

Excess rains and leaching of nitrogen, potassium and sulfur

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Over the past two weeks some areas have received 10+ inches of rainfall in southeastern Virginia. With heavy rainfall events comes the concerns of leaching of nutrients out of the rooting zone. Nutrients most at risk to be lost via leaching are nitrogen, potassium, and sulfur. It is important to consider soil type when making decisions on applying additional nutrients. Leaching losses will be more severe on deep sandy soil types whereas on soil types with clay loam textured subsoils; nutrients may still be present in finer texture subsoil and available to plant roots. Soil type and quantity of rainfall must be taken into account when making management decisions on the severity of leaching losses.

Given the timing of the rainfall and current growth stage of cotton in Virginia, producers have several options for correcting or applying extra nutrients which may have leached. Most cotton is just starting to bloom or just prior to bloom and will still be responsive to soil applied as well as foliar nutrients. If it is suspected that leaching losses have occurred it is imperative to add sufficient quantities of nutrients to mitigate any adverse impacts on yield. Therefore, as much as 10-30 lbs of additional nitrogen and potassium may be needed. Avoid applying over 30 lbs of nitrogen per acre at first bloom as a delay in maturity of cotton could be observed from over application of nitrogen. The most economical sources of nitrogen, potassium, and sulfur are going to be traditional soil applied sources such as UAN solutions, ammonium sulfate, and muriate of potash. There are additional liquid fertilizers which contain potassium, such as 0-0-15 and 0-0-25-17S (potassium thiosulfate), however the costs of these materials may be cost prohibitive when used as soil applied sources of potassium. Please check with your fertilizer distributor on the availability of these sources. If you are planning to mix UAN solutions and any fluid potassium source, conduct a jar test first as potassium nitrate crystals could form upon mixing. This problem can be remedied by adding water to dissolve the crystals. At this stage of development in cotton, application of these materials will need to be done using high clearance applicators. For fluid fertilizer sources drop nozzles must be used to ensure contact with the soil as well as minimize any burn to the leaf surface. Broadcasting granular fertilizers such as urea, ammonium sulfate, and muriate of potash will most likely cause leaf burn where granules stick to leaf surfaces. This burn will be cosmetic and at the rates recommended (10-30 lbs nitrogen and potassium per acre) will not impact lint yield.

The next option to supply nitrogen, potassium, and sulfur is to do so in foliar applications. Price of foliar nutrients may be cost prohibitive at nutrient application rates appropriate for compensating for severe leaching losses. If losses are estimated to be moderate to slight then foliar application of nutrients may be a viable option for producers. Source is everything for foliar application of nutrients to reduce the risk of foliar burn on cotton leaves. Urea and potassium nitrate sources are the most common foliar fertilizers; potassium nitrate (13-0-44) gives producers a source of nitrogen and potassium. Current VA recommendations are to apply 10 lbs of potassium nitrate or urea in 15 gallons of water per acre, this will result in the application of 1.3 lbs. of nitrogen and 4.4 lbs. of K₂O per acre in a single application. Please be aware of the quantities of nutrients being applied, for example an application of 1 quart per acre of 0-0-25-17S (potassium thiosulfate) will supply 0.76 lbs. of K₂O per acre and during peak bloom cotton will need up to 3.5 lbs. of K₂O per acre per day. Also, products containing sulfur are more likely to cause leaf burn, so use the recommended rates on the label provided by the product manufacturer to reduce this risk. When applying foliar fertilizers be aware of tank mixes with herbicides and other pesticides to ensure no adverse effects on efficacy of crop protection chemicals as

well as formation of precipitates in solution. Also, tank mixing of foliar fertilizers could increase the risk of leaf burn.

Data has shown that cotton is responsive to nutrient applications during the early bloom stages, however application of nutrients beyond the fourth week of bloom has shown little impact on yield of cotton. So there is still time to correct any adverse effects from leaching losses of nitrogen, potassium, and sulfur given the recent weather history!