

Beating Flea Beetles

They eat tiny holes in the leaves of many vegetable plants: beans, beets, cabbage and related plants, corn, mustard and other greens, solanums (eggplant, pepper, potato, tomato), and sweet potato. All flea beetles are diminutive creatures (See photo at [Texas A&M University](#) site.), dark in color; some species transmit plant diseases while dining in our vegetable gardens.

Indications of flea beetle damage to plants

- Leaves look like they've been peppered with fine shot. There may be hundreds of tiny holes in a single leaf. See photo in extension bulletin [1198E, Potato Flea Beetles: Biology and Control](#). (PDF)
- When plants are disturbed, tiny black insects jump.
- Heavily damaged plants may be wilted or stunted.
- Potatoes have surface scars or deeper holes bored into them, causing discoloration.

Preventive Measures

Home gardeners should avoid applying insecticides to plants they are growing for food. Strategies to help prevent flea beetle damage without resorting to chemical insecticides follow.

Planting

Schedule seed sowing so that seedlings will emerge during periods of low flea beetle activity. Delay spring planting or grow the most vulnerable crops in the fall, when flea beetles stop reproducing.

Plant resistant vegetable varieties that have hairy or waxy leaves. Interplant cabbages or broccoli with radishes; the flea beetles should prefer the radishes. Tomatoes may provide protection to cabbage-family crops when interplanted with them.

Set out large healthy transplants rather than sowing seed directly into the garden. Do everything you can to encourage speedy establishment of the transplants. In general, flea beetles prefer small tender leaves (like those of emerging seedlings) to large thick ones (like those of more mature plants).

Surround vulnerable plants with a living mulch or diversified planting to disguise them. Many flea beetles are strong fliers; chemical clues produced by plants let beetles know that host plants are emerging or are present. Pests zone in on tasty plants more easily when they are surrounded by bare soil than when they are surrounded by a multitude of different types of plants.

Plant vulnerable crops that will tolerate it, in shade, since flea beetles prefer sunny sites. Swiss chard, radishes and turnips tolerate some shade. Grow vulnerable crops near taller shade-giving crops if you have no other shady spots for growing vegetables.

Plant seed thickly, thinning after early-season flea beetle populations have diminished and/or plants have five or six leaves, are well established, and can thus withstand flea beetle attacks.

Rotating crops as a single strategy is not that useful in combating flea beetles, because flea beetles are very mobile and they are attracted to so many hosts. In combination with the use of floating row covers, however, crop rotation is highly effective. Plant the primary crop where a non-susceptible crop grew last season. After planting, promptly install a lightweight floating row cover over seedlings. Such covers are designed to be used primarily as insect barriers, transmit plenty of light, and do not cause excessive heat buildup. If pollination is necessary, uncover plants when they have at least five to six true leaves, or when flowers open. If edible leaves are the reason for which the crop is grown, keep it covered until harvest. Ideally one should anchor edges of floating row cover with soil, boards, rocks, bricks or "earth staples" but even an unanchored cover should dissuade flea beetles from attacking the crop underneath. Bending wire fencing into an arch or building a wire cage and attaching row cover to the wire framework makes it is easier to remove the cover for weeding, pollination and harvesting. See the article *Season Extension Techniques...*, cited in Resources below, for more information about floating row covers.

Trap Crops

Plant an early-season trap crop of 'Southern Giant' mustard, a proven flea beetle delicacy. The trap crop should occupy flea beetles while seedlings of the primary crop are emerging and getting established. The trap crop, which is usually sited along the edge of the garden, should be about one percent of the size of the primary crop. Make multiple sowings of the trap crop during the two weeks before the primary crop is sown or transplanted. When the plants in the primary crop have five to six true leaves, pull the infested trap crop and destroy it. (An alternative is to spray flea beetles with a labeled insecticide once they are actively feeding on the trap crop.) 'Southern Giant' mustard, if allowed to go to seed, can become a weed, so be sure to pull it or deadhead plants before that stage if you don't want volunteer mustard seedlings all over the garden. Nasturtiums, arugula, radish, turnip and other crops are used as traps crops, but not as successfully as 'Southern Giant' mustard.

There are distinct disadvantages to using trap crops. They might be responsible for attracting more flea beetles to the garden than would otherwise have been present. If trap crops aren't pulled and destroyed (or sprayed) in time, they might help support additional generations of flea beetles. Immature stages of beneficial insects, which are usually less mobile than adults, may be destroyed along with the trap crops. Flea beetles' hard bodies and well-developed hind legs may help them escape insecticide sprays. Likewise, flea beetles might not stay on the trap crop when it is pulled up.

Mulches

Use thick layers of organic mulch, which may make it difficult for female fleas beetles to deposit eggs near the base of garden plants in late spring. Except for the Western potato flea beetle, most flea beetle larvae do not damage plants, but they do mature into another generation of hungry garden pests!

Cultivating, Weeding and Removing Plant Residues

Cultivate frequently before and after planting to destroy larvae and eggs in soil. Use a tiller, a garden fork, a hoe or other implement to bring the soil-dwelling stage of the flea beetle population to the surface, exposing it to the elements and predators. Tilling after harvest may kill adults settling in for the winter.

Remove weeds (potential food and/or hiding places for flea beetles) and plant residues (hibernation sites) from areas where vegetables are grown. Plow weeds and crop debris under after harvest.

Attracting Beneficial Insects

Since flea beetles' natural enemies include microscopic braconid wasps, beneficial soil-dwelling nematodes, and a tachinid fly, provide habitat for beneficial insects in and around the vegetable garden. Small-flowered plants such as daisies, cosmos, alyssum, yarrow, dill, fennel, angelica, clover and coneflower attract beneficial insects. Aim to have some of these in bloom throughout the season. (See our March 2004 article [Be a Beneficial Gardener – Support Your Local Insects!](#).)

Sprays

Sprinkle vulnerable crops lightly with water in the middle of the day, since flea beetles prefer dry conditions. Spray cole crops with "tomato leaf tea" to repel flea beetles and to enhance the effectiveness of a trap crop. Apply garlic spray to vulnerable crops. Spraying catnip tea as a repellent is usually ineffective.

Keep Flea Beetles Outside

After working outside, always change clothes before working with indoor plants. Flea Beetles may get trapped in clothing where they can go undetected until they find their way to susceptible houseplants such as African violets.

Controls

There may be instances when the time for prevention has long since passed, and control is the name of the game. Even at such a time, one can find success without resorting to chemical insecticides. Most healthy vegetable plants can tolerate 20 to 30 percent defoliation. It may not be necessary to keep a crop covered if the leaves are not the primary reason for growing it. Instead, employ methods for control such as those that follow.

Stick-em Up

Pass sticky shields or boxes over infested plants to catch beetles as they jump; or install white sticky traps every three to five feet among vulnerable plants. To make your own sticky traps, use plastic foam insulation board or another rigid material that is white or can be painted white, cut into four-by-six-inch rectangles. Cover each white rectangle with a plastic bag or clingy plastic wrap. Coat the plastic with a commercial vegetable-based sticky substance like Tangle Trap, which is marketed for making insect traps and comes in paste, brush-on and spray-on formulations. Hang traps at plant height, close to plants. Keep traps clean and sticky. When traps are covered with insects and soil, use rubber gloves to dispose of the soiled plastic; then replace the plastic bag or clingy plastic wrap and re-apply the sticky substance.

Soap 'em

Apply insecticidal soap at the cotyledon stage (when seedlings have their first leaf-like growth) for partial control. Insecticidal soap can burn the leaves of some plants, so test it first. Apply to just a few plants, then wait 48 hours

before a full-scale spraying. To be effective, spray must douse the insects. Insecticidal soap does not affect insects once it has dried on leaves. Avoid spraying during the heat of the day. On a very sunny day, rinse soap off plants a few hours after spraying. In hard-water areas, mix insecticidal soap with distilled water to help soap dissolve well.

Vacuum 'em

Vacuum flea beetles off foliage – and be prepared to repeat the process frequently to achieve any significant control. Look for cordless bug vacuums, which have sealed disposable cartridges lined with nontoxic sticky gel, on the internet or at a local store.

Dust 'em

Wearing a mask, dust agricultural lime over leaves as often as necessary; reapplying after rain or high winds, to keep leaves lightly coated. Or sprinkle leaves with hardwood ashes several times a week. Diatomaceous earth (DE), applied as a powder-like dust to plants, is an effective repellent in dry climates. (Unfortunately, peak populations of flea beetles in the Pacific Northwest typically coincide with rainy weather). Diatomaceous earth, a mineral product mined from the silicate skeletons of tiny marine creatures called diatoms, acts like ground glass, cutting into the waxy coat of insects and causing them to dry out and die. Be aware that DE is not selective; it kills spiders and beneficial insects as well as pests. Don't overuse it. It is not toxic to humans if eaten, but it is irritating if inhaled. If you deem it appropriate to use DE, use only the natural grade (not the type used in swimming pool filters) and wear goggles and a dust mask during application.

Predatory Nematodes

Since flea beetle larvae are vulnerable to predatory nematodes, purchase them to use when and if your local County Extension/Master Gardener office recommends it. See the article [Using Insect Parasitic Nematodes in Resources](#) for more information on predatory nematodes.

Save the Beer for the Slugs

Although some sources recommend using traps baited with beer, just like for slugs and snails, the University of California IPM Online site dedicated to flea beetles on cole crops states that baits are not effective.

Neem

Neem (Azadirachtin) has natural insecticidal properties and is biodegradable and non-toxic to birds and mammals. Neem discourages flea beetles by making treated plants unpalatable. To determine what type of flea beetle you are combating and whether Neem is recommended as a control, call your local County Extension/Master Gardener office or check the [PNW Insect Management Handbook](#).

Don't give up trying to grow crops that are vulnerable to flea beetle damage. Determine which of the above strategies work for you, and keep growing all that wonderful produce!

Resources

A Gardener's Utility Belt. *Organic Gardening*. July/August 2003:8.

Antonelli, A.L., and Roy M. Davidson. [Potato Flea Beetles: Biology and Control](#). WSU Cooperative Extension Bulletin 1198E. Retrieved February 8, 2005.

Chaney, W.E., N.C. Toscano, and E.T. Natwick. [Cole Crops. Flea Beetles](#). How to Manage Pests. UC Pest Management Guidelines. Retrieved February 8, 2005, from <http://www.ipm.ucdavis.edu/PMG/r108300511.html>

Chapline, Jake. Entomology's New Frontier. *Organic Gardening*. July/August 1998:40.

Davidson, Ralph H., and William F. Lyon. *Insect Pests of Farm, Garden and Orchard*, eighth edition. New York: John Wiley & Sons, 1987.

Flea Beetles. i. Mar/Apr 2000:64.

Kuepper, George (March 2003). [Flea Beetle: Organic Control Options](#). Retrieved February 7, 2005, from Appropriate Technology Transfer for Rural Areas.

Peterson, Cass. Uninvited Visitor Gobbles the Greens. *New York Times*. (Late Edition (East Coast)). April 4, 1999:96.

[Glossary](#). Retrieved February 8, 2005, from University of California Statewide Integrated Pest Management Program Resources.

[Using Insect Parasitic Nematodes](#). General Guidelines. Retrieved February 9, 2005, from Insect Parasitic Nematodes, IPN Web, Ohio State University.