



Bermudagrasses in Georgia



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Bermudagrass (*Cynodon* spp.) Is an important warm-season, perennial, sod-forming forage grass in Georgia and throughout the southeast. Bermudagrass is productive from spring until fall and is well-suited for grazing or hay production. It is a high-yielding grass: 5 to 7 tons of hay per acre can be produced with good management when there's ample moisture.

Several varieties of bermudagrass are used in Georgia, ranging from Common bermudagrass to the high-yielding, good quality hybrid bermudagrasses. The best variety to use depends on your location in the state and the intended use.

Significant advancements have improved bermudagrass yields and forage quality. Dr. Glenn Burton, principal geneticist at the Georgia Coastal Plain Experiment Station in Tifton, released several hybrid bermudagrasses for use in the south. His releases include Coastal, Midland, Coastcross I, Tifton 44, Tifton 78 and Tifton 85.

Varieties

COASTAL BERMUDAGRASS was the first hybrid forage bermudagrass developed for use in southern forage programs. Coastal, an F₁ hybrid of Tift common bermuda and a bermudagrass introduced from Asia, was released more than 55 years ago and has been established for hay and grazing on approximately 15 million acres in the southern United States. In Georgia, Coastal is best adapted to the Coastal Plain and lower Piedmont areas. It is not as cold tolerant as Tifton 44 and may winter-kill in the mountains.

Coastal produces high yields of good quality forage when properly fertilized and managed but, like the other hybrid bermudagrasses, Coastal produces few viable seeds and must be established from vegetative planting material.

TIFTON 85 BERMUDAGRASS is the latest release from the USDA program in Tifton. It has exceptional yield and produces high quality grazing and hay. Tifton 85 was released in 1992 as a highly digestible hybrid cross of Tifton 68 and an introduction from South Africa. It has larger stems and broader leaves than most other bermudagrasses. Its large rhizomes and stolons spread rapidly and, under good growing conditions, may grow 2 to 3 inches a day. Hay yields and digestibility are considerably better than Coastal, Tifton 44 and Tifton 78 hybrid bermudagrass. Tifton 85 is not as cold tolerant as Coastal and is best adapted to the Coastal Plain region. Although Tifton 85 might survive most winters in the Piedmont region, a severe winter would severely damage stands.

TIFTON 44 BERMUDAGRASS is a winter-hardy hybrid bermudagrass released in 1978. Tifton 44 is a cross between Coastal and a winter-hardy bermudagrass from Germany. This hybrid produces more rhizomes than Coastal and is better adapted to the northern areas of the bermudagrass growing regions of the country. Tifton 44 bermudagrass produces higher quality forage than Coastal or Alicia, averaging 7 percent higher in digestibility than Coastal and 10 percent higher than Alicia. Hay yields are similar to Coastal. Tifton 44 starts to grow earlier in spring and grows later into the fall than Coastal or Alicia. Tifton 44 must be established from vegetative planting material (sprigs) and is more difficult to establish than the other forage bermudagrasses.

TIFTON 78 BERMUDAGRASS was released in 1984. Tifton 78 is the best of many crosses made between Tifton 44 and Callie. Compared with Coastal, Tifton 78 grows taller, has larger stems and a similar rhizome system, spreads much

faster, is more easily established, and starts growth earlier in the spring.

Tifton 78 is less winter-hardy than Tifton 44. It is well adapted throughout the Coastal Plain and may be grown in the lower Piedmont. Plantings in north Georgia experience some winter-kill during severe winters. The potential for winter injury can be reduced with good management. Do not apply nitrogen after September 1, and do not cut hay after mid September. Tifton 78 pastures can be grazed in the fall, because grazing does not put as much pressure on the stand as does the complete defoliation of a hay cutting. Recent plantings of Tifton 78 have been difficult to maintain. Special attention should be made to maintain good fertility levels and to control insects to reduce stand losses.

RUSSELL BERMUDAGRASS was released by Auburn University and Louisiana State University. The origin can be traced to a long-established field of bermudagrass in Seale, Alabama. It is a dense, lower-growing productive hybrid. Limited testing shows Russell yields well (similar to Coastal) and is winter hardy. Forage quality appears to be similar to Coastal. It exhibits morphological characteristics similar to common bermudagrass.

FLORAKIRK BERMUDAGRASS is a fine-stemmed hybrid cross between Tifton 44 and Callie. Test results show that it has slightly higher digestibility than Coastal. This bermudagrass is not very winter hardy and is susceptible to leaf rust. It is more suited to Florida than to Georgia.

MIDLAND BERMUDAGRASS is a winter-hardy hybrid (Coastal x a winter-hardy Indiana common) best adapted to the upper Piedmont and Mountain regions. Midland is similar to Coastal in yield, growth habit and forage quality. Some Midland stands still exist in north Georgia; however, the variety has largely been replaced by Tifton 44.

ALICIA BERMUDAGRASS was selected from a group of bermudagrasses introduced from Africa

and marketed by a Texas businessman in the early 1970s.

Alicia is relatively easy to establish and produces high hay yields (similar to Coastal and Tifton 44), but its forage is lower in quality than Coastal (about 10 percent less digestible). Alicia is susceptible to rust, a foliage disease that destroys leaf tissue and reduces yields and quality. Alicia can be grown throughout the Coastal Plain and lower Piedmont areas. Coastal, Tifton 44 and Tifton 85 are better choices than Alicia for new plantings.

GRAZER AND BRAZOS BERMUDAGRASSES are two other hybrids grown in the southern United States. Grazer was released from Louisiana State University and is a cross of selections from Italy and Kenya. It has large stems with wide leaves but is not as productive as Coastal. Brazos was released in Oklahoma in 1982. Brazos also has larger stems and leaves than Coastal but does not perform as well as Coastal. Neither is well suited to Georgia conditions.

COASTCROSS I AND CALLIE are two hybrid bermudagrasses previously grown in Georgia. More productive hybrids have replaced their acreage. Both were subject to winter-kill and loss of stands.

COMMON BERMUDAGRASS was introduced into the United States from India or Africa more than 150 years ago. It proved to be well-adapted to the humid south and quickly became a widespread weed in cultivated crops. Common produces viable seed and also spreads by stolons and rhizomes so, once it is established in a pasture, it is difficult to eradicate. Common bermudagrass usually is present in combination with fescue or as a contaminant in improved bermudagrass pastures on more than 400,000 acres in Georgia. Because it is hardy, forms a dense sod, can be established from seed, and can be maintained on infertile soils, Common is well-suited to conservation uses.

Selections from Common have been made and are sold as varieties. Several varieties on the mar-

ket may also be blends of different types of Common. Although Common does not usually provide high yields – only 50 to 60 percent as much hay per acre as Coastal – it can be effectively used in forage programs to provide summer grazing. In north Georgia, it is best used in combination with fescue and clover. Seed Common in spring (April to June) on a prepared seedbed at the rate of 5 to 8 pounds of seed per acre. Research is underway in Georgia to compare yields and persistence of newly-marketed varieties with the hybrid bermudagrasses.

Establishment

Soil Selection

Bermudagrasses are deep-rooted, sod-forming grasses best adapted to fertile, well-drained soils. They can be grown in north Georgia on bottom land that floods in winter provided the soil has good internal drainage and water does not stand on the soil surface for several days. They are not suited to poorly-drained flatwood soils in south Georgia, but because bermudagrasses use water efficiently, they can grow on sandy upland soils that are not well-suited for row crop production.

Seedbed Preparation

Bermudagrasses is established best on a well-prepared, weed-free seedbed. Soil test before preparing the seedbed and apply the recommended amounts of lime, phosphorus and potassium. Tilling, which is necessary to prepare the soil for planting, will incorporate the lime and fertilizer nutrients into the soil.

Prepare the seedbed at least two to four weeks prior to sprigging to allow the soil to settle. If it is necessary to plow shortly before sprigging, pack the soil by cultipacking or using a heavy roller. Freshly-plowed coarse soils dry quickly, reducing the chance of sprig survival.

Planting Dates

Bermudagrass varieties that produce rhizomes such as Coastal, Tifton 85, Tifton 44, Tifton 78 and

Alicia can be planted from late January until late July. Early sprigging of bermudagrass (before the grass breaks dormancy) has some very significant advantages. Soil moisture conditions are usually more favorable in late winter, and sprigs dug before breaking dormancy will have a higher level of stored food reserves to initiate growth once temperatures are warm enough for growth to occur. Bermudagrass plants depend on stored food reserves for winter survival and for the energy to grow in early spring until sufficient leaf area has developed to sustain growth. Sprigs dug in early spring – just after the plants have broken dormancy – will have lower levels of food reserves.

With dormant sprigging, the rhizomes are in the soil and ready to grow as soon as temperatures are warm enough. This also allows more time for the soil to “settle” and to achieve good soil-sprig contact.

You can plant bermudagrass successfully throughout the spring and summer, but good moisture is essential for warm season plantings. Extended periods of dry weather that may occur from May to July can reduce sprig survival and plant growth. Plantings made after late July in north Georgia and after late August in south Georgia may not develop a rhizome system sufficient for winter survival.

Planting Material

Hybrid bermudagrasses produce few viable seeds and must be established from vegetative plant material. Freshly dug sprigs (rhizomes or stolons) are your best source of planting stock for the bermudagrasses. Coastal, Tifton 85 and Alicia can also be established from topgrowth (mature stems). Tifton 44 does not establish easily from topgrowth.

Dig good quality sprigs from pure, well-maintained stands of bermudagrass and plant soon after digging. To ensure hybrid purity and quality, consider purchasing sprigs from certified fields. A list of certified bermudagrass growers can be obtained from your local county extension

office or by calling the Georgia Crop Improvement Association.

Do not let sprigs freeze, dry out or go through heat before planting. Although properly stored sprigs can remain viable for several days after digging, their vigor will decline. If you have to store the sprigs, spread them out in a thin layer (12 inches or less), moisten them, cover them with burlap or a tarpaulin and keep them in a shaded area. Exposure of sprigs to the sun and wind after digging will increase desiccation and rapidly reduce their viability.

If topgrowth is used for planting material, the stems should be six to seven weeks old and have six or more nodes. Planting should take place quickly after cutting the stems. Scatter tops and disk them into moist soil; pack the soil with a heavy roller or tractor tires to decrease moisture loss and ensure good soil contact.

Sprigging

Plant 30 to 40 bushels of fresh, good-quality sprigs per acre 2 to 3 inches deep. Properly adjusted commercial sprigging machines will do an acceptable job. Firm the soil around the sprigs by using the press wheels on the sprigging machine or with tractor wheels. On soils with a high clay content, do not cover sprigs with more than 1 inch of soil.

Apply 35 to 50 pounds of nitrogen per acre after the bermudagrass sprigs start to grow. With early planting dates, a second nitrogen application will be necessary to promote rapid coverage.

Do not apply nitrogen after mid August.

No-Till Sprigging

Bermudagrass sprigs can be successfully planted with no-till sprigging machines. Since the soil does not need to be plowed, the erosion potential is reduced and fields that are too hilly to plow can be established in hybrid bermudagrasses with this equipment. The existing vegetation on fields that will be established should be killed with a herbicide before the field is sprigged. After sprigging, management is similar to

that for fields established with conventional equipment.

Weed Control in Newly Sprigged Bermudagrass

Good weed control during the establishment phase is critical. Newly-established bermudagrass is unable to compete with rapidly growing annual grasses and broadleaf weeds. A thick cover of weeds prevents the bermudagrass stolons from rooting and slows stand establishment.

Options to control weeds in newly-established bermudagrass include timely mowing, grazing and herbicides. As of February, 1997, and with the exception of certain formulations of 2,4-D, there are not preemergence herbicides labeled for use at the time of planting bermudagrass sprigs. 2,4-D can be applied immediately after sprigging and will provide short-term (two to four weeks) control of some annual grasses and broadleaf weeds. A second application will be needed three to four weeks later. Rainfall will be needed to obtain satisfactory weed control. Preemergence applications of 2,4-D have generally been less effective in controlling annual grasses than other herbicides previously labeled for this use. In contrast, post-emergence applications of 2,4-D at rates of 0.5 to 1.0 pounds of active ingredient per acre are highly effective for the control of broad-leaf weeds such as common cocklebur, common ragweed and morningglories.

Research is being conducted by agrichemical companies and land grant universities to identify herbicides for the control of annual grasses during bermudagrass establishment. For example, Zorial® effectively controls annual grasses during establishment. As of February, 1996, however, Zorial is not registered for this use. The registration status of Zorial is subject to change. Check with your county extension agent or agrichemical dealer for the latest information on herbicides labeled for this use.

Winter Survival

Newly-established bermudagrass spreads as stolons (above-ground runners) and develops roots at nodes on stems to form new plants. These new plants and stolons may die during the winter, leaving only the original plants, unless the new plants have formed rhizomes. Rhizomes are large underground stems that serve as food storage organs and as sources of vegetative buds for forming a thick sod. Bermudagrass planted early is more likely to develop sufficient rhizomes for winter survival than grass planted in late summer.

Bermudagrasses start to store food reserves in the rhizome system during late summer. You should not cut new plantings for hay in late summer, so the plants can accumulate considerable growth to supply the food reserves necessary for winter survival.

Most failures in establishing fields usually are caused by:

- ◆ Poorly prepared seeds bed.
 - ◆ Inadequate moisture at planting.
 - ◆ Planting sprigs too dry or desiccated.
 - ◆ Not using enough planting material.
 - ◆ Not firming soil around planting material.
 - ◆ Planting too deep or too shallow.
 - ◆ Severe weed competition.
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Fertilization

You need a sound fertilization program to produce high yields of good quality forage for hay or grazing and to maintain healthy, productive stands.

Bermudagrass grows well at a soil pH range of 5.5 to 6.5. High rates of nitrogen increase soil acidity, making frequent applications of limestone necessary. Test your soil each year and apply lime when needed.

Bermudagrass is a heavy user of fertilizer nutrients. A 6-ton per acre hay yield will remove

significant quantities of fertilizer nutrients (see Table 1), which must be replaced to maintain soil fertility levels.

Table 1. Fertilizer Nutrients Removed in 6 Tons of Bermudagrass Hay

<i>Nutrients</i>	<i>Pounds/Acre</i>
Nitrogen (N)	300
Phosphorus (P ₂ O ₅)	84
Potassium (K ₂ O)	252
Calcium (Ca)	36
Magnesium (Mg)	27
Sulfur (S)	27

Nitrogen

Nitrogen (N) stimulates plant growth and increases the crude protein content of the forage. With adequate moisture, bermudagrass responds to high rates of nitrogen fertilizer. Several applications of nitrogen will be used more efficiently than a single large application. The quantity of nitrogen and frequency of application depend on how the crop is used – for hay or grazing – and how intensively the crop is managed.

N rates for hay production: Apply 75 to 100 pounds of nitrogen per acre in the spring before rapid growth begins and apply a similar quantity after each harvest except the last harvest in the fall. Since bermudagrass grows more rapidly in late spring and early summer and is higher in quality during that period than in late summer, some hay producers prefer to apply heavier rates of nitrogen in spring and early summer than in late summer.

N rates for grazing: When bermudagrass is used for grazing, the amount and frequency of application of nitrogen depend on the stocking rate. With moderate stocking rates, an application of 50 to 75 pounds of nitrogen per acre in April, June and July is adequate. Heavily stocked pastures may require 60 to 80 pounds of nitrogen every four to six weeks.

Nitrogen Sources

Three major nitrogen sources are used on bermudagrass in Georgia. These are solid ammonium nitrate AN (34 percent N), urea-AN solutions (30 to 32 percent N) and AN solutions (19 to 21 percent N). Other nitrogen sources used in Georgia include anhydrous ammonia (82 percent N), solid urea (46 percent N) and ammonium sulfate (21 percent N). All sources can be used successfully if applied correctly.

Since nitrogen is applied topdressed to bermudagrass, there is a potential during warm weather for some volatilization loss of nitrogen from any material containing urea. Urease enzymes, found in plants and soils, can convert the N in urea to a gas. This occurs at the soil surface but not after the urea leaches into the soil. Approximately ¼ inch of rainfall is needed to incorporate urea and essentially eliminate volatilization. Under field conditions, if there is ½ inch of rainfall within 72 hours after application, N losses from urea-based fertilizers are negligible. *Surface-applied nitrogen in forms other than urea will not be volatilized under Georgia conditions.*

You need to take certain precautions when using anhydrous ammonia. Because it is a gas, it must be injected approximately 6 inches beneath the soil surface, and the injection slot must be properly sealed to prevent significant losses of N. Because injection equipment is required, most anhydrous ammonia is applied by custom applicators.

You can use ammonium sulfate on bermudagrass; however, it is very acid-forming when compared to other N sources. It forms three times as much acidity as urea, urea-AN, AN and anhydrous ammonia. Growers can compensate for this additional acidity by maintaining a good liming program.

In summary, any commercially available N source will be effective if applied correctly. Select an N source based on cost per pound of N and/or convenience of application.

Potassium

Potassium (K) is second only to nitrogen in the concentration found in bermudagrass. Potassium is essential for high yields and to maintain healthy stands. The rates of potassium needed vary with soil K levels, cropping intensity and rates of nitrogen used. (See Table 2.)

Table 2. Pounds of Potassium (K₂O) Needed per Acre for Hay Production or Grazing with Different N Rates and Soil Test K Levels

Nitrogen Rate lbs/A	Low	Medium	High
	Hay Production lbs of K ₂ O to apply per acre		
200	250	200	150
300	300	250	200
400	350	300	250
	Grazing		
150-250	120	60	30

Potassium is more efficiently used with multiple applications. Applying potassium in the spring before rapid growth begins and after every other harvest should be satisfactory.

Bermudagrass Decline

Many bermudagrass stands in Georgia have slowly declined over a period of years to the point that the stands are too thin to be productive. As the stand thins, weeds encroach and further reduce the value of the hay field or pasture. The one factor usually consistent in situations when bermudagrass stands have lost vigor and productivity is low soil K levels. Bermudagrass uses large quantities of potassium, which is removed when the grass is harvested for hay. High rates of nitrogen stimulate forage growth and increase hay yields. When high N rates are coupled with low rates of potassium fertilization, K levels decline due to the high rate of removal. In effect, we are mining the soil of K.

Bermudagrass that is K deficient is less winter-hardy and stands may thin during harsh winters. Keep K rates up to maintain stands.

Phosphorus

Phosphorus (P) is essential for many plant processes and is necessary for high forage yields. Phosphorus does not leach readily from the soil, so one application per year is sufficient. You can apply phosphorus any time during the year. Rates of phosphorus needed for grazing and hay production are shown in Table 3.

Table 3. Pound of Phosphorus (P₂O₅) Needed per Acre for Hay Production or Grazing with Different N Rates and Soil Test P Levels

Nitrogen Rate lbs/A	Soil P Levels		
	Low	Medium	High
	Hay Production lbs of P ₂ O ₅ to apply per acre		
200	80	60	30
300	90	70	40
400	100	80	50
	Grazing		
150-250	60	30	0

Quality Hay Production

Bermudagrass that is well fertilized, harvested at the proper time and stored to minimize losses can produce high yields of good quality hay. Bermudagrass hay is widely used in rations for beef and dairy cattle and horses.

Fertilization

A good fertilization program is essential for successful hay production. Fertilization guidelines are in the section on fertilizers on page 7.

Harvest Intervals

The harvest interval affects forage yields and forage quality. Forage quality (digestibility and

protein content) is highest when the grass is very young and declines as the grass matures (see Figure 1). Total dry matter yields per acre, however, increase with time. Harvesting bermudagrass at four- to five-week intervals represents the best compromise between forage yields and forage quality. This harvesting interval produces hay that has a high proportion of leaves to stems and is easy to cure.

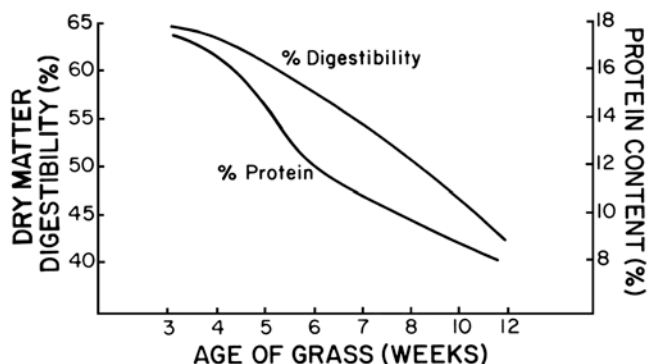


Figure 1. Quality of Coastal Bermudagrass as Influenced by Age of Accumulated Growth Since Previous Harvest

Harvesting

Because close clipping will not harm stands, bermudagrass can be cut as low as the mower and terrain will allow.

You need a mower in excellent mechanical condition to obtain a clean cut. Bermudagrass has relatively fine stems, so mechanical conditioning – crimping or crushing stems – is not necessary for rapid curing. A hay tedder used to fluff the swath or windrow after 4 to 6 hours of drying time will increase the rate of drying. In good hay drying conditions, the moisture content should be low enough for baling (less than 20 percent) in 24 to 36 hours.

High quality, leafy hay is more difficult to retain in bales than longer, stemmy hay. As moisture content and other factors change, periodic baler adjustments are necessary to obtain a tight bale that will withstand handling.

Grazing Management

Bermudagrass pastures should be managed to keep young, leafy forage available for grazing. Cattle consuming young, leafy forage will gain weight faster and produce more milk than cattle grazing older, stemmy grass that is lower in digestibility and protein content. Animal weight gains on poor quality forage are limited by reduced forage quality (digestibility and protein content) and reduced intake of forage by the animal.

You should manage bermudagrass pastures to keep forage growth 2 to 4 inches in height. When pastures are understocked, a tall growth of bermudagrass will accumulate. Cattle will then start to "spot graze," continuously grazing small areas in the pasture where the grass is kept shorter by repeated grazings. When this occurs, the pasture is not being used efficiently. When Tifton 85 is grazed, different management is needed. Tifton 85 will be more productive and carry more cattle when at least 4 inches of growth is maintained in the pasture.

The key to good grazing management is matching the stock rate to the grass growth rate. Since bermudagrass growth is affected by moisture, fertilization and the season of the year, the growth rate is not constant throughout the grazing season. To maintain forage growth within the desired limits, vary the stocking rate by adding or removing animals from a pasture or by reducing the area available for grazing.

Weed Control

A vigorous, well-maintained stand of bermudagrass is the first line of defense against a weed infestation. Cultural practices such as liming, fertilizing, proper grazing and hay practices should be closely followed to promote a dense cover of bermudagrass. Most broadleaf weeds can be effectively controlled with properly timed applications of 2,4-D (numerous trade names), dicamba (Banvel) and triclopyr (Remedy). Two-

way mixtures of 2,4-D and dicamba (Weedmaster) or 2,4-D and picloram (Grazon P+D) may also be used to control a wide spectrum of broadleaf weeds in bermudagrass pastures and hay fields. Metsulfuron (Ally) can be used to control "Pensacola" bahiagrass and several broadleaf weed species. If necessary, hexazinone (Velpar) is available for the control of smutgrass. Paraquat (Gramaxone Extra) can be used on dormant bermudagrass for the control of winter annual grasses and certain broadleaf weeds.

As of February, 1997, no selective preemergence or postemergence herbicides are labeled for control of annual grasses such as crabgrass, goosegrass and sandbur in pastures and hay fields. Research is being conducted by agrichemical companies and land grant universities to identify herbicides for the control of annual grasses. Results of this research are promising. Refer to the current edition of the *Georgia Pest Control Handbook*, your county extension agent or an agrichemical dealer for the latest information regarding herbicides labeled for annual grass control in bermudagrass hay fields and pastures. Spot applications of glyphosate (Roundup) may be used to control annual grasses; however, the bermudagrass will be severely injured or killed in areas treated with glyphosate. Wick-bar applications of glyphosate are very useful to control johnsongrass in hay fields. Delay the use of the wick-bar until a suitable height difference exists between the bermudagrass and the johnsongrass so the wick-bar does not come in contact with the bermudagrass foliage.

Depending on the herbicide, there is often a time period that much elapse between application and animal grazing or hay removal from the field. This period is known as a *grazing or haying restriction*. Since grazing and haying restrictions vary among the various herbicides, the individual herbicide label should be read carefully and fully understood before use. Additionally, grazing and haying restrictions are also shown in the current edition of the *Georgia Pest Control Handbook*.

Diseases

Diseases have not been a major limiting factor for bermudagrass in Georgia. Two fungus diseases caused by *Helminthosporium* and *Rhizoctonia* occur periodically in bermudagrass fields.

Helminthosporium

This fungus can attack roots, crowns, stems and leaves and is considered by far the most critical disease attacking bermudagrass. *Helminthosporium* causes reddish-brown to purplish-black spots to appear on the foliage. The spots enlarge, becoming longer than they are wide and frequently merge together to kill the entire leaf. Dead leaves are tan in color and appear in circular areas in the field. Black streaks appear on infected stems. The fungus works its way from the stem into the crown and roots, causing a dark brown discoloration. Infected stems tend to become spindly and lodge but do not break off.

Low potassium levels in the soil predispose bermudagrass to *Helminthosporium*. Spittlebug injury also increases losses due to this disease. *Helminthosporium* is easy to control if the following practices are followed:

1. Keep potassium levels up.
2. Burn bermudagrass fields each year four to six weeks before new growth begins.
3. Control spittlebug injury.
4. Remove hay as soon as it is ready.

Rhizoctonia

This disease is caused by the soil fungus *Rhizoctonia*, which is responsible for a lawn disease

known as brown patch. In hot, wet weather, the fungus infects stems and leaves causing brown circular patches varying from a few inches to several feet in diameter.

A fungicide treatment for *Rhizoctonia* control is not practical under field conditions. The best control is to avoid excessive rates of nitrogen and remove hay as soon as it is ready.

Summary

Bermudagrass is a productive, warm-season, perennial forage crop that can be used effectively in forage programs throughout Georgia. Good management is necessary to produce and use good quality forage and maintain healthy, productive stands.

Seven Keys to Managing Bermudagrass:

1. Select the variety best suited to your area and intended use.
2. Prepare a good seedbed; plant fresh, good quality sprigs; and control weeds.
3. Test your soil and apply recommended rates of fertilizer.
4. Harvest for hay at four- and five-week intervals.
5. Manage grazing pastures to keep the forage young and leafy.
6. Use only herbicides that are labeled for use on bermudagrass pastures and hay fields.
7. Follow all approved cultural practices to improve bermudagrass competition with weeds.

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