



# Choosing, Establishing, and Managing Bermudagrass Varieties in Oklahoma

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Bermudagrass [*Cynodon dactylon* (L.) Pers.] is used for pasture and hay across much of Oklahoma and the southern U.S. It is an introduced, perennial, sod-forming grass that serves as the principle forage base for many livestock enterprises. Bermudagrass can be an important component of a forage production system because of its high forage production potential, ability to withstand drought and close grazing, and the absence of devastating insect and disease pests. Bermudagrass is best adapted to sandy loam soils in central and eastern Oklahoma where annual precipitation is about 28 inches per year or more. However, it is successfully grown throughout most of Oklahoma on many different soil types. In recent years its use has increased in the Oklahoma and Texas panhandles and adjacent regions under irrigation. The average nutritional value of bermudagrass is similar to that of many other warm-season perennial grasses. Accordingly, it has been used primarily in cow-calf type enterprises as a grazed and/or conserved forage.

There are several important criteria that should be considered in establishing and using bermudagrass as a forage. These include selection of a variety, establishment options and methods, and cultural management requirements for sustaining stands and production. The purpose of this publication is to provide information that will help producers make decisions on establishing bermudagrass for forage.

## New Establishment versus Renovation

Bermudagrass was widely planted on old cropland beginning in the late 1940s and early 1950s as cotton production declined. The bermudagrass in many of these plantings thinned over time due primarily to inadequate soil fertility levels required to sustain good stands. Other frequently undesirable species such as broomsedge, three-awn, and ragweed, now dominate the sites. In many of these sites, bermudagrass continues to persist as a sparse component of the vegetation, though it may not be readily evident. Where such conditions exist, bermudagrass can be restored as the major or sole vegetative component through fertility management and management to eliminate or suppress other species. The restoration process will require time and patience. However, this alternative is less costly to making a new planting of bermudagrass and provides a means of spreading the costs over time.

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## Establishing Bermudagrass

### Variety Selection

Choosing which bermudagrass variety to plant is an important decision. Bermudagrass varieties differ in performance characteristics related to adaptation, establishment, forage production potential, and forage nutritive value. Varieties that are poorly adapted to an area typically decline over time in stand density and productivity. However, stands of adapted, well-managed cultivars can persist for many years. The most important requirement of a bermudagrass variety for Oklahoma is its ability to survive the winters. The average severity of winters increases as latitude increases in Oklahoma, so some varieties that are used in the southern part of the state are very poorly adapted to the northern part. After the winter hardiness requirement is satisfied, subtle performance differences among varieties such as disease resistance and site adaptation should be considered.

The current commercial bermudagrass varieties can be categorized as to establishment type (seed or sprigs) and by growth morphology. For growth morphology, the varieties are separated into two groups often referred to as "grazing types" and "hay types." The grazing types are distinguished from the hay types by being shorter in stature and forming a more dense sod. Regardless of this terminology, both types of varieties can be grazed and cut for hay. Most of the grazing type varieties were selected as naturally occurring plants as opposed to the hay type varieties that originated from breeding programs. Accordingly, nature selected the plants for the adaptation traits needed to survive in the environments from which they came. Compared with hay type varieties, the grazing type varieties generally spread more aggressively during establishment, resist weed encroachment to a greater extent in mature sods, but have lower yield capability, especially in high yield environments. Table 1 lists the major clonal (sprigged) varieties currently available for use in Oklahoma.

There are only a few commercial seed-propagated forage bermudagrass varieties on the market. But, the number has grown in recent years and likely will expand at a greater rate in the future. The seed of currently marketed bermudagrass varieties is produced either in the traditional bermudagrass seed producing areas along the Colorado river in Yuma County, Arizona, and the adjacent California Imperial Valley or in Oklahoma. In Arizona and California, bermudagrass

**Table 1. Commercial clonal bermudagrass varieties available for use in Oklahoma.**

Variety	Date Released	Type	Major Characteristics
Alicia	mid 1960s	Hay	Moderately cold tolerant; marginally adapted to the first tier of counties in southern Oklahoma. Established with top cuttings or sprigs; spreads rapidly during establishment; high forage yield potential.
Coastal	1943	Hay	Moderately cold tolerant; marginally adapted to the first tier of counties in southern Oklahoma; widely grown in southern states; high forage yield potential.
Goodwell	2007	Hay/grazing	Cold hardy, good adaptation to the bermudagrass growing area north of Oklahoma, high yield potential; establishment method similar to Midland 99.
Midland	1953	Hay	Hardy throughout most of Oklahoma; best adapted to sandy loam soils in central and west central Oklahoma; used on coarser textured, better drained soils in eastern Oklahoma.
Midland 99	1999	Hay	Hardy throughout most of Oklahoma; high forage yield potential.
Ozark	2002	Hay	Cold hardy for northern Oklahoma; best adapted to sandy loam soils; establishment similar to Midland and Midland 99.
Greenfield	1954	Grazing	Good establishment features; better stand persistence than Midland in eastern Oklahoma on alluvial soils; good performance relative to Midland under moderate to low yield environments.
Hardie	1974	Hay	Cold hardy through most of Oklahoma; high yield potential; poor stand persistence, especially in eastern Oklahoma due to disease susceptibility and intolerance to low soil pH.
Tifton 44	1978	Hay	Cold hardy through most of Oklahoma; high yield potential.
World Feeder <sup>1</sup>	1990	Grazing	Adapted throughout Oklahoma; good establishment features; similar to Greenfield in growth morphology and yield performance.

<sup>1</sup> Proprietary variety of Agricultural Enterprises Corp., Oklahoma City, OK.

seed production began early in the 1900s displacing alfalfa production as soil salinity increased. The bermudagrass that had become naturalized to the area after its introduction by 1850, or perhaps before, is the basic stock that has supported that industry over the past century. This bermudagrass has historically been referred to as 'Arizona Common' or just "Common." Seed is also produced in the same area of a bermudagrass called "Giant" [*C. dactylon* var. *aridus*], but to a much lesser extent.

Arizona and California provide the bulk of the world supply of bermudagrass seed harvested from about 30,000 to 60,000 acres. Bermudagrass seed production in Oklahoma began around 1985 and constitutes only a few hundred acres, but has potential for growth. The varieties produced in Oklahoma have greater cold hardiness than those now produced in Arizona and California and consequently are better adapted to the northern part of the bermudagrass belt.

There are two kinds of bermudagrass seed with respect to seed tag labels, namely "bermudagrass" and "giant bermudagrass." Additionally, bermudagrass seed is sold as VNS (variety not stated), by variety name (e.g. 'Cheyenne' or 'Wrangler'), or as a brand that usually is a blend of different varieties or types (e.g. 'Pasto Rico'). The components of blended bermudagrasses sold by brand name are subject to change from year to year. However, the components and their compositions in a blend must be given on the label, so the information is available to the consumer. There are several seeded forage bermudagrasses commercially available. The list in Table 2 may not be inclusive and seed of some of the varieties listed may be difficult to find.

Establishing a new bermudagrass pasture may cost in excess of \$100 per acre considering the price of fertilizer,

lime, seedbed preparation, sprigs (or seed), and planting. Accordingly, the practices that minimize risk of stand failure are important.

## Establishment by Sprigging

### Sprigging Dates

Bermudagrass sprigs may be planted from late winter through the summer months if soil moisture is available to promote bud germination and growth of the young plants. The best window for sprigging is generally considered to be during the 4 to 6 week period prior to the beginning of bermudagrass growth. Sprigging usually begins in the latter half of February in southern Oklahoma and in early to mid-March in the northern half of the state. Early sprigging is considered desirable because new spring growth uses the root carbohydrate reserves, so planting before growth has begun will ensure the highest root carbohydrate levels for vigorous growth when warm weather occurs. Furthermore, the sprigs planted will be mostly rhizomes and root crowns, which are the sources of new buds. Most sprigs dug after spring growth has begun will contain a substantial amount of above ground growth, which has a very short life and seldom contributes to establishment success. However, successful stands can be achieved by using sprigs harvested after growth has begun, and it is not unusual for sprigging to extend into June.

### Site Preparation

Planting of bermudagrass sprigs is generally done on a tilled soil, though "no-till" sprigging equipment is now available. For traditional site preparation, all soil nutrient deficiencies

**Table 2. Commercial seed-propagated bermudagrass varieties.**

Name	Source	Description
----- . Marketed as "Variety Not Stated" . -----		
Common	Many Seed Companies	The naturalized bermudagrass common to the seed producing area of Arizona and California; moderate cold hardiness; best adapted south of about 34° Lat. and in subhumid climates; used as a turf and forage grass.
Giant	Many Seed Companies	Larger, faster growing, but less cold tolerant than common. Used in blends with common or other bermudagrasses to speed establishment; usually winter kills throughout Oklahoma.
----- . Varieties . -----		
Cheyenne	Pennington Seeds	Initially released for turf and described as having good cold tolerance.
NK-37	Northrup King Co.	The only named variety of giant bermudagrass. Very little, if any, seed on market. Characteristics same as giant.
Wrangler	Johnston Seed Co.	Very cold tolerant, well adapted to transition zone. Used as forage and for soil stabilization; performance similar to Greenfield and Guymon.
----- . Brands/Blends . -----		
Morhay	H&H Seed Co.	Blend of common and giant seed
Pasto Rico	KF Seeds	Blend of common and giant seed
Pasture Supreme	Kaufman Seeds	Blend of common and giant seed
Rancho Frio	Seeds West	Blend of Cheyenne and giant seed
Sungrazer	KF Seeds	Blend of Wrangler and KF 194
Texas Tough	East Texas Seed Co.	Blend of common and giant seed
Tierra Verde	Seeds West	Blend of common and giant seed
Vaquero	Cebeco International Seeds	Blend of Mirage, Pyramid, and CD-90160 seeds

should be corrected during the tillage operations. Before preparing the site, use a soil test to determine the phosphorous, potassium, and lime requirements. Incorporation of these elements into the top 6 inches of the soil prior to establishment is more efficient than broadcast applications after planting. The final tillage operation should be one that firms the soil, usually accomplished with a spike-tooth harrow, cultipacker, or roller. Adequate soil nitrogen is important in speeding the rate of establishment and in obtaining useable production from newly-planted bermudagrass in the establishment year. Nitrogen fertilizer can be incorporated prior to planting or applied post-planting.

**Sprigging Methods**

Sprigs are typically planted with commercial planters that place the sprigs into rows spaced 20 to 30 inches. The sprigs are covered with soil and press wheels firm the soil over the sprigs. No-till sprigging equipment offers an option to preparing a tilled planting site. For no-till sprigging, if non-dormant vegetation is present on the site, a preplant application of an herbicide such as glyphosate will usually be beneficial. It is also possible to obtain stands by broadcasting sprigs with equipment such as a manure spreader and then incorporating the sprigs into the soil, usually by lightly disking. Firming the soil after disking with a culti-packer or similar tool improves chances of success.

Sprig quality and planting depth are important regardless of planting method. Quality is highest in freshly dug sprigs that have been protected from desiccation and heating. Least risk of poor establishment is achieved by planting sprigs in moist

soil at a depth not exceeding about 2.5 inches below the soil surface. Under these conditions, sprigs are distributed at variable depths in the top 2.5 inches of the soil and parts of many sprigs will be visible above the soil surface. Planting at lower depths to reach moist soil is a frequent practice, but carries greater risk of failure due to the drier soil and deeper planting depth.

Sprigging rates vary greatly, with a minimum of 20 bushels of sprigs per acre usually recommended. Heavier sprigging rates generally achieve better initial stands and faster sod cover. Sprigging rates of 60 to 80 bushels per acre are not unusual, especially when sprigs are available at low cost.

**Establishment by Seeding**

**Seeding dates**

Since bermudagrass seed will not germinate until soil temperatures reach approximately 65°F, the optimum planting time for seeded bermudagrass cultivars is from May 1 through June 15.

**Site Preparation**

The seedbed is prepared in the same manner as described above for sprigging. It is especially critical to have a very firm seedbed.

**Seeding Methods**

Bermudagrass seed can be planted by broadcasting or using a drill capable of handling small seeds. Planting depth

is critical. The seed should be distributed within the top 1/4 inch of the soil. When broadcast, the seed may be incorporated into the soil by lightly harrowing. The usual seeding rate recommended for pasture bermudagrass is from 2 to 5 pure live seed (PLS) pounds per acre. Bermudagrass seed is sold as hulled (naked caryopses), unhulled (caryopses within lemma and palea), or a mixture of hulled and unhulled. The seed also may be coated with compounds claimed to enhance germination and seedling growth. Coating approximately doubles the weight of seed. The number of uncoated seed in a pound varies with variety but is on the order of 1.1 and 1.8 million for unhulled and hulled seed, respectively.

## Post Planting Management

The major problem associated with bermudagrass stand establishment is competition from weedy plants. Herbicides are available for controlling some of the broad leaf weedy species found in new and established bermudagrass. Your local County Extension Agriculture Educator can provide information on herbicides labeled for weed control in bermudagrass pastures. During the establishment year, grassy weeds can be suppressed by mob grazing, or to a lesser extent by mowing. Grazing will also be beneficial in suppressing many of the palatable broadleaf weeds. Mowing is helpful and recommended, but by the time the weeds are tall enough to mow, they have already competed severely with the bermudagrass.

Allowing the bermudagrass to accumulate at least 4 to 6 inches of growth during the last 4 to 6 weeks of the grow-

ing season will enhance its ability to survive the winter with minimal stress.

## Keys to Successful Establishment

- Soil test to determine phosphorus, potassium, and lime requirements.
- Prepare a smooth, firm seedbed. Where required and if possible, lime should be applied at least 3 to 4 months before planting. Phosphorus and potassium should be worked into the soil just prior to planting.
- Sprigs should be planted in moist soil. The preferred planting dates are late February through early April. Seeded varieties should be planted by June 15.
- Weed control is essential. Anticipate the weed problems you are likely to encounter and take action to control them.
- Avoid harvesting until the bermudagrass has developed into a solid stand and the root system has established.
- Regardless of the bermudagrass variety planted, it is important that newly established bermudagrass be allowed to make considerable growth during the late summer and early fall of the first year without being harvested.
- Allow the bermudagrass to accumulate growth during September and October.
- Graze only after bermudagrass has been browned by cold weather.
- Follow a sound fertility and grazing management program in the following years to maintain a productive stand.

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