

Organic Control of Vegetable Garden Pests - Susan Mulvihill

2022 WSU Master Gardener Advanced Education Conference

Pest Profiles:

Aphids

- ❖ 1/8" long, look for the cornicles ("tailpipes") to positively ID them
- ❖ They exude waxy substance for defense
- ❖ They excrete honeydew from their sap-sucking activities
- ❖ Aphids reproduce asexually, except late in the year they mate and female lays eggs, which hatch in spring
- ❖ Females are born pregnant!
- ❖ Live birth
- ❖ Crops they bother: artichokes, asparagus, beans, beets, cabbage family (arugula, broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale, kohlrabi, radishes, rutabagas, turnips), corn
- ❖ Look for puckered leaves, sticky honeydew
- ❖ Controls: spray them with a jet of water; don't use a lot of nitrogen fertilizer; use floating row cover or agricultural insect netting over susceptible crops (for whole season if plants don't require pollination OR keep cover in place until plants start blooming – this gives the crop a head start)
- ❖ Organic products: Horticultural oil, insecticidal soaps*, Neem*, plant extracts, pyrethrins* (*= toxic to pollinators, so apply very early or late in the day when they're not active; avoid spraying near flowers)

Cabbage worms (imported)

- ❖ Adult: imported cabbage white butterfly
- ❖ Larva: caterpillar (green with yellow stripe)
- ❖ We also get cabbage loopers and diamondback caterpillars (same controls)
- ❖ Crops they bother: cabbage family crops
- ❖ Look for holes in leaves, caterpillars on undersides of leaves near midrib
- ❖ Controls: floating row cover (these crops don't need pollination), hand-pick, clean up plant debris
- ❖ Products: *Bacillus thuringiensis kurstaki*, Neem*, plant extracts, pyrethrins*, spinosad* (note that these controls will also work for cabbage loopers and diamondback caterpillars)

Carrot rust flies (a.k.a. Carrot root flies)

- ❖ Adult: 1/5" long fly with shiny black body and orange head
- ❖ Larva: 1/4" long cream-colored maggot, overwinter in soil
- ❖ They are attracted to the scent of carrots
- ❖ Crops they bother: Carrot family (carrots, celeriac, celery, dill, fennel, parsnips)
- ❖ Look for tunnels, grooves and roots, rust-colored excrement
- ❖ Controls: Crop rotation, plant later in season, intercrop with garlic to disguise carrot scent, floating row cover, don't overwinter crops in the ground, clean up debris, pull up Queen Anne's Lace (host plant)
- ❖ Easy DIY project: Erect a 2-foot-tall barrier around planting because flies aren't able to fly higher than the tops of the plants

Leafminers

- ❖ Adult fly lays eggs on leaves, maggots hatch and tunnel through leaf cells, then drop to soil to pupate
- ❖ Most commonly seen on beet family crops (beets, spinach, Swiss chard)
- ❖ Can also be found on artichoke, bean, melon, pea, pepper, potato, squash, & tomato foliage but unlikely to affect harvest since we don't eat the leaves of these crops
- ❖ Look for squiggly lines on leaves or transparent areas on leaves
- ❖ Easiest solution for beet family crops and potatoes: row cover! Also crop rotation, clean up crop residue, apply beneficial nematodes, Neem*, plant extracts, pyrethrins*, or spinosad*

Root maggots

- ❖ There are cabbage and onion root maggots – adult is a fly
- ❖ Look for wilted cabbage family seedlings, yellow leaves
- ❖ Scarred root crop surfaces, tunnels in roots
- ❖ If problem last season, consider skipping a year of growing the same crop
- ❖ Practice crop rotation
- ❖ Don't use fresh animal manures (they attract the adult flies)
- ❖ Floating row cover or ag netting over crop
- ❖ Can apply beneficial nematodes to the soil
- ❖ Clean up & dispose of garden debris; don't leave overwintering habitat for them!

Slugs

- ❖ Gastropods ("stomach-foot"); they are mollusks (Mollusca phylum of invertebrates)
- ❖ Nocturnal
- ❖ Crops they bother: Artichokes, basil, beans, beet family crops, cabbage family crops, lettuce, peppers, tomatoes
- ❖ Look for irregularly-shaped holes, slime trails
- ❖ Controls: Eliminate moist hiding places, water in the morning, use drip irrigation if possible, hand-pick, trap under boards
- ❖ Use beer traps
- ❖ Copper foil barriers around base of single-stemmed susceptible plants (i.e., broccoli)
- ❖ Products: Diatomaceous earth, plant extracts, organic slug bait (non-organic bait contains metaldehyde, which is toxic to pets, etc.)

Beneficial insects:

Insect	What They Eat
Assassin bugs	Aphids, cabbage worms, Colorado potato beetles, cucumber beetles, cutworms, earwigs, hornworms, leafhoppers, stink bugs
Damsel bugs	Aphids, cabbage worms, Colorado potato beetle eggs and larvae, corn earworms, cutworms, various insect eggs, leafhoppers, whiteflies
Ground beetles	Aphids, carrot rust flies, Colorado potato beetles, corn earworms, diamondback moths, root maggots, slugs, squash vine borers
Lacewings	Aphids, asparagus beetle larvae, cabbage worms, Colorado potato beetle larvae, corn earworms, hornworms, various insect eggs, leafhoppers, thrips, whiteflies

Ladybugs	Aphids, asparagus beetles, Colorado potato beetle larvae, corn earworms, hornworms, various insect eggs, leafhoppers, whiteflies
Long-legged flies	Adults and larvae prey on aphids, spider mites, thrips
Parasitic wasps	Aphids, asparagus beetles, cabbage loopers and worms, carrot rust flies, Colorado potato beetles, corn worms, diamondback moths, flea beetles, hornworms, leafminers, root maggots, squash vine borers, stink bugs, thrips, whiteflies
Praying mantids	Aphids, asparagus beetles, Colorado potato beetles, earwigs, grasshoppers, leafhopper, squash bugs, stink bugs
Spiders	Aphids, asparagus beetles, cabbage worms, Colorado potato beetles, corn earworms, cutworms, diamondback moths, leafhoppers, leafminers, pillbugs and sowbugs, squash bugs, stink bugs

How to attract more beneficial insects to your garden:

Eliminate the use of pesticides

- ❖ They are non-selective: They kill both the bad bugs AND the good bugs that would have controlled them for you
- ❖ Insects become resistant to the sprays, which makes them a nightmare to control (i.e., Colorado potato beetles, spider mites)
- ❖ They are hazardous to handle
- ❖ Who wants that stuff on their food?

Create habitat for beneficials

- ❖ Plant a diverse habitat of flowers, shrubs, trees, native grasses
- ❖ Choose flowers with different types of flower heads to accommodate the insects' mouthparts, and provide nectar and/or pollen
- ❖ Leave the leaf litter under shrubs
- ❖ Rocks or logs for beetles to hide underneath

Interplanting

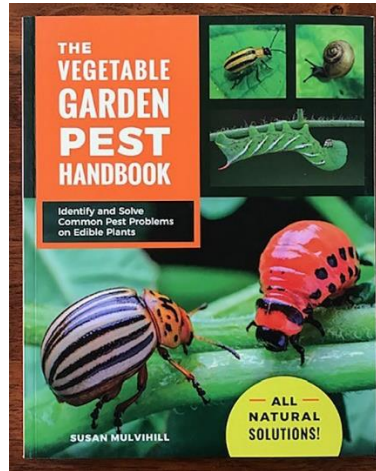
- ❖ Plant herbs and flowers with your veggies to attract more beneficials
- ❖ Beneficials will be on hand to help with pest insect issues
- ❖ Examples: Nasturtiums, marigolds, chives, sunflowers, zinnias

Build your own insect hotel

- ❖ This fun project is both educational and fascinating
- ❖ Purpose: To provide shelter for hibernation and for laying eggs
- ❖ Which bugs will it attract?
 - Beetles, lacewings, ladybugs, moths, solitary bees (carpenter, digger, mason and sweat)
- ❖ There are only two rules for an insect hotel
 - Cover it with a roof to keep rain and snow off the materials and inhabitants
 - The front of the hotel should face south or east for maximum morning light
- ❖ Be creative! Do a web search to get plenty of inspiration; you'll be amazed at the variety of structures folks have built

The Vegetable Garden Pest Handbook by Susan Mulvihill

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Your complete, easy-to-use guide to the most commonly-encountered vegetable garden pests. Learn about their life cycles, what they look like (over 200 photos!), which crops they bother, what their damage looks like, and choose organic products and strategies to control them. Discover which bugs are beneficial, which pests they prey upon, and how to attract more of these good guys to your garden. Learn about organic products & which insects they control. Choose from helpful do-it-yourself projects to make traps, barriers, and even an insect hotel to attract the good bugs!

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Susan Mulvihill is the author of The Vegetable Garden Problem Solver Handbook (Feb. 2023), The Vegetable Garden Pest Handbook, and co-author of Northwest Gardener's Handbook. She has been a Spokane County Master Gardener for 20 years and is the longtime garden columnist for Sunday edition of The Spokesman-Review newspaper in Spokane. Her YouTube channel has over 400 videos on a wide range of gardening topics. Susan's goals are to get everyone to grow a vegetable garden and use organic methods.

Connect with Susan!

Website/blog: SusansintheGarden.com

Facebook/Instagram: [@SusansintheGarden](https://www.facebook.com/SusansintheGarden)

YouTube: [youtube.com/SusansintheGarden](https://www.youtube.com/SusansintheGarden)

Email: Susan@SusansintheGarden.com