

2023 Beneficial Insect Report

Seven-spotted Lady Beetle (*Coccinella septempunctata*)
on Yarrow in the Public Garden. May 31, 2023.

Seven-spotted Lady Beetle is a non-native species that was introduced into the United States in the 1950's from Europe for aphid control. Both adults and larvae are predatory on aphids as well as a variety of other small insects and their eggs.



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Biological Control

Insects that prey upon other insects are considered beneficial and play an important role in maintaining the health of our landscapes. Supporting populations of beneficial insects or using them to suppress harmful insects is an essential strategy in any Integrated Pest Management program (IPM).



Figure 1 Convergent Lady Beetles released on Roses in the Public Garden Photo by Friends of the Public Garden

Aphids are small insects in the Order Hemiptera, that feed on many different plants. They use their piercing-sucking mouthparts to remove sap from plants. Their feeding results in a variety of symptoms such as yellowing, leaf curling, or distorted growth throughout the plant. While consuming large amounts of phloem from plants, aphids excrete honeydew, a sweet, sticky liquid that coats the leaves. Honeydew attracts other insects such as ants and wasps and encourages the growth of sooty mold fungus. In severe cases, accumulation of this black sooty mold can reduce a plant's ability to photosynthesize.

Since aphid females can reproduce parthenogenetically, without mating, populations of aphids can escalate quickly in the landscape.

In situations where pest insects are high and there are not enough natural enemies present, periodically increasing the number of predators can be an effective strategy to controlling pest insects. This year we released a total of 800 Convergent Ladybugs (*Hippodamia convergen*) to manage high populations of aphids on both the roses and several European beech trees in the Public Garden. Convergent Lady Beetle is native to Massachusetts and both adults and larva are predators of soft-bodied insects with a preference for aphids.



Figure 2 Convergent Lady Beetle Image 5512202



Figure 3 Milkweed Aphids (*Aphis nerii*) Photo by aroid from San Luis Obispo, CA, USA



“You can enjoy the fascinating world of insects if you give them the food they need to reach maturity and reproduce.”

- Doug Tallamy

Planting annuals, such as these Zinnias in the Public Garden, can be a short-term solution to providing nectar and pollen resources in our urban parks.

Figure 4 Zinnias in the Public Garden Photo by Friends of the Public Garden

Providing Nutrition for Beneficial Insects

While it is well known that all natural predators feed on other insects for nourishment, it should be noted that *almost all insect predators also require pollen and nectar* at some point in their life cycle. Having an adequate supply of pollen and nectar to supplement their diets is even more important for natural predators when prey is scarce or of poor quality.

Pollen is one of the most nutritious non-prey foods consumed by beneficial insects because it contains carbohydrates, fats, proteins, vitamins, and minerals.

Nectar is primarily composed of sucrose, glucose, and fructose. These sugars are an easily digestible and high energy food that can dramatically increase survival of many insect predators, especially lady beetles, in the absence of prey.



Both pollen and nectar are necessary for insect life processes such as growth, reproduction, flight, metamorphosis, and diapause. Unfortunately, these food sources are very limited in the urban environment. With this in mind, our city parks are in a unique position to provide the pollen and nectar beneficial insects need through proper selection of trees and flowers. The newest plantings by *The Friends of the Public Garden* at the Cheers Gate in the Public Garden are a great example of implementing this concept.

Figure 5 The Cheers Gate in the Public Garden with new shrubs, perennials, and groundcovers. Photo by Friends of the Public Garden

Over the summer, with the supervision of Director of Capital Projects & Parks Care, Rebecca McKeivitz, new flowering shrubs, ground covers, and perennials were planted in the Cheers Gate borders. Included in these plantings are Echinacea, Yarrow, Clethra, and Foam Flower. Using perennials and shrubs such as these, with different flower structures, allows a wider variety of insects to access the pollen and nectar they need to survive and thrive.

Meeting the nutritional needs of the natural predators that live and work in our parks can lead to a healthy urban environment. All urban green spaces offer potential for pollinators or natural predators, and all can become important links in a chain of wildlife habitat winding through developed land. At the most basic level, healthy greenspaces mean healthy people and healthy communities.

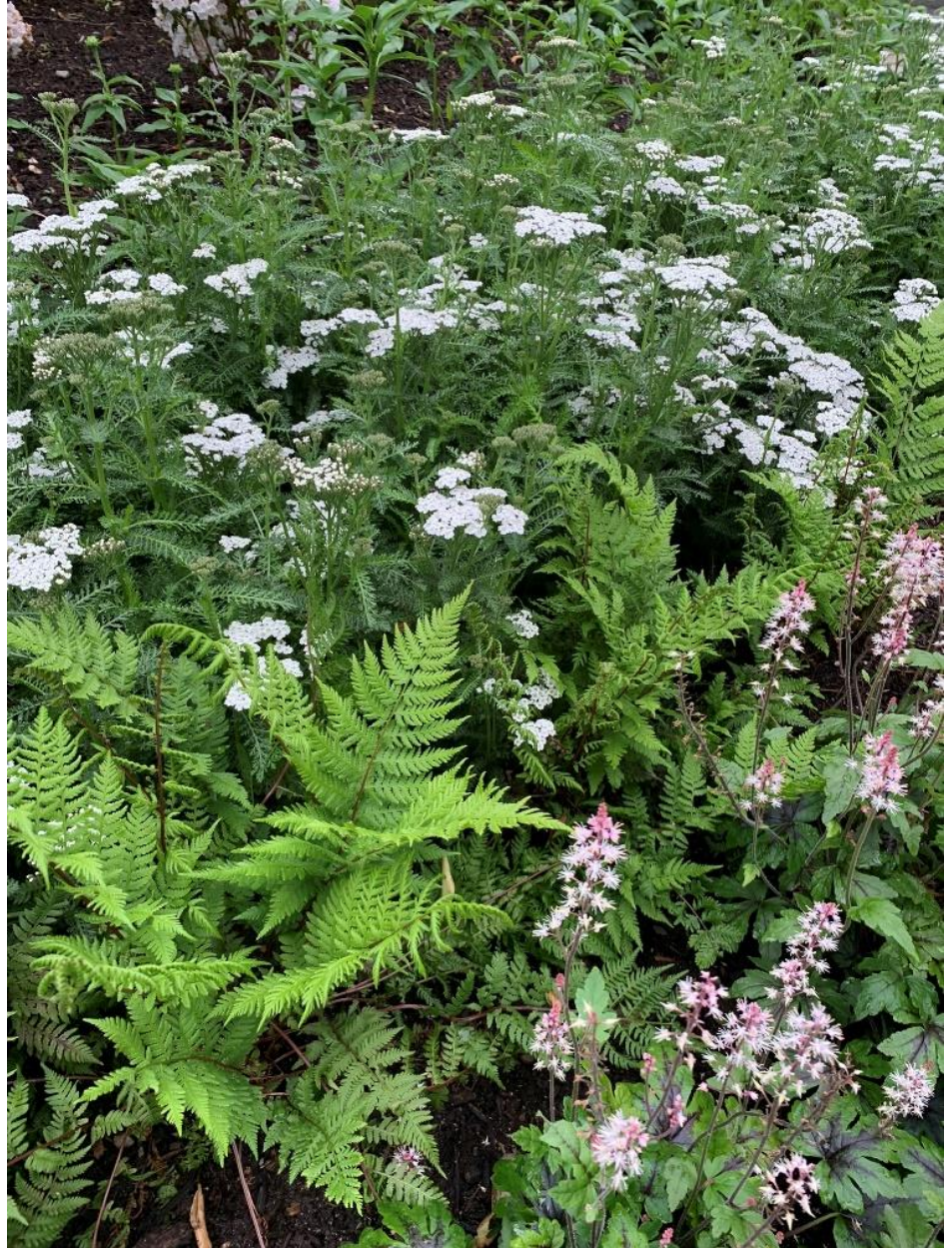


Figure 6 Perennials come back every year, making them a great investment when creating pollen and nectar rich flower beds. Photo by Friends of the Public Garden

Spotlight on Insect and Spider Inventory

A biological inventory or survey of the plants and animals in a community is a first step to understanding an ecosystem. Not only do inventories serve as a baseline, helping us track changes over time, but they allow us to determine biodiversity.

Accurately identifying the insects and spiders that I encounter in the parks or find as by-catch on our Elm Bark Beetle sticky traps is necessary to know more about them, such as their diet or habitat requirements. By understanding their specific needs, we can realize their connection to other species and have a better appreciation of the whole ecosystem in the parks.

Cicada Killer Wasp

This year on The Mall I was able to collect a recently deceased Cicada Killer Wasp (*Sphecius speciosus*). Cicada Killers are large, native, solitary wasps that prey on Cicadas. Measuring up to 2" long, Cicada Killers are one of the largest wasps in New England. They have black abdomens with jagged pale-yellow stripes and dark orange wings, head, and legs.



Figure 7 Cicada Killer Wasp

Female Cicada Killers create a nest in the soil that consists of a tunnel with several branched chambers. Upon completion of the nest, the female Cicada Killer actively hunts, captures, and paralyzes Cicadas with her stinger. After dragging the Cicada back to the nest, the Cicada Killer Wasp then lays an egg on the subdued cicada body which later serves as food for the developing wasp larva. Adults emerge in summer, early July, and die off in September or October. As adults, these beneficial wasps also visit flowers for nectar, pollinating them in the process.



Figure 8 Dog-day Cicada (Genus Tibicen)

Cicadas can cause damage when the adult females insert their eggs into the twigs of trees and shrubs or when young Cicadas living in the soil suck sap from nearby tree or shrub roots.

Because the Cicada is much larger than the Cicada Killer, bringing the paralyzed prey back to the nest is a very difficult task for the female wasp.



Figure 9 Cicada Killer Wasp (*Sphecius speciosus*) holding a Cicada. Photo by Bill Buchanan, U.S. Fish and Wildlife Service



Figure 10 Cicada Killer Wasp dragging prey back to her nest. Image UGA5290071

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