



ALL ABOUT BUGS

THE GOOD AND THE BAD



Organic Methods to Deter Pests
From Eating Your Garden
Before You Do



Savory Seeds



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OUR GOAL

Gardening is one of those vast topics that can seem intimidating to start initially and even more so when you find yourself in the middle of a deep dive about which methods are going to solve your aphid problem. It may have taken awhile to discover aphids were even the name of the small bugs acting like your lettuce patch was their personal salad bar.

The goal of this booklet and others by Savory Seeds is to provide a concise picture of the 'what' and 'how' of gardening. What is this worm digging through my zucchini? How do I get rid of it?

We all have other things we would rather be doing in our garden than fighting hornworms on our tomato plants. Like making salsa with said tomatoes and enjoying it with some chips.

This booklet will not get rid of every bug in your garden and you don't want it to. There are beneficial bugs who will fight your pests for you and be glad to do so. Instead of aphids eating your lettuce, they'll be eaten as a snack by the very lovely lady bug, which is not to be confused with its nasty cousin, the Mexican bean beetle (see page 8)



SUMMARY: PREVENTION OVER CURE

Grow Your Traps and Attract Your Fighters

Pictured right is a beneficial Milkweed Assassin. A bit of controversial bug because while it will eat almost all of the pests listed in this booklet, it has also been known to eat other beneficials like ladybugs. However, I lean with the crowd that says leave them to do their dirty work so I don't have to. They love to lurk on nearby leaves to pretty flowers and wait for their prey.

Milkweed is a great trap plant for aphids and where this assassin gets its name. I've also found a great number of them hanging around the hand-sized platform of flowers on my elderberry bushes.

Growing trap plants, or plants that deter pests to begin with, is best paired with plants that attract beneficial bugs. If you planned purely on planting vegetables in your garden because you think you have no use for flowers, think again. Not only are they beneficial on the bug front, but many can also be eaten. We eat everything in our garden, just like the Milkweed Assassin.

If you want the simplest, instant solution to an infestation, here it is:

Toss the plant.



I've taken infested plants and let them soak in Castille soap before burying it in the compost pile, but the trash is also a great option. Don't see it as a failure, no one can beat mother nature, but you can plant a replacement.

Do not plant your replacement plant until you know the infestation hasn't spread to other areas of your garden. I always take a tossed plant as a sign that I didn't help my beneficial bugs thrive. I'm left short-handed and have to hire some of their friends.

You can buy beneficial bugs if you can't or don't want to wait for them to come to you but by the time they arrive, you'll have to give them a reason to stay. Hint: it's flowers

I promised concise solutions to pest problems and that is what I'll deliver. On the following pages I've made charts with sections for where to look for these hungry bugs, what they look like, and prevention methods

THE GOOD

Stop killing your friends



Trichogramma Wasps

They lay their eggs inside freshly laid eggs of moths so their pupae will eat the moths' eggs before they have a chance to turn into caterpillars that will eat your plants.

Because they don't live in hives, they have nothing to defend so are harmless to humans.

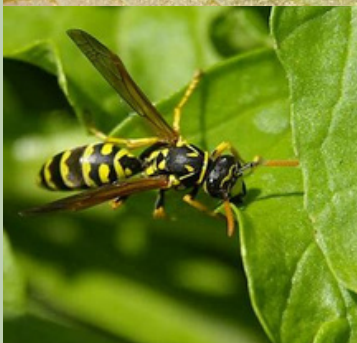


Braconid Wasps

Kills aphids, beetles, flies, caterpillar and moths by laying eggs under the skin of their host. When laying eggs, the female injects a virus to run interference on the host's immune system seeking to eliminate the eggs.



The cocoon phase of the braconid wasp emerging from a deserving hornworm before it eats too many of my tomatoes.



Paper Wasps

Feed on caterpillars, beetle larvae, and flies as well as help pollinate because they feed on the nectar of flowers. They are only dangerous when they're around their nest but if you see them hopping flower to flower, just leave them alone. They're not aggressive like yellow jackets but the resemblance is fear evoking.

They can eat on fruit but think of it as a dessert after a meal of your more havoc wrecking pests. The enemy of your enemy is your friend.



Beneficial Nematodes

They're microscopic so if you purchase them, you'll have to water down the medium they come in and water your soil with them in the morning or evening.

They kill ticks, insect larvae, caterpillars, white grubs, etc. by releasing a gut bacteria after being ingested by the garden pest.



Soldier Beetles a.k.a Leatherwings

They resemble fireflies but they don't glow. Aside from feeding on aphid and caterpillar larva, they also pollinate flowers by feeding on nectar and pollen.

You should already have zinnias and marigolds in your garden for a number of reasons but if you haven't, plant them to attract soldier beetles. They also love goldenrod and other bright colored flowers.



Lady Bugs

They're great for controlling aphid populations as well as adorable. They also eat mites and pollen.

To attract more lady bugs, plant marigolds, sweet alyssum, yarrow, cilantro, chives, calendula or other disc flowers that act as a landing pad for these little guys. I've also seen them eating aphids on my trellised peas so if you don't have pollen for them to eat, you must have bugs. I'd rather supply the pollen.



Green Lacewings

Eat aphids, mites, mealybugs, moth eggs, thrips, white flies, leafhoppers, and small caterpillars as well as pollen and nectar.

Plant yarrow, dill, coreopsis, cosmos, daisies, cilantro, dill, goldenrod, sweet alyssum, or sunflowers to attract. They like native flowers, grasses, or flowers with a lot of foliage to lay their eggs on



Pirate Bug

Eat aphids, thrips, whiteflies, small caterpillars and spider mites by gripping them with their front legs and draining them until they dehydrated and die.

Like almost all the beneficial bugs listed so far, they like marigolds, cosmos, and goldenrod.



Dragonflies

One of my favorites because they eat mosquitos and flies, but they also revealed a termite population in my old house window sill by taking turns diving to it to have a feast. The belief that they are a symbol of good luck has some merit in my experience.

They like water and colorful flowers, but they'll also be drawn into the garden by prey so plant traps like zinnias and nasturtiums if you don't have a water source.

If you were planning on having a water feature or already have one, place a flat rock or aquatic plants like lilies for them to sunbathe.

THE BAD

CABBAGE WORMS A.K.A CABBAGE WHITE BUTTERFLY

WHERE: Kale, Cauliflower, Broccoli and of course Cabbage

SIGNS: You may see their poo before you see significant damage

PLANTING TIPS: Plant Red & Purple Varieties or with Thyme

PREVENTION: Spray BT (Bacillus thuringiensis) every 1 to 2 weeks

GOOD BUG: Trichogramma Wasps



CUCUMBER BEETLE

WHERE: Squash, Cucumber, Melon, Green Beans

SIGNS: They eat flowers and foliage so less fruit flowers and wilting foliage edges

PLANTING TIPS: Plant more mature plants, not seedlings or direct sow

PREVENTION: Manual Removal

GOOD BUG: Braconid Wasps,

Nematodes, and Soldier Beetles



CUTWORM

WHERE: Cabbage, Corn, Lettuce, Beans; Roots and Foliage of young plants

SIGNS: Active in the evenings & Cloudy days

PLANTING TIPS: Plant seedling out in toilet paper tubes as collars

PREVENTION: They overwinter in soil or wood piles; clear debris and mulch with compost. Use crushed eggshells or used coffee grounds around plant

BT or DE (Diatomaceous earth) every 2 weeks



CABBAGE FLY & MAGGOT

WHERE: Cabbage, Cauliflower, Broccoli, Brussel Sprouts

SIGNS: Lays eggs where the stem meets the soil & in the soil itself

PLANTING TIPS: Plant radishes as a trap plant. If infected, pull radish and resow. Can pull infected plant, kill maggots off roots and replant

PREVENTION: Beneficial Nematodes, Wasps



MEXICAN BEAN BEETLE

*SQUASH BEETLES LOOK SIMILAR BUT WITH FATTER SPOTS

WHERE: Beans, Peas, Beet, Squash, Tomatoes

SIGNS: Yellow eggs are laid on the underside of leaves. Spray or dip the leaves in diluted castile soap or rub your thumb over them

PLANTING TIPS: Plant with Rosemary, Marigolds, and Nasturtiums



SQUASH VINE BORER & ADULT MOTH

WHERE: Guess

SIGNS: Leaves of plants will start to wilt. There will be sawdust-like remnants at the base of the plant

PLANTING TIPS: Plant squash in multiple areas of the garden or varieties that are resistant

PREVENTION: Keep base clear of plant debris & BT every 2 weeks
DE and Parasitic Wasps are alternatives



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THRIPS
MORE LIKELY TO SEE THEIR DAMAGE THAN THEM

WHERE: Onion, Iris, Impatiens, Chives, Roses, Tomatoes, Cucumbers

SIGNS: Leaves of plants will start to change color in a speckled pattern, either white or dark brown. When you can see them, spray with diluted soap spray. Check back every 3 days and respray as needed.

PLANTING TIPS: Plant Oregano, Basil & Garlic to deter thrips

PREVENTION: DE every 3 weeks. Pirate Bug, A. Cucumeris, Lady Bugs, Lacewings



WHITE FLIES

WHERE: Everywhere. They're not picky.

SIGNS: Leave a honey dew residue from sucking the plant, which can also attract ants. Spray with high-powered hose.

PLANTING TIPS: Plant hummingbird friendly flowers to invite them to dinner

PREVENTION: Spray regularly with castile soap spray or use sticky traps around plants. Ladybugs and Green Lacewings



JAPANESE BEETLE AND GRUB

WHERE: Can be a lot of places but prefer Roses, Beans, Grapes, and Raspberries. I've also found them on my Zinnias.

SIGNS: Rough-edged holes or edges on foliage

PLANTING TIPS: Plant Geraniums, they're this bug's drug. They'll eat the blossoms, get dizzy & fall off the plant, making them easy to handpick. I prefer a spare garden brick but if you're picking up a lot, toss them in a cup of diluted dish soap as you collect.

PREVENTION: Spray neem oil every 1 to 2 weeks. Beneficial nematodes attack grub stage but not adults. Traps are not recommended because they can attract more beetles.



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EARWIGS ONLY AN ISSUE IN LARGE NUMBERS

WHERE: Basil, Flowers, Lettuce, Celery, Fruit, Under pots and in Wood piles

SIGNS: Will leave jagged tears

PLANTING TIPS: Avoid planting near woodland or decaying plant matter

PREVENTION: Traps can be anything from a garden hose to logs laying on the ground. Remove trap and squish. DE also helps.



SLUGS AND SNAILS

WHERE: Beans, Lettuce, Cabbage, Tomatoes, Fruit

SIGNS: Active in the evening. Leave giant holes or tears where they've snacked all night.

PLANTING TIPS: Don't overwater or use chunky mulch. Can companion plant with garlic, green onion or chives.

PREVENTION: Garlic spray (also good for deterring mosquitos). A small trench with a board over it can be used as a trap.



FLEA BEETLES

WHERE: Radishes, Nasturtiums, and I've also had them on Eggplant foliage

SIGNS: Small, round holes. They jump away quickly like fleas

PLANTING TIPS: Plant what they're attracted to as traps. Radishes are great because the beetle will eat the foliage but the root can still be eaten.

Repelled by Basil.

PREVENTION: Regularly spray with very diluted castile peppermint soap in the evenings. Some gardeners also include a small amount of rubbing alcohol. Spot test before covering everything and spray off before the sun gets too high.



THE WORST

Not a scientific opinion but mine based on experience



APHIDS

Also in white, black, brown, light green, orange

WHERE: Underside of leaves and on plant stems. Love anything and everything.

SIGNS: Leaves of plants will start to wilt, curl and turn brown

PLANTING TIPS: Plant milkweed as a trap plant

PREVENTION: They're soft-bodied so are easily killed with high-powered hose, castile peppermint soap (every 3 days), DE, Neem oil and bugs; Lady bugs and green lacewings



SQUASH BUG

WHERE: On squash fruit, in the dirt around plant base, underside of squash leaves

SIGNS: They'll lay eggs on foliage or flowers and when born, they suck all the nutrients from the plant. Leaves will shrivel, flowers will fall off if they leave anything.

PLANTING TIPS: Plant squash in multiple areas of the garden. I plant shorter sunflowers as trap plants and knock them off taller sunflowers with an electric fly swatter. They also like zinnias, nasturtiums or tansies. Can cover plants until blossoms appear.

PREVENTION: Keep base clear of plant debris. Spray underside with Castile soap or scrap off eggs with a spoon.



TOMATO HORNWORM

Looks like a dinosaur the meteor should've hit

WHERE: Tomatoes, Eggplants, Potatoes, Peppers

SIGNS: Leaves will curl, which is normally a sign there are eggs or a worm under it. The tops of branches will look pruned.

PLANTING TIPS: Plant basil, marigolds, and dill to deter

PREVENTION: Parasitic wasps, lady bugs, green lacewings, and spray BT every couple weeks



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