

# Sharp Bros. Seed Co.

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## TECHNICAL GUIDE

### ESTABLISHING NATIVE GRASSES

2nd Edition

- \* Weed Control Prior to Seeding-Seedbed preparation
- \* Planting a cover crop
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- \* Soil fertility
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At Sharp Bros. Seed Co. we have worked with a variety of customers over many years who have successfully seeded and established native grass species. These species demonstrate amazing tenacity once they are established. Natives are tolerant to extremes of heat or cold, drought and a variety of other harsh environmental conditions. Seed and seedling characteristics of natives are different from those of most domesticated crops or turf grasses. Native species generally have small seeds. Seedling vigor generally is lower than that of many domesticated plant species. Most natives require shallow seeding depths. Germination can be somewhat prolonged due to naturally occurring seed dormancy. Successful establishment requires attention to detail in seedbed preparation, seeding and early management.

#### WEED CONTROL PRIOR TO SEEDING AND SEEDBED PREPARATION

Reducing the population of weed seeds prior to planting is important to successful seeding. Prevent or reduce weed seed formation for the season prior to planting to as great a degree as possible. When cover crops are established prior to native seeding, it may be beneficial to control weeds in the cover crop. Choose herbicides that will not carryover in the soil to cause problems for the emergence of the native species. Cover crops should not be allowed to form seed so that they do not become weeds themselves. When considering tillage, attention should be given to the effect it will have upon weed germination. Generally a 'stale' or untilled seedbed will produce a lower population of emerging weeds than will a freshly tilled seedbed. An ideal situation would be to plant native seed "no till" into the residue of a cover crop which was seeded "no till". Chemical weed control, prior to planting, would be necessary in such a system.

"when it comes to seedbeds, stale is good, fresh is bad"

#### PLANTING A COVER CROP

(For purposes of this discussion, cover crops discussed are planted prior to seeding of natives, are allowed to grow, make cover and are dead at the time natives are seeded). The best cover crops are those which form residue or mulch which is persistent or will not readily decompose. The need for a persistent mulch is most critical in semi-arid, low humidity, and windy

environments. In humid regions a persistent mulch is useful but less critical. Native grasses are seeded very shallow and may be slow to germinate. The process of imbibing water from the soil and actual germination is possible only if the soil surface remains moist throughout the time these processes are ongoing. Mulch provides shading which slows the drying of the soil surface. In many cases native seeds are not able to germinate without the protection afforded by mulch. Surface shading is also critical as the seedlings develop secondary (or permanent) root systems. The permanent roots of all grass species develop from buds which are above the seed. (See "Comparison of Grass and Broadleaf Seedling Development" at end of this paper.) Since native grass species are planted very shallow, these roots must grow at or slightly below the soil surface. Soil must be moist for these roots to grow. Once again, surface soil moisture, maintained and protected by cover crop residue, is essential to native grass establishment.

**"Cover crop residue helps maintain surface soil moisture which is critical to germination and permanent root system development."**

Native seedlings in humid areas have a good chance of success with a variety of mulch covers, some of which are not persistent. Harvested soybean stubble is an excellent example of a non-persistent mulch which has frequently yielded good results in humid climates. A variety of herbicides are available for thorough control of annual grasses during the soybean production season. As a result the grassy weed "seed pool" can be reduced and lower the population of these weeds that emerge in the native seed planting. It should be noted that annual grasses are frequently the most damaging weed competition in native seeding. Soybeans also have the effect of improving the tilth of the soil which results in good seedbed conditions for the native seeding. These advantages may outweigh the shortcomings of the quick decomposition which is characteristic of soybean stubble.



Avoid cover crops which leave residues that may be allelopathic (naturally occurring chemicals that inhibit germination of seedlings). This phenomena has been observed when planting native grasses into wheat stubble, though the effects are not predictable. For this reason using wheat stubble as a cover crop or wheat straw as an applied mulch is discouraged.

Professionals in the field of native species establishment have found forage sorghum or sorghum-sudan cover crops the most effective cover crops. Seed formation by these cover crops can be limited or controlled by use of male sterile (non self pollinating) hybrids and by planting late so that sorghums are not able to mature and form seed. Sorghums are warm season cover crops and are grown the summer prior to planting natives. Cool season cover crops, planted in the fall prior to seeding natives, can also be used. Oats or rye would be the best choices in this category. Chemical treatment may be necessary to kill these cover crops before forming viable seed. Note that cool season cover crops will not form a persistent mulch cover as will sorghums and therefore should be considered a second choice.

### **EROSION CONTROL**

In many cases the cover crop residue will provide all of the protection that is necessary to guard the soil against wind and water erosion. However, steep slopes may be threatened by water erosion even where cover crops are well established. Mechanical erosion controls are necessary in these areas.

**"Sterile sorghums are the ideal cover crop"**

### **SOIL FERTILITY**

As a class, warm season native grasses in the seedling stage are not highly responsive to soil nitrogen. In other words, little if any additional growth or vigor will be observed in native warm season grass seedlings where soil nitrogen is plentiful as compared to sites where soil nitrogen is limited. By contrast, most weed species are more vigorous when soil nitrogen supplies are generous.

As a result fertilization with nitrogen prior to seeding native warm season grasses may actually be detrimental since it increases the competitive growth of weeds while having little benefit to native grass seedlings. In most circumstances nitrogen fertilizer application is discouraged prior to native warm season grass seeding. As an extension of this strategy, many native seeders prefer to not fertilize or under fertilize cover crops which precede native seeding. Cover crops will absorb much of the residual soil nitrates in this situation and “tie up” absorbed nitrogen within the cover crop plant tissue. As cover crop residues decompose nitrogen will slowly be returned to the soil. This nitrogen management scheme gives native warm season grasses a competitive advantage over weed species.

**“Low soil nitrogen levels can be beneficial during the seeding year of warm season grasses.”**

Note that the preceding discussion specified the effects of nitrogen on warm season grass seedlings. Cool season grass seedlings, including natives, are generally more responsive to nitrogen. Grass mixes that are exclusively cool season or dominated by cool season species may respond very favorably to nitrogen fertilization prior to planting or shortly after emergence. When native grass mixes are dominated by warm season species, as is often the case, the nitrogen management strategy that favors those grasses should be used.

Soil tests may indicate deficiencies of other soil nutrients: phosphorus, potassium, sulfur, zinc, etc. These deficiencies may be corrected by fertilizer application prior to cover crop seeding or native grass seeding. Soil tests are strongly recommended where native seedlings are applied to areas where extensive earth moving has occurred. Fertility levels may be far from “normal” in such areas. Occasionally, even nitrogen levels may be so depleted as to require modest applications prior to planting natives.

### **WEED CONTROL AFTER NATIVE GRASS EMERGENCE**

Native grass species can be sensitive to herbicides prior to becoming fully established. Consequently many native seeders avoid herbicides the first year. It should be noted that herbicides can be used successfully during the first year, however grass reaction to herbicides is dependent upon many environmental variables. Prescribing first year herbicide applications is beyond the scope of this paper. Seek the advice of a professional who is experienced with local conditions to determine products, application rates and timing.

Mowing is a time honored method of weed control in native grass plantings. Weeds commonly achieve plant height well above that of native grasses in the first season of growth. Mowing improves the competitive advantage of native grasses. Examine the site in order to determine the best mowing height. The goal is to remove as much foliage from weeds as is possible while removing minimal leaf area from the native grasses. Choose a mowing height that best meets that goal. Mow whenever significant damage can be dealt to the weed population. Caution must be used when mowing, so that native seedlings are not inadvertently damaged. Mowing weed growth that is very heavy can cover small native seedlings with large amounts of residue. Removal of a thick weed canopy can occasionally cause native seedlings to be “shocked” by sudden exposure to full sunlight. Frequent mowing is the best means of avoiding these problems.

**“Mowing improves native grass seedlings' ability to compete with weeds.”**

After the grasses have become established (after the first year's growth) additional weed control options may be considered. Examine the planting to see if interseeding is necessary. If the stand is adequate (no interseeding necessary) a pre-emergence herbicide could be applied during the winter or early spring following the first summer's growth. An application of this type can greatly reduce the weed population during the following spring and summer. Choose a product which is practical to apply and proven safe and effective in the local area. Choose a product or products that are labeled for all of the species in the native seeding and which has been proven safe and effective in the local area. Many native seeders avoid herbicides and rely on mowing for weed control throughout the establishment period. Burning old residue as native grasses initiate growth

in the spring can be highly beneficial as a means of weed control and stimulating vigorous growth in native species. Burning is commonly used in the spring of the third season or in following seasons. Non selective herbicides such as glyphosate (Roundup) can be safely applied while warm season grasses are dormant - late fall, winter and early spring. Such a treatment can control unwanted cool season grasses (perennials or annuals) as well as broadleaf weeds such as dandelion or mustard. Note that glyphosate can kill or injure desirable cool season grasses such as western wheatgrass, Canada wildrye or Virginia wildrye.

### **CHOOSING A PLANTING DATE AND DEPTH**

In temperate climates, native grasses are commonly seeded through the months of December to May or early June. Where irrigation is available seeding can be performed through July and into early August. The following discussion will be limited to dryland, non irrigated plantings. Minimum soil temperatures are required for native seed germination as is true of any seed. Cool season grasses may begin to germinate in February or March. Note that cool season grasses may also be planted in August or September so that they are able to sprout and establish before winter. Warm season grasses typically germinate in April, May and June. Should germination times dictate planting times? Not necessarily. Where native species are seeded into high residue conditions (good cover crop) it is often difficult to achieve good seed to soil contact. Seedings which are made during the winter or early spring may have seed to soil contact improved by the beating action of rainfall, weight of snow and the freezing and thawing (heaving) activity of the soil. For this reason, many native seeders state that they frequently have the best results with seeding performed well before germination temperatures are achieved. When planting very early, it is reasonable to assume that some seed may be attacked by fungus, consumed by rodents or lost through some other venues. Nonetheless the positive factors that improve seed to soil contact seem to override negatives associated with seed loss. It should be emphasized that legions of successful native seeding have been performed in every month from December through May. Most native grasses are seeded from 1/4 to 1/2 inches deep. A few exceptions such as Eastern gamma grass and Indian ricegrass benefit from deeper placement.

**“Planting may  
be performed  
December  
through May.”**

### **ADDING WILDFLOWERS (Forbs)**

Native wildflowers are an important addition to many native grass plantings. Besides adding beauty to stands of native grasses, wildflowers are an important food source for game birds, song birds, and mammalian wildlife as well as grazing livestock.

Choosing when to seed these wildflowers depends largely on the management strategies that are intended. Inclusion of wildflowers eliminates the possibility of some herbicide use. Many herbicides which control weeds may also kill wildflowers. Where use of such herbicides is planned it would be best to delay planting of wildflowers for one to three years. This would allow herbicide use until the grasses are established and herbicides are not needed. Wildflower species will generally establish well in stands of established grass. Wildflower species have been added as an enhancement planting to thousands of acres of conservation reserve program (and with good results). The nature of wildflower seedling growth makes this possible. Seedlings form a tap root at germination that grows without a pause as the plants develop. By comparison grasses form a seedling root from the seed upon germination, but then abandon the seedling root system as the permanent root system develops.

Growers who choose not to use herbicides may want to include wildflowers when making the initial seeding of native grasses.

### **ADDITIONAL RECOMMENDATION**

Natural Resource Conservation Services personnel or Extension Service personnel can provide valuable advice in choosing species, seeding, establishment and long term management of native seeding. These professionals are highly experienced in these subjects and are themselves a “natural resource”.