ORGANIC FARMING RESEARCH FOUNDATION

PEST PROFILE

SOLANACEAE LOVING FLEA BEETLES

Know your Pest	**Tuber Flea Beetle** *Epitrix tuberis*	**Pale Striped Flea Beetle** *Systena blanda*
Flea beetles are highly mobile and may fly long distances in search of suitable plants.		
	Prefers Potato, especially potato tubers, but will also feed on tomatoes and other plants in the nightshade family.	Adults have a wide range of hosts, including bean, beet, eggplant, lettuce, melon, pea, pepper, pumpkin, radish, alfalfa Weed Hosts: pigweed, lambsquarters, purslane, ragweed, cocklebur, wild sunflower, and others. Larvae appear to prefer lambsquarters and shepherd's purse.
	**What do the eggs look like? Where do they lay them?** Elliptical in shape. White to yellowish gray. They are laid at the base of host plants, or in soil around the base of the plant. Eggs hatch in 11-13 days (at 77°F). Adults mate and lay eggs singly or in groups of 3-4 in soil at the base of host plants.	
	**What do the larvae look like?** Larvae feed on the root hairs and taproots of seedlings. Damage is usually minimal at this phase except in the case of the Tuber Flea Beetle which feeds on potato tubers and the roots of potatoes. When larval development is complete, larvae pupate in small earthen cells for 9-13 days before emerging as adults.	

KEY STRATEGIES FOR ECOLOGICAL PEST MANAGEMENT

<table>
<tr><td rowspan="2">Stress the Pests</td><td colspan="2">• Plant a trap crop to attract pests away.
• Pile mulch or soil high on the base of the potato plant to prevent Tuber Flea Beetle from laying eggs around the base of the plant.</td><td>• Remove alternative food sources.
• Interrupt life cycles.
• Create a barrier with floating row cover.</td></tr>
<tr><td>What are its food habits? What parts of the crop does it like to eat?

Tuber Flea Beetles feed on potato tubers and foliage, tomato, and other plants in nightshade family; larvae create shallow scars in potato tubers that damages yield of marketable tubers.

Adult Pale Striped Flea Beetles feed on both upper and lower leaf surfaces, but most often on the underside of leaves where they chew small, circular holes through to the upper cuticle. They prefer many weeds, but will amass large populations and eat a wide range of crop foliage, especially early in the season.</td><td>What factors influence its abundance?

In early fall, adult beetles leave fields to overwinter in areas with leaf litter or crop residues. To help reduce their abundance, manage weeds, remove crop residues, and make sure to rotate crops so that susceptible crops are not in the same area year after year. Tuber flea beetle populations have been shown to be much greater in fields previously cropped to potatoes.</td><td>What is its life cycle? When does it emerge?

Adults overwinter outside the field in hedgerows, grassy and woody field borders, and in ditch banks. They move into the field in spring. Larvae emerge and feed on root hairs for 25-30 days, then pupate for 10-15 days before adult beetles re-emerge at the start of summer. There are 2+ generations per year, with overlap in generations such that crops are almost always at risk.</td></tr>
<tr><td>Enhance the Populations of Beneficial Insects</td><td colspan="2">Attract beneficials by providing food or shelter.</td><td>Don’t forget the edges! Plant in your borders to increase the population of natural enemies.</td></tr>
</table>

KEY STRATEGIES FOR ECOLOGICAL PEST MANAGEMENT

Know your Allies	**What are beneficial insects that can keep the populations down?** The following insects will feed on adult stages of flea beetles: • Braconid wasp (Microctonus vittatae) • Lacewing larvae (Chrysoperla spp.) • Big eyed bugs (Geocoris spp.) • Damsel bugs (Nabis spp.)	**What kinds of plants will help entice beneficials?** The following can enhance floral resources and encourage predatory insects: • Anise • Dill • Chamomile • Marigold • Clover	**Time your planting to give your crop the upper hand on emerging insects.** Planting later than the "normal window" may help plants avoid the first generation of overwintering flea beetles.
Healthy Crop Diversity	Grow a variety of crops with natural defenses against pests or are unattractive to the pests on your farm.	Build your soil - healthy crops can better withstand pest pressure.	Use crop rotation and avoid large areas of monoculture.

Sources

eOrganic - Managing Cruciferous and Solanaceous Flea Beetles in Organic Farming Systems - https://eorganic.org/node/12461

Cornell University - Flea Beetle Pests of Vegetables - https://ecommons.cornell.edu/bitstream/handle/1813/43272/flea-beetles-veg-FS-NYSIPM.pdf?sequence=1

University of Minnesota Extension - Flea Beetles - https://extension.umn.edu/yard-and-garden-insects/flea-beetles#cultural-controls-3089561

Colorado State University Extension - Flea Beetle Fact Sheet - https://extension.colostate.edu/docs/pubs/insect/05592.pdf

SARE Handbook - Manage Insects on Your Farm - https://www.sare.org/resources/manage-insects-on-your-farm/

Washington State University Whatcom - Potato Flea Beetles: Biology & Control - http://whatcom.wsu.edu/ag/documents/seedpotatoes/eb1198e.pdf/

Utah State University Extension - Flea Beetles on Vegetables - https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1902&context=extension_curall

Canola Council - Flea Beetles - https://www.canolacouncil.org/canola-encyclopedia/insects/flea-beetles/

Check Out the OFRF National Organic Research Agenda (NORA)
http://www.ofrf.org/research/nora