



Corn Earworm on Vegetables

Thomas P. Kuhar, Chris Philips, Hélène Doughty, Adam M. Alford, and Eric Day

Department of Entomology, Virginia Tech

Classification: Order: Lepidoptera, Family: Noctuidae, Genus and Species: *Helicoverpa zea* (Boddie)

Common Names: Tomato fruitworm, Sorghum headworm, Vetchworm, Podworm, and Cotton Bollworm

Life Cycle and

Description: Corn earworm adult moths are tan-colored with a maximum wingspan of ~1.5 inches. Wings have dark central spots that are easily visible even from the underside. Adults are nocturnal, living for

~15 days, and can be found flying throughout summer and into early fall months. A single female moth can lay as many as 3000 eggs. Corn earworm eggs are laid singly, are cream to pale green colored, are ~1/2 mm in size, and have a ribbed dome appearance. Eggs hatch ~3-4 days with reddish brown bands appear prior to hatching. Corn earworm larva are variable in color, ranging from green to brown to pinkish. Larvae have four



Figure 1. Corn earworm egg. John Ruberson, Kansas State University, Bugwood.org



Figure 2. Corn earworm adult. Eric Burkness, Bugwood.org



Figure 3 Corn earworm larvae. Whitney Cranshaw, Colorado State University, Bugwood.org

pairs of abdominal prolegs, with a reddish brown head, and have pale lateral lines along the length of the body. Larvae undergo 6-8 instars in 2-3 weeks depending on temperature. Upon completion of development, larva drop to the ground from the infested crop, where they then burrow ~2-4 inches within the soil to pupate and overwinter. Corn earworm pupae are ~0.5-1 inch in length and dark brown.

Plants Attacked:

Corn earworms have a very broad host range and can feed and develop on >300 different host plants including many vegetable crops.



Figure 4. Corn earworm on pea. Central Science Laboratory, Harpenden, British Crown, Bugwood.org



Figure 5. Corn earworm on tomato

Sweet corn, tomatoes, beans, broccoli, cabbage, pepper, and lettuce are the most commonly attacked vegetables within Virginia.

Damage: The preferred host of corn earworm is corn. Larva will feed on the tassels, leaves, shoots, silks, and kernels near the tip of a corn ear. On tomato, larva feed on leaves and fruit and because a single larva often feeds on more than one fruit, this pest can cause a tremendous amount of damage to tomatoes. Similar damage can be found on beans and other fruiting vegetables.

Monitoring Thresholds: No sampling protocol is established for sweet corn, but methods for monitoring have been suggested (Hoffmann et al. 1996). On tomato, 20-30 plants should be observed per field for any sign of eggs, which are generally laid on leaves below the highest flower cluster (Kuhar et al. 2006). Adults can be monitored by blacklight and pheromone traps. If more than 20 moths are caught per night the insecticide treatment should be considered.



Figure 6. Corn earworm on sweet corn.

Cultural Control: In Virginia, corn earworm is typically a late summer pest of vegetables, so spring planted vegetables often escape significant pest pressure. Generally, sweet corn, beans and tomatoes harvested before mid-July escape serious pest damage. In small gardens, hand picking and destroying

wormy fruit and damaged pods can help eliminate the pest. Transgenic sweet corn containing the *Bacillus thuringiensis* (Bt) genes (=Attribute™) can effectively reduce sweet corn injury to that crop. Currently, Bt or any other CEW-resistant varieties are not available for other vegetable crops.

Organic/Biological Control: *Bacillus thuringiensis* (Bt) should provide enough control for garden vegetables such as tomatoes, beans, and lettuce. For earworm control on sweet corn, apply 20 drops of mineral oil with a medicine dropper to silks inside tip of ear after silks have wilted (3 to 7 days after silks first appear). Numerous natural enemies have been identified, but none are effective at controlling corn earworm and preventing crop damage.

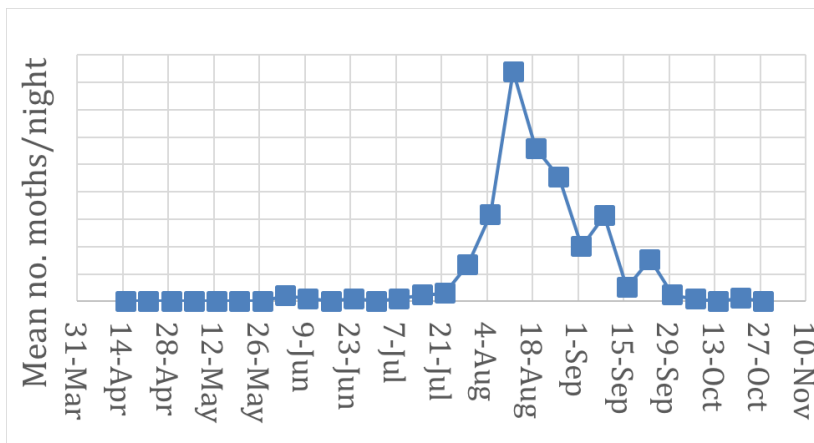


Figure 7. Corn earworm adult flight timeline

Chemical Control: For control recommendations on vegetables, refer to the most recent Mid-Atlantic Commercial Vegetable Production Recommendations VCE Publ. No. 456-420 (SPES-103P)

<https://pubs.ext.vt.edu/456/456-420/456-420.html>. For sweet corn:

Apply at 2 – 3 d intervals during silking.

For green beans: Treat when pods are 1 inch long (pin stage) and weekly thereafter.

For tomato: Treat every 5 – 7 days when fruit begins to set. Continue as long as fruit is present if needed.

Useful References:

- Capinera, J.L. 2001. Handbook of Vegetable Pests. Academic Press, New York. P. 395-400.
- Foster, R. and B. Flood. 1995. Vegetable Insect Management. Meister Publishing Company, Willoughby, Ohio. p. 35.
- Gatton, H., S. Nessler, T. Kuhar, K. Jennings, S. Whitney-King, D. Monks, S. Rideout, S. Toth, C. Waldenmaier, M. Weaver, and H. Wilson. 2007. Pest management strategic plan for tomato in Virginia, North Carolina, and Delaware. 2007. Online. <http://www.ipmcenters.org/pmsp/pdf/SRTomato.pdf>
- Hoffmann, M.P., J.P. Nyrop, J.J. Kirkwyland, D.M. Riggs, D.O. Gilrein, and D.D. Moyer. 1996. Sequential sampling plans for scheduling control of lepidopteran pests of fresh market sweet corn. J. Econ. Entomol. 89: 386-395.
- Kuhar, T.P., B.A. Nault, E.M. Hitchner, and J. Speese. 2006. Evaluation of various sampling-based insecticide spray programs for management of tomato fruitworm in fresh-market tomatoes in Virginia. Crop Prot. 25: 604-612.
- Speese, J., T.P. Kuhar, A.D. Bratsch, B.A. Nault, V.M. Barlow, R.J. Cordero, and S. Zheng-Xing. 2004. Efficacy and economics of fresh- market Bt transgenic sweet corn in Virginia. Crop Prot. 24: 57-64.