Virginia Cooperative Extension
Virginia Tech • Virginia State University

EXPERT REVIEWED

SPES-797P

Native Plants in the Landscape: Understanding Native Plants

Authored by Sierra Seekford, Agriculture and Natural Resources Agent, Virginia Cooperative Extension Chesterfield Office; Laurie Fox, Horticulture Associate, School of Plant and Environmental Sciences, Hampton Roads Agricultural Research and Extension Center, Virginia Tech; Alex Niemiera, Professor, School of Plant and Environmental Sciences, Virginia Tech; and Meredith Steele, Associate Professor, School of Plant and Environmental Sciences, Virginia Tech

Interest in incorporating native plants into residential landscapes continues to increase. Many Virginians may have considered planting, or have already planted, natives in their landscapes. A clear understanding of exactly what they are and the terminology surrounding them will help in making smart choices and incorporating them successfully into the landscape (Rihn et al. 2022). This publication covers the meaning of the term "native plant," key words to remember when shopping for plants, and how these plants can benefit individuals, the landscape, and the environment.

What Are Native Plants?

At the federal level, Executive Order 11987 says: "Native species' means all species of plants and animals naturally occurring, either presently or historically, in any ecosystem of the United States." The U.S. Forest Service defines native plants as "indigenous terrestrial and aquatic species that have evolved and occur naturally in a particular region, ecosystem, and habitat" (U.S. Forest Service, n.d.). Finally, it's generally accepted that native also means a species that occurred naturally prior to the colonial settlement of the United States.

Coevolution with Other Native Species

Many native plants and insects are generalists, meaning a plant will receive many species of pollinators or a pollinator will visit many species of plants. However, some native plants, insects, and other animal species have specialized relationships. Doug Tallamy, an entomologist at the University of Delaware, has conducted research showing that 90 percent of native insects are specialists that feed on three or fewer families of plants (Tallamy 2004). A well-known example of a specialized relationship is the one between monarch butterflies and milkweeds, which are essential host plants for the butterflies to lay eggs on and for the caterpillars (larvae) to eat to complete their lifecycle (fig. 1). Another example is the yucca plant and the yucca moth, because only the yucca moth can pollinate the flowers of the yucca plant. In return for pollination, the moth lays its eggs and the larvae feed on the seeds of the yucca plant (Landry 2010). A third example is the long tubular flowers of coral honeysuckle, which are specialized for hummingbird beaks. These relationships exist because the plant, insect, and animal species coevolved for millions of years.

Figure 1. A monarch caterpillar eats a swamp milkweed, *Asclepias incarnata*. (Photo by Laurie Fox)

Native to a Region or Area

Because native plants have been adapting to certain geographic areas for long periods of time, they are better adapted to the local pests, temperatures, soil conditions, humidity, rainfall, and environmental events like storms, floods, fires, etc., than non-native plants. Understanding the specific area where plants are native to is important because it impacts species selection, availability for purchase, and the chance for successful establishment. For example, is the native area the East Coast of the

United States, the mid-Atlantic area of the East Coast, the state of Virginia, or the Mountain, Piedmont, or Coastal region of Virginia? See the sections below and the resource list for places to find information on native status.

When choosing native plants, consider local ecotypes — plants that are sourced and grown within a 100- to 200-mile range of the site. The plants will be more likely to establish and thrive, and they will help protect and conserve the local native plant genetics.

Don't be afraid to ask professionals at the nursery or garden center where the native plants are sourced. For example, dogwood trees from Florida or California may not establish or grow as well in Virginia as those from Maryland or North Carolina. It's also possible for anyone to collect seeds or propagate from local ecotypes, although it's a good idea to ask permission from the property owner first. Remember, never dig plants out of the wild. Doing so harms the ecosystem.

In addition to selecting plants that are native to the area, make sure to match the plants to specific site conditions. Most residential landscapes are considered disturbed sites, and conditions can vary greatly across short distances or within a small area. For example, topsoil could have been scraped away, fill soil could have been added, or the site soils could have been compacted, all of which could cause poor drainage. Concrete foundations and walkways can leach calcium hydroxide (lime) into the soil, which increases the soil pH (more alkaline) and affects nutrient availability. A soil test will provide important pH and nutrient information. Just because a plant is native to a specific area doesn't mean it will grow in the specific conditions of a "disturbed" site within that area.

Resources to Find Plants Native to an Area

Many resources are available that provide information on Virginia native plants. The Digital Atlas of the Virginia Flora provides information on a plant's native status and geographical distribution to the local (city or county) level. Another resource is Plant Virginia Natives. This initiative offers 10 downloadable Virginia regional native plant guides, along with many other resources, on its website. The Virginia Department of Conservation and Recreation has a native plant finder on its website, as well as brochures on native plants for the Coastal, Piedmont, and Mountain areas of the state. Other organizations that have information are your local Virginia Cooperative Extension Office and local chapters of the Virginia Native Plant Society, the Virginia Master Naturalists, and the Butterfly Society of Virginia.

Important Terminology

biodiversity – The variety of life in a place on Earth or across the entire Earth.

cultivar – A plant that has been selected for a particular desirable characteristic and retains that characteristic when cultivated (usually propagated asexually) by humans. The cultivar name is displayed in single quotation marks. In some instances, a native cultivar may be referred to as a "nativar." Figure 2a is the native common yarrow *Achillea millefolium* (note no quotation marks around the native plant's name), and 2b is the cultivar *Achillea millefolium* 'Colorado Mix', a cultivar selected for the different color of the flowers. Cultivars may not provide all the benefits that the straight species does. Mt. Cuba Center and Penn State University have been doing research on this.

Figure 2a. *Achillea millefolium,* common yarrow. (Photo by Sierra Seekford.)

Figure 2b. *Achillea millefolium* 'Colorado Mix'. (Photo by Sierra Seekford.)

ecotype – A population of species, whether native or not, that has adapted to a particular set of environmental conditions through a process of natural selection (Norcini 2007), usually within a 100- to 200-mile range.

hybrid – A genetic cross of two plants from two different genera or species that results in unique, often desirable, characteristics. Hybrid plants are denoted with an "x" between the first and second parts of the species name. For example, *Dryopteris* x *australis* (Dixie Wood Fern) is a naturally occurring hybrid between *D. celsa* and *D. ludoviciana*.

introduced – A species that is not native and has been brought to the location through human activity either deliberately or accidentally (Norcini 2007).

invasive species – Species intentionally or accidentally introduced by human activity into a region in which they did not evolve and that cause significant harm to natural resources, economic activity, or humans

naturalized – A term used to describe a species that is not native to an area but has established a sustained population in that area (Norcini 2007).

straight species – A native plant that is true to its wild type without human intervention.

variety – Plant with a unique characteristic that makes it different from the original species but that can be reproduced by seed. An example of a naturally occurring variety of a native is the white-flowering redbud *Cercis canadensis var. alba*.

Benefits of Native Plants

One of the most important benefits of native plants is that they provide pollen and nectar for bees, butterflies, and many other beneficial insects; leaves for caterpillars; and fruits and nuts for wildlife and people. The best way to attract songbirds to an area is to plant native host plants that support the soft, nutritious caterpillars that baby birds eat. For example, Carolina chickadees are more likely to visit landscapes with native plants, especially during the breeding season when caterpillars are available as a food source for young birds (Narango et al. 2017). Trees that support the most caterpillars include oak (*Quercus*), cherry (*Prunus*), willow (*Salix*), birch (*Betula*), and poplar (*Populus*) (Narango et al. 2020).

Other benefits of planting natives:

- The creation of plant communities, which are groups of plants that live together, interact with each other, support insect and wildlife communities, and connect with the surrounding environment.
- The formation of sustainable and resilient landscapes that require less maintenance, take care of themselves over the long term, and recover quickly from problems like storms, drought, fire, and pests.
- A reduction of fertilizer and pesticide use because the plants are adapted to the soil nutrient levels and are resistant to pests, so they require less or no chemical inputs.
- Reduced maintenance because the plants don't require frequent pruning, watering, mulching, or weed control.
- The creation of habitat by providing hunting perches, nesting sites, and shelter from storms and predators.
- The reinforcement of the local ecology. Native plants in landscapes and local parks provide connections and pathways between natural areas.
- The establishment of a "sense of place" is often associated with native plants, which are often associated with a specific geographic area (e.g., dogwood in Virginia or palm trees in Florida).
- The prevention of erosion by providing vertical canopy layers (in a plant community) that absorb and reduce the amount of rainfall that hits the ground and runs off. Root layers (shallow fibrous roots of perennials and deeper roots of shrubs and trees) absorb rainfall and stabilize slopes.
- The moderation of flooding risks by absorbing rainfall through the canopy and root layers and by creating channels that allow rainfall to soak into the ground rather than run off.
- The prevention of invasive plants by growing natives in dense layers that prevent invasive plants from getting started.
- The promotion of beauty by having interesting shapes and colorful foliage, bark, flowers, or berries, and by attracting wildlife like butterflies and songbirds through the seasons (fig. 3).

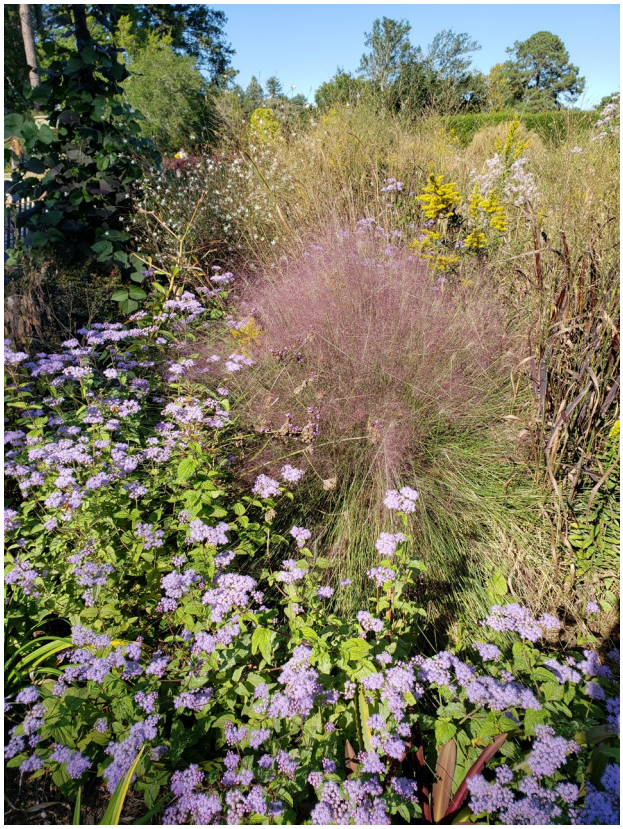

Figure 3. Native plants can remain beautiful well into fall. (Photo by Sierra Seekford.)

- The improvement of soil by adding organic matter, reducing compaction, and creating channels for rainwater to soak into the ground.
- The improvement of water quality by removing pollutants from stormwater before it carries them into natural waterways.
- The improvement of air quality by removing carbon dioxide from the atmosphere.
- The improvement of mental and physical health by calming the mind and body. Research has shown that taking a walk around a landscape, enjoying its different features, fragrances, and textures, and just observing plant and animal interactions can help to reduce stress and mental fatigue (Hall and Knuth 2019).

Understanding what native plants are, the terminology surrounding them, and the many benefits they offer will help when choosing which ones to incorporate into a particular landscape. More information on incorporating and maintaining native plants can be found in the next two Extension publications in the Native Plants in the Landscape series (SPES-798P and SPES-799P), available under the publications menu on the Virginia Cooperative Extension website (www.ext.vt.edu).

Resources

Bringing Nature Home: How You Can Sustain Wildlife with Native Plants, by Douglas Tallamy, was published in 2007 and offers recommendations for planting natives, emphasizing how doing so benefits native wildlife.

Butterfly Society of Virginia (https://www.butterflysocietyofva.org/) educates Virginians about butterflies and moths and promotes conservation efforts.

Chesapeake Bay Foundation (https://www.cbf.org/virginia). With offices in Richmond and Hampton Roads, the foundation provides events, educational resources, and programs for residents throughout Virginia. Search for "native plants."

Digital Atlas of the Flora of Virginia (https://vaplantatlas.org/). This site shows which native plants grow in specific geographic areas of Virginia.

Homegrown National Park (https://homegrownnationalpark.org/) calls for urgent action to add native plants and remove invasive ones from the landscape. It provides information on plants and insects and supports activities for kids.

How Can I Help? Saving Nature with Your Yard, by Douglas Tallamy, was published in 2025 and tackles questions commonly asked at the author's popular lectures. The book offers actionable guidance that will help homeowners take the next step in their conservation efforts.

James River Association (https://thejamesriver.org/). With a focus on the James River watershed area of Virginia, the association sponsors events, educational resources, programs, and cost-share opportunities.

Ladybird Johnson Wildflower Center (https://www.wildflower.org/learn/container-gardening-native-plants) provides cultural information on native plants, as well as pictures.

Mt. Cuba Center (https://mtcubacenter.org/) near Wilmington, Delaware, publishes reports on its website about native plants, especially in the Mid-Atlantic region.

Nature's Best Hope: A New Approach to Conservation That Starts in Your Yard, by Douglas Tallamy, was published in 2020 and outlines the author's vision for a grassroots approach to conservation, showing how homeowners can turn their yards into conservation corridors that provide wildlife habitats.

Plant Virginia Natives (https://www.plantvirginianatives.org/) encourages the use of native plants and conservation landscaping practices with 10 regional Virginia guides, links to regional native plant campaigns, and many other resources.

USDA Plants Database (https://plants.sc.egov.usda.gov/) provides plant information, images, native status, and distribution maps.

Virginia Cooperative Extension's website (https://ext.vt.edu/) offers searchable publications like "Stormwater Management for Homeowners" and "Native Plants in the Landscape – Understanding, Incorporating and Maintaining," as well as local office locations and contact information.

Virginia Department of Conservation and Recreation Natural Heritage Program (https://www.dcr.virginia.gov/natural-heritage/nativeplants) maintains the Virginia Invasive Plant Species List and offers downloadable flyers on native plants for the Coastal, Piedmont, and Mountain areas of Virginia.

Virginia Institute of Marine Science (https://www.vims.edu/) offers the Field Guide to Virginia Salt and Brackish Marsh Plants and information on living shorelines.

Virginia Master Naturalists (http://www.virginiamasternaturalist.org/) offers information on training and events.

Virginia Native Plant Society (https://vnps.org/) has local chapters and native plant sales.

Xerces Society (https://xerces.org/) offers resources to protect bees and other pollinators.

Acknowledgements

The authors would like to express appreciation for the reviews and comments provided by the following individuals: Dr. Kristopher Criscione, Assistant Professor and Nursery Production Specialist, School of Plant and Environmental Sciences, Hampton Roads AREC, Virginia Tech; Quinn Bracken, Extension Agent, Henrico, Virginia Cooperative Extension; Michael Andruczyk, Senior Extension Agent, city of Chesapeake, Virginia Cooperative Extension; Dr. Barbara Fair, Extension Horticulture Specialist and Associate Professor, North Carolina State University; and Lisa Kuder, Native Plants and Landscapes Specialist, Clarksville Facility, University of Maryland Extension.

References

Hall, C. and L. Knuth. 2019. "An Update of the Literature Supporting the Well-Being Benefits of Plants: A Review of the Emotional and Mental Health Benefits of Plants." *Journal of Environmental Horticulture* 37(1):30–38. https://doi.org/10.24266/0738-2898-37.1.30.

Landry, C. 2010. "Mighty Mutualisms: The Nature of Plant-pollinator Interactions." *Nature Education Knowledge* 3(10):37. https://bit.ly/4sS4JV4.

Narango, D. L., D. W. Tallamy, and P. P. Marra. 2017. "Native Plants Improve Breeding and Foraging Habitat for an Insectivorous Bird." *Biological Conservation* Vol. 213, Part A, September 2017, Pages 42-50. https://doi.org/10.1016/j.biocon.2017.06.029.

Narango, D. L., D. W. Tallamy, and K. J. Shropshire. 2020. "Few Keystone Plant Genera Support the Majority of Lepidoptera species." *Nature Communications* 11, 5751 (2020). https://doi.org/10.1038/s41467-020-19565-4.

Norcini, J. G. 2007. "Native Plants: An Overview." University of Florida/Institute of Food and Agricultural Sciences Extension Environmental Horticulture Department Publication ENH1045. Last review 7/2025.

Rihn, A. L., M. J. Knuth, B. J. Peterson, A. P. Torres, J. H. Campbell, C. R. Boyer, M. A. Palma, and H. Khachatryan. 2022. "Investigating Drivers of Native Plant Production in the United States Green Industry." *Sustainability* 14, 6774. https://doi.org/10.3390/su14116774.

Tallamy, D. W. 2004. "Do Alien Plants Reduce Insect Biomass?" *Conservation Biology* 18(6), 1689-1692. https://doi.org/10.1111/j.1523-1739.2004.00512.x.

U.S. Forest Service, United States Department of Agriculture. n.d. "Native Plant Materials." Accessed April 9, 2023. https://www.fs.usda.gov/wildflowers/Native_Plant_Materials/.

Virginia Cooperative Extension is a partnership of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and local governments. Its programs and employment are open to all, regardless of age, color, disability, sex (including pregnancy), gender, gender identity, gender expression, genetic information, ethnicity or national origin, political affiliation, race, religion, sexual orientation, or military status, or any other basis protected by law.

VT/0726/SPES-797P