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.

Table. 1

Evaluating New Herbicides for Snap Beans, 2014

Trt No.	Treatment	Rate	Growth Stage	Crop Injury % Stunting			Yield lbs/40ft
				6/10	6/27	7/8	
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

Table. 2

Evaluating New Herbicides for Snap Beans, 2014

Trt No.	Treatment	Rate	Growth Stage	Weed Control (%)				
				Wild Buckwheat	Common Purslane	Common Lambsquarter	Harry Gallinsoga	Large Crabgass
1	Handweeded Check			99	99	99	99	99
2	Dual Magnum	1 pt	PRE	87	99	99	99	99
	Reflex	1/4 pt	PRE					
3	Pyroxasulfone	1 oz	PRE	33	99	99	99	92
4	Pyroxasulfone	2 oz	PRE	95	99	99	99	96
5	Acetochlor	7 oz	PRE	33	53	99	99	92
6	Acetochlor	11 oz	PRE	43	53	99	99	99
7	GWN-10293	1 oz	PRE	50	99	99	99	90
8	GWN-10293	2 oz	PRE	50	99	99	99	90
9	GWN-10293	1 oz	PST	0	43	90	88	50
	NIS 0.25%							
10	GWN-10293	2 oz	PST	0	43	93	93	70
	NIS 0.25%							
11	A-16003	2.5 oz	PRE	43	99	99	99	80
12	A-16003	3.5 oz	PRE	38	99	99	99	80
13	A-16003	2.5 oz	PST	0	83	95	99	80
	NIS 0.25%							
14	A-16003	3.5 oz	PST	0	90	95	99	95
	NIS 0.25%	0.25						

Table. 3

Evaluating New Herbicides in Lima Beans, 2014

Trt No	Treatment	Form	Rate	Growth Stage	Crop Injury (%)						YIELD lb/40ft
					Stunting 6/26	Stunting 7/7	Chlorosis 7/7	Necrosis 7/17	Stunting 7/17	Stunting 8/1	
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

Post Treatments applied 6/30