

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

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Objective: To evaluate the influence of spray volume, droplet size and nozzle type (single vs twin-fan) on product coverage, canopy penetration and efficacy of fungicide applications in peanut.

Location: Lang Farm, Tifton, GA

Methods & Data Collection: The study treatments consisted of three different spray volumes of 10, 15 and 20 gallons were acre (GPA) applied using three different droplet sizes - Medium, Very Coarse and Ultra Coarse. Additionally, a single versus twin-fan nozzle comparison was also performed for each spray volume and droplet size combination. All treatments were replicated four times and implemented in plots that measured 6-rows wide (18 ft.) by 100 ft. long. Fungicide applications were made at 45, 60, 75, 90 and 120 days after planting (DAP). During each application, water sensitive paper was placed at the top, middle and bottom of the canopy to assess spray coverage and canopy penetration at these plant heights. Canopy measurements and leaf area index were also measured on the day of each application to assess change in peanut canopy throughout the season. Water sensitive paper was analyzed immediately after each application. Disease ratings for leaf spot were recorded at 90 and 120 DAP while white mold ratings were taken immediately after digging.



Results Summary: The spray volume and droplet size results were similar to the 2021 study where the 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; however, 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. The comparison between single and twin fan nozzles indicated that no influence of number of nozzle fans but more of droplet size created by the nozzle. The nozzle producing finer droplets had more coverage regardless of the nozzle fans. Overall, the study 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. Both single- and twin-fan nozzles provide comparable coverage for the same droplet size.

