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W208-Vegetable Pests - Colorado Potato Beetle

The University of Tennessee Agricultural Extension Service

UT Extension
W208

Vegetable Pests

Colorado Potato Beetle

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The Colorado potato beetle, *Leptinotarsa decemlineata* (Say), is found throughout most of the United States and Mexico and has been introduced into Europe and parts of Asia. Mexico is considered the center of origin for this pest. The Colorado potato beetle is an important pest of Solanaceous plants. Potato is the preferred host, but this insect pest also will feed on tomato, eggplant, pepper, tobacco, ground cherry, horse-nettle, nightshade, belladonna, thorn apple, henbane, buffalobur and other related plant species.

Damage

This insect is a leaf beetle (Family Chrysomelidae) with the destructive stages (larvae and adults) feeding primarily on the foliage. Extensive defoliation can occur in a short time. Feeding by larvae and adults is nearly continuous; larvae only stop feeding to molt. If the host plant has aboveground fruits, such as eggplant and tomato, the Colorado potato beetle also may eat or damage young fruits.

Description and Life Cycle

Adults are 3/8 inch long, yellowish orange, with hard, rounded, outer protective wings; 10 black stripes down the back (five on each outer wing); a tannish-orange head with black markings; and tannish-orange legs. Eggs are football-shaped, bright orange and mostly laid in clusters of 10 to 40 eggs. Larvae are soft-bodied, reddish, with two rows of black spots down each side, black legs and a black head (½ inch long when mature). The rounded yellow pupa (ca. ½ inch long) forms in a cell in the soil.

Adults overwinter in the soil and/or under surface litter, becoming active as temperatures increase in the spring. Adults then feed, mate and lay clusters of eggs on the undersides of leaves. Each female may lay 300+ eggs during her lifetime. Eggs hatch in 4-9 days; larvae initially feed on foliage in groups. Larvae undergo four instars and become full grown in 2-3 weeks. The larvae then burrow into the ground where they pupate; the pupal stage lasts 5-10 days before the adult emerges. There are usually two, occasionally three, generations

Figure 1. Pupa, larva and adult
(Images courtesy of North Carolina Cooperative Extension).

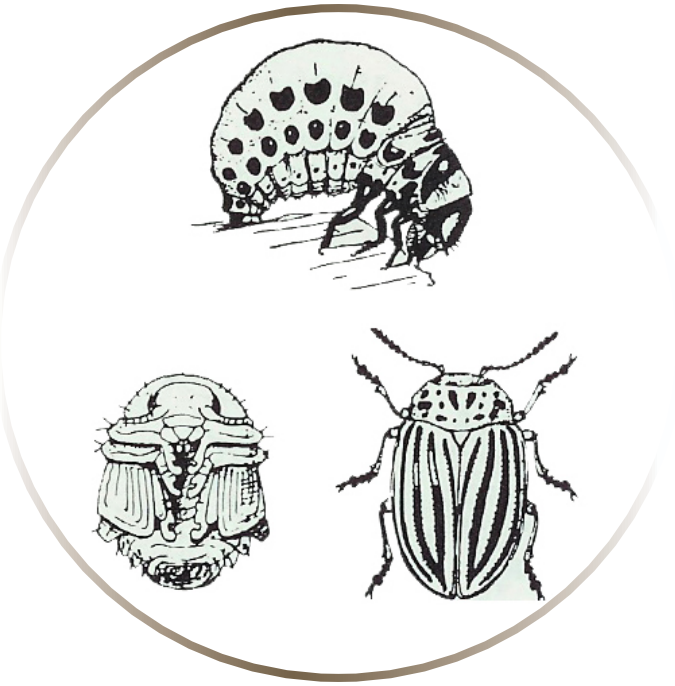

Figure 2. Colorado potato beetle damage to potato
(Photograph courtesy of L. Buss, University of Florida).

Figure 3. Life stages of Colorado potato beetle (Photographs A and C courtesy of R. Bessin, University of Kentucky; B courtesy of J. Castner, University of Florida; and D courtesy of W. Cranshaw, Colorado State University, Bugwood.org).

A. Adult

B. Egg cluster

C. Larvae

D. Pupa

per year, with first-generation larvae found in May-June and second-generation larvae found in July-August.

A false potato beetle, *Leptinotarsa juncta (*Germar), which is not considered a serious pest, often may be confused with the Colorado potato beetle. These two species can be distinguished by the stripe pattern on the outer wings. The false potato beetle has the third and fourth stripe connected on each outer protective wing, often giving it the appearance of one wide stripe. The false potato beetle mainly feeds on weeds, such as horse-nettle.

Figure 4. False potato beetle (Image courtesy of M. C. Thomas, Florida Dept. of Agriculture & Consumer Sciences, Bugwood.org).

Control

The control threshold is reached when more than one Colorado potato beetle larva or adult per plant is detected. Non-chemical and chemical controls are available for management of Colorado potato beetle. Non-chemical controls are a tool that can often be used to prevent Colorado potato beetle from reaching the control threshold. A discussion of these management tools follows.

Non-chemical Controls

Because the Colorado potato beetle has been documented to rapidly develop resistance to some chemical insecticides, the use of other non-traditional strategies to reduce pest populations also is important in management of this insect pest. These include cultural control, mechanical control and biological control. One of the most important cultural controls is crop rotation. Since the adults only crawl relatively short distances from their overwintering sites to nearby fields, it is best to plant a nonsusceptible crop the year after an infested susceptible crop is grown. Other cultural controls include destruction of crop residues, early or late planting dates to avoid infestation and defoliation at stages critical to plant yield, and proper selection of plant cultivars. For example, cultivars with large amounts of foliage will tolerate more damage than those with less foliage. Early-maturing cultivars harvested promptly also will reduce the food source for this pest.

A simple mechanical control is the use of hand picking to remove and destroy eggs, larvae and/or adults. Vacuum sucking or other devices can also be used to dislodge and remove damaging insects. Care should be taken when hand picking these pests from plants, because the beetles contain chemicals that can burn and blister sensitive skin. Barriers, such as row covers and plastic-lined trenches, also can be helpful to prevent this pest from damaging plants.

Biological control organisms can also help to reduce damaging populations of the Colorado potato beetle. For example, several predaceous insects, such as the spined soldier bug, the twospotted stink bug and various lady beetles, prey on the eggs and small larvae of this pest. A parasitic tachinid fly, *Myiopharus doryphorae* (Riley), and a fungus, *Beauveria bassiana* (Bals.), attack the beetles and can reduce populations. In addition, predation on larvae and adult beetles by birds also helps to reduce populations.

Chemical Controls

Several chemical insecticides, available for use in the home garden, give good control, but timing is critical. It is best to apply chemical treatments when the larvae are small. Commercial vegetable growers have access to more chemical control options. The availability of chemical pesticides changes regularly. Always

consult your local county Extension agent for a list of currently approved and recommended chemical insecticides. The following links provide access to listings of recommended chemical control options for homeowners and commercial production growers:

- "UT Extension Insect and Plant Disease Control Manual" (vegetables, home garden insects): http://eppserver.ag.utk.edu/redbook/pdf/homegardeninsects.pdf

- "Southeastern U.S. Vegetable Crop Handbook" (commercial growers): http://www.sripmc.org/docs/SoutheasternVegetableGuide.pdf

Always use pesticides according to the label; also use protective clothing and dispose of remaining pesticide in a properly approved manner.

References (and Internet Sites)

North Carolina State University, Insect and Related Pests of Vegetable Crops (edited by K. A. Sorensen and J. R. Baker):
http://ipm.ncsu.edu/AG295/html/index.html

Ohio State University:
http://ohioline.osu.edu/hyg-fact/2000/2204.html

University of Florida:
http://creatures.ifas.ufl.edu/veg/leaf/potato_beetles.htm

University of Georgia:
http://www.ent.uga.edu/veg/solanaceous/colorado.htm

University of Kentucky:
http://www.uky.edu/Agriculture/Entomology/entfacts/veg/ef312.htm

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