EVALUATING POTENTIAL NEW HERBICIDES FOR SNAP AND LIMA BEANS

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This planting season was very difficult. The extremely cold weather through the end of March and into April led to virtually frozen soils early in the season. This led to difficulties with soil preparation for planting and also to non-uniform seeding with planters in the early crops, including snap beans. Subsequent heavy rains saturated soils and prevented some of the intended trials. The data from the trials with the new herbicides is presented here. The trials focused on uses with tank mix partners and post-emergence graminicides will be repeated and reported in 2015.

The primary focus of the herbicide trial in both snap and lima beans in 2014 was to evaluate crop tolerance to four relatively new products and eventually support possible residue trials through the IR-4 Program. Manufacturers of two products, pyroxasulfone and acetochlor, have indicated their interest in expanding registrations into specialty crops. Thus, weed scientists in multiple states are evaluating these products. Additionally, two very new herbicides, GWN-10293 and A-16003 are in the very initial stages of phytotoxicity testing. Pyroxasulfone and acetochlor are in the same class of herbicides as s-metolachlor (Dual Magnum) and dimethenamid (Outlook) and have preemergence activities. The chemistries of GWN-10293 and A-16003 are not yet identified but they have both preemergence and post-emergence activities.

SNAP BEANS. Pyroxasulfone applied at 1 oz product/A caused little and transient crop stunting while at 2 oz/A stunting was considerable (Table 1). Yields with both treatments were lower than the handweeded check and the Dual Magnum treatments. In the low rate this was due to uncontrolled wild buckwheat while in the high rate it was the result of the crop injury (Table 2). With acetochlor initial injury with both rates was considerable but was outgrown quickly, wild buckwheat was better controlled and yields were not negatively affected. GWN-10293 at both rates applied preemergence caused excessive stunting that increased over time and sharply decreased yields. Post-emergence applications were also a total failure. Similar phytotoxicity occurred with all four applications of A-16003. It is likely that the preemergence injury associated with pyroxasulfone and acetochlor was enhanced by the very cool and wet soil conditions early in the growing season as we have seen previously with other registered herbicides in snap beans.

LIMA BEANS. In this trial, acetochlor was not tested. The others used in snap beans were evaluated along with post-emergence applications of Raptor and Blazer. Very similar to the snap beans, injury with pyroxasulfone was minor with the low rate and greater and longer lasting with the high rate resulting in reduced yields (Table 3). Limas were very tolerant of both rates of GWN-10293 applied preemergence but post-emergence applications caused extensive and long lasting injury and reduced yields. Crop tolerance to A-16003 was virtually identical to that observed with GWN-10293. Post-emergence Raptor caused significant and relatively long-lasting crop stunting but did not result in decreased yields. Blazer applied at both 0.5 and 1 pt rates also caused excessive stunting that lasted more than two months. Yields with the higher rate were reduced but due to the overall variability in yields the difference was not significant.

	e. 1								
Eval	uating New Herbicides	for Snap B	eans, 2014				T		
Trt			Growth	Crop Inj	ury % Stun	ting	Yield		
No.	Treatment	Rate	Stage	6/10	6/27	7/8	lbs/4	Oft	
1	Handweeded Check			0	0	0	35		
2	Dual Magnum	1 pt	PRE	15	0	0	36		
	Reflex	1/4 pt	PRE						
3	Pyroxasulfone	1 oz	PRE	15	0	0	23		
4	Pyroxasulfone	2 oz	PRE	43	7	0	22		
5	Acetochlor	7 oz	PRE	33	0	0	31		
6	Acetochlor	11 oz	PRE	43	0	0	29		
7	GWN-10293	1 oz	PRE	15	20	12	18		
8	GWN-10293	2 oz	PRE	30	77	70	0		
9	GWN-10293	1 oz	PST		83	80	0		
	NIS 0.25%								
10	GWN-10293	2 oz	PST		93	88	0		
	NIS 0.25%								
11	A-16003	2.5 oz	PRE	37	88	92	0		
12	A-16003	3.5 oz	PRE	60	98	99	0		
13	A-16003	2.5 oz	PST		98	99	0		
	NIS 0.25%								
14	A-16003	3.5 oz	PST		99	99	0		
	NIS 0.25%	0.25							
LSD	(P=.05)			6.5	41	26	10.6	5	
Tabl	e. 2								
Eval	uating New Herbicides	for Span B							
	0		eans, 2014						
			eans, 2014		V	Veed Co	ntrol (१	6)	
Trt			Growth	Wild	V Common	1	•	6) Harry	Large
Trt No.	Treatment	Rate			Common	Com	mon	Harry	•
			Growth	Wild	Common	Com	mon Juarter	Harry	•
No.	Treatment		Growth	Wild Buckwheat	Common Purslane	Com Lambso	mon Juarter 9	Harry Gallinsoga	Crabgass
No. 1	Treatment Handweeded Check	Rate	Growth Stage	Wild Buckwheat 99	Common Purslane 99	Com Lambso 99	mon Juarter 9	Harry Gallinsoga 99	Crabgass 99
No. 1	Treatment Handweeded Check Dual Magnum	Rate	Growth Stage PRE	Wild Buckwheat 99	Common Purslane 99	Com Lambso 99	mon juarter 9 9	Harry Gallinsoga 99	Crabgass 99
No. 1 2	Treatment Handweeded Check Dual Magnum Reflex	Rate 1 pt 1/4 pt	Growth Stage PRE PRE	Wild Buckwheat 99 87	Common Purslane 99 99	Com Lambso 99	mon juarter 9 9 9	Harry Gallinsoga 99 99	Crabgass 99 99
No. 1 2 3	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone	Rate 1 pt 1/4 pt 1 oz	Growth Stage PRE PRE PRE	Wild Buckwheat 99 87 33	Common Purslane 99 99 99 99	Com Lambso 9! 9!	mon juarter 9 9 9 9	Harry Gallinsoga 99 99 99 99	Crabgass 99 99 99 99 99 99 99 99
No. 1 2 3 4	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone	Rate 1 pt 1/4 pt 1 oz 2 oz	Growth Stage PRE PRE PRE PRE	Wild Buckwheat 99 87 87 33 95	Common Purslane 99 99 99 99 99	Com Lambso 99 99 99 99 99	mon juarter 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99	Crabgass 99 99 99 99 92 96
No. 1 2 3 4 5	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz	Growth Stage PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 33 95 33	Common Purslane 99 99 99 99 99 53	Com Lambso 9! 9! 9! 9! 9!	mon Juarter 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99	Crabgass 99 99 99 99 90 90 92
No. 1 2 3 4 5 6	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz	Growth Stage PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 87 33 95 33 43	Common Purslane 99 99 99 99 99 53 53	Com Lambso 99 99 99 99 99 99 99	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99	Crabgass 99 99 99 99 99 99 99 99 99 99 99 99
No. 1 2 3 4 5 6 7	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 1 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 33 95 33 95 33 43 50	Common Purslane 99 99 99 99 99 53 53 99	Com Lambso 99 99 99 99 99 99 99	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99 99	Crabgass 99 99 99 90 90 90 90
No. 1 2 3 4 5 6 7 8	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 1 oz 2 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 87 33 95 33 95 33 43 50 50	Common Purslane 99 99 99 99 99 53 53 53 99 99	Com Lambso 99 99 99 99 99 99 99 99 99 99	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99 99 99	Crabgass 99 99 99 92 96 92 99 99 90 90 90
No. 1 2 3 4 5 6 7 8	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 1 oz 2 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 87 33 95 33 95 33 43 50 50	Common Purslane 99 99 99 99 99 53 53 53 99 99	Com Lambso 99 99 99 99 99 99 99 99 99 99 99	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 0	Harry Gallinsoga 99 99 99 99 99 99 99 99 99	Crabgass 99 99 99 92 96 92 99 99 90 90 90
No. 1 2 3 4 5 6 7 8 9	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293 NIS 0.25%	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 1 oz 2 oz 1 oz 1 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 33 95 33 43 50 50 50 0	Common Purslane 99 99 99 99 53 53 53 99 99 99 43	Com Lambso 99 99 99 99 99 99 99 99 99 90 90	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 0	Harry Gallinsoga 99 99 99 99 99 99 99 99 99 99 88	Crabgass 99 99 99 92 96 92 96 92 96 92 96 92 95 92 95 95 90 90 50
No. 1 2 3 4 5 6 7 8 9	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293 NIS 0.25% GWN-10293	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 1 oz 2 oz 1 oz 1 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 33 95 33 43 50 50 50 0	Common Purslane 99 99 99 99 53 53 53 99 99 99 43	Com Lambso 99 99 99 99 99 99 99 99 99 90 90	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99 99 99 99 88	Crabgass 99 99 99 92 96 92 96 92 96 92 96 92 96 92 95 92 93 94 95 90 90 50
No. 1 2 3 4 5 6 7 8 9 9 10	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293 NIS 0.25% GWN-10293 NIS 0.25%	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 1 oz 2 oz 1 oz 2 oz 1 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE PRE PRE	Wild Buckwheat 99 87 33 95 33 43 50 50 50 0 0	Common Purslane 99 99 99 99 53 53 99 99 99 43 43	Com Lambso 99 99 99 99 99 99 99 99 99 99 99 90 91 91 91 91 91	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99 99 99 99 88 88	Crabgass 99 99 99 92 96 92 96 92 96 92 96 92 95 90 90 90 90 70
No. 1 2 3 4 5 6 7 8 9 10 11	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293 NIS 0.25% GWN-10293 NIS 0.25% A-16003	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 2 oz 1 oz 2 oz 2 oz 2 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE PST PST	Wild Buckwheat 99 87 33 95 33 43 50 50 50 50 0 0	Common Purslane 99 99 99 99 53 53 53 99 99 43 43 43 43	Com Lambso 99 99 99 99 99 99 99 99 99 99 99 99 99	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99 99 99 99 88 88 93 93	Crabgass 99 99 99 92 96 92 96 92 96 92 96 97 90
No. 1 2 3 4 5 6 7 8 9 10 11 12	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293 NIS 0.25% GWN-10293 NIS 0.25% A-16003 A-16003	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 2 oz 1 oz 2 oz 1 oz 2 oz 1 oz 2 oz 3.5 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE PST PST PST	Wild Buckwheat 999 87 33 95 33 95 33 43 50 50 50 0 0 0 0 0 43 38	Common Purslane 99 99 99 99 53 53 53 99 99 99 43 43 43 99 99 99	Com Lambso 99 99 99 99 99 99 99 99 99 99 99 90 90	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Harry Gallinsoga 99 99 99 99 99 99 99 99 99 99 88 88 99 99	Crabgass 99 99 99 92 96 92 96 92 96 92 96 92 93 94 95 90
No. 1 2 3 4 5 6 7 8 9 9 10 10 11 12	Treatment Handweeded Check Dual Magnum Reflex Pyroxasulfone Pyroxasulfone Acetochlor Acetochlor GWN-10293 GWN-10293 GWN-10293 NIS 0.25% GWN-10293 NIS 0.25% A-16003 A-16003 A-16003	Rate 1 pt 1/4 pt 1 oz 2 oz 7 oz 11 oz 2 oz 1 oz 2 oz 1 oz 2 oz 1 oz 2 oz 3.5 oz	Growth Stage PRE PRE PRE PRE PRE PRE PRE PRE PST PST PST	Wild Buckwheat 999 87 33 95 33 95 33 43 50 50 50 0 0 0 0 0 43 38	Common Purslane 99 99 99 99 53 53 53 99 99 99 43 43 43 99 99 99	Com Lambso 99 99 99 99 99 99 99 99 99 99 99 90 90	mon juarter 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 0 3 3 9 9 5 5	Harry Gallinsoga 99 99 99 99 99 99 99 99 99 99 88 88 99 99	Crabgass 99 99 99 92 96 92 96 92 96 92 96 92 93 94 95 90 90 90 70 80 80

Tab	le. 3										
Eva	luating New He	rbicides	s in Lin	na Beans	, 2014						
Trt	Treatment	Form	Rate	Growth	Stunting	Stunting	Chlorosis	Necrosis	Stunting	Stunting	YIELD
No				Stage	6/26	7/7	7/7	7/17	7/17	8/1	lb/40ft
1	Dual Magnum	7.62 EC	1 pt	PRE	7	0	0	0	0	3	19
2	Dual Magnum	7.62 EC	1 pt	PRE	3	27	25	25	43	18	20
	Raptor	1 AS	15 oz	PST							
	NIS 0.25%			PST							
3	Pyroxasulfone	85 WG	1.1 oz	PRE	10	12	0	0	20	10	17
4	Pyroxasulfone	85 WG	2.2 oz	PRE	30	30	0	0	37	20	13
5	Dual Magnum	7.62 EC	1 pt	PRE	3	47	12	12	27	15	17
	Blazer	2 L	0.5 pt	PST							
	NIS 0.25%										
6	Dual Magnum	7.62 EC	1 pt	PRE	3	63	20	20	43	28	12
	Blazer	2L	1 pt	PST							
	NIS 0.25%										
7	GWN-10293	50 WG	0.5 oz	PRE	3	0	0	0	6.7	20	14
8	GWN-10293	50 WG	1 oz	PRE	3	0	0	0	6.7	0	18
9	GWN-10293	50 WG	0.5 oz	PST		50	22	22	47	20	10
	NIS 0.25%										
10	GWN-10293	50 WG	1 oz	PST	0	57	33	33	57	18	13
	NIS 0.25%										
11	A-16003	1.67 L	2.5 oz	PRE	0	0	0	0	0	0	24
12	A-16003	1.67 L	3.5 oz	PRE	0	0	0	0	7	3	20
13	A-16003	1.67 L	2.5 oz	PST		70	33	33	70	50	10
	NIS 0.25%										
14	A-16003	1.67 L	3.5 oz	PST		80	57	57	77	57	9
	NIS 0.25%										
LSD (P=.05)					7	5	6	5	12	13	8
Pos	t Treatments ap	plied 6,	/30								