



Common Name: **Mexican bean beetle**

Scientific Name: *Epilachna varivestis* Mulsant

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Fig 1. Mexican bean beetle adult, eggs, larva and pupae.

Mexican Bean Beetle (MBB), *Epilachna varivestis* Mulsant (Fig. 1), is an herbivorous lady beetle (Coccinellidae) that feeds on bean crops (legumes) in North America. It is similar to the squash lady beetle, *Epilachna borealis*, which feeds primarily on cucurbits. MBB can cause significant defoliation damage to various bean crops particularly in the genus *Phaseolus* (snap beans, lima beans, pole beans, etc.). It will also feed on soybean, alfalfa, beggarweed, kudzu, and other legumes.

Identification

Mexican bean beetle can be easily confused with other ladybeetle species despite behavioral and morphological differences (Fig. 2). All life stages of MBB can be readily found within the canopy of bean plants. When there is a severe infestation, characteristic feeding damage to bean leaves will be apparent as well (Fig. 3).

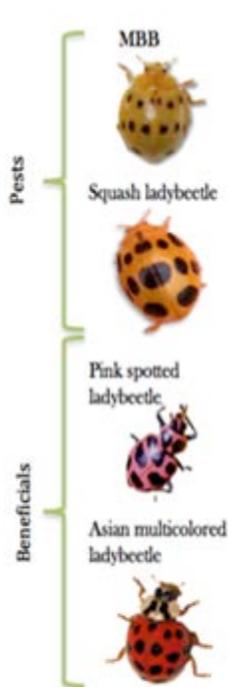


Fig 2. Common ladybeetles found in Virginia

Adult MBB are similar in size and shape to their beneficial relatives (commonly referred to as “ladybugs”). They are yellow or bronze, with 16 black spots arranged into three rows. The color of the head and “pronotum” (plate behind the head) are consistent with the yellowish color of the elytra. Adults are 6-8mm long and 4-6mm wide; though size can vary based on their diet. Males are generally smaller than females, and can be distinguished by a notch at the end of the last abdominal segment. Adults can walk and fly, but are generally sluggish once they have located a suitable host plant. Most of their time is spent feeding or mating within the plant canopy; but adult MBB will fly long distances if food becomes scarce or when locating overwintering sites.

Eggs are yellow or orange, and generally deposited in clusters of 40-60 on the underside of bean leaves. They are usually 1.2mm long and 0.6mm wide. Eggs hatch after about seven days.

Larvae are cylindrical with forked spines covering the body. They are about 8mm long. The body is yellow and the spines are either black, or yellow with black tips. Larvae generally remain attached to the bottom of leaves while constantly feeding. The larval stage requires around 2 weeks to develop.

Pupae are similar in appearance and size to the larvae, except the spiny covering of the larvae turns pale and is pushed to the hind end of the insect. The rest of the pupa is yellow and relatively smooth. At this stage, the beetle attaches itself to its host plant by at its anterior end and becomes immobile. Pupation lasts 9 days.

Native Range and Distribution

Mexican bean beetle is native to the plateau region of Mexico. In 1918, MBB appeared in Alabama and quickly increased its range to cover the entire East Coast, from Florida to New England. A 2013 grower survey showed MBB to be most commonly found in the Appalachian region of the mid-Atlantic, especially in organic agricultural systems. There are sparse populations in the Rocky Mountains and Great Plains. MBB is uncommon in Pacific Coast states.

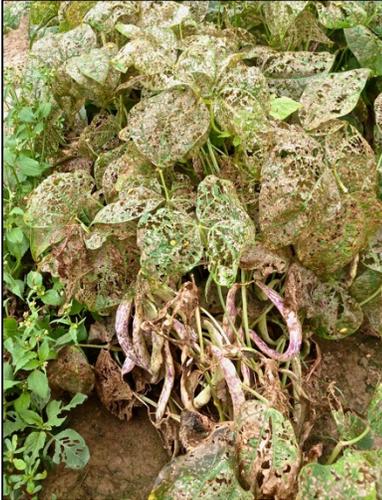


Fig 3. MBB damage on snap

Damage

MBB larvae and adults feed primarily on foliage, but will also eat pods and flowers as leaves become scarce. Injury to beans appears in the form of holes in the tissue at first, but the beetle will continue to feed until only a vein skeleton remains. Larvae are responsible for the majority of feeding injury to bean crops. Each larva can consume between 30 - 70 cm² of foliage before pupation. Snap bean crops can usually withstand at least 20% defoliation before yield decreases; however, this amount varies with crop growth stage, bean variety and environmental conditions.

Management

Cultural Methods: Because these beetles can fly long distances and overwinter as adults in various locations, common cultural pest management strategies like crop rotation or post-season crop destruction are ineffective. However, other cultural methods may prove advantageous in certain systems.

Planting beans as early as possible may allow beans to mature before beetle populations reach economically damaging levels. On the other hand, delaying bean planting until early summer may cause reduced beetle survival, due to MBB's reduced success as temperatures increased above 80°F. Other cultural methods, such as trap-cropping and the use of reflective mulch, are currently being researched.

Mechanical: Row covers can be used to prevent beetles from accessing the bean crop. Because MBB is easily visible within the leaf canopy, hand removal is a viable method for smaller farms and gardens.

Biological Control: A parasitoid wasp, *Pediobius foveolatus*, is available for purchase. The wasp has been shown to prevent between 70 to 100% yield loss resulting from MBB. However, timing of the release is critical and it can take up to three weeks to receive wasps in the mail. It is best to release the wasp when MBB larvae first appear. Because it is native to India, it is unable to survive winters in a temperate climate; therefore, wasps must be purchased and released annually.



Fig 4. *Pediobius* on MBB larva

Insecticides: Conventional bean producers generally utilize systemic seed treatments; however, they are only effective for ~20 days after planting.

Foliar applications of various carbamate, pyrethroid or neonicotinoid insecticides will control MBB. Consult the Commercial Vegetable Production Recommendations (VCE Pub. No. 456-420) for a list of products and rates.

Resources:

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