

# NATIVE PLANTS, NATURAL LANDSCAPES

## OZARK CHAPTER FALL 2021





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"EACH INDIGENOUS PLANT HAS POTENTIAL TO ATTRACT AN ENTIRE SYSTEM OF CREATURES -MICRO TO MACRO, WITH WHICH IT HAS EVOLVED -POLLINATORS, SEED DISPERSERS, PREDATORS, SCAVENGERS, AND SAPROPHYTES."

-CHARLOTTE SEIDENBURG



Witch Hazel (*Hamemelis virginiana*) Photo Getty Images Wild Ones,

It is hard to believe it is already fall! This is such an exciting time of year for many of our members as we gear up for the fall native plant sales. A great way to finish off an exciting year for our chapter as our membership nearly doubled in 2021!

Our team of Site Visit volunteers has also continued to grow, as have the requests from residents of Northwest Arkansas for our free consulting services. We are happy to provide this service and to assist you with your native plant gardening and landscaping projects by recommending species based on site conditions, and by pointing you in the direction to where you can acquire these plants.

The rain garden and bioswale planting at the Thunder Chicken Trailhead in Springdale has also come along nicely this past year. We look forward to continuing to collaborate with the Northwest Arkansas Master Naturalists on this project, which has been a rewarding way for our volunteers to get outside, and to socialize in a safe and distant manner while being part of a worthwhile project in a highly visible area.

As our monthly webinars continue to be popular, we have started holding virtual membership meetings in conjunction with these programs. These meetings include a half-hour open discussion guided by that month's webinar topic. Also at these meetings we seek feedback from our members and announce upcoming educational and volunteer opportunities, so you don't want to miss out! We look forward to seeing you at the next one, and hopefully we will be able to meet in person again sometime next year.

Finally, as many of us start to think about the fall gardening season and begin preparing our native plant gardens for winter, choosing which native plants you would like to purchase from local fall native plant sales can be challenging. Nevertheless, know that we are here to help you by answering any questions you may have. Please do not hesitate to reach out.

Dutifully Yours,

Eric Tuselier

Eric Fuselier, President Wild Ones – Ozark Chapter

# program schedule

Wild Ones – Ozark Chapter is pleased to offer educational programs that support our mission. Please email <u>WildOnesOzarkChapteregmail.com</u> to sign up.

## Webinars

Wednesday, October 6th, 11am: The important role of herbaria in recent discoveries of invasive species risk from hitchhiking propagules at international seaports with Dr. Travis Marsico

Tuesday, October 12, 11am-12pm: Ecotype Seed Collection and Cleaning with Laurie Scott

Thursday, November 4th, 6pm: **Native Edible and Medicinal Plants for your Ozark Garden** with Eric Fuselier at the Botanical Garden of the Ozarks. Register at <u>https://www.bgozarks.org/edible\_medicinal-plants/</u>.

Wednesday, November 10, 1–2pm: ARDOT's Monarch Habitat Initiative with Joe Ledvina

Wednesday, November 17, 1pm: History of the University of Arkansas Herbarium with Jennifer Ogle

Wednesday, December 15, 11am-12pm: **Ozark Plant Communities as Design Inspiration** with Scott Biehle

## **In-Person Presentations**

Saturday, November 13, 10am: **Native Edible and Medicinal Plants of the Ozarks** with Eric Fuselier at the Ponca Elk Education Center in Ponca, AR

Saturday, December 4, 1pm: Winter Botany with Eric Fuselier at Compton Gardens in Bentonville, AR

November 6th, 9am to 11.30am: **Native Seed Harvesting and Broadcasting** at the Fayetteville West Side Water Resource Recovery Facility, 15 South Broyles Ave, 72704

HEREARIUM. F. LEBOY HARVEY. apocynacial and to saconifolinuo, Habitat Rich woods Locality. r. W. ark Photo Credit: University of Arkansas Herbarium



As people transition to using more native plants in their landscapes, they often need support and advice. The Ozark Chapter of Wild Ones is now offering the service of onsite visits in Northwest Arkansas.

The role of the Site Visits Committee is to offer guidance, encouragement, resources, and professional connections to homes and non-profits. Prior to the site visit, a short questionnaire will be sent to establish the priorities of the person asking for help. Our services will be offered in a manner that does not compete with professionals.

If you would like to sign up for a visit, send an email to <u>wildonesozarkchapter@gmail.com</u>. Please use Site Visit in the subject line.

If you are interested in being on the Site Visits Committee and making home visits, please contact <u>morrisonlissa3@gmail.com</u>.

## NATIVE PLANT SOURCES

The Site Visit Committee is gathering a list of sources for native plants. Below are some of sources identified. Please share with us contact information for your favorites at wildonesozarkchapter@gmail.com.

Missouri Wildflowers Nursery www.mowildflowers.net

Prairie Moon Nursery www.prairiemoon.com

Pine Ridge Gardens www.pineridgegardens.com

Ozark Soul www.ozarksoul.com

North Creek Nursery (wholesale only) www.northcreeknurseries.com

White River Nursery www.whiterivernursery.com

Holland Wildflower Farm www.hollandwildflowerfarm.com

For Wildflower Seeds email: <u>hwildflowerfarm@cox-internet.com</u>

## **KEEPING IN TOUCH**

**Facebook** – Our Chapter Facebook page is open to the public.

https://www.facebook.com/OzarkWildOnes

**Board meetings** - Member meetings are temporarily on hold due to Covid-19, but the Board continues to meet monthly. We're developing online programming - so keep an eye on our Facebook postings. **National Website** - Members of Wild Ones have exclusive access to abundant resources on the national Wild Ones website. Registration gives you access to files, publications, and articles only available to members. On the upper right-hand corner of the main page is a "member login" button that will give you instructions for registering.

You'll be able to access archived Journal articles, vote on the annual photo contest, sign up for the discussion group, and much more! <u>https://ozark.wildones.org/</u> Lissa Morrison shared three photos of her pollinator garden located at her home in southeast Madison County. The photos were taken on Sept. 3, 2021.

MEMBER GARDEN SPOTLIGHT







Photo by Lissa Morrison

# About the Photographer



Lissa Morrison, chapter vice president, has been in the horticulture industry for 35+ years. She has owned a wholesale plant nursery, a residential landscaping business, and a retail garden center. Lissa was on the horticulture staff at the Botanical Garden of the Ozarks for eight years.

> A bumble bee drinks nectar from blue lobelia (*Lobelia siphilitica*) Photo by Lissa Morrison

# Lake Springdale Trailhead UPDATE

by Steve Alarid, Member, Wild Ones - Ozark Chapter



Inland sea oats, *Chasmanthium latifolium*, with ripening seed heads. Photo by Steve Alarid If you have not yet had a chance to visit our Lake Springdale native rain garden/bioswale project, right now is a good time; come over and see it! Many of the plants are blooming and serving their natural roles in feeding and hosting a variety of local wildlife. Plant ID labels have been recently added to help everyone recognize these beautiful natives.

Of course, this is still only the first year of establishing an ambitious urban landscape design, so the plantings are still immature. However, almost everything that was placed during the past year is surviving and thriving.



Foreground: orange coneflower (*Rudbeckia fulgida*), aromatic aster (*Symphotrichum oblongifolium*), Arkansas bluestar (*Amsonia hubrichtii*), purple coneflower (*Echinacea purpurea*), switch grass (*Panicum virginicum*) Photo by Steve Alarid Some items of interest looking ahead are:

- We are beginning Phase 2 planning to expand the project into a contiguous park area. Next season's activities will include adding new plants and training some of the woody shrubs as they begin to grow larger.
- The city of Springdale is expanding its trail system by connecting the Razorback Greenway with the nearby ADFG Ozark Highlands Nature Center. The new paved bike/hike trail will run directly adjacent to our project! Our garden is poised to be seen by an increasing number of trail users!
- NWA Master Naturalists' Interpretive group is planning to design new signage for the project, explaining and promoting the value of native plants in landscape design.

The project has been successful so far thanks to a small but loyal corps of volunteers from both our Wild Ones chapter and NWA Master Naturalists. The valiant few have persevered through spring and summer, weeding, watering, and generally pampering our little green buddies. Would you like to participate? Just contact Wild Ones project lead Steve Alarid: stevealarid55@gmail.com or text 479-877-5123.



Switchgrass, *Panicum virginicum*, with two Monarch butterfly, *Dannaus plexippus*, chrysalises Photo by Steve Alarid



growth. For scale, see hickory nut in lower center Photo by Steve Alarid

About the Author

Steve spent 33 years in natural resource management as a forester and wildland firefighter with the U.S. Forest Service. His home property in Springdale was recently approved by Arkansas Audubon as a Gold-Level Bird-Friendly Yard and by National Wildlife Federation as Certified Wildlife Habitat. Current affiliations include NWA Master Naturalists and Ozark Chinquapin Foundation. Visible in the background: Winged sumac, *Rhus copallinum*.









## Native Plant Production, What Has Worked Best for Us

By Rose Gergerich, Member, Wild Ones - Ozark Chapter

This is the third of three articles describing the Northwest Arkansas Master Naturalists Native Plant Project. These articles are not designed to convince folks to grow native plants. If you need convincing, we recommend two books by Douglas Tallamy: *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants* and *Nature's Best Hope: A New Approach to Conservation that Starts in Your Backyard*.



The three articles in this series are:

- 1. Native Plant Production: A Year's Timeline (<u>see Summer 2020 Wild</u> <u>Ones - Ozark Chapter Journal</u>)
- 2. Native Plant Production: Educating Ourselves and Others about Native Plants and Their Value (<u>see Spring</u> <u>2021 Wild Ones - Ozark Chapter</u> Journal)
- 3. Native Plant Production: What Has Worked Best for Us (this issue)

Background: Milkweed seeds. Photo Getty Images.

## Native Plant Production, What Has Worked Best for Us

## A. Collecting Seeds

- Get permission
- Don't collect from rare species
- Leave some to grow next year
- Leave some for the seed eaters
- Identify source plant and tag the plant while flowering
- Wait until seed is ripe (will be dry, and many will be dark in color and firm)
- Put collected seed in a paper bag and dry thoroughly at room temperature
- Be informed of unique seed collection instructions for some seeds, especially for berries and fruits (see websites given below)
- Prepare data sheet for seed collected (date, plant name, collector, location)



Image 1: Beautyberry seed extraction. Fresh beautyberry fruit is "smushed" by hand, and then this mixture is swirled in a glass of water which causes the seeds to collect on the bottom of the glass. The fleshy berry pieces can then be poured off. With repeated washings, this results in a prep of nice clean seeds. Seeds are dried and stored in the refrigerator until the time for 2 months of cold, moist stratification



Image 2: Spicebush seeds are removed from the flesh of freshly collected fruit, then washed and cold, moist stratified until planting. The seeds should not be allowed to dry. Photo by Kitty Sanders

## **B. Cleaning and Storing Seeds**

- Check resources for unique requirements for seed storage (Image 1, above)
- Identify the seed using online resources and magnifier if needed
- Separate the seed from extraneous organic material
- Store the cleaned, dry seed and data card in a sealed container in the refrigerator (NOT freezer)
- Watch for seeds that require special conditions as indicated (Image 2, left)



AP environmental science students from Fayetteville High School processing native seeds Photo by Eric Fuselier

## C. Seed Treatments

Many native plant seeds require an overwintering period or other treatments, such as bruising the seed coat, before they will germinate. For propagation of native plants, the seeds often need to be pretreated to overcome their natural dormancy in order to ensure consistent and timely germination in the greenhouse. Prior to these treatments, most seeds are stored dry under refrigeration. Stratification is a process of pre-treating seeds and storing seeds under cold, moist conditions for varying lengths of time in order to simulate natural conditions that seeds would experience in the soil during the winter months. An excellent guide to pre-treatment requirements for many native plant seeds can be found at the Lake to Prairie Wild Ones website: <u>laketoprairie.wildones.org/wp-</u>

content/uploads/sites/12/2015/04/Seed-Germination-

Instructions.pdf. Additional information on seed treatments of native plant seeds can be found at the Ladybird Johnson Wildflower website: www.wildflower.org/plants, the Prairie Moon Nursery website: www.prairiemoon.com, and the Missouri Wildflower Nursery website: mowildflowers-net.3dcartstores.com, as well as other informative websites that can be accessed by searching the name of the native plant of interest.

For both cold, moist stratification and warm, moist stratification (required by more than 75% of our native seeds), we have found that a stratification mixture of equal parts of fine-milled sphagnum peat moss (naturally antifungal) and fine sand (not beach sand) works well. Water is added to this mixture, and the mixture is tossed together and held for a few minutes to allow the moss to fully absorb water. Then the mixture is gently "wrung out" to remove excess water. The prepared stratification mixture is mixed with the seed at roughly 3 parts of stratification mixture to seed. We store this seed mixture in small Ziploc bags, and care is taken to avoid any visible water in the bag, which may lead to mold growth.

Other seed treatments include the addition of nitrogen-fixing bacteria (Rhizobium sp.) to the seeds of many native legume-type plants. This inoculum is applied to the seed just prior to planting. The source we use for nitrogen-fixing bacteria is Prairie Moon Nursery www.prairiemoon.com/inoculum-for-legumes.

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It is important to remember that the requirements for germination of native plant seeds are often unique, and that it is well worth your time and effort to determine what those requirements are at the time of seed collection. For example, it is very disappointing to have a great collection of dried spicebush seeds only to find out later that the seeds needed to be kept moist to ensure germination (personal experience here).

## D. Soil Mixes

We use different soil mixes for different stages of plant growth and diverse types of plants. Our carefully stored and pre-treated seeds are planted into a commercial soil mix (ProMix) that contains mycorrhizal fungi, which will colonize the seedling roots and help with water and nutrient absorption from the soil. We also use this soil mix for seedlings that are transplanted into quart-size pots (for early sales) or into smaller cup-sized pots or flats for transplanting into gallon pots (for later sales). We purchase two soil mixes prepared to our specifications by a local landscaper for our tree and shrub seedlings and our seedlings that are transplanted into gallon pots. The "recipes" for these soil mixes are given below, and the original source for these mixes is: <u>www.uaex.edu/publications/pdf/fsa-6098.pdf</u>.

#### Mix Number 1: Tree Soil Mix Recipe (by volume):

1 part peat moss 1 part composted bark 1 part compost 1 part sand 1 part perlite

Also, 2 tablespoons of lime for each shovel of peat moss to adjust pH.

#### Mix Number 2: Potting Soil Mix for Non-Tree Plants (by volume):

3 parts milled pine bark 1 part peat moss 1 part sand

For each cubic yard, add 8 pounds of ground limestone or dolomite (we use agricultural limestone).

Since neither of these seed mixes contain fertilizer, we use Osmocote Plus according to the manufacturer's instructions.



Perlite Photo Getty Images

## E. Recycled Materials for Pots and Labels

In order to reduce the environmental impact of our project, we make every effort to use recycled materials that would otherwise end up in the landfill. Local nurseries, landscaping businesses and other organizations have happily donated used pots that would otherwise end up in a landfill. Additionally, we ask folks who have purchased plants from us, or who have received plant donations, to return pots to us. In order to prevent the spread of plant diseases from these used pots, all recycled pots are brushed to remove debris and then soaked for 30 minutes in a 10% bleach solution followed by thorough rinsing with water. Although this is a labor-intensive effort for our volunteers, it results in the use of thousands of recycled pots (Image 3). In addition to using recycled pots, we also use the plastic slats of recycled Venetian blinds to make labels for all of our plants. The blinds are cut into different sizes depending on the size of the pot to be labeled, and labels with the seed accession number, common name and scientific name of the plant are affixed to the cut blind slats (Image 4).



Image 3. Each seeded pot and transplanted plant is tagged with a label made from recycled Venetian blind slats. Each label lists the unique seed identification number, the common name and the scientific name of the plant. Photo by Rose Gergerich



Image 4: A garage full of thousands of stacked pots ready for cleaning and reuse Photo by Rose Gergerich

#### F. Planting Seeds

Before planting seeds, the soil mix in the pots is thoroughly wetted, and the seeds are sown on the surface of the wetted soil mix. A good rule of thumb is to cover the seeds with soil equivalent to two times the width of the seed. However, some seeds require light to germinate and should not be covered with soil. Small seeds are covered with a dusting of soil mix, and the pots are placed in a tray to allow for bottom watering which avoids disturbing the upper layer of soil and small seeds in the pot.

The time it takes for seed germination varies widely. Some seeds germinate within three days while others may require two to three weeks before the seedlings emerge. Probably the all-time record for seed germination time at the Master Naturalist Nursery was set by pawpaw seeds, which sprouted 3-4 months after planting.

## G. Pest Control

The use of chemical pesticides is avoided to ensure that the native plants we grow are not damaging to the native insects and animals that folks are trying to encourage with their native plantings. However, there are several steps that we take to manage pests without chemical pesticides:

- Care is taken to avoid overwatering of seeded pots, since this can lead to seedling death from damping-off fungi and problems with fungal gnats.
- 2. Yellow sticky sheets are hung above the potted plants to attract and immobilize insect pests such as gnats and aphids which are attracted to the color yellow. (Image 5)
- 3. As mentioned above, all recycled pots are cleaned with bleach to kill root-infecting fungi that might infect the plants.
- 4. Mouse traps are set for those pesky mice that find young seedlings delectable and always manage somehow to get into the greenhouse.
- 5. BT (*Bacillus thuringiensis*) is used judiciously to kill unwanted caterpillars. The two lobelias that we grow (cardinal flower and blue lobelia) can be decimated by hordes of small caterpillars, but treatment with BT takes care of the problem. Other desired caterpillars (monarch, spicebush, pipevine, etc.) in large numbers can decimate plant seedlings, and these are physically removed from the seedlings and moved to established plants, or they are conveyed to butterfly nannies who raise them for the local botanical garden.



### H. Trees & Shrubs

Most of our trees and shrubs are purchased as bare root seedlings from the Missouri Department of Conservation (<u>mdc.mo.gov/trees-plants/tree-seedlings/order-seedlings</u>). For large tree seedlings, especially those that have tap roots, the seedlings are planted in tall tree pots (10 x 18 inch, round) using the soil mix that is prepared for us (see above) and fertilized with Osmocote Plus.

#### I. Shaded Container Garden

After the danger of frost has passed, we transplant seedlings into gallon pots using the soil mix prepared for us and fertilize the seedlings with Osmocote Plus. The plants are then moved to a shaded container yard (30% shade cloth). Growing the plants in partial shade reduces the need for watering, especially during the hot summer months. Plants that like more shade, such as violets and wild ginger, are grown next to buildings to avoid afternoon and evening sun. (Image 6)



Photo by Rose Gergerich

### Conclusion

It is only through the ongoing efforts of enthusiastic Master Naturalist volunteers who work throughout the year that we are able to accomplish all of the tasks associated with growing thousands of native plants in the nursery. The materials and methods described here are only a fraction of the ones that work well for the production of native plants, but these are the ones that have worked well for our project.

## ABOUT THE AUTHOR:

Arkansas Master

Naturalists

Rose Gergerich grew up on a dairy farm in northern Wisconsin where she learned to grow and appreciate plants from her parents and grandparents. She is retired from the University of Arkansas in Fayetteville after a 30-year career as a professor in the Department of Plant Pathology with a specialization in virology. She lives out in the boondocks in southern Washington County, Arkansas with her husband. She is an active member of the Northwest Arkansas Master Naturalists and helped to form the Native Plant Team in that chapter. She enjoys working with fellow Master Naturalists in the greenhouse and nursery on her piece (peace) of land in the Arkansas Ozarks.





Registration for 2022 Master Naturalist training is now OPEN SEATING IS LIMITED REGISTER TODAY!

# Go Native

## BY CARTER CARRIGAN

Talk to your land Talk to your seeds Talk to your plants Discuss all their needs.

Touch them, sing to them Praise them, promise them Handle them with care Protect them with a prayer.

Show them you are gentle Show them you are thoughtful Open up and nature opens to you Nature lets you in -May its force be with you.

# FOR MORE THAN POLLINATORS

Optimizing the Use of Native Plants in Urban and Suburban Landscapes

## Part II : Native Plants for Improving Air Quality

By Eric Fuselier, Project Scientist, Olsson

One of the many ways plants help to sustain life on this planet is by providing the oxygen which we need in order to breathe. As a by-product of photosynthesis, molecular oxygen (O2) is essential to the survival of most living organisms on Earth. But oxygen isn't the only molecule found in the atmosphere. Our modern industrial society releases pollutants into the atmosphere on a scale never before seen in human history. Exposure to these airborne pollutants is a risk factor for such adverse health effects as cardiovascular disease, lung disease, and lung cancer, among others. Suffice it to say that the quality of the air we breathe is just as important as the quality of the water we drink. In this article, we'll focus on how we can use native plants to improve air quality by controlling and transforming some of these contaminants.

## **How it Works**

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There are two main phytotechnological mechanisms that we can make use of when trying to improve air quality:

• **Phytoaccumulation** refers to a process by which aerosol particles are deposited onto the solid surfaces of leaves, where they then accumulate, thereby decreasing their concentration in the air. Airborne particles can also carry a wide range of other contaminants, such as polycyclic aromatic hydrocarbons (PAHs), persistent organic pollutants (POPs), and heavy metals, which may

attached to these particles. Once deposited, some of these particles can be absorbed into the plant, though most are retained on the surface of the leaves. It is important to note that this detention of particles is only temporary, as the particles will later either become re-suspended into the atmosphere or deposited into

the soil after being washed off by rain or from leaf abscission. Therefore, additional phytotechnology should be used below these plants to prevent these particles from contaminating stormwater runoff (<u>see Part I in this series of</u> <u>articles</u>). Phytometabolism is a process where organic contaminants are first broken down by plants through phytodegradation (see Part I in this series of articles) and then incorporated into the plant's biomass. In order for plants to grow, they need nutrients such as nitrogen (N), phosphorus (P), and potassium (K), which they use to carry out photosynthesis and to build biomass. These nutrients are inorganic elements, so plants first have to break down organic molecules (or in this case, organic contaminants). The metabolites that are left over from this process are then "phytometabolized" and incorporated into the plant's biomass.

Specific air contaminants are discussed below, along with native plant species that can be used to remediate or control these contaminants using the two phytotechnological mechanisms discussed above.

## **Particulate Matter**

Particulate matter refers to the mixture of solid particles and liquid droplets found suspended in the air. Common examples include dust, soot, and smoke. These particles can range in size, with some large enough or dark enough to be visible to the naked eye, and others only able to be detected using an electron microscope.



Particulate matter is generally divided into one of two categories, based on their size:

- PM10 includes inhalable particles with a diameter of 10 microns or smaller, and
- PM2.5 are much finer inhalable particles with a diameter that is equal to or smaller than 2.5 microns.

Common sources of particulate matter in the air we breathe include industrial activities, automobile emissions, construction sites, unpaved roads, smokestacks, and fires. Because of their small size, particulates can become lodged deeply into lung tissue. Smaller particles (PM2.5) pose an even greater danger, not only due to their ability to become lodged even more deeply into lung tissue than larger particles, but also due to their ability to travel greater distances in the air. Once lodged into the lung tissue, the particulates can cause irritation of the respiratory airways and reduce lung function, and they have been linked to cardiac diseases and some cancers. Particulate matter can also carry heavy metals (including lead, a known neurotoxin) and other contaminants that become attached to the particulates.

Phytoaccumulation can offer an effective way to remove these particulates from the air before they enter our lungs or the lungs of other living creatures. Conifers have been shown to be more effective at collecting the ultrafine particles (PM2.5) than broad-leaved species. That's not to say that broad-leaved species are completely ineffective in remediating particulates, though. Research has also shown that broad-leaved species with waxy leaf

TABLE 1: NATIVE TREE AND SHRUB SPECIES FOR REMOVAL OF PARTICULATE MATTER								
Common Name	Scientific Name	Sunlight Requirements	Soil Moisture Requirements					
Common Persimmon	Diospyros virginiana	Full sun to part shade	Dry to medium					
Eastern Red Cedar	Juniperus virginiana	Full sun	Dry to medium					
Ashe Juniper	Juniperus ashei	Full sun	Medium					
Common Ninebark	Physocarpus opulifolius	Full sun to part shade	Dry to medium					
Black cherry	Prunus serotina	Full sun to part shade	Medium					
Shortleaf Pine	Pinus echinata	Full sun	Dry to medium					
Shingle Oak	Quercus imbricaria	Full sun	Medium					
Bur Oak	Quercus macrocarpa	Full sun	Dry to medium					
Blackjack Oak	Quercus marilandica	Full sun	Dry to medium					
Water Oak	Quercus nigra	Full sun	Medium to wet					
Willow Oak	Quercus phellos	Full sun	Medium to wet					
Northern Red Oak	Quercus rubra	Full sun	Dry to medium					
Shumard Oak	Quercus shumardii	Full sun	Dry to medium					
Post Oak	Quercus stellata	Full sun	Dry to medium					
Black Oak	Quercus velutina	Full sun	Dry to medium					
Winged Sumac	Rhus copallinum	Full sun to part shade	Dry to medium					
Fragrant Sumac	Rhus aromatic	Full sun to part shade	Dry to medium					
Bald Cypress	Taxodium distichum	Full sun	Medium to wet					
Winged Elm	Ulmus alata	Full sun	Medium					
Rusty Blackhaw	Viburnum rufidulum	Full sun to part shade	Dry to medium					

coatings, leaf hairs, and a greater leaf area index can also be effective at removing particulates from the air. See Table 1 for a list of tree and shrub species native to Arkansas that meet one or more of these criteria.

## Nitrogen Oxide (NOx) Gases

Nitrogen oxides (NOx) are created by the combustion of fossil fuels. Sources of these gases in the atmosphere include power plants and emissions from automobile engines. Over-exposure to nitrogen oxides can cause irritation to the respiratory airways and to the mucosa of the eyes and nose. Those already struggling with existing diseases of the airway (such as chronic obstructive pulmonary disease, or COPD) are especially susceptible to these adverse effects. Nitrogen oxides are also major contributors to acid rain and smog.

Plants take up nitrogen dioxide from the atmosphere and assimilate it into organic nitrogencontaining compounds, though species vary in their capability to do this. *Robinia pseudoacacia* (black locust) has been shown to have high resistance to damage in its tissue by nitrogen dioxide, as well as a high capability of assimilating this containment into its biomass. Because of this, *Robinia pseudoacacia* would make a good candidate for remediating urban air via phytometabolism where NOX emissions are high.

## **Volatile Organic Compounds (VOCs)**

Volatile organic compounds (VOCs) are compounds that have a high vapor pressure and low water solubility. While VOCs are emitted from a variety of sources including paints, adhesives, and cleaning products, as well as from fuels and automobile emissions, about two-thirds of VOC emissions in the atmosphere are generated by the world's vegetation. Once in the atmosphere, VOCs then combine with other elements in the air, such as nitrogen dioxide (NO2) to form ozone (O3). Exposure to many VOCs have also been linked to an increased risk of cancer. At low levels they can irritate the tissue in the eyes, nose, and respiratory airways. VOCs also have powerful neurological effects, and can cause headaches, dizziness, and even memory impairment.

Some species of trees release lower amounts of VOCs than others. When we select these species for use in urban and industrial areas where nitrogen dioxide emissions are high, harmful reactions with

#### TABLE 2: NATIVE TREE SPECIES THAT EMIT LESS VOLATILE ORGANIC COMPOUNDS (VOCs)

Common Name	Scientific Name Sunlight Requirements		Soil Moisture Requirements	
Downy Serviceberry	Amelanchier arborea	Full sun to part shade	Medium	
River Birch	Betula nigra	Full sun to part shade	Medium to wet	
Eastern Red Cedar	Juniperus virginiana	Full sun	Dry to medium	
Basswood	Tilia americana	Full sun to part shade	Medium	
Winged Elm	Ulmus alata	Full sun	Medium	
American Elm	Ulmus americana	Full sun	Medium	
Slippery Elm	Ulmus rubra	Full sun	Medium	

airborne chemicals can be reduced. See Table 2 for a list of trees native to Arkansas which have been shown through research to release lower levels of VOCs than other species of trees commonly used in urban settings.

The last



## **Other Air Pollutants**

Like nitrogen oxides, carbon dioxide (CO2) is produced by fossil fuel combustion. At low levels, adverse health effects from exposure to carbon dioxide is minimal; however, at extremely high levels it can inhibit the ability of the body to take in oxygen. Carbon dioxide is also a strong greenhouse gas that contributes to a rise in global temperatures and the resulting changes to climate. Urban trees sequester carbon from the atmosphere, where in the United States they're estimated to store approximately 700 million tons of carbon. Carbon dioxide is also a contributor to acid rain when it becomes trapped within rain droplets as they fall through the atmosphere. Once inside the rain droplets, the carbon dioxide reacts with the water (H2O) to create carbonic acid.

Sulfur oxides (SOX) are also released into the atmosphere from the combustion of fossil fuels where they contribute to acid rain and smog. Adverse health effects from exposure to sulfur oxides are similar to those of nitrogen oxides, causing inflammation of the respiratory airways and impaired lung functioning. Sulfur dioxide and nitrogen dioxide emitted from automobiles, power plants, and industrial activities create complex chemical reactions that result in most of the forms of particulate matter in the atmosphere.

Ground-level ozone is created by reactions between VOCs and nitrogen oxides as they are exposed to sunlight. Inhaling ozone can create a variety of health problems similar to that of nitrogen oxides and sulfur oxides, mostly affecting the respiratory system. It can also exacerbate diseases of the airway such as asthma and bronchitis, and can impair lung function. Common symptoms of ozone overexposure include sore throat, coughing, shortness of breath, and pain or burning in the chest. Studies have revealed that planting urban trees, especially species that emit lower levels of VOCs, can be a viable strategy to help reduce urban ozone levels.

Urban trees also provide additional benefits such as reducing air temperatures (and thus transpiration rates) by providing shade. This helps to reduce energy usage, and consequently reduces power plant emissions. A reduction in emissions from power plants can also help further reduce urban ozone levels. A study conducted by Nowak et al. (2006) concluded that in the United States, the positive physical effects provided by urban trees were more beneficial than the chemical release of VOCs in terms of affecting levels of ozone concentration.



Juniperus virginiana (needles only) Photo by Eric Fuselier

## **Design Techniques**

A study conducted by Yang et al. (2008) illustrates the impact that different types of vegetation have on the reduction of the air contaminants discussed above, with larger plants and those with a greater leaf surface being better overall at reducing these contaminants (see Table 3).

Table 3: Annual Removal Rate of Air Pollution perCanopy Cover by Different Vegetation Types inChicago between August 2006 and July 2007.

Vegetation Type	NO <sub>2</sub> (g/m²/yr)	SO <sub>2</sub> (g/m²/yr)	PM10 (g/m²/yr)	O <sub>3</sub> (g/m²/yr)	Total (g/m²/yr)
Short grass	2.33	0.65	1.12	4.49	8.59
Tall herbaceous plants	2.94	0.83	1.52	5.81	11.1
Deciduous trees	3.57	1.01	2.16	7.17	13.91

Note: The non-vegetated surfaces were excluded from the calculation. Source: Yang et al., 2008

The arrangement in which the vegetation is planted is also important. Since air pollutants are dispersed primarily by wind, the effects of emissions are not necessarily confined to the immediate vicinity of their source. Although the concentration of pollutants does decrease with distance from their source, these pollutants can still cover a large area. One study (Zhua et al., 2002) found that particulates originating from roadways often travel up to 240 feet from their source.

Vegetation buffers can be planted adjacent to locations where land uses produce emissions high in particulates and nitrogen dioxides, including roadways with high traffic volumes, industrial districts, oil refineries, and coalburning power plants. When we include species that will maximize the collection of particulate matter, or lower the amount of VOCs emitted where ozone is a concern, these buffers can be effective for distances up to 600 feet from the sources of these contaminants. In addition to roadway buffers, urban trees can also reduce the exchange of air between the atmosphere and the street environment, forming a green ceiling over the street environment. In the rural and less populated parts of Arkansas, these canopies can limit the ability of contaminated air from higher up from mixing with the cleaner air at ground-level, leading to below-canopy air quality improvements. However, the reverse is true in more densely urbanized areas where tall buildings can create "street canyons", and these green ceilings can trap pollutants under their canopies, thereby reducing low-level air quality if planted too close together. Therefore, thought should be given to the spacing of trees in densely urbanized areas in order to allow sufficient ventilation so that contaminants, such as ground-level ozone, aren't adversely impacting the air quality where the majority of human activity is occurring.



## Conclusion

Improving air quality is yet another application of phytoremediation in which native plants can help improve environment quality. The greatest improvement in air quality from urban trees and other vegetation has been reported for particulate matter, ozone, sulfur dioxide, and nitrogen dioxide, with a greater percentage of tree coverage found to be correlated with an improvement in air quality. However, it should be noted that while urban trees remove tons of air pollutants annually, the overall improvement in air quality in cities has been minimal. Nevertheless, the most beneficial contribution that urban trees make to air quality is their contribution to passive temperature cooling and the sequestration of atmospheric carbon. With a simultaneous reduction in our use of fossil fuels, native plants can still play an important role in the regenerative efforts to improve and restore air quality.



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Taxodium distichum, bald cypress 'Mogwai' Photo by Jasmine Dorn 2016

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# About the Author



Eric Fuselier is a Project Scientist at Olsson where he works with engineers to minimize the environmental impact from the infrastructure projects they design. Eric is currently serving as the President of Wild Ones – Ozark Chapter in Northwest Arkansas.

## GROUING TOGETHER A WILD ONES - OZARK CHAPTER QUARTERLY COLUMN

Would it surprise anyone if I said I love plants? That I love learning about them as much as I love admiring their beauty? And that I value the good they bring into my life and into the lives of our larger ecological communities?

This love and appreciation of nature isn't new to me. Having the ability to cultivate my own private natural landscape, is.

I was born and raised in one of the most populated cities in the world. I grew up navigating steel and concrete mazes of skyscrapers and subways. In a city where metal and glass buildings frame small zones of blue sky. Where hot steam and thunderous rumbles rise from potholes on black tar roads and subway grates like dragons snoring underfoot.

Green spaces were very few, but very treasured to me.

I remember the oak saplings in front of the NYC apartment building I grew up in. The chained-off, neatly mowed green spaces with their "Keep Off Grass" signs. Stopping to smell the flowers in front of the many tiny brownstone gardens on the way to school.

I remember my joy whenever we visited my grand-aunt Mary's farm in Rome, NY. Picking watercress, running barefoot in the grass, chasing butterflies, bleating with goats...and giggling at the clouds as they Etch-A-Sketched themselves across that big blue sky. Those few visits are among my happiest childhood memories.

And then we'd go back home to our óth floor apartment, located in the forest of 6-storey brick buildings in a town ironically called "Woodside". Back to the crowds, the noise, the smell, the dirt, the steel and concrete, the black and gray.

Back to being an ant in the anthill that is New York City.

These days, my lived environment is worlds different. I am grateful to be land steward to my very own piece of the Ozarks with my wonderful husband, Joe. I love learning about the native plants that live here with us, and I love sharing my love of them with you even more.

I dedicate this column to us all, and especially to our childlike wonder at the natural world around us.

Whether you grew up with pristine landscapes or admiring the determined solitary weeds that burst through concrete sidewalks, it's my hope that this month's featured native plant - *Passiflora incarnata* - will instill you with as much wonder as it does me.



Grow in Health,

Jasmine "Chef Jazzy D" Dorn Wild Ones - Ozark Chapter Member-at-Large and Journal Designer



I stop in my tracks every time I see this flower. I can't help but smile every time I pause to appreciate her resplendent intricacy.

Passiflora incarnata bloomed weeks earlier than usual this year. Her early blooms coincided with my growing need to decide the focus of this season's article.

Passiflora incarnata - with her ability to stop me in my tracks without fail - volunteered.

The decision to write about *Passiflora* brought up all sorts of happy memories of this plant. One favorite being one midsummer late afternoon shortly after moving to Lowell.





I was standing in our glorious mess of a field, looking around in amazement. The unkempt field was overrun with all sorts of unfamiliar plants, many of which are now familiar. Purple-white alien flowers contrasted against a deep green canvas of trident-shaped foliage. Green dragon-egg fruits dangled on her vines or sat on the ground, waiting to sound a startling "pop" if stepped upon.

The neighbor's horses grazed in my periphery as the sun was setting behind them. All sorts of winged things buzzed from one colorful flower to the next.

Those late summer days marked major transitions in my life. From single to married, renter to homeowner. And from casual gardener to permaculturalist, herbalist, Master Naturalist, and native plant columnist.

In hindsight, I can now see *Passiflora* in my hand the very moment I realized this land would forever change me.

*Passiflora* is more than beautiful; she's a potent medicine. She is a relaxant herb used to calm the nerves. She can ease stress, anxiety, tension, inflammation, and insomnia, and more. Her leaves, vines, tendrils, seeds, and green dragon egg fruits are all edible, too.

This season, I'm thrilled to introduce you to *Passiflora incarnata* ... or to offer you a broader understanding if you are already familiar with her abundance.

We'll start with a bit of the botany before moving into how she supports our local ecosystem. From there, into the garden we go to talk about growing *Passiflora* from seed to harvest.

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## A Bit of Botany

Passiflora incarnata is a fast-growing perennial vine native to the southeast United States. It is one of two cold-hardy varieties of *Passiflora* whose vines die back in winter and return in spring.

## what's in a name?

Passiflora is from two Latin words: **passiō** – passion, and **flora** – flower. Put the two together and you have it – passionflower. Though it doesn't imply any of the *steamy* kind of passion ... but I get ahead of myself.

Incarnata – means "flesh-colored," which some say refers to the color of the flower. Because I never met a purple person, this Latin nerd prefers the alternate Latin definition for *incarnata*: "incarnate/embodied."

"Passionflower incarnate" sounds so much weightier than "flesh-colored passionflower" anyway. Wouldn't you agree?

But wait, what? What's with the "passion" part of it? Is passionflower an aphrodisiac?

No, not technically, though *Passiflora* does calm, destress, and ease tension, which can help.

Early Christians named this plant *Passiflora incarnata* because its floral characteristics are said to mirror the numeric symbolism of the passion/crucifixion of Jesus Christ.

Common names include passionflower, wild passionflower, and maypop.



## habitat

Passiflora grows wild in the usual "weed" places: open, disturbed areas, sandy fields, roadsides. She prefers dry feet, so you can also find Passiflora at the top of hills, berms, or edges of built-up roads.



#### Passiflora incarnata is native to the SE US https://plants.usda.gov/home/plantProfile?symbol=PAIN6

## featured plant parts



#### stems

The long green stems of passionflower vines rarely branch, except for injury. A gripping tendril grows from the base of each leaf's petiole.

## leaves

The leaves alternate, having 3 – sometimes 5 – lobes on stalks up to 3" long.

## flowers

These unusual flowers begin blooming in mid July and continue until first frost. They are large, intricate flowers – about 2" across – with prominent styles and stamens. They have many dark purple corona filaments capped by a 3– pronged stigma and 5 anthers.

## fruits

These dragon egg fruits are 1-3" in length with a diameter of 2-1/2 to 3". They're green when immature, turning a crinkled yellow or brown when ripe. The fruits must ripen on the vine.

See the reference section for links to websites with more botanical details.

## ecology

*Passiflora* supports many native and migratory fauna. Here, we take a quick look at one that floats like a butterfly and another that buzzes like a bee.

## gulf fritillary (Agraulis vanillae)

The gulf fritillary is a butterfly that migrates as far north as Pennsylvania before overwintering in the south.

> Passiflora incarnata, and other Passiflora varieties are the host plant of the gulf fritillary.

If we want more of these gorgeous butterflies, we should plant more of these gorgeous flowers.

Gulf fritillary eggs on *Passiflora incarnata* https://entnemdept.ufl.edu/creatures/bfly/gulf\_fritillary.htm

## carpenter bee (Xylocopa sp.)

Carpenter bees are an important pollinator. They pollinate a variety of native plants and native plant agricultural crops.

*Passiflora incarnata* and carpenter bees co-evolved in symbiosis, meaning that plant and bee evolved to support each other's needs.

The carpenter bee perfectly matches the shape and size of *Passiflora*'s morphology. Pollen is rubbed and deposited on the bee's back as it searches for nectar in the middle of the flower. Check out this video of a carpenter bee pollinating *Passiflora*, from Indigenous Landscapes: <u>https://www.facebook.com/watch/?v=2208395636149253</u>.

I wish I were a carpenter bee so I could crawl through the jungle gym of *Passiflora* stigmas and stamens and pistils (oh my!) as I get a sweet snack in exchange for playing pollen courier.



Photo by Jasmine Dorn

## growing Passiflora

I didn't have to plant *Passiflora* in my garden.

Every year, she flings herself widely, strewing her alien flowers and dragon eggs all over my field (yay!). Her fast-growing tendrils reach to grab and climb thick grasses and trees.

Which brings me to my first point about growing *Passiflora* ... site selection.

## site selection

*Passiflora* is a rhizomatous vine. Her roots run horizontally through the soil and can shoot up new plants 15–20 feet away from the main vine. This sprawling behavior is ideal for polyculture farming ... where we grow different plant species and fill in bare patches with weedy edibles ... but less than ideal for the home gardener.

Here's some ideas on where to plant *Passiflora* based on what you want to achieve.

When you hear "vining deciduous plants," think "shade."

In your home garden, trellis *Passiflora* in full sun and enjoy the shade beneath. Because *Passiflora* leafs out in early summer, giving other plants a chance to grow, she will not shade out other desirable spring plants.



Example of growing a *Passiflora* variety on a trellis (*P. ligularis*, native to Central America). *Passiflora incarnata* can be grown the same way. Photo Getty Images In a crop garden, give *Passiflora* the same support you'd give a climbing pole bean. Strategically place the support to provide shade to more tender crops.

Worried about rising temperatures?

Joe and I are. We have plans to "insulate" the south side of our house with *Passiflora* vines. This will help keep the house cool in summer while providing us with food and medicine. (Because failing to plan is planning to fail!)

We love letting her run wild in our field. The butterflies and bees love it even more than we do.

## growth needs

*Passiflora* flowers and fruits will be most abundant when grown in full sun. The plant will grow in part sun, but blooms and fruits will be minimal.

And who doesn't want lots and lots of alien flowers and dragon eggs?

*Passiflora* is drought-tolerant. She tolerates wet and acidic soil, but prefers well-draining soil. She dislikes wet feet.



Passiflora incarnata Photo by Jasmine Dorn



"*Passiflora* can cover the side of a 25' tall house in a year"

Solomon Gamboa, <u>Native Plant</u> <u>Agriculture</u> pp28-31

## planting

You can grow *Passiflora* from seed or cuttings. Because seeds can take up to a year to germinate, you may consider buying a plant or getting a cutting if you're impatient like me.

**Seeds**: *Passiflora* seeds are finicky germinators. You should scarify the cleaned seeds with sandpaper and stratify them for 2-3 months before germinating. Sowing in a warm greenhouse, using bottom heat, or sowing seeds directly in late spring will help germination.



Passiflora incarnata seeds Photo Getty Images

**Cuttings**: You can take a cutting from a mature vine in early summer. It will take up to three months to root.

The plant will begin fruiting 1-2 years after planting, and fruits take 2-3 months to ripen.



harvesting

Ripe *Passiflora incarnata* fruit Photo by Trish Redus, NWA Master Naturalists

Fruits must ripen on the vine. Fruit is ripe when the green dragon egg turns yellow and shrivels. This is also the time to collect seeds.

The ideal harvest time is after the morning dew has evaporated but before the sun warms the plant.

Harvest aboveground parts when the plant is flowering or in fruit. Cut the vine at the ground level, leaving the root system intact for the future. Harvest the more mature plants, leaving the younger ones to seed the area.

Remove fruit from the vine before drying the leaves and stems.



## passionflower incarnate

I lived almost 50 years without ever seeing a flower as alien-looking as *Passiflora*.

Looking back at that first day I marveled at *Passiflora* because of her impossible intricacy, I knew nothing of her, except beauty. Then I learned about the many ways she can be used as food and medicine. And now I understand that she is a crucial food source for native pollinators.

It is time to expand her presence on our land.

It is my hope that this article inspires you to include this exotic-looking plant in next year's garden plan.

Passiflora incarnata Photo Getty Images

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## # About the Author

Jasmine "Chef Jazzy D" Dorn is all about human and environmental health. After achieving significant progress on her own health journey through adopting a plant-based dietary lifestyle, and intensive studies in functional nutrition, she is now dedicated to helping others improve their health outcomes through nutrition and lifestyle modifications. An adventurous plantbased chef, gardener, and herbalist, she is energized by learning and sharing knowledge.

Find her at https://ChefJazzyD.com or https://facebook.com/ChefJazzyD





## Wild Ones Statement on the Use of Nativars

In the fall 2012 the National Board of Directors established a committee to develop a position for Wild Ones on the use of nativars. The resultant statement was adopted in 2013. This position statement was revised and updated by the Wild Ones Executive Committee in 2021, with input from Honorary Directors, and approval by the Board.

#### Nativars: Where do they fit in?

Wild Ones encourages the use of native plants to promote biodiversity and ecosystem health in gardens and landscapes. Do nativars, which are cultivars of native plants, have the same ecological value as straight-species plants? What is the difference between a nativar and a straight-species native?

A native plant is one belonging to a species that was present in a region, habitat, or ecosystem prior to European settlement. These plants have held an ecological niche in our landscape for centuries and reproduce, primarily, through open pollination. These plants are sometimes referred to as straight-species or wild-type natives.

A cultivar is any plant that is developed or selected for its desirable characteristics and maintained by propagation. Cultivars are reproduced through cloning methods such as grafting, cutting, root divisions, layering, tissue culture, etc.

A nativar is a cultivar that came from a straight-species NATIVE plant. Nativars are propagated for many reasons: flower colors or forms, compact size, insect or disease resistance, tolerance of certain environmental conditions, and more. Nativars can be a native plant that is a genetic variant found in nature that is then selected and propagated to retain a particular or unique aspect. They can also be obtained through the process of artificial selection in which plant breeders grow plants with desirable characteristics and eliminate those with less desirable characteristics.

## How do you know if you have a nativar or a straight species plant?

Nativars can be identified by checking for a variety name, in addition to the species name, which is given on a tag or catalog. For example, Brandywine red maple, Acer rubrum 'Brandywine', is a cultivar, whereas the native, from which it is derived, would simply be labeled as Red Maple, Acer rubrum.

The desire for a novel or improved plant product, particularly one that is easy to replicate, grow, and market is understandable, yet these plants may not provide the same ecological return that comes from a straight-species native. One way in which these plants



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are more limited is in their lack of genetic diversity; another limitation may be in their delivery of ecosystem services.

#### **Genetic Biodiversity**

Native plants grown from seed carry the wealth of their native gene pool. They perpetuate this diversity as they grow and participate in successful pollination. This genetic diversity helps whole species to survive and adapt when confronted by environmental stress. Each successive generation of plants reproducing in this manner continues to maintain a rich heritage.

Most cultivars, including nativars, are propagated by cloning, so that each plant has the same genetic makeup as the parent plant, and so on. A cloned cultivar has a set genetic package. Sometimes these clones go on to participate in the natural reproductive cycle by cross-pollinating with other true natives, sometimes they do not.

If only a small percentage of the plants being planted in gardens and landscapes are nativars there would be no concern. However, the mass-production, and increased use of nativars over straight species native plants is a concern for ecologists, environmentally friendly gardeners, horticulturists, and native plant professionals. Straight species open-pollinated plants, and the genetic diversity they contain, are the foundation of both nature and horticulture. They are the building blocks of future horticultural selections as well as the key to ecological preservation.

#### **Ecosystem Service**

Do nativars serve the same ecological function in the landscape with the same degree of effectiveness as

"When we try to pick out anything by itself, we find it hitched to everything else in the Universe." -John Muir

*to pick out elf, we find everything* Her research recognized that 'native wild vs. native cultivar' studies need to be conducted to better understand how different cultivar species may or may not be an equal replacement for their native type.

> In addition to the research cited above, native plants are an essential component of complex functioning food webs. For

example, in the study by D.L Narango, D.W. Tallamy, and P.P. Marra, Nonnative Plants Reduce Population Growth of an Insectivorous Bird, 2018, found that chickadees foraged 86% of the time on native plants. Chickadees achieved successful replication rates ONLY in yards with less than 30% introduced woody plants. This study, and others, underlines the importance of landscapes with at least 70% native plants for optimal ecological stability.

straight-species plants? Research on this topic is

ongoing, and there is much yet to be discovered about

the differences between specific nativars and straight species in regards to their particular usefulness to pollinators, as well as their ability to provide other

ecological services, such as food sources for insects.

dissertation, From Nursery to Nature: Evaluating Native

Herbaceous Flowering Plants Versus Native Cultivars for

Pollinator Habitat Restoration, 2016, found that when

particular nativars varied significantly in color, size, or

shape from their wild-type, they provided less ecological

Annie White, at the University of Vermont, in her

#### Request natives when you buy

As advised by Dr. Douglas Tallamy, Wild Ones Honorary Director, University of Delaware entomologist and author of Bringing Nature Home: How You Can Sustain Wildlife with Native Plants, "It is a bad idea to load the landscape with cultivars that have no genetic

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variability... I think the safest policy right now is to encourage the use of straight species. Ask for them at your local nursery; encourage nurserymen to start stocking more straight species. The nursery industry has not embraced the message that native plants are more about ecosystem function than about looks. We have to convince them that there is a market for plants with high function."

Difficulties may occur when native plants are not readily available or when they are labeled as natives and they are not. Seek out native plant nurseries in your ecoregion and ask for straight-species natives from your landscape sources. Planting wild-type natives, not nativars, is particularly important when preparing a natural restoration or habitat.



Rudbeckia hirta nativar 'Cherry Brandy,' Photo credit: Cliff Orstead



Native black-eyed Susan, Rudbeckia hirta, Photo credit: Lisa Olsen

While a nativar will most likely be a better ecological fit for North American gardens than an exotic species from Asia or Europe, it remains to be seen to what extent it can fill the ecological niche and provide the genetic richness of a native plant. It is the mission of the Wild Ones organization to promote environmentally sound landscaping practices to preserve biodiversity, through the preservation, restoration and establishment of native plant communities.

## Short-list of references for revised nativar statement:

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## Seed Collecting for Monarchs!



The Pollinator Partnership has joined forces with the Arkansas Monarch Conservation Partnership and Arkansas Native Seed Program, as well as several other organizations and agencies to expand Project Wingspan into Arkansas, and we need your help!

We are looking for enthusiastic seed collecting volunteers in three regions of Arkansas (see map) to help identify and collect seed from milkweed and other valuable native nectar plants.

As a seed collecting volunteer you will be provided with training and be making valuable contributions to support migrating monarchs and other imperiled pollinators.

#### No seed collecting experience is required but basic plant knowledge is preferred.

Project Wingspan is also looking for landowners and public land managers with robust native plant populations who are interested in supporting local habitat restoration efforts by providing native seed collection sites.

## To learn more about this project visit: https://www.pollinator.org/wingspan

Photo: Heath Hamilton

To sign-up as a *volunteer seed collector* please fill out the online form here: https://tinyurl.com/Wingspan-volunteer To see our list of target plants and sign-up as a *seed collection location* please fill out the online form here: <u>https://tinyurl.com/PWseedsite</u>

