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WEED CONTROL IN DRYLAND NARROW-ROW DRY BEAN PRODUCTION

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Introduction

Dry bean weed control options are limited to relatively few products. Viper (bentazon and imazamox) is the best in-crop product. Treflan (trifluralin) is also available and could be useful for preventing early competition by grassy and broadleaf weeds. This demonstration also evaluates the effect of varying seed rate on weed growth and yield. CDC Blackstrap is a new black bean that is high-yielding, suitable for straight-cutting, and suitable maturity for much of Saskatchewan. Since growers are unfamiliar with weed control in dry beans, this demonstration serves to introduce them to the available options and results.

Materials and Methods

CDC Blackstrap certified seed was planted on May 27. Replicates 1 and 2 were seeded on a field of canola stubble near Redvers about 2 km from the Research Farm. Replicates 3 and 4 were seeded on pea stubble at the South East Research Farm. This was done to ensure that there would be enough weed pressure to compare, as volunteer canola is a difficult challenge. The Research Farm quarter had very little weed pressure. There was a burn-off of glyphosate and Buctril M on May 21. Treflan treatments were applied on May 28 after seeding.

Table 1. Herbicide and bean seed rate treatments used in the trial.

Treatment Code	Seed Rate Target pl/m2	Herbicide Applied
SR1-H1	50	Treflan
SR1-H2	50	Viper
SR1-H3	50	Treflan + Viper
SR2-H1	40	Treflan
SR2-H2	40	Viper
SR2-H3	40	Treflan + Viper
SR3-H1	30	Treflan
SR3-H2	30	Viper
SR3-H3	30	Treflan + Viper

Results and Discussion

Emergence was in line with expectations generally based on the target seeding rates. Herbicide use did not affect plant populations.

Weed biomass was not affected by seed rate but was clearly affected by herbicide use. Treflan alone (H1) was not effective at controlling the volunteer canola, which was the main weed problem. Viper herbicide was very effective at reducing weed biomass. Herbicide use affected the height of the beans, likely due to suppression of the beans where they were weedy.

Table 2. Yield, weed biomass (air dry), dockage and other agronomic parameters for three seeding rates and three herbicide treatments.

Treatment	Emergence	Weed Biomass	Crop Height	Yield	Dockage	Dockage
	Pl/m2	g/m2	cm	Lb/ac	Lb/ac	%
SR1-H1	57.4	422	35.4	1468	150	10.8
SR1-H2	47.2	683	34.5	1487	25	1.4
SR1-H3	40.2	531	34.1	1261	22	1.3
SR2-H1	32.4	25	37.3	1923	172	11.2
SR2-H2	39.8	33	41.4	1927	21	1.3
SR2-H3	39.0	22	42.4	1727	21	1.35
SR3-H1	27.5	24	36.6	1749	152	12.0
SR3-H2	33.2	23	35.5	1680	17	1.0
SR3-H3	33.6	32	40.1	1476	21	1.5
P values	<0.01	0	0.12	0.099	<0.01	0.99
LSD	0.0334	240	6.6	472	108.15	8.23
SR1	48.3	157	36.4	1713	65	0.045
SR2	37.0	246	37.1	1698	71	0.046
SR3	31.4	195	38.9	1488	63	0.0482
P values	<0.01	0.42	0.4236	0.184	0.9608	0.99
LSD	6.7	139	3.8	272	62	4.75
H1	39.097	545	34.7	1405	158	11.3
H2	40.054	27	40.3	1859	21	1.2
H3	37.593	26	37.4	1635	21	1.4
P values	0.75	<0.01	**<0.01**	0.008	<0.01	<0.01
LSD	6.7	139	3.8	272	62	4.8

Yield was not significantly affected by seed rate, though there did seem to be a trend to higher yield with higher seed rate. Yield was affected by herbicide treatment which reflects weed competition. Dockage weight, which was primarily canola and wheat seed, was highest with the Treflan only treatments (H1). Dockage percentage was also higher with the H1 treatment. Seed rate did not affect either dockage weight or percentage, which suggests that even at higher seed rates beans are not competitive with volunteer crops like wheat and canola. Yield was higher on the wheat stubble (1975 lb/ac for wheat stubble vs. 1517 lb/ac for canola stubble) for non-weedy factors H2 and H3. Yield was suppressed more (27%) due to volunteer canola in the canola stubble than due to wheat volunteers and other weeds on the wheat stubble (13.5%).

Table 3. Influence of two trial locations on yield and weed control.

Herbicide Treatment	Wheat Stubble Reps	Canola Stubble Reps
	Yield (lb/ac)	Yield (lb/ac)
H1 – Treflan Only	1708.8	1101.5
H2 – Viper Only	2137.9	1579.7
H3 – Treflan + Viper	1812.5	1457.6

Conclusions

Weed control using Viper (imazamox and bentazon) was effective for controlling weeds in dry beans. Treflan may be helpful for resistance management but was not effective as a sole spring-applied treatment, particularly for controlling volunteer wheat and canola.

Seed rate did not influence weed biomass, dockage weight or dockage percentage. Yield tended to be lower for the lowest seeding rate (S3) compared with higher seeding rates (S1 and S2), but this trend was not statistically significant. Beans are not competitive with weeds, so herbicide weed control is important. This demonstration also suggests that previous crop history could influence yield in beans based on the effect of wheat and canola stubble replicates. The two locations were close in proximity so had similar rainfall.

Extension:

The two locations for this trial were visited by a group of 30 during the SERF Plot Tour on July 25, 2018. There was some interest in the potential of CDC Blackstrap as an alternative to soybeans.

Acknowledgements:

Jock Sutter provided the land for this trial.

Gowan Canada provided the Treflan.

Abstract:

Three seed rates and three herbicide treatments were evaluated with CDC Blackstrap black bean at Redvers in 2018. Two replicates were located on wheat stubble and two were located on canola stubble to ensure adequate weed pressure. Treflan alone resulted in considerable weed growth but Viper was effective in controlling volunteer canola and volunteer wheat. Seed rate did not significantly affect yield but there was a trend suggesting the lowest seed rate was not optimal. Herbicide use was the dominant effect in this trial. The canola stubble had more yield loss due to lack of weed control than the wheat stubble did. Yield tended to be higher on the wheat stubble, which suggests that a trial on previous cropping history or stubble height could be warranted in dry bean.