EVALUATION OF THE FENTON REACTION TO DEACTIVATE CONTAMINATE RATES OF 2,4-D ON NON-TRANSGENIC COTTON G.T. Cundiff D.B. Reynolds Mississippi State University Mississippi State, MS T.C. Mueller University of Tennessee

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<u>Abstract</u>

A study was conducted in 2014 and 2015 in two locations in each year. Locations included the Blackbelt research facility in Brooksville, MS and the R.R. Foil research facility in Starkville, MS. The study was conducted as a split plot factorial arrangement of treatments in a randomized complete block. Factor A included either deactivation or no deactivation of the 2,4-D analyte using the Fenton Reaction and Factor B consisted of a rate titration of 2,4-D at the rates of 16, 4, 1, 0.25, and 0.0625 fl.oz/A. At each rate for the deactivated treatment 110 g of iron sulfate hepta-hydrate and 130 ml of 30% hydrogen peroxide were added to a 0.5 gal solution to represent both the tank and the addition of the Fenton Reaction. Glyphosate was added to each treatment at a rate of 31.41 fl.oz/A. Analytical analysis on treatments were performed on High Performance Liquid Chromatography (HPLC). Results from 2014 and 2015 indicate a significant difference at each rate with respect to injury, plant height reduction, nodes above cracked boll (NABC), yield reductions and ppm analyte 2,4-D recovered. When the Fenton Reaction is utilized, a reduction in the 2,4-D analyte was observed in each rate, proving that 2,4-D can be deactivated utilizing the Fenton Reaction. Further research is needed to determine at which dilution rate is most suitable for a producer to effectively and efficiently clean the spray system once 2,4-D has been added.