

EFFICACY OF GLYPHOSATE WITH VARIOUS SPRAY PARTICLE SIZES FROM AIR INDUCTION, EXTENDED RANGE, TURBO FLOOD AND TURBO TEEJET NOZZLE TIPS. Robert N. Klein, Stevan Knezevic, Robert G. Wilson, Alex R. Martin, Fred W. Roeth, and Brady F. Kappler, Professors and Extension Educator, University of Nebraska, Lincoln, NE 68583.

Field research was conducted at several sites across Nebraska in 2004 to determine the effect of varying particle sizes on the efficacy of glyphosate. The glyphosate used for all purposes was Roundup WeatherMax. The trial was conducted at Scottsbluff, North Platte, Concord, Clay Center and Lincoln. The nozzles and pressures were chosen based on the particle size distribution obtained from each using a Sympatec Helos particle analyzer. The analyzer uses laser diffraction to determine particle size and distribution. Nozzles are classified into categories Very Fine, Fine, Medium, Coarse, Very Coarse and Extremely Coarse based on droplet size. The nozzles used in the study and their classification were: XRC11003 at 35 psi - Fine; XRC11004 at 20 psi - Medium; TT11003 at 35 psi - Coarse; TF2 at 20 psi - Very Coarse, AIC110025 at 50 psi - Very Coarse. The nozzles all delivered 0.28 gallons per minute at the given pressures. The volume median diameter in microns and percent of spray volume less than 210 microns determined by the analyzer are as follows: XRC11003 at 35 psi with water, 0.19 lb ae/a glyphosate + 2% AMS, 0.39 lb ae/a + 2% AMS, 0.77 lb ae/a + 2% AMS = 237-41, 217-48, 206-51, 201-53; XRC11004 at 20 psi with water, 0.19 lb ae/a glyphosate + 2% AMS, 0.39 lb ae/a + 2% AMS, 0.77 lb ae/a + 2% AMS = 327-22, 293-29, 285-31, 289-31; TT11003 at 35 psi with water, 0.19 lb ae/a glyphosate + 2% AMS, 0.39 lb ae/a + 2% AMS, 0.77 lb ae/a + 2% AMS = 400-16, 381-18, 367-19, 346-22; TF2 at 20 psi with water, 0.19 lb ae/a glyphosate + 2% AMS, 0.39 lb ae/a + 2% AMS, 0.77 lb ae/a + 2% AMS = 574-7, 578-7, 536-9, 472-13; AIC11025 at 50 psi with water, 0.19 lb ae/a glyphosate + 2% AMS, 0.39 lb ae/a + 2% AMS, 0.77 lb ae/a + 2% AMS = 571-6, 536-5, 498-7, 404-20.

Three glyphosate rates were used for the field efficacy trials were: 0.58 lb ae/a, 0.29 lb ae/a, and 0.145 lb ae/a. Ammonium sulfate at 2% w:w was included in each treatment, and treatments were applied at 10 gpa. Weeds were planted at each site to obtain a uniform stand. Weeds planted were: field corn, common oil sunflower, ivyleaf morningglory, common lambsquarters and velvetleaf. Over all the weeds, locations and glyphosate rates, only small differences in efficacy were observed. Therefore, one should make nozzle tip selection when applying glyphosate and ammonium sulfate based on particle size that is least prone to drift.