WARM-SEASON GRASSES

ESTABLISHING AND MAINTAINING PLANTINGS FOR EROSION CONTROL, WATER QUALITY, AND WILDLIFE HABITAT

Conservation Practice Job Sheet

Natural Resources Conservation Service (NRCS) **July 2003**

INTRODUCTION

Warm-season grasses produce most of their growth during the warmest months of the year, typically from June through early September. Many warm-season grasses are deep rooted, long-lived perennials with considerable tolerance to relatively low pH, low fertility, and drought. Warm-season grasses grow best on deep, well drained soils, although a few species will tolerate poorly drained soils.

Warm-season grasses, either alone or in combination with legumes and/or wildflowers, can be planted to reduce soil erosion and sedimentation, improve water quality, provide wildlife habitat, provide forage, and beautify an area. Stiff-stemmed warm-season grasses can serve as a barrier to erosion and can trap sediment carried by water and wind. Warm-season grasses with a bunch-type growth form provide excellent nesting and protective habitat for many species of birds, as well as a food source of seeds and insects.

When properly managed, warm-season grasses provide high quality forage. They are recognized as an important summer component of a pasture management system. They can also be harvested and stored as hay. In addition, warm-season grasses are used for beautification. Many species serve as ornamental plants in landscaping around homes and businesses.

Warm-season grasses can play a significant role in conservation and agricultural production. However, establishment and maintenance requirements are significant and should be considered. First-time users of warm-season grasses must pay special attention to the details of managing these grasses (mowing, weed control, etc.) while they are becoming established. Full establishment usually takes two to three years. Once established, mature stands that are not regularly harvested (not hayed or grazed) may pose a fire hazard. Firebreaks of cool-season grasses may need to be maintained around buildings, woodlands, or other locations as appropriate.

This job sheet provides instructions for planting and maintaining warm-season grasses in good condition so they can serve their intended purpose. Using proper planting and management techniques, especially during the establishment years, will significantly improve plant health, reduce weed problems, and increase the likelihood of success.

SITE PREPARATION

Before planting, it is essential to reduce competition from other vegetation that may be present on the planting site, such as grasses or weeds. Warm-season grass seedlings are slow to establish, and can be easily out-competed by faster growing weeds and most cool-season grasses. The type and density of the existing vegetation will determine how much pre-planting control is needed.

It's important to allow adequate time to complete this process. If significant quantities of noxious or aggressive weeds or invasive plants are present, be aware that you may need a year or two to control them before you can plant, especially if you will be planting a large area. By state law, noxious weeds in Maryland are Johnsongrass, shattercane, Canada thistle, bull thistle, plumeless thistle, and musk thistle.

For more information about controlling specific weeds in grass plantings, contact your local office of Maryland Cooperative Extension; the Maryland

Land owners and managers please note: *If you received cost-sharing for your grass planting, be sure to check with your funding agency/organization for specific maintenance or management requirements.*

Department of Agriculture, Weed Control Section; or the Maryland Department of Natural Resources, Wildlife and Heritage Service.

Cropland Sites

If warm-season grasses will be planted into a clean, relatively weed-free area, then competition from existing vegetation should not be a concern. However, a cover crop or nurse crop may be needed for erosion control and/or to reduce future weed competition (see page 3).

Take into account any noxious or aggressive weeds in cropland that might have been suppressed (but not killed) with previous herbicide applications. If live rootstocks are present, these weeds may be very difficult to kill in a new planting without destroying the desirable plants. If you think you may have a noxious weed problem, or if you don't know the field's weed history, it may be prudent to wait one full growing season to see what comes up. Use an appropriate herbicide to treat weeds if they occur, then plant the warm-season grasses.

Sites with Existing Vegetation

If warm-season grasses are going to be planted into existing vegetation (for example, other grasses or weeds), you will need to reduce competition before planting. For sites that need extensive preparation, much of the work can be done during the fall prior to spring planting.

Mow or brush hog the field or planting site. Then either treat the area with an appropriate herbicide or cultivate the planting area to reduce competition.

Using herbicides. Choose a non-selective herbicide such as glyphosate (for example, Roundup, KleenUp). A selective herbicide such as Plateau may be used instead, depending on the species of warm-season grasses, legumes, and wildflowers you are planting, and the species of weeds you are trying to control. Follow all label directions when using herbicides, and consider herbicide persistence (carryover) as it may affect new plantings.

For extremely vigorous turf or weeds, you should plan to make one application of herbicide in early fall, followed by another the next spring before planting. Or, if you make the first herbicide application in the spring, you should plan to make a second application a few weeks before planting, if needed.

Do not plant the warm-season grasses until the competing vegetation is sufficiently controlled. It is much easier to control the competition before planting than afterward. Cultivation of the planting area may be needed following herbicide treatment if the dead plant matter is very thick and will be difficult to plant through. You may also need to re-spray after cultivation if weed seeds brought to the surface germinate.

Using cultivation only. If you do not want to use herbicides, then you will need to cultivate the field or planting site. Cultivation is usually less effective than herbicides for killing heavy sod or persistent weeds. Also, bare ground produced by cultivation may be subject to erosion and can provide a good seedbed for more weed growth. If necessary, use a cover crop or nurse crop (see page 3) to control erosion and help suppress weeds.

Herbicide Carryover

Carryover from herbicide treatments (recently applied or from prior years) can pose a threat to new plantings. Seedlings are particularly sensitive to herbicide carryover. Herbicides such as Basagran, Blazer, Poast, Plateau and Roundup have low persistence and generally do not pose a risk for carryover. Herbicides such as Atrazine, Preview, Canopy, Classic, Lorox Plus, Command, Scepter and Treflan have medium to high persistence and can pose a risk of carryover. The persistence of herbicides is directly affected by factors such as soil pH and moisture. To assess risks before planting, read the herbicide label or contact the manufacturer for specific information on persistence.

PLANTING

Planting Dates

Recommended planting dates range from late winter to late spring, and may include fall plantings. Most warm-season grasses are usually planted in the spring. Warm-season grasses need a soil temperature of at least 50 degrees F in order to germinate. If soil temperatures are colder than 50 degrees, or moisture is not adequate, the seeds will remain dormant until conditions are favorable.

Before deciding on the best planting date for a site, consider the need for weed control vs. the likelihood of having sufficient moisture for germination and growth of grass seedlings. Where weeds are likely to be a problem, planting in mid to late spring will allow more time for emergence and control of cool-season weeds before planting. On droughty sites, plantings made during late winter to early spring are more likely to have the soil moisture necessary for seedling establishment.

To obtain recommended planting dates for your area, contact your local NRCS Field Service Center.

Types of Seed

Many warm-season grasses (for example, big bluestem, little bluestem, and indiangrass) have fluffy or chaffy seeds that are best planted by using a specially designed native grass drill. Native grass

drills have picker wheels in the seed box that stir the seed and push it down into the large drop tubes.

Other warm-season grasses (for example, switchgrass, coastal panicgrass, and deertongue) have small, relatively "clean" seeds that can be planted by using a conventional grass drill or cultipacker-type seeder. A grain drill may also be used if it can be properly calibrated to plant small seeds at the recommended rate. Eastern gamagrass has a large, clean seed that can be drilled with a corn planter.

Warm-season grasses are sold in pounds of Pure Live Seed (PLS). PLS = (purity x germination)/100. PLS is important because native grass seed tends to be significantly lower in purity and germination than the seed of cool-season grasses.

Some native grasses (such as eastern gamagrass) are especially slow to germinate, and should be "stratified" before planting. Stratification involves placing the seed in a moist material at a specified temperature and period of time to simulate natural conditions. Stratification can be a do-it-yourself project, but most people find it is easier and more reliable to purchase "treated" (pre-stratified) seed. Stratified seed must be planted very soon after treatment because the seed is moist and tends to get moldy.

Seed Availability

Seeds of many species may be available throughout the year, but supplies are usually best from late winter to early spring. Don't wait to buy seed until the day you are ready to plant. Local seed suppliers may not always have the species or varieties you want. You may need to order your seeds by mail or on the Internet. Contact your local NRCS Field Service Center if you need the names of suppliers. Store all seed in a cool dry place before planting.

Using a Cover Crop or Nurse Crop

If erosion is a concern, use a cover crop or nurse crop of 20 to 40 pounds/acre of oats, barley, or wheat. Oats are the preferred nurse crop for warm-season grasses because they are less competitive than the other small grains. Plant the small grain as a cover crop at the higher rate in the fall prior to a spring planting of warm-season grasses, or at the lower rate as a nurse crop along with the warm-season grasses.

If erosion is <u>not</u> a concern, a cover crop or nurse crop can be planted at the lower seeding rate to help suppress weeds.

Planting Methods

Generally, the best method for establishing warm-season grasses is to use a no-till planter to drill seed into existing cover (for example, into a cover crop, crop residue, chemically killed weeds or grasses, etc.). No-tilling into undisturbed soil greatly reduces the germination of annual weeds and minimizes erosion, especially where slopes are 6 percent or more.

No-till planting into plant residue. On sites where existing vegetation was killed with herbicide or there is crop residue from previous years, no-till the warm-season grasses directly through the dead residue. Add a nurse crop as needed to control erosion and/or suppress weeds. If you must work up the soil because the residue is too thick to plant through, it is strongly recommended that you use a cover crop or nurse crop.

No-till spring planting into a fall cover crop. In the fall, prepare a seedbed by working the soil with a plow, disk, or similar equipment. Continue tillage until a reasonably uniform seedbed is prepared. Then plant a cover crop. In the spring, no-till the warm-season grass seed into the cover crop. (If the cover crop is tall, mow it first and no-till into the stubble.) If aggressive or noxious weeds have developed since the previous fall, use an appropriate herbicide to treat them before planting.

Broadcast planting. If necessary, warm-season grasses can be planted by broadcasting onto a conventionally prepared seedbed. Broadcast seed onto a well-prepared, firm seedbed. Grasses with small or fluffy seeds may need to be mixed with a filler (for example, sawdust, finely ground corn, or slightly moistened peat moss) to achieve an even distribution of seed. Incorporate the seed into the soil 1/8 to 1/4-inch deep by cultipacking, raking, or dragging. Broadcasting is usually less successful than no-tilling because it is more difficult to get good seed placement in the soil. Do not broadcast eastern gamagrass. It needs to be drilled 1/2 to 1-inch deep.

Lime and Fertilizer

Warm-season grasses are much more tolerant of poor site conditions than most cool-season grasses. It is usually not necessary to add lime to native grass plantings, provided the soil pH is 5.0 or above. A pH of 5.5 to 6.5 is ideal for most species.

Similarly, phosphorus (P_2O_5) and potassium (K_2O) should only be applied if a soil test indicates that these nutrients are in the <u>low</u> range. Remember that the use of commercial fertilizer and other forms of plant nutrients must be in compliance with Maryland nutrient management regulations, as applicable. For additional information, consult with your local Maryland Cooperative Extension specialist or certified nutrient management consultant.

Warm-season grasses need very little nitrogen. Do <u>not</u> apply any nitrogen at the time of planting because it will only encourage weed growth.

PROTECTING PLANTS

Use fences and other exclusion devices to control livestock and human access to the planting, at least until it is well established. Many types of fences and exclusion devices are available. Contact your local NRCS Field Service Center for recommendations for your site.

MAINTENANCE AFTER PLANTING

Warm-season grasses usually take two to three years to become fully established. During that time, weeds can be a major problem.

The goal of weed control is to reduce (but not eliminate) competition from broadleaf and grass weeds such as mare's tail, ragweed, dandelion, foxtail, crabgrass, etc. Many of these plants provide good food and wildlife cover, but if they get too tall and dense, they will shade out the warm-season grass seedlings. Don't wait until weeds are four feet tall before trying to control them. Mowing them at that stage will produce so much plant litter that you may smother the seedlings.

Planting Year

Do not let weeds get taller than 18 inches. Control weeds by mowing or by treating with an appropriate herbicide. Mow at a height of 4 to 6 inches or just above seedling height. ***Do not mow the seedlings!*** Discontinue mowing after early August unless you can set the mower high enough to stay above the seedlings.

Selective herbicides can be sprayed over the planting to control specific weeds. Herbicides are most effective when weeds are young and actively growing. Be sure to read and follow all label directions. Many warm-season grasses and wildflowers are Plateau-tolerant, but some are not (for example, switchgrass). A broadleaf herbicide such as 2,4-D can be used to kill weeds in a grass planting, but it will also kill most legumes and wildflowers in the stand. Also, 2,4-D may seriously damage grass seedlings if they are not past the 4 to 5 leaf stage. Do not apply herbicides on windy days when spray drift can damage nearby plantings.

Control noxious weeds as required by Maryland state law.

Second and Third Year After Planting

If your planting site previously contained cool-season grasses (for example, tall fescue), some of these plants may persist. Inspect the planting in early spring. If unwanted cool-season grasses comprise more than 25 percent of the stand, either treat with an appropriate herbicide or keep the area mowed very short until the warm-season grasses start to green up. (Note: While the warm-season grasses are still dormant, Roundup can be used to kill cool-season grasses, but it will also kill most legumes or wildflowers that are growing.)

Throughout the growing season, mow as needed above seedling height (about 8 inches or so) to keep weeds under control. Always avoid damaging the plantings during mowing and herbicide applications.

If weed pressure is very low, you can apply 40-60 pounds/acre of nitrogen to stimulate growth of the warm-season grasses. Apply lime, phosphorus, and potassium only if soil tests indicate that they are needed (i.e., pH is less than 5, or P and K test results are in the "low" range).

Continue to control noxious weeds as required by Maryland state law.

Fourth Year and Beyond

The warm-season grasses should be well established by this time. Established stands require very little frequent attention, but most need occasional management to rejuvenate the stand and to keep trees and shrubs from invading.

The type and frequency of management will depend on the purpose of the planting. Dense stands of grasses are useful for erosion control and sediment trapping, but may be too dense to provide good wildlife habitat for feeding and nesting. For optimum wildlife habitat, you may need to periodically "thin" the grass stand and stimulate regeneration of wildflowers and legumes. All management practices should be conducted outside of the primary nesting season for birds and ground-nesting wildlife (April 15 - August 15).

For optimum water quality benefits, you should maintain a dense stand of grasses and, where feasible, use management practices such as haying and flash grazing to remove nutrient-rich top growth from the site.

Prescribed burning. This is the most effective management technique for removing accumulated plant litter and controlling woody plants. Where feasible, a warm-season grass stand should be burned once every three to four years. Prescribed burning requires a permit and may not be allowed in some areas. Contact your local office of the Maryland Department of Natural Resources, Forest Service, for current information concerning permits and assistance for this practice.

Prescribed burning requires the use of firebreaks that are usually 12 to 15 feet wide. Firebreaks can either be bare ground that is disked up just before burning, or a mix of cool-season grasses and/or legumes. Contact your local NRCS Field Service Center to obtain information about cool-season mixes for firebreaks.

Mowing. Where burning is not feasible, mowing can be used to control woody growth. For optimum wildlife benefits, mow on a 2 to 3 year rotation, so that only 1/3 to 1/2 of the planting is mowed each year. The remaining unmowed areas will provide year-round wildlife food and cover. The best time to mow is late winter to early spring, preferably in March. This will allow grasses to provide protective cover for wildlife during the winter. On sites where soils are usually too wet in the spring, you can mow in the fall after the grasses are dormant (usually beginning October 1), when soils are dry. Do not mow during the primary nesting season (April 15 - August 15).

Tall warm-season grasses such as big bluestem, indiangrass, switchgrass, coastal panicgrass, and eastern gamagrass produce large quantities of top growth. Mowing these grasses is not an effective technique for maintaining the stand unless the cuttings are removed. If the cuttings are not removed, they can smother new growth.

Light strip disking. Light strip disking can be used to maintain a warm-season grass planting in a condition that will encourage the growth of plants and insects that provide wildlife food and cover. When performed correctly, light strip disking will:

1. Temporarily reduce the density of the warm-season grass plants;
2. Provide openings in the planting for movement of quail, pheasants, and other wildlife; and,
3. Increase plant diversity by partially exposing the soil surface. This will encourage the germination of broadleaf flowering plants such as goldenrod, aster, blackeyed susan, annual lespedeza, and partridge pea. Broadleaf flowering plants provide good habitat for native pollinators. These insects and others also serve as important protein sources for adult birds and their young.

Depending on site conditions, plantings may need to be strip disked every three or four years to thin the stand. Before disking, mow the area that will be disked. Then lightly disk to leave a minimum of 50% plant residue remaining on the soil surface after disking has been completed. Disk a strip in one or two passes. Run disk gangs almost parallel to the direction of travel, and at a shallow depth of 2-3 inches. Do not use a heavy offset plowing disk. The purpose of light disking is to disturb the soil surface, not to prepare a conventional seedbed.

Disked strips can be up to 60 feet wide (depending on the size of the planted area), laid out on the contour in an alternating pattern of disked and undisked strips. Undisked strips should be at least twice the width (for example, at least 120 feet wide) of the disked strips.

For best results, strip disk in late winter to early spring, preferably in March. This will allow grasses to provide protective cover for wildlife during the winter. On sites where soils are usually too wet in the spring, you can disk in the fall, beginning October 1, when soils are dry. Do not strip disk during the primary nesting season (April 15 - August 15).

Grazing. Livestock can be used to manage a warm-season grass stand, even if the stand was not primarily intended for livestock forage. Warm-season grasses are best grazed during July and August. Initial grazing should not begin until the plants are 15 to 24 inches tall. Graze down to 6 inches, and allow regrowth to 12 inches before grazing again. The final grazing height should be about 9 inches to allow sufficient recovery before dormancy.

To minimize adverse impacts on wildlife, graze only 1/3 of the stand each year. When properly managed, grazing livestock have minimal impacts on nesting birds and other wildlife. Therefore, grazing is acceptable during the nesting season, *provided that the area is not overstocked or overgrazed.*

Weed control. If it becomes necessary to control weeds during the nesting season (for example, noxious weeds), contact your local weed control specialist concerning recommendations for spot-treating the weed problem. Noxious weeds must be controlled at all times according to Maryland state law.

For more information about controlling specific weeds, contact your local office of Maryland Cooperative Extension, or the Maryland Department of Agriculture, Weed Control Section.

Please note: Brand names are mentioned in this jobsheet for informational purposes only. NRCS does not intend any endorsement of brands mentioned, nor criticism of similar products not mentioned.

PLANTING PLAN for WARM SEASON GRASSES		
Name:	**Farm No.:**	**Tax Map:**
	Tract No.:	**Parcel:**
Address:	**Primary Purpose(s):** ☐ **Erosion Control** ☐ **Water Quality** ☐ **Wildlife Habitat for:**	**Recommended Planting Date(s):**
Assisted by:		
Date:		

Planting Area (Field # , Firebreak, etc.)	**Acres**	**Species**	**Cultivar (if any)**	**Seeding Rate (lbs/ac)**	**Total Quantities Needed**
Nurse/Cover Crop		**Oats, Barley, or Wheat** *(oats are preferred because they are less competitive)*		**20 - 40**	

Additional Recommendations/Notes: