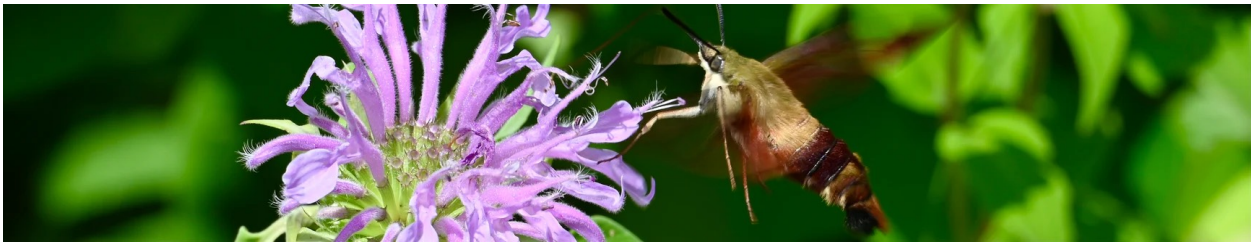


August 20, 2022

On Cultivars and Wildtype Natives

Native, introduced, invasive, cultivar… *nativar*? These words are used often in native plant contexts, but what do they all mean?

There is an enormous amount of confusion around these terms. We're going to go through them here briefly: how NPU understands them, uses them, what we recommend, and why. The explanation behind the observations can be complicated, so we will only touch lightly on them. First, the terms.

Native - a species that occurs(ed) naturally in a region without being introduced by humans. For North America, this means a species that existed in a region prior to Eurasian settlement.

Introduced, or **non-native** - a species that was brought to a region by humans either by accident or intentionally. This includes agricultural species- grains, fruits, vegetables, and herbs. This concept applies to insects and other animals, as well as fungi, microbes, and viruses.

Invasive - an ***introduced*** plant species that spreads prolifically and chokes out other plants, severely reducing diversity in an area.* This concept applies to insects and other animals, as well as fungi, microbes, and viruses.

*This is NOT the same as a native plant that spreads prolifically in garden beds. Native plants often create stands of one species where space allows and, while this is normal to a certain extent, it's made more dramatic by human disturbance of the soil. Some plants thrive in disturbed areas, others are slow to establish, and still others will die out. It depends on their structure, life cycle, and role in the ecosystem they have evolved to fill. Regardless, a large stand of one native species isn't a problem, and resolves itself over time as the area undergoes succession and prolific colonizer species give way to longer lived species.

Cultivar/nativar - a "cultivated variety" of a species that has undergone alteration by humans in order to exaggerate some desired characteristic, such as flower size/color, leaf color, lack of seeds/thorns, etc. This is usually done through selective breeding (including hybridization) but cultivars are occasionally made via GMO methods. Cultivars are usually propagated by cloning one individual that showed the desired traits, thus insuring a standardized product. **Cultivar** refers to any altered species, and is regulated to the point that a variety of cultivar can be trademarked. **Nativar** is an

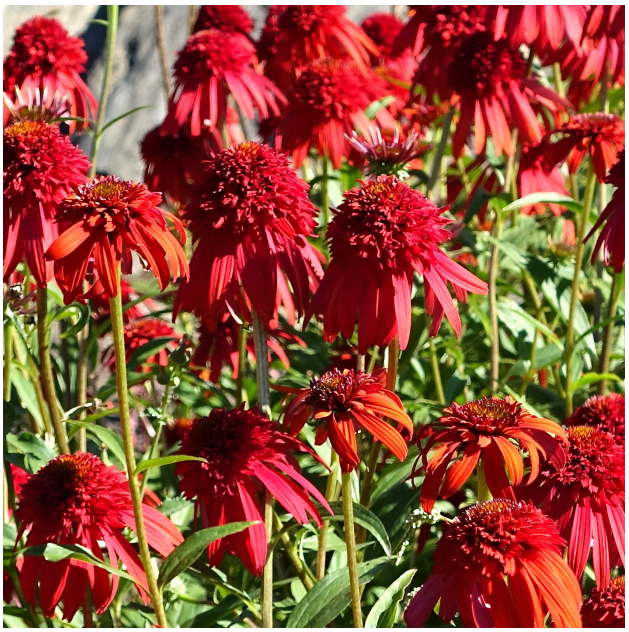
adaptation of the word turned marketing device- it's a cultivar derived from a native species. As an entirely unregulated term, a nativar may be derived from species native to the continent but not the region, or may be a native species hybridized with one (or more) non-native species.

Wildtype - an individual of any species that is genetically indistinguishable from wild individuals in that species' native range. This includes species variation and mutations that occur in wild populations.

Ecotype - a population of a species from a specific area. Generally used to refer to a population that has adaptations to local conditions that may be absent from other populations of the same species. Where these differences are obvious, they are often written as *var. (name)* following the scientific name. Ex: *Rudbeckia fulgida var. deamii* is an ecotype of black-eyed susan (*Rudbeckia fulgida*) originating in southern Illinois, Indiana, and Ohio. However, this can also be as simple as a population of plants growing in a valley that is more tolerant of water than a population of the same species growing on a ridge.

Why should you insist on wildtype native plants?

Because they are, as a rule, both hardier and more valuable to wildlife than any other option. We are losing species, genetic diversity, and ecosystem resilience and functionality at an alarming and unprecedented pace. Ecosystem restoration begins with soil regeneration - which is inseparable from reintroducing native vegetation. This leads to improvements in water retention, rebounding insect and animal life, and carbon sequestration - which eventually leads to reducing global temperatures and cleansing fresh and salt water sources.



The Echinacea cultivar "Hot Papaya" showing the common 'double flower' mutation. This produces petals where the reproductive organs (stamens and carpels) would normally be. Extra petals on the flower head means less seed, pollen, and nectar can be produced. Petal density can exclude large pollinators entirely. Specific parent species unidentified.

Does that mean nativars, *even those with purely native origins*, are less valuable to wildlife?

In the vast majority of cases, **YES**. Unfortunately, so far, there is a severe lack of scientific study about the effects of cultivar/nativars on wildlife. The reasons include but aren't limited to the term itself being unregulated, new varieties constantly being created and falling in and out of fashion, and lack of funding. What few studies there are

indicate that cultivars often make less nectar, pollen, and seeds. Simply put, they spend less energy on reproduction and more energy on blooms. Flowers bred for a densely petaled bloom often exclude pollinators from what nectar and pollen is produced. In our own garden, even what appeared to be only a change in the color of bee balm petals caused a nativar to be essentially unused by pollinators while the wildtype nearby was literally buzzing. Cultivars often change foliage color as well. Ecologist Doug Tallamy found that color changes alter the structure and chemical composition of leaves, which makes cultivars less attractive or less nutritious to native insects that would otherwise host (lay eggs) on them. This has since been supported by additional studies as well, including HERE by Baisden, et al, and HERE by Wilde, et al.

Wildtype common ninebark. Reduced usefulness of dark-leaved cultivars by host insects is a risk. Photo by Eric Hunt.

Physocarpus opulifolius *"Diabolo", a dark-leaved cultivar of common ninebark. This and similar cultivars are oft used in landscaping. Photo by David J. Stang.*

Of thousands of nativars, there are a scant handful that may produce more nectar than their wild counterparts. Again, due to the lack of standardization/regulation and study, these traits may not be present in every individual and may change in the future as the varieties continue to be developed. Other varieties, often bred or cloned from a single wild individual, may be more resistant to diseases or more tolerant of extreme conditions. While these varieties must necessarily lack genetic diversity, it is possible they may not have reduced wildlife benefit at all. But for customers concerned with supporting wildlife, planting nativars is like playing Russian roulette with five bullets.

NPU's Stance on cultivars derived entirely or in part from non-native species:

We do not ourselves sell, nor do we support the sale of, non-native species as ornamentals, "sterile" cultivars included. Some states list "sterile" cultivars as exceptions to their invasive species bans, so we cannot stress this enough. Unfortunately, anyone that has worked to remove invasive species has seen several times over that varieties billed as "sterile" are rarely 100% infertile. Bradford pear, purple loosestrife, butterfly bush, and Miscanthus grass (Chinese silvergrass/

maidengrass) are all prime examples of “sterile” cultivars that in practice turned out to be “self-sterile”, and immediately crossed with other species and varieties when planted, to disastrous effect. These articles (linked above) give a good run-down of the complex issues surrounding reduced fertility in cultivars.

NPU’s Stance on nativars derived solely from native species:

We advise planting wildtype native species only. In the past, lack of access to wildtype natives has been cited as a reason to settle for nativars. Native Plants Unlimited’s mission is to address that lack, by providing wildtype native plants for retail sale. The primary value of nativars is that they may limit the further introduction and spread of non-native species by replacing them at traditional nurseries and big box stores (which present another set of problems concerning pesticides and growing practices.) The reduction of wildlife value (vs wildtypes) and general inability to know for certain that a variety isn’t hybridized with non-native species are reasons enough to avoid them where wildtype natives are available.

While we don’t favor the use of nativars, those with few aesthetic modifications vs their wild counterparts can still be of value to wildlife. These were often collected decades ago from a single plant, isolated population, or natural hybrid, like “Annabelle” hydrangeas (from *Hydrangea arborescens*), “Jacob Cline” scarlet bee balm (from *Monarda didyma*), or “Major Wheeler” coral honeysuckle vine (Lonicera sempervirens). While they appear to have similar wildlife value vs wildtypes, they may still be susceptible to problems associated with limited genomic variability.

NPU exclusively sells native wildtype plants, of local ecotype when possible.

We support banning the sale and trade of plants that tend to escape from lawns and gardens into untended areas. Unfortunately, previously “well behaved” introduced species can become invasive in different regions, or after a change in local conditions. For instance, we had personally never seen hostas reseed in woodlands until 2017, but we believe this is becoming a problem possibly due to changing growing conditions, and longer growing seasons.

NPU does sell a few species native to surrounding states, particularly those to the south and west. We are anticipating plant communities from those regions spreading here naturally due to climate change, as

some already have.

So what's in it for you?

-A diversity of native plants provide immediate benefits like shade, reduction of runoff/ standing water, and savings of time and money by reducing artificial inputs (like herbicides, pesticides, and fertilizers).

-No need to spend time and money on annuals! Much energy, chemicals, unrecyclable/ single use plastic, and water goes into the production, distribution, and maintenance of annuals, yet they offer essentially no wildlife support and need replaced every year, if not every season! The goal here is to reduce the amount you buy, by planting a diversity of native plants so that there's always something blooming, colorful and intriguing going on in your garden beds. The first time you spot a hummingbird nectaring on your bee balm is MAGIC! We believe most people naturally transition away from annuals, as their native gardens mature and expand.

-Children LOVE learning in the outdoors with insects and wildlife. Providing a wildlife haven and a native food garden can be a gratifying way to engage with the land and with family!

-Last, but not least, there are positive and incalculable mental health benefits. Who would have guessed being surrounded by beauty and life could be so uplifting?