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NITROGEN MANAGEMENT FOR COTTON IN THE SOUTHEAST

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Abstract

Nitrogen management for cotton in the Southeastern U.S. is dictated by the type of soil found in this region. The predominate soil types are classified as Coastal Plain Ultisols. These soils are characterized as being highly weathered, acid, sandy and inherently low in both native fertility and organic matter. Nitrogen management practices developed specifically for these soils include rates, sources, split applications and petiole sampling. Recommended nitrogen rates for the states of this region (which includes Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Virginia and Tennessee) range from 50 to 105 lb N/a. All states recommend adjusting rates within this range based on factors such as previous crop and history of inadequate or excessive vegetative growth. Georgia is the only state to recommend increasing N rates based on realistic yield goal expectations. The most common N rate recommended for the region is somewhere around 80 lb N/a. Due to the chance of leaching on these sandy soils and balancing vegetative and reproductive growth, all states also recommend that the N be applied in split applications. In general, it is recommended to apply one quarter to one third of the total N rate at planting and the remainder as a sidedress application sometime between first square and first bloom. There is a limited amount of research comparing different N fertilizer sources for cotton production in the region. However, this limited data suggest that there are number of N fertilizer materials available that are suitable for cotton production so cotton growers can base their choice on factors such as availability and price. The two most common sidedress N materials used are probably granular ammonium nitrate and liquid UAN (urea ammonium nitrate) solutions. Poultry litter is another popular fertilizer material used mainly as an N source for cotton in this region. Research studies have shown that the combination of 2 ton/a of poultry litter applied preplant plus an additional 50 lb N/a commercial fertilizer at sidedress is a good N management strategy for cotton. Higher rates of poultry litter could be used to supply all the N required, however, P fertilization would be excessive and cause undue environmental concerns. The strategy mentioned above is basically a “P-based” rather than an “N-based” nutrient management plan. Tissue and/or petiole sampling are recommended by states in this region to fine tune nitrogen management especially when changing fertilization practices such as using poultry litter or converting to conservation tillage. Foliar feeding nitrogen during the peak bloom period may be recommended by petiole testing and can be an efficient and effective method of providing additional N required by a high yielding crop. Nitrogen rates up to 100 lb N/a are not considered to be excessive especially when using proper split applications, growth regulator management, boron fertilization and insect control.