Old World bollworm *Helicoverpa armigera*

The Old World bollworm is a cosmopolitan pest of many herbaceous crop plants outside the Americas. The larvae of this moth damage growing tips and reproductive parts of various vegetable and flower crop plants such as corn, tomato, legumes and chrysanthemum. If introduced into Michigan, this insect potentially disrupts vegetable and ornamental productions.

Michigan risk maps for exotic plant pests.

Other common names

corn earworm, cotton bollworm, tobacco budworm

Systematic position

Insecta > Lepidoptera > Noctuidae > *Helicoverpa armigera* (Hübner)

Global distribution

Widely distributed in Africa, Asia, Europe and Oceania. No establishments reported from Americas. Primarily tropical and subtropical species; the moth also occurs in northern territories via migration.

Quarantine status

This insect is listed as an exotic organism of high invasive risk to the United States (USDA-APHIS 2008).

Plant hosts

The larvae feed on over 120 plant species of cultivated and wild plants. Some of its host crop plants relevant to Michigan include alfalfa, beans, cabbage, carnation, cauliflower, corn, chrysanthemum, geranium, peas, pepper, pink, small grains, squash, tomatoes and zucchini.

Biology

Female moths lay eggs singly or in small clusters on their host plants, most commonly on the top third of the plant and growing points. Larvae feed on various plant parts including leaves, growing tips, buds, flowers, seeds, and fruits, causing extensive damage (Carter 1984). Larvae burrow into fruits of tomato, ears of corn and seed pods of pulses. They pupate in the cocoon underground, 5-10 cm deep. Flights occur at dusk and night. They overwinter as pupae. Two to three generations develop per year in the northern range.

Identification

- **Adult**: 35-40 mm wingspan and 12-20 mm long; body stout and light brown; forewings grey to brown with a network of fine, wavy, dark lines; brown band near the edge of forewing; hind wings buff with a dark band near the edge, which contains a pale section; undersides of wings buff with dark bands near the edge; forewing has a dark, comma-like mark underside. View image: http://lepidoptera.butterflyhouse.com.au/heli/armi.html.
- **Larva**: Up to 40 mm long; body color varies from green, yellow, pink and red-brown to almost black; a broad cream stripe running over spiracles along each side. Several pale, fine, wavy, broken lines run along the body dorsally; a single dark stripe running along the middle of the back; head pale brown.
- **Pupa**: 15-20 mm long, pale to dark brown.
- **Egg**: 0.5 mm diameter, spherical, white to brown in color.

Adult. (Photo: W. Billen, Pflanzenbeschaustelle, Weil am Rhein, Bugwood.org)

Adult. (Photo: G. Csoka, Hungary Forest Research Institute, Bugwood.org)

Prepared by T. Noma, M. Colunga-Garcia, M. Brewer, J. Landis, and A. Gooch as a part of Michigan State University IPM Program and M. Philip of Michigan Department of Agriculture.

Larva in tomato fruit. (Photo: Central Science Laboratory, Harpenden Archive, British Crown, Bugwood.org)

Larva. (Photo: G. Csoka, Hungary Forest Research Institute, Bugwood.org)

Pupa. (Photo: P. Mazzei, Bugwood.org)

Carnation flower heads damaged by Old World bollworm show petals eaten away and larval entry holes. (Photo: Central Science Laboratory, Harpenden Archive, British Crown, Bugwood.org)

The Old World bollworm can be confused with the related New World species *Helicoverpa zea*, which also has the same common names and a large host range.

Signs of infestation

- Presence of larvae on the food plants.
- Chewing damage in leaves, growing tips, buds, flowers, seeds and fruits.

Management notes

Sex pheromones of this moth have been identified and can be used for adult monitoring. The moth is noted as an occasional pest of chrysanthemum in greenhouses (Carter 1984)

Economic significance to Michigan

This insect is a serious pest of many agricultural crops in the Old World and Oceania because of its broad host range, high reproductive potential, ability to migrate long distances, and acquisition of insecticide resistance. A wide range of vegetable and flower crop productions and nurseries may potentially be disrupted if this insect is established in Michigan.

Likely pathways of entry in Michigan

Importation of fruit, flowers, vegetables and live plants.

If you find something suspicious on a susceptible host plant, please contact MSU Diagnostic Services (517-355-4536), your county extension office, or the Michigan Department of Agriculture (1-800-292-3939).

References

Anon. 2009. CAPS surveys for 2009. Ohio Department of Agriculture. (http://www.agri.ohio.gov/divs/plant/caps/docs/CAPS_Surveys_2009.pdf)

Carter, D. J. 1984. Pest Lepidoptera of Europe with special reference to the British Isles. Dr W. Junk Publishers, Dordrecht, the Netherlands.

Chumakov, M. A. and Kuznetsova, T. L. Interactive agricultural ecological atlas of Russia and neighboring countries: *Helicoverpa armigera* Hbn.—cotton bollworm. (http://www.agroatlas.ru/en/content/pests/Helicoverpa_armigera/)

DPI&F Entomology team. 2007. *Helicoverpa armigera* and *H. punctigera*. Queensland Government, Australia. (http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/26_8147_ENA_HTML.htm)

Herbison-Evans, D. and S. Crossley. 2009. *Helicoverpa armigera* (Hubner 1805). (http://www-staff.it.uts.edu.au/~don/larvae/heli/armi.html)

USDA-APHIS. 2008. Pests of national concern for fiscal year 2009. (http://www.aphis.usda.gov/plant_health/plant_pest_info/pest_detection/downloads/survey/survey-2009/Appendix-G.pdf)

Witzgall, P., T. Lindblom, M. Bengtsson, M. Tóth. 2004. The pherolist. (http://www-pherolist.slu.se/pherolist.php)

February 2010.