

Section 2  
Foliage & Seed-Feeding & Mining Insects

PREDICTING CORN EARWORM DAMAGE

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This report covers recent research efforts on our project for the management of corn earworm (*Helicoverpa zea*) on sweet corn in the Willamette Valley of Oregon. These efforts have been directed towards improving the damage prediction capabilities of CEWSIM, a computer program for corn growers in the Willamette Valley. CEWSIM is designed to predict the net economic benefit of pesticide applications. The damage prediction model used in CEWSIM is a regression model. This model uses pheromone trap catch and the date of 1st silk as input variables and predicts percent ear infestation. The purpose of our research has been to improve this model by including local crop and terrain information as well as knowledge of regional damage patterns.

Methods used included a pheromone trapping survey, damage sampling, and site mapping. Between May 8 and September 23, corn earworm pheromone traps were placed and monitored every three days in 30 commercial processed sweet corn fields. These fields ranged from Junction City in the South to Salem and Stayton in the North. Each time a trap was checked, corn development was observed as well. Prior to harvest, a minimum of 200 ears from each field were inspected to determine earworm damage levels. Each field was also mapped at two levels of resolution. First, a 0.31 mile (0.5 km) radius around the trap was mapped completely to show every crop, forest, tree row, hill, meadow, and human residence. Second, a 1.55 mile (2.5 km) radius around the trap was mapped only for corn fields and their development stages.

The results of this study can be summarized as:

- 1) The CEWSIM damage prediction program provided a reasonable, though generally conservative prediction of damage levels in 1990.
- 2) A preliminary analysis of regional damage level resulted in no strong regional patterns within the study area. This means we may not have to modify our damage predictions based on what region within the valley the corn is growing.
- 3) A preliminary analysis indicates that greater amounts of corn growing near your field should decrease the damage prediction.
- 4) The presence of wind blocking features north of a corn field does have a significant impact on predicted damage for that field. We define wind blocking features to be things such as tree rows, forests, hills, and buildings. Results of this analysis indicate that the existence of such wind blocking features due north of your field can actually increase the amount of earworm damage you can predict.