University of Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

RESEARCH REPORT

Tank-Mix Evaluation for Genisys Mobility in a Low Speed Wind Tunnel

Jeffrey Golus

University of Nebraska - West Central Research and Extension Center

North Platte, NE

2023

University of Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Tank-Mix Evaluation for Genisys Mobility in a Low Speed Wind Tunnel

One nozzle and two spray solutions were analyzed with a Sympatec Helos Vario KR particle size analyzer in a low speed (15 mph air flow) wind tunnel. With the R7 lens installed, it can detect particle sizes in a range from 18 to 3500 microns. This system uses laser diffraction to determine particle size distribution. The width of the nozzle plume was analyzed by moving the nozzle across the laser by means of a linear actuator, and each treatment was replicated three times. The nozzle tested was AIXR11004 at 40 psi.

Results are in the tables that follow. Dv10 is the micron size (µm) at which 10 percent of the spray volume is of the reported size and smaller. Dv50 and Dv90 are similar statistics. Relative span is calculated by the formula (Dv90-Dv10)/Dv50, and is a measure of the uniformity of the droplet size distribution. The percent less than 105 µm (Pct <105 µm) is the percentage of the spray volume that is 105 µm and smaller, with percent less than 141 µm (Pct <141 µm), 150 µm (Pct <150 µm), 210 µm (Pct <210 µm), and 730 µm (Pct <730 µm) being similar measurements.
Droplet Size Distribution data is modelled for downwind deposition using AgDisp. A t test is performed comparing the three reps of a standard tank-mix solution containing Enlist Duo with the test Enlist Duo/Enlist One tank-mixtures. If the t test indicates the test Enlist Duo/Enlist One tank-mixture results in downwind deposition at 30 feet not greater than standard tank-mix solution containing Enlist Duo alone at 30 feet ($p>=0.1$), the tank-mix passes this portion of the process.

The data presented in this report is a factual finding of how various application parameters affect droplet size; in no way should anything in this report be considered an endorsement of any product on behalf of the University of Nebraska or the researchers involved in this work. In addition, this data represents the actual droplet size for each treatment. In no way should the following data supersede the label requirement for a given pesticide or adjuvant.

Table 1. Products used, rates and abbreviations.

Tr	Solution	Rate	Rate Unit	Nozzle
t 1	Enlist Duo	2.8	%v:v	AIXR11004
2	Enlist One + Genisys Mobility	1.25 + 5.6	%v:v + g/l	AIXR11004

Table 2. Climatic data and instrument used during testing.

Metric	Data
Wind speed (mph)	15
Temperature(°F)	70
Relative humidity (%)	37
Measurement distance (in)	12
Particle size analyzer	HELOS KR with R7 lens

University of Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 3. Reference nozzle measurements and spray classification.

Nozzle	Pressure psi	Classification Threshold	Dv10 µm	Dv50 µm	Dv90 µm	Relative Span	Pct <105 µm	Pct <141 µm	Pct <150 µm	Pct <210 µm	Pct <730 µm
11001	65.3	VF/F	67	142	243	1.25	29.20	49.51	54.56	81.52	100.00
11003	43.5	F/M	115	252	415	1.19	7.96	15.92	18.06	36.18	100.00
11006	29.0	M/C	172	382	641	1.23	2.98	6.28	7.18	15.46	96.31
8008	31.9	C/VC	207	458	754	1.19	1.88	4.09	4.69	10.28	88.47
6510	17.4	VC/XC	317	623	944	1.00	0.34	1.04	1.23	3.29	66.52
6515	14.5	XC/UC	392	761	1103	0.93	0.11	0.49	0.60	1.76	45.78

Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 4. Droplet size characteristics for Enlist Duo with AIXR11004 at 40 psi (Oct 6 and Oct 24)

Solution	Rate	Nozzle	Dv10	Dv50	Dv90	Relative span
			µm			
Enlist Duo	2.8	AIXR11004	266	488	747	0.99
Enlist One + Genisys Mobility	1.25 + 5.6	AIXR11004	278	515	788	0.99

Table 4. Continued.

Solution	Rate	Nozzle	Pct < 105 µm	Pct < 141 µm	Pct < 150 µm	Pct < 210 µm	Pct < 730 µm
				%			
Enlist Duo	2.8	AIXR11004	0.34	1.18	1.42	4.60	88.91
Enlist One + Genisys Mobility	1.25 + 5.6	AIXR11004	0.29	1.01	1.23	3.97	85.36

Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 5. Estimated deposition (fraction of applied) at 30 feet from AgDisp for tested tank-mixtures containing Enlist One compared to Enlist Duo alone. A p value greater than 0.10 is required for a tank-mixture to pass.

Solution	Base Deposition (Fraction of Applied)	TankMix Deposition (Fraction of Applied)	P Value	Metric
Enlist One + Genisys Mobility	0.01528	0.01350	0.9982	Pass

University of Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

RESEARCH REPORT

Evaluation for Genisys Mobility in a Low Speed Wind Tunnel

Jeffrey Golus

University of Nebraska - West Central Research and Extension Center

North Platte, NE

2024

Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Evaluation for Genisys Mobility in a Low Speed Wind Tunnel

One nozzle and two spray solutions were analyzed with a Sympatec Helos Vario KR particle size analyzer in a low speed (15 mph air flow) wind tunnel. With the R7 lens installed, it can detect particle sizes in a range from 18 to 3500 microns. This system uses laser diffraction to determine particle size distribution. The width of the nozzle plume was analyzed by moving the nozzle across the laser by means of a linear actuator, and each treatment was replicated three times. The nozzle tested was TTI11004 at 63 psi, and the tests were run February 7, 2024.

Results are in the tables that follow. Dv10 is the micron size (µm) at which 10 percent of the spray volume is of the reported size and smaller. Dv50 and Dv90 are similar statistics. Relative span is calculated by the formula (Dv90-Dv10)/Dv50, and is a measure of the uniformity of the droplet size distribution. The percent less than 105 µm (Pct <105 µm) is the percentage of the spray volume that is 105 µm and smaller, with percent less than 141 µm (Pct <141 µm), 150 µm (Pct <150 µm), 210 µm (Pct <210 µm), and 730 µm (Pct <730 µm) being similar measurements. Data were analyzed using a mixed model ANOVA (PROC MIXED) with replication set as random in SAS 9.2. Mean separation was conducted at $\alpha = 0.05$ level using a Tukey adjustment.
Droplet Size Distribution data is modelled for downwind deposition using AgDisp. A t test is performed comparing the three reps of a standard tank-mix solution containing Engenia + Induce with the test Engenia tank-mixtures. If the t test indicates the test Engenia tank-mixture results in downwind deposition at 110 feet not greater than standard tank-mix solution containing Engenia + Induce at 110 feet ($p>=0.1$), the tank-mix passes and can be included on the list of approved tank-mixes.

The data presented in this report is a factual finding of how various application parameters affect droplet size; in no way should anything in this report be considered an endorsement of any product on behalf of the University of Nebraska or the researchers involved in this work. In addition, this data represents the actual droplet size for each treatment. In no way should the following data supersede the label requirement for a given pesticide or adjuvant.

University of Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 1. Products used, rates and abbreviations.

Trt	Solution	Rate	Rate Unit	Nozzle
1	Engenia + Induce	12.8 + 4.8	fl oz/a + fl oz/a	TTI11004
2	Engenia + Genisys Mobility	12.8 + 0.56	fl oz/a + %v:v	TTI11004

Table 2. Climatic data and instrument used during testing.

Metric	Data
Wind speed (mph)	15
Temperature (°F)	70.1
Relative humidity (%)	44
Measurement distance (in)	12
Particle size analyzer	HELOS KR with R7 lens

Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 3. Reference nozzle measurements and spray classification.

Nozzle	Pressure psi	Classification Threshold	Dv10 µm	Dv50 µm	Dv90 µm	Relative Span	Pct <105 µm	Pct <141 µm	Pct <150 µm	Pct <210 µm	Pct <730 µm
11001	65.3	VF/F	65	140	239	1.24	30.09	50.75	55.88	82.82	100.00
11003	43.5	F/M	114	248	406	1.18	8.11	16.23	18.42	37.06	100.00
11006	29.0	M/C	172	383	643	1.23	3.05	6.37	7.28	15.53	96.31
8008	31.9	C/VC	207	456	762	1.22	1.85	4.07	4.67	10.30	88.07
6510	17.4	VC/XC	324	631	947	0.99	0.30	0.93	1.11	3.03	65.38
6515	14.5	XC/UC	391	756	1097	0.93	0.11	0.47	0.58	1.72	46.40

Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 4. Droplet size characteristics for TTI11004 at 63 psi.

Solution	Rate	Nozzle	Dv10[1]	Dv50	Dv90	Relative span
			μm			
Engenia + Induce	12.8 + 4.8	TTI11004	309	621	969	1.06
Engenia + Genisys Mobility	12.8 + 0.56	TTI11004	322	657	1015	1.05

Table 4. Continued.

Solution*	Rate	Nozzle	Pct < 105 µm[1]	Pct < 141 µm	Pct < 150 µm	Pct < 210 µm	Pct < 730 µm
					%		
Engenia + Induce	12.8 + 4.8	TTI11004	0.21	0.77	0.94	3.03	65.23
Engenia + Genisys Mobility	12.8 + 0.56	TTI11004	0.20	0.71	0.85	2.71	59.61

Nebraska Lincoln EXTENSION

West Central Research and Extension Center

402 West State Farm Road, North Platte, Nebraska 69101, Phone: (308)696-6715

Table 5. Estimated deposition (fraction of applied) at 110 feet from AgDisp for tested tank-mixtures containing Engenia compared to Engenia + Induce. A p value greater than 0.10 is required for a tank-mixture to pass.

Solution	Base Deposition (Fraction of Applied)	TankMix Deposition (Fraction of Applied)	P Value	Metric
Engenia + Genisys Mobility	0.00208	0.00194	0.9012	Pass