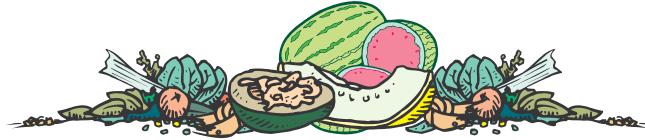


VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the
Purdue University Cooperative Extension Service

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No. 436
June 25, 2004

<http://www.entm.purdue.edu/entomology/ext/targets/newslett.htm>

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TIME TO SCOUT HORNWORMS ON TOMATOES - (Frankie Lam) - A few hornworm adults were collected by the blacklight trap at Southwest Purdue Agricultural Center during mid-June. This indicated that hornworm eggs will be laid on the tomato leaves and this is the time to scout the field or garden for hornworms. Hornworms are one of the most destructive and widely distributed insect pests of tobacco and tomato plants. The caterpillars consume large amounts of foliage and occasionally feed on tomato fruits.

Two species of hornworm attack tomato and tobacco in the United States. The caterpillars are usually green, and attain a length of 3-4 inches when fully grown. The tobacco hornworm has seven diagonal stripes on each side of the body and the horn is slightly curved and red (Figure 1), whereas the tomato hornworm has eight curved stripes and the horn is straight



Figure 1. Tobacco hornworm with seven diagonal stripes on each side and a red horn at the end of the body. (Picture by Frankie Lam)

and black. The horns of hornworms are unable to sting a person in any way. Both hornworms attack tomato, tobacco, eggplant, pepper, potato, and related weeds. In past years most of the hornworms found at our Center are tobacco hornworms. The hornworms pupate in soil. Their adults are swift-flying hawk moths or hummingbird moths (Figure 2). They fly at dusk and suck nectar by hovering about beds of flowers.



Figure 2. Tomato hornworm adult (hawk moth). (Picture by Frankie Lam)

Although hornworms may cause severe damage on some plants in the field, they usually do not occur in large numbers. In home gardens the best tactic for hornworm management is by handpicking. Scout the tomato fields for the presence of hornworms, feeding damage, or worm poop. During a warm day the caterpillars usually hide on the underside of leaves in the lower portion of tomato plants or in the plant debris. However, their poop or frass can be seen easily on leaves or fruits. Most of the hornworms move to the top canopy feeding on the leaves when the temperature is cool; the best time to sample the caterpillars is in the morning or in the evening. The economic threshold for hornworms is 0.5 larva per plant. Insecticides, including Asana, Avaunt, Baythroid, Danitol, Entrust, Fury, Intrepid, Lannate, Mustang Max, Pounce, Sevin, Spintor, Warrior, and some *Bacillus thuringiensis* insecticides (Agree, Biobit, Cutlass, Dipel, Javelin, and XenTari) are labeled for the control of hornworms. Follow label directions carefully before using any pesticides. Furthermore, fall plowing may destroy many of the overwintering hornworm pupae in the soil.

SAMPLING AND MANAGING SQUASH VINE BORER IN PUMPKINS AND SQUASH - (Frankie Lam) - The pumpkins of our study at Southwest Purdue Agricultural Center was transplanted in the field on June 14. Squash vine borer eggs were observed on the pumpkins on June 18. Although only a few squash vine borer eggs were found on the plant, this is the time to scout for their eggs and manage the pest.

The squash vine borer is an occasional pest of pumpkins and squash in Indiana. The squash vine borer adult is a “clear wing” moth with wingspan about 1 1/2 inches (Figure 1). Their front wings are



Figure 1. Squash vine borer adult is a “clear-wing” moth. (Picture by C. Welty)

metallic green, whereas the hind wings are almost without scales. The body of the moth is generally orange-red with black bands on the abdomen. The moth is a daytime flier, and is commonly mistaken for a wasp. Symptoms of plants attacked by the borers appear in mid-summer when a runner or an entire plant turns yellow or wilts suddenly and the infested



Figure 2. Squash vine borer feeding inside the pumpkin might cause yellowing and wilting of the plant. (Picture by Frankie Lam)

vine usually dies beyond the point where the borer tunneled into the stem (Figure 2). The presence of the borer is usually not noticed by growers until after the damage is done. Damage is usually worse in areas where squash and pumpkins are grown year after year.

The eggs of the borer, which are small (1/20 inch) and brown, are usually laid singly at the base of the plant, on the petioles of leaves, on the stems, or occasionally on the surface of leaves (Figure 3). The eggs



Figure 3. Squash vine borer eggs lay on a pumpkin leaf. (Picture by Frankie Lam)

will hatch within a few days. The squash vine borer larvae bore into the plant immediately after hatching. As the larvae bore into the stem, they leave behind a telltale sign of sawdust-like frass at the entrance hole. The larvae, which are white grub-like caterpillars, feed inside the stem for 2-4 weeks (Figure 4). The larvae



Figure 4. Squash vine borer feeding inside the stem of pumpkin. (Picture by Frankie Lam)

destroy the vessels in the stems, causing the vines to wilt and eventually die. Once inside the vine, little can be done to control the pest. After they are full-grown, the larvae leave the vine and spin silken cocoons in soil.

In the northern areas of the Midwest, the larvae overwinter in the cocoons, whereas in the southern areas, they pupate and give rise to the second-generation.

Currently no economic threshold has been developed for the squash vine borer. From mid-June through early August, if adult moths are found in fields, vines should be checked for any signs of eggs and larval feedings. Scout at least 5 plants in 10 locations for borer eggs and frass in each 20-acre field. One of the methods recommended for the management of the borer is to scout for moist, sawdust-like frass piled outside small holes at the base of the plant and split the stem lengthwise above the point of attack to remove the larvae from the stem, then cover the stem with soil to encourage new roots to form above the damaged areas. This method may save the plant, depending on the severity of the damage; however, the infested plant may be weakened or eventually die. Conducting this tactic for the management of the pest in large areas is time consuming and labor intensive. Another method is that once frass and larvae are found in the field, two insecticide applications, spaced 5-7 days apart, are recommended to control the majority of the newly hatched larvae before they enter the vines. Ambush, Asana, Pounce, and Thiodan are labeled for the control of squash vine borer. Be certain to read the label carefully before using any pesticides.

WHAT TO DO WITH FLOOD-DAMAGED PRODUCE - (*Diana Lange with revisions by Liz Maynard, 2004*) - One popular question this year is if flooded produce can still be harvested and safely consumed. If the produce was submerged in flood or rain waters, it is safe to consume as long as it is firm, unblemished, and the plant remains healthy and survives. If sewage-contaminated water was involved, then the produce should be discarded. Be sure to watch the flooded portion of the field for 1-2 weeks after the waters recede for signs of spoilage.

Leafy greens (lettuce, spinach, etc.) most likely should be discarded if they were flooded for more than a couple of days. It is hard to remove all of the dirt to consume this type of produce. Harmful bacteria can build up, so most often the greens should be discarded. One other solution is to wash the greens off with 100 parts per million chlorine solution, followed by a rinse with clean water. This surface disinfects the produce, but there is no guarantee that you will reach all of the edible portions of the vegetable. A 100 ppm chlorine solution can be made by mixing 5.25% sodium hypochlorite with water: 7.25 teaspoons in 5 gallons of water, or 1.5 cups in 50 gallons of water.

Broccoli, cabbage or other bulky types of vegetables should be safe as long as dirt can be thoroughly washed or peeled off. Root crops should be fine as long as the plant survives and there are no soft spots on the produce.

FUNGICIDES AND RAIN - (*Dan Egel*) - I am often asked whether one should apply fungicides before a rain. The fear is that the fungicide will wash off in the rain, leaving the plants with no protection. As a general rule, if the fungicide will dry on the foliage before the rain starts, go ahead and begin the applications. In most cases, the fungicide will dry within 30 minutes of application.

If one waits for the rain to pass before spraying, much of the benefit of the fungicide will be lost. Remember that rainy weather is the time when vegetable leaves are most in need of protection against fungal diseases. Most fungal diseases need rain to splash the spores from leaf to leaf; wet leaves are necessary for the spores of fungal diseases to start infection. (One exception to this rule is powdery mildew, which does not need rain for spread or to start infection.). If a fungicide application is made *before* a rain, the spores that are splashed during the rain will be more likely to land on a leaf with good fungicide coverage.

Similarly, it is not necessary to apply fungicides again every time it rains. It is best to maintain a schedule and keep to it. For most situations, maintain a 7 to 14 day fungicide schedule. Apply fungicides more often during rainy periods or when heavy dews occur. Fungicide applications can be spread out during drier periods. Fungicides do not have to be visible on the leaves in order to offer protection. The MELCAST system of disease forecasting for muskmelon and watermelon takes into account the weather so that fungicide applications are applied when most needed. Contact Dan Egel (812) 886-0198 if you have questions about MELCAST.

COMMERCIAL VEGETABLE GROWERS MEETING - (*Dan Egel, Chris Gunter, and Frankie Lam*) - Commercial vegetable growers are invited to attend an informal question and answer session sponsored by the Southwest Purdue Agricultural Center on Tuesday June 29. Purdue University Specialists will be present to discuss disease, insect, weed and other production problems. There will be two meetings, one in the Oaktown area at the Green Acres Farm Market on US 41 at 4 pm and a second meeting at the Ellermann Farm packing shed on Watermelon Rd. at 7 pm. Interested growers should come prepared to ask questions or bring plant samples. Light refreshments will be served. For directions or further information please call Dan Egel at (812) 886-0198.

CANTALOUPE LEAF EDGES YELLOWING - (*Chris Gunter*) - There have been a few calls about yellowing on the edges of older leaves this year. These leaves are typically seen in the middle of the row and are usually

the oldest leaves on the plant. Yellowing of these older leaves is normal on most vegetable plants this time of year. Typically this yellowing is caused by salt burn (Figure 1).



Figure 1. Yellowing on the leaf edge of cantaloupe. (Picture by Chris Gunter)

Salt burn is a noninfectious disorder that affects muskmelons more than watermelons. Early in the morning, water droplets from the plant accumulate at the edge of the leaf (Figure 2). If these water droplets have a high salt content, the leaf margin will turn yellow. Salt accumulation is often associated with foliar application of nutrient solutions and/or pesticides. Copper sprays, for example, often result in distinct bands of yellow tissue around leaf margins. Soil applied urea or ammonium nitrate fertilizers may contribute as well.

No yield loss has been recorded as a result of these symptoms and therefore no control measures are necessary.



Figure 2. Water droplet accumulation on the leaf edge of cantaloupe. (Picture by Chris Gunter)

CORRECTION - CSA-MI upcoming conference on Community Supported Agriculture conference listed as November 12-24, in the last Vegetable Crops Hotline, are actually November 12-14, 2004. Also, the deadline of July 1 is for the early discount; registrations will be accepted until the date of the conference, though late charges will apply after October 8. For more information on the conference, contact CSA-MI at csafarm@jackpine.com, call (231) 889-3216 or toll free at (877) 526-1441, or see the website at www.mlui.org/csaconference.

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