Investigating Spray Parameters and Precision Technologies to Improve Fungicide Applications in Peanut

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Objective: To evaluate the influence of spray volume and droplet size on product coverage, canopy penetration and efficacy of fundicide applications in peanut

Location: Lang Farm, Tifton, GA

Methods & Materials: This study was organized as a factorial arrangement of spray volume and droplet size where three different spray volumes of 10, 15 and 20 gallons were acre (GPA) were applied using three different droplet sizes - Medium, Very Coarse and Ultra Coarse. Each combination of spray volume and droplet size was replicated four times and implemented in plots that measured 6-rows wide (18 ft.) by 100 ft. long. A six-row sprayer equipped with a commercial rate controller was used for making all fungicide applications while spray volumes and droplet sizes were achieved by changing nozzle type and size.

Data Collection: Fungicide applications were made at 48, 62, 92 and 122 days after planting (DAP). During each application, water sensitive paper was placed at the top, middle and bottom of the canopy to asses spray coverage and canopy penetration at these plant heights. Canopy measurements and leaf area index was also measured on the day of each application to asses change in peanut canopy throughout the season. Water sensitive paper was analyzed using DropScope instrument and software immidiately after each application. Disease ratings for leaf spot were recorded at 92 and 122 DAP while white mold ratings were taken immidiately after digging. Yield was recorded at harvest by weighing center two rows in each plot.

Results: No interaction existed between the spray volume and droplet size for any of the application timings. Results showed highest coverage was attained for the spray volume of 20 GPA and with medium droplets. Spray coverage reduced with a decrease in spray volume and an increase in droplet size. Spray penetration at the middle of the peanut canopy was similar for both 20 and 15 GPA spray volumes, and similarly for medium and very coarse droplets while it was significantly lower for 10 GPA and for ultra coarse droplet. There was no significant difference in spray penetration at the bottom of the canopy between all three spray volumes and among all three droplet sizes, althought spray coverage was significantly reduced at the bottom of the canopy when compared to the top and middle of the canopy. Fungicide efficacy was not reduced at the lower spray volumes or for larger droplet sizes as indicated by leaf spot or white mold ratings. Overall, results suggest that fungicide application efficiency can be improved by using adequate spray volume (15 GPA or higher) and nozzles that produce medium to coarser droplets.