



Enhancing Seed Mixes With Wildflowers

By Diane Wilson

When planning your erosion control projects, keep in mind that seed mixes can be enhanced with wildflowers that are vital to domesticated and wild pollinators. Many erosion control projects are in areas that have undergone significant disturbance, and it is important to replace lost floral resources in these areas as well as establish erosion control. Pollinators provide a vital ecosystem function and rely on flowers for food and survival. In turn, many other types of wildlife benefit from the work of pollinators.

Animal and insect pollinators are essential to pollination for more than 75 percent of the world's flowering plants, which includes roughly 35 percent of the world's crops. Honey bees and certain wild bees are beneficial insects, providing crop pollination services for numerous fruits, nuts, berries, melons and squash. Honey bee keepers have experienced declines in their honey bee hive populations due to disease and the effects of stress. Proper nutrition from ample supplies of nectar and pollen improves honey bee health and makes them better equipped to fend off these obstacles. Some native pollinators have declined in numbers, become endangered or even gone extinct due to the loss of natural food supplies and habitat. Native pollinators are essential components in healthy ecosystems, and mitigating their loss is imperative.

Ecosystem services are the resources and processes that are supplied by natural ecosystems that benefit people. Human activities such as large-scale farming have impacted the environment to the point that some of these ecosystem services have been compromised. Long-term ecosystem health is being recognized as an important goal in order to maintain these benefits from nature. One type of ecosystem service is the pollination of flowers. Pollinators contribute to crop pollination as well as the pollination of many flowering plants in wild areas, which are an important resource for many types of wildlife. The loss of pollinators can have serious, long-term implications to the production of many food crops and the quality of the environment. By planting pollinator habitats, honey bees, wild bees and other pollinator populations can be conserved and even increased, and they can provide valuable ecosystem services to adjacent farmland or natural areas.

According to the Xerces Society for Invertebrate Conservation, there are more than 4,000 species of bees in the U.S. alone. Native bees are the predominant pollinators of flowering plants in nature and provide a vital service to the ecosystem. Without native bees, many native plant populations would decline, impacting other wildlife that is dependent on them. Wildflowers as well as flowering shrubs and trees provide cover, food and nesting sites for many wild animals. These include turkeys, ptarmigan, prairie chickens, grouse, hummingbirds, waxwings, rodents and larger mammals such as deer and elk. In turn, the decrease or loss of these animals impacts the survival of carnivores and other organisms that depend on them for food.

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Additionally, monarch butterflies are completely reliant on certain plants for survival and deserve our attention since monarch populations have been in decline for a number of years. The loss of nectar sources and milkweed has been indicated as a major contributor to this decline. Adult monarchs feed on flower nectar and lay their eggs only on milkweed species such as butterfly milkweed (*Asclepias tuberosa*), which provide food to monarch caterpillars.

If honey bees are in short supply, the pollination needs of some crops can be filled by certain species of native bees. Native bees can be major pollinators of agricultural crops and sometimes do the job more efficiently than honey bees. Native squash bees are major pollinators of cultivated squashes,



(Left) A butterfly feeds on a purple coneflower. (Center) Honeybees are able to feed on a wide variety of wildflowers. (Right) A squash bee pollinates a pumpkin flower.

and the blue orchard bee is a highly efficient pollinator of fruit trees such as apples, plums, pears and peaches. Bumble bees can be effective pollinators for tomatoes, peppers and strawberries, and the southeastern blueberry bee is an indigenous pollinator of blueberry plants.

Evaluate Your Site Conditions

Plant selection should depend upon site conditions in order to enhance success. By matching plants to the soil type and fertility, water availability, amount of sun, and climate, the plants will be more likely to thrive on their own and require fewer resources and maintenance. Regional native species can be good choices for sustainable landscapes, but make sure they are matched to the project's site conditions.

Evaluating site conditions is an important factor that is sometimes overlooked. The fact that seed originates from a given region will not guarantee successful establishment at every project site in that region. Many environments have been substantially altered from the original conditions that existed prior to disturbance. For example, a shady project site in the Great Plains region will not support native plants that evolved in a sunny environment, even if the seed came from a natural area nearby.

Choose the Right Flowers

Determine which plant species that are beneficial to pollinators are best for your area. Seed companies can make recommendations, and the plant database on the Lady Bird Johnson Wildflower Center website can assist you in selecting plants by region, bloom time and site characteristics. Most importantly, it also indicates the value of the plant to honey bees and native bees. Additionally, the Xerces Society and Pollinator Partnership have pollinator plant lists available for many regions of the U.S.

Bees, butterflies and other pollinators should have nectar and pollen available throughout the growing season, and it is important to include spring-, summer- and fall-blooming plant species. Annuals are a nice addition since they will bloom the first year and provide food within one or two months. Most perennials do not bloom until the second season.

Include a variety of flower shapes, sizes and colors. Research

indicates that including many types of flowers in a seed mix can provide benefits to a greater diversity of pollinators. Try to include a minimum of a dozen flower species in your seed mix, and add more if appropriate species are available for your site conditions.

Purchase High-Quality Seed

It is important to purchase high-quality seed from seed companies that can provide a lab test indicating germination percentage and test date, purity analysis and noxious weed content. A noxious weed exam is especially important because it determines if the seed is within tolerance of state and federal noxious weed laws. Planting rates should be based upon the pure live seed (PLS) of the seed lots being purchased. Because germination and purity can be highly variable from one lot to the next, using the PLS planting rate will ensure that you are planting the correct number of "live" seeds in an area.

The PLS is obtained by multiplying the percent purity by the percent total viable seed and then dividing by 100. To convert a PLS seed quantity to the bulk amount, simply divide it by the PLS in decimal form. For instance, if a seed lot has a PLS of 84.03 and you need five PLS pounds, divide five by 0.8403, which equals 5.95 bulk pounds. If you need to convert bulk pounds to a PLS amount, simply multiply it by the PLS (in decimal form) of the seed lot. For example, using the same lot above with a PLS of 84.03, five bulk pounds multiplied by 0.8403 equals 4.20 PLS pounds.

Reclamation and erosion control projects provide excellent opportunities for providing pollinators with food resources, boosting pollinator abundance and diversity, and enhancing the environment. Some pollinators provide essential services for crop production, and native pollinators are a vital component of wildland areas. When your next project comes up, consider adding some wildflower seeds to your seed mixture.

About the Expert

Diane Wilson is an ecologist who has worked in the seed industry for more than 30 years. She has studied the flower preferences of honey bees and native pollinators and done seed production research to get new wildflowers into the marketplace for pollinator conservation projects.