LESSON 5

THE BENEFITS OF BENEFICIAL INSECTS

What do beneficial insects do in the edible garden? How can gardeners create a habitat for the different life stages of beneficial insects?

Encouraging beneficial insects means creating a water supply, a safe space to lay eggs on an insects preferred plants, some shade or hiding spaces, and an ample supply of pests to for the beneficial insects to eat.

Just as soil health depends upon a web of biological activity to feed plants through their roots, plants are equally dependent of a diversity of organisms above ground. Beneficial microbes protect a plant by edging out pathogens and deterring negatively parasitic organisms from draining a plant's nutrients. Beneficial insects above ground are also important to plants' ability to fruit and manage pests.

Honeybees and pollinators are the most obvious examples, as they are essential to much of the fruit and vegetable production that we depend upon for our food.

Many other types of beneficial insects help defend cultivated plants from pest infestation and destruction. Predatory insects such as wasps, for example, devour parasitic insects like cucumber beetles and prevent them from overtaking a plant when it is under stress.

Annuals and vegetables are particularly vulnerable to infestations of aphids or whitefly when they are not getting enough nutrients and water. Some beneficial microbes help defend plants by ensuring a supply of nutrients and promoting production of substances that repel pests like aphids. If the plant is under stress and the aphids have no predators, however, the plant will have a hard time evicting all of the new pests. Likewise, simply buying a bag of ladybugs won't help a plant recover from an aphid attack if the plants cannot get the nutrients they need from the soil.

Thus, beneficial insects feed upon pests and parasitic insects as part of a food web that connects all the way down to the smallest bacteria in the soil. Encouraging beneficial insects in your garden begins with promoting microbial activity in the soil and extends to cultivating flowering plants that attract predatory insects that will be most beneficial for each particular plant and pest.

Predatory insects seek out nectar from flowering plants and inviting habitats in the soil during their adult lives. These insects also require plants for foraging, reproduction, and as food sources for their young larvae. Flowering herbs such as dill, fennel, and parsley are particularly attractive to many beneficial predators. They also appreciate a large

Hoverfly on a chicory flower. Image credit: Sarah Mallin.

BENEFICIAL PREDATORS

- Aphid Midge - attracted to pollen plants where they lay their eggs to hatch and feast on aphids

- Ground Beetles - prefer hiding near perennials in mulch or ground cover habitat during the day, emerge at night to feed upon gastropods, eelworms, cutworms, cabbage maggots, leatherjackets, and other larvae and insect eggs

- Centipedes - prefer mulch and ground cover hiding habitats by day so that they can feed upon small insects and slugs by night

- Braconid Wasps and other predatory wasps - attracted to the garden by nectar and flowering umbels like fennel, dill, parsley, carrot and yarrow. These wasps prey on moths, beetle larvae, and aphids

- Hoverflies - drawn to the garden by marigolds and nasturtiums, the adult flies lay their eggs directly in aphid colonies so the hungry larvae can devour the aphids when hatched

- Lacewings - feast on aphids, caterpillars, mealybugs, scales and thrips while enjoying pollen from flowers like angelica, coreopsis, cosmos, and alyssum

- Ladybugs - well-known for eating the pesky aphid during both larval and adult stages, they prefer a diverse selection of plants and flowers for habitat and foraging

- Pirate Bugs - hungry for just about any insect, pirate bugs love goldenrod, daisies, and yarrow

- Spined Soldier Bugs - brave predators of hairless caterpillars and beetle larvae

- Yellow Jackets - enjoy eating flies and caterpillers, attracted by brightly colored pollen flowers and fragrant nectar
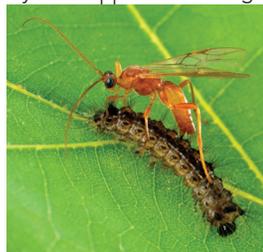
Left: Ground Beetle. Image source: www.extension.umn.edu
Right: Braconid Wasp. USDA photo by Scott Bauer, public domain
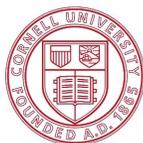
LESSON PLAN 5

A BENEFICIAL INSECT TOUR

OBJECTIVES:

Help gardeners understand how they can create inviting habitats for beneficial predators and pollinators.

Connect the cycle of beneficial insects to pollination and the balance of life below the soil to emphasize the community garden as an integral part in the global ecosystem.

MATERIALS NEEDED:

• A divserse garden or wildlife area

• Optional: magnifying glass and insect identification guide

Common Green Lacewing. Image credit: Charles J Sharp, http://commons.wikimedia.org/wiki/User:Charlesjsharp.

ACTIVITIES:

1. Create a small pool of water near flowering plants in the garden and observe how long it takes for a crowd of wasps to convene for a drink. This happens most often in the morning, but can occur midday when it is very dry and hot out.

2. Take a walk through the garden and identify brightly colored or sweet smelling flowers and observe bees or buttlerflies at work moving around pollen.

3. Ask gardeners to investigate plots and identify inviting habitats for beneficial insects. Some gardners keep their soil bare and plot pristinely cleaned, but eneficial insects need plant debris for egg-laying and shelter. Ladybug houses, mulch, certain kinds of plants, and an area for water droplets and/or dew to collect are all good habitat attractions for beneficial insects.

4. Inspect beans, cucumbers, kale, and tomatoes for soft bodied pests such as aphids, cucumber beetles and whitefly. Ask gardeners to suggest plantings that will attract predators for these garden pests.

Left: Ladybug Adult. Image Credit: Dominik Stodulski, http://commons.wikimedia.org/wiki/File:BIEDRONA.JPG.
Right: Ladybug Larva. Image Credit: Marienkäferlarve, http://commons.wikimedia.org/wiki/File:Marienk%C3%A4ferlarve_%28Coccinellidae.jpg.