Native Warm Season Grass Establishment

Description:

Native warm-season grasses (NWSG) are grasses historically native to an area that grow during the warm months of the year and are dormant during autumn and winter. Growth for warm season grasses begins when soil temperature reaches approximately 55 degrees Fahrenheit (F). The growth rate increases with the temperature to a maximum of about 90 degrees F. Historically, native warm season grasses were common across the state, but have been largely replaced with introduced cool season grasses.

Benefits:

Research has shown that a greater diversity of wildlife species can be produced with native warm season grasses (particularly when established with diverse native forbs) than with typical cool season grass plantings. Native warm season grasses are classified as bunch grasses that grow upright with bare ground in between. This provides overhead cover for protection, quality nesting structure, and facilitates ease of travel and access to seeds and insects for food. NWSG are an integral component of early successional cover for species such as bobwhite quail, cottontail rabbit, field sparrow, Henslow's sparrow, grasshopper sparrow, indigo bunting, prairie warbler, dickcissel, eastern meadowlark, loggerhead shrike, American kestrel, northern harrier and others. Fields of NWSG and associated forbs (broadleaf herbaceous plants) are also used by wild turkeys for nesting and brood rearing and by white-tailed deer for bedding and escape cover. While several native grass species provide good agricultural forage for livestock, dense grass-only plantings significantly reduce wildlife benefits as does significant disturbance (mowing, haying, intense grazing) just prior to or during the primary nesting season (April 15-August 15).

Recommended Varieties of the Mid-South:

Big Bluestem: Roundtree, Kaw, Oz-70
Little Bluestem: Aldous
Indiangrass: Newberry, Osage, Rumsey
Sideoats grama: El-Reno, Trailway
Switchgrass: Kanlow (upland and lowlands), Cave-in-Rock (lowlands), Durham, Blackwell. Blackwell is preferred for most wildlife plantings, as it is a shorter variety that remains upright through the winter.
Eastern gamagrass: Highlander, Pete, Iuka

Planting Rate:

A seeding rate of 4-6 lbs. /acre (PLS, or pure live seed) of native warm season grasses is sufficient in establishing a stand for conservation purposes (erosion control, wildlife). This is about ½ the seeding rate used to establishment livestock forage. A minimum of three or more species plus native legumes and/or forbs should be used in wildlife plantings. Planting the proper rate is important for both cost and proper establishment. If you are not familiar with calculating the PLS rate from the bulk seed (which usually contains some percentage of inert materials), see UT Extension Publication SP731 or consult with a knowledgeable resource professional such as a TWRA private lands biologist.

Planting Dates:
Native warm season grass stands do best when planted from March through early June. This also falls within the recommended Tennessee-USDA planting dates of March 1-July 1.

pH and Fertilizer Recommendations:
Soil testing of the field should occur using (University of Tennessee or any certified NAPTP Lab). Soil sampling should be done several weeks prior to planting time. Areas of contrasting soils, problem spots or portions of fields significantly different should be sampled separately, provided the area can be fertilized separately. Examples: bottomland and upland. See University of Tennessee publication PB 1061 (UT PB1061) for soil sampling information. If pH is 5.0 or higher apply no lime; if lower apply 2 tons per acre. *Do not apply* nitrogen at planting, as this will stimulate weed competition. Apply phosphate ($P_2O_{5)}$ and potash (K_2O) as recommended from soil sample.

Seedbed Preparation:
Proper herbicide applications should be made to kill existing introduced grasses or problem weeds. Herbicide application the fall prior to planting and just preceeding the spring planting are recommended to adequately eradicate introduced grasses. If the thatch of the field is sparse and only a couple inches high, no further preparation should be necessary before no-till planting NWSG. The no-till method of planting will be scheduled for steeper areas to avoid excessive erosion during establishment. For broadcast seeding the seedbed should be prepared by plowing and disking (or harrowing), then rolling or cultipacking, broadcasting seed with a carrier, then rolling or cultipacking again.

Drilling and No-till Planting:
Smooth seeds such as switchgrass can be planted using a conventional drill with the alfalfa box set to place the seed ¼ inch deep. Debearded fluffy seeded species can also be planted with a conventional drill; however, the debearding process will add to the seed cost. Eastern gamagrass seed can be planted with a corn planter. Seed dormancy rates can be an issue, particularly with switchgrass and eastern gamagrass. For more information on dormancy, see UT Extension Publication SP731 or consult with a knowledgeable resource professional such as a TWRA private lands biologist.

The seeding of fluffy seeded species will need to be drilled with a no-till specialized to plant these seeds. These drills have grass seed boxes with dividers and agitators, picker wheels and oversized drop tubes. Conventional drill equipment is not designed to accurately plant stands of the fluffy native grasses.

Seed placement in any drilling is critical. Planting too deep is a common cause of stand failure. Optimum depth is ¼ inch deep, and seed planted deeper than ½ inch are not likely to germinate. When drilling, up to 1/3 of the seed may be left on top of the ground as long as the press wheels are ensuring good seed-to-soil contact.

No-till planting is the preferred method since soil disturbance is lessened, thus reducing weed competition and soil erosion. The drills are available through some soil conservation districts and the Tennessee Wildlife Resources Agency. The drills are usually operated at 4-5 mph, which is slower than row crop drilling.

Native warm season grasses may be no-till planted into fields containing crop residue. All existing vegetation must be eradicated prior to no-till planting into fescue and Bermuda grass fields. Refer to "Fescue Eradication Job Sheet" for no-till planting into fescue.

Broadcasting:
Broadcast fluffy seed (bluestems, indiangrass, sideoats grama) with a drop spreader or cyclone spreader and then cultipack or drag to lightly cover seed. Do not attempt to cover all the seed. When using a cyclone spreader, try mixing seed with various carriers at a ratio of 2 seed units:1 carrier unit. Suggested carriers include pelletized lime, cracked corn, cottonseed hulls or fertilizer.

Evaluating a Successful Establishment:
Native warm season grasses are slow to develop during the first year of growth and should be very sparse, particularly in stands planted for wildlife. Most of the first year growth is primarily root development. An adequate stand is defined as having a minimum of at least 1 native grass seedling and one forb/legume species per four (4) square feet at the end of the second growing season. Weeds may be numerous and expected but will provide excellent wildlife cover. Typically, it is not until the second growing season before native warm season grass will flower and produce seed. Remember, patience is a must!