



Beet Webworms

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Order: Lepidoptera

Family: Crambidae

In Virginia, two species of beet webworms may be encountered on vegetables, particularly beets, spinach, and chard.

Species: Hawaiian beet webworm (HBW) – *Spoladea recurvalis* (Fabr.)
Beet webworm (BW) - *Loxostege sticticalis* (L.)

LIFE CYCLE AND DESCRIPTION:

Both Hawaiian beet webworm (HBW) and beet webworm (BW) have multiple generations per year, and the total number is based on temperature. In tropical and subtropical climates, HBW is active year round, and can complete a generation in about 30 days. The species cannot overwinter in Virginia, but can migrate



Fig. 1. Hawaiian beet webworm larva, Alton Sparks, University of Georgia, Bugwood.org

northward during the season to become a pest in late summer and early fall. BW is found throughout the U.S., but is more common in the western states. This species has fewer generations per year and can overwinter in the soil as a mature larva.



Fig. 2. Beet webworm larva, Frank Peairs, Colorado State University, Bugwood.org

Eggs – HBW eggs are laid singly or in small clusters, usually in a row on the lower leaf surfaces close to large veins. The eggs are small (0.5 mm x 0.25mm) flat elliptical-shaped, iridescent white, and hatch in about 4 days.

Beet webworm eggs are also deposited in a cluster like row, however, they are usually found underneath the leaves or near succulent plants on dry twigs or clods of soil. They are similarly flattened and oval in shape, however, they are larger measuring 1 mm x 0.7 mm wide, and can be found in groups of 200-300 eggs. The duration of the egg stage is 3-5 days.

Larvae – HBW larvae are initially a pale white color with a few dark spots around the head (Fig. 1). Mature larvae are a darker gray green color with white lateral lines contrasted by a thin black dorsal stripe. Sparse white hairs grow along the length of the body, but they lack the dark rings that usually accompany such hairs on many webworms. The development of the larval period takes 9-13 days, and as they prepare to pupate they will turn a solid pinkish or rust color.

Beet webworm begins its first larval stage at 4 mm with pale green coloring; at maturity (5th instar) it can be up to 20 mm and deepen to an olive green or even darker black (Fig. 2). An obvious black dorsal stripe is bordered by a pale stripe on either side. The most apparent feature of this species is the numerous circular spots along its body; within each dark circle is a lighter white spot surrounding the growth of a hair. During average field conditions, duration of the larval stage takes between 17-20 days, with an optimal temperature of 30°C. The beet webworm larvae often weave webs together to form a tunnel from a sheltered path to their food source; hence, their common name.

Pupae - When beet webworm larvae reach maturity, they drop to the soil and construct compact vertical silk-lined cells 1 cm below the surface. The pupa of beet webworm is between 2.5 and 5 cm long. Pupation occurs in this cell, however not all larvae that enter the soil pupate immediately; some will first enter a prepupal diapause. If daylight is restricted to less than 13 hours, diapause will be induced. Under normal field conditions the pupal stage

lasts between 7 and 14 days. The pupae begin a yellow color, but turn darker brown as they mature. It is also important to note that their posterior end has eight small spines.

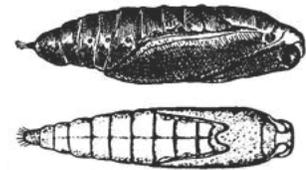


Fig. 3 Beet webworm pupae

Adult - The adult HBW moth is dark brown with a broad white band beginning at the inner margin of the median band that transverses the front and hind wings (Fig. 4). At the tip of the band is a recurved “tooth” that resembles a fishhook, which gives this species the name recurvalis – to bend backward. Wingspan measures 19-21 mm.

The BW moth has a yellowish brown base color with a patchwork of light and dark markings across the forewing (Fig. 5). The most prominent trait is a dark distal border on the fringe of the front wing contrasting a cream colored band along its margin. At rest, the wings are folded and the outline of the moth is triangular. The wingspan of the BW moth is around 22 mm.



Fig. 4. Hawaiian beetle webworm moth
T. Kropiewnicki,
<http://bugguide.net/node/view/151261>



Fig. 5. Beetle webworm moth
J. Stiefel,
<http://bugguide.net/node/view/40815>

PLANTS ATTACKED:

HBW and BW highly favor plants in the Chenopodiaceae family, of which the vegetables beets, chard, and spinach are commonly attacked. It is also commonly found on weeds such as smooth amaranth/pigweed and lambsquarters. In the western U.S., BW is known primarily as a pest of sugar beets. Vegetables occasionally injured include cabbage, cantaloupe, carrot, cucumber, garlic, lettuce, mustard, onion, peas, potato, pumpkin, rhubarb, spinach, and turnip.

DAMAGE

Small beetle webworms feed on the underside of lower leaves, they do not break through the leaf surface. As they develop, they create holes in the leaf, eventually eating all but veins and stems. Larvae will often construct silk lined tubes from the host plant or soil to the feeding site; this webbing behavior is the cause of this species common name. When preferred weed species are consumed, the larvae seek out alternate food sources such as vegetable crops; this is when most crop damage occurs.

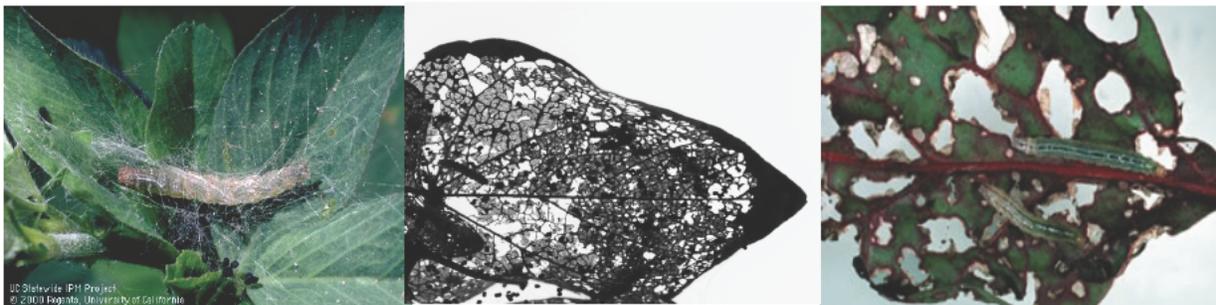


Fig. 6. Webbing and leaf skeletonizing injury from beetle webworm larvae.

DISTRIBUTION

Hawaiian beet webworm is found throughout tropical and subtropical regions of the world. In North America, it is found in the southern states from California to Florida and some of the eastern states. It has been known to cause damage in Virginia, but cannot overwinter here; therefore, damage is a result of migration later in the season.

Beet webworm, an immigrant from Europe, is present coast to coast, but a particularly troublesome pest of sugar beets in western areas (Utah to Kansas).

CULTURAL CONTROL

There are numerous cultural practices that can help alleviate webworm damage. Tillage can destroy the overwintering larvae in the soil. Next, eliminating preferred weeds, such as lambsquarters and pigweed, before the adult's oviposition flights can prevent initial infestation by minimizing the amount of eggs deposited on nearby crops. However, destruction of these weeds after eggs have hatched will only drive the larvae to other sources of food crops nearby. Lastly, if a high population already exists, it is possible to clip and destroy all caterpillars found within the webbed leaves.

BIOLOGICAL CONTROL

Numerous parasites and predators have been found on beet webworms; however, it is unlikely that they can be counted on to control populations. Beet webworms are susceptible to many types of hymenopteran parasitoids, and the parasitoid complex is very similar between these species. Known parasitoid species include: *Cotesia marginiventris*, *Venturia infesta*, *Argyrophylax albincisa*, *Chaetogaedia monticola*, *Eucelatoria armigera*, and *Nemorilla pyste*.

CHEMICAL CONTROL

Beet webworm populations are sporadic, and insecticidal control should occur only if high pest densities are observed. *Bacillus thuringiensis* and many other lepidopteran insecticides have been found to provide control, in addition to having low impact on natural enemies. Insecticides should be applied when larvae are small.

USEFUL REFERENCE

Capinera, J.L. 2001. *Handbook of Vegetable Pests*. Academic Press, New York. P. 459-479.