DETERMINATION OF EFFECTIVE CLEANING METHODS FOR SPRAYER HOSE AFTER **APPLICATIONS OF 2.4-D Derek M. Scroggs** A. M. Stewart LSU AgCenter, Dean Lee Research Station Alexandria, LA D. K. Miller LSU AgCenter Alexandria, LA B. R. Leonard LSU AgCenter Winnsboro, LA James L. Griffin LSU AgCenter **Baton Rouge, LA** David C. Blouin

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Abstract

This study was initiated at the Dean Lee Research and Extension Center, Alexandria, LA, in the fall of 2006. Cotton was sowed and grown in trade gallon nursery containers, three seed per pot, in a greenhouse. Soil type in each pot consisted of a fifty percent mixture of potting soil plus a fifty percent mixture of a sandy loam soil. Experimental design was a Randomized Complete Block (RCB) with 4 replications. Plants were grown under a solar light for twelve hours a day with daytime temperature at 80 degrees and nighttime temperature at 70 degrees. Plants were watered with an automatic misting system for 5 minutes once a day. Treatments consisted of a factorial arrangement of two pesticide applications (Factor A: 1= glyphosate (Roundup WeatherMax[®]) alone @ 22 oz/A or 2= glyphosate @ 22 oz/A + dimethoate @ 12 oz/A) and six clean-out solutions (Factor B: 1= water, 2= ammonia @ 1% solution, 3= bleach @ 1% solution, 4= nitrogen @ 100% solution, 5= Wipe-Out[®] @ 1% solution, or 6= none). Two foot sections of sprayer hose (1 for each treatment) were allowed to soak for two weeks in a solution of 2,4-D (ester formulation). After drying, sprayer hose was attached to a backpack sprayer and subjected to a clean-out procedure. When clean-out was complete, glyphosate alone or glyphosate + dimethoate was applied to cotton plants. Cotton plants were rated for 2,4-D injury at 5, 11, and 14 days after treatment (DAT) and were assigned an indicator variable 0= no injury or 1= injury. Data were subjected to ANOVA using SAS PROC MIXED and means were separated using Tukey's HSD at the 0.05 level of significance.

For treatments that contained glyphosate alone, sprayer hose clean-out with water, ammonia, bleach, nitrogen, and Wipe-Out[®] resulted in cotton injury incidences of 31, 33, 25, 22, and 19%, respectively. When no clean-out solution was used, the chance of having cotton injury rose to 100%, higher than all other clean-out solution treatments. For treatments that contained glyphosate plus dimethoate, sprayer hose clean-out with water, ammonia, bleach, nitrogen, and Wipe-Out[®] resulted in cotton injury incidences of 81, 67, 92, 75, and 64%, respectively. Unlike when glyphosate alone was applied, chances of having cotton injury from all clean-out solutions were similar to that of applying nothing at all, which resulted in 100% injury.

When water, bleach, nitrogen, and Wipe-Out[®] were used to clean-out sprayer hose before treatments of glyphosate alone, cotton injury incidences resulted in 31, 25, 22, and 19%, respectively. These results were lower than cotton injury incidences when the same clean-out solutions were used and treatments of glyphosate plus dimethoate were applied with resulting chances of injury at 81, 92, 75, and 64%, respectively. When ammonia was used to clean-out sprayer hose prior to applications of glyphosate alone, chance of cotton injury was at 33%, which was similar to the chance of having injury when dimethoate was included in the treatment, which was at 67%. When no attempt was made to clean-out sprayer hose, resulting cotton injury incidences were at 100% for both treatments, which would indicate that a proper hose contamination procedure was used for the study.

Chances of having cotton injury increased over time. Cotton injury incidences at 5, 11, and 14 DAT were 49, 60, and 68%, respectively, indicating a slow presence of 2,4-D injury to cotton, which may be accounted for by the growth hormonal activity that 2,4-D exhibits.

Results suggests only minimal differences exit between clean-out solutions. An increase in release of 2,4-D from contaminated sprayer hose was realized when application involved glyphosate plus dimethoate. Cotton injury from contaminated hose may not appear immediately and can be persistent over time. Growers should be cautioned when using sprayers that have applied 2,4-D previously before making post applications to cotton.