The Evaluation of Boomless Nozzles for Weed Control in Pastures, Rangelands, and on Roadsides

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P	PSI	DROP SIZE	CAPACITY ONE NOZZLE IN GPM		SPRAY WIDTH "W" (FEET)		NOZZLE SPACING "X" = 0-3"								NOZZLE SPACING "X" = 0-3"										
				24"	incigni '	GPA FOR ONE NOZZLE					GALLONS PER 1000 SQ. FT.				GPA FOR ONE NOZZLE					GALLONS PER 1000 SQ. FT.					
						4 MPH	6 MPH	8 MPH	10 MPH	15 MPH	20 MPH	2 MPH	3 MPH	4 MPH	5 MPH	4 MPH	6 MPH	8 MPH	10 MPH	15 MPH	20 MPH	2 MPH	3 MPH	4 MPH	5 MPH
(B)1/4XP10R	20 30	XC	0.71 0.87	8.5 10.0	10.0 11.0	10.3 10.8	6.9 7.2	5.2 5.4	4.1 4.3	2.8 2.9	2.1 2.2	0.47 0.49	0.32 0.33	0.24 0.25	0.19 0.20	8.8 9.8	5.9 6.5	4.4 4.9	3.5 3.9	2.3 2.6	1.8 2.0	0.40 0.45	0.27 0.30	0.20 0.22	0.16 0.18
(B)1/4XP10L	40 50	XC	1.00 1.12	11.0 12.5	12.5 13.5	11.3 11.1	7.5 7.4	5.6 5.5	4.5 4.4	3.0 3.0	2.3 2.2	0.52 0.51	0.34 0.34	0.26 0.25	0.21 0.20	9.9 10.3	6.6 6.8	5.0 5.1	4.0 4.1	2.6 2.7	2.0 2.1	0.45 0.47	0.30 0.31	0.23 0.24	0.18 0.19
	60 20	XC	1.22 1.42	13.0 9.0	14.5 11.0	11.6 19.5	7.7 13.0	5.8 9.8	4.6 7.8	3.1 5.2	2.3 3.9	0.53	0.35	0.27	0.21	10.4	6.9	5.2	4.2	2.8	2.1	0.48	0.32	0.24	0.19
(B)1/4XP20R (B)1/4XP20L	30 40 50	XC XC	1.75 2.00 2.25	11.5 13.5 14.5	12.0 14.0 15.0	18.8 18.3 19.2	12.6 12.2 12.8	9.4 9.2 9.6	7.5 7.3 7.7	5.0 4.9 5.1	3.8 3.7 3.8	0.86 0.84 0.88			"R",	, 'L'								_	.33 .32 .34
	60 20	XC XC	2.50	15.0	16.0 11.0	21	13.8	10.3	8.3 8.2	5.5	4.1 4.1	0.94				8	-	-	-						.35
(B)1/4XP25R	30 40	XC	2.13 2.50	12.0 13.5	13.5 14.5	22	14.6 15.3	11.0 11.5	8.8 9.2	5.9 6.1	4.4 4.6	1.0		VIII	M									"Y"	.36
(B)1/4XP25L	50 60	XC XC	2.75 3.00	14.5 15.0	15.0 16.0	23 25	15.6 16.5	11.7 12.4	9.4 9.9	6.3 6.6	4.7 5.0	1.1 1.1		A	Д		4	C		7	12				.42 .43
(B)1/2XP40R	20 30	XC	2.87 3.53	11.0 13.0	12.0 14.5	32 34	22	16.1 16.8	12.9 13.4	8.6 9.0	6.5	1.5	4	Ç,	30		33	а	3	7			9	_'	.54
(B)1/2XP40L	40 50 60	XC XC	4.00 4.55 5.00	14.0 15.0 16.0	15.5 16.0 17.5	35 38 39	24 25 26	17.7 18.8 19.3	14.1 15.0 15.5	9.4 10.0 10.3	7.1 7.5 7.7	1.6 1.7 1.8	7						_		1				.58 .64 .65
(D)4 (DVD00D	20 30	XC XC	5.60 6.83	13.0 15.0	15.5 16.5	53 56	36 38	27 28	21 23	14.2 15.0	10.7	2.4	1.7	1.3	1.0	51	34	- " W	20	13.7	10.2	2.3	1.6	1.2	.82 0.94
(B)1/2XP80R (B)1/2XP80L	40 50	XC XC	8.00 8.73	16.0 16.5	17.5 18.0	62 65	41 44	31 33	25 26	16.5 17.5	12.4 13.1	2.8	1.9	1.4	1.1	57 60	38 40	28 30	23 24	15.1 16.0	11.3 12.0	2.6	1.7	1.3	1.0
	60	XC	9.60	17.5	18.5	68	45	34	27	18.1	13.6	3.1	2.1	1.6	1.2	64	43	32	26	17.1	12.8	2.9	2.0	1.5	1.2

BROADCAS	T and T	URF	Application Rate (GPA)												Gal/100	Swath				
Application:	Miles Per Hour												Miles P	r	Width (ft)					
Model	PSI	GPM	4	5	6	7	8	10	12	14	16	18	20	2	3	4	5	@ 40 PSI		
	30	1.7	12.4	9.9	8.3	7.1	6.2	5.0	4.1	3.5	3.1	2.8	2.5	0.57	0.38	0.28	0.23	17		
FC-XT020	40	2.0	14.6	11.6	9.7	8.3	7.3	5.8	4.9	4.2	3.6	3.2	2.9	0.67	0.45	0.33	0.27			
1 G-X 1 020	50	2.2	16.0	12.8	10.7	9.2	8.0	6.4	5.3	4.6	4.0	3.6	3.2	0.74	0.49	0.37	0.29			
	60	2.4	17. Right-of-Way Pattern Standard Pattern												0.53	0.40	0.32	1		
	30	2.1	14.4 Str	inless	attern				Stainle						0.44	0.33	0.27			
FC-XT024	40	2.4	16.	steel Polys	scetal Flow	rates = 3.7 -1	9.8 gpm at 30	- 60 psi	stee		al Flow rate	s = 0.9 - 26.3	gpm at 30 - 6) psi	0.51	0.38	0.30	18		
10 KIOZ4	50	2.7	18.(-4						-4	X					0.57	0.43	0.34	10		
	60	2.9	19.						_100	7 15					0.61	0.46	0.37			
	30	3.7	25		Med	lium-Coarse Dr	oplets				Medium	-Coarse Drople	ts		0.78	0.58	0.47			
FC-XT043	40	4.3	30						1	/						0.68	0.54	18		
1 C-X 1043	50	4.8	33 Distances = 15:16 feet							Distances = 16-20 feet						0.76	0.61	10		
	60	5.3	36	29	24	21	18.2	14.6	12.1	10.4	9.1	8.1	7.3	1./	1.1	0.84	0.67			

Note: Application rates are based on overall swath widths listed at 48" height. Refer to operating instructions if using a different swath.





























Field trials were conducted to evaluate pattern quality, herbicide efficacy, droplet spectra and swath width comparing boomless nozzles

Materials and Methods:

Experiment: Field Plots located near Manhattan, KS

Design: 4 x 2 randomized complete block with split plot and 3 reps.

Main plot: Herbicide (glyphosate and paraquat)

Subplots: Spray nozzle Plot Size: 20 ft. x 25 ft.

Species: wheat (head and seedling stages)
Visual Ratings: 28 days after treatment (DAT)
Herbicides (2): Paraquat, 0.5 and .375 lb ae/a,

NIS at .25% v/v

Glyphosate, 0.387 and .28 lb ae/a,

N PAK AMS @ 5.0% v/v

Spray Volume: 18 GPA Estimated swath width: 15 feet Spring plots: 30-inch wheat

Fall plots: 6-inch wheat

Application Conditions:

Date: May 2 and Nov 14, 2006

Temp: 78 and 55 degrees

R. H.: 40 and 55%

Wind: Direction – 155 and 90 degrees (90 would be perpendicular to plot).

Wind Speed: 2-5mph, 3-6





Materials and Methods cont.:

Spray Tips: TeeJet BoomJet XP

Hypro Boom Extender XT Evergreen Boombuster BB Wilger ComboJet WC-J

Orifice Size: XP - 20R

XT - 024

BB – Mod 140

WC-J - DR 8003, 04, 06, 08

Pressure: 35-40 PSI

Boom height: 36 inches

Speed: 3.5 MPH

Gator/4-wheeler designed sprayer





Materials and Methods cont.:

Boombuster (BB) Mod 140 XP 20R XT 024



Wilger 8003, 8004, 8006, 8008







Results

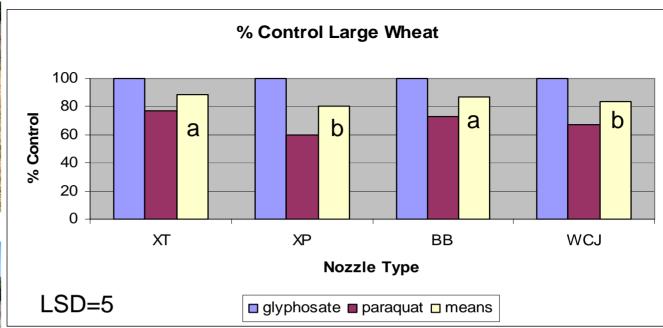
Discussion

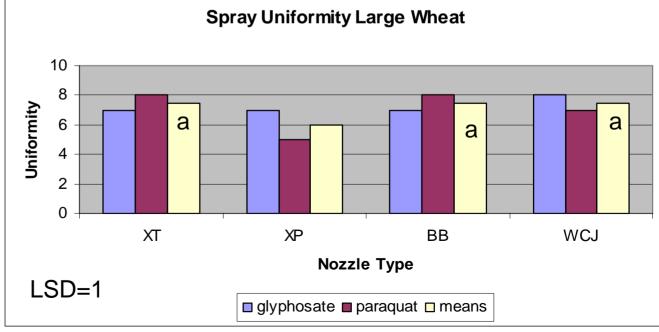








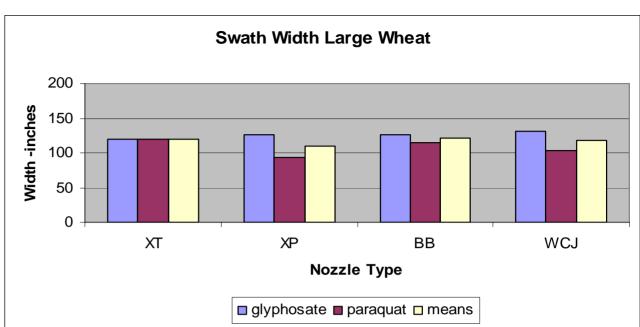


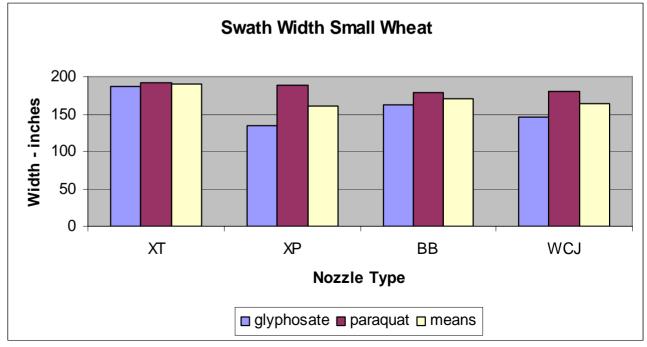












Summary Statements:

- Expected differences in chemical were shown with glyphosate at 100% control and paraquat control ranging from 77 (XT) down to 60% (XP). The BB was 73% and the WC-J was 67%
- Uniformity of control across the spray swath showed little differences with glyphosate but ranged from 8 (XT & BB), WC-J at 7, and down to 5 XP with paraquat.
- Mode of action, coverage, and droplet size will effect the results.

Summary Statements:

- In the tall wheat trials the swath width based on width of control was best for WC-J (131-inches with glyphosate) and lowest with the XP (94inches with paraquat).
- In the small wheat trials the XT had the widest width at 192-inches and the XP controlled over the least width at 134-inches.
- Wind direction and height of spray stream may effect results.
- Droplet analysis and pattern quality evaluations are not complete at this time.

