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Colorado Potato Beetle Control

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Colorado potato beetles are common in all potato growing areas of Idaho. Both adults and larvae feed on potato leaves and stems. Because of the greater number of larvae and their habit of feeding on terminal growth, larval feeding is more damaging. Potato plants can tolerate a light infestation, but under some conditions the insects consume enough foliage to cause a reduction in tuber size and quality. Under extreme conditions, the plants are entirely defoliated and killed.

The adult beetle is about three-eighths of an inch long, one-fourth of an inch wide, ovate, convex and hard-bodied. It is yellowish-brown with 10 black stripes on its wing covers and black spots on its head. The female lays yellow to light orange eggs in groups of 10 to 30. The eggs are arranged in orderly, perpendicular rows on the underside of leaves. The newly hatched larvae, which are sluglike in appearance, are cherry red except for glistening black heads and feet. As the larvae grow, the body color changes to a yellowish-red or orange, but the head and feet remain black, and a line of black spots forms along the sides of the abdomen.

Seasonal and Life History

Colorado potato beetles overwinter as adults 4 to 10 inches deep in the soil. They emerge as the soil warms in the

spring just before emergence of potato plants. Adults are strong fliers and can travel several miles to potato fields. If potato plants are not available, the beetles will feed on the foliage of tomatoes, ground cherry, nightshade and other members of the nightshade family. Volunteer potato plants, which emerge earlier than commercial potatoes, are usually heavily infested. Adult beetles produced from such plants may initiate infestations in commercial potato fields. Southwestern Idaho usually has two complete generations and a partial third generation of beetles. Southeastern Idaho has one complete generation and a partial second. The rest of the state has two generations per year.

Adult beetles lay from 300 to 500 eggs on the foliage in scattered locations throughout the fields. Hatching occurs in about a week. The larvae pass through four growth stages in 2 to 3 weeks. The mature larvae burrow into the soil to a depth of 4 to 10 inches and build a cell in which to pupate. Transformation to adults occurs in 5 to 10 days. Adults that emerge in mid-July or August may start a new generation during the current growing season or overwinter in the soil.

Ladybird beetles, green lacewings, collops beetles and predatory shield bugs eat beetles in the egg or larva stage. Since the adults are such strong fliers, no known cultural control programs will reduce populations significantly.

Table 1. Percent loss in yield of U.S. No. 1 potatoes at different levels of defoliation of (Russet Burbank*) potato plants.

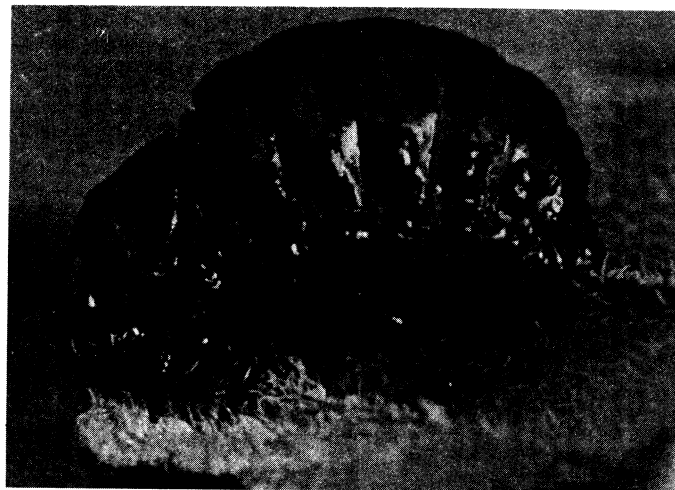
Stage of growth	Percent defoliation									
	10	20	30	40	50	60	70	80	90	100
6 to 8 inch	1	2	3	5	8	11	16	21	27	34
8 to 12 inch	3	6	9	13	18	24	32	41	50	60
12 to 15 inch	5	10	16	23	30	39	49	59	70	81
50% bloom	6	13	20	29	39	49	60	70	81	91
Full bloom	7	14	22	32	42	52	63	73	83	93
Past bloom	5	12	19	26	33	41	49	58	67	76
Full growth	4	9	13	18	23	28	34	42	50	58
Near maturity	2	4	6	8	11	14	17	21	25	31

*Most varieties exhibit the same growth characteristics in relation to inflorescence and growth stage. However, because the rate of maturity differs among varieties, the time needed to reach any given growth stage will also differ. These data have proven reliable estimates of yield loss for several varieties.

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Distinguishing features of the adult beetle are 10 black stripes on its yellowish-brown wing covers and black spots on its head.



The Colorado potato beetle larvae are cherry red in color except for glistening black heads and feet.

Damage

No established threshold now exists on which to base Colorado potato beetle control. Judging when to treat, however, can be based on amount of damage occurring to the potato crop. W. C. Sparks and G. W. Woodbury determined percentage loss in yield from defoliation of U.S. No. 1 Grade Russet Burbank potatoes during different stages of plant development (Table 1). Potatoes were mechanically defoliated in their plots, but insect defoliation results would be similar.

Control

Consider the following criteria when deciding whether to control beetles in a specific field:

1. Adult feeding seldom causes serious damage.
2. Foliar sprays should be applied when most of the eggs have hatched but before serious defoliation occurs.
3. Severe defoliation is much more likely in early season because it takes fewer beetles to defoliate a small plant than a mature plant.
4. Short-lived chemicals such as parathion or phosphamidon may require retreatment much sooner than materials with longer residual actions.
5. Where soil-applied Di-Syston or Temik have been used, Colorado potato beetle populations may still develop.

Both of the soil-applied insecticides listed in Table 2 will control the Colorado potato beetle and the green peach aphid. Several contact insecticides are also available for late-season control when systemics have lost effectiveness.

All insecticides are poisonous and must be handled with care to protect the operator, livestock, adjacent property and the consumer. Read and follow the label carefully each time an insecticide is used. Keep records of the pesticides you use and apply.

Pesticide Residues — These chemical recommendations are based on the best information currently available. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow

Table 2. Chemicals for Colorado potato beetle control.

Insecticide	Rate/acre active ingredient (lb ai/A)	Minimum days from application to harvest	Application method and remarks
Soil treatment			
Di-Syston	3	75	At planting in seed furrow or dress; post-plant sidedress. See labels for full details. Foliar treatments following systemic treatments may be needed for late season beetle infestations.
Temik	2-3	90	
Foliage treatment			
endosulfan*	1	none	Apply when most of the eggs have hatched but before severe defoliation occurs; repeat within 10 to 14 days as needed.
Guthion	$\frac{3}{8}$	7	
Imidan	1	7	
Monitor	$\frac{3}{4}$ -1	14	
Parathion	$\frac{1}{2}$	5	
Phosphamidon	$\frac{1}{2}$	14	
Sevin	1	none	
Pydrin	.05-0.1	7	
Furadan	$\frac{1}{2}$ -1	14	Do not apply to furrow irrigated fields.
Sprinkler foliage treatment			
Sevin	2	0	Apply Sevin through sprinkler systems containing anti-siphon and check valves which prevent water source contamination. See labels for complete instructions.

*Do not plant root crops — other than carrots, potatoes, sugarbeets and sweet potatoes — as followup crops after endosulfan application.

suggestions carefully with respect to dosage levels, number of applications and minimum interval between application and reentry or harvest.

Trade Names — Trade names are used in this publication to simplify the information presented. Use of these names neither implies endorsement of products nor criticism of similar products not mentioned.

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