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# The Mexican Bean Beetle: Its Control With Parasites

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Adult Mexican bean beetle and "lacy" damage.

Cover: Mexican bean beetle larvae feed on bean leaf.

## **The Mexican Bean Beetle: Its Control With Parasites**

The Mexican bean beetle is one of the most destructive insect enemies of beans in the Middle Atlantic States and certain other areas east of the Mississippi River. In recent years it has been especially troublesome on soybeans. The beetle spread east during the 1920's from the Southwest, where it had been a pest for many years.

### **Appearance and Life Cycle**

The adult beetle is light brown, is about one-fourth inch long, and has 16 black spots on its back. Except for its color, it looks similar to the familiar and beneficial "ladybugs." The beetle's eggs are yellow and are generally found in clusters on the undersides of bean leaves.

The larva (young) is oval and is covered with spines that make it appear fuzzy. It is yellow. When full grown it is one-third to one-fourth inch long. It next enters the pupal or resting stage and gradually takes on the appearance of the adult beetle.

When the beetle first emerges as an adult it is light yellow, but it becomes light brown within a few days.

The beetle spends the winter as an adult, hibernating under pine needles or leaves in woodland, or in fields if the crop residue has not been plowed under. In spring the beetles come out and the females lay eggs, generally on the underside of bean leaves. Egg-laying continues through spring and summer.

The eggs hatch 5 to 14 days after they are laid, and the larvae feed for about 2 to 3 weeks. Then they become pupae and rest on the underside of bean leaves or on nearby weeds, remaining inactive for about a week before emerging as adults. In 10 to 14 days, unless winter hibernation time is nearing, the adult female beetles begin laying eggs.

### **Damage**

Young larvae feed on the underside of bean leaves. Older larvae and the adult beetles may eat completely through the leaves, leaving only the veins and giving the leaves a lacy look. Besides soybeans and snap beans, other kinds of beans and ladino clover may also be damaged.





Top: Adult Mexican bean beetles and eggs on underside of bean leaf.



Bottom: Beetle eggs, greatly enlarged.



Beetle larva, showing spines that make it appear fuzzy.



Top: Beetle pupa, transforming from larva to adult, on underside of bean leaf.



Bottom: Bean plants grown in laboratory for parasite production, showing beetle damage.

## The Parasite Control Program

Several State departments of agriculture, in cooperation with USDA's Animal and Plant Health Inspection Service (APHIS), conduct biological control programs using a tiny stingless parasitic wasp, *Pediobius foveolatus*, to control the beetle in soybean fields.

The wasp lays its eggs inside the larva of the Mexican bean beetle. The wasp eggs hatch and the wasp larvae devour the insides of the beetle larva, killing it.

The wasps then complete their development inside the dead shell, or "mummy," of the beetle larva and emerge; and the females seek out more Mexican bean beetle larvae in which to lay eggs.



Top left: Tiny stingless wasp lays eggs inside Mexican bean beetle larva.

Top right: Dead shells of beetle larvae, or "mummies." The young wasps develop inside.

Bottom: Laboratory rearing of parasites.



The wasp is not able to survive the winter in the United States, so the program maintains small laboratory colonies throughout the year. As spring approaches, increasing numbers of wasps are reared in the laboratory.

Meanwhile, one-eighth acre "nurse plots" are planted with a combination of snap beans and soybeans. Fertilizer and a herbicide generally are also applied at that time. This is done as early as the soil can be worked, in advance of regular soybean planting time, and next to fields that will later be planted in soybeans.

When the beetles emerge from hibernation in spring, they are attracted to the nurse plots and begin feeding.

Progress of beetles in the nurse plots is checked regularly. When the pests' numbers and life stage are at the proper point, the parasitic wasps are released in the plots. Within a few minutes of their release, the wasps may be seen laying eggs in beetle larvae.

Top: Herbicide being applied to nurse plot at planting time.

Bottom: Releasing wasps in nurse plot.





Sometimes nurse plots become very heavily infested before time to release the wasps, and light doses of insecticide may be applied to keep the plots sufficiently intact.

Two releases of parasites are made in each plot, wherever possible, to insure their establishment.

Followup scouting helps keep track of the entire complex of soybean pests in an area. During bad beetle years, a single application of insecticide may be necessary to save a crop from serious damage, but the parasites, nevertheless, can reduce the number of applications and acreage on which they are needed.



Top: Scouting helps keep track of entire soybean pest complex.

Bottom: Some insecticide may still be required to prevent serious damage by beetles.

### **Control With Chemical Insecticides**

If you live in an area not included in the biological control program described in this brochure, and if Mexican bean beetles are causing serious damage to your beans, you may need to use a chemical insecticide. Several different materials are registered for this purpose by the Environmental Protection Agency. Your local Extension agent or State Extension specialist can help you determine which one is best for you and also help you integrate Mexican bean beetle control into your total farm pest-control system.

For more information about chemical control, see Leaflet No. 548, "Controlling the Mexican Bean Beetle." Single copies are available free from your local Extension agent or by writing to the Office of Governmental and Public Affairs, U. S. Department of Agriculture, Washington, DC 20250. Send your request on a postcard, and be sure to include your ZIP Code.



Adult beetle approaches soybean plant.

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