

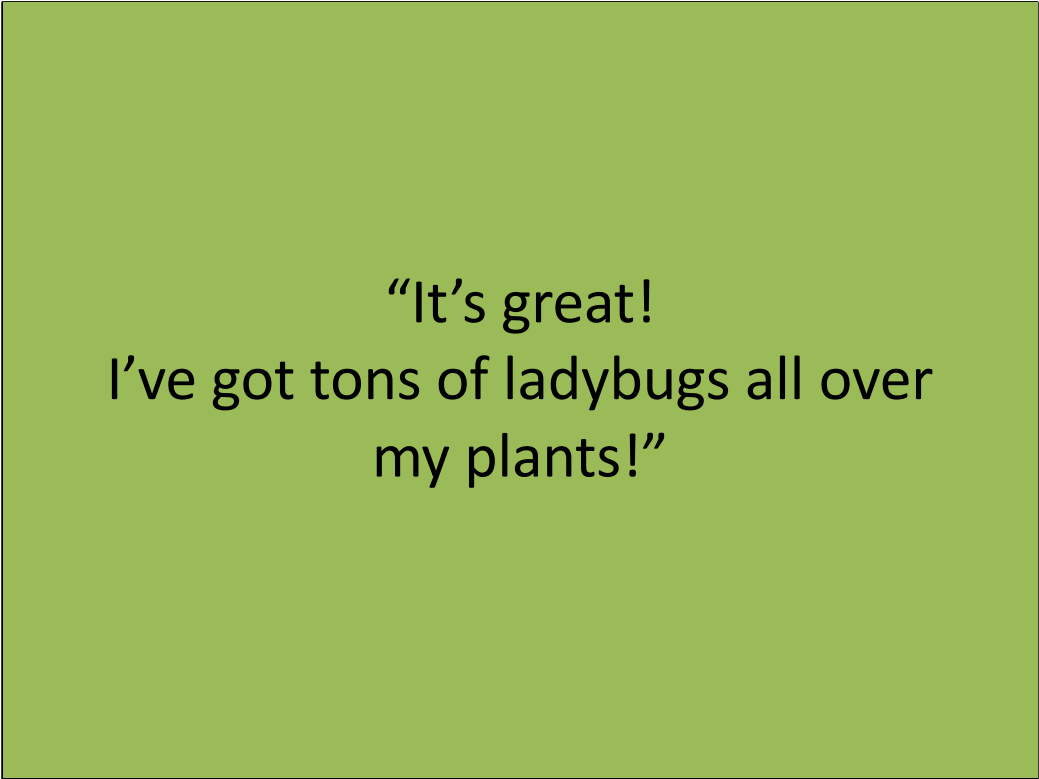
# Know Your Enemy

Strategies for Dealing with  
Weeds and Insect Pests  
in the  
Community Vegetable Garden

Susan Levi-Goerlich







“It’s great!  
I’ve got tons of ladybugs all over  
my plants!”

I was inspired to do this talk by a couple of communications I’ve had with gardeners. One was a former gardener. He excitedly told me his plot was full of ladybugs. He was thrilled. He mentioned that the ladybugs were especially interested in his bean plants.



It turned out they were the bad south-of-the-border cousins of our beloved and helpful ladybugs. They were Mexican bean beetles and the larvae were destroying his bean plants.

## Weeds or desirable plant?



“There’s only one sure way to tell the weeds from the vegetables. If you see anything growing, pull it up. If it grows again, it was a weed.”

—Corey Ford, “Advice to the Home Gardener” as quoted in *The \$64 Tomato*

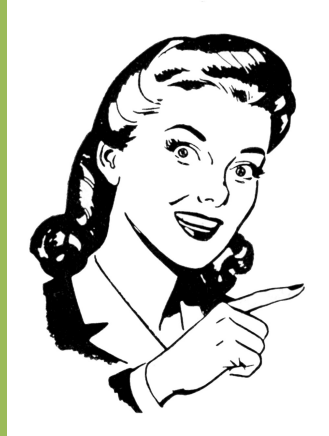
I’ve also had many communications with gardeners about weeds. One new gardener asked, in all sincerity : “How can I tell the difference between my plants and the weeds?” My tongue in cheek response of “Pull out the plant and if it comes back, it's a weed” wasn’t a really satisfying answer.

But hopefully you won’t let your garden get to that point.

I mentioned to a friend of mine, a very proper Master Gardener, that I thought it was helpful to know what’s all over your garden—whether it be weeds or insects---to give them a name.

This was her response:

It's helpful to be able to name your  
nemesis.



“I’ve got a name  
for them!  
I call them all  
%#!^#\*  
!!!!”

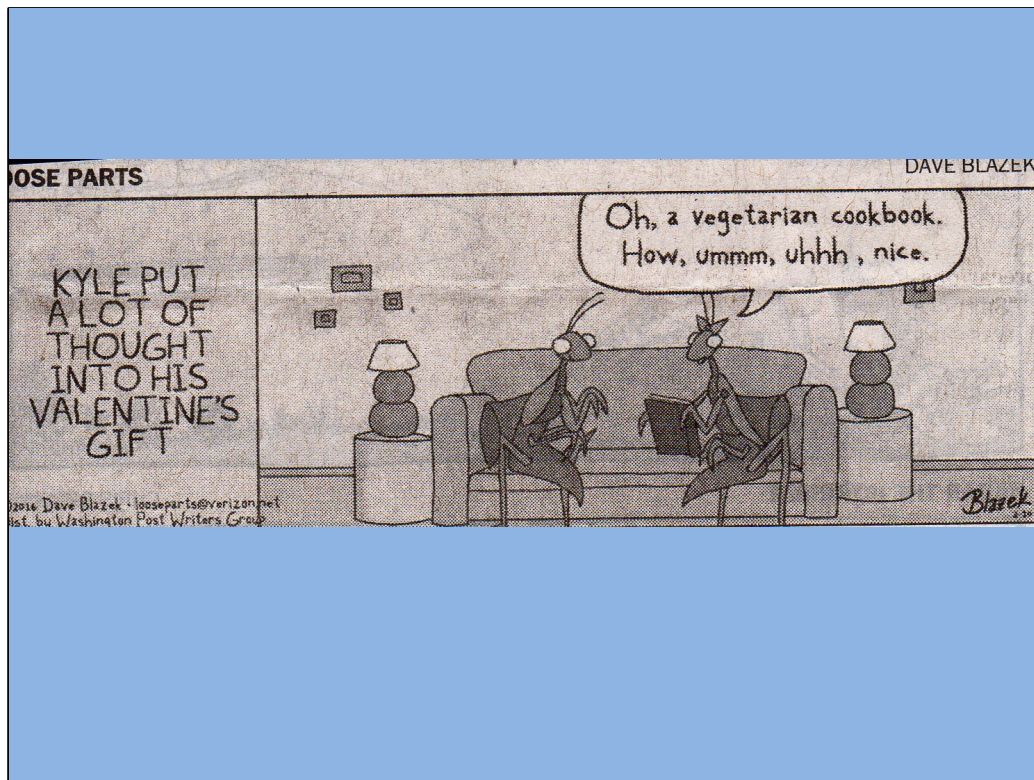
Sometimes it's helpful to be able to be a bit more precise!

# INSECTS

There are almost a million species of insects in the world. In the North America alone there are more than 100,000 species.

Most insects are good and serve a purpose: they are predators, pollinators, or they enrich or aerate the soil.





I'm a vegetarian and in general I think a meat-free diet is great. But in the garden, many of the vegetarian insects are the ones who are eating your plants---and you need the carnivorous predators—like the praying mantids and ladybugs-- to take care of them.



# INSECTS

A very small percentage of insects are considered pests. Some are good in one life stage (i.e., cabbage white butterfly) but pests in another (cabbage worm).

A nuanced approach helps when dealing with insects so that you keep the good guys while reducing the impact of the bad.

I will only cover organic control methods. While not all of our gardens are “organic only,” this talk will only focus on organic control methods. If you use other methods, ALWAYS read the labels, use them responsibly and be aware of the effects on your neighbors’ plants.

## This is not a nuanced approach

- Human Health Hazards
- Resistance Development
- Secondary Pest Outbreak
- Effects on Pollinators
- Environmental Pollution



Resistance develops when the the only pests who aren't killed by a pesticide survive and pass on their genes. (Darwinism at work. We hear about this all the time with antibiotic resistant infections).

A secondary pest outbreak can occur when a pesticide is applied and wipes out all the targeted insect plus their predators. Another non-targeted insect's populations explodes because there are no longer any predators.



STRATEGIES FOR DEALING WITH INSECTS:

## Before you plant your garden

- Plan to rotate your crops.
- Time your planting.
- Plan to plant a diversity of plants. They will support the good guys.
- Provide habitat for pests' enemies, such as birds and beneficial insects.
- Consider companion planting (i.e. marigolds).
- Choose resistant cultivars if possible\*.

### **Rotate crops**

Know the crop families: Nightshades, brassicas, onions/garlic, etc. and don't plant where another family member was the previous season.

Plant beans after broccoli.

Don't plant tomatoes, eggplant or potatoes where they have been before.

### **Attract predators and parasites with flowers**

- Plant open faced flowers and herbs
- Mint (anise hyssop, thyme)
- Carrot (dill, yarrow)
- Aster (tansy, marigold, zinnia)

**Diversify** A variety of plants in a garden will support a diverse array of organisms which will help minimize pest problems.

\* Some big box stores had been labeling plants that were treated with neonicotinoids.  
This may even include vegetable plants!



This may no longer be an issue because the profound effects of the neonicotinoids created a big backlash and led to a number of big-box stores no longer selling plants treated with neo-nics, but still...Buy from trusted sources.

Be careful what you plant—you may be killing pollinators.

Neonicotinoids have been implicated as one factor in the honey bee die-offs around the country.

Not all plant sellers may be disclosing whether the plants were treated.

Ask!

STRATEGIES FOR DEALING WITH INSECTS:

## During the growing season

- Look carefully! Recognize and observe: holes, spots, egg masses, feeding damage, stippling.
- Identify your insects.
- Hand-pick and squish or drown the pests.
- Use physical controls:
  - Row cover excludes many pests. (For some plants you need to remove the row cover to allow pollination.)
  - Collars for cutworms
  - Traps (i.e., beer for slugs)
  - Phermone traps (i.e., for Japanese beetles),
  - Blast of water (for aphids)
  - Kaolin clay
- Allow the good guys to show up

Allowing the good guys/natural enemies of the insects to show up (or introducing them if need be) is called biological control.

**Predators** feed on insects and other prey. Ex. Lady beetle, lacewing, soldier bug, predatory mites. praying mantids, wheelbugs.

**Parasites** lives on or inside its host and usually kills it slowly (i.e., on tomato hornworm.) There are some predatory nematodes as well.

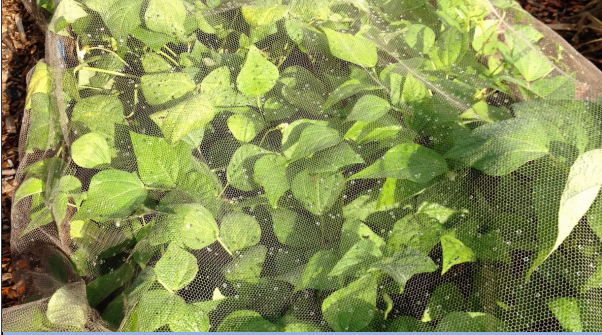
**Pathogens:** Bacteria, viruses, fungi, nematodes, and other microorganisms infect pests resulting in disease and death.

If you used insecticides, you may kill off the good guys. Plant diversity helps encourage the good guys to take up residence in your garden.

STRATEGIES FOR DEALING WITH INSECTS:  
Physical barriers: Row cover and netting



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STRATEGIES FOR DEALING WITH INSECTS:  
Physical barriers: Row cover and netting



STRATEGIES FOR DEALING WITH INSECTS:  
Allow the heroes to arrive on the scene



Praying mantis chowing down on stink bug.  
Aphids losing the battle against Ladybird beetles.  
Tomato hornworm parasitized by braconid wasps.

## STRATEGIES FOR DEALING WITH INSECTS:

### Spraying

- If you choose to spray anything (even organic sprays) please read the label carefully, use only as directed and remember that you are in a community garden: be respectful of your neighbors.
- If you spray, target the pests directly; do not spray indiscriminately.
- Insecticidal soap must make direct contact with insect; it does not kill eggs. Dissolves the epicuticle. Commercially available or you can make a mixture of Ivory soap and water.
- Homemade sprays can be made from garlic, chives, marigolds, hot peppers, or Ivory Soap and water. Some work; some don't. Most require repeated applications.
- Commercial organic sprays: Pyrethrum (from chrysanthemum), Rotenone, Bt (*Bacillus thuringiensis*), Spinosad. They are natural, but they are still toxins.
- Neem oil, horticultural oils. Spray directly on the insects to cause suffocation. Must be 55° or higher for 3-4 days to be effective.

With all pesticides:

Always read the label

Follow label instructions

Pyrethrums :nerve toxin. Contact killer.

Spinosad: nerve/stomach poison. Ingestion. Low toxicity to beneficial insects.

Neem oil : azadirachtin- growth regulator. Works on contact and by ingestion.

Details:

**Pyrethrum** is a fast acting contact poison that 'knocks down' susceptible insects.

Insects are left paralyzed by the toxic effect of pyrethrum. The normal function of the nervous system is affected, stimulating repetitive nerve discharges leading to paralysis. However, some insects are able to recover after the initial knockdown if the dose is too low. Stink bugs appear to fall into this category.

Warning, there is also a synthetic pyrethroid on the market but it is not labeled organic.

**Spinosad.** It's a secondary metabolite from the aerobic fermentation of *Sacharopolyspora spinosa* (a naturally occurring soil microorganism). Spinosad is a nerve and stomach poison and must be ingested to kill insects. Paralysis and death occur within minutes although insects may remain on the plant for up to two days. Spinosad has limited translaminar activity, meaning it can move somewhat into leaf tissue. This makes it effective against leafminers that feed within leaves. It has very



low toxicity to non-target organisms including pollinators and other beneficial insects. Spinosad will control: caterpillars (e.g. armyworms, European corn borer, cabbageworm, corn earworm, cutworms, hornworm) and borers, thrips, leafminers, sawflies, Colorado potato beetle. Less effective on beetles and not effective against sucking insect pests such as bugs and aphids.

Only a small amount per gallon is required- about 4 tablespoons per gallon of water). It's very important not to spray spinosad more than 2—3 times per growing season to reduce the risk of pests developing resistance to the active ingredients. Organic farmers alternate spinosad with B.t. for controlling caterpillar pests.

**Neem oil:** Pesticide active ingredients are based on neem seed extracts, including azadirachtin, neem oil and neem oil soap. Azadirachtin, one of the more than 70 compounds produced by the neem tree, acts mainly as an insect growth regulator, but also has anti-feedant and oviposition (egg-laying) deterrent properties. Most commercially available neem products list azadirachtin as the primary active ingredient. Such products are broad-spectrum insecticides, which work by contact or ingestion. As an insect growth regulator, azadirachtin prevents insects from molting by inhibiting production of ecdysone, an insect hormone. Azadirachtin is chemically similar to ecdysonlids, the hormones responsible for triggering molts (Weinzierl and Henn 1991). As an anti-feedant it may cause an insect to stop feeding after ingestion due to secondary physiological effects. As an egg-laying deterrent, volatile compounds from neem may repel some insects from depositing eggs on a plant surface.

STRATEGIES FOR DEALING WITH INSECTS:

## At the end of the growing season

- Clean-up at the end of the season to remove hiding places and overwintering sites.
- Do not compost plant materials with diseases or insect masses on them.

Removal of debris (plant or otherwise) from gardening areas can eliminate breeding and habitat areas for pests.

# Integrated Pest Management (IPM)

- Monitoring and Record Keeping
- Identify the Pest
- Learn the Life Cycle of the Pest
- Define Your Pest Threshold
- Take Measures to Control the Pest
  - Cultural
  - Biological
  - Physical
  - Chemical

You many have heard about Integrated Pest Management (IPM). Most of what I already talked about falls under to topic of IMP. I just broke it down a little differently.

IMP is a holistic gardening approach that promotes good management and stewardship and minimizes environmental harm.

Deals with all factors influencing plant growth

- allows you to manage problems at acceptable levels rather than eliminating them
- IMP uses least toxic approaches first

One key factors is identifying your pest.

- The identity of the pest will help determine the best control method that should be used for management.
- Knowing the life cycle of a pest will help determine vulnerable life stages when control measures would be most effective.

**Cultural** measures alter the environment: rotate crops, plant resistant crops, timing, planting diversity, provide habitat for predators, end-of-season clean-up. These are the things you do before and after the growing season.

**Biological** include: predators, parasites and pathogens

**Physical** include row cover, traps, collars

Since a key factor in IMP is identification, here are some common insect pests in the vegetable garden.

**In the interest of time I'll go through these pretty quickly, but this entire PowerPoint presentation is available on the Columbia Gardeners website, under tips.**

INSECTS GALLERY:  
Cabbage White butterfly and Imported cabbageworm  
*Pieris rapae*



- Most common butterfly.
- Floating row cover, handpick.
- *Bacillus thuringiensis* (Bt), insecticidal soap.
- Pyrethrum, neem, spinosad – use with sticker spreader.

INSECTS GALLERY:

## Mexican Bean Beetle

*Epilachna varivestis*



- These are ladybugs gone bad. They are vegetarians; most ladybugs are predators.
- Copper colored; 8 spots on each wing.
- Row cover.
- Handpick and crush
- The eggs look just like ladybird beetle eggs—but if they're on beans, its most likely bean beetles.
- Parasitic wasp and spined soldier bug will eat the larvae.
- These are only a pest of organic growers; synthetic chemicals can eliminate the problem.
- Pyrethrum, neem, spinosad spray top and bottom of leaves.

INSECTS GALLERY:

## Aphids

*Aphidoidea*



- Tiny, soft bodied sucking insects. Live birth.
- In the summer they are clones of the mother (no sex is needed!) and the offspring are also females. In late summer/fall both males and females are produced.
- Attendant ants will protect aphids-they get sugar from the aphids.
- Use healthy, non-stressed plants.
- Strong stream of water every couple of days may help control them.
- Insecticidal soaps and garlic spray can also help.
- Predators like ladybird beetles love to munch on them.

INSECTS GALLERY:  
**Squash Bugs**

*Anasa tristis*



- No organic pesticide for homeowners.
- Floating row cover.
- Hand pick tear out section of leaf with eggs and crush with a rock or place in a plastic bag and remove from the garden.
- Kill nymphs with neem, horticultural oil or insecticidal soap.



INSECTS GALLERY:  
**Harlequin bugs**

*Murgantia histrionica*



- Feed primarily on members of cabbage and mustard families.
- Row cover.
- Crush.
- Insecticidal soap alone or with pyrethrum or neem.
- Cleome can be used as a trap crop.
- Good garden hygiene is important-clear away old brassicas as well as the weeds near them. They overwinter in ground debris.
- Eggs are barrel shaped with a black swirl.

INSECTS GALLERY:  
**Squash Vine borer**

*Melittia cucurbitae*



- Adult resembles a wasp. About  $\frac{1}{2}$ " long. Eggs are tiny—about  $\frac{1}{25}$ " long. Larvae is a pale wrinkly worm about 1" long.
- Floating row cover.
- Phermone traps may work.
- Cover 1<sup>st</sup> 2 inches of the stem (ie with stockings.)
- Cut out borer and mound soil over wound.

INSECTS GALLERY:

## Tomato hornworm

*Manduca quinquemaculata*



- It's the larvae of the sphinx or hummingbird moth. Only eats members of the nightshade family.
- Tomato hornworms are also parasitized by a number of insects. One of the most common is a small braconid wasp, *Cotesia congregatus*. Larvae that hatch from wasp eggs laid on the hornworm feed on the inside of the hornworm until the wasp is ready to pupate. The cocoons appear as white projections protruding from the hornworms body. If such projections are observed, the hornworms should be left in the garden to allow the adult wasps to emerge. These wasps kill the hornworms when they emerge from the cocoons and will seek out other hornworms to parasitize.

INSECTS GALLERY:

## Colorado potato beetle

*Leptinotarsa decemlineata*



- Adults and larvae feed on foliage and can skeletonize a plant.
- The eggs look like ladybird beetle eggs, but haphazardly arranged.
- They overwinter as adults. So rotate crops!
- Floating row cover over hoops
- Crush or drown
- Surround (kaolin clay) – reapply after rain
- B.t. var. tenebrionis and spinosad



INSECTS GALLERY:

## Brown Marmorated Stinkbug

*Halyomorpha halys*



- True hard shell bugs like squash and stink bugs are hard to kill
- Use row cover where possible
- Hand pick and destroy adults and eggs-drop into soapy water
- Trap crops (tall, like sunflowers) may be helpful.
- Insecticidal soap and botanicals can be used on 1<sup>st</sup> and 2<sup>nd</sup> instars (nymphs)
- No organic pesticide available for homeowners to kill adults

INSECTS GALLERY:  
**Cucumber beetle**

In the genus *Aclymma*



- Yellowish green with 4 black lines or with stripes.
- Over-winter as adults.
- Small, fast.
- May be spotted or striped.
- These insects carry bacterial wilt and mosaic virus.
- Floating row cover.
- Hard to hand-pick—they're fast!
- Pyrethrum, neem oil, spinosad

INSECTS GALLERY:  
Flea beetles



- Floating row cover over hoops immediately after planting.
- Surround (kaolin clay) on the leaves – reapply after rain (Diatomaceous earth may serve the same purpose).
- Pyrethrum, neem, spinosad.
- Hard to control organically.
- Plant a trap crop of radish or mustard greens
- Use yellow sticky traps.

INSECTS GALLERY:

## Spotted Lanternfly

(*Lycorma delicatula*)



- Spotted lanternfly (*Lycorma delicatula*) is an invasive sap-feeding insect native to eastern Asia. It was first detected in Maryland, in October 2018.
- Spotted lanternfly is spreading in Maryland and a quarantine is in place in many counties in MD, including Howard. This means a permit is required for any **businesses** moving within or through these counties, along with any movement in the quarantine areas in DE, NJ, PA, and VA. Prevent the spread of spotted lanternfly by inspecting your vehicle and any outdoor equipment (grills, mowers, camping supplies, firewood, etc.) when traveling in and out of the quarantine zones in Maryland, Pennsylvania, Virginia, Delaware, and New Jersey.
- This pest does not bite or sting. It feeds on grapes, apples, stone fruits, hops, oak, pine, tree of heaven and other plant species. It is primarily a threat to Maryland's agricultural crops.
- All Maryland residents are urged to report sightings of Spotted Lanternfly to the Maryland Department of Agriculture (MDA) [Submit your report online](#).
- They suck out the sugars and leave honeydew (excrement) which attracts other pests and supports the growth of sooty mold and generally weaken the plant.
- Scrape, smash, report.
- The egg masses are about 1 inch in size and look like mud and contain 30–50 eggs. Eighty to 90 percent of egg masses on trees are found 10 feet above the ground or higher. Egg masses should be scraped off with a putty knife, credit card, or other firm, blunt-edged tool to scrape.



- Natural enemies include spiders, praying mantids and assassin bugs., predatory stink bugs, and birds. Support a healthy environment for natural predators by growing a variety of flowering plants and plant types in your landscape. Plant diversity provides food and habitat for natural enemies.
- Spotted lanternflies are constantly on the move. Spot-spraying and whole-yard insecticide treatments will only put a small, temporary dent in the population while putting a variety of other organisms at risk.
- Insecticidal soap and neem oil are effective only if they are applied directly to spotted lanternflies and the surfaces on which they are feeding and walking. Neem oil and insecticidal soap have a short period of residual activity and would need to be re-applied at intervals recommended on the product label.

INSECTS GALLERY:

## Jumping worms



- “Jumping worms” encompass three similar-looking non-native, invasive species.
- The worms thrash wildly and move in a snake-like manner; their feeding produces granular castings that look like coffee grounds on the soil surface.
- They change soil composition, making it drier and depleted of nutrients, which limits normal plant germination and growth.
- Individual worms can reproduce without a mate (parthenogenesis) and their populations can increase quickly. They displace and out-compete other earthworms.
- They live only at the surface level of the soil and leaf litter (epi-endogeic) and therefore do not help gardeners with deep soil aeration, nutrient movement, or water infiltration.
- They can digest wood and favor areas with leaf mulch; areas with pine needles and native grasses are less attractive to them (source: University of Wisconsin-Madison). They are moved by way of human and animal activities -- most likely in the cocoon stage which is difficult to detect. They spread into new areas by way of mulches, compost, and potted plants; in soil on tools, equipment, and shoes; and in soil runoff.
- There are currently no chemical control methods for invasive jumping worms.
- Physical removal methods:
  - Hand-pick worms, seal them in a trash bag and discard the bag in your trash.
  - Worms also can be killed by putting them into a container with vinegar

- or rubbing alcohol. Dead worms can be composted.
- Solarization of compost or mulch. Solarization of garden soil is more difficult because the killing temperature of 105F cannot be maintained. Worms under the plastic will move to a different location.

INSECTS GALLERY:  
**BENEFICIAL INSECTS**

Ladybird beetle • Praying mantids • Lacebug •  
Spiders • Soldier beetle • Butterflies • Worms •  
Bees • Centipedes • Many, many others



INSECTS GALLERY:

## Lacewings

*Chrysopidae*



Lacewing eggs are laid on stalks because the larvae are cannibalistic. The stalks are barbed so they can only move towards the leaf, not towards other eggs. They are very beneficial and very aggressive. The adults do not eat insects (they eat pollen and nectar).

INSECTS GALLERY:  
**Ladybird beetle**

*Hippodamia convergens*



Ladybird beetles.

Larvae look like little alligators

# Resources

Grow It Eat it

<https://extension.umd.edu/locations/howard-county/environment-and-natural-resources/master-gardener/grow-it-eat-it>

Maryland Home and Garden Information Center

<http://extension.umd.edu/hgic>

Ask an Expert

<https://extension.umd.edu/learn/ask-gardening>

Bug of the Week Website

<http://bugoftheweek.com>



# Weeds

- Weeds are plants growing out of place. They are not inherently bad plants.
  - They may be wildflowers or may provide food for wildlife.
  - They may be edible or have medicinal properties.
  - Some may even have been intentionally planted and then they got out of control.



Weeds are plants growing where they don't belong. Weeds are not inherently bad plants.

# Weeds

- The vegetable garden is particularly sensitive to these “plants growing out of place”.
  - Weeds compete with the vegetables for light, water and nutrients.
  - Weeds can harbor insect pests and diseases.
  - Some weeds can even release toxins into the soil that inhibit other plants from growing.
- A community garden has an even lower tolerance for weeds as each gardener’s plot (and paths) can impact that of their neighbors.

## WEED STRATEGIES

- Consider weeds when you prepare your plot. Different preparation methods all have different impacts on your weed population:
  - Solarization.
  - “Cover and smother.” Weeds need light to grow.
  - Tilling: Stale seedbed: Till and then come back and hoe or rake (after the seeds have been brought to the surface and have sprouted) BEFORE planting.
- Sometimes we are our own worst enemies and plant problems. Know what you’re planting. Common daylily (*Hemerocallis fulva*), mint and Jerusalem artichoke can all become extremely invasive.

- Save yourself heartache (and a backache!) by doing a little research before you plant something. It may be tempting to try something new, and that Jerusalem artichoke or horseradish root may look so small, unassuming and innocent, and it may be well behaved for the first year or so, but then they can become real problems.
- Be especially skeptical and vigilant about plants that people are giving away. (There’s a reason they have enough to give away!) Sometimes it is, in fact, wise to look a gift horse in the mouth. (I speak from experience.)

## WEED STRATEGIES

- Plant densely to crowd out weeds.
- Mulch. Sometimes organic mulch is appropriate; other times weed block/landscape fabric may be needed.
- If you don't mulch, hoe and cultivate frequently.
- Remove weeds before they go to seed.
- Pull weeds when the soil is moist.
- Do not compost weeds that have gone to seed or perennial weeds.
- Soaker hoses allow you to water your plants but not all the weeds too.

- Some intensive planting strategies rely on shading out weeds while allowing the desirable plants to grow.
- Don't just heap mulch in paths on weeds that are established and growing-pull them out and then mulch.
- An oft-repeated adage is: "One year's seeds, seven years weeds". In reality, many weed seeds can remain viable in the soil for much longer, even decades!
- I like free plants as much as the next person. But do yourself a favor and don't let your plants go to seed, Volunteer plants can become weeds.

## WEED STRATEGIES

- Take revenge on some (edible) weeds (like dandelion, purslane, lambsquarter, violets, garlic mustard) by eating them. (But don't plant them!)
- Homemade controls
  - Most require repeated applications.
  - For weeds, remedies like vinegar and salt might work, but you have to be careful about how they'll affect the soil pH and salinity.
- If you use an herbicide,
  - make sure it is approved for vegetable gardens.
  - Follow the directions carefully and do not spray on windy days or when bees are present.
- Clean up your garden at the end of the season.
- Do not leave unplanted soil bare; cover it or use cover crops/green manure.

- With any edible weeds, be sure to check on how to prepare them BEFORE consuming them. For example, Stinging nettle loses its sting when it's cooked, but you would not want to eat it raw.
- Cover crops are planted in the fall and then turned over in the early spring. This may not work well if you have raised beds. Also do not let the cover crop go to seed. And make sure what you plant is appropriate for your needs (rye is pretty tough).

## WEED STRATEGIES

Know your enemy.

- Identify the weed.
- Is it an annual or a perennial?



## ANNUAL VS. PERENNIAL WEEDS

### Why does it matter?

**Annual weeds** live for just one year and ensure their survival by sending out thousands of seeds each growing season. They are like an army that tries to overwhelm you by their sheer numbers.

- Pull the weeds before they go to seed.
- Do not compost the seed heads.
- Mulch to discourage seed germination.



Think of annual weeds like the infantry (or the Terracotta Warriors).

## ANNUAL VS. PERENNIAL WEEDS

### Why does it matter?

**Perennial weeds** will come back every year. They may spread by roots, rhizomes, stolons (runners), and/or seeds.

- Dig out perennial weeds and try to dig the entire root; any remaining pieces can regenerate.
- Tilling will chop up roots and may start many new plants.
- Weed-whacking is largely ineffective as it leaves the root to re-grow.



Think of perennial weeds like the Terminator: "I'll be baaaack".

WEEDS GALLERY: PERENNIALS

**Mugwort** (*Artemisia vulgaris*)

“Chrysanthemum weed”. Green leaves with silvery undersides. Spreads primarily by rhizomes.



**Mugwort** (*Artemisia vulgaris*)

“Chrysanthemum weed”. Green leaves with silvery undersides. Spreads primarily by rhizomes.

WEEDS GALLERY: PERENNIALS

## Creeping Charlie (*Glechoma hederacea*)



- Also called ground ivy.
- In the mint family.
- The vines have nodes where the leaves grow and these nodes will form roots if they come in contact with the soil; you cannot simply pull it up. Every rooted node can turn into a new plant if left behind.
- Can form a dense mat.
- Sets seeds also.
- Hand-pull when the soil is moist. Can try cover and smother.

## WEEDS GALLERY: PERENNIALS

### Bermuda Grass (*Cynodon dactylon*)

“Wiregrass”. Forms dense mats. Grows aggressively via stolons and rhizomes. Control is difficult; Persistent removal, solarization and plastic mulch may help.



**Bermuda grass** (*Cynodon dactylon*) “Wiregrass”. Forms dense mats. Grows aggressively via stolons and rhizomes. Control is difficult; Persistent removal, solarization and plastic mulch may help.

## WEEDS GALLERY: PERENNIALS

### Bindweed (*Calystegia sepium*)

“Wild morning glory”. Twining vine. Extensive root system. Spreads via seeds and rhizomes. Hand weeding is the most effective control.



### **Bindweed** (*Convolvulus sepium*)

“Wild morning glory”. Twining vine. Extensive root system. Spreads via seeds and rhizomes. Hand weeding is the most effective control.



WEEDS GALLERY: PERENNIALS

## Canada Thistle (*Cirsium arvense*)

Invasive. Purple flowers. Spreads by rhizomes and seeds. Vigorous root system. One stalk can produce 1500 seeds. Persistence is necessary for control.



**Canada thistle** (*Cirsium arvense*) Invasive. Purple flowers. Spreads by rhizomes and seeds. Vigorous root system. One stalk can produce 1500 seeds. Persistence is necessary for control.

WEEDS GALLERY: PERENNIALS

**Clover** (*Trifolium repens*)

Can form large clumps. Control by hand-pulling, hoeing and/or mulch. Benefits the soil by fixing nitrogen.



**Clover** (*Trifolium repens*)

Can form large clumps. Control by hand-pulling, hoeing and/or mulch. Benefits the soil by fixing nitrogen.

WEEDS GALLERY: PERENNIALS

## Yellow Nutsedge (*Cyperus esculentus*)

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WEEDS GALLERY: PERENNIALS

## Broadleaf Dock (*Rumex obtusifolius*)

Taproot can grow 5 feet deep. Spreads primarily by seed. A single plant can produce 60,000 seeds. Control with tillage or cutting root at least 3" below soil level.



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## Plantain (*Plantago major* & *P. Lanceolata*)

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## WEEDS GALLERY: PERENNIALS

### Mint (*Mentha*)

This herb becomes invasive if not managed. Mints have square stems, opposite leaves and are aromatic. They spread by stolons. Hand-pull when the soil is wet. Edible.



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**Poison Ivy** (*Toxicodendron radicans*)

Spreads by seed and rhizomes. All parts of the plant contain urushiol, an oil that can cause a severe rash. Birds and wildlife feed on the seeds.



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## WEEDS GALLERY: BIENNIAL

# Poison Hemlock

(*Conium maculatum*)

Biennial. Invasive. Toxic to humans and livestock. Reproduces by seed. Gardeners are required to remove it—take precautions.



- Poison hemlock is an erect biennial weed that can grow six to ten feet tall. First year: rosette of dark green leaves. Second year: branching and alternately arranged leaves on erect stems. Smooth, hollow stems that are covered with purple spots. The leaves are pinnately compound (each leaf is made up of several pairs of leaflets), multi-stemmed, and fern-like.
- Easily mistaken for Queen Anne's Lace or wild carrot, but Poison hemlock is distinguished by hollow, purple splotched stems. Flowers are white umbrella-like clusters. The root system is a fleshy white, with a long and sometimes branched taproot.
- Reproduces by seed.
- Management:
- You are responsible for removing any Poison Hemlock you find in your plot.
- Email your garden site manager if you find this plant in your plot for his/her information only.
- Pull the newly established plants by hand (wear gloves), or by hoe. When pulling the plants by hand, the entire taproot needs to be removed from the soil to prevent regrowth.
- The whole plant and the root needs to be removed while wearing protective clothing to cover your whole body, goggles to cover your eyes, gloves, and a mask.

This plant can cause painful damage to your eyes, skin, and lungs. It can kill if ingested. Never touch it with your bare hands, never weed whack it, never burn it, never compost it. Any plant that has been removed needs to be double bagged in plastic bags, then carefully disposed off in trash. Carefully dispose off your protective clothing and equipment.

- Several herbicides (e.g. glyphosate, or 2,4-D) can control poison hemlock. Make sure to you follow the directions on the label for dosage, application, and what personal protection you should wear during application.

WEEDS GALLERY: ANNUALS

## Henbit and Dead nettle

(*Lamium aplexicaule* and *L. purpureum*)

Members of the mint family. Winter annuals. Reproduce by seed. Suppress with mulch; control by pulling and cultivation. Edible/Medicinal.



**Henbit and Deadnettle** (*Lamium aplexicaule* and *L. purpureum*) Members of the mint family. Winter annuals. Reproduce by seed. Suppress with mulch; control by pulling and cultivation. Can be edible/medicinal. (Do research first!)

WEEDS GALLERY: ANNUALS

## Hairy Bittercress (*Cardamine hirsuta*)

Has an exploding seedpod. Each plant can produce thousands of seeds. The plant is easily hand-pulled before seedpods form. Edible.



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## WEEDS GALLERY: ANNUALS

### Shepherd's purse (*Capsella bursa-pastoris*)

Has triangular, purse shaped seedpods. Spreads by seed (more than 30,000 per plant). Easily hand-pulled when young. Edible/Medicinal uses.



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WEEDS GALLERY: ANNUALS

## Common chickweed (*Stellaria media*)

Winter annual. Forms a dense mat. Each plant produces thousands of seeds. Control by crop rotation and spring cultivation. Easy to pull. Edible/Medicinal.



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## Galinsoga

(*Galinsoga ciliate* & *G. parviflora*)

"Quickweed". Easily pulled. Spreads by thousands of seeds. Edible



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WEEDS GALLERY: ANNUALS

## Smartweed (*Polygonum pensylvanicum*)

Pink beadlike seeds. Leaves may have purple spot in middle. Can grow 3 feet high.  
Shallow taproot. Control by hand-pulling when young.



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WEEDS GALLERY: ANNUALS

## Lambsquarter (*Chenopodium album*)

Rapid growing (average height of 3 feet) and adaptive. Each plant can produce 70,000 seeds. Control by cultivation and minimizing seed production and dispersal.



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WEEDS GALLERY: ANNUALS

## Wood sorrel (*Oxalis stricta*)

Spreads via seeds and rhizomes. Best controlled by hand-pulling and mulching.  
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WEEDS GALLERY: ANNUALS

## Purslane (*Portulaca oleracea*)

Succulent fleshy leaves. Spreads via seeds (which can remain viable in the soil for 40 years). Forms mats. Control by hand-pulling or hoeing and mulching. Edible



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WEEDS GALLERY: ANNUALS

## Fleabane (*Erigeron annuus*)

Member of the aster family and is a native wildflower, This is a good example of a “plant growing out of place” as it can spread aggressively by re-seeding.



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## Non-native invasives



- There's a whole other category of bad weeds. Some sometimes show up at the garden but occur more frequently in the woods. There's a great program run by HoCo Rec and Parks and HoCo Master gardeners called Conservation Stewardship (which I call weeding the woods).
- Weeding the woods helps put into perspective the responsibility of weeding my 20'x25' plot.

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weeds?

Probably not



But if you plan carefully and know your  
enemy, you can at least win the battle.

Can you win the war against weeds? No. There are too many of them and they have evolved to survive. And it's especially challenging in a community garden. But if you're diligent, you CAN win this season's battle.

## Resources

Weed ID and management:

<https://extension.umd.edu/resource/weed-identification-and-management-home-landscapes>

Maryland Home and Garden Information Center

<http://extension.umd.edu/hgic>

Ask an Expert

<https://extension.umd.edu/learn/ask-gardening>



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