

# Plant Diversity Initiative

## Including Design, Plant Selection and Maintenance Recommendations

September 2018



*"We are only temporary stewards of the land. What we leave to the next generation can be either a gift or a burden."*

An important goal of the Nebraska Statewide Arboretum is to enable the development of botanically diverse landscapes. This goal is based on the general premise that diverse landscapes are both healthier and visually more appealing than many of the "cookie cutter" landscapes that are so common today. Such landscapes typically include a relatively narrow group of plant species and cultivars that are repeated throughout much of the country but which often do not reflect the native flora or the local soil and climatic limitations.

### **Botanical Diversity**

In regard to tree planting one need only look at the problems associated with Dutch elm disease, pine wilt disease or the emerging threat of emerald ash borer to realize the importance of botanical diversity in limiting disease and insect problems. In Nebraska, we still plant large numbers of just a few types of trees including Scotch pine, Colorado spruce, 'Patmore' green ash, and 'Red Sunset' maple among others. Because of a lack of diversity, the tree cover in many communities is under an almost constant threat of significant decline from diseases, insects or weather events.

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Several types of shrubs, herbaceous perennials and grasses also become overused in many landscapes. 'Goldmound' spirea, feather-reed grass, 'Stella d'Oro' daylily and 'Maynight' salvia are just a few examples of plants that seem to have magically appeared in nearly every planting during the last few years. These are good plants when properly used. However, because of our tendency to stick with the familiar, an incredible variety of plants, many of which are native, are being overlooked. Few people in Nebraska know about some of the most promising landscape plants such as chinkapin oak (*Quercus muehlenbergii*), mountain mahogany (*Cercocarpus montanus*), Fremont's clematis (*Clematis fremontii*), purple prairie clover (*Dalea purpurea*) and prairie dropseed (*Sporobolus heterolepis*) to name just a few.

### **Adaptability**

Beyond overuse another issue to consider is adaptability. One of the more common garden plants, purple coneflower (*Echinacea purpurea*), provides a good example. Although this beautiful plant deserves its spot in the landscape, it isn't the only or even the best *Echinacea* choice for much of Nebraska. This plant is actually native to woodland edges in the eastern U.S. In Nebraska, *E. purpurea*

should at least share the stage with pale purple coneflower (*E. pallida*) and western purple coneflower (*E. angustifolia*), both native plants that thrive in hot, dry conditions and provide an ornamental display that many consider to be superior in the genus.

### **Plant Diversity Initiative**

In an effort to increase visual and genetic diversity in the landscape, the Nebraska Statewide Arboretum has implemented the Plant Diversity Initiative to encourage the use of a greater variety of plants. The attached Sustainable Landscape Development Guide provides information and recommendations to help with plant selection. It also includes a list of some plants that are considered to be problematic or overused in some Nebraska landscapes. NSA funded projects will be reviewed closely to insure that such plants are used sparingly and appropriately.

There are literally thousands of types of trees, shrubs, grasses, flowers and other plants that can be used in the Nebraska landscape. There are also numerous resources to assist with plant selection, including local nursery and landscape professionals as well as numerous books, catalogs, periodicals and other publications. Another great option includes exploring plant related sites on-line. A good place to start is the NSA web site (<http://arboretum.unl.edu/>) where numerous plant lists are maintained. A Google search will also reveal numerous great web resources.

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## **Sustainable Landscape Development Guide**

### **Design, Plant Selection & Maintenance Recommendations**

#### **Design Recommendations**

1. **Good planning and design are important.** Thinking ahead will save time, money and mistakes.
2. **Understand the planting site.** The physical limitations of the planting site (soil, topography, climate, etc.) will help guide plant selection and design.
3. **Natural, free-flowing designs are typically more appropriate for Nebraska than very formal designs.**
4. **Let the landscape reflect a “sense of place”** or the spirit of its natural surroundings.
5. **Try to plant most trees, shrubs and perennials in natural and complementary groupings.** Don't scatter plants indiscriminately across the site. Mulch in mass wherever possible. Evergreen trees and shrubs are especially nice in groupings. Use them as screens, framing elements and as backdrops to other plantings.
6. **Diversity is good, but don't plant one of everything.** Try to balance diversity with repetition and massing (three or more of the same species). The use of a core group of species repeated throughout the landscape will create a stronger feeling of design continuity from one part of the site to the next.
7. **Spacing plants close together is better than too far apart.** As happens in nature, it is OK to let plants grow together, to touch and overlap, and to rely on each other for support. Avoid planting trees exact distances apart.
8. **Separate turf grass from landscape plantings.** Use mulch under/around trees and shrubs and plant in mass.
9. **Native grasses and perennials should be incorporated into the landscape when possible.** We should be proud to convey our prairie heritage in our planted landscapes. Grasses add textural contrast and winter appeal to the landscape.
10. **Wildflower plantings should be planted with care.** Such plantings are not maintenance free and often end up looking weedy when not properly done. Use native mixes developed specifically for the type of soils to be planted in. Always try to include grasses with wildflowers.
11. **Weeds will sprout in open areas.** Fill bare areas with desirable plants or mulch.
12. **Concentrate on tree planting,** especially in large areas. Trees provide the greatest long term benefits to the community forest and the people and wildlife that live there.

## **Plant Selection Recommendations**

1. **Emerald ash borer** is relatively new insect to North America that threatens to kill most native ash trees across the continent. Until the full threat of this insect is known native ash species including green ash (*Fraxinus pennsylvanica*), white ash (*F. americana*), black ash (*F. nigra*) and blue ash (*F. quadrangulata*) are no longer recommended for planting in Nebraska. North American native ash trees are not allowed for planting under cost-share programs of NSA.
2. **Pine wilt disease** is currently killing many Scotch pines (*Pinus sylvestris*) in eastern Nebraska. Scotch pine is no longer recommended for planting in the eastern ½ of Nebraska and is not allowed for planting under cost-share programs of NSA.
3. **Limit the use of over planted or problematic species and cultivars, including the following.**
  - **Trees:** ‘Red Sunset’ maple, ‘Autumn Blaze’ maple, ‘Greenspire’ linden, pin oak, ‘Sunburst’ honeylocust, Russian olive, Siberian elm, ‘Bradford’ pear, ‘Spring Snow’ crabapple, ‘Newport’ plum, Amur maple, red maple, Colorado spruce, and Austrian pine, etc.
  - **Shrubs:** Winged euonymus (burning bush), wintercreeper euonymus, barberry, ‘Goldmound’ spirea, bumald spireas, ‘Little Princess’ spirea, dwarf cranberrybush, ‘Mohican’ viburnum, snowball bush viburnum, ‘Nearly Wild’ rose, some junipers.
  - **Herbaceous Plants:** ‘Karl Foerster’ feather reed grass, Miscanthus grass, ‘Stella d’Oro’ daylily, ‘Kobold’ gayfeather, ‘Purple Dome’ aster, Echinacea purpurea, creeping phlox, Japanese fleecflower.
3. **Do not use plants that are an invasive threat to native landscapes.** Russian olive, salt cedar, common buckthorn, multiflora rose, Tatarian honeysuckle, purple loosestrife and brome grass are some of these.
4. **Limit the use of unusually shaped or colored species** since they can detract from the rest of the landscape. Shrubs on standards are especially difficult to use in good taste and are usually not long lived.
5. **Limit the use of cloned (grafted) plants.** Genetic diversity is important to a healthy landscape. In Nebraska, some grafted trees are more prone to injuries from weather events than non-grafted types.
6. **DO NOT select trees and shrubs on flower or fall color effect alone.** Spring and fall colors are short lived – especially in Nebraska. Remember that the tree will need to look good the other 50 weeks of the year.
7. **Fruit adds interest to the landscape.** Walnuts, acorns, berries, samaras, crabapples, pods and many other fruits add another element of interest to the landscape and provide great benefit to wildlife.

## **Maintenance Recommendations**

1. **Keep the mowers and string trimmers away from trees and shrubs.** Mower “blight” typically causes more harm to young plantings than most insects and diseases combined.
2. **Mulching is beneficial when done properly.** Trees and shrubs should be mulched with a two to four inch layer of organic material (wood chips typically) spread in a five to six foot diameter circle around the trunk (or to the drip line). Avoid piling the mulch deeply or burying the base of trunks and stems. Trees and shrubs planted close together should be mulched in one large bed. Mulch breaks down and usually needs to be replaced every two to three years.
3. **Use only organic materials for mulch.** Do not use of rock mulch as it reduces soil fertility and reradiates heat back onto the plants.
4. **Plastic weed barriers and landscape fabric should not be used.** Weed barriers limit or prevent the healthy exchange of important gasses in the root zone and they often pull up and become unsightly over time.
5. **Hard edging (plastic or steel) is not necessary for most planting beds.** Edging limits the flexibility of the landscape to change over time and can actually increase maintenance requirements. Trench edging is preferred. It provides a more naturalized edge.
6. **Don’t over-prune.** Not all trees should be single-stemmed or pruned to eight feet above the ground. The natural growth habit of trees and shrubs should be considered when pruning. Lower branches should be left on evergreens unless there are visual/safety issues that need be addressed. Lower branches should also be left on young deciduous trees until they are well established in the landscape.
7. **Grass and perennial plantings need to be cut back at least occasionally** which can be hard work if not adequately prepared. A brush mower or trimmer will come in handy. Prairie plantings require intense weed control and periodic mowing for the first three years to become well established. After establishment try to burn prairie plantings at recommended intervals.

8. **Strive for low maintenance landscapes** through diverse appropriate plant selection and placement. There is no such thing as a “no maintenance” landscape.

### **Additional Recommendations for Environmentally-Sound Landscapes**

1. **Embrace the natural – native plants, native landscapes, and native ecosystems.**

- Learn to enjoy native plants and how they grow.
- Let the landscape reflect our place on the Great Plains – Celebrate Nebraska!
- Don't expect perfection in the landscape - be willing to put up with some rough edges.
- Enjoy the dynamic and ever-changing nature of the landscape.

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2. **Reduce the need for supplemental watering.**

- Water is a finite resource that will only become more valuable as time goes on.
- Emphasize plants that require little or no supplemental water to survive after establishment.
- Zone plants according to natural moisture requirements.
- Where possible, use drip and other low-output irrigation systems in place of high-volume spray heads.
- Keep turf-irrigation to a minimum and avoid permanent in-ground sprinkler systems if possible.

3. **Reduce the reliance on fertilizers, herbicides and pesticides.**

- Nitrates in streams and groundwater are often traced to misuse of fertilizers.
- A vast palette of plants are available that require no supplemental fertilizing in most soils.
- Most landscape plants grow better in soils with high organic matter.
- Organic-based and green fertilizers are alternatives to chemically based fertilizers.
- The evidence is clear that many common pesticides do more harm to the landscape than good.
- Insects and pathogens are a natural part of the ecosystem and should be tolerated as much as possible. In fact, the vast majority of insects and pathogens are benign to most healthy plants and landscapes.
- Many organic pesticides are available and should be favored over chemical pesticides.

4. **Eliminate the negative consequences of turf-grass maintenance.**

- America's infatuation with turfgrass has become ridiculous in the last 50 years.
- Mower and trimmer damage, excessive irrigation and misuse of pesticides in relation to lawn care are widespread and common problems in the landscape.
- Turfgrass often out-competes trees and other landscape plants for soil moisture and nutrients.
- The lawn should be considered as just one part of a bigger landscape composition.
- Resist the “perfect carpet” approach. The lawn does not need to be perfectly green, uniform and weed-free. A few rough spots are OK. In fact trees will likely grow better in and around lawns that are botanically diverse.
- Most turf grass species do not grow naturally under trees - especially where shade is heavy. Don't fight it - mulch it, or plant shade tolerant plants.
- The lawn can consist of more than just a few types of grasses. Several types of sedges and low growing perennials can also be used as part of a lawn mix.