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Planting and Managing Bermudagrass for Forage

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Bermudagrass can be used to advantage in forage systems on many Coastal Plain and Piedmont farms. Bermudagrass is a warm season grass which provides some grazing in June and September but makes most of its growth during July and August when the cool season grasses are in their slump. In addition to grazing, bermudagrass may also be used for hay and silage. Although it is lower in palatability than orchardgrass, and the daily intake of digestible nutrients by grazing animals is less than from a good orchardgrass-ladino clover pasture, livestock perform well on properly managed bermudagrass.

Often there is enough common bermudagrass pasture already on the farm to furnish mid-summer grazing when properly fertilized and managed. Some bermudagrasses can be established by seeding in late spring in prepared seedbeds. These types are not recommended for Virginia except in situations where the stand is needed for only two to three years. They generally do not have the winter hardiness to survive winters this far north and are not as productive as the hybrid varieties. When a new stand of long-lived, productive bermudagrass is desired, it is best to plant one of the improved, higher yielding varieties that must be vegetatively propagated.

Midland bermudagrass is an improved hybrid, cold-hardy variety which has great potential use in Virginia since it is adapted in all areas of the state at medium to low elevations. Midland has yielded well at Petersburg, Holland, Warsaw, Charlotte Courthouse, and has even done reasonably well at Blacksburg at elevations of about 2,100 feet.

Coastal bermudagrass was the first hybrid variety released for use in the South and has yielded well in Suffolk, Southampton, Norfolk, and Dinwiddie counties. In most years it has given satisfactory performance as far west and north as Chatham, Charlotte Courthouse, and Warsaw but has shown considerable winter killing at these locations during severe winters.

Tifton 44 bermudagrass is a cross between Coastal bermudagrass and a winter hardy German bermudagrass. It is similar to Midland in its winter hardiness with generally higher yields and quality. Compared with Coastal, it is darker green, has finer stems, and makes a denser sod.

Source of Sprigs — Each of these varieties must be propagated vegetatively by sprigs since neither produces live seed. Sprigs are the underground stems or rhizomes which are taken from established fields and transplanted into new fields. Only certified sprigs or those of known origin should be planted.

Sprigs are bulky to transport and fairly difficult to ship and keep alive. Producers establishing a new stand should be certain to use freshly dug sprigs. Complete custom planting services are available. Most of these are located in North Carolina.

It is often desirable to establish a nursery plot from which to dig sprigs for new plantings or have a reliable source in the community. Locate nursery plots on soil free of common bermuda. The nursery should be on sandy soil for ease of digging. One acre of well-established bermudagrass will produce enough sprigs to plant 20 to 30 acres each year.

Selecting the Field — Select a soil which is well drained. These varieties do well on a wide variety of soil types but do not perform satisfactorily on wet, poorly drained areas. The planting site selected should be as free as possible of common bermuda, which is less productive than the hybrids. Select the area in advance. Apply glyphosate (Roundup) herbicide while the common bermuda is growing rapidly and seedheads are present to kill most of the common bermudagrass plants. To assure nearly complete kill, fall disk or spring tooth harrow to expose the rhizomes, then seed rye.

When to Plant — Plant between April 1 and June 1 for greatest success. If possible, plant with sprigs that have not broken dormancy.

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Lime — Have the soil tested. Apply lime as needed to adjust the pH to 6.0 to 6.5.

Seedbed Preparation — Prepare a weed-free, smooth, firm seedbed as for seeding a new pasture. Plow and prepare the seedbed in advance and wait until a rain before planting, if possible.

Fertilization — Disk into the soil during seedbed preparation 70 lbs of N and the amounts of $P_2 0_5$ and $K_2 0$ per acre based on soil test results (Table 1).

Table 1. Fertilizer Rates Establishing Bermudagrass Stands

Soil Test Class	lbs/Acre $P_2 0_5$	$K_2 0$
L	110	110
M	80	80
H	50	50
VH	0	0

After the plants begin to send out new runners, or stolons, across the soil surface, broadcast 40 to 60 lbs of nitrogen per acre and repeat every 30-45 days thereafter but not later than August 15

Digging and Care of Sprigs — The bermudagrass stand to be used as a source of sprigs should be burned off prior to digging. Specially designed sprig diggers are available which dig the sprigs and shake the soil from them. Another technique is to disk heavily several times in different directions, then pull the sprigs out with a spring tooth harrow and windrow them with a side delivery rake. Small quantities can often be handled most simply by digging with a shovel and shaking the sprigs free of soil.

Do not allow the sprigs to dry out or to be packed tightly for more than a 6 to 8 hour period to avoid heating. Digging and planting the same day is most desirable.

Planting may be done in several ways:

1. **Specially designed sprig planters** provide a rapid and usually very reliable means of sprigging. Sprigs are planted in rows with a minimum of labor required.
2. **Conventional transplanters**, such as those used for tobacco, are effective, but are much slower and require considerably more labor than the specially designed planter. Driving the tractor wheel over the row after planting helps to keep the sprigs in contact with moist soil and encourages early growth.
3. **Hand sprigging** is the most time consuming and labor demanding method. It is not practical for large acreage but may be the best approach for small plantings, such as establishing a small nursery. Several variations may be followed, including use of a hand sprigger which pushes the sprig into the soil, a spade to open a hole to drop the sprig in, or plowing a furrow to drop the sprig in, then covering it. Always pack the soil around the sprigs immediately after planting.
4. The sprigs may be **broadcast** on the prepared seedbed manually or by a manure spreader and disked in. The soil should be firmed with a roller or cultipacker after the sprigs are disked in. This is the quickest and "crudest" method of establishing a stand but can be successful, especially if irrigation is available.

Row Spacing and Sprig Needs — Except when broadcast, sprigs should be planted every 18 to 24 inches in rows 3 to 4 feet apart. Naturally, the closer the plant spacing and the rows, the sooner the stand will fill in. This spacing requires from 15 to 20 bushels of sprigs per acre, or 180-240 lbs of sprigs, since each bushel of clean sprigs weighs about 12 lbs. Broadcast plantings require more sprigs — 30 to 40 bushels per acre.

Sprig Placement — Cover each sprig with 2 to 4 inches of soil. Firm the soil around each sprig to help protect it from drying.

Weed control is **important** for successful stand establishment. Bermudagrass cannot tolerate shading, and competition from weeds will seriously weaken the plants and reduce spreading. Bare soil must be available in order for the stolons to creep along the surface and put down new roots.

There is currently no herbicide labeled for preplant control of weeds. Annual grasses such as crabgrass, foxtail, and fall panicum are often serious concerns if not controlled. 2,4-D may be applied for control of most broadleaf weeds. Apply when the weeds are 2 to 3 inches tall. Do not graze dairy animals on treated areas within seven days after application. Combinations with dicamba (Banvel) may be required for increased spectrum of weed control.

Cultivation will help to control weeds in bermudagrass planted in rows but must be stopped after the stolons begin to spread to prevent damage to them. Use of a spike tooth harrow or a rotary hoe as weed seeds begin to germinate will also help.

Grazing should not be permitted the first season. Livestock grazing new plants pull many of the spreading stolons loose from the soil before they have time to become established. Harvesting for hay or

simply mowing is the best use for the growth during the establishment year.

Management After the Establishment Year

Do not be dismayed if many of the stolons produced the first year die back to the parent plant. This often occurs in stands which do not become strongly established the first year because of such factors as dry weather, winter cold injury, low fertility, or poor weed control. The parent plants will produce new stolons and rhizomes and spread rapidly the second season if given the opportunity.

Weed control may be necessary. If the stand did not fill in the first year, weeds **must** be controlled to allow the stand to develop. Apply 2,4-D for broadleaf weed control in early spring at the same rates as in the establishment year and observe the same grazing precautions. Combinations with dicamba (Banvel) may be required for an increased spectrum of weed control. Metsulfuron (Ally) is also registered for broadleaf weed control in bermudagrass which has been established at least 60 days and has no grazing restriction. Paraquat can also be applied in early spring while the bermudagrass is dormant and immediately following a hay cutting.

Fertilization is **essential** for the stand to continue to improve and produce high yields of high quality forage. The forage bermudagrasses respond dramatically to nitrogen fertilization. Bermudagrass stands are very well suited for applications of manure or other biological waste since it both tolerates and utilizes high rates of nitrogen application. The $P_2 0_5$ and $K_2 0$ may all be applied in winter or early spring or in split applications during the growing season. A practical schedule to follow for N applications is 100 lbs in April in a complete fertilizer with $P_2 0_5$ and $K_2 0$, 50 lbs in June, and 50 lbs in August. The last N application should be made no later than August 15 to allow time for the bermuda to utilize it before frost.

Soil tests will determine more precisely the fertilizer needs of bermudagrass. Fertilization rates based on soil test results are summarized in Table 2. Follow the topdressing schedule suggested above.

Table 2. Fertilizer Rates for Annual Applications on Bermudagrass for Pasture

Soil Test Class	lbs/Acre N	$P_2 0_5$	$K_2 0$
L	175-255	110	110
M	175-225	80	80
H	175-225	0	0
VH	175-225	0	0

Bermudagrass hayfields generally require a 3:1:2 ratio of N, $P_2 0_5$, and $K_2 0$ during the season but in greater amounts than for pastures. If soil tests are not available, following this ratio will avoid underfertilizing. Using this ratio as a guide, 300 lbs N, 100 lbs $P_2 0_5$, and 200 lbs $K_2 0$ per acre should be applied each season for high yields and quality. A practical schedule is to apply 100 lbs each of N, $P_2 0_5$, and $K_2 0$ per acre in April, 100 lbs N per acre after the first hay cut, and 100 lbs each of N and $K_2 0$ after the second hay cut. If the third cutting is made prior to August 15, another 50-75 lbs N per acre may be applied for additional yield from the fourth cutting.

Although the 3:1:2 ratio is a good guide, soil tests will determine more precisely the fertilizer needs of your bermudagrass. Fertilization rates for hay production based on soil test results are summarized in Table 3. Follow the topdressing schedule suggested above.

Table 3. Fertilization Rates for Annual Applications on Bermudagrass for Hay

Soil Test Class	lbs/Acre N	$P_2 0_5$	$K_2 0$
L	240-300	110	255
M	240-300	80	205
H	240-300	50	100
VH	240-300	0	0

Grazing management is important in making full use of the stand for top quality and high production. Bermuda pastures may be grazed continuously as long as they are not grazed shorter than 2 to 3 inches. Yields are usually less under continuous than under controlled rotational grazing where the pastures are grazed down to 2 to 3 inches, then allowed to recover to 6 to 8 inches before grazing again. Never allow the plants to produce seed heads. When this occurs, quality decreases and growth stops.

Hay production is high (4-8 tons per acre) and harvesting is done during the summer when hay curing conditions are excellent. Hay cuttings should be taken before plants produce seed heads. This will usually result in a hay cutting about every 35-45 days, depending on growing conditions. Aim for 4 hay cuttings each season. Topdressing with N after each cutting before August 15 increases yields and improves quality.

Bermudagrass may also be stored as silage. Experience with bermudagrass silage in Virginia is

limited but states south of Virginia report that it is high enough in dry matter that it can be chopped and put directly into the silo without wilting. Follow the same harvest schedule as for hay.

After the stand is two years old, burning the dry cover in early spring is helpful. This allows the bermudagrass to start growing earlier, provides higher quality grazing or hay, and helps control certain weeds.

An example of the production capacity of bermudagrass and its response to nitrogen fertilization is shown by the data in Table 4. These data are the results of a test demonstration conducted for four years on a stand of Midland bermudagrass on Durham soil located on the farm of Mr. W. Irby in Nottoway County. Note that, in spite of the very dry season, hay yields resulting from 300 lbs of nitrogen per acre averaged nearly 6 tons per acre over the four-year period.

Overseeding established bermudagrass stands with rye provides additional winter and early spring grazing. This may delay spring growth of the bermudagrass but does not harm the stand. Seeding two bushels per acre with a no-till drill or by disking lightly followed by a grain drill is effective. Seed when soil moisture is present and near the normal frost date in the fall. Graze the bermudagrass down to about 2 inches before seeding. Applying 30-60 lbs N per acre in February will increase the rye growth. Graze the rye heavily in late spring or clip it to prevent shading of the bermudagrass.

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Table 4. Yield of Midland Bermudagrass Under Various Rates of Nitrogen Fertilizer in Three Applications.* Nottoway County, W. Irby Farm.

N Application (lbs/Acre)	Tons/Acre, 12% Moisture Forage**				
	1st Year	**2nd Year**	**3rd Year**	**4th Year**	**Average**
0	1.4	0.7	2.0	0.4	1.1
33 + 33 + 33	3.6	3.2	3.6	2.0	3.1
66 + 66 + 66	4.9	4.8	4.5	3.0	4.3
100 + 100 + 100	6.3	6.8	5.7	4.2	5.7
133 + 133 + 133	7.4	7.8	6.5	5.3	6.7

*100 lbs P_2O_5 and 300 lbs K_2O applied in March each year.
**3 cuttings each year except 1973, when 4 were made.