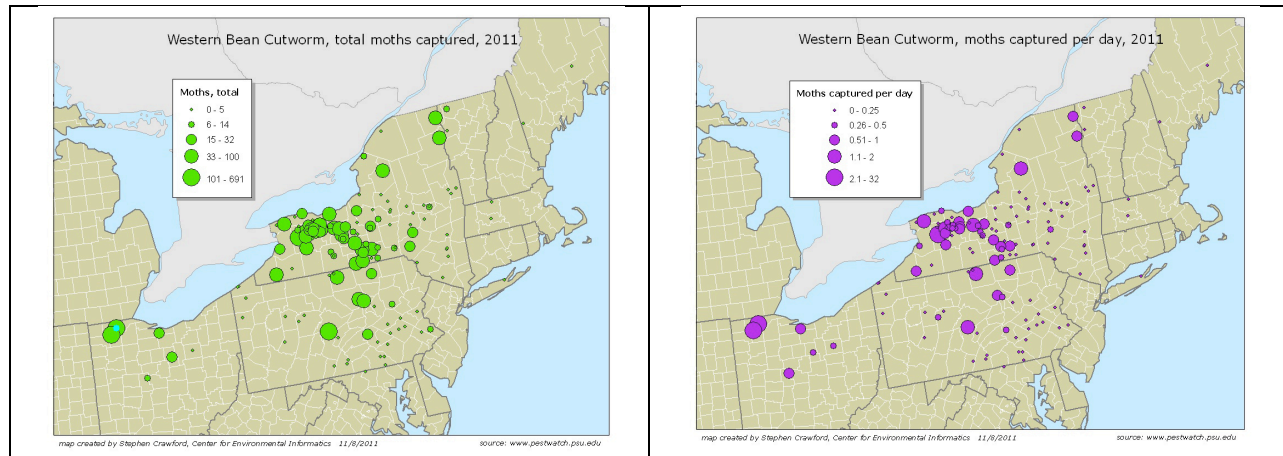


The New Worm In Town: Managing Western Bean Cutworm in Sweet Corn

Abby Seaman, Vegetable IPM Coordinator, NYS Integrated Pest Management Program

Western bean cutworm (WBC) is an emerging pest in NY, with the capacity for substantial damage to sweet corn. Native to North America, WBC has historically been a pest of corn and dry beans in the high plains region of the western US. However, in the last decade, infestations have steadily been moving eastward. In 2008, moths were collected in Ontario, Canada and in 2009 WBC was confirmed in Pennsylvania, New York and Quebec. Pheromone trapping in 2010 and 2011 showed that the pest was broadly distributed in NY (Fig. 1). Numbers have not been high enough to cause economic damage in 2010 and 2011, but based on the experiences of states to our west, we expect that numbers will increase in the next several years and WBC will be one of the suite of worm pests to be managed in sweet corn.

Figure 1. Western Bean Cutworm trap captures 2011



Life Cycle of Western Bean Cutworm

While called a cutworm, WBC is not a traditional cutworm, like black cutworm, which tend to be active in spring cutting down seedlings. WBC has one generation per year. It overwinters in the soil as a mature larva ready to pupate. Spring development begins when temperatures exceed 50°F. Larvae pupate in May and adult moths emerge in mid-summer. Females lay masses of 80-600 eggs on the upper surface of corn leaves near the top of the plant. Late whorl to early tassel stage corn is preferred for egg laying. Eggs are white when first laid, turning pink, and then purple when they are within hatching. Eggs hatch 5-7 days after they are laid. Larvae eat their egg shells immediately after hatching and then typically feed on pollen gathered in the whorl, tassel or silk tissue. As these tissues senesce, larvae move into the ear where they feed on developing kernels. Larvae enter through the silk channel or through the side of the ear. Multiple larvae can infest one ear, making it unmarketable for the fresh market. The appearance of WBC changes as it passes through its six larval stages. Newly hatched larvae are dark, with a dark head capsule, turning pink to tan as they develop. Starting at the fourth larval stage, larvae are best identified by two wide black stripes behind the head, which is orange at this stage. The body at this point is tan and smooth with few distinguishing features. Larvae complete development in 43-70 days, depending on temperature. Mature larvae drop from the plant and overwinter in cells that they construct 5-10 inches below the soil surface. Light, sandy soils are

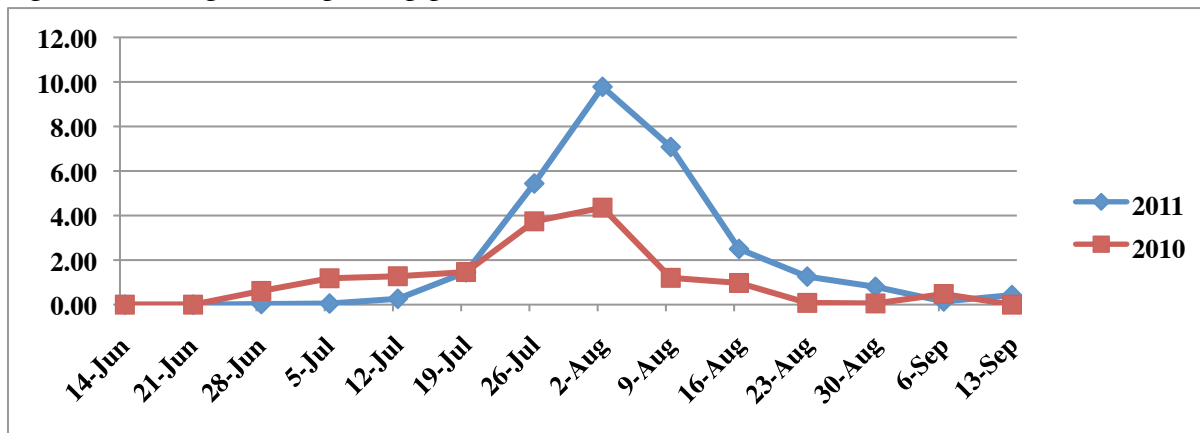
most conducive for successful overwintering.

Scouting, Thresholds, and Management

Because we don't have direct experience yet with WBC we are relying on states and provinces to our west for scouting and threshold information. Once it's present in higher numbers and causing economic damage it will be possible to fine tune recommendations for our conditions.

The management goal WBC will be the same as for the other sweet corn worm pests, European corn borer, corn earworm, and fall armyworm: control larvae while they are still on the outside of the plant, before they are protected inside the ear. The group of plantings that is in the late whorl to early tassel stage during the moth flight will be most at risk. WBC traps have been added to the sweet corn pheromone trap network so we will be tracking the flight and reporting numbers in newsletters and on the web (see list of resources below). The flight timing for the past two seasons has been very similar (Fig. 2), with the peak the first week of August.

Figure 2. Average WBC per trap per week 2010 and 2011.



Egg masses are easy to see in the field and will be the best stage to scout for. Because of the potentially large number of eggs in an egg mass, the usual treatment threshold of 15% infested plants at tassel emergence may need to be adjusted. Compared with European corn borer, WBC may feed for a longer period of time outside the plant, providing a longer window to target the larvae with an insecticide before they enter the ear. The best time for treatment would be soon after egg hatch while larvae are still in the upper part of the plant. This may coincide fairly well with treatment for corn borer at tassel emergence.

Thresholds are still being developed for WBC. A threshold of 4% infested plants for processing sweet corn and 1% infested plants for fresh market corn has been recommended in Michigan, but again they are in the first couple of years of dealing with economically damaging populations, so these could change.

Many insecticides currently used for worm pests in sweet corn also have WBC on the label. Currently available Bt transformed sweet corn varieties are not effective against WBC. Effective Bt proteins are being included in field corn and will be available in sweet corn in the future.

Resources

If you live in a county that participates in a regional vegetable extension program, you can get pheromone trap catches (and much other useful information) by enrolling and subscribing to weekly Pest Updates. The Cornell Vegetable Program is in 12 counties in western NY: <http://blogs.cce.cornell.edu/cvp/>. The Capital District Vegetable and Small Fruit Program operates in 11 counties in eastern NY:

<https://www.facebook.com/pages/Capital-District-Vegetable-and-Small-Fruit-Program>. If you don't have access to a weekly pest update, trap catches for WNY are posted at <http://blogs.cornell.edu/scptnetwork/>. For other areas, the PestWatch web site posts trap catches from several northeastern states: <http://www.pestwatch.psu.edu/>.

Fact sheet from Ohio: <http://ohioline.osu.edu/ent-fact/pdf/0040.pdf>

Fact Sheet from Illinois:

http://ipm.illinois.edu/vegetables/insects/western_bean_cutworm/

ID card from students in Tracy Baute's lab at the University of Guelph, Ontario:

<http://blogs.cornell.edu/scptnetwork/western-bean-cutworm-id-card/>