

**BERMUDAGRASS**  
(*Cynodon dactylon*)

by

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Bermudagrass is a perennial sod-forming grass which has stolons and rhizomes. Bermudagrass is highly responsive to nitrogen fertilization. Hybrid varieties are sterile and vegetatively propagated by sprigs. "Common" bermudagrass can be propagated by sprigs or seed. Bermudagrass is well adapted to many soil types, but does not tolerate poorly drained soils.

Below is a list of some varieties which have been successfully grown in sections of Tennessee:

**SPRIGGED ECOTYPES**

Sprigged bermudagrass is slow to establish, typically taking one to two years to provide good surface coverage. Sprigged types are generally superior in production and quality to seeded "common" types. Under high management, over eight tons of production per acre per year is possible. Hybrids rarely produce viable seed.

**Coastal**

An upright hybrid only adapted to Southwest Tennessee. It is not as winter hardy as other ecotypes listed here. Coastal is not as productive or digestible as Tifton 44. Released in 1943.

**Hardie**

A low growing, grazing type hybrid that has produced 6 percent more yield that was 6 percent more digestible than Midland in several tests in Oklahoma, where it was bred. In some years, Hardie has been damaged by *Helminthosporium* leafspot. Hardie has performed well in the northern Highland Rim area up into Kentucky. Maury State in Kentucky has had excellent results with Hardie. Released in 1980.

### Midland

A hybrid between Coastal and a cold-hardy "common" from Indiana. Bred in Georgia, Midland was named and released by the Oklahoma station when it greatly surpassed "common" in Stillwater tests. More cold hardy than Tifton 44. Yields are lower than Tifton 44. May be difficult to find certified sprigs of Midland. Some Midland fields have over time transformed into a stand of "common" bermudagrass. Released in 1954.

### Quickstand

A "common" type selected from ecotypes found growing on the Robinson substation of the University of Kentucky (UK) Agriculture Experiment Station near Quicksand in Eastern Kentucky. It is a winter hardy variety. It is being used as a dual purpose species for both turf and forage. Yields of Quickstand have been better than for unselected "common" bermudagrass. Released in 1993. Quickstand produces very few viable seed. Farm scale seeding must be from sprigs rather than seed. Quickstand bermudagrass was sprigged on Bush Stadium, the St. Louis Cardinals baseball field.

### Tifton 44

The best of several thousand hybrids between Coastal and a "common" bermudagrass from Berlin, Germany. It is similar to Coastal in yield and disease resistance, but is much more winter hardy, starts growth earlier in the spring, is more digestible, and has given 19 percent better gains when grazed or fed as pellets. Presently, Tifton 44 is the benchmark bermudagrass in Tennessee. Released in 1978.

### Vaughn's No. 1

A hybrid developed in White County, Tennessee. Advertised as being observed to survive temperatures of 20 degrees below zero. Vaughn's #1 is an upright type. Vendor recommends establishment by spreading clippings from an established plot with a manure spreader on a well prepared soil, then disk in and cultipack twice. This is a patented product, which you can plant your entire farm from the initial planting, but you can't sell sprigs or clippings to another farm. A premium is paid for the first five acres planted.

### "COMMON" (SEEDED) ECOTYPES

Seeded types of bermudagrass typically establish providing good surface coverage within six weeks when adequate moisture is available. Under high management, over five tons of production per acre per year is possible.

"Common"- Unnamed

An unnamed, seeded type of bermudagrass that has not been selected for specific traits. Source may be from anywhere, so characteristics are not known. It may or may not be adapted to a specific area.

Cheyenne

A "common" type selected for winter hardiness, deep rooting, and turf characteristics. Advertised as winter hardy to the 40 degree latitude "Louisville, Kentucky." Cheyenne has done extremely well to date in a two-year trial at the University of Tennessee, Martin. Yields and stand are equal to hybrids.

Guyman

A "common" type selected for winter hardiness, easy establishment, fast spreading, density, and drought tolerance. Advertised as the most winter hardy seeded variety. Guyman is also a turf type of bermudagrass. Lower yielding than Cheyenne.

**ESTABLISHMENT****A. SPRIGGING**

Hybrid bermudagrass produces few to no seed, and is reproduced and spread by sprigs or clippings from existing plantings. "Coastal," "Hardie," "Midland," "Quickstand," "Tifton 44," and "Vaughn's #1" are some of the varieties typically propagated.

1. Prior to the sprigging operation, pulverize soil to a depth of between 3-4 inches. No-till sprigging equipment is also available for sprigging.
2. Soil amendments should be applied according to soil test. These soil amendments should be applied prior to planting. The pH suitability range is between 5.1 and 8.4. The desired pH is above 6.1.
3. Sprigging should be in the spring between April 15 and July 1.
4. Sprigs should be planted within 24 to 48 hours at a rate of 20-24 bushels or 25-30 cubic feet per acre. There are usually about 1,000 sprigs per bushel. Higher sprigging rates achieve coverage faster.
5. The sprigs should have large white rhizomes and be kept cool and moist until they are planted. The sprigs should be planted 1-2 inches deep in moist soil with the tip of the green sprig remaining above ground. Deeper plantings have more moisture, but are slower to spread. The sprigs

should be planted with a sprigger machine for optimum results. Tobacco setters or tree planters may also be used to plant bermudagrass. Broadcast methods of planting (e.g., manure spreader) have been used with varying results. If the broadcast spreader method is used, the sprigs should be immediately pressed into the soil with the use of a cultipacker or similar equipment. Ideally, freshly sprigged fields would be irrigated soon after sprigging. All operations should be done across the slope or on the contour. Slopes greater than 15 percent should be planted in alternate 50' strips to prevent erosion. After establishment of the initial planting, remaining strips may be established.

6. Competition from grasses and other plants following sprigging can hamper the establishment of bermudagrass. Crabgrass is a very common weed when establishing bermudagrass, and is generally of very good quality, so it should not be overlooked as a forage. If grazing during the establishment period, be cautious to not graze to the point that stolons are pulled up. Clipping or haying during establishment years is ideal because plant material lost at harvest may root on damp soil. Presently, few herbicides are labeled for forage application. Consult the Cooperative Extension Service for recommended herbicides labeled for bermudagrass. Some herbicides are labeled for turf, but not for forage (e.g., MSMA has arsenic in it and has been suspect for killing horses and leaving residue in meat). Always read and follow current labeling information for rates and possible setbacks from water. See item 2 under Management.

#### B. SEEDING

1. Only "common" types of bermudagrass produce viable seed. "Common" ecotypes may be reproduced by sprigging or seeding. As mentioned above, "Common" (unnamed), Cheyenne, and Guyman are typically seeded. Varietal named seeded types of bermudagrass are selections of "Common" bermudagrass.
2. Soil amendments should be applied according to soil tests prior to planting. The pH suitability range is between 5.1 and 8.4. The desired pH is above 6.1.
3. Recommended seeding dates are between May 10 and July 1. Bermudagrass seed does not germinate well before the mean daily temperature is 65 degrees for several days.

4. Plant bermudagrass on a level, firm seedbed and cultipack after seeding. When walking on the seedbed, you should not sink more than 1/2". If the seedbed is not firm, cultipack prior to seeding. Seeding depth should be 0-1/2". Often, establishment failures are due to planting too deep.
5. Seeding rates for hulled bermudagrass broadcast plantings is 6-9 lbs./acre. Seeding rate for drilling is 4-6 lbs./acre. Drills with small seed attachments can be used with very good results. The hose on the small seed attachment should be adjusted to allow the seed to fall on top of the soil and be covered only by drag chains or press wheels.
6. Competition from grasses and other plants following seeding is typically not the problem as it is with sprigging, because cover is established so much quicker. However, after establishment, hybrids are typically more vigorous and have fewer weed problems. Presently, few herbicides are labeled for forage application. Consult the Cooperative Extension Service for recommended herbicides which are labeled for bermudagrass. Some herbicides are labeled for turf, but not forage (e.g., MSMA has arsenic in it and has been suspect for killing horses and leaving residue in meat). Always read and follow current labeling information for rates and possible setbacks. See item 2 under Management.

## MANAGEMENT

Proper management is the key to achieving and maintaining a good stand of bermudagrass.

1. P and K should be applied according to a soil test. Splitting K application will reduce luxury consumption. For establishment of bermudagrass, apply 30 lbs. of nitrogen at planting and 30 pounds one month later. Research has shown nitrogen from urea to typically be only about 80 percent as effective as N from ammonia nitrate. Nitrogen application will aid the sprigs in the production of stolons. On established stands, the rate of N topdressing depends on the need for forage. Apply one-half of the N around May 1. Broadcast the remaining nitrogen after the first hay cutting, or about June 15 to July 1. Avoid applications of N after early August because of possible winter injury. If high rates of N are used, typically higher rates of P and K are needed to maintain balanced fertility. Response to micronutrients rarely occurs.

Nitrogen Maintenance Recommendation

	<u>Total N</u> <u>Top-dressed</u>
Maintenance of "Common" Bermudagrass	60-180
Maintenance of Hybrid Bermudagrass	
Pasture	120-240
Hay	120-400

2. Competition from other plants in the landscape must be controlled during the establishment of the bermudagrass stand. Competitive vegetation should be kept less than 8" tall. Competitive vegetation can be controlled by herbicide applications, mowing, and/or grazing.
3. Bermudagrass stands can be damaged by hard freezes during the winter months. Allow the last cutting or grazing to grow about eight weeks until the average date of the first killing frost (28<sup>o</sup>) in the fall, which will enable the grass to build reserves to give more vigorous growth and better stands the next spring. Winter annuals such as rye, ryegrass, or wheat can be no-tilled into the bermudagrass in the fall to help provide some winter cover to lessen the impact of freezing temperatures. Winter annuals can also provide some grazing potential during the bermudagrass dormancy period. During the establishment period, do not seed ryegrass in bermudagrass because of possible competition due to overlapping growing seasons. Rye or wheat are better choices during the establishment years.
4. If bermudagrass is managed for hay, it should be mowed as soon as it reaches boot stage or an effective height of 15-18 inches. Subsequent cuttings should be made every four weeks thereafter until September 1. Different varieties will mature at different heights.
5. If the bermudagrass is managed for grazing, the grazing cycle should be managed to maintain a height between two and six-eight (2"-8") inches. Bermudagrass will tolerate continuous grazing, but rotational grazing will provide better weed control and increase yield potential. Bermudagrass must be kept in the vegetative stage for optimum productivity and quality. New growth following close grazing (2") is usually the most nutritious; however, quantity (4"-6" of height) must be present for the best average daily gains of cattle.

6. Legumes can be established in the bermudagrass stand. If legumes are used, annual nitrogen applications should be reduced or eliminated. Due to the high response of bermudagrass to N fertilization, optimum production cannot be achieved with interseeded legumes; however, quality will be higher.

### CONSIDERATIONS

1. Bermudagrass generally has a crude protein range from 8-12 percent and TDN levels in the upper 40's to 60's. Crude protein levels as high as 19.9 and TDN values as high as 68.5 have been recorded by University of Tennessee Forage Testing Lab. If bermudagrass is allowed to reach maturity, the nutrient value will decline rapidly. The rate of nitrogen application also has a direct effect on the level of crude protein. After frost, the quality is very low.
2. Installation costs may vary depending on site conditions, availability of sprigs, and types of equipment used. Generally, the sprigs cost approximately \$40-\$160 per acre. Annual returns from bermudagrass can range between \$350-\$500 per acre under a high level of management.
3. Once established, bermudagrass forms a thick mat of vegetation that provides excellent soil erosion protection. Bermudagrass stands can provide erosion control in concentrated livestock areas and are capable of withstanding high volumes of runoff water. In winter, livestock like to bed down in residual stands of bermudagrass.
4. Bermudagrass can be invasive, moving vegetatively on livestock feet, and with "common" types of bermudagrass seed can be transported on equipment or by animals ingesting seed or runoff water. Hybrid bermudagrass is typically easier to control than "common" types.
5. Bermudagrass has a low wildlife value. If wildlife habitat is a concern, consider native warm season forages such as switchgrass, eastern gamagrass, big bluestem, indiagrass, or little bluestem.
6. About two weeks before the last average time for a killing frost in the spring, bermudagrass sods not containing winter annuals can benefit from burning. This practice will control winter weeds, spittlebug, and other pests; promote early growth; and frequently increase forage quality and yield. When planning a prescribed burn, always consult a trained individual for developing and performing the burn. Contact the Tennessee Division of Forestry for permitting and assistance.

**SUMMARY**

Bermudagrass is just one of several plants that can be used to provide soil erosion protection, heavy use protection, forage production, and water quality enhancement through nutrient uptake. With proper management, bermudagrass and other warm season species (e.g., old world bluestems, eastern gamagrass, indiagrass, red river crabgrass, switchgrass, etc.) can provide an important addition to cool season forage systems. Conservation management systems that include multiple types of vegetation provide benefits to the soil, water, air, other plants, humans, and animals as part of a process to enhance the ecosystem. Typically 10-30 percent of a forage system should be in warm season forages.

For additional information about bermudagrass, contact the Natural Resources Conservation Service, Cooperative Extension Service, or industry representatives. This Technical Note lists only a few of the available suppliers which provide services to producers of bermudagrass. This is not an all inclusive list, and NRCS is not endorsing these vendors. Feel free to add additional suppliers to the list as information becomes known.

Some sources of bermudagrass sprigs, seed, and specialized equipment:

**SPRIGGED TYPES**

<u>Name</u>	<u>Variety</u>	<u>Phone No.</u>
Freddie Kimble 290 Inman Road Clinton, Kentucky 42031	Hardie	(502) 653-8544
John Lloyd 515 Browning Spring Road White Plains, Kentucky 42464	Hardie	(502) 676-8114
Jimmy Stevens 818 Stroud Road Wingo, Kentucky 42088	Hardie	(502) 653-4331
Elkhorn Springs Farm Chris Rose 7562 Georgetown Road Midway, Kentucky 40347	Quickstand	(502) 695-5190
Charles L. Williams and Associates P. O. Box 978 Fayetteville, Tennessee 37334	Quickstand	(931) 732-4774

SPRIGGED TYPES CONTINUED

<u>Name</u>	<u>Variety</u>	<u>Phone No.</u>
Will Gresham Route 3, Box 292 Somerville, Tennessee 38068	Tifton 44	(901) 465-4257
Shelby Hughs Auburn, Kentucky	Tifton 44	(502) 542-4821
Jimmy Kelly P. O. Box 65 Decaturville, Tennessee 38329	Tifton 44	(901) 852-4274
Max Miller Route 1, Box 161 Bethel Springs, Tennessee 38315	Tifton 44	(901) 934-4316
Jim Reeves Redbud Farms Route 2, Box 182 Stanton, Tennessee 38069	Tifton 44	(901) 476-9517
Mike Short 3920 Celina Road Tompkinsville, Kentucky 42167	Tifton 44	(502) 487-6536
Travis Kennedy 14750 Highway 57E Middleton, Tennessee 38052	Vaughn's #1	(901) 376-0102
Carl or Ron Paschal 12 Paschal Road Alexandria, Tennessee 37012	Vaughn's #1	(615) 529-2988

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Ned Dennis Box 426 Albertville AL	Tifton 44 Russell	(256) 878-4536
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Herbert Dennis 1104 7th St. S Clanton AL.	Tifton 44 Tifton 85 Coastal	(205) 755-1971
	Tifton 328-419 Tifton 11	Russell

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AGRONOMY TECHNICAL NOTE NO. TN-18

SEEDED TYPES

<u>Name</u>	<u>Variety</u>	<u>Phone No.</u>
Curtis and Curtis, Inc. Star Route Box 8A Clovis, New Mexico 88101	Cheyenne	(505) 762-4759
Pennington Seed, Inc. P. O. Box 290 Madison, Georgia 30650	Cheyenne	1-800-277-1412
Johnston Seed Company P. O. Box 1392 Enid, Oklahoma 73702	Guyman	1-800-375-4613
Robeson Seed P. O. Box 1951 Amarillo, Texas 79114	Guyman	(806) 359-8516

The Monroe County, Kentucky Conservation District has a bermudagrass sprig harvester and sprigger available for rent. Their telephone number is (502) 487-6589.

The Hickman County, Kentucky Conservation District also has a bermudagrass sprigger available for rent. Their telephone number is (502) 487-6589.

No-till Bermudagrass Sprigger Equipment Sales:

Holden-Sodmaker  
Route 1, Box 151  
Southwest City, Missouri 64863  
Telephone No.: (417) 762-3464

*Justin Seed Co.*

*940-648-2751*

*35% Giant  
17% Cheyenne*

*Pennington*

*Coleman, Al.*

*1 800-768-7333*

**REFERENCES**

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Ball, D.M., C.S. Hoveland, G.D. Lacefield, 1996. Second Edition, Southern Forages.

Stipes, J.D., K.R. Johnson, 1994. Tech. Note #84, Hybrid Bermudagrass Establishment For Erosion Control and Forage Production.

Univ. of Tenn. at Knoxville, 2/94. Fertilizer Recommendations-Field Crops.

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Ky. Foundation Seed Project, 1997. Quickstand Bermudagrass, personal communication.

Paschal, Carl and Ron, 1997. Vaughn's #1, personal communication.

Douglas, Joel Plant Materials Center Manager, Coffeeville, Mississippi. 1998. personal communication.

Pennington Seed Co., 1997. Cheyenne bermudagrass, personal communication.

Ag. Processors Inc., 1997. Guyman bermudagrass, personal communication.

10-36% summer sheep  
WSG species  
varieties  
oversleeding rye wheat "ryegrass"

Grass 2-8<sup>th</sup>

Hay 2-15<sup>th</sup> post ~~of~~ not browned

Common or	60-180	5 ton
	120-240	
	120-480	8 ton

TDN 40-60

Protein 8-14 high 19.9

invasiveness

Mg. Common

Rd. river crab

e grass

Wheat grass

drought might get up cattle