THE ECONOMICS OF Bt CORN IN WISCONSIN

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The Wisconsin DATCP has conducted annual surveys of European corn borer (ECB) populations in Wisconsin corn fields since the 1940's. Using these annual ECB population data and published research (Mitchell et al. 2002, Hurley, Mitchell and Rice 2004), the long-run average percentage yield loss due to ECB in nine Wisconsin regions (crop reporting districts) is estimated (Table 1). However, because ECB populations are uncertain, the random distribution of these yield losses is also estimated to capture the uncertainty in yield losses due to ECB. These yield losses are then combined with USDA-NASS five-year (1999-2003) average corn yields to estimate the long-run average net benefit of Bt corn in each Wisconsin region, assuming a corn price of $2.00/bu and a technology fee of $18/bag ($7.43/ac) (Table 1).

Table 1. European corn borer (ECB) population pressure, yield loss from ECB, average corn yield, average net benefit of Bt corn, and probability that this net benefit is negative for the nine Wisconsin regions and the state as a whole.

Region	Average ECB/plant	Coefficient of Variation ECB/plant	Yield Loss from ECB	5-year Average Yield (bu/ac)	Average Bt Corn Net Benefit ($/ac)*	Probability Negative Net Benefit
NW	0.31	1.20	4.04%	123.8	2.06	57.6%
NC	0.17	1.05	3.46%	119.2	0.66	64.1%
NE	0.25	1.14	3.83%	125.6	1.76	59.1%
WC	0.60	1.48	4.75%	132.8	4.15	50.0%
CN	0.58	1.52	4.69%	125.0	3.44	52.4%
EC	0.29	0.97	4.09%	135.4	2.92	54.0%
SW	0.79	1.30	5.21%	141.8	5.86	44.2%
SC	0.70	1.31	5.04%	139.2	5.27	45.9%
SE	0.68	1.82	4.75%	123.4	3.44	52.7%
State	0.49	0.87	4.80%	133.2	4.28	48.4%

* Assuming $7.43/ac Bt corn technology fee, 20% conventional corn planted as refuge, and a corn price of $2.00/bu.

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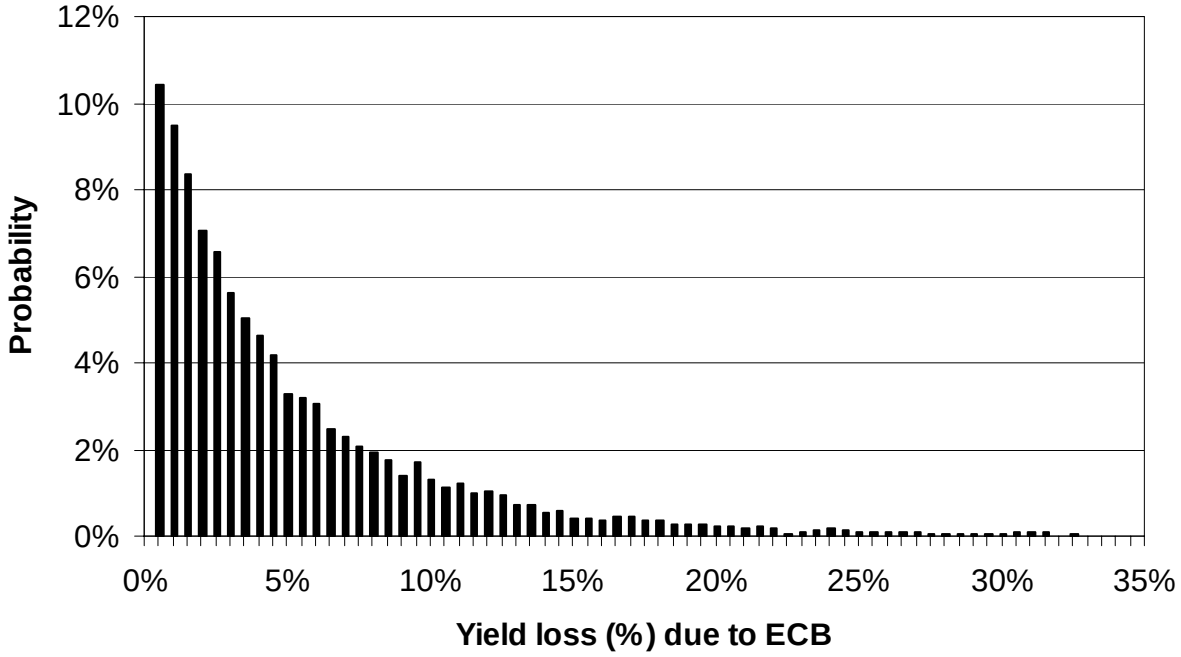
Results indicate that Bt corn on average yields a positive net benefit (value of the yield gain exceeds the cost of Bt corn) for Wisconsin farmers. However, the distribution of yield losses is highly skewed towards low losses (Figure 1). As a result, farmers in most years should expect Bt corn to generate a net loss (cost exceeding the yield benefit), but in years that it does generate a net benefit, the benefits can be quite large, so that on average Bt corn generates a positive net benefit.

The presentation will focus on providing an intuitive understanding of what the results imply for the performance of Bt corn in Wisconsin, as well as explain what the analysis does not include (e.g., yield loss due to lodging).

Figure 1. Distribution of yield loss due to European corn borer in South Central Wisconsin.



References

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