

Flea Beetle Pest Management for Organic Potatoes

Several species of flea beetles are commonly found in organic potato fields in North America. Adults of many of these species feed on the leaves of potatoes and other plants in the family Solanaceae, but tuber flea beetle larvae are the most common cause of flea beetle damage to potato tubers (Figure 1). Some flea beetle species found in potato fields, such as cabbage and crucifer flea beetles, do not feed on potato plants or damage tubers. This guide describes the steps for flea beetle identification, damage assessment, monitoring, and management.

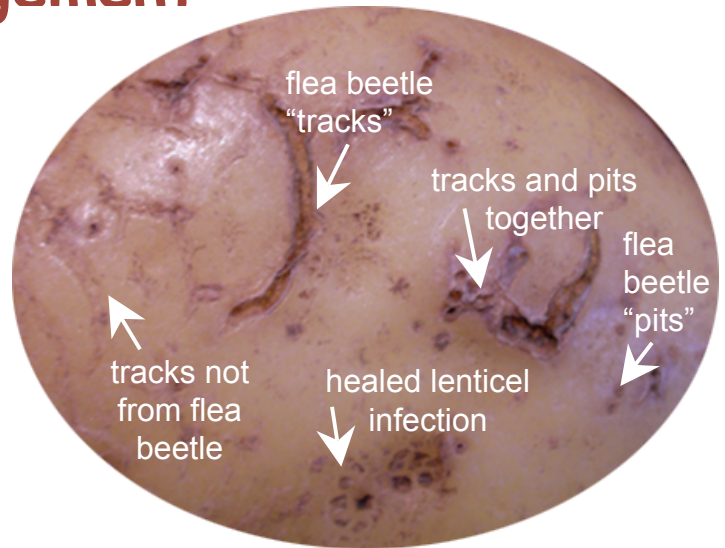


Figure 1. Damage from flea beetle larvae and other tuber blemishes. (Tuber shown is twice actual size.)

Identification of flea beetles

The flea beetles found on potato plants are small (between 1.5 and 2.2 mm long). Flea beetles can be distinguished from other small beetles by their large hind legs. Most flea beetles commonly seen in potatoes jump when disturbed, making identification difficult. To see the identifying characteristics, you may need to collect beetles and examine them with a magnifying glass. Follow the blue brackets in Figure 2 to identify flea beetles found in potato fields.

Potato-feeding flea beetles (hairy and dull)					Brassica-feeding flea beetles (shiny, hairless)		
Black-brown body			Bronze-brown body		Metallic blue	Metallic bronze	
Can't fly	Dense hairs		Banded				
Potato FB	Eggplant FB	Tuber FB	Tobacco FB	Western potato FB	Crucifer FB	Cabbage FB	
<i>Epitrix cucumeris</i>	<i>E. fuscula</i>	<i>E. tuberis</i>	<i>E. hirtipennis</i>	<i>E. subcrinita</i>	<i>Phyllotreta cruciferae</i>	<i>P. albionica</i>	
Eastern North America	Throughout North America	Western North America	Throughout North America	Western North America			

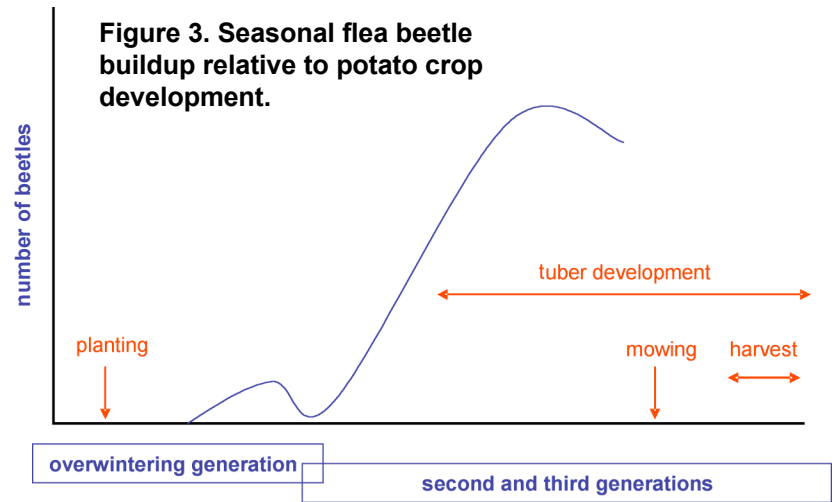
Figure 2. Key to flea beetles commonly found on potato plants.

This bulletin is one of a series on organic potato production developed by “OSPUD.” OSPUD is a collaboration among 11 farmers operating diversified organic vegetable farms and Oregon State University personnel. The purpose of OSPUD is to improve potato quality and profitability through a participatory learning process and on-farm, farmer-directed research. The first 2 years of OSPUD were supported by Western SARE Grant SW05-091. For more information on OSPUD, visit ospud.org.

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Flea beetle life history and population growth in and around potato fields

Flea beetles overwinter as adults in the soil or under plant debris in undisturbed areas near the field where they emerged. In spring, overwintering beetles move to potato fields to feed on leaves and lay eggs at the base of plants. Adults first colonize and establish in field edges. There can be one or two more generations during the crop season, depending on species and climate. The chance for damage to tubers throughout the field increases the longer the tubers remain in the ground or if control measures are not taken.



Monitoring

The objective of flea beetle management is to manage the emerging overwintering generation with the options listed below. The tuber flea beetle is the main species to monitor. Once it is warm enough, this pest can enter potato fields as soon as plants emerge. At least once per week, monitor three or four locations within the first rows along field margins and one or two locations in the center of the field. Sample 5 to 10 plants at each location. Use a sweep net for larger plants and visually inspect smaller plants. The tuber flea beetle will jump if startled by your shadow or sudden movement, so check where you cast your shadow when monitoring.

	Management tactic	Mechanism and known effectiveness
Preventive methods	Sanitation of overwintering sites and removal of host plants	Research has shown that the need for late-season suppression is greatly reduced if the overwintering population is reduced.
	Rotating with non-Solanaceous crops	Tuber flea beetle populations have been shown to be much greater in fields previously cropped to potatoes.
	Early planting and harvest	Since tuber damage from flea beetles increases as beetle populations build, early planting and harvest can minimize accumulation of damage.
	Mulching and hilling over the base of the plant	Piling mulch or soil high on the base of the potato plant can prevent flea beetles from laying eggs around the base of the plant.
	Biological control	The nematode species <i>Steinernema carpocapsae</i> has been shown to reduce damage by flea beetle larvae.
	Resistant crop plants	Glandular, sticky leaf hairs may deter feeding by the adults, but the degree of tuber protection has not been assessed.
	Reduced tillage, intercropping, strip cropping, and/or undersowing	Moderately reduces flea beetle populations and damage. May work by enhancing natural enemies or by masking crop plants.
	Row covers over the plants	Can provide effective control in fields without overwintering populations, but can be difficult to use on a large scale.
Mitigation	Sprays	Approved antifeedant and killing materials provide varying levels of control when applied to edges or whole fields at the outset of infestation.
	Mass trapping	Some species are highly attracted to yellow sticky traps and pheromones, but these products have not been tested on flea beetles in potatoes.