Project Title: Effects of Herbicides on Spring Wheat Stem Solidness and Agronomic Performance

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Objective: To evaluate herbicides effects on spring wheat stem solidness

Results:

Twelve herbicides, representing three different modes of action, were evaluated for their effects on spring wheat stem solidness and agronomic performance. Scholar spring wheat was planted on April 28, 2006 at a seeding rate of 75 lb/ac in 7" rows to a depth of 1.5 inches. Four representative herbicides from the auxinic, ALS, and ACCase herbicide classes were applied on May 24 when the crop was at the 4-leaf state. In addition, an individual member of each herbicide class was applied on June 21 during the boot stage of development. The herbicides were applied using a backpack sprayer with Teejet XR11002 nozzles in 20 GPA.

Individual effects of herbicides on stem solidness were only observed with the third and fourth internodes. None of the treatments increased pith development compared to the check. However, several herbicides did cause a slight reduction in stem solidness. This was most evident for Discover applied at the boot stage. When herbicides were grouped based on their modes of action, internodes 3 and 5 showed differences among herbicide classes. The ACCase group had less pith in the third internode, while the ALS group tended to produce more pith in the fifth internode. Overall, herbicide effects were minor and were not consistent across the range of internodes.

It is notable that the lowest yields were associated with the ALS group of herbicides. This was largely attributed to phytotoxic effects of Silverado.

Summary:

Herbicide effects on pith development were minor, with the ACCase group causing the greatest reduction in stem solidness.

Table 1. Effects of herbicides on stem solidness and agronomic performance in spring wheat grown at Kalispell, MT in 2006 season.

Trt No.	Treatment Name	Rate (lb ai/ac)	Appl Code	Stem solidness						Yield	Grain moisture	Test weight	Protein
				Internodes					Total				
				1	2	3	4	5		bu/ac	%	lb/bu	%
1	Clarity	0.1250	A	2.8	1.9	2.6	2.3	1.2	10.9	61.3	10.6	62.7	14.9
2	2,4-D ester	0.9500	A	1.9	1.8	2.2	1.6	1.4	8.6	61.1	11.0	61.9	15.1
3	Stinger	0.1240	A	3.1	1.8	2.6	2.4	1.2	11.0	66.1	12.2	62.3	14.6
4	Starane	0.1250	A	2.6	2.2	2.8	1.9	1.4	10.9	64.6	10.8	63.6	14.8
5	Everest	0.0262	A	2.4	1.8	2.5	1.7	1.6	10.0	59.9	11.9	58.2	14.9
6	Silverado	0.0028	A	2.5	1.8	2.3	1.6	1.3	9.4	55.1	11.0	61.6	15.3
7	Express	0.0156	A	2.5	2.1	2.3	1.6	1.6	10.0	59.0	11.0	62.1	15.0
8	Ally	0.0038	A	3.0	2.3	3.1	2.3	1.8	12.4	60.1	11.2	62.5	14.7
9	Axial	0.0520	A	2.6	2.0	2.4	2.0	1.2	10.1	61.5	11.2	61.7	15.0
10	Hoelon	1.0000	A	2.1	1.6	2.0	1.6	1.4	8.7	63.1	11.3	62.8	15.0
11	Discover	0.0500	A	2.2	1.7	2.2	1.6	1.3	9.0	59.5	10.7	62.5	14.9
12	Achieve	0.1800	A	2.4	1.9	2.4	1.9	1.5	10.0	60.9	11.1	62.2	14.9
13	Stinger	0.1240	B	2.6	1.9	2.3	2.1	1.2	10.0	59.4	10.6	62.2	15.1
14	Express	0.0156	B	2.3	1.7	2.4	1.8	1.8	10.0	59.7	10.9	62.0	15.0
15	Discover	0.0500	B	1.8	1.4	1.9	1.5	1.8	8.3	62.9	10.8	62.6	14.7
16	Check			2.9	1.9	2.7	2.4	1.5	11.3	60.6	10.4	62.6	14.7
	Mean			**2.5**	**1.9**	**2.4**	**1.9**	**1.5**	**10.0**	**60.9**	**11.0**	**62.1**	**14.9**
	LSD (P=0.05)			**NS**	**NS**	**0.57**	**0.72**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

A: 4-leaf stage; B: booting; NS: not significant (P>0.05).

Table 2. The effect of mode of action on stem solidness and agronomic performance in spring wheat grown at Kalispell, MT in 2006 season.

Trt No.	Mode of action	Appl Code	Stem solidness						Yield	Grain moisture	Test weight	Protein
			Internodes					Total				
			1	2	3	4	5		bu/ac	%	lb/bu	%
1-4	Auxinic	A	2.6	1.9	2.6	2.1	1.3	10.4	63.3	11.1	62.6	14.8
5-8	ALS	A	2.6	2.0	2.5	1.8	1.6	10.5	58.5	11.3	61.1	15.0
9-12	ACC	A	2.3	1.8	2.2	1.8	1.4	9.4	61.3	11.1	62.3	15.0
Mean			**2.5**	**1.9**	**2.4**	**1.9**	**1.4**	**10.1**	**61.0**	**11.2**	**62.0**	**14.9**
LSD (0.05)			**NS**	**NS**	**0.31**	**NS**	**0.23**	**NS**	**3.1**	**NS**	**NS**	**NS**

A: 4-leaf stage; NS: not significant (P>0.05).