PUBLICATIONS
1992

FIELD DAY REPORT - 1992

Texas A&M University Agricultural Research and Extension Center at Overton

Texas Agricultural Experiment Station
Texas Agricultural Extension Service

Overton, Texas

April 30, 1992

Research Center Technical Report 92-1

ALFALFA INTERSEEDED INTO COASTAL BERMUDAGRASS
II. EFFECT OF NITROGEN RATE

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Background. Much of the deforested acreage in eastern Texas is producing Coastal bermudagrass. This grass tolerates acid soil conditions, requires high amounts of nitrogen fertilizers, and withstands some neglect. Alfalfa requires deep, well-limed, well-drained soils and a higher level of management to maintain the stand. Alfalfa was interseeded into Coastal bermudagrass to determine the feasibility of growing both crops together, evaluate forage quality improvement, and study the nitrogen requirement of the grass when grown with alfalfa.

Research Findings. The Darco fine sand soil was limed to achieve pH 6.7 to 6.9. The limestone was roto-till incorporated into the Coastal bermudagrass at growth initiation in the spring. The following fall the Coastal bermudagrass was harvested within 2 inches of the soil surface. Alfalfa, variety 'Alfagraze', was seeded in rows spaced 9, 18, 27, and 36 inches apart. Five pounds of N and 100 lbs each of phosphate and potash were applied, in a blend that contained magnesium, sulfur, boron, copper, and zinc, before planting alfalfa. A blend containing 0-20-23 as N, P_2O_5, and K_2O and approximately 3% magnesium, 6% sulfur, 16% boron, 1% copper, and 0.1% zinc was applied at 500 lb/ac in mid-winter and late summer. More potash was applied at 100 lb/ac in mid-winter and late summer. Nitrogen (N) rates of 0, 25, 50, 75, and 100 lb/ac were applied across the row spacings following each cutting. Yield data from the first harvest year show that alfalfa production was only slightly increased by increasing N rate (Fig. 1). Bermudagrass dry matter production, averaged over row spacing, was increased up to the 75 lb N/acre. Bermudagrass yield at the 75 lb N/acre rate was not significantly different, statistically, from that at the 50 lb N/acre treatment.

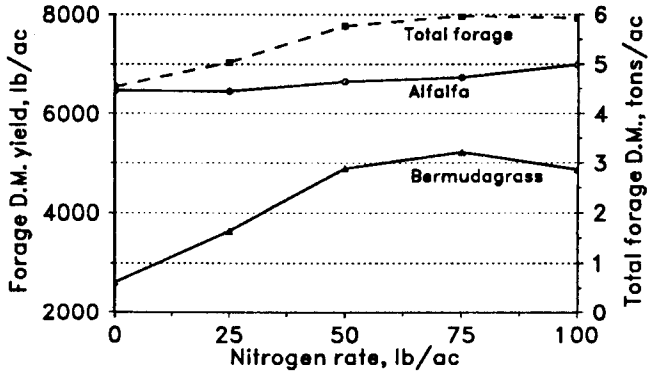

Figure 1. Effect of nitrogen rate on 'Alfagraze' alfalfa and 'Coastal' bermudagrass dry matter yield.

Total yield was optimized at 50 lb/ac (Right Y-axis, Fig. 1).

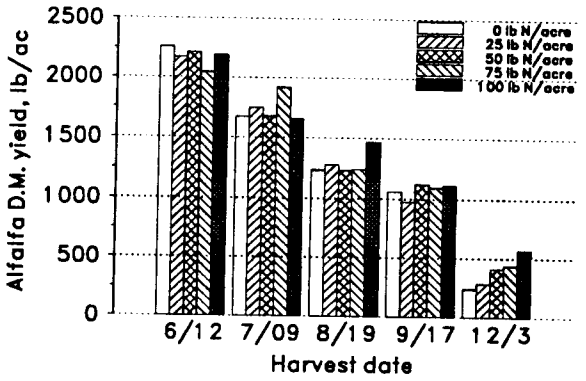

Fig. 2. Response of alfalfa interseeded into Coastal bermudagrass to N rate and harvest date.

Alfalfa yield declined steadily with successive harvests (Fig. 2). Alfalfa yield was not affected by increasing N rate until the August 19 harvest. At this harvest, alfalfa yield was significantly increased by the 100 lb N/acre treatment. In the final harvest, yield was increased by increasing rates of N. Bermudagrass yield was increased by N rate (Fig. 3). The response to N was not significantly different above the 50 lb/acre rate of application at any harvest time. Total bermudagrass yield increase due to N was 1.3 tons dry forage/acre.

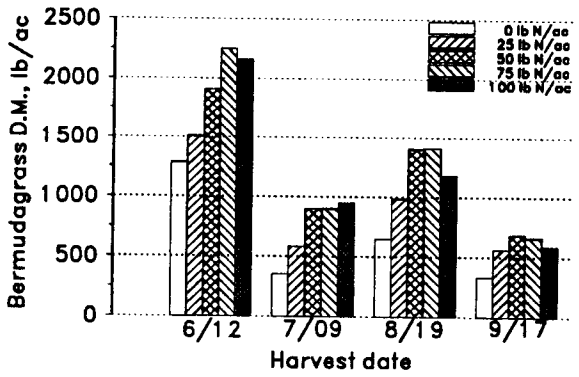

Fig. 3. Coastal bermudagrass response to N rates and harvest dates in interseeded alfalfa.

Application. Data from this first harvest year demonstrate the practicality of alfalfa production in Coastal bermudagrass. Alfalfa was only marginally responsive to applied N. This indicated that the alfalfa plant was well nodulated by N fixing bacteria in this limed, acid soil. The alfalfa crop remained green through the winter and initiated strong regrowth this spring. Continued alfalfa production in Coastal bermudagrass should begin to supply N for grass growth. This will be evaluated as the experiment progresses.