

Bermudagrass in Kentucky

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Interest in bermudagrass [*Cynodon dactylon* (L.) Pers] is increasing in Kentucky as livestock producers continue their search for warm-season perennial forages capable of filling in the mid-summer growth slump we commonly experience with our traditional cool-season grasses. This is partially due to the recent availability of seeded bermudagrass varieties with improved winter hardiness thereby reducing establishment cost and increasing the odds of success.

Bermudagrass is a warm-season perennial that is widely grown in the southern United States for pasture and hay. Like other warm-season plants, bermudagrass makes its best growth at 80-90°F. Climatically, Kentucky lies within a transition zone where extreme temperatures and rainfall changes occur within and between seasons. Cool-season grasses (i.e. tall fescue and orchardgrass) are well adapted to this zone, but forage productivity and quality typically reach season lows during the mid-summer months. In most years, bermudagrass growth starts in late April and continues rapidly until mid-September when cooling temperatures begin to limit growth. Bermudagrass growth ends with the first killing frost which typically occurs around mid-October.

Establishment

In 2000, the UK Extension Publication entitled, “Bermudagrass: A Summer Forage in Kentucky” was published. At that time, the only bermudagrass varieties winter hardy enough to survive in Kentucky had to be established by “sprigging” rhizome and stolon pieces into a prepared seedbed making the cost of establishment quite high. Successful establishment by sprigging is also highly dependent upon immediate rainfall if irrigation is not available. Steps to following when establishing bermudagrass with sprigs are listed in Table 1.

Today, bermudagrass varieties that can be established by seed are available and being marketed in Kentucky. While this development offers another option for establishing bermudagrass, it's important that producers understand that many of these seeded varieties are not winter-hardy enough to survive our Kentucky winters and generally yield less dry matter than many of the top sprigged varieties (Table 2-4). Steps to following when establishing bermudagrass by seed are listed in Table 1.

Table 1. Important Steps to following when establishing bermudagrass with sprigs or seed.

Sprigging

1. Sprig bermudagrass from early May through mid-June if irrigation is not available.
2. Wait for a rain if the soil is extremely dry before sprigging.
3. Use only fresh moist healthy sprigs.
4. Sprigs should be planted the day they are harvested.
5. Keep sprigs in a moist and cool place if planting is delayed.
6. Sprigs can be broadcast and disked lightly or planted in rows using a modified tobacco setter.
7. At least 20 bu/ac of sprigs (a bushel=1,000 sprigs) are recommended if planted with a commercial sprigging machine.
8. At least 40 bu/ac of sprigs should be used when a broadcast method that leaves many sprigs in poor contact with the soil is used.
9. Cultipacking after sprigging firms soil around the sprigs and aids in establishment.

Seeding

1. Bermudagrass can be seeded from early May through early July.
2. A seeding rate of 6-8 lbs/ac is recommended.
3. Bermudagrass can be broadcast seeded into a prepared seedbed or no-till planted into a killed sod.
4. A seeding depth of ¼ inch or less is ideal.

Table 2. Bermudagrass Variety Trial – Morgan Co. (2000-2001).

| Variety | Type | Dry matter yield (t/ac) | | |
|--------------|-------|-------------------------|-------------------|------|
| | | 2000 | % winter survival | 2001 |
| Quickstand | Sprig | 2.1 ab | 81 | 8.5 |
| World Feeder | Sprig | 2.0 b | 53 | 7.3 |
| Wrangler | Seed | 1.7 b | 78 | 8.3 |
| CD90160 | Seed | 3.4 a | 0 | --- |

*Values within a column followed by the same letter are not significantly different at the 95% level of probability

Table 3. Bermudagrass Variety Trial – UK Robinson Station (2002-2003).

| Variety | Type | Dry matter yield (t/ac) | | |
|------------|-------|-------------------------|------|------------|
| | | 2002 | 2003 | 2 yr total |
| Tifton 44 | Sprig | 7.5 * | 4.7* | 12.2* |
| Midland 99 | Sprig | 6.6* | 4.7* | 11.4* |
| Quickstand | Sprig | 7.5* | 3.2 | 10.7* |
| CD 90160 | Seed | 5.7 | 3.6 | 9.4 |
| Wrangler | Seed | 4.2 | 3.4 | 7.7 |
| 74x12-6 | Sprig | 6.1 | 3.7* | 9.8 |
| Cheyenne | Seed | 5.9 | 3.7* | 9.6 |
| Coastal | Sprig | 6.0 | 1.0 | 7.0 |
| Tifton 85 | Sprig | 4.3 | 0.7 | 5.1 |

*Not significantly different from highest value in the column at the 95% level of probability.

Table 4. Bermudagrass Variety Trial – VT Southern Piedmont AREC, Blackstone, VA.

| Variety | Type | Dry matter yield (t/ac) | | |
|-------------------|--------------|-------------------------|------------|------------|
| | | 2003 | 2004 | 2005 |
| Tifton 44 | Sprig | 0.5 | 4.2 | 7.2 |
| World Feeder | Sprig | | | 6.7 |
| Vaughn's #1 | Sprig | 1.5 | 3.7 | 6.5 |
| Midland 99 | Sprig | 0.3 | 3.5 | 6.2 |
| SunGrazer | Seed (blend) | 1.7 | 3.5 | 5.9 |
| Cheyenne | Seed | 1.8 | 3.4 | 5.8 |
| Midland | Sprig | 0.3 | 3.3 | 5.7 |
| Quickstand | Sprig | 0.9 | 3.9 | 5.6 |
| Hardie | Sprig | 1.2 | 4.2 | 5.4 |
| Riata | Seed (blend) | 0.4 | 3.6 | 5.2 |
| Wrangler | Seed | 0.3 | 3.0 | 5.2 |
| Rancho Frio | Seed (blend) | | | 4.8 |
| LSD (0.05) | | 0.4 | 0.6 | 0.9 |

Weed Control

Control of undesirable grasses and broadleaf weeds is one of the biggest challenges in establishing bermudagrass. Unfortunately, options for chemical control of grass weeds such as crabgrass and goosegrass are extremely limited for livestock forage use. However, frequent mowing during establishment can reduce competition for sunlight if weed pressure is high. The use of 2,4-D is also recommended as a post emergence control of broadleaf weeds in bermudagrass when legumes have not been interseeded.

Fertilization

Under good management, bermudagrass is a high yielding forage that responds to high levels of N fertilization. In a five-year study at the UK Robinson Station, dry matter yields of Tifton-44 increased with increasing N rate up to 380 lbs N/acre. In a three-year study at the Virginia Tech Southern Piedmont Station, Blackstone, VA, Dr. Chris Teutsch measured a dry matter yield response up to 485 lbs N/ac (personnel communication).

For new seedings, improved weed control and greater fertilizer N use efficiency will be obtained if fertilizer N applications are delayed one month after sprigging/seeding (30 to 60 lbs N/ac). For established stands, 60-100 lbs N/ac should be applied following each harvest for maximum production throughout the growing season. The last N application should be made by mid-August. Phosphorus and potassium fertilizer should be added according to soil test to maintain adequate nutrient availability.

Forage Quality

In all forage crops, quality tends to decrease with advancing maturity. As warm-season grasses such as bermudagrass mature, fiber concentrations increase and contribute to a decline in digestibility. Higher growth temperatures also hasten maturity and increase lignification (thickening of cell walls), which reduces digestibility. However, quality of bermudagrass hay cut at 28-day intervals compares favorably with that of timothy, orchardgrass and tall fescue hay cut at comparable stages of maturity (Table 5).

Table 5. Approximate crude protein and total digestible nutrients (TDN) content of various hay crops

| <u>Type of Forage</u> | <u>Approx. Usual Nutrient Level¹</u> | |
|------------------------------|--|--------------------|
| | <u>%Crude Protein</u> | <u>%TDN</u> |
| Alfalfa | 17-22 | 57-62 |
| Orchardgrass | 12-15 | 55-60 |
| Tall Fescue | 10-15 | 55-60 |
| Timothy | 8-12 | 58-62 |
| Bermudagrass | 9-11 | 50-56 |

¹Based on recommended production and harvesting practices. Adapted from D.M. Ball, C.S. Hoveland, and G.D. Lacefield. Southern Forages 1991.

Bermudagrass can be successfully used as part of a Kentucky forage program to supplement cool-season grass summer production. Wise use of cool-season perennial grasses and legumes in combination with bermudagrass can improve the odds of producing a year-round feed supply for livestock. When using bermudagrass as far north as Kentucky, the potential for winterkill always exist and only the most winter-hardy varieties should be considered.