UMass Extension

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IPM Fact Sheet Series

UMass Extension Fruit Team Fact Sheet #

Biodiversity: A Brief Overview & Practical Application

What is biodiversity?

Sweet cherry trees (*Prunus avium*) produce blossoms that need to be pollinated in order to produce fruit.

The word "biodiversity" refers to all the different kinds of animals, plants, fungi, and microorganisms like bacteria found in a given area. It is the variety of life in the world, an ecosystem, or habitat. Biodiversity is a key factor in maintaining a healthy environment; this important ecological characteristic is imperative to the availability of resources (such as food, water, and shelter). It results in an intricate network that maintains homeostasis on small and large scales, providing resilience and adaptability by drawing in a multitude of ecological service providers. It is estimated that pollinators (organisms that transfer pollen, enabling fertilization and reproduction), such as birds and insects, assist in one third of crop production globally. Apples, cherries, blueberries, and squashes are just a few examples of foods we eat that rely on this ecological service. The inherent activities of other invertebrates, such as non-pollinator insects and bacteria, assist in soil health by making nutrients available for plants to grow; this is not only crucial for the plant's growth, but these nutrients are imparted onto the consumer as well. The various habitats within our biosphere (the worldwide sum of all ecosystems) rely on biodiversity, and the wellness of our planet depends on the health of these ecosystems; for example, the biological compositions of wetlands and grasslands naturally channel rainfall for more effective absorption into the soil appropriate to the site. While trees and terrestrial plants that make up forests help keep our air clean, lesser known eco-warriors such as sphagnum moss (found in peat bogs) and marine algae are massive carbon sinks; approximately 50% of global carbon dioxide is sequestered by marine algae, and 44% of soil carbon is stored in peat bogs. The destruction of these ecosystems threatens the health of the entire network, compromising their ability to sustain life.

This peat bog in Canada has been restored thanks to conservation efforts. These peat bogs are a threatened ecosystem due to unsustainable levels and methods of *Sphagnum* moss harvesting.

Why is biodiversity important?

There are many ecological services that result from influencing biodiversity, for example,

healthy soil increases production and yields. A greater variety of insects encourages better pollination, increases the array of predatory species that mitigate pest species, and offers a more varied diet to support other animals that feed on them, and those animals bring their own contributions to the site. Biodiversity correlates with ecological health and stability; according to the World Wildlife Foundation's 2022 Living Planet Report, global populations of mammals, fish, amphibians, reptiles, and birds have decreased by 69% since 1970. As the climate becomes more and more unstable, these populations suffer as individuals and as a whole, further compromising the planet's ability to maintain equilibrium and offer a good quality of life for its inhabitants.

Common blue violet (*Viola sororia*) is a New England native that blooms early and enjoys shade, making it a great low-maintenance ground cover.

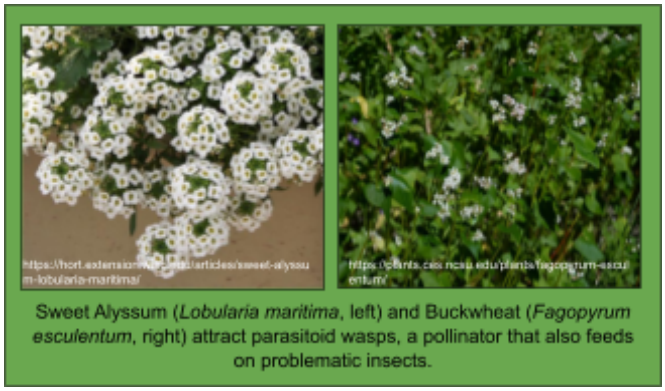
Common sunflower (*Helianthus annuus*) acts as an insectary, and significantly reduces the pathogenesis of *Crithidia bombi*, a harmful parasite, in bumblebees.

How to Increase Biodiversity

One way to increase biodiversity is to create a pollinator garden. Planting species conducive to providing abundant food and shelter for pollinating insects increases their survival rate, as well as the proliferation of the plants they feed from. Helping to sustain their population also means assisting the populations that feed on them, a compounding effect that spreads throughout the food web. Any site can benefit from the addition of a pollinator garden, whether it be a home garden, a farm, even an abandoned lot or a median in the road. Besides offering ecological amenities to advantageous organisms, pollinator gardens can also be enjoyable to people, as they can be fragrant and attractive to look at; they can also be as simple or complex as the gardener pleases. Throwing handfuls of seeds into the yard is one way to establish such a garden, but if one was willing to invest more time and effort, a spiral garden with a small pond at the bottom provides significantly more growing space and a greater variety of conditions which increases its usefulness. One might also elect to focus on native plant species in their pollinator paradise to mimic the healthiest version of the natural environment, a move that encourages prosperousness of native animal species. Native species occur naturally in a given region, rather than being introduced by human activity, therefore establishing native plants fortifies the aspects of the given area that are most crucial to its vitality, with the added bonus of requiring less maintenance. However, there are plenty of naturalized species that are excellent contenders for a pollinator paradise. When sowing a garden such as this, consider including early spring bloomers, plants that bloom in late summer through the fall, and blooms that only open at night to provide for a varied diet, encouraging more biodiversity!

Red clover (*Trifolium pratense*), left, and Queen Anne's Lace (*Daucus carota*) aren't picky about their growing conditions.

Daisy fleabane (Genus: *Erigeron*) is a weedy wildflower. There are two species that are native to New England: pictured left is *E. annuus* and on the right is *E. strigosus*.



Sweet Alyssum (*Lobularia maritima*, left) and Buckwheat (*Fagopyrum esculentum*, right) attract parasitoid wasps, a pollinator that also feeds on problematic insects.

Partridge pea (left, *Chamaecrista fasciculata*) and Mighty Mustard (*Brassica juncea*), more insectary and pollinator crops.

References

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