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PASTURE FERTILIZATION IN LOUISIANA



Louisiana State University
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PASTURE FERTILIZATION IN LOUISIANA

There are many different strategies of fertilizing pastures. These vary according to stocking rate, presence or absence of legumes, and whether the pastures consist of summer or winter plants.

The recommendations in this publication assume a good stand of grass and a stocking rate of one cow per acre. Producers using lighter stocking rates can reduce fertilizer use, thereby substituting land for fertilizer.

SOIL TESTING

Soil testing is strongly encouraged to determine lime and fertilizer needs. A good soil testing program can identify problem areas in fields, save money on unnecessary fertilizer use and increase yields through increased fertilizer use.

Proper soil sampling is important. It is recommended to break large fields into 10-acre blocks. Sample fields smaller than 10 acres as a separate field. Sample known problem areas within a field separately.

For each sample, collect soil from 10-15 places in the field at random from a depth of 0-6 inches. Place the soil in a clean plastic bucket. Thoroughly mix the soil and remove about 1 pint for analysis. Your county agent can provide information sheets and soil sample boxes.

PH AND LIMING

Summer grasses (bermudagrass and bahiagrass) are tolerant of acid soils. They rarely respond to lime applications until the soil pH reaches very low levels. Louisiana research has shown that Coastal bermudagrass failed to respond to lime applications when the soil pH was 4.9 and calcium levels are adequate. Research studies in other states support this work.

Clovers and winter grasses are less tolerant of acid soils. It is recommended that the

soil pH be maintained at a level of 5.5 or above if clovers or winter grasses (ryegrass, wheat, etc.) are grown.

WINTER ANNUALS - PREPARED SEEDBED

Planting winter annuals (ryegrass, wheat, etc.) on a prepared seedbed will generally provide more days of grazing than overseeded systems because of earlier establishment of the crop. On a prepared seedbed system, apply all the recommended phosphate and potash before the last tillage trip and incorporate.

Nitrogen may be handled in several ways. In general, use a total of about 1 pound of nitrogen per acre per day of grazing. In south Louisiana, where 180 days of grazing may be obtained, a total of 180 pounds of nitrogen per acre may be needed. In north Louisiana, only 150 pounds of nitrogen per acre may be needed because of fewer grazing days in the winter.

One method of nitrogen application is to apply one-half the needed nitrogen along with the phosphate and potash just before planting. The remainder of the nitrogen can be applied in February.

Some producers prefer a three-way split of the nitrogen with 20-30 pounds of nitrogen being applied at planting. When the grass becomes tall enough to fall over, an additional 60 pounds of nitrogen are applied. The remainder of the nitrogen can be applied in February.

If the nitrogen is to be surface applied and not incorporated in hot weather, such as in September, ammonium nitrate is the preferred nitrogen source. If the nitrogen is applied in cool weather, either ammonium nitrate, ammonium sulfate or urea can be used with equal effectiveness.

TABLE 1

P and K Recommendations for Winter Annuals by Soil Test Level

----- recommended rate (lbs/A) -----

Soil Test Level	P ₂ O ₅	K ₂ O
Very Low	100	120
Low	80	90
Medium	60	60
High	0	0
Very High	0	0

Sulfur and magnesium may be needed on winter annuals. If soil test magnesium levels are medium, low or very low, use magnesium to avoid grass tetany disease in cattle. In very sandy soils, sulfur may be deficient. If grass fails to "green up" after a nitrogen application, suspect a sulfur deficiency. Using 24 pounds of sulfur per acre should eliminate sulfur deficiency.

WINTER ANNUALS - SOD SEEDED

Sod-seeded winter annuals usually yield good grazing in the spring, but little, if any, in the fall and early winter. The competition by the summer grass usually eliminates much growth by winter annuals in the fall and early winter.

This early-season competition complicates fertilization of sod-seeded winter annuals. In general, less nitrogen will be applied than in prepared seedbed systems because fewer days of grazing will be obtained. Usually 90-120 pounds of nitrogen is sufficient in a sod-seeded system.

Timing of fertilization is important in sod-seeded systems. If fertilizer is applied too early, the summer grass will grow and choke out the winter annuals. The best system appears to be to apply all the recommended phosphate and

potash and 24-40 pounds of nitrogen after the summer grass has become dormant (usually after the first killing frost). Then apply the remainder of the nitrogen in February. Since all fertilizer application should be made during cool weather, the effectiveness of urea, ammonium sulfate and ammonium nitrate should be equal.

TABLE 2
Recommended N Rate by Production System and Location

----- Recommended N (lbs/A) -----		
Production System	North La.	South La.
Ryegrass - Prepared Seedbed	150-160	180-200
Ryegrass - Overseeded	90-120	90-120
Ryegrass - Clover	0	0

WINTER ANNUALS WITH LEGUMES

Adding legumes to a winter annual system requires two major management changes. First, the soil pH should be above 5.8. Most clovers do poorly in acidic soils. Liming the soil to a pH of at least 5.8 will help ensure a good stand of clover.

Second, the nitrogen requirement is eliminated. Properly managed, clovers can supply all the nitrogen necessary in a grass-legume mixture. Be sure to inoculate the clover seed properly with the correct *Rhizobium* species inoculant.

It is recommended to apply all the recommended phosphate and potash when the clover is seeded or when clover growth begins, if the clover is coming back from previous year's seedings. Don't apply any nitrogen at this time.

If nitrogen is applied during this period, there is the danger the grass will grow so quickly that it will choke out the clover. Patience is required to allow the clover to establish. Most grazing in a grass-clover system will come in the spring.

If a clover stand is not established, treat the field as described in the fertilizer sections on winter annuals without legumes.

TABLE 3
Nitrogen Fertilizer Replacement Value of Selected Clovers (Rosepine, La.)
Bowie fine sandy loam

Clover	N Replacement (lbs/A)	Seeding Rate (lbs/A)
Arrowleaf	121	5
Crimson	125	12
White	75	3
Red	97	8
Subterranean	90	12
Berseem	94	15

Source: Louisiana Agriculture Vol 34, No. 2, Winter 1990-91

TABLE 4
Effect of Nitrogen Rate on Percentage of Clover in Grass-Clover Mixture

N Rate (lbs/A)	Percent Clover	
	April 29	May 29
0	30	29
60	17	10
120	1	6

Source: Alabama Agricultural Experiment Station Bulletin 559. June 1984

SUMMER PERENNIAL GRASSES

Summer perennial pastures in this region are generally thought of as bermudagrass, bahiagrass, dallisgrass and some native grasses. Fertilization rates will vary according to your location in the state and stocking rate.

Fertilizer timing and rates will also be different if the grasses are being planted as compared to fertilizing established pastures. When planting summer grasses, apply all the phosphate and potash recommended from soil analysis and 20-40 pounds of nitrogen per acre before planting and before the final tillage operation is conducted. If heavy weed pressure exists, use the lower amount. Applying too much nitrogen at this time will encourage excessive weed growth.

After the planted grass emerges and begins to cover, apply 40-60 pounds of nitrogen per acre. This will help the grass cover quickly. Don't apply nitrogen if the weeds are outgrowing the grass. It may be necessary to clip or spray broadleaf weeds and annual grasses to reduce their competition with the planted grass.

When the grass is fully established, fertilize as indicated in the next section.

TABLE 5

P and K Recommendations for Summer Perennial Grasses by Soil Test

---- recommended rate (lbs/A) ----

Soil Test Levels	P ₂ O ₅	K ₂ O
Very Low	100	120
Low	80	100
Medium	60	80
High	0	0
Very High	0	0

FERTILIZING ESTABLISHED GRASSES

For established summer grasses, all the phosphate and potash recommended by soil analysis and 60-80 pounds of nitrogen should be applied in the spring soon after the grass begins to grow. In south Louisiana, this is usually early March. In north Louisiana, this is usually in mid-March to early April. Applying fertilizer earlier than this does not make the grass grow any earlier and encourages weed growth. If broadleaf weeds are present, control them before applying fertilizer.

An additional 60-80 pounds of nitrogen should be applied in early-mid June. These two applications are usually sufficient except in south Louisiana. In this area, another 30-40 pounds of nitrogen may be applied in late August or early September for late fall grazing if ryegrass is not to be overseeded in the field.

In summer pastures, ammonium nitrate or ammonium sulfate are generally preferred over urea-containing sources because of less loss of nitrogen from volatilization.

TABLE 6

Recommended N Rate for Summer Perennial Grasses by Location

----- Recommended N (lbs/A) -----

Time	North La.	South La.
Grass Growth Begins	60-80	60-80
June	60-80	60-80
Late August	0	30-40

SUMMER ANNUAL GRASSES

The summer annual grasses generally include millet, sudangrass or sorghum-sudangrass crosses. These grasses require a higher soil pH than perennial summer grasses. The soil should be limed for these grasses when the soil pH drops below 5.5.

Apply all the recommended phosphate and potash plus 60-80 pounds of nitrogen at or shortly before planting. Apply an additional 40-60 pounds of nitrogen monthly after each rotational grazing or cutting.

If a second planting of summer annual grass is made in the same field in the same year, apply 60-80 pounds of nitrogen per acre at the second planting. To prevent nitrate poisoning, don't apply nitrogen to these grasses in dry weather. Also avoid grazing these grasses after a frost to prevent Prussic Acid poisoning.

SUMMARY

There are many different ways to fertilize pastures, depending on individual producers' needs. All methods should begin with a good soil analysis. Then manipulate different fertilizer schemes to reach your desired outcome. The recommendations in this publication assume a heavy stocking rate of about one cow per acre.

NOTES