

# Vegetable Insects

Department of Entomology

## SQUASH BEETLE ON CUCURBITS

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Squash beetle, which is native to Central and Eastern North America, belongs to the family of lady beetles (Coccinellidae). Most insects in this family are beneficial, often eating large numbers of pest insects such as aphids. The exceptions are the squash beetle and the Mexican bean beetle. The squash beetle is an occasional pest on cucurbits, and the Mexican bean beetle is a common pest on beans, especially in the lower Midwest.

**Adult.** The adult squash beetle is yellow and has seven black spots on each wing cover (Fig. 1). The body is about 3/8 inch long and has a hemispherical shape similar to that of the beneficial lady beetles. However, the adult squash beetle is larger than most of the lady beetle adults, which are about 1/4 inch long (Fig. 2).

In the Midwest, the overwintered squash beetle adults appear from late May to June, depending on the latitude. The next generation adults emerge in early August and overwinter in the leaf debris of woody areas. There is one generation per season (Fig. 3 on pg. 2).



Fig. 1. A squash beetle is about 3/8 inch long.  
(Photo credit: Frankie Lam, Purdue University)

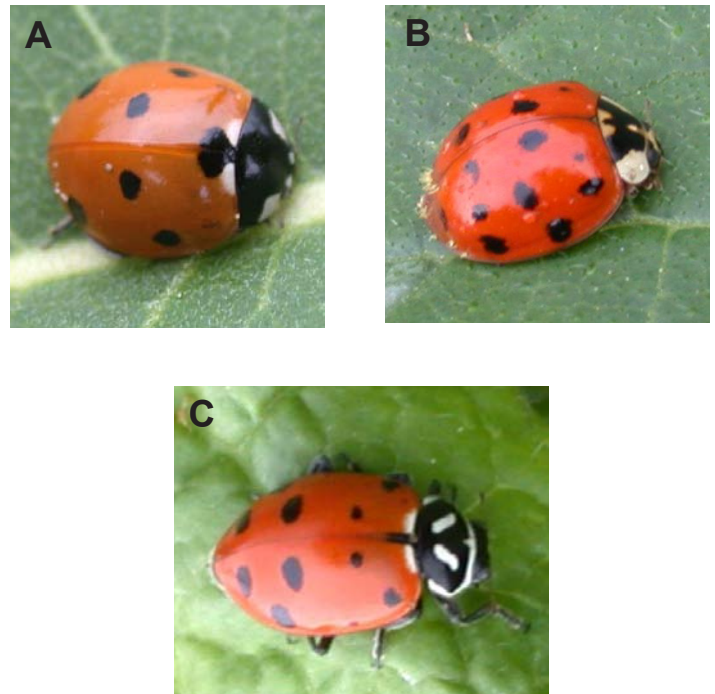


Fig. 2. (A) A seven-spotted lady beetle is about 5/16 inch long; (B) An Asian lady beetle is about 1/4 inch long; (C) A convergent lady beetle is about 1/4 inch long.  
(Photo credit: Frankie Lam, Purdue University)

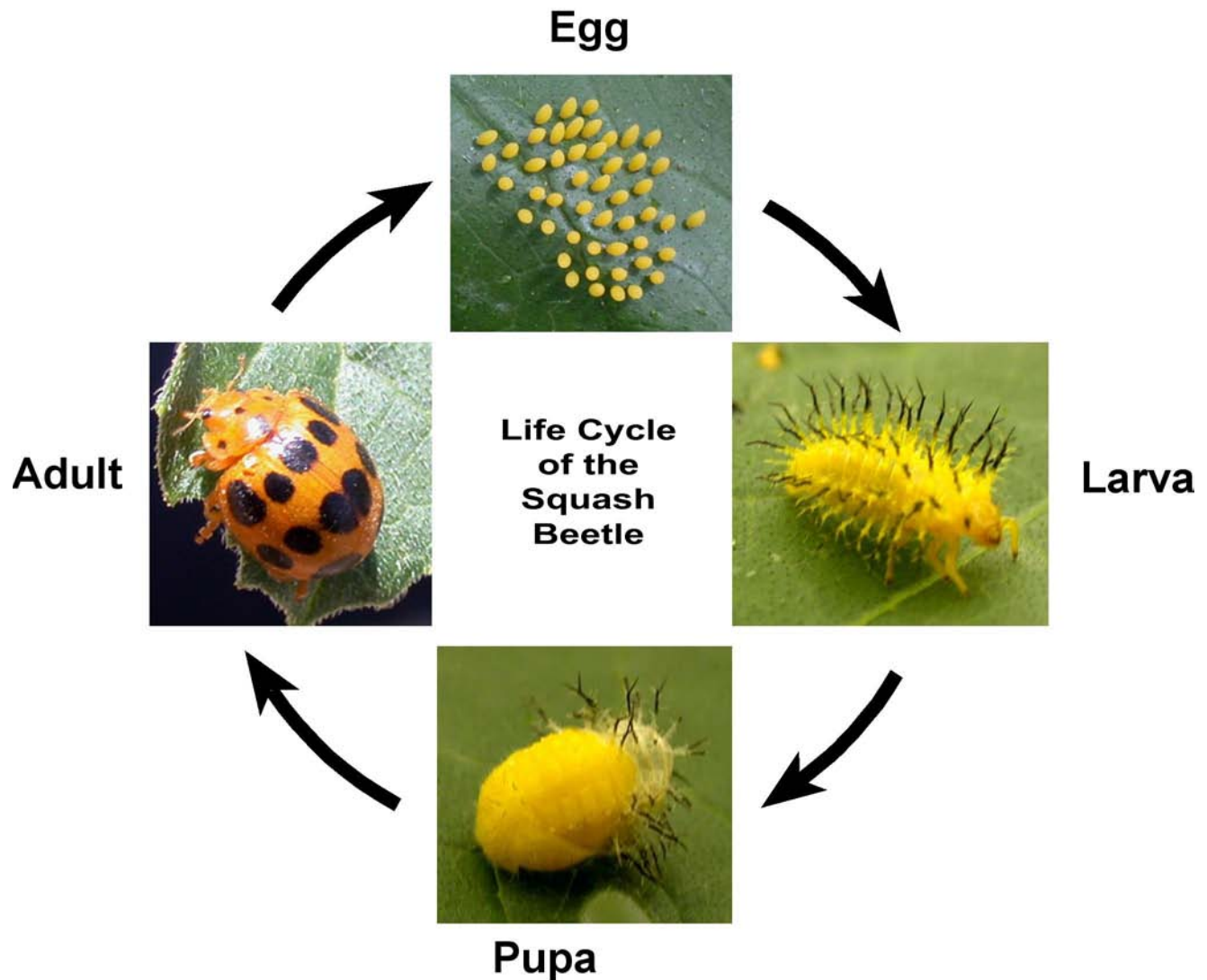


Fig. 3. Life Cycle of the Squash Beetle. (Photo credit: Frankie Lam, Purdue University)

**Egg Mass.** In July, the female beetles lay egg masses of 30 to 50 eggs on cucurbit leaves. The eggs are bright yellow and bullet-shaped, with the long axis attached perpendicular to the leaf surface (Fig. 4A). However, their egg masses look similar to those of the lady beetles (Fig. 4B), and it is not easy to distinguish between them.

**Larva.** The larvae of squash beetle are yellow and oval, and have rows of long, forked spines on the back (Fig. 5A). The larvae of lady beetles usually look like a small “alligator” and do not have long, forked spines (Fig. 5B). It takes about 3 weeks for the larvae to develop into adults, depending on the temperature.

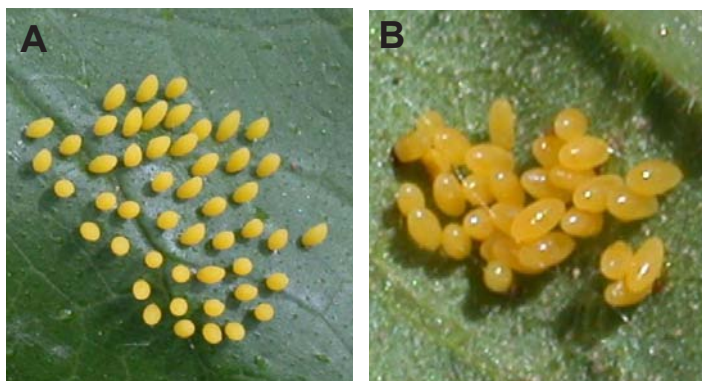


Fig. 4. (A) Egg mass of squash beetle;  
(B) Egg mass of beneficial lady beetle.  
(Photo credit: Frankie Lam, Purdue University)





Fig. 5. (A) A squash beetle larva has rows of long, forked spines at the back; (B) Different species of beneficial lady beetle larvae, which look like small “alligators.”  
(Photo credit: Frankie Lam, Purdue University)

**Pupa.** The larvae pupate during late July to August. The pupa (Fig. 6A) has spines at the posterior end; however, spines are usually not found on the pupa of lady beetles (Fig. 6B). Research at Cornell University has found that a combination of chemicals is secreted from the spines of the squash beetle pupae, serving as defensive secretions in avoiding predation from other insects.

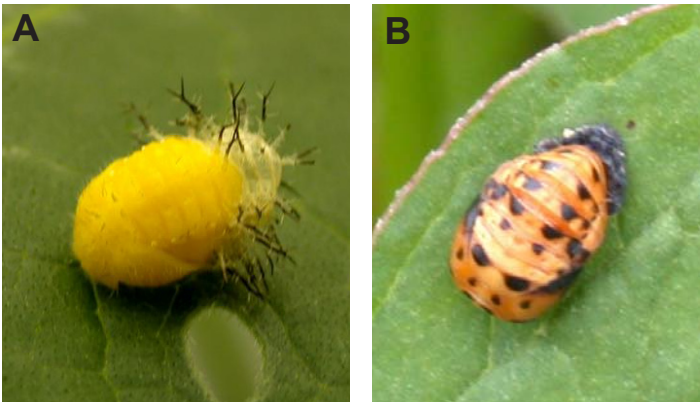


Fig. 6. (A) Pupa of squash beetle;  
(B) Pupa of beneficial lady beetle.  
(Photo credit: Frankie Lam, Purdue University)

**Injury on Cucurbits.** Both adults and larvae of squash beetle feed on the leaves of cucurbits. A feeding test conducted at SouthwestPurdueAgricultural Center has demonstrated that the squash beetle feed on cucumber (Calypso), muskmelon (Eclipse) (Fig. 7), squash (CashFlow F1 and Turks Turban), pumpkin (Mystic Plus), and watermelon (Royal Sweet). Most larvae used in the test pupated and developed into adults. However, the pest has also been reported to feed on blossoms and pods of lima beans and cowpeas, and on corn silks.

The squash beetle larvae and adults usual feed on the underside of leaves and snip a circular trench that arcs from one leaf edge to another (Fig. 8). After it has completed the trench, the insect then feeds on the tissue isolated by the trench for 1-2 hours before searching for another leaf. A study at



Fig. 7. Feeding test on the development of squash beetle larvae to adult on muskmelon conducted at Southwest Purdue Agricultural Center.  
(Photo credit: Frankie Lam, Purdue University)



Fig. 8. The squash beetle larva snipped a circular trench on the underside of leaf before feeding.  
(Photo credit: Frankie Lam, Purdue University)

University of Delaware showed that this feeding characteristic reduces the influx of chemical defenses from the injured plant to the entrenched tissues, thereby preserving the leaf tissue’s suitability for feeding. Moreover, the larvae only feed on the tissue between veins on the underside of the leaves, leaving the upper surface more or less intact. As a result, their feeding gives the injured leaf a characteristic lace-like skeletonized appearance on the upper surface (Fig. 9).

**Symptoms of Squash Beetle Injury and Gummy Stem Blight Disease.** Growers should learn how to distinguish between the symptoms of squash beetle injury and gummy stem blight disease of watermelons because they look similar. Hours after beetle feeding on watermelon foliage, the intact tissue of the leaf turns brownish-black, which looks like gummy stem blight that is caused by a fungus that attacks



Fig. 9. Lace-like skeletonized appearance on the upper surface of an injured leaf.  
(Photo credit: Frankie Lam, Purdue University)

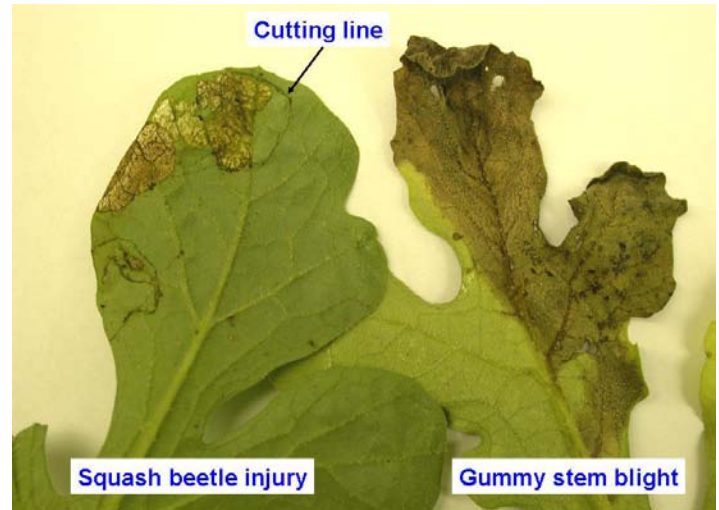


Fig. 11. Symptoms of squash beetle injury (left) and gummy stem blight disease (right) on the underside of watermelon leaf. (Photo credit: Frankie Lam, Purdue University)

watermelons and other cucurbits. Symptoms of gummy stem blight on leaves often appear as irregularly shaped brown areas. The key diagnostic feature of the disease is the presence of small, black fungal structures called "pycnidia" embedded in the diseased tissue. They are best seen with 10X magnification. The symptoms of squash beetle feeding injury and gummy stem blight on the upper surface of watermelon leaves are shown in Fig. 10. The easiest way to distinguish the two symptoms is to look at the underside of the leaf. The squash beetle adults and larvae cut a circular trench in the leaf before feeding (Fig. 11). If the leaf was damaged by the insect, there should be a thin cut-line encircling the brownish area of the injured leaf.



Fig. 10. Symptoms of squash beetle injury (left) and gummy stem blight disease (right) on the upper surface of watermelon leaf. (Photo credit: Frankie Lam, Purdue University)

**Management.** Not much research has been done on the economic threshold of squash beetles on cucurbits in the Midwest because only small populations are occasionally found on cucurbits, and they do not affect cucurbit production. In the summer of 2006, we observed patchy squash beetle populations in cucurbit fields in southwest Indiana.

Because both the larvae and adults are not very aggressive defoliators, handpicking is recommended for the management of the pest by home gardeners. Based on our observation in southwest Indiana, the best time of day to scout for squash beetles on cucurbits is around noon. The restricted use insecticide, endosulfan, sold as Endosulfan 3EC, Phaser 3EC, Thiodan EC, is labeled for the control of squash beetle. Most of these insecticides have a restricted entry interval (REI) of 24-48 hours and preharvest interval (PHI) of 2 days. Growers should read the label carefully before applying insecticides.

- Squash beetle, *Epilachna borealis* (F.) (Coleoptera: Coccinellidae)
- Sevenspotted lady beetle, *Coccinella septempunctata* L. (Coleoptera: Coccinellidae)
- Asian lady beetle, *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae)
- Convergent lady beetle, *Hippodamia convergens* Guérin-Ménéville (Coleoptera: Coccinellidae)

READ AND FOLLOW ALL LABEL INSTRUCTIONS. THIS INCLUDES DIRECTIONS FOR USE, PRECAUTIONARY STATEMENTS (HAZARDS TO HUMANS, DOMESTIC ANIMALS, AND ENDANGERED SPECIES), ENVIRONMENTAL HAZARDS, RATES OF APPLICATION, NUMBER OF APPLICATIONS, REENTRY INTERVALS, HARVEST RESTRICTIONS, STORAGE AND DISPOSAL, AND ANY SPECIFIC WARNINGS AND/OR PRECAUTIONS FOR SAFE HANDLING OF THE PESTICIDES.

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