

Native Warm-Season Grasses Georgia Alabama South Carolina



**Jimmy Carter Plant Materials Center
Americus, Georgia**

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**Native Warm Season Grasses
for
Georgia, Alabama and South Carolina**



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This resource guide serves as a tool for selecting and establishing native warm season grasses in Georgia, Alabama and South Carolina. The guide is a description of native warm season grasses that are adapted to Southeastern conditions. The plant materials technology includes information on optima seeding rates, management, using native grass drills and conventional drills for switchgrass and eastern gamagrass seed. The guidelines in this document are to be used by NRCS Field Offices to supplement the field office technical guide (FOTG) regarding native grasses. This guide is an evolving document that will be updated as new information is available and as new plant materials are developed and tested at plant materials centers.



Native Warm-Season Grasses

In Georgia, Alabama, South Carolina

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INTRODUCTION

Historically, all forage production and landscape cover in the area east of the Mississippi River has been accomplished through the use of introduced grasses and legumes. In the Northeastern US species from the European or Mediterranean areas have predominated, while species of tropical or subtropical origin have been commonly used in the Southeastern US.

In recent years interest in the use of a number of native grasses has increased. Species of interest include: switchgrass (*Panicum virgatum*), indiangrass (*Sorghastrum nutans*), eastern gamagrass (*Tripsacum dactyloides*), big bluestem (*Andropogon gerardii*), and little bluestem (*Schizachyrium scoparium*). These grasses are currently used on rangeland and planted pastures in the West Central United States. It has been proposed that these grasses have potential for pasture, hay, erosion control, biomass, wildlife habitat, and as a plant material for riparian buffer strips in the Southeast. A significant amount of data on native warm season grasses has been accumulated by USDA-Natural Resources Conservation Service, Plant Materials Centers in the Southeast. Much of this has been oriented toward erosion control, grazing land, wildlife, establishment, and management.

The use of native warm season grasses has become a top priority across the nation. NRCS has emphasized their use in several programs, such as, CRP and WHIP. However, many field office personnel are unfamiliar with the most widely used native grasses such as switchgrass, indiangrass, big bluestem, little bluestem, and eastern gamagrass.

Native warm season grasses have the potential of producing forage for small farmers in the Southeast with less commercial nitrogen (N) fertilizer in a low-input system.

IDENTIFICATION AND DESCRIPTION

Of the many native warm season grasses, switchgrass, big bluestem, indiangrass and eastern gamagrass show the most potential for the southeast. All are called warm season grasses because of their adaptation to warm day climates, but they differ in their seasonal production of forage. In general, eastern gamagrass and switchgrass greens up and mature earliest, while big bluestem is intermediate and indiangrass matures latest. Unlike tall fescue and other cool season grasses, warm season grasses are most productive from June to early September. Therefore, a combination of separate cool and warm season pastures can be managed to supply a more constant supply of high quality forage throughout the season than either cool or warm season grasses alone.

Native grass seedlings have very low vigor and do not compete well with weeds. Consequently, switchgrass, big bluestem and indiangrass are moderately difficult to establish and may need two years before they can be hayed or grazed. In exceptional years, plantings may establish well enough to allow grazing in the first year.

Warm season grass pastures will not withstand continuous, close grazing or close clipping without reducing yield the following year. Rotational grazing is necessary to maintain productive warm season grass stands.

In return for careful management, a farmer can produce two to four tons of forage per acre on well-fertilized, warm season grasses between late June and early September. Assuming a mature cow requires 30 pounds of forage per day, one acre of warm season grass can supply sufficient forage for two cows during the summer. During low rainfall or long drought periods, native warm season grasses provide forage for grazing.

Big Bluestem (*Andropogon gerardii*)

Big bluestem is a warm season, rhizomatous, perennial bunch grass 4 to 6 feet tall. One of the best features used to identify this grass. Leaf blades are long and flat. Seedheads consist of 2 to 3 distinct racemes on top of the stem and resemble the toes of a turkey's foot which suggests another common name, turkey-foot grass. The seedhead has three racemes that resemble a turkey's foot. Seed are relatively dark and hairy. Big Bluestem grows on a wide variety of soils and is extremely drought-tolerant, with root systems that may grow 12 feet deep. Big bluestem provides excellent wildlife habitat and quality forage for livestock.



Big Bluestem





Eastern Gamagrass

Eastern gamagrass (*Tripsacum dactyloides*)
Eastern gamagrass is a robust warm-season, rhizomatous perennial grass that grows from 5 to 9 feet in height. It may reach 6-8 feet in height, producing conspicuous stools up to 4 feet in diameter. Over time, stool size increases with age and the center will lack stems and leaves. Eastern gamagrass will grow to 5-9 feet tall. The seedhead is comprised of two or three terminal spikes 6-10 inches long. Leaf blades are 12 to 24 inches long and 3/8 to 1/2 wide, flat and have a pronounced midrib. Eastern Gamagrass is extremely deep-rooted and drought tolerant. It grows best on relatively moist, well-drained fertile soils, but does not tolerate standing water for long periods. 'Highlander' 'Pete' and 'Iuka' are cultivars well suited for Georgia, Alabama and South Carolina. Cattle like it so well, grazing should be closely monitored to keep stand from being grazed too hard. 'Pete' can produce up to 16,000 pounds of dry matter per year.



Indiangrass

Indiangrass (*Sorghastrum nutans*)
Indiangrass is a rhizomatous, perennial warm season grass. It attains heights of 4 to 7 feet. Indiangrass is typically 4 -7 feet in height. Leaves are flat and narrow at the base, growing 10-24 inches long. The seedhead is golden bronze to yellow, 6-12 inches long, and usually formed in late August. The seed are tan and very fluffy. Indiangrass produces a deep root system and is quite drought-tolerant. Indiangrass provides quality wildlife habitat and quality forage for livestock.



Little Bluestem

Little Bluestem (*Schizachyrium scoparium*)
Little bluestem is a warm season bunch grass that is perennial and grows between 2 and 4 feet in height. Leaf blades are flat and are from 6 to 10 inches long and 1/8 to 1/4 inch wide. The stem is flattened at the base and often red or purplish during early growth. Mature plants are reddish-brown. Little bluestem seed also appear hairy. Little bluestem grows on a side variety of soils and is one of the most attractive grasses in summer and fall. Little bluestem provides quality wildlife habitat and has great potential for landscaping and erosion control on poor, droughty soils. It is an important forage grass that is grazed readily by livestock, deer. Small game, such as, rabbit and quail can be found in stands of this grass.

Switchgrass (*Panicum virgatum*)

Switchgrass is a warm season, rhizomatous, perennial grass that ranges in height from 3 to 6 feet. Switchgrass typically reaches 3-6 feet in height. Switchgrass is an early-maturing warm-season grass, flowering in early to mid June. Switchgrass is adapted to a wide variety of soils and site conditions. With an extensive root system, switchgrass is extremely drought-tolerant, but also does well on relatively wet sites with at least one cultivar ('Kanlow') tolerant of extended flooding. Seed from switchgrass are small, smooth and hard, somewhat resembling millet in size and color. There are many cultivars of switchgrass. 'Kanlow' (uplands and lowland) and 'Cave-in-Rock' (uplands are well suited for wildlife cover and livestock forage. It is a bunch grass with flat leaf blades about 1/2 inch wide and 30 inches in length. It is a good cover plant for birds and some small game. 'Alamo' is a good forage on sites in coastal plain and Piedmont regions. It can be used for forage, conservation buffers, streambank stabilization, filter strips and wildlife.



Switchgrass

ESTABLISHMENT OF NATIVE WARM SEASON GRASSES

Native warm season grass may need special attention given for purchasing and planting seed, and for management of established stands. The following features are important to note which make warm-season grass planting different from other traditional plantings:

- Planting rates for warm season grasses are based on pure live seed (PLS) lb/acre and **NOT** bulk lb/acre.
- All warm-season grasses require a firm seedbed for best establishment.
- Traditional seeding equipment works well for switchgrass and eastern gamagrass, but fluffy-seeded species such as big bluestem, little bluestem and indiangrass require special equipment and/or techniques for successful seedings.



Switchgrass (*Panicum virgatum*)





Planting Eastern gamagrass at the Jimmy Carter Plant Materials Center.



Eastern gamagrass 3 months after planting.



Eastern gamagrass InterCenter Strain Trial (clipping in progress) to determine dry matter production from 13 accessions and one standard called 'Pete'. The dry matter yield for all accession averaged 13,726 lbs./Ac. One accession from Montgomery, AL produced 17,000 lbs./Ac. of dry matter yield.

PURCHASING SEED

It is best to purchase certified seed of varieties adapted to the region of planting. Certified seed is guaranteed to be true to a variety, and use of certified seed may lead to a more reliable planting. It is best to order different species and varieties separately instead of pre-mixed because seeding and management specification will differ between species.

Warm season grass species should be purchased on a pure live seed (PLS) basis. Do not confuse 12 lb PLS/acre with 12 bulk lb/acre. Failure to recognize PLS when purchasing seed and figuring seeding rates may yield unexpected results.

TIME OF SEEDING

Warm season grasses are best established during March through May. Early planting is critical even though warm season grasses do not germinate until soil temperatures are above 50 to 55 degrees F. Avoid planting after June 1 because moisture and weed competition may delay stand establishment.

Early establishment allows seedlings to develop good root systems before summer drought and greatly increases the ability of the grasses to compete with weeds. Irrigation (if available) should be applied when soil conditions are very dry to enhance seed germination and stand establishment.

Native grass seed typically contains higher percentages of dormant seed than cool season forages. Planting early into cool soil will chill the seed and may help dormant seed to germinate.

Seeding into warmer soil in late spring can be helpful in controlling weeds. The first flush of weeds is allowed to germinate and then is killed by final tillage or contact herbicide just prior to planting. Ideally, this practice would result in the shortest period of bare ground and would get grass seedlings up as quick as possible to compete with other weeds.

SEEDBED FERTILITY

Warm season native grasses can be productive on low fertility soils, but fertilization will increase plant vigor. Soil test the field prior to planting or cultivating. The pH should be adjusted to a range of 5 - 6 if needed. Incorporate lime in the fall to allow it time to adjust pH before planting in the spring. Fertility up to medium levels for phosphorous (P), and potassium (K). Incorporate P and K into the soil at planting time. Do not apply nitrogen (N) at or before planting time. Nitrogen and phosphorous have been shown to increase productivity. However, nitrogen promotes weed growth, as well. Unless weed competition is low, N should be excluded the first year until a stand becomes established. The only exception for N application is planting critical sites, such as log decks, log roads, skid trails and other impoverished soils.

In addition to the above guidelines, follow the fertilizer and lime recommendation in your state. Consult your Field Office Technical Guide (FOTG) for more specific information based on site and soils.

SEEDBED PREPARATION

Native warm season grasses are best established by creating a tilled, firm seedbed. It is best to remove all vegetative cover through the use of approved herbicides or extensive tillage. Seedbeds should be adequately plowed, disked and packed prior to planting. A cultipacker works well for firming the seedbed. If a prepared hard seedbed is rained on before planting, harrow and cultipack again before planting.

EQUIPMENT USED FOR SEEDING

Ideally seed will be drilled into a prepared seedbed. Switchgrass may be planted with a conventional drill because it has a hard, smooth seed coat. Conventional drills equipped to seed alfalfa work well. Eastern gamagrass seed is about the size of corn seed and is best planted with a corn planter. Big and little bluestem and indiangrass seed have appendages with fine hair and will not pass through conventional equipment unless they can be ordered as "debearded" or brushed seed. Debearded seed may pass through a conventional drill, though it may still be best to use a special drill designed for fluffy seed. Seed drills advertised as "native grass drills", such as a Tye or Truax drill, have special boxes equipped with picker wheels and augers which help prevent seed from sticking together and move the seed to the drilling mechanism. Native seed drills have multiple boxes, which allow for the planting of both switchgrass and fluffy seeded species at the same time. Switchgrass, indiangrass, and big and little bluestem should be seeded at 1/4 to 1/2 inch deep. In sandy soils be especially careful not to bury seed too deep! Eastern gamagrass is usually seeded at 1/2 to 3/4 inches deep. Planting native grasses with conservation tillage equipment is not recommended at this time.

If a seed drill is not available, seed may be broadcast over a site. Broadcast fluffy seed (bluestem and indiangrass) with a drop spreader or cyclone spreader and then drag to lightly cover seed. If you are using a cyclone spreader, try mixing seed with inert matter such as kitty litter or sawdust for better spreading. Successful broadcast seeding can be achieved by increasing seeding rate and by rolling or cultipacking before and after seeding. When planting a small area (1/4-acre) in droughty conditions, an optional step to enhance the stand would involve lightly mulching the seeded area.



SEEDING RATES

Warm season grasses species vary in their growth characteristics. This makes it more difficult to manage mixtures for pasture or hay use, so only one species should be seeded per field. In areas planted for wildlife and erosion control the management of mixtures is not as critical. Information is being developed on the use and adaptability on establishing native grasses in mixtures.

Seeding rates for pasture and hay, wildlife, critical area treatment and conservation buffers are found in the Tables 1 and 2.

Table 1: Seeding rate for species planted alone

| Species | Seeds/lb. | Pounds of Pure Live Seed (PLS) per Acre | | | |
|-------------------|-----------|---|-----------|---------|---------------|
| | | Forage | Wildlife* | Buffers | Critical Area |
| Big bluestem | 165,000 | 7 | 3 | 7 | 8 |
| Little bluestem | 255,000 | 7 | 3 | 7 | 8 |
| Switchgrass | 389,000 | 6 | 2 | 10 | 10 |
| Indiangrass | 175,000 | 7 | 3 | 8 | 8 |
| Eastern gamagrass | 7,800 | 14 | 7 | 14 | 14 |

* For best results plant with mixed species listed in Table 2.

Table 2: Seeding rate for mixed species plantings

| Species | Seeds/lb. | Pounds of Pure Live Seed (PLS) per Acre | | | |
|----------------------------|-----------|---|------------|-----------|---------------|
| | | Forage | Wildlife | Buffers | Critical Area |
| Big bluestem | 165,000 | 4 | 1.5 | 4 | 7 |
| Little bluestem | 255,000 | 3 | 1.0 | 3 | 7 |
| Switchgrass* | 389,000 | 4 | 0.5 | 3 | 5 |
| Indiangrass | 175,000 | 4 | 1.5 | 3 | 7 |
| Eastern gamagrass* | 7,800 | ** | ** | 4 | ** |
| Forbs | | NA | 1-3 | NA | NA |
| Total lbs PLS / Ac. | | 15 | 5.5 | 17 | 26 |

* Switchgrass and eastern gamagrass should not be pre-mixed with fluffy-seeded species

** Eastern gamagrass is best when used alone for these applications

SEED QUALITY

Warm season grasses can be quite variable in germination rate and the purity of seed. Pure Live Seed (PLS) should always be used when purchasing seed and to determine the bulk amount of seed necessary for a planting. It may be necessary to increase your seeding rate to provide the recommended rates of pure live seed.

Read the seed tag to determine contents of the bag and seed quality. From the tag you can obtain information on **% germination, % inert material, % other seed,** and **% weed seed.** With this information you can compute the **percent pure live seed and pounds of bulk seed** required.

RECOMMENDED VARIETIES OF NATIVE WARM SEASON GRASSES FOR USE IN GEORGIA, ALABAMA AND SOUTH CAROLINA

Big bluestem

- 'Rountree' Preferred variety for hay production, adapted to the southeast, good seedling vigor and forage productivity. Matures two weeks earlier than 'Kaw'. Origin: Iowa. Recommended for wildlife plantings in a mixture (3 lbs PLS/ac) with other native grasses.
- 'Kaw' Preferred pasture variety; adapted in most of the southeast, especially to drought sites. Not recommended as a pure stand but in a mixture (3 lbs PLS/ac) with other native grasses. Origin: Kansas.

Little bluestem

- Cimarron Preferred variety for wildlife plantings. Adapted to the southeast.
- Aldous Not well adapted in most of the southeast. Can be used for wildlife plantings in a mixture with other native grasses. Not recommended for forage. Demo plantings in South Carolina have been successful.

Indiangrass

- 'Lometa' Preferred variety for the southeast. Good seedling vigor and superior forage production given normal rainfall. Survival and production is better than 'Rumsey' and 'Cheyenne' at the Jimmy Carter Plant Materials Center. Recommended for forage, buffers, wildlife plantings and critical areas.
- 'Rumsey' Survival and production not as good as 'Lometa'. Not recommended as a pure stand but in a mixture with other native grasses for forage. Can be planted in mixtures for wildlife plantings.
- 'Cheyenne' Not a certified variety, although noncertified seed is available. The performance in most of the southeast is not as good as 'Lometa' or 'Rumsey'. Recommended use is in mixed stands for wildlife plantings on drought sites. Not recommended for forage.
- 'Oto' Not well adapted in most of the southeast. Can be used for wildlife plantings in a mixture with other native grasses. Not recommended for forage. Origin: Nebraska.





‘Americus’

It is a native of the southeast (Georgia and Alabama). It has a wide range of adaptation and performs better than 'Lometa' in most sites in the southeast. Competes well with 'Pensacola' bahiagrass. Performs better than bahiagrass on drought sites. Recommended in pure stands. Conservation uses include: forage, buffers, wildlife, urban landscapes and critical areas. This accession is scheduled for release in 2-3 years. It is the only indiagrass variety that is native to the southeast.

Eastern gamagrass

'Pete'

Adapted to most of the southeast. It can be used for forage, silage, hay, nutrient reclamation from lagoons and municipal spray fields because of good nitrogen and phosphorus uptake. Used for urban conservation during the 1996 Atlanta Olympics for beautification and erosion control. Can be used for conservation buffers.

'Tuka'

'Tuka' is a new variety and its full range of adaptation is unknown at this time. The plant materials centers have established plantings to determine the performance and adaptation in the southeast. Pete is the preferred variety at this time.

‘Highlander’

‘Highlander’ is a new variety that is adapted for use in the eastern part of the United States. It can be used for forage, erosion control, wildlife habitat, and water quality improvement.

‘San Marcos’

‘San Marcos’ was originally collected in 1964 from a native stand in Hays County, Texas near the town of San Marcos. San Marcos is a tetraploid adapted throughout much of Texas and southern Oklahoma where low land types of eastern gamagrass are commonly found. It may be produced successfully in areas of lower rainfall (less than 28") if grown under some type of irrigation system. Its forage value is highly palatable to all livestock and must be managed accordingly to avoid overgrazing.

Switchgrass

'Alamo'

'Alamo' switchgrass is highly recommended throughout the southeast. It has been fully tested for conservation uses and is recommended for forage, buffers, wildlife plantings, critical area treatment, shoreline and streambank stabilization and nutrient reclamation.

'Cave-In-Rock'

'Cave-In-Rock' is recommended in the northern portion of the Southeastern Region. Not as good on critical sites as 'Alamo'. Adapted to lowland and upland sites with good palatability and animal gains. More dormant seed than 'Blackwell' and tends to be slow to establish. It is a good variety for wildlife plantings.

'Blackwell'

Not well adapted in the lower southeastern portion of the Southeastern Region. Can be used in mixed stands for wildlife plantings. Less forage production than 'Cave-In-Rock'. Fine stemmed and rust resistant

'Shelter'

Adapted mostly for wildlife plantings. Not recommended for forage and/or erosion control.

Miami
Stuart
Wabaso

These relatively new pre-varietal releases (source-identified) which are adapted for use in Florida. The conservation uses include forage, wildlife and critical area treatment. These releases are established vegetatively.





SPECIAL USES OF NATIVE WARM-SEASON GRASSES

Erosion Control

On critical areas, warm-season grasses will control erosion. They will provide low maintenance cover on banks and roadsides of state and U.S. highways. Excellent for streambank stabilization and conservation buffers. Native grasses can be used successfully for critical area treatment for urban conservation.

Photo 1 Switchgrass Buffer- conservation buffer/filter strip reduces erosion from adjacent croplands. Use of switchgrass instead of fescue in a filter strip vastly improves it for wildlife cover while retaining all of the erosion control ability.

Photo 2 Alamo switchgrass is used for streambank stabilization at Thurmond Lake in South Carolina

Photo 3 Eastern gamagrass used for municipal wastewater Sprayfield in Bellview/Perry located in Marion County, near Ocala, Florida.

Photo 4 Jones Urban Farms Representative observes/evaluates harvest stage of Sunflower plants in Alabama. Native grasses are used with Sunflowers in a cut-flower arrangement.



Wildlife Habitat

Wildlife biologists and upland game managers use warm-season grasses for game habitat, nesting and holding areas. The stubble of the grasses remains protected “trafficways”. Little bluestem, big bluestem and indiagrass are usually in these seeding mixtures.

For wildlife plantings on fallow and cropland fields and woodland edges use the planting information provided below.



Wildlife planting – Mixture of switchgrass, little bluestem, and indiagrass plants for wildlife after a clear-cut in Abbeville, South Carolina.

SEEDBED PREPARATION

Fallow/Cropland Fields

Till soil to a depth of 3 inches prior to seeding. Follow the procedures described above for seedbed preparation.

Woodland Edges

Establishing food plots along woodland edges can be difficult due to compacted soils and tree roots. Till soil or disk the area to a depth of 3 inches or as much as possible to loosen the soil. Broadcast seed and cultipack to ensure good seed soil contact.

Slopes Greater than 8 Percent

Disk area lightly, no less than 2 inches. Broadcast seed and cultipack to ensure good seed soil contact. Area must be mulched to prevent erosion and loss of seed. Mulch should be applied on slopes at a rate of 1000 lbs./Ac.

Planting Date, Seeding Rates, Fertilizer and Lime

Procedures described above for planting dates, seeding rates and fertility should be followed. The only exception is on highly erodible sites and sites with very poor sterile soils. On these sites use 40 to 60 lbs./Ac of nitrogen to promote growth.

MANAGEMENT OF NATIVE WARM SEASON GRASSES

Grazing Management

Initial grazing of native warm season grasses in the early summer should not begin until the plants are 12 to 15 inches tall. Plants may be grazed no lower than 8 to 10 inches. These are tall grasses and the taller the plants are maintained the more vigorous the forage production that you will have. Grazing lower than 6 inches will result in plants with less vigor. You can graze the plants somewhat more intensely in the late spring to early summer as long as you reduce the grazing pressure in time to permit growth back to 12 inches in late summer and give the grass some rest in the fall. A rest in the fall before frost will provide for a vigorous start the next year.





Rotational grazing (grazing different fields) is recommended to reduce trampling and enhance utilization. A 4 to 6 week rest period allows grasses to recover and light regrowth can occur. In a rotational grazing system regulate to avoid regrowth. The duration of grazing of an individual paddock or field should not exceed 1 week.

DO NOT GRAZE WARM SEASON GRASSES AS CLOSE TO THE GROUND AS TALL FESCUE OR YOU WILL DAMAGE THE STAND. YOU WILL GET MAXIMUM PRODUCTION WITH MODERATE GRAZING INTENSITY.

Hay Management

Switchgrass should be hayed in the late boot stage (usually mid to late June). Bluestem reaches this stage in early to mid July. This produces the best compromise between hay quality and tonnage. It allows regrowth prior to frost, replacing energy reserves in the roots so that the stand can produce a vigorous growth the following year. At the same time, it permits adequate regrowth that can provide wildlife with good winter cover. Gamagrass can be hayed up to three cuttings (early June, July and August); however it needs 45 days rest before first frost. DO NOT cut hay stubble lower than 8 inches to allow the grass to make a more rapid recovery to maintain a healthy stand. If you are emphasizing wildlife in the haying operation, consider leaving a band of unmowed grass adjacent to woody cover, fencerows and drainage corridors.

Prescribed Burning

Native warm season grasses are especially well adapted to management with fire. A spring burn will remove old growth, recycle nutrients tied up in standing dead vegetation, control invasive, control brush invasion, and produce a succulent forage for calves and young stock. Prescribed burning is the most economical method to improve or maintain native grasses. The best time to burn is from December through March. Check with the State Forestry Commission before burning.



Rotational grazing demonstration at the Jimmy Carter PMC



Periodic controlled burning of warm season grasses maintains their vigor, improves palatability for livestock, removes old growth, and helps control invasive weed competition.

Mowing native warm-season grasses can also be an effective way of management. The best time of year to mow is during the fall through late winter. Mow on a three-year cycle where 1/3 of the area is mowed each year.

Do not mow during the spring or summer months because of the nesting season. When mowing, cuts grass no lower than 6 inches and allow stubble to remain until spring to help insulate plant roots and provide cover for wildlife. If native warm-season grasses are cut lower than 6 inches during the active growing season, the stand will be reduced significantly.

Weed Control

Post-planting weed control requires prompt attention especially during the establishment year. Inspect the planting every two to four weeks for weed pressure. Light infestations of foxtail or broad-leaved weeds during the establishment year are generally not considered to be a problem. Severe infestations of noxious or highly competitive weeds, such as crabgrass, may require spot spraying with an herbicide such as glyphosate. There are a few broadcast herbicides available to control weeds in native grass restoration plantings. Plateau™ is a relatively new herbicide labeled for most warm-season grasses, though switchgrass may be sensitive to this herbicide. The use of glyphosate during the winter when warm-season grasses are dormant may be useful for controlling cool-season species such as tall fescue. A combined program of mowing, herbicides, and prescribed burning often provides the best results at controlling weeds.

Weed Control The First Year

Mow the growing plants to a height of 8-10 inches during June, July, and August. This will slow the weeds but won't harm the grasses. It is important to mow early and often to assure adequate control. Mowing height should never be less than 6 inches.

Weed Control The Second Year

Evaluate the stand to determine if mowing for weed control is necessary. If it is, mow to a height of 8-10 inches. For wildlife habitat, do not disturb during nesting season.

If there is enough material for a spring burn, burning may be used for weed control. Spring burns will tend to encourage warm-season species and work well to control cool-season plants. Burn, in the spring, when the cool-season plants are growing and the warm-season plants are just barely starting to grow.



Planting native grasses in Early County, Georgia with drill.



USING NATIVE WARM-SEASON GRASSES FOR WILDLIFE HABITAT

Native grasslands are the most endangered ecosystem in the South. Historically, the region contained vast acreages of native grassland and savannas with scattered trees and shrub cover, which was maintained by fire. Today, that acreage has been replaced with non-native grasses (e.g., tall fescue, orchardgrass and bermudagrass), agricultural crops, forest cover and suburban development. As a result, several wildlife species dependent upon quality early successional habitat have experienced significant declines in population. Native warm season grasses can be used to enhance 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 native warm season grasses 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. Native warm season grasses are established for wildlife primarily because of the structure of cover provided. Suitable cover is more often a limiting factor for species such as quail, rabbits and grassland songbirds than food. Native warm season grasses are not planted as food plots.



Importance of open structure

Because most native warm season grasses grow in “bunches” open space at ground level can provide when bunches are not too dense. As open structure at ground level allows mobility for small wildlife (e.g., quail, rabbits, sparrows and young turkeys) through the field. Dense vegetation and thatch build-up (such as that presented by perennial cool-season grasses) inhibits movement and makes finding food (seed and invertebrates) difficult. When these conditions prevail, the number of animals an area can support is reduced, leading to stagnant or declining populations.

Sparse stands of native warm season grasses with an open structure at ground level are obviously attractive for brood rearing, but they are also used for nesting – one bunch of native warm season grass represents a potential nesting site – if the field has not been burned or disced in the past year. Birds and rabbits use senescent (dead) leaves of previous years' growth to construct and line nests. An attractive and stems remain erect into the following growing season.



Bobwhite quail nest situated at bottom of broomsedge.

This reduces thatch build-up, provides protective cover through winter and allows birds, such as Henslow's and field sparrows, dickcissels and indigo buntings, to nest above ground amongst the senescent stems the following spring.

Although moderately dense stands of native warm season grasses may not be as attractive for brooding, they are used for nesting and escape cover. Obviously, these stands may have more potential as nesting sites than sparse stands, but they also offer more protective cover, especially during winter. Extremely dense stands, however, inhibit movement of some small animals and become less attractive. At this point, management is needed to thin the stand.

Importance of forbs and shrubs

An open structure at ground level also enables the seedbank (seed in the top few inches of soil) to germinate. Arising from the seedbank are plants such as ragweed, blackberry, partridge pea, beggar's-lice, pokeweed, native lespedezas and annual sunflowers. Forb cover is critical in making a field of native warm season grass most attractive to wildlife. These plants provide an excellent canopy of broodrearing cover for quail and wild turkeys; quality forage for deer, rabbits and groundhogs; and later produce seed and soft mast that is an important source of energy through summer and into fall and winter for many wildlife species.

Scattered brush and small trees also can make a field of native warm season grass and associated forbs more attractive to wildlife, particularly bobwhites and several species of songbirds. Bobwhites often use brushy cover as a "covey headquarter" during fall and winter. Indigo buntings, dickcissels, yellow-breasted chats, cardinals, prairie warblers, white-eyed vireos, eastern kingbirds, loggerhead shrikes and others use scattered clumps of shrubs and small trees for perching and nesting. Many of these shrubs and small trees also offer a valuable food source for many birds and mammals. Examples include American crapapple, wild plum, hawthorn, sumac, wild cherry, persimmon, elderberry, hazelnut, witchhazel, dogwoods, Carolina buckthorn and viburnums and devil's walkingstick.



Forbs (e.g. partridge pea, blackberries) provide excellent brooding cover and a source of seed for bobwhites quail.





Winter Cover

Native warm season grasses provide quality cover during winter if the grasses are not previously bushhogged or otherwise destroyed. Fields of native warm season grass are often magnets for rabbits, over-wintering songbirds and deer. This can be especially critical for small wildlife at a time when quality cover is at a premium. Tall native warm season grass, such as big bluestem, indiangrass and switchgrass, are especially valuable as their stems “lodge” (remain somewhat upright, leaning against each other), continuing to provide cover even after winter rains, snow and wind. Deer seek out native warm season grass fields on cold, clear days because they can remain hidden in the tall grasses, yet are able to absorb the sun’s warm rays. In low-lying bottomlands that periodically flood in winter, fields of switchgrass (especially the Kanlow variety) can attract large numbers of ducks when shallowly flooded.

Managing Native Warm-Season Grass Fields for Wildlife

A field of native warm season grass is no better than the techniques (s) used to manage it. If not managed correctly, native warm season grass can become rank and unattractive to many wildlife species. Management is needed to set back succession and create the vegetative composition and structure desired. An open structure at ground level within a native warm season grass field is determined largely by the density of grass bunches and stand management, especially burning. If the field is not disturbed periodically by prescribed burning or disking, and open structure at ground level will not be maintained.

Burning

Prescribed burn reduces litter buildup, sets back succession, increases nutrient availability and stimulates herbaceous growth. Fields are most often burned in late winter, just before spring green-up. This reduces winter cover only for a short time and does not disrupt nesting birds and rabbits. If woody succession is a problem, fields can be burned just after bud break to kill woody competition. Prescribed burn during growing season can be used when native warm season grasses have become too dense and additional forb growth is desired. Burning at this time also can be used to reduce wood succession, if completed before leaf senescence. Using prescribed burn is efficient, effective, cheap and easy; however, planning and experience are necessary. Burning is controlled and objectives are met only when conducted under the appropriate conditions.



Burning is strongly recommended to manage fields of native warm season grasses. These pictures show the burn in progress and the site two weeks after burn.

Prescribed burn is contained by creating firebreaks (disked strips 10-30 feet wide) around the area to be burned. Firebreaks should be planted for increased food resources around native warm season grass fields. By planting various mixtures in different sections of the firebreak, a supplemental food source is available year-round.

Seed quality and estimating PLS

Buying quality seed is an important consideration when establishing native warm season grasses. Seed purity commonly runs 50-70 percent because of an inordinate amount of inert material (stems, leaves and other debris) and the germination rate may be only 50-60 percent. Therefore, it is critical to plant according to percentage of pure live seed (PLS) which is determined from information on the seed tag.

PLS is calculated as follows:

Seed: Indiangrass (Osage)

Pure seed: 67.62%

Other crop: 0.05%

Weed Seed: 0.42%

Inert: 26.23%

Origin: MISSOURI

Germination: 64.00%

Firm/Dormant: 22.00%

Total Germination: 86.00%

Noxious Weeds: NONE

Test date: 28 December 2003

[67.62% (pure seed) 86.00% (total germination)] 100=58.15% PLS.

To plant 6 lbs. PLS per acre [6 lbs (desired rate) 58.15 (PLS) 100 = 10.32.

Therefore, approximately 10 lbs of bulk material from the seed bag should be planted.

Seed dormancy

Switchgrass and eastern gamagrass tend to have a high dormancy rate. Germination can be improved by treating the seed. Switchgrass seed can be wet-chilled by soaking it in a mesh sack overnight and allowing it to drip-dry the following morning. The seed then should be stored in a cool location (e.g., a cellar or walk-in cooler set at approximately 40-45°F) for at least two weeks. For best germination, remove seed from chill treatment and allow to air dry with a fan blowing over the seed until seed flows freely. Plant immediately. Eastern gamagrass requires a six-week chilling process. The best option for planting eastern gamagrass is to buy cold-stratified seed direct from a seed dealer and plant immediately upon receiving shipment. Eastern gamagrass seed can be purchased pre-chilled.





Mixtures

Tall mixtures provide cover for groundnesting birds, as well as those that nest above-ground (e.g., dickcissel, field sparrow, Henslow's sparrow and red-winged blackbird). Tall mixtures also provide excellent cover for brood rearing and escaping predators. In addition, sufficient structure is present in tall native warm season grass fields for deer to bed during day and excellent cover is available through winter for many wildlife species. Short mixtures provide quality nesting cover for ground-nesting birds and can provide attractive broodrearing cover. Selected forbs should be added to wildlife mixtures to enhance brood habitat, invertebrate availability, seed production, forage and/or aesthetic value.



Planted forbs are intended to complement the forb community that should arise naturally from the seedbank. Forbs most often added to native warm season grass mixtures include partridge pea, Illinois bundleflower, roundhead lespedeza, perennial sunflowers, purple prairieclover, purple coneflower, black-eyed susan, blazing star and lance-leaved coreopsis.

| Seeding mixture (lbs PLS per acre) | Objectives & Considerations |
|---|---|
| Wildlife – tall grass mixture 1.5 lbs big bluestem 1.5 lbs indiagrass 1.0 lb little bluestem 0.5 lb switchgrass 1.0 lb native forbs | Nesting cover Brooding cover Winter cover |
| Wildlife – short grass mixture 3.0 lbs little bluestem 0.5 lb indiagrass 1.0 lb native forbs | Nesting cover Brooding cover |

Evaluating success- what to expect

Native warm season grasses develop relatively slowly during the year of establishment. Most of the first-year plant growth is root development. Leaf and stem growth may not reach more than 2 feet high by the end of the first growing season. Typically, it is not until the second growing season that most native warm season grass develop considerable aboveground biomass, flower and produce seed. However, if the correct plant procedures are followed and soil moisture is not limiting, excellent growth will occur during the year of establishment, with considerable above ground biomass and extensive flowering.



Native warm season grass planted for wildlife should be very sparse during the year of establishment. Remember, bare ground space between bunches is desirable? “Weeds” may be numerous and should be expected. Many, hopefully, most, of the “weeds” will be desirable forbs (as described earlier). Landowners planting native warm season grasses should not expect the field to look like a field planted to cool-season grasses. Patience is necessary!



This is what you are looking for! This is a IUKA eastern gamagrass seedling with its characteristic “corn like” appearance. Note the bare ground and lack of weeds germinating around the seedling. This is what should be expected from a properly applied pre-emergence herbicide.

Planting date and methods

Native warm season grasses should be planted mid-April through early June. Later plantings can be successful, but germination and growth may be reduced, as rain is less dependable in June and July. Seed may be top sown or drilled, but should not be planted any deeper than ¼ inch. In fact, when drilled, at least one-third of the seed should be obvious on top of the planting furrow. The exception to this rule is eastern gamagrass, which should be planted approximately 1 ½ inch deep.





Seeding rates and mixtures

Seeding rates depend upon landowner objectives. If sown for wildlife, a sparse stand of grasses with abundant forbs and adequate bare ground is desired.

If sown for hay or pasture a dense stand without forbs and less bare ground is desired. Thus a relatively light seed rate (4-6 pounds PLS per acre) is recommended when establishing native warm season grass for wildlife and a heavier seeding rate (8-12 pounds PLS) is recommended when establishing hayfields or pasture.



This field of 'Alamo' switchgrass was planted on May 3, 2005. The photo was taken 6 weeks after planting.

NATIVE GRASS DRILLS



Planting with a no-till drill designed for native warm season grass seed is highly recommended. Do not drill seed any deeper than ¼ inch! In fact, as much as 30 percent of the seed should be obvious on top of the planting furrow.

Drilling – For even grass distribution and a continuous, solid stand, native warm season grasses planted for wildlife should be planted with a drill. When planting bluestems or indiagrass, a drill with a specialized seed box containing “picker wheels” is necessary or the fluffy seed of these grasses will lodge in the seed chute. These drills often are available for use through state wildlife agencies, soil conservation districts, the Natural Resources Conservation Service and some local chapters of Quail Unlimited. Switchgrass can be planted with a conventional drill. Any drill, however, must be calibrated before planting. Eastern gamagrass is usually planted with a corn planter in rows 18-24 inches apart, but some producers like to plant rows only 12 inches apart to reduce stool size and make stems more upright so haying is easier. Native grass drills can be used to plant eastern gamagrass.



NATIVE GRASS DRILLS



Manually Operated Native Grass Drill



Seeder used to plant switchgrass in a small steep area

Manually Operated Broadcast Seeder

For wildlife food plots, odd areas and small plantings a manual operated broadcast seeder (seed slinger) is available from Truax. The *Seed Slinger* is used for surface application of many types of seed on areas that are too small, too steep, or inaccessible for other types of seeding equipment. The manually operated model is fitted with a hand crank and shoulder strap for carry across the field or small plots.

The *Seed Slinger* is a broadcast seeder developed for surface broadcast application of native prairie grass and forb species as well as some introduced grass and legume species. The *Seed Slinger* seed hopper features two seed compartments. The large compartment is for large fluffy, chaffy seeds such as, big bluestem, little bluestem, and indiangrass. The second smaller compartment is for smaller, hard seed such as switchgrass, alfalfa, clover species, etc.

Conclusion

Native warm season grasses can provide excellent wildlife habitat. Converting perennial cool-season grass acreage to native warm season grasses and establishing field borders around crop fields will help increase wildlife populations dependent upon early successional habitats. Native warm season grasses also can produce high-quality forage for livestock. For producers interested in wildlife, native warm season grasses are a much better alternative than non-native, warm-season grasses, such as bermudagrass.

Establishing and managing native warm season grass is quite different from cool-season grasses. However, landowners should not be skeptical. The advantages for wildlife and the quality of forage produced have been proven time and again. For comprehensive and detailed information on establishing and managing native warm season grasses, ask for a copy of *Native Warm-Season Grasses – Georgia, Alabama and South Carolina*. Contact the USDA-NRCS Jimmy Carter Plant Materials Center located in Americus, Georgia and the NRCS state wildlife biologist.



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Acknowledgments

Some data for this publication and technical reviews were provided by:
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Literature Citation

Surrency, D., Owsley, C., Rev. 1. 2006. Native Warm Season Grasses for Alabama, Georgia and South Carolina, USDA-NRCS Jimmy Carter Plant Materials Center, Americus Georgia.

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Quote from Dr. Don Ball, Auburn University concerning 'Native Warm Season Grasses for Georgia Alabama and South Carolina'

"The publication is well written and informative. Anyone interested in growing Native grasses in the three states for which it was written needs to read it."

Availability

For more information about native warm season grasses or to obtain a copy of this publication, contact Donald Surrency, Plant Materials Specialist, Thomson, Georgia, 706-595-1339. E-mail don.surrency@ga.usda.gov. or Mike Owsley, Jimmy Carter PMC, Americus, Georgia, 229-924-4499. E-mail mike.owsley@ga.usda.gov. For more information log on to the Jimmy Carter Plant Materials Center homepage. The homepage address is www.ga.nrcs.usda.gov/technical/pmc/pmc.html.

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