



SEEDS & SCIENCE

# NATIVE RESTORATION GUIDELINES

EDITION 1





## STEP 1: RESEARCH AND PLANNING

Well in advance of planting day, set aside some time to think about all of the steps involved with a native restoration project. The time you take to plan your project in advance may help to avoid frustrating, time consuming problems later.

### CLARIFY YOUR GOALS

Determine why you're planting native species and the purpose you want your native restoration to serve. Consider what you want your native restoration to look like in 5, 10, or even 50 years. Keep these goals in mind throughout the entire planning process.

### SET YOUR BUDGET

Native plants take less time and money to maintain than a traditional lawn in the long run, but they usually require a significant investment up front. Setting a budget will help to determine what project size and scope you can tackle. If you're running into economic or time constraints, consider starting with a smaller area or with fewer species. You can always increase the size of your planting or add additional species over the next several years.



**BIG BLUESTEM (ADROPOGON GERARDII)**



**WESTERN YARROW (ACHILLEA MILLEFOLIUM)**

## CONDUCT A SITE ASSESSMENT

Learn as much about your site as possible. This will help to determine which native species are best suited for the project.

- Is the soil sandy, silt, clay, or loam? Sandy soils are dry and don't hold water, silty soils have more intermediate drainage, and clay soils retain water and become sticky when wet. Loam soil is a combination of multiple soil types.
- How well does the site drain water? You can get a good idea of how well the site drains by looking for areas that dry out quickly or hold standing water after a heavy rain.
- Is the site sloped? If so, what direction does the slope face? Typically, north facing slopes are wet and cool, west and south facing slopes are dry and hot, and east facing slopes have a more moderate temperature and moisture level.
- How much sun does the site get? Most prairie plants need at least half a day of sun to thrive. If the site is shady, plan to plant savanna or woodland species.
- What is currently growing on the site? If there are already native species growing on the site, you may want to consider inter-seeding into the existing vegetation to enhance the site and protect the plants that are already there. If the site is overgrown with invasive species, plan on killing undesirable vegetation before planting. It is crucial to eliminate the competition if you are to have a successful restoration project.
- Are there any structures near the site? Prescribed burning is one of the best ways to manage a native planting. As a safety precaution, plan on keeping a buffer of at least forty feet between the planting and any burnable structures.
- How large is the site? Area can be calculated by multiplying the length times the width. There are 43,560 square feet in 1 acre. It's a good idea to estimate the area slightly larger than it actually is. It's much easier to plant a little extra seed than to run out.

## SELECT A NATIVE SEED MIX

A seed mix should be selected based on your site research, budget, and project goals. In many cases, one of Shooting Star Native Seed's pre-designed native seed mixes may be an ideal match for a site. They've been designed for a broad range of environmental conditions, include species that will attract wildlife, and will bloom throughout the year. If you would like to modify one of our mixes or design your own mix, we are more than happy to help! Seed should be stored in a cool, dry place, at a temperature below 70° F. The storage location should be protected from direct sunlight, moisture, and rodents.

### TIMING

Native seed should only be planted at certain times of the year. Different methods should be used based on the planting time.

- **SPRING SEEDING (MAY - JUNE):** Planting in May or June provides optimum conditions for the establishment of grasses, while many wildflowers may be delayed until the following spring because of their dormancy. Weeds will most likely have started growing in the early spring, so at least one herbicide application will most likely be necessary prior to planting.
- **FALL SEEDING (MID-OCTOBER - GROUND FREEZE):** Fall plantings should be timed so that seeds will stay dormant over the winter and then germinate the following spring. Many of the wildflowers will break their dormancy over the winter which gives them a jump start on the grasses in the spring. This is also a great time to inter-seed wildflowers into an existing native planting.
- **FROST SEEDING (SNOW-FREE PERIODS OF WINTER, AS LATE AS MID-MARCH):** This method works well if the ground is bare or if the soil was tilled before the ground froze. Seed should be broadcast directly onto the soil. Freezing and thawing throughout the winter will work the seeds into the soil.
- **TEMPORARY SEEDING (MID-MARCH - APRIL, JULY - MID-OCTOBER):** Native seed should not be planted during these periods. If soil is disturbed and needs to be stabilized during these times a temporary cover crop of Oats (for spring plantings) or Winter Wheat (for fall plantings) should be planted at a rate of 50 – 100 pounds per acre.



ILLINOIS BUNDLE FLOWER (DESMANTHUS ILLINOENSIS)



SIDEOATS GRAMA (BOUTELOUA CURTIPENDULA)



OX-EYE SUNFLOWER (HELIOPSIS HELIANTHOIDES)



LITTLE BLUESTEM (SCHIZACHYRIUM SCOPARIUM)



## STEP 2: SITE PREPARATION

### WEED CONTROL

Weed control is critical when establishing native species. Native seedlings put most of their energy reserves into root establishment during the first year or two, and above-ground growth can be very slow. Plants can be shaded out very easily by fast-growing weeds, which should be eliminated prior to planting to help the project be successful.

One method of weed control on large sites is the use of a broad-spectrum, glyphosate herbicide. This will kill any growing weeds, and subsequent sprayings (at about one-month intervals, or whenever a site greens up with weeds again) will kill weeds that have germinated from seed stored in the soil. Sites that were previously planted with corn or soybeans will most likely only need to be sprayed once prior to planting. Old pastures may require several applications over multiple years to properly prepare a site. If more persistent broad-leaf weeds are present, herbicides such as 2,4-D can be sprayed along with the glyphosate application. Glyphosate degrades very quickly once it is sprayed and can be used up to the day before planting, while other herbicides should be applied at least two weeks prior to planting.

If spraying is not an option, another effective method of weed control is tilling. An initial tilling at a depth of 3 – 6 inches will kill most weeds, and subsequent shallow tillings at approximately 2 – 3 inches deep will eliminate newly germinated weed seedlings. This will gradually reduce the amount of weed seed present in the soil. Subsequent tillings should be shallow to prevent more deeply buried weed seeds from being brought to the surface.

If a temporary cover crop of Oats or Winter Wheat is planted, it will offer some weed control by simply crowding out the weeds. Tilling the cover crop under to prepare the soil for planting native seeds should kill any weeds that may have grown.

In smaller areas, smothering with black landscaping fabric, leaf compost, or grass clippings is an efficient method of weed control. The site should be kept covered for an entire year prior to planting.

### SEED BED PREPARATION

The soil needs to be prepared into a firm, fine-textured seedbed and should be relatively free of debris before planting. The site can be tilled shallowly with a disc to achieve this. If the soil is still full of clumps, it can be dragged with a harrow or drag to break it up more finely. On smaller areas, tilling with a roto-tiller and then raking with a garden rake works well. If the soil is very soft, to the point where your foot presses down half an inch or more, the soil is too loose. Any seed spread here may be buried too deep to properly germinate. The soil should be packed down with a roller or culti-packer prior to seeding.



PARTRIDGE PEA (*CHAMAECRISTA FASCICULATA*)



SWITCHGRASS (*PANICUM VIRGATUM*)



PURPLE PRAIRIE CLOVER (*DALEA PURPUREA*)

## STEP 3: PLANTING

Each site is unique and there is not a single planting method that is appropriate for every project. It may be possible to plant an entire project using one method, or varying conditions may require planting using a combination of methods.

### NATIVE NO-TILL DRILL

No-till drills are typically used to seed larger areas, sites with existing vegetation, or areas with hard ground. They plant seed in rows by opening a shallow groove in the soil, which causes only minimal soil disturbance. Seeds should be planted at a depth between 1/8 and 1/4 inch below the soil surface, and some seeds should be visible on the surface after planting. Many no-till drills have separate seed boxes for small seed, fluffy seed, and cover crop, and when calibrated correctly can plant them all very accurately.

### BROADCAST SEEDER

A broadcast seeder is an ideal choice for larger sites that have recently been tilled. After being broadcast, seed should be packed with a roller to ensure that good seed to soil contact has been made.

### HAND BROADCASTING

Hand broadcasting is commonly used for small projects or in areas that are too wet or steep to use a mechanical seeder. Because such a small amount of native seed is needed per acre, planting by hand can be very challenging. Consider bulking up the mix with either an inert material (like sawdust or vermiculite) or a cover crop of Oats or Winter Wheat. It is also a good idea to divide both the planting area and the seed into smaller increments to ensure that the seed is evenly distributed throughout the entire site. Lightly raking, rolling, or dragging the site after broadcasting ensures that good seed to soil contact has been made.

### WETLAND AREAS

When seeding in wetland areas or along the edge of a body of water, the soil is often too wet; however, if the soil is bare and above the water level, it is possible to broadcast wetland seed. The site should be lightly raked and covered with straw or erosion control blanket after broadcasting if possible. Wetland plants that establish at the water's edge will naturally fill in as the water level changes over time. Wetland seed is very easily smothered by sedimentation. The bottoms of basins that are likely to be flooded and silted in before plants become established should not be seeded. In areas where the water level fluctuates, it is better to establish wetland plants at the edges and allow them to spread into deeper water or dry pond bottoms on their own.

### COVER CROPS

An annual cover crop is sometimes planted along with native species in an effort to suppress weed growth and reduce soil erosion. Oats are commonly used in the spring and Winter Wheat is used in the fall. Both should be applied at a rate of 50 – 100 pounds per acre.

### MULCHING

Mulch can be used to help prevent erosion and to hold moisture in the soil for the germinating seeds. On steep sites, a straw-based erosion control blanket can also be used. On flatter sites, clean, weed-free straw can be used at a rate of two tons per acre. It should be crimped in place with a disc anchor.



ALSIKE CLOVER (TRIFOLIUM HYBRIDUM)



BLACK-EYED SUSAN (RUDBECKIA HIRTA)



# NATIVES YEAR OVER YEAR

## YEAR ONE

Don't expect your native planting to look great after the first year. During this time, native seedlings put most of their energy into root development, and will most likely not grow more than a few inches. Invasive species will continue to grow quickly and will need to be mowed an average of three times in the first year whenever they reach a height of 18 inches. This will prevent the fast-growing weeds from dropping seed and from shading out the native seedlings. The first mowing (late June - early July) should be to a height of 4 inches, the second mowing (late July - early August) should be to a height of 8 inches, and the final mowing (late August - early September) should be to a height of 12 inches. It's important to gradually increase the mowing height so the new native seedlings are not harmed. Abstain from hand pulling weeds in the first year. Native seedlings may accidentally be pulled out and new weed seeds can be brought up to the soil surface.



## YEAR TWO

In the second year, the planting should be dominated by cool season native grasses like Canada Wild Rye and early emerging wildflowers like Black-eyed Susan, Wild Bergamot, and Yellow Coneflower. If weeds begin to grow, mow them once to a height of 12 inches early in the spring. Make sure to time your mowing before weeds begin to flower. Common weeds like Curly Dock, Burdock, Canada Thistle, Wild Parsnip, or Sweet Clover can also be eliminated by spot spraying with glyphosate or hand pulling.



## YEAR THREE

If there is enough fuel to carry a fire, plan on a prescribed burn in March or April of the third year. This will stimulate growth of new wildflowers as well as warm season grasses like Big Bluestem, Indiangrass, Switchgrass, and Sideoats Grama. These species should take the place of most of the early emerging species from the previous years. Always use extreme caution when burning. Prairie fires burn very quickly and can get out of control in no time. As a safety precaution, plan on mowing a 10-15 foot firebreak around the perimeter of your prairie prior to burning if your site doesn't already have firebreaks such as roads, rivers, or agricultural fields. If you are not experienced, please don't try to conduct a prescribed burn on your own. There are several organizations and companies that can provide the personnel and equipment to make sure your burn is done safely. If burning is not an option, plan on mowing to a height of 6 inches and removing the thatch in the early spring. If not removed, the thatch layer can cause poor plant growth or even cause plants to die.



## YEAR FOUR & BEYOND

Additional species will continue to appear over the next several years. Some species can take as long as ten years to emerge. Continue to utilize controlled burn every 2 - 3 years if possible. It may be beneficial to implement a burn rotation in which only a section of the prairie is burned at a time. This will provide steady habitat for early nesting birds as well as protection for overwintering butterflies. If you wish to add diversity, wildflowers can be interseeded in the late fall. Continue to spot spray or hand pull weeds if they are still a problem. As your prairie continues to mature, the weed population should dissipate.

