Managing Squash Bug Populations Through Identification and Control

EXTENSION

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Squash bugs, or Anasa tristis, are true bugs from the order Hemiptera that feed primarily on plants in the family Cucurbitaceae. These plants include squash, pumpkins, cucumbers, melons, watermelons and gourds. They will feed on any cucurbit, though, if it is their only option. Fortunately, squash bugs are relatively easy to spot and identify; however, they can be somewhat difficult to treat and devastating to a crop. This fact sheet covers identification techniques and treatment methods for squash bugs.

Identification

Adult squash bugs are small, oblong insects measuring one-half of an inch to three-quarters of an inch in length and slightly wider than one-quarter of an inch at adulthood. Adults are brownish colored and have wings that make an X shape when folded on their back (Figure 1). Newly-hatched nymphs have a light green abdomen with a red head and thorax, which turn black as they age, and black legs and antennae. Older nymphs (second through fifth instars) have a soft, light gray body with black legs and antennae (Figure 2). Both adults and nymphs have a strong, foul odor when crushed. Eggs laid by squash bugs are reddish-brown, typically arranged in diamond shaped patterns on the underside of leaves and are about one-sixteenth of an inch in size (Figure 3).

Life Cycle

Mature adults overwinter in soil, plant debris and brushy field edges. Although adults tend to isolate, nymphs congregate in groups upon hatching, sometimes completely covering parts of the plant. Eggs are found anywhere on a leaf; however, they are typically laid at the base of the leaf where it joins the petiole on the underside of the leaf. Adult females lay eggs in masses averaging 18 eggs per mass and will continue to produce eggs for several weeks, laying an average of 10 eggs per day. Egg development takes anywhere from six to 15 days, and nymphs require about 25 to 48 days to reach maturity, depending on temperature. A squash bug life cycle from egg to adult takes three-and-a-half to 8 weeks.

Figure 1. Adult squash bug.

Figure 2. Squash bug nymph.

Figure 3. Squash bug nymph.

Damage Caused/Disease Vectored

Squash bugs cause damage to a crop mainly through feeding on the plant. These insects possess piercing-sucking mouthparts, and their feeding affects the function of the vascular tissue of the plant. While healthy plants can tolerate a few insects, it does not take long for an insect population to overwhelm a crop. Along with causing physical damage, these insects can also transmit a bacteria (Serratia marcescens) that causes Cucurbit Yellow Vine Disease, which affects all cucurbits and is typically lethal to the plant. Infected plants turn yellow and often die before harvest. A cross section of the stem base of the plant will often show a honey-colored ring of dead tissue.

Cultural Control Measures

The most beneficial cultural control measure is to keep the field clean of residual plant debris. Squash bugs hide and overwinter in debris. Removing dead leaves and vines, as well as reducing weed populations, eliminates habitat for these pests. Removing residue is an effective way to simultaneously clean the growing area and reduce the number of lingering insects.

Other useful control practices include squishing or using tape to peel off eggs and placing boards around plants. Since squash bugs hide under objects, periodically stepping on the boards and squishing the insects underneath reduces the number of pests on a crop. Another control option that falls in between cultural and chemical is treating a trap crop such as squash or pumpkins with a systemic insecticide (a systemic insecticide causes the whole plant to become toxic). Since squash bugs prefer these varieties of plants over other cucurbits, the bugs will migrate to them and be killed after feeding upon them. It is important to note, however, that crops treated with a systemic insecticide are no longer edible, although the fruits can still be used for decoration in the case of pumpkins and gourds. Floating row covers are a pest exclusionary method that works well when the plants are small, but it is important to remove the cover when flowers emerge, so pollinators are not excluded.

Planting crops, either by seed or transplant, as early in the season as possible to avoid the late season increase of insects is also a viable option. However, all cucurbits will attract squash bugs, and once they are in the field they will never fully be eradicated, which is why an integrated pest management plan is so important. When a cucurbit crop is the desired cash crop, do not plant any other cucurbit crops in the prior season. One technique might be to try a multi-year crop rotation where cucurbit plants are grown every other year to give the overwintered adults time to disperse between crops.

Some species of cucurbits are less appealing to squash bugs than others, however this is only evident when growing more than one species at the same time. Squash bugs will attack any cucurbit and will still overtake a less favorable variety if that is the only one available.

Lastly, there are a few biological control measures that provide benefit against squash bugs. However, they are the most effective in a greenhouse environment. One of these beneficial insects is the tachinid fly, Trichopoda pennipes, which parasitizes late-stage nymphs and adults. This fly can reduce the pest population by about 20%. Another insect, Gryon pennsylvanicum, parasitizes the eggs of squash bugs. Although other egg parasitoids exist, this tiny fly is responsible for most cases of parasitized eggs in squash bugs. Other generalist predators that attack squash bugs include spiders, ground beetles, rove beetles, big-eyed bugs, wheel bugs and lady beetles. It is important to manage expectations when using predatory insects. Expect population reduction, not total eradication.

Chemical Control Measures

Squash bugs are susceptible to a variety of insecticides and some organic control measures exist which can greatly reduce the number of insects. Some insecticides and their application rates are listed below. Always read and follow label instructions. The active ingredients for each chemical are listed in the table. If the listed brand name is unavailable, try looking for another product with the same active ingredient. Here are some best management practices to improve the efficacy of insecticides. Use a sprayer with enough pressure to thoroughly penetrate the dense foliage and plant undersides where the insects hide. The underside of leaves, fruit and litter on the ground are all probable hiding spots for these insects. Next, be sure to wait until the evening to apply chemicals, so that most of the flowers will be closed. This reduces the chance of harming pollinating insects. Lastly, the younger nymph stages are generally the easiest to kill with insecticides since their bodies are still soft and they tend to group together, making them an easier target.

Insecticides for Squash Bug Control Options

Name, Mode of Action	Active Ingredient	Rate	Notes	Contact/Systemic
Acetamiprid (Assail), 4A	Acetamiprid	5.3 oz/acre	Most effective on newly laid eggs and nymphs	Contact
Flupyradifurone (Sivanto Prime), 4D	Flupyradifurone	10.5-14 oz/acre	Not for cantaloupe, honeydew or muskmelon	Systemic
Pyrethroid, 3A	Pyrethrin[1]	Multiple rates	Be aware of pre-harvest intervals	Contact
Clothianidin (Belay), 4A	Clothianidin	3-4 oz/acre	Don't spray this after 4th true leaf	Contact, Systemic
Dinotefuran (Venom or Scorpion), 4A	Dinotefuran	Multiple rates	Apply as a foliar or soil treatment	Contact, Systemic
Neem oil	Neem Oil[1]	½-1 qt/acre	Wet the tops and bottoms of leaves	Contact, Systemic
Carbaryl (Sevin), 1A	Carbaryl	½-1 qt/acre	No more than 6 applications/year	Contact
Esfenvalerate (Asana), 3	Esfenvalerate	5.8-9.6 oz/acre	Do not apply to plants used for food	Contact
Diatomaceous earth (Celite 610)	Silicon Dioxide[1]	70 dry pounds per acre	Reapply after a rainfall event	Contact

Table 1. [1]This indicates a product is Organic Materials Review Institute (OMRI) approved for organic production (allowed with restrictions) in 2024. Always check with your certifier before adding a new chemical input to your system.

Conclusion

Squash bugs are one of the most common pests of cucurbit plants. Fortunately, there are several practical ways of controlling these insects including field hygiene, multiple modes of action insecticides and mechanical removal. Implementation of a variety of these measures facilitates an integrated pest management program, which can help safeguard yields and strive for crop health.

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