

Forage Bermudagrass Variety Selection

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Bermudagrass is grown statewide in Arkansas and is an important warm-season grass for hay, grazing, and erosion control. Choosing the best variety can be difficult because of the potentially large selection, but adaptation or lack of adaptation to local climate and growing conditions can quickly narrow the list of choices. Forage yield potential is often the first characteristic considered in the selection process, but cold tolerance, especially in north Arkansas, can outweigh yield differences. Other factors to consider are field conditions, level of management inputs, method of establishment, disease tolerance, and variety availability. Well-adapted varieties can be maintained indefinitely with good fertility and production management. The list of varieties shown in this fact sheet is limited to those that have shown adaptation to regions of Arkansas at the time of publication.

The intended use of the bermudagrass will affect choice of variety. Although all varieties can be grazed or harvested for hay, hybrids are generally selected when hay production is the major enterprise. The yield advantage of the hybrid varieties over the common types is expressed to the fullest extent in high-yield environments such as irrigation and high fertility. High fertility must be maintained for high forage production systems. Stands will decline if fertilizer rates do not match hay yield removal. Lower yielding varieties

may be suitable where grazing with occasional hay harvest is the primary focus.

Selection Based on Consistency

Variety selection should be based on consistency of performance rather than results from a single year. That concept is shown in Table 1 which provides data on several varieties grown for five years at the USDA-ARS Center at Booneville, Arkansas. Tifton 44 and Midland 99 were generally the top-yielding hybrid varieties. In most years, yield of those varieties far exceeded the yield of "Common" bermuda, but in 2003 when all varieties performed well, yield of those hybrids was not significantly higher than that of common bermuda. Tables 2-4 illustrate ranking consistency of variety performance. Table 2 shows that Midland 99 and Tifton 44 were the top-yielding varieties across most years. Table 3 shows that many varieties performed statistically similar to common bermudagrass across most years. Table 4 shows that a couple of varieties consistently performed lower than common bermudagrass. Results of a three-year test conducted by county agents at the SWREC-Hope (Table 5) showed a similar ranking with the hybrids Tifton 44 and Midland 99 ranking highest and seeded varieties ranking lower.

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Table 1. Bermudagrass variety test (2000 to 2004) at USDA-ARS station – Booneville, Arkansas.

Variety	Year				
	2000	2001	2002	2003	2004
	----- Lbs dry matter per acre -----				
CD90160		3997	6571	11225	10879
Cheyenne			4841	14949*	11372
Common	2767	7392	9309	14840*	10130
Jiggs	3796*	4216	8086	15716*	10970
Midland	2048	7159	9546	14694*	11207
Midland 99	3652*	10404*	12321*	16464*	13945*
OK Wonder	1274	6242	9528	15278*	11919*
Ozark			10039	13434	12613*
Quickstand	1155	6680	9181	13617	9601
Russell	3555*	7575	10094*	14712*	10970
Tifton 44	3751*	8816*	12649*	16574*	12777*
Tifton 85		2628	11134*	15132*	11353
World Feeder			4672	14237*	11682
Wrangler				11718	10459
LSD $p \leq 0.05$	790	2179	1758	2916	2044
<div></div> Not tested *Total yield not significantly different from top-yielding variety that year.					

Table 2. Frequency of varieties producing total dry matter not significantly different than the top-yielding variety. Bermudagrass variety test (2000 to 2004) at USDA-ARS station – Booneville, Arkansas.

Variety	Year				
	2000	2001	2002	2003	2004
CD90160					
Cheyenne				X	
Common				X	
Jiggs	X			X	
Midland				X	
Midland 99	X	X	X	X	X
OK Wonder				X	X
Ozark					X
Quickstand					
Russell	X			X	
Tifton 44	X	X	X	X	X
Tifton 85			X	X	
World Feeder				X	
Wrangler					
<div></div> Not tested X = Total yield NS from top variety.					

Table 3. Frequency of varieties producing total dry matter not significantly different than Common bermudagrass. Bermudagrass variety test (2000 to 2004) at USDA-ARS station – Booneville, Arkansas.

Variety	Year				
	2000	2001	2002	2003	2004
CD90160					X
Cheyenne				X	X
Common	X	X	X	X	X
Jiggs			X	X	X
Midland	X	X	X	X	X
Midland 99				X	
OK Wonder		X	X	X	X
Ozark			X	X	
Quickstand		X	X	X	X
Russell	X	X	X	X	X
Tifton 44		X		X	
Tifton 85				X	X
World Feeder				X	X
Wrangler					
<div></div> Not tested X = Total yield NS from Common variety.					

Table 4. Frequency of varieties producing significantly less total dry matter than Common bermudagrass. Bermudagrass variety test (2000 to 2004) at USDA-ARS station – Booneville, Arkansas.

Variety	Year				
	2000	2001	2002	2003	2004
CD90160		X	X	X	
Cheyenne			X		
Common					
Jiggs		X			
Midland					
Midland 99					
OK Wonder	X				
Ozark					
Quickstand	X				
Russell					
Tifton 44					
Tifton 85		X			
World Feeder					
Wrangler			X	X	
<div></div> Not tested X = Total yield significantly lower than Common variety.					

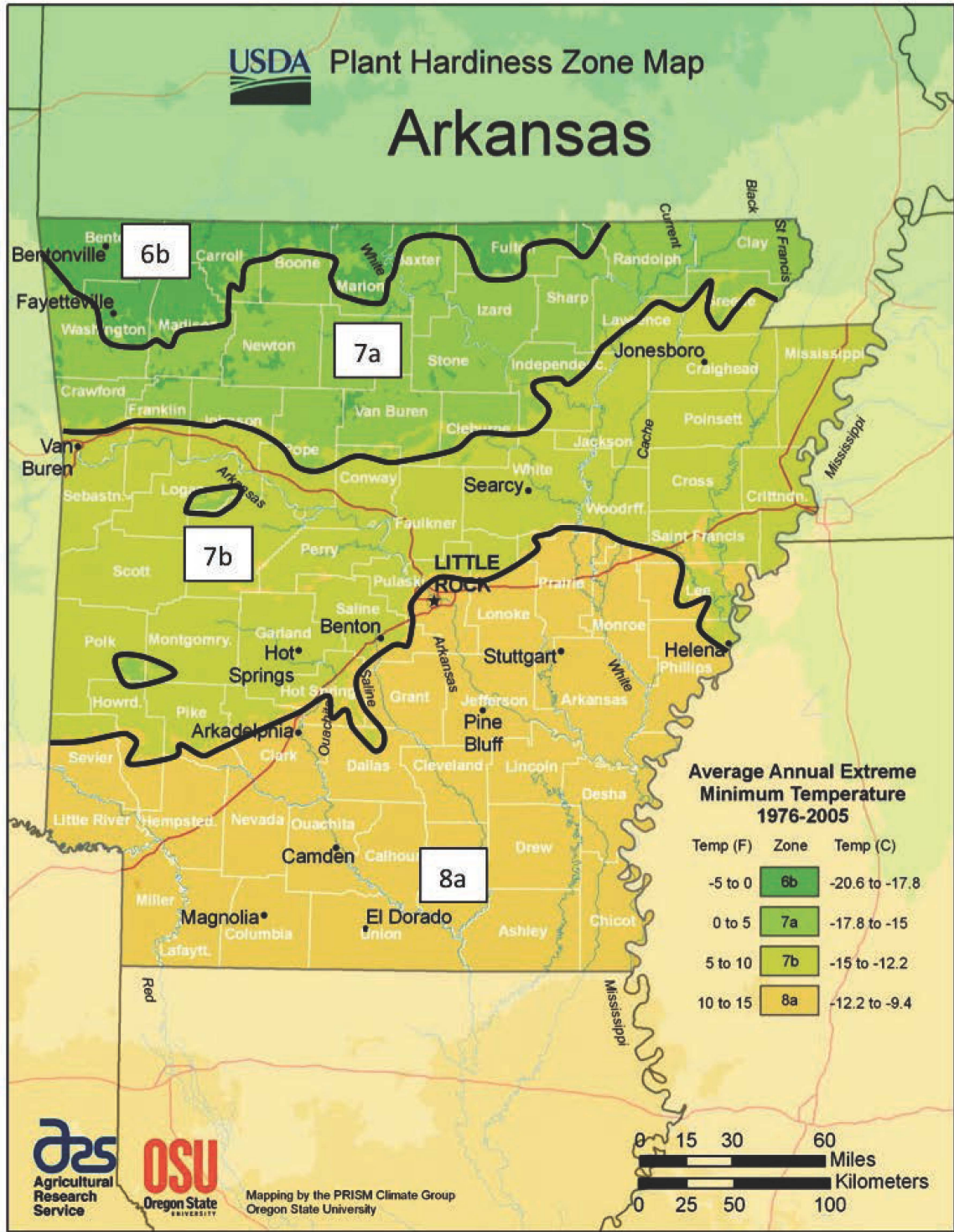
Cold Tolerance

Plant adaptation zones based on Arkansas winter temperatures are shown in Figure 1. Cold tolerance is a primary criteria for selecting a bermudagrass variety especially in north Arkansas. Some very popular varieties grown in the Gulf Coastal areas do not have enough cold-tolerance to be persistent in Arkansas. Cold-sensitive varieties may completely winterkill or may become winter-damaged and require time to re-develop the sod density they had prior to the winter injury. This causes late spring greenup, excessive weed invasion, and reduced yields. Cold-sensitive varieties are at greatest risk the first winter after seeding. Thereafter, they tend to be less susceptible to winter injury, probably because of better developed root and rhizome systems. Common bermuda is a seeded-type and has highly variable characteristics with moderate to low freeze tolerance. Giant, another seeded-type, has low freeze tolerance and usually winterkills within one to two winters in Arkansas, but makes more growth than Common during the establishment year. Seed of Giant has long been blended with seed of cold-tolerant varieties and sold by brand names in order to take advantage of the better establishment year growth of the former and the better stand persistence of the latter.

Table 5. Dry matter yield of Ouachita District bermudagrass test (SWREC-Hope) 2013 - 2015.

Variety	Average Total Yield	Rank	% Crude Protein	% Total Digestible Nutrients
Tifton 44*	5,855	1	11.7	60.0
Midland 99*	5,463	2	12.7	62.4
Ozark*	5,432	3	12.6	62.3
Vaughan's #1*	5,159	4	13.1	63.2
Genesis*	4,820	5	13.7	64.7
Common**	4,722	6	13.4	63.7
Sungrazer Plus**	4,696	7	13.3	62.7
Sungrazer**	4,560	8	13.7	63.4
Mohawk**	4,488	9	13.6	63.2
Cheyenne II**	4,486	10	13.4	63.0
Wrangler**	3,986	11	14.5	64.5
*Planted from sprigs **Planted from seed				

Figure 1. Approximate boundaries of USDA Plant Hardiness Zones in Arkansas.



Definitive information is not available on the relative freeze tolerance of all the varieties and blends. Available information suggests that Wrangler has substantially greater freeze tolerance than any of the other seeded varieties, making it a good selection for north Arkansas. But it has lower yield performance and is not a top performer in south Arkansas where winterkill is less of a concern. The results of a test at Haskell, Oklahoma (near Tulsa), of several seeded varieties and blends in comparison to Tifton 44, Midland 99, and Ozark are given in Table 6. The test was planted May 17, 2000. Only Guymon (no longer available) and Wrangler had early growth in the springs of 2001 and 2002 on a par with the sprigged standards. Giant suffered nearly total winterkill during the first winter. Seeded varieties other than Guymon and Wrangler had to “re-establish” from isolated surviving plants in spring 2001 and were not ready for harvest until mid-July.

Table 6. Visual ratings of early-season growth (% greenup) indicating cold tolerance during springs of 2001 and 2002 of seeded and sprigged bermudagrass varieties at the Eastern Research Station, Haskell, Oklahoma. Test planted May 17, 2000. (Oklahoma State University test)

Variety	% Greenup ¹		
	4-6-01	5-15-01	4-12-02
----- Seeded Varieties/Blends -----			
Common	8	24	1
Tierra Verde	0	4	6
CD90160	6	29	3
Ranchero Frio	4	5	21
Giant	0	0	0
Cheyenne	8	28	5
Guymon	89	93	50
Wrangler	94	96	58
KF-194	23	66	5
----- Sprigged Varieties -----			
Midland 99	93	98	11
Tifton 44	93	95	40
Ozark	55	80	25
Mean	39	51	20
CV (%)	22	20	47
5% LSD	12	15	14
¹ Visually estimated percent of total plot area with new growth.			

These varieties also had delayed greenup in spring 2002, but recovered faster than in spring 2001. In 2002, the yields of Guymon and Wrangler were greater than most of the other seeded varieties at first and second harvests, but had lower yields than most of the other varieties at the third and fourth harvests. None of the seeded varieties in the Haskell test had yields as great as the sprigged hybrid varieties.

Some sprigged varieties also showed severe winter injury during the same winter (2001) in a west-central Arkansas test at the USDA-ARS Center at Booneville (Table 7). Spring greenup was greatest for Quickstand and Oklahoma Wonder, but severe winter injury was noted for Russell, Jiggs, and Tifton 85. Jiggs had over 80% winterkill, Tifton 85 had over 60% winterkill, and Russell showed significant winter injury with slow greenup. These varieties grew back from surviving plants and produced no harvestable forage until third cutting for Jiggs and fourth cutting for Tifton 85. Russell produced very low yield for first and second cuttings and recovered by third cutting.

Table 7. Bermuda variety emergence, Spring 2001 – Booneville, Arkansas.

Year	Variety	April 5	April 16
		% Emergence	
2001	Midland 99	2.5	22
	Tifton 44	2	20
	Russell	0	3
	Common	2	30
	Midland	6	67
	Quickstand	8	82
	OK Wonder	10	85
	Jiggs	0	0
	Tifton 85	0	4

Seeded vs. Sprigged Varieties

From an establishment standpoint, there are two basic types of bermudagrass – those that can be established from seed and those that must be established from sprigs or fresh cuttings. Access to sprigging equipment or commercial spriggers may dictate whether a producer chooses a hybrid or seeded variety. Varieties that can be established from seed are listed in Table 8. Seeded varieties typically have lower yield potential than top hybrid varieties, but can still produce acceptable dry matter yield.

To make yield comparisons across many tests, Common bermuda yield in different trials was set at 100% and the yield of other varieties was calculated as a percent of Common yield. If a variety consistently yielded higher than Common, it's average yield percent will be shown as higher than 100%. The range of yields and number of trials from which the percent is derived are also listed.

Varieties planted from sprigs or cuttings are listed in Table 9. To make yield comparisons across many tests, Tifton 44 bermuda yield in different trials was set at 100% and the yield of other varieties was calculated as a percent of Tifton 44 yield. If a variety yield averaged higher than Tifton 44, it's yield will be shown as higher than 100%. The range of yields and number of trials from which the percent

Table 8. Characteristics and yield potential ranking of bermudagrass varieties planted from seed (list is non-inclusive).

Variety	Yield Potential as % of Common Bermudagrass Yield*	Probable Best Adapted Zones in Arkansas**	Notes
Common	100	7b, 8a	Sold as VNS (variety not stated); seed produced predominately in Arizona and California. Moderate to low cold tolerance, relatively good production, average forage quality. Used for both turf and forage.
CD90160	83% (6) 54-107	7b, 8a	Moderate to low cold tolerance. Similar or lower yielding than Common. Often used as a component of seed blends.
Cheyenne	103% (3) 95-112	Statewide	Often better performance than seeded Common bermudagrass. More cold tolerant than Common. Marketed by Pennington Inc.
Giant	93% (1)	Winterkills often in Arkansas	Sold as VNS, kind 'Giant' bermudagrass; seed produced predominately in Arizona and California. Poor cold tolerance, quick establishment, and high production during establishment year. Often used as a component of seed blends.
KF-194	106% (2) 100-112	Statewide	More cold tolerant and similar to higher yielding than Common. Often used as a component of seed blends. Marketed by KF-Seeds.
Mohawk	95% (1)	Statewide	Developed for turf use. More cold tolerant than Common. Marketed for forage use by Pennington Inc.
Wrangler	88% (5) 57-103	Statewide	Best cold tolerance among seeded varieties; can be grown in northern parts of the bermudagrass belt. Lower yielding than Common. Marketed by Johnston Seed.
Variety Blends			
Tierra Verde	96% (2) 84-108	Statewide	Blend of Mohawk and Sahara II. Marketed by Pennington Inc.
Sungrazer Plus	99% (1)	Statewide	Blend of KF-194, CD90160, and Giant. Marketed by MBS Seed.
Vaquero	- - -	7b, 8a	Blend of CD90160, Pyramid, and Mirage. Marketed by DLF Seed.
Gaucha	- - -	7b, 8a	Blend of CD90160 and Rancher. Marketed by DLF Seed.
Sungrazer	97% (1)	Statewide	Blend of KF-194 and Wrangler. Marketed by MBS Seed.
<p>* Yield potential was calculated as a percentage of yield of Common in university variety performance trials (AR, OK, MO, KS) where comparative data were available. Number of test years are shown in (). The range of percent yield from those tests is also shown.</p> <p>** Adaptation estimate based on USDA plant hardiness zones shown in Figure 1. Certain varieties may perform well outside listed zones during periods of mild climate or disease conditions.</p>			

is derived are also listed. Some varieties listed in Table 6 are naturally occurring common-types selected from producer fields. They often produce little seed and are vegetatively propagated from sprigs or cuttings. Hybrid varieties produce little or no viable seed and generally produce higher forage yields than common-type and seeded varieties.

For most hybrid bermudagrass varieties, a bushel of sprigs contains about 400 sprigs and weighs about 15 pounds. Satisfactory stands can be established by using 12-15 bushels per acre if planted by hand in 3-foot rows, 15-20 bushels per acre if planted by machine in rows, or 40-50 bushels per acre if broadcast and disked into the soil.

Another method of establishing a bermudagrass field is by using long hay (cuttings). This involves

going into an existing field of a known variety, baling the tall forage while it's green, and then immediately transporting this baled green material to a prepared seedbed for planting. The stems of the bermuda forage should have several nodes because the cut stem will develop roots at each node when planted. The normal method of planting cuttings is to broadcast the long hay onto the seedbed and then disk in, not bury, the cut material. Sections of the stems should be protruding from the soil surface. A cultipacker may be used to firm the seedbed after planting. A small square bale of green, uncured clippings weighing 100 pounds will plant about 2,500 square feet when spread over the area. About 17-18 bales are required to plant 1 acre.

Table 9. Characteristics and yield potential ranking of bermudagrass varieties planted from sprigs or top cuttings (list is non-inclusive).

Variety	Planting Method	Date Released	Yield Potential as % of Tifton 44 Yield*	Probable Best Adapted Zones in Arkansas**	Notes
Alicia	Sprigs/ cuttings	1970	62% (2) 58-66	8a	From African selections. Rapid establishment; can be established with top cuttings, yield comparable to Coastal, quality less than Coastal, low cold tolerance, susceptible to leaf disease. Reportedly good choice for poorly drained soils in south Arkansas.
Coastal	Sprigs	1943	73% (4) 60-87	8a	Released from USDA-ARS in Georgia. Considered a standard for bermudagrass varieties in the lower South. Low cold tolerance.
Greenfield	Sprigs	1954	81% (11) 61-100	6b, 7a	Natural field selection released by the Oklahoma Ag. Exp. Station. A standard for "Common" bermudagrass in the upper South. Low growing, forms dense sod, establishes well, better adapted to fine-textured soils than Midland. Very cold tolerant.
Hardie	Sprigs	1974	91% (14) 57-114	6b, 7a, 7b	Released by the Oklahoma Ag. Exp. Station. Good cold tolerance; susceptible to some leaf diseases.
Jiggs	Cuttings preferred	2000	79% (5) 48-101	8a	Private release from east Texas. Lower cold tolerance than Coastal. High yield where adapted.
Midland	Sprigs	1953	82% (21) 55-92	Statewide	Released from Oklahoma State Ag. Exp. Station and USDA in Georgia. Moderate to good cold tolerance; susceptible to some diseases, moderate yield.
Midland 99	Sprigs	1999	105% (16) 97-118	Statewide	Released by Ag. Exp. Stations in OK, AR, KS, and MO, Noble Foundation, and USDA. Upright growth, open-sod. Very cold tolerant. Slightly superior in cold tolerance to Tifton 44. One of the top-yielding hybrids with good cold tolerance; good disease resistance and stand persistence in the upper South.

(continued)

Table 9 (continued)

Variety	Planting Method	Date Released	Yield Potential as % of Tifton 44 Yield*	Probable Best Adapted Zones in Arkansas**	Notes
Ozark	Sprigs	2001	100% (18) 79-127	Statewide	Released by Ag. Exp. Stations in OK, AR, KS, and MO, Noble Foundation, and USDA. Very cold tolerant. Yield similar to Tifton 44 and Midland 99 in several tests.
Quickstand	Sprigs	1993	67% (5) 30-82	6b, 7a, 7b	Collected from surviving plants at the Univ. of KY Robinson Station. Released by UK, NRCS, and USDA. Grown in colder areas of east central states. Low growing, dense sod, good establishment. Forage yield about same as Greenfield.
Russell	Sprigs/cuttings	1994	87% (5) 80-95	8a	Released from Auburn University and LSU. Natural field selection discovered in Russell County, AL. Dense sod. High first harvest yield. Good establishment. Low cold tolerance.
Tifton 44	Sprigs	1978	100	Statewide	Released from USDA-ARS in Georgia. A standard for hybrid bermudagrass varieties in the upper South. One of the top-yielding hybrids with cold tolerance. Slow establishment has been reported.
Tifton 85	Sprigs	1993	75% (4) 30-91	Southern sections of 8a	Released from USDA-ARS in Georgia. Rapid establishment, higher forage yield and forage quality than most other hybrid varieties where adapted. Cold tolerance less than that of Coastal. Adaptation is marginal and only very south Arkansas.
Vaughn's #1	Cuttings/sprigs	1994	88% (1)	Statewide	Natural selection from a Tennessee field. Fast establishment, good yield, and good cold tolerance. Can be propagated with top cuttings. Little yield data available from comparative research tests.
World Feeder	Sprigs	1989	73% (13) 37-91	Statewide	Natural selection from a field in Oklahoma. Highly promoted for many characteristics, but many independent tests have shown it to yield about the same as Greenfield and/or less than standard "hybrid" varieties. Good cold tolerance. Dense sod.
<p>* Yield potential was calculated as a percentage of yield of Tifton 44 in university variety performance trials (AR, OK, MO, KS) where comparative data were available. Number of test years are shown in (). The range of percent yield from those tests is also shown. Yield of Common bermudagrass ranged from 64%-90% (avg. 75%) of the yield of Tifton 44 bermudagrass in trials including both varieties.</p> <p>** Probable adaptation based on USDA plant hardiness zones shown in Figure 1. Certain varieties may perform well outside listed zones during periods of mild climate or disease conditions.</p>					

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