TECHNICAL NOTES

UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE
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PLANT MATERIALS TECHNICAL NOTE NO. 13

PLANNING SITE AND SEEDBED PREPARATION FOR CROPLAND CONVERSION TO NATIVE SPECIES

INTRODUCTION

The success of any conservation plantings depends on several factors including but not limited to seed quality, planting techniques, and proper site and seedbed preparation techniques. The majority of the time doing proper site and seedbed preparation is often overlooked, yet it is considered one of the most important steps in establishing a successful planting. Some of the biggest hurdles in establishing native plants on old cropland fields include excessive weed growth, fertility and residual herbicides. On average U.S. cropland is low in fertility and may contain herbicide residues, as well as an abundance of annual weed seeds.

Taking the time to evaluate and address these factors prior to planting will greatly increases the success of most native plantings.

FACTORS TO CONSIDER - Cropping History, Residual Herbicides, Fertility, and Weeds

The importance of knowing and understanding the cropping history of a specific site helps us evaluate possible fertility and residual herbicide problems within the field. Most cropland fields have some type of cropping history record associated with the field. Producer and Farm Service Agency records should help out with identifying cropping history of the field. Knowing the previously grown crops will give you an indication of potential problems or limitations that may exist with fertility and residual herbicides.

Preplant or pre-emerge herbicides that have been extensively used for some field crop may have a lingering effect on many of the native species you are trying to establish. Some herbicides may persist for more than one year in the soil following the season of use. Planning low residual herbicides during the last year of cropping prior to conversion to native species could lessen residual carryover. Consult with your parish agricultural extension agent for specific information on herbicides and possible carryover.

Many cropland fields being planted to natives are low in fertility from continuous cropping over time. One important step prior to site prep and seedbed preparation is to have your soil tested for basic nutrient levels. Doing a soil fertility test prior to seedbed preparation is critical if we are to understand the health of the soil and are to have any chance of establishing natives.

A basic soil fertility test will give the producer an indication of available nitrogen, phosphorus, and potassium levels in the soil. Additional test maybe performed to indicate levels of organic matter and other micronutrients. Your local parish agricultural extension agent can provide kits and instructions for soil fertility testing.

If your soils test shows your fields to be low in basic nutrients then consider applying these elements when you prepare your seedbed. Avoid applying any fertilizer at the time of planting. Fertilizers applied at planting will only encourage weeds. Only apply the recommended phosphorus and potassium called for in the soils test during seedbed preparation. Avoid applying nitrogen until the natives are up and growing (over the next 2-3 year).

Excessive weed competition is considered the biggest hurdle to establishing native plants. Desirable native plants do not compete well with aggressive weedy plants. Weeds compete for light and moisture that native plant seedlings need to survive. On average native plants are slow to germinate and establish. Weed competition can be significantly lessened the first few years following planting if adequate time and effort is placed on proper site and seedbed preparation before planting. If weeds are not controlled or the competition lessened before or during the first year of planting, the growth of native grasses, forbs, and legumes will be severely affected. Planning well in advance will greatly reduce weed problems after planting. On fields with a heavy weed infestation consider committing one to two years prior to your planned planting to concentrate on weed control.

SITE AND SEEDBED PREPARATION METHODS

Site and seedbed preparation may be accomplished using three different methods.

1. Chemical Site Preparation

Chemical site preparation uses herbicides to terminate the existing vegetative cover that is present on the field. Typically this involves the application of some type of none selective herbicide (e.g. glyphosate) to destroy the existing vegetation on the field. This method should only be used when undesirable vegetation exists. Chemically treated fields will have a cover of dead residue and should show minimal signs of living vegetation. Depending on the vegetative composition of the field, chemical site preparation will usually require multiple applications over a period of time to address all your weed problems. Often treatments are needed in the spring-summer and fall-winter to target both warm and cool season weeds. This type of site preparation tends to be more risky than conventional land preparation methods (i.e. mechanical preparation) due to possible weed flushes following wet periods. Chemical site preparation should not be used when inter-seeding into already established desirable species.

Chemical site preparation should be considered when your plans involve using a no-till grassland drill to install your seeds or when it’s important to maintain some type of cover on the field for erosion control. This type of site preparation should not be used if you are planning on broadcasting your seeds. Chemically prepared seedbed should also be considered if the producer has no or inadequate tillage equipment available. Consult with your parish agricultural extension agent for specific information on herbicides available to perform chemical site prep.

2. Mechanical Site Preparation

Mechanical site preparation involves using some type of tillage implement to destroy the existing vegetative cover that is present on the field. Operations may include disking, sweeps, or moldboard plowing that completely destroys standing vegetation. Each producer has a unique set of different tillage tools and methods that can be used to prepare a seedbed. Following the final plowing the site should be firmed using equipment such as a roller, harrow, cultipacker, or other implement to firm but not pack the final seedbed. This method should not be used when desirable vegetation exists and your plans include interseeding other species. Mechanical site preparation destroys undesirable vegetation and may bury weed seeds at a depth where they cannot germinate, leaving the site clean and free of living vegetation. Depending on the vegetative composition of the site, mechanical site preparation will require multiple applications over a period of time to address all your weed problems. Often disturbance is needed in the spring, summer, and fall to target both warm and cool season weeds.

Mechanical site preparation should be considered when your plans involve using a conventional grassland drill (i.e. without no-till capacity), or using a broadcast seeder. It should not be considered if any potential erosion problems exist. Mechanical site preparation should be considered if the producer needs to prepare a site heavily infested with undesirable vegetation. Mechanically prepared sites should be a clean, weed free, firm, moist, and smooth prior to planting.

3. Combination of Treatments

One option commonly used when preparing a seedbed for native plants involves a combination of chemical and mechanical treatment. Under certain conditions, existing vegetative cover maybe destroyed by spraying (burn down herbicide) followed by disking. This practice should be used when hard to control vegetation exists or severe weed pressure is present. This method usually involves repeated chemical and/or mechanical treatments to accomplish your goal. As with all site preparation methods considerations should be given to complete operations the year before a planned seeding. This gives time to address potential problems that may arise.

Sites prepared using a combination of treatments may be planted with a no-till grassland drill, a conventional grassland drill (i.e. without no-till capacity), or using a broadcast seeder, depending on the final operation. Consideration should always be given to any erosion problems that potentially may exist.

CONCLUSION

Proper seedbed preparation should always be considered the foundation and the first important goal to accomplish by anyone planning or installing a native planting. Spend the time to evaluate and record details about each site with regards to cropping history, prior herbicide usage, fertility, and potential weed problems. Always remember that dense stands of annual and perennial weeds may out-compete grass seedlings for soil moisture, light, and nutrients, and ultimately prevent establishment.

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