

Effects of cropping history on European corn borer abundance in processing sweet corn

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European corn borer (ECB), *Ostrinia nubilalis*, has historically been an important pest of corn in eastern North America. In recent years, ECB populations have decreased; this is primarily attributed to increased adoption of *Bt* corn varieties, leading to areawide suppression of ECB. However, there are still “hot spots” of high ECB populations found near sweet corn fields (Fig. 1). Processing sweet corn does not contain the *Bt* trait so that it can be exported for overseas markets. In order to protect processing sweet corn from ECB, growers make ~1-4 pyrethroid applications per field. If the cause of ECB hot spots can be determined, growers will have a better understanding of risk of ECB attack for an individual field and fields classified as low-risk could receive fewer insecticide applications.

One suggested cause for ECB abundance may be highly concentrated areas of repeated processing sweet corn (*Bt*-free) plantings. Our hypothesis was that processing (*Bt*-free) sweet corn fields in areas where processing sweet corn is grown intensively will have more ECB than those where processing sweet corn is not grown intensively. This hypothesis was tested by monitoring numbers of ECB caught in traps placed in fields meeting these conditions.

Methods. Processing sweet corn fields were monitored for ECB moths using pheromone-baited traps in 2015 and 2016 (Fig. 2). In 2015, 34 fields were monitored and in 2016 36 fields were monitored. Half of the sweet corn fields were located in areas where processing sweet corn had been intensively grown and half in areas where processing sweet corn had not been intensively grown. Two pheromone traps were placed along the edge of each field in a “grassy action sites” where ECB were predicted to be active. One trap included lure for *E*-race ECB, the other included lure for *Z*-race ECB. Traps were monitored weekly for three weeks, targeting the late whorl-early tassel to harvest period when the corn is most attractive to female moths. Results from two “low” traps and three “high” traps were removed from 2016 the analysis because these fields had no yield as a result of the drought.

Results. The difference in ECB *E* trap catch was marginally significant in 2015, but was not statistically different in 2016 (Fig. 3). ECB *Z* trap catch did not statistically differ between the two sweet corn intensity groups in either year (Fig. 3). 2016 was unusual both in terms of the drought and many growers reported high caterpillar pest pressure. A third year of data collection will be needed before conclusions can be drawn about field planting history and ECB pressure. The results from 2015 indicate that it is possible that the *Bt*-free processing sweet corn is providing a refuge for ECB *E* populations,

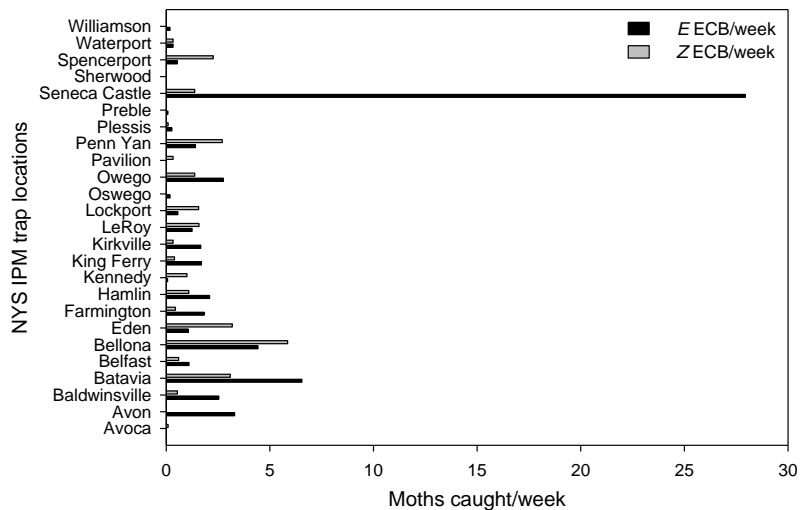


Fig. 1. Trap catches of *E* and *Z* strain ECB recorded from the New York State Integrated Pest Management Sweet Corn Pheromone Trap Network in 2015. Note high levels of *E* strain ECB in Seneca Castle.

resulting in higher ECB *E* catches, where processing sweet corn is grown intensively. Overall, relatively few moths were caught in this study, emphasizing that ECB abundance has substantially decreased over the past decade.

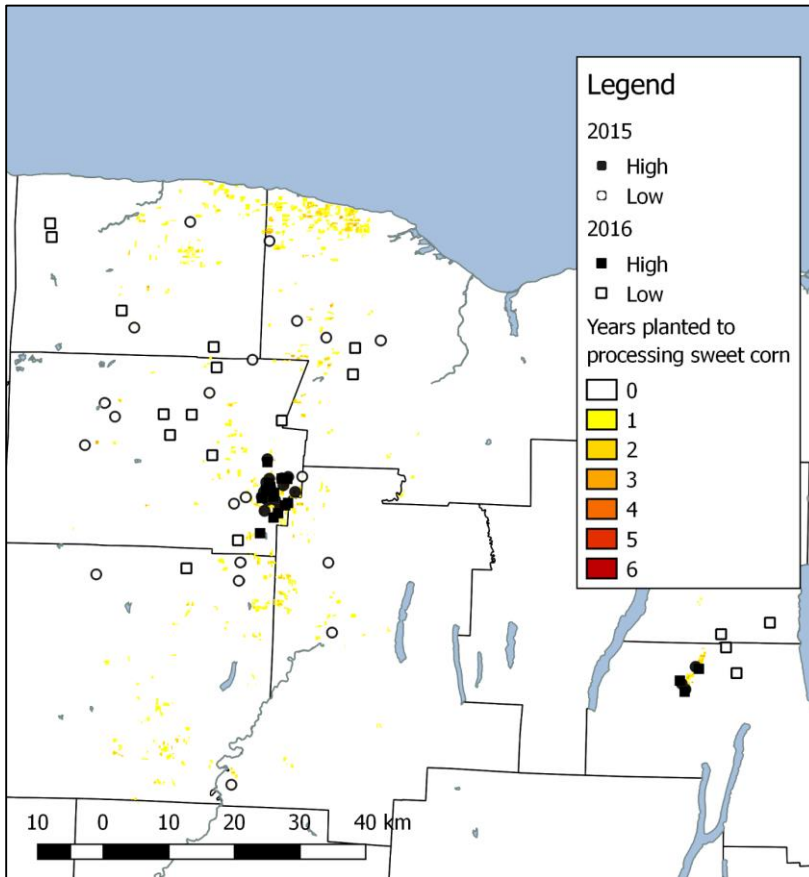


Fig. 2. Locations of processing sweet corn fields in 2015 and 2016. The processing sweet corn intensity is indicated by a black (high) or white (low) shape. Map shading indicates the number of years an area was planted to processing sweet corn.

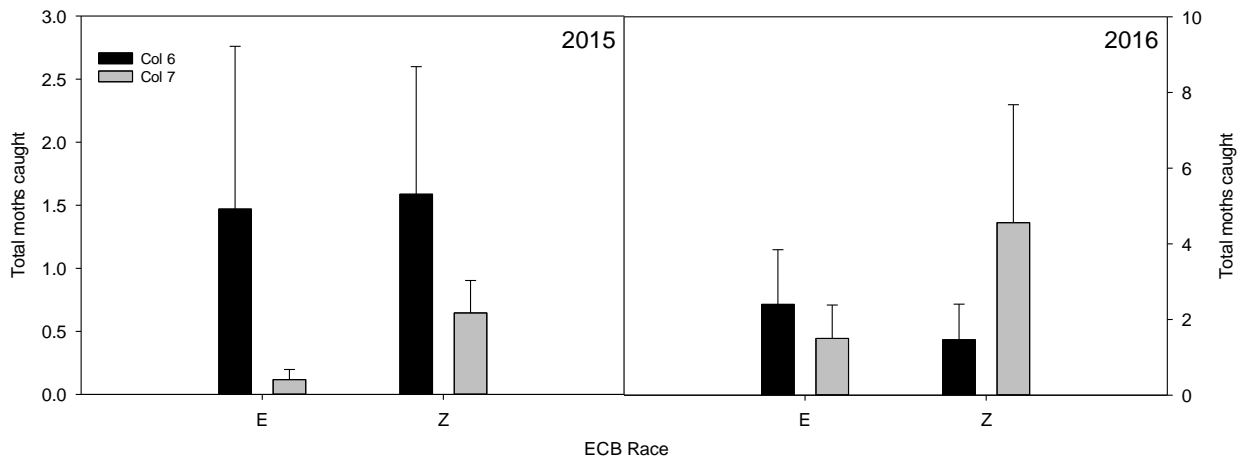


Fig. 3. ECB *E* and *Z* caught in processing sweet corn fields in high and low sweet corn intensity areas (2015 and 2016).