

## The Hornworm's Nemesis

By Susan Camp

I had planned to write about tick-bite prevention and tick removal this week, but Sherry Hamilton's great article in last week's Gazette-Journal covered that topic very well. Fortunately, where gardening is concerned, there are plenty of topics waiting for a column.

Bonnie Bernard, a fellow Gloucester Master Gardener and Tree Steward, sent me an interesting photo of a strange-looking caterpillar that she found on one of her tomato plants. The creature appears to be covered with bizarre projections that look like grains of rice or insect larvae. This caterpillar and his cousins are the bane of tomato and tobacco growers. It is a hornworm, and it loves tomato plants. It isn't crucial for the home gardener to distinguish a tomato hornworm from a tobacco hornworm. This one happens to be the tobacco hornworm (*Manduca sexta*), recognizable by the red horn on its rear end. The tomato hornworm (*Manduca quinquemaculata*) has a black horn. Both species are yellow-green in color with seven pairs of diagonal lines along the sides. They can reach 4 inches in length. Hornworms are found throughout Virginia and most of the United States. The 3 to 5-inch moths of both species are similar in appearance: a nondescript black, white, and gray.

Hornworms feed on the leaves and unripe fruit of plants in the nightshade family, including tomato, tobacco, peppers, and eggplant. Virginia Cooperative Extension (VCE) Publication 3104-1551 "Hornworms on Tomato" notes that the caterpillars seem to appear suddenly right before they pupate, but they begin feeding during their immature stages of growth and often aren't noticed because they are camouflaged by the leaves of the host plant.

The white projections on the body of the hornworm in Bonnie's photo are one of nature's curiosities. Even though they resemble larvae, they are the cocoons of the larvae of braconid wasps. A large family of wasps, the Braconidae include almost 2000 species in North America. The species *Cotesia congregatus* frequently invades tomato and tobacco plants.

Braconids are parasitoid insects. The larvae develop a parasitic relationship with the host caterpillar, feeding on its tissue without killing it, but weakening it so that it will die soon after the larvae are ready to pupate. It is crucial for the host caterpillar to remain alive during the process, so that it can provide an unending supply of nutrients to the developing braconid larvae.

The female braconid wasp lays her eggs just under the skin of the hornworm. When the eggs hatch, the larvae begin to feed on the non-essential tissue of the caterpillar.

When it is time to pupate, the larvae chew their way to the outside of the caterpillar's body, where they each spin a silky, yellowish-white cocoon. Mature braconid wasps will emerge through the top of the cocoon. The wasps are 1/8 to 1/2 inch long, and black with yellow legs and transparent wings. Female braconids will sting if provoked. When the adult wasps emerge from their cocoons, they immediately seek out new hornworm hosts. The caterpillar will die soon after the wasps emerge.

Sure, this is a curious situation, but why is it significant to tomato gardeners? At the conclusion of the parasitic relationship between the larvae and the caterpillar, the farmer will have a dead hornworm and as many as 500 braconid wasps that will seek other hornworm hosts to continue the process. If you find hornworms on your tomato plants, handpick and destroy them, unless they have larvae pupae attached. Leave those caterpillars in place, so new braconids can develop and hatch.

An article from Galveston County Master Gardeners “Braconid Wasps on Hornworms” contains color photos of larvae and mature wasps. VCE Publication 426-366 “Minimum-chemical Gardening” contains information on ways to decrease dependence on toxic pesticides and herbicides through adoption of alternative techniques, including the use of parasitoid and other beneficial insects.

August 31, 2017