20. At an .85 coverage level, the break-even yields is 227 bushels per acre

$$227 \text{ break-even yield} = \frac{\$4.62 \text{ projected price} \times 185 \text{ bu TA-APH yield} \times .85 \text{ coverage level}}{\$3.20 \text{ harvest price}}$$

When the harvest price is above the projected price, the harvest price is used in calculating the guarantee when the harvest price for RP policies. In this case, the formula in (1) simplifies to:

$$(2) \quad \text{Break-even yield} = \text{TA-APH yield} \times \text{coverage level}$$

### References

Schnitkey, G. "[Will High Yields Rescue 2014 Crop Returns?](#)" *farmdoc daily* (4):162, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, August 26, 2014.