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## ALFALFA PRODUCTION ON ACID, HUMID REGION SOILS

V. A. Haby, S. A. Reeves, F. M. Rouquette, Jr., and G. W. Evers

**Background.** Scientists at the Texas Agricultural Experiment Station at Overton are evaluating management practices for production of alfalfa on acid soils. Current research includes evaluation of alfalfa row spacing, nitrogen transfer, soil series, limestone, and nutrient requirements. Establishment, weed control, and grazing management are being studied. Demonstration plantings of alfalfa using current knowledge are being coordinated by Texas A&M University System Agricultural Experiment Station and Agricultural Extension Service personnel.

**Research Findings.** Alfalfa can be grown on acid, humid-region soils.

**Application.** Here are guidelines for management of alfalfa on acid soils:

- (1) Begin soil preparation one year in advance of the projected alfalfa planting time.
- (2) Site selection is critical. Alfalfa requires a neutral, well-drained soil with low subsoil acidity. In most acid subsoils, red-yellow indicates good aeration. Gray indicates wet, poorly drained conditions. Subsoil levels of available aluminum (Al) and manganese (Mn) must be low.
- (3) Acid soils should be sampled at 0-6, 6-12, 12-24, 24-36, and 36-48 in. depths. Analyze the surface sample for lime requirement to raise soil pH to 6.8-7.0 and for P, K, S, Mg and B. Analyze subsoil depths for pH. A subsoil pH of 5.5 or above is desired. If below 5.5, analyze for available Mn and 0.01 M calcium chloride (CaCl<sub>2</sub>) soluble Al. Soluble Al levels greater than 1.0 ppm in the 6-48 in. soil depth can lower production levels of nonirrigated alfalfa.
- (4) Apply limestone at the recommended rate the winter preceding fall planting. Disk the limestone into the 0-6-in. soil depth in late February to May, even where alfalfa will be overseeded into bermudagrass. Pack the soil with a roller. With adequate rainfall, the bermudagrass will reestablish quickly. Incorporate needed P, K, and B with the limestone. Fertilize reestablished bermudagrass as normally done for grazing. In late summer, stop N fertilization to reduce grass competition with emerging alfalfa seedlings. Resample the 6-in. depth to verify that pH is approximately 7.0 and determine additional fertilizer and limestone needs. Add additional lime if the pH is below 6.5. When the soil tests very low in P, up to 150 lb P<sub>2</sub>O<sub>5</sub> per acre may be needed to establish alfalfa successfully. Apply potassium, sulfur, and other plant nutrients as recommended by soil test. Liming low-buffer-capacity soils to pH 7 decreases the level of plant-available, soil boron. Apply B at rates of 3 to 4 lb/ac for alfalfa on B-deficient soils. Analyze the 0-6 in. soil depth each fall and fertilize at recommended nutrient rates.
- (5) In October, reduce grass height to 3 in. Lightly disk the soil. Drill preinoculated

alfalfa seed or freshly inoculated seed into moist soil. A short stubble allows more sunlight to reach seedlings and protects them from harsh winter conditions. Plant seed less than 1/2-in. deep using a drill with packer wheels, or a cultipack seeder for good soil-seed contact. At 9-10 in. row spacings, plant 20 lb. seed/ac. Reduce the seeding rate by one-half when doubling width between rows. Broadcast and winter or spring seeding of alfalfa are discouraged in the acid soil regions of Texas, particularly when seeding into grass sod due to competition and unpredictable rains.

(6) Alfalfa grown in a grass sod limits herbicide choices. Broadleaf weeds can be controlled with 2,4-DB if sprayed when less than 2 inches tall. Most young grasses can be controlled by Poast. There is no herbicide labeled for selective control of grassy weeds when alfalfa is planted in a grass sod. Balan or Eptam may be incorporated into the top 2-3 in. of soil before planting alfalfa on a prepared seedbed. Treflan granules can be applied pre-emerge for grass and broadleaf weed control on established alfalfa. Pursuit can be used for broadleaf weed control after seedling alfalfa has reached the second true-leaf growth stage. To help avoid injury to alfalfa, read and follow label directions.

(7) Alfalfa weevil and its larval stages are a problem from mid-winter to early spring. Monitor alfalfa each week, beginning in mid-February, for infestation and buildup of harmful insect populations. The three-cornered leafhopper can damage alfalfa in spring and summer. Other harmful insects include aphids, grasshoppers, and other beetles. Check alfalfa for blister beetle during summer months before cutting for hay. Blister beetles in hay can be fatal to horses.

(8) Curing first-growth alfalfa hay in East Texas is difficult due to poor drying conditions. A cutter-conditioner encourages drying. Tedders, hay preservatives, and drying in the barn are helpful drying aids. A slight dew helps prevent leaf loss from dry alfalfa during baling. Spring growth may be harvested by grazing, greenchopping, or silage. When alfalfa is grazed, bloat can be a problem. Preventive measures include allowing cattle their fill of hay, pregrazing on grass, feeding poloxalene free choice, and allowing cattle to graze intermittently for 1 to 2 hours before full-time grazing on alfalfa. To sustain alfalfa stands, graze rotationally with a high stocking rate. Trampling by cattle can damage new growth buds at the crown of the alfalfa plant. Remove cattle when stubble has been grazed to a height of 2-3 in. Allow a regrowth period approximating 4 weeks, depending on precipitation availability, before resuming grazing.

Manage mixed stands of alfalfa and grass to benefit alfalfa. Applying N to an alfalfa-bermudagrass mixture can cause strong grass competition and will not be economical in pastures that have been fertilized and grazed for a number of years before establishing alfalfa.