Beneficial Insects on NYC Farms

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On the cover: This pinkspotted lady beetle is eating dandelion pollen, but will also happily munch on aphids and other insect pests.

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Introduction

This guide provides information on beneficial insects commonly found on New York City farms as well as how to recognize and identify them.

Beneficial insects in this guide refers to natural enemies of pests as well as pollinator insects, like bees.

Throughout the guide, quickly determine where you would expect to see each insect using this key:

- **in the AIR**
- **on the PLANT**
- **on the GROUND**

Text under the common name of each insect is part of the scientific name of that insect.
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Insect Parts

Below is a diagram of the basic parts of an insect’s body. These body parts will be referred to in the coming pages.

* Not all insects have wing covers, but for those that do, the wing covers are often folded over the wings.
Ground Beetles
Carabidae

Common Prey
caterpillars, grasshoppers, beetles, aphids, flies, snails, slugs, and more

Physical Characteristics
• 0.04 to 2.4 inches
• Most are dark brown or black, shiny or metallic
• Uniformly thin antennae, not clubbed or branched
• Prominent trochanters (bumps on hind legs)
• Have hard wing covers that cover their entire abdomen
Rove Beetles
Staphylinidae

Common Prey
insect eggs, small larvae, slugs, and mites

Physical Characteristics
• 0.03 to 0.9 inches
• 6-7 segments on the abdomen (gives the abdomen a striped pattern)
• Wing covers do not cover full length of abdomen
Soldier Beetles
Cantharidae

Common Prey
insect eggs and larvae, aphids, snails, slugs

Physical Characteristics
• 0.07 to 0.7 inches
• Usually black with red or orange markings
• Long and thin bodies
• Long antennae
Lady Beetles
ladybugs, lady bird beetles
Coccinellidae

Common Prey
aphids, mites, caterpillars, insect eggs

Physical Characteristics of Adult Beetles
• 0.06 to 0.4 inches
• Typically red or pink colored with black spots, but some can be yellow or dark brown and/or with no spots or white spots
• Wing covers that cover entire abdomen
Lady Beetles - immature
ladybugs, lady bird beetles
Coccinellidae

Physical Characteristics of Larvae

- Larvae have elongated, flattened alligator-like bodies and are usually dark colored with bright spots.
- Pupae are usually orange and black and do not move.
Tiny Wasps

Many tiny wasps are parasitoids of other insects, meaning that they lay eggs on or in the insects, and their young kill the insect host while they develop. Each tiny wasp species may parasitize only specific pests; hosts include eggs, larvae, and adults of aphids, whiteflies, caterpillars, flies, beetles, leafhoppers and more.

Physical Characteristics

• 1/8 inch or less
• 2 pairs of wings (4 wings total)
• Large, oval-shaped eyes
• Thin waists
• Usually black, dark-blue or green, and often metallic

Photo by David Cappaert, Bugwood.org
Tiny Wasp**s continued**

Tiny wasp adults may be difficult to see in the field, but you can also watch for parasitized host insects.

Cocoons (pupae) of Braconid wasps that have parasitized a tomato hornworm.

Parasitized aphid “mummy”
Predatory Large Wasps

Wasps that live in colonies (social wasps, like yellowjackets and hornets) can pose a stinging hazard, but wasps that live alone are very unlikely to sting you.

Common Prey

caterpillars and grasshoppers

Physical Characteristics

- 0.4 to 1.25 inches
- 2 pairs of wings
- Thin waists
- Black or brown bodies
- Tend to have white, yellow, red, or orange markings

Example of a social wasp

Examples of solitary wasps
Parasitoid Large Wasps

Common Prey
aphids, beetles, bugs, caterpillars, flea beetles, flies, eggs and larvae of other insects

Physical Characteristics
• 0.06 to 0.8 inches
• 2 pairs of wings
• Slender bodies with narrow waists
• Adult female wasps find hosts and deposit one or several eggs in, on, or near the host. Wasp larvae feed on host and eventually kill it.
• Not always easy to distinguish parasitoid from predatory wasps. Females may have a long, stinger-like appendage used to deposit eggs.
Hover Flies
*Syrphidae*

**Common Prey**
*aphids, mealybugs, spider mites, thrips*

**Physical Characteristics**
- 0.3 to 0.8 inches
- 1 pair of wings (2 wings total)
- Adults tend to have black/yellow stripes on abdomen
- Large eyes
- Many have flat bodies
- Adults resemble bees or wasps but have only 2 wings instead of 4
- Often seen hovering around flowers
- Pollinators as adults and predatory as maggot-like larvae

*Hover fly larva*
Robber Flies
Asilidae

Common Prey
wasps, grasshoppers, other flies

Physical Characteristics
• Up to 3 inches
• Larger in size compared to hoverflies and most other flies
• Bristles on legs and around mouth
• Usually brown, grey, or black colored
Spiders/ Harvestmen
Araneae/Opiliones

Technically, not insects; beneficial to farms as they are predators that eat insects.

Common Prey
Many insects, including beetles, caterpillars, leafhoppers, and aphids; also non-pests like bees and butterflies.

Physical Characteristics
• 0.1 to 1.25 inches
• 4 pairs of legs (8 total) – best distinguishing factor
• Have between 6 and 8 eyes
• Spiders have two body segments with a prominent waist; harvestmen appear to have a single body segment

Spider
Harvestman (often referred to as “daddy longlegs”)

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Lacewings
Neuroptera

Common Prey
aphids, small caterpillars, beetles, thrips, mites, whiteflies, mealybugs

Physical Characteristics
• 0.3 to 1 inch
• Long, slender bodies
• Either green or brown
• Long antennae
• Two pairs of net-veined wings
• Lacewing larvae have alligator-like bodies and long, sickle-shaped jaws
• White eggs laid on long stalks on leaves

Photo by Caitlin Tucker
Predatory Stink Bugs
*Pentatomidae*

**Common Prey**
caterpillars, beetle larvae, specifically Colorado potato beetle larvae

**Physical Characteristics**
- 0.2 to 1 inch
- Shield-shaped bodies
- Common species are brown, but predatory stink bugs come in many colors.
- Pointy shoulders
- Predatory stink bugs have a beak that is thick at the base, whereas pest stink bugs have beaks that are slender at the base
- Beak is tucked under the insect when not feeding

Brown marmorated stink bug is a pest.
Minute Pirate Bugs
Orius

Common Prey
thrips, mites, aphids, caterpillars, beetle larvae

Physical Characteristics
• 0.1 to 0.2 inches
• Oval-shaped
• Triangular black head
• Black and white wing patches
• Also feed on pollen and nectar
• Nymph pirate bugs are brown or bright orange

Adult minute pirate bug

Minute pirate bug nymph (bottom) pursuing a thrips (top).
Bees
Anthophila

Bees come in a variety of colors, shapes, and sizes.

Common Physical Characteristics
• 2 pairs of wings (harder to see in this picture) – often look like a single pair of wings because they are linked together

- distinct, but not elongated waist
- oval-shaped eyes
- long-ish antennae, often with a kink
- triangular or tear-shaped head
- oval/barrel-shaped abdomen
- pollen-carrying hair on legs or abdomen
Bumble Bees  
*Bombus*  
- 0.6 to 1 inch  
- Fuzzy abdomen  
- Large eyes  
- Thicker body than other bees  
- Yellow, orange, and black  
- Tip of abdomen is rounded

Honey Bees  
*Apis*  
- 0.5 to 0.7 inches  
- Yellow and black-striped abdomens  
- More slender and less hairy than bumblebees  
- Tip of abdomen is pointy

Large Carpenter Bees  
*Xylocopa*  
- 0.5 to 1 inch  
- Abdomen is smooth and shiny (not fuzzy)  
- Black and yellow in color
Bee Types

Other Wild Bees
Wild bees may be quite small. Here are some examples:
More Information

For more information on beneficial insects and what habitats they prefer, visit the New York State Integrated Pest Management Biocontrol webpage.

nysipm.cornell.edu/environment/biocontrol/

Biocontrol Bytes is a blog about biological control created by the New York State Integrated Pest Management Program to help New Yorkers who are trying to control pests.

blogs.cornell.edu/biocontrolbytes/

NYC Market Growers Update is an occasional email publication focused on production-oriented resources for NYC urban farmers who are growing for market or growing at a similar scale (e.g. nonprofit farms growing for food banks).

https://rb.gy/wxbwj
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