Evaluation of Postemergence Herbicides on Flax

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A trial was conducted to evaluate potential of various postemergence applied herbicides for use in flax. Herbicides applied in this trial are not labelled for use in flax, with the exception of Bison (MCPA plus bromoxynil) and cannot be applied to flax grown for commercial production as this would result in illegal crop residue. Flax 'York' was planted on May 2, 2020 into canola stubble using a no-till drill at a rate of 28 lb/acre and at a depth of 1.5 inches. Flax emerged on May 19. Postemergence herbicides were applied 1 week after flax emergence on May 26 using a tractor-mounted research plot spray at a spray volume of 10 gallons per acre using 8002XP flat fan nozzles. Flax was evaluated for injury at 1, 2, 3, 4, and 5 weeks after treatment application. Flax stand was measured using two 0.5 m^2 quadrats per plot on June 4, at 9 days after treatment application. Flax height was measure on July 22, at 7 weeks after treatment. Flax was harvested using a small plot combine (Kincaid XP) on September 4.

At 7 days after treatment (DAT), most of the herbicides applied resulted in some injury to flax. Treatments resulting in little or no injury to flax included Bison (MCPA plus bromoxynil), Basagran (bentazon), and Basagran plus Raptor (bentazon plus imazapyr). Treatments that resulted in minor injury included Armezon (topramezone) at 0.5 and 0.75 oz/acre, with 9.3 and 11% injury, respectively. Treatments resulting in moderate injury (16.3 to 18.3%) included Armezon plus Bison (topramezone plus MCPA plus bromoxynil), Raptor (imazapyr), Laudis (tembotrione) and Laudis plus Bison (tembotrione plus MCPA plus bromoxynil). Injury for most of the treatments lessened over time, with the exception of Raptor applied alone in which injury increased to 27.5% at 14 DAT, then reduced to 16.5% at 28 DAT, and then to 11.3% at 36 DAT. Injury to flax from Armezon plus Bison remained greater than 10% until after 28 DAT. While Raptor alone resulted in the greatest injury to flax, the combination of Raptor plus Basagran resulted in little or no injury. The type of injury that resulted from herbicide treatments varied. Raptor treatments resulted in stunted growth. Armezon and Laudis treatments resulted in bleaching injury as these herbicides inhibit pigment production in plants.

Stand counts taken one week after treatment did not show any difference between herbicide treatments. Crop heights measured 35 DAT showed a reduction in flax height compared to both the untreated control and to the Bison treatment following application of Armezon plus Bison, Raptor alone, Laudis, and Laudis plus Bison. Even while application of Raptor resulted in the greatest amount of injury and reduced flax height, seed yield of flax was greatest in this treatment and yield was similar to the Bison treatment. Flax yield was least in the untreated control. Flax is a very adaptable crop that is able to recover from early season injury from herbicides. This season most of the rainfall occurred during the last week of June and the first week of July. Prior to this rainfall, flax was extremely drought stressed and had limited growth. The timing of this rainfall allowed for flax growth after most of the injury to the flax had diminished and didn't give an advantage to herbicide treatments that didn't cause injury to the flax. On a year with more normal rainfall distribution, this early-season crop injury that occurred may have resulted in reduced yields. Further evaluations are needed under different environments to verify the results of this trial.

Table 1. Response of flax to postemergence herbicides.

Treatment		Injury					
Product name	Rate	7 DAT	14 DAT	28 DAT	Stand Count	Height	Yield
		—————%—————			#/m^2	cm	lb/acre
1Armezon	0.5fl oz/a	9.3b	4.8d	0.0c	314.3-	34.1ab	455c
COC	1% v/v						
2Armezon	0.75fl oz/a	11.0b	4.5d	1.8bc	246.8-	34.0ab	466bc
COC	1% v/v						
3Bison	1pt/a	0.0c	3.5de	0.0c	277.0-	35.4a	601ab
4Armezon	0.75fl oz/a	18.3a	18.8b	13.0a	293.8-	30.4cd	497bc
Bison	1pt/a						
COC	1% v/v						
5Basagran	1pt/a	0.0c	0.0e	0.0c	219.0-	36.4a	453c
COC	1% v/v						
6Raptor	4oz/a	16.3a	27.5a	16.5a	292.3-	28.8d	693a
NIS	0.25% v/v						
28% N	2.5gal/100 gal						
7Basagran	1pt/a	0.0c	4.8d	0.0c	304.5-	34.9a	596ab
Raptor	4oz/a						
MSO	1% v/v						
8Basagran	1pt/a	1.3c	4.0de	0.0c	291.3-	35.1a	500bc
Raptor	6oz/a						
MSO	1% v/v						
9Laudis	3oz/a	17.8a	10.0c	4.5b	262.8-	32.1bc	476bc
MSO	1% v/v						
10Laudis	3oz/a	18.0a	11.0c	5.5b	265.3-	31.7bc	431c
Bison	1pt/a						
MSO	1% v/v						
11Untreated		0.0	0.0	0.0	269.0-	36.4a	427c
LSD P=.10		2.64	4.14	3.95	60.64	2.72	137.89
CV		26.39	42.79	87.84	18.31	6.76	22.59
Treatment F		56.073	23.708	12.539	1.180	4.858	2.016
Treatment Prob(F)		0.0001	0.0001	0.0001	0.3418	0.0004	0.0703

Note: all of the above treatments, with the exception of Bison, are experimental and are not labelled for use in flax. Application of these treatments to flax is against the label and would result in illegal residues on the crop seed that could result in rejection of harvested seed by the purchaser.

Flax was planted on May 2 and emerged on May 19, 2020.
POST herbicide treatments were applied on May 26, 2020, 1 weeks after flax emergence.
Stand counts were measured on June 4 and heights were measured on June 23, 2020.
Flax was harvested on September 4, 2020.
Means followed by same letter or symbol do not significantly differ (P=.10, LSD).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison.