



All Mixed Up: Evaluating Seed Mixes

©Prepared by Michael P. Anderson
m-p-anderson@att.net
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You're restoring prairie to your back forty and you're shopping for a seed mix. You can buy either Mix A with 50 species for \$600 or Mix B with 40 species for \$700. Which is the best deal? It must be Mix A because you get more species for less money—right? Maybe, maybe not.

In order to evaluate the quality of a seed mix you need to know which species are in the mix, the proportions of the species in the mix, and something about the quality of the seeds. Knowing which species are in the mix is important for several reasons.

First, the species must be appropriate for your site. If you have a sandy, dry site and the species in the mix are for a wet site, it doesn't matter how cheap the seeds are—you've wasted your money because they won't grow.

Second, some species are inexpensive while others are very expensive. For example, Black-eyed Susan (*Rudbeckia hirta*), Yellow Coneflower (*Ratibida pinnata*), and Ox Eye Sunflower (*Heliopsis helianthoides*) sell for a few dollars per ounce, while Shooting Star (*Dodecatheon meadia*), Wild Geranium (*Geranium maculatum*), and Cream Wild Indigo (*Baptisia leucophaea*) may sell for more than \$100 per ounce. Thus, Mix A might not be a bargain if it's loaded with inexpensive species.

Many nurseries sell prepared seed mixes, e.g., short prairie for dry soil or tall grass prairie for mesic soil. These mixes often come with the promise that they will contain

“at least” some number of forbs and grasses to be selected by the nursery from a longer list of species, but you have no way of knowing (or controlling) if you'll be receiving the expensive Shooting Star or the inexpensive Yellow Coneflower. You also don't know anything about the proportions of the selected species. To be fair, some nurseries now provide this information.

Look for it to help you make an informed decision. If you have any doubts, contact the nursery or consider having a custom seed mix made just for you and your land.

Designing a quality seed mix is part art, part science and should be based on site characteristics, species behavior, and your goals.

The ecological behavior of the species in the mix is another important consideration. Be wary of mixes with a high proportion of rhizomatous species, species that grow aggressively, and species that readily reseed themselves because they can overwhelm and exclude the more subdued species.

Examples include most of the Sunflowers (*Helianthus spp.*), Grass Leaved Goldenrod (*Solidago graminifolia*), Canada Tick Trefoil (*Desmodium canadense*), Common Milkweed (*Asclepias syriaca*), Frost Aster (*Aster pilosus*), and Stiff Goldenrod (*Solidago rigida*). That's not to say these species shouldn't be planted, just don't plant them too heavily. Or do as I often do and individually spot plant them into discrete areas instead of including them in the mix.

It's also very important to consider how readily a species establishes from seed. Easily established species should be planted at a relatively light rate so they won't become overly abundant and suppress or

extinguish the species that germinate and mature more slowly. This is especially true when they are tall or coarse textured.

Examples include Black-eyed Susan, Ox Eye Sunflower, and most of the *Silphiums*, including Compass Plant (*Silphium laciniatum*), Rosinweed (*Silphium integrifolium*), and Cup Plant (*Silphium perfoliatum*).

Many easily established species are also relatively inexpensive making it

tempting to load up on them—a big mistake.

Again, that's not to say these species shouldn't be planted, just don't plant them too heavily or spot plant them.

Conversely, difficult to establish species need to be sown at a higher rate to assure their presence in your prairie. Examples include New Jersey tea (*Ceanothus americanus*), Wild Rose (*Rosa spp.*), Rough Blazingstar (*Liatris aspera*), and Pasque Flower (*Anemone patens*). Very small seeded species, such as Shooting Star, Culver's Root (*Veronicastrum virginicum*), Prairie Alumroot (*Heuchera richardsonii*), and many of the Lobelias (*Lobelia spp.*) are often inadvertently planted too deep to survive because the seeds easily sift or wash deep into the soil. Thus, I usually increase the seeding rate of the small seeded species to account for their lower germination rate.

Another important consideration is the grass to forb ratio of your seed mix. Mixes with a high proportion of grass typically develop into a nearly solid stand of grass that can eliminate many of the forbs. This is especially true if the grasses are tall or rhizomatous species, such as Big Bluestem (*Andropogon gerardi*), Switch (*Panicum virgatum*), or Indian (*Sorghastrum nutans*). How much grass is too much? In addition to the species of grass, it depends on your site, your goals, the weather, especially while the planting is getting established, and a myriad

of other variables. My earliest plantings, nearly 25 years ago, were about 30 to sometimes 40 percent grass (based on seed number, not seed weight). Most of my custom mixes are now 5 to sometimes 10 percent grass, although the higher number is somewhat inflated by the higher seeding

rates I use for Little Bluestem (*Schizachyrium scoparium*) and Side Oats (*Bouteloua curtipendula*) when planting on silty soil.

A poorly designed mix will be a disappointment and a waste of your time and money.

Seed quality is another important consideration. Pure live seed (PLS) is a standardized measure of seed quality. It's calculated by multiplying seed purity (cleanliness) by the proportion of live (viable) seeds. For example, if the seed is 90% pure and 80% of the seeds are viable the seed is 72% PLS. Determining PLS requires laboratory testing.

Buying seed on a PLS basis ensures the ounce of Big Bluestem you're buying contains an ounce of viable seeds. Most native plant nurseries sell grass seed by PLS, some also sell forb and shrub seeds by PLS. Given the choice, I prefer to buy seed on a PLS basis.

For most restorations the cost of the seed is the most expensive part of the process. Designing a quality seed mix is part science, part art, and should be based on site characteristics, species characteristics, and your restoration goals. A well-designed mix will achieve your goals. A poorly designed mix will be a disappointment and a waste of your time and money.

