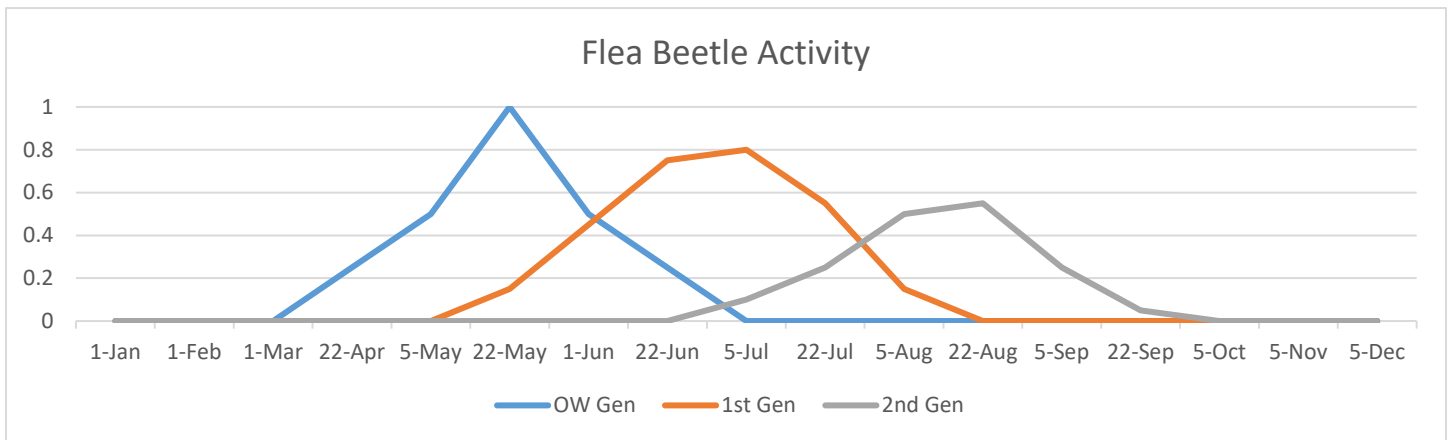


Flea Beetle Biology (*Phyllotreta cruciferae*, *P. striolata*)

Identification & Damage:

The crucifer flea beetle is uniformly black and shiny, about 2 mm in length, while the striped flea beetle has two yellow stripes on its back. These flea beetles only feed on brassica crops; those found on corn or solanaceous crops are different species. Adults feed on leaves leaving small round holes which can become enlarged as the leaves grow. Heavy feeding can kill seedlings outright or delay maturity, reduce yield, or make crops unmarketable. Crops with more waxy leaves (*Brassica oleraceae* e.g. cabbage, broccoli, kale) are less attractive and feeding is restricted to leaf margins, especially as crop matures and the waxy coating thickens. Crops with glossy leaves and spicy aromas (*B. napa* and *B. juncea* e.g. bok choy, Napa cabbage, mustard) are highly attractive, and the whole leaf is damaged. These crops are susceptible from planting until harvest.



Life Cycle:

Adults overwinter outside the field in woods or hedgerows and move into the field in early-May. Adults mate and lay eggs singly or in groups of 3-4 in soil at base of plant. Eggs hatch in 11-13 days (at 77°F). Larvae emerge and feed on root hairs for 25-30 days, then pupate for 10-15 days before re-emerging as adult beetles in late-June. There are at least two generations per year, with the second generation adults emerging in late-July, but they overlap considerably such that crops are almost always at risk whenever they are planted. In mid-September, adult beetles leave fields to overwinter in areas with leaf litter or crop residues.

Monitoring & Thresholds:

Because brassica crops differ greatly in susceptibility and attractiveness there is no fixed economic threshold that applies to all crops. Beetles can be difficult to count, as they hop when disturbed. Yellow sticky cards placed in the canopy or feeding damage can be used to monitor beetle populations. Control if damage to cotyledons or seedlings is stunting growth, or if damage to greens will reduce marketability.

Flea Beetle Management

Cultural Controls & Prevention:

- **Crop rotation:** Break the cycle.
 - Plant spring crops as far as possible from last season's fall brassica crops.
 - Separate early and late-season brassica crops.
- **Delay planting** until July to break the reproductive cycle. *This may not be economically feasible for many growers
- **Use row covers or insect netting.** Covers provide excellent protection if well secured around all edges immediately after seeding or transplanting. Remove and replace the same day for cultivation, as needed.
- **Trap cropping:** take advantage of flea beetles' preferences for certain crops and use the more attractive types to lure FB to one area where you can kill them more effectively. Plant the trap earlier than the main crop and be prepared to spray it regularly, or the beetles will move into your main crop.
- **Destroy crop residue** (above and below ground) promptly to starve adults, they will move to a new field. Discing may kill eggs and larvae of beetles in soil.
- **Provide adequate water and nutrients for crop growth;** avoid soil compaction.
- **Intercropping** can limit damage, as beetles will have a harder time finding host plants and will move out of the field
- **Mulches:** Plastic, straw, or living mulches can hamper flea beetles' ability to find host plants, can prevent egg-laying in the field, encourage ground-dwelling beneficial insects like ground beetles that feed on larval or adult flea beetles
- **Parasites and predators.** A native parasitoid wasp, *Microctonus vittatae*, is found throughout North America and can kill adult flea beetles, although the rate of parasitization is low. Generalist predators such as lacewing larvae (*Chrysoperla* spp.), big eyed bugs (*Geocoris* spp.), and damsel bugs (*Nabis* spp.) have also been known to feed on adult stages of flea beetles. Flowering plants such as anise, dill, chamomile, marigold, or clover can be grown around the host plants to enhance floral resources and encourage the native parasitic wasp and other generalist predators. For more about insectary plantings see: coming soon!
- **Entomopathogenic nematodes** in the families Steinernematidae and Heterorhabditidae can attack the larval stage of flea beetles, thereby reducing the size of the population within a field over time.

Cultural Controls & Prevention

- **Always use a spreader sticker to improve coverage on waxy crops!!** Frequent re-application may be necessary!!
- **Conventional:** There are many effective materials available, both contact and systemic. Please consult the [New England Vegetable Management Guide](#) for the most up to date recommendations.
- **Organic:** Entrust works best and has some residual activity, as it sticks to the leaf and is then ingested by FB as they feed. Pyganic and azadiractin products have some contact activity—use the highest labeled rate.
- **Use Surround WP to protect seedlings!** Learn how from this video: coming soon!

