IMPACT OF SOIL ACIDITY ON COTTON PRODUCTION

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Abstract

Cotton production in Oklahoma has expanded significantly in recent years. A large portion of this expansion has occurred on ground that has traditionally been managed for continuous wheat systems, a crop that can be managed successfully in slightly acidic soil conditions. This has led to potential problems for growers intending to produce cotton on these sites. The objective of this research is to determine at what soil pH level producers may begin to see a significant impact on lint yield or other important physiological characteristics. This experiment took place in three site years across two locations in north central Oklahoma. At both locations, 2 varieties (Deltapine 1612 & Nexgen 3930) were planted across a target soil pH gradient ranging from 4.0 to 8.0. Soil pH was adjusted with the application of hydrated lime or aluminum sulfate. Results show that there is a positive correlation between soil pH and lint yield until reaching a plateau, likely somewhere between the pH ranges of 5.0 and 6.0 depending on cultivar and conditions. Once falling below this threshold, lint yield rapidly decreased to near complete crop failure as the soil pH approached a measurement of 4.0.