THE EFFECT OF A NEW VENTURI NOZZLE ON POSTEMERGENCE WEED CONTROL. Robert E. Wolf and Dallas E. Peterson, Associate Professor and Extension Specialist, Biological and Agricultural Engineering, and Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66506.

This study was planned to measure herbicide efficacy comparing a new venturi type nozzle and three other nozzles, all designed to reduce drift while maintaining adequate efficacy. The experiment included comparisons of a chamber style nozzle, the turbo flat-fan from Spraying Systems (TT); a venturi style, the AirMix from Greenleaf (AM); the Ultra LoDrift from Hypro (ULD), also a venturi style; and the new design, a turbo-venturi combination, the turbo flat-fan induction also from Spraying Systems (TTI). The TTI is the chamber style turbo flat-fan incorporating a venturi system for added drift control. Orifice size and operating pressure for each nozzle treatment were selected to deliver a spray volume of 94 L/ha at 9.6 km/h while maintaining a similar droplet size. Droplet sizing charts based on ASAE S-572 (*Spray Nozzle Classification by Droplet Spectra*) were used and a medium droplet spectra was chosen. To achieve 94 L/ha and a medium droplet spectra, the TT11002 and AM11002 were used at 276 kPa and the ULD120015 and the TTI110015 were used at 483 kPa. The applications were made with a tractor-mounted 3-point sprayer equipped with a 4-nozzle boom. Nozzles were spaced at 51 cm and located 51 cm above the target. Glyphosate at 0.17 kg ae/ha and paraquat at 0.25 kg ai/ha were used to compare efficacy on common velvetleaf, common sunflower, sorghum, and corn. Sublethal herbicide rates were used to accentuate efficacy differences. AMS at 5% v/v was added to the glyphosate treatments and NIS at 0.25% v/v was added to the paraquat treatments. The experiment had a randomized complete block design in a split plot arrangement with herbicide as the main plot and spray tip by pressure as the subplot. Treatments were replicated three times. Efficacy ratings for 27 days after treatment (DAT) are reported.

Efficacy ratings show that very few significant differences and interactions were found among herbicide and nozzle variables. At 27 DAT species control varied between glyphosate and paraquat as would be expected. Glyphosate provided better control for corn and sorghum compared to paraquat and was similar to slightly less than paraquat for sunflower control. Paraquat had significantly better control for the velvetleaf treatments (LSD=10). With glyphosate, the TTI was significantly better than the AM for velvetleaf control (LSD=6). No other glyphosate and nozzle comparisons were significantly different across all species. With paraquat, the ULD had significantly better control than both the AM and the TTI for velvetleaf control (LSD=6). Also with paraquat, the ULD was significantly better for sorghum control than the TTI (LSD=5), but the TTI was significantly better than both the ULD and AM with corn control (LSD=6).

There were no significant differences among nozzle treatments when compared across the paraquat and glyphosate for all species. Sunflower control was best in the nozzle comparisons with velvetleaf somewhat lower. The corn and sorghum treatments were lower with sorghum slightly better than corn.

As evidenced in this study, only a few significant differences were found among treatments. Difference between paraqaut and glyphosate were expected. Since there are no significant differences in control among nozzle types across all species applicators would be advised that using the new TTI at a higher pressure (483 kPa) should provide sufficient efficacy. However, when analyzing each chemical and nozzle treatment independently, reduced control may result when using the TTI with paraquat for velvetleaf control. With glyphosate the TTI was better for velvetleaf control.

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