



Hornworms in the Home Gardens

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Introduction

Hornworms are caterpillars that feed on tomato plants in vegetable gardens. The name “hornworm” refers to the spine-like projection on the end of the abdomen. Hornworm leaf feeding damage is most commonly observed in late summer when tomato plants are defoliated, seemingly overnight. In Virginia two species of hornworms occur on tomato, the tomato hornworm and the tobacco hornworm. This fact sheet refers to both as hornworms.

Damage

Hornworms (Fig 1, 2) are voracious feeders on the leaves and sometimes the fruits. They begin feeding on the outer edge of the leaf and notch inward similar to other caterpillars. Early feeding damage often goes unnoticed as the host plants are actively growing. Hornworms grow and molt 5 times. The full-grown caterpillar does most of the feeding and will quickly strip away leaves and even feed on the tomato fruit. This feeding damage is often observed for the first time when large full-grown caterpillars remove a significant number of leaves. Look for the frass or large droppings under where hornworms feed.



Figure 1. Tobacco hornworm. Eric Day, Virginia Tech.

Description

The egg of the hornworm is round, pale, slightly iridescent, and approximately 1 mm (1/16 inch) in diameter. It can be found attached to the leaf singly.

The tobacco hornworm (Fig. 1) is a bright green caterpillar with diagonal stripes on its sides. The diagonal stripes are white with dark spots. Also, on the side are small circles (called spiracles) which are the openings for breathing. A red horn is at the end of the abdomen. Newly hatched caterpillars are 5 mm (1/4 inch) in length and full-grown caterpillars can reach 80 mm (3 inches) in length. The tomato hornworm (Fig. 2) is very similar to tobacco hornworm but the white markings on the tomato hornworm are V-shaped and the horn is dark blue.



Figure 2. Tomato hornworm. Whitney Cranshaw, Colorado State University, Bugwood.org.

The pupa (Fig. 3) can be up to 70 mm (2 ¾ inch) long and is reddish brown. It has a distinctive loop projecting from the head and connecting to the body that hold the developing mouthparts. Hornworms pupate in the soil and the pupa stage is often dug up in the spring when the garden is tilled.



Figure 3, Tobacco hornworm pupa. Nancy Hinkle, University of Georgia, Bugwood.org

The adults of hornworms (Fig. 4) are large brown moths with a wingspan of 90-120 mm (3-4 ¾ inches). The wings are mottled with gray wavy lines. The abdomen has yellow spots. The moth has long mouthparts which it uses to feed on flower nectar at night.



Figure 4. Tobacco hornworm adult moth. Lyle J. Buss, University of Florida.

Common Hosts

Hornworms feed primarily on tomato and tobacco. They will occasionally feed on other solanaceous plants such as eggplant, potato, green pepper, tobacco, and even jimsonweed.

Distribution

Hornworms are widespread throughout Virginia. The tobacco hornworm is more abundant than the tomato hornworm but both occur on tomato.

Cultural Control

Handpick and destroy caterpillars on a daily basis. Check carefully as the green coloration with pale markings help the caterpillars blend in with the foliage.

Organic/Biological Control

The *Bacillus thuringiensis* strain for caterpillars (Bt var. *kurstaki*), sold under various trade names and formulations, is effective against young hornworms. Since Bt *kurstaki* is specific to caterpillars, it's considered more environmentally friendly than an insecticide treatment.

Hornworms are often parasitized by a small wasp that develops inside the caterpillar and pupate in white cocoons on the back and sides of the hornworm (Fig 5.) Leave any parasitized hornworms

in the garden, as the wasps will emerge from the white cocoons and seek out other hornworms.



Figure 5. Cocoons of parasitic wasps on tobacco hornworm. Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org

Chemical Control

For Chemical recommendations, see the current VCE Pest Management Guide for Home Grounds & Animals

Important Species of Hornworms

The two species of hornworm found on tomato are the tobacco hornworm, *Manduca sexta* and the tomato hornworm, *Manduca quinquemaculata*. They are both native to Virginia.

Interesting Facts

Manduca sexta, the tobacco hornworm, is easy to rear in the lab on artificial diet. It is used in teaching labs as well as experiments related to insect development, genetics, and behavior.

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