

SPRAY PARTICLE SIZES AND GLYPHOSATE EFFICACY. Robert N. Klein, Alex R. Martin, Fred W. Roeth and Brady F. Kappler. Professors and Associate Extension Educator, University of Nebraska, North Platte, NE 69101 and Lincoln, NE 68583.

Field research was conducted at several sites across Nebraska in 2004 and 2005 to determine the effect of particle sizes on the efficacy of glyphosate (Roundup WeatherMax). The nozzles and pressures were chosen based on the particle size distribution obtained from each using a Sympatec Helos particle analyzer with the rate of glyphosate used in the research. The nozzle tips used in the study were XRC11003, XRC11004, TT11003, TF2, AIC110025 used at pressures delivering 1.06 L/min.

Three glyphosate rates were used for the field trials: 0.65 kg ae/ha, 0.32 kg ae/ha, and 0.16 kg ae/ha. Ammonium sulfate at 2% m/m was included in each treatment, and treatments were applied at 93.54 L ha<sup>-1</sup>. Table 1 lists the spray particle sizes with the various pressures and glyphosate rates used in the research. Weeds planted: field corn, common oil sunflower, ivyleaf morningglory, common lambsquarter and velvetleaf. Only small differences in efficacy were observed. Therefore, one should make nozzle tip and pressure selection when applying glyphosate with ammonium sulfate based on particle size that is least prone to drift.

Table 1. Spray particle sizes with Air Induction, Turbo Flood, Turbo TeeJet, and Extended Range nozzle tips with three rates of Roundup WeatherMax and 2% ammonium sulfate.

Nozzle	Pressure (Bars)	Roundup Rate* (liters)	% < 210	% > 730	VMD	Classification
AI 110025	3.45	None	6	24	571	VC (VC)
AI 110025	3.45	.4	5	19	536	VC
AI 110025	3.45	.8	7	12	498	VC
AI 110025	3.45	1.6	20	4	404	C
TF 2	1.38	None	7	28	574	VC (XC)
TF 2	1.38	.4	7	30	578	VC
TF 2	1.38	.8	9	24	536	VC
TF 2	1.38	1.6	13	13	472	VC
TT 11003	2.41	None	16	5	400	VC (VC)
TT 11003	2.41	.4	18	4	381	C
TT 11003	2.41	.8	19	3	367	C
TT 11003	2.41	1.6	22	3	346	C
XR 11004	1.38	None	22	0	327	C (C)
XR 11004	1.38	.4	29	0	293	M
XR 11004	1.38	.8	31	0	285	M
XR 11004	1.38	1.6	31	0	289	M
XR 11003	2.41	None	41	0	237	F (F)
XR 11003	2.41	.4	48	0	217	F
XR 11003	2.41	.8	51	0	206	F
XR 11003	2.41	1.6	53	0	201	F
* Roundup WeatherMAX (.4= .22 kg ae/ha; .8= .43 kg ae/ha; 1.6= .87 kg ae/ha) In 93.54 L ha <sup>-1</sup> and 2% ammonium sulfate F= Fine VC= Very Course ( ) – Spraying Systems Co. Classification M= Medium XC=						

Extremely Course

C= Course