

Pest, Disease & Weed Management

What is a weed?

- A plant growing in a spot that you don't like.
- Nature's way of repairing bare soil. Bare soil is sick soil, and "weeds" provide important ecosystem functions to help repair and restore disturbed soils. They are also extremely hardy and resilient, because they serve the function of lone pioneers colonizing land that's been damaged by a fire or a landslide.

Weed prevention

- Don't create conditions that foster weeds: bare, disturbed soil. Nature sees this as a problem for which "weeds" are the solution. Don't create this problem!

Soil Health (good for so many reasons...)

1. Keep soils covered (mulch, mulch, and mulch some more)
2. Minimize soil disturbances (tilling, walking on planting beds)
3. Increase plant/root diversity (companion planting, crop rotation, cover crops)
4. Keep living roots in your soil year round (winter cover crops)
5. Incorporate livestock rotation (Chickens & ducks on a small scale)

Disease Control

- Practicing soil health principles (healthy soils grow healthy plants)
- Managing airflow
 - Trellising, spacing (avoid square foot gardening), variety selection, mulch, wind break location
- Managing leaf contact with water
 - High tunnels, drip irrigation, timing of watering, mulch
- Selecting the best varieties
 - Disease resistance in hybrids (cucurbits, tomatoes, and anything else you have trouble with)
- Spraying (mineral vs biological)
 - Copper & sulfur, effective but will build up in your soil
 - New sprays that use beneficial bacteria. Best if you start with inoculated soil and seeds, spray the plant and roots at transplanting, and then spray regularly throughout the season. Out-compete the bad bugs in the game of leaf colonization. Some sprays have growth promoting effects too, it's an interesting new field of research on these sprays. Serenade is pretty affordable.

Pest Control

- We've bred the bitterness out of plants (this is a primary defense plants use to keep from being eaten) and then we've set them up in orderly buffet lines in our gardens. It's no wonder the bugs come to feast!
- Avoid chemical sprays as much as you can, as these often kill more beneficial insects than they do pests.

- Consider broad spectrum insecticides to be your “nuclear option” and then consider, if you need this option, that it’s probably better to just remove the plant(s) from your garden.

Integrated Pest Management (IPM)

1. Biologic control (creating conditions to attract beneficial insects)
 - a. Plant more flowers! At least 5% of the garden should be in flowering plants and herbs.
 - b. Create water stations, rock and wood piles, hedge rows, perennial plantings
 - c. Learn what the good bugs look like! Don’t spray at the first sign of creepy crawlies!
 - d. Don’t use chemical fertilizers and try to avoid under or over watering.
 - e. Remove stressed or diseased plants as soon as possible. They will emit stress hormones that attract pests.
2. Cultural control (management strategies to reduce pests from multiplying)
 - a. Select disease & pest resistant varieties or use highly susceptible varieties as trap crops to draw away pests (the sacrificial eggplant crop)
 - b. Intercropping and companion planting
 - c. Removal of pest habitat and host weeds, cleaning up dead crop residue at the end of the season
 - d. Time plantings to avoid pest problems (Squash vine borers, pickleworm)
3. Physical control (barriers and traps)
 - a. Row cover, netting, plant collars, etc
 - b. Thick mulch
 - c. Pheromone traps (be careful!)
 - d. Regular scouting and hand picking
4. Chemical control (sprays, using the most specific spray possible and only using broad spectrum sprays in emergencies)
 - a. This is your mode of last resort! You need to know what your threshold damage is for using chemical control. For backyard gardens, you can live with some blemished vegetables and should spray only if crop failure is imminent. If you are depending on your crops for income, you need to consider economic thresholds, and you’ll probably have a lower tolerance for damage.
 - b. Don’t spray at the first sign of damage. This method is the most likely to have negative impacts on the environment and kill beneficial insects! Use the most selective pesticides you can buy and spot spray problem areas instead of coating your whole garden. Avoid broad spectrum or persistent pesticides!!!
 - c. But ask yourself, why are you having an emergency? What conditions led up to this problem? Is it better to just remove the crop from the garden rather than spraying every few days to keep the plants alive?