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PLANT MATERIALS TECHNICAL NOTE NO. 14

CONSERVATION PLANTING METHODS FOR NATIVE AND INTRODUCED SPECIES

INTRODUCTION

The success of any conservation plantings depends on several factors including but not limited to seed quality, using the proper site and seedbed preparation techniques, and using the proper planting method. Deciding on the best planting method depends on the type and condition of the site, equipment availability, and the type of seed being planted. Native and introduced grassland species can be difficult to plant due to variability's in seed size, weight, and shape. Little bluestem, Indiangrass, and big bluestem all have light, fluffy/chaffy seeds. Switchgrass has a small hard seed that may have several hundred thousand seeds per pound, and eastern gamagrass has a large irregularly shaped seed. Often conservation seed mixes include multiple seed types being planted on the same site. This makes it extremely important for the producer to understand planting methods commonly used and the need to have specialized equipment available to properly plant grassland species.

Taking the time to evaluate and address equipment needs prior to planting will greatly increase the success of any planting. Included below are 4 planting methods commonly used when establishing both native and introduced plant.

Drill Seeding

Drill seeding is probably the most commonly used method of planting seed of any type. Drill seeding involves mechanically pressing seed into the ground. As a seed drill moved across a field, seed from a hopper is metered out; it falls through tubes into some type of soil opening device (i.e. disc openers, chisels) that plants the seed at a set depth. Most seed drills have an adjustable planting depth to accommodate differences in seed sizes. The typical planting depth of most conservation species ranges from ¼ inch to 1 inch in depth. The soil opening and planting operation is normally followed by a set of packer wheels that press and firm the soil over the seed. No further soil preparation is required after drill seeding is completed.

Two types of seed drills are commonly used by the agricultural producer. A grain drill that has a single seed box and is typically used for planting wheat, oats and other small grains, and a grassland seed drill that utilizes multi seed boxes, each adapted to planting different seed types (i.e. fluffy/chaffy seed, small slick hard seed) such as big bluestem, switchgrass, Illinois bundleflower, and Indiangrass. See Table 1.



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Grain drills are not adapted to handle the extreme variability’s associated with native seeds and many introduced improved pasture grasses such as bermudagrass.

Most grassland drills are built around the ideal of using three separate seed boxes. One box functions as a conventional small grain box used for planting small grains or similar uniform native materials such as eastern gamagrass, a second box that contains specialized “picker wheels” and agitators to mix, stir, and meter fluffy chaffy seeds (e.g. little bluestem, Indiangrass), and a small hard seed box used for planting legumes and small hard seeded grasses and forbs (e.g. switchgrass, bermudagrass, partridge pea).

Grassland drills maybe classified as a conventional type meaning those drills that requires a prepared seedbed to operate in and as a “no-till” type drill that is able to operate on an unprepared site.

Native seeds generally feed through a drill at variable rates because of differences in seed size, seed shape, and seed weight. Chaffy or fluffy native grass seed does not behave like other more common slick hard seed species which flow much easier. Because of these differences, proper drill calibration is an important step to guarantee planned planting rates are applied. Consult the equipment manufactures specific guidelines on calibration and adjustment prior to any seeding operation. Following drill calibration, record the settings used for future reference. Repeat the calibration procedure several times to confirm your results and recheck under actual planting conditions throughout the day. Daytime conditions such as changes in humidity and temperature will have an effect on drill calibration settings. Recalibrate when you change lots of seed, even if similar lots has the same pure live seed (PLS) rating. Different lots act and flow differently.

An in depth guide on seed drill calibration is contained in the publication “Idaho NRCS Plant Materials Technical Note 19 - Calibrating a Seed Drill for Conservation Plantings, July 2004”.

Table 1 Drill Type Used for Various Species

	Grain Drill	Grassland Seed Drill
Wheat	√	√
Oats	√	√
Soybean	√	√
Big Bluestem		√
Little Bluestem		√
Illinois Bundleflower		√
Partridge Pea		√
Indiangrass		√
Eastern Gamagrass	√	√
Ryegrass	√	√
Clovers		√
Bermudagrass		√
Bahiagrass		√
Misc. Forbs(Wildflowers)		√
Switchgrass		√
Fluffy/Chaffy Seeds		√
Small Slick Hard Seeds		√

Broadcasting

Broadcasting is defined as planting or sowing seeds across an area by scattering either by mechanical means or by hand. Broadcasting is considered the most economical method of applying seed to large areas of land. Mechanical broadcast planters typically are cyclone spreaders driven by a tractor power-take-off (PTO), an electric motor, or by hand operation. Aerial broadcast (using an airplane or helicopter) seeding is another mechanical method used in certain areas and has proven successful when planting large inaccessible areas.

Using your hands is probably the most commonly used method of broadcast planting. Never underestimate the effectiveness of spreading seed by hand. Many small areas are not adapted to mechanical planting. This is where spreading seed by hand is an effective planting method.

All seeds maybe successfully planted by broadcasting if specific guidelines are observed when using this method. A prepared seedbed is critical if you are the guarantee good seed to soil contact. Following seeding some type of light tillage or culti-packing should be used to help incorporate the seed, improve seed to soil contact and improve germination rate.

Broadcasting works on the principle of centrifugal force and the inherent weight of the seed to distribute it across the site. When planting light fluffy seeds such as Indiangrass and little bluestem you will need to mix your seed with some type of carrier (pelletized lime, rice hulls, fertilizer, cracked corn, cottonseed, hulls, and damp sand) to add weight and help distribute the seed.

Calibration of a broadcast spreader is not as accurate as with drill seeding due to the method of seed delivery used. To calibrate a broadcast seeder determine your bulk seeding rate per acre and convert that to an anticipated seeds per square foot. Place several small tarps at multiple locations across the path of seeder. Operate the seeder across the tarps and check each tarp for the average seed count per square foot. Increase or decrease the rate of seed flow by use of the adjustable gate on the spreader.

Most people realize that stands tend to be poorer with broadcast seeding and usually try to compensate with higher seeding rates. Higher seeding rates typically only increase seed costs and lead to crowded plant populations. Poor stands as a result of broadcast planting normally result from poor seed to soil contact, seeds being covered too deep, and predation from birds and small mammals. Poor stands can be a problem with excessive weed population and the competition for available moisture.

Sprigging

Sprigging refers to a planting operating in which sprigs or rhizomes, stolons, or mature stems of vegetatively propagated species are planted into a prepared seedbed. This operations is done by a machine commonly referred to as a sprigger which uses a disc or coulter to open the soil surface and into which vegetative parts are deposited 1-2" deep. This operation is almost exclusively use when planting improved varieties of bermudagrass, but could be applied to other rhizomatous grasses or plants.

The term sprigging commonly involves two machines, the sprig harvester and the sprig planter. The sprig harvester digs rhizomatous grasses, separates the soil from the roots, and then transfers

the material to a holding trailer. The sprig planter or sprigger will tills and opens narrow strips, spreads the vegetative materials, and crimps them into the soil. For sprigging to be successful having adequate moisture available following planting either by irrigation or rainfall is critical.

Hydroseeder

Hydroseeders are designed to apply seed and some type of mulch in one operation through a water-based slurry system. These systems are used to plant steep slopes, areas where compaction is detrimental, and on sites not accessible by other means. These are self contained units normally mounted on a trailer or truck and composed of a large mixing tank with some type of agitating either by paddles or jets, a motor driven high pressure pump to move the material, and a discharge hose or a stationary gun attached to the unit to apply the material to the site. Delivery hoses allow movement of the slurry materials up to 400 feet, while stationary guns mounted on the units provide a spray range of approximately 200 feet.

Hydroseeding is an expensive operation due to equipment cost, manpower require to operate, and mulching supplies. This method of seeding also requires large amounts of water be available at the planting site. The expense and justification of using these machines is limited to revegetation of highway right-of-ways, steep mineland reclamation, dam and levee face stabilization, and the establishment of lawns.

CONCLUSION

Determining the proper planting equipment based on the site, equipment available, and the type of seed being planted should always be considered by anyone planning or installing a conservation planting. Producers need to spend the time to evaluate and record details about each option and understand the fundamental differences and cost associated with each method.

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