Irrigation for site-specific, precision management of cotton.

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Fertigated SDI: Over the past two years, an SDI study installed in 2005 at the Tennessee Valley Research and Extension Center (TVREC) has evaluated four precision fertigation management scenarios. All treatments received 135 pounds per acre of nitrogen and potassium (K2O), 20 pounds per acre of sulfur, and l.0 pound per acre of boron. Phosphorus fertilizer was surface-applied to maintain P at high soil test levels. Drip fertilizer was 8-0-8-1.2S-0.06B made using 32% liquid N, potassium thiosulfate, fertilizer grade KCL, solubor, and water. In 2007, the non-fertigated control was the highest yielding of five treatments, however it was not significantly different from the two highest fertigated treatments. The three highest yielding treatments in 2007 received surface-applied preplant nitrogen and phosphorus. Beneficial downward movement of surface-applied fertilizer early in the 2007 season was likely enhanced by early season rainfall. Fertigated cotton yields averaged 2.9 bales in 2007 and 3.0 bales in 2006.

Sprinkler irrigation: The sprinkler scheduling study initiated in 2006 was continued during 2007 at TVREC to test the soil and plant response of cotton grown using six irrigation treatments. 2007 was the second driest growing season on record at Belle Mina, after 1954. Sprinkler-irrigated cotton yields averaged 2.3 bales in 2006 and 3.5 bales in 2007, with higher 2007 yields likely due to a change in experimental method in 2007 using less frequent, deeper irrigations. The highest yielding sprinkler treatment in 2007 (irrigation at 100% x estimated pan evaporation x canopy cover adjustment) yielded 4 bales per acre. Per acre pumping costs for irrigation were calculated for the 2006 and 2007 cotton sprinkler and SDI trials. In 2008, a canola-soybean-cotton rotation will be incorporated into 24 of the 48 sprinkler plots to assess the economic feasibility of adding two energy crops to a cotton rotation in northern Alabama.