Two-gene Clearfield® winter wheat tolerance to tank mixes of Beyond® plus sulfonylurea herbicides

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A field study was conducted on the WSU Cook Agronomy Farm near Pullman, WA to determine if two-gene Clearfield winter wheat varieties were tolerant to post-emergence applications of sulfonylurea (SU) herbicides, Affinity® BroadSpec and Ally® Extra, tank-mixed with Beyond herbicide. Imazamox, the active ingredient in Beyond herbicide, is an ALS-inhibitor (Group 2), as are the sulfonylurea herbicides. The purpose of this study was to determine if the new two-gene Clearfield wheat varieties had sufficient tolerance to ALS-inhibitors to allow tank-mixing of SU herbicides with Beyond.

The soil at this site is a Thatuna silt loam with 3.4% organic matter and a pH of 5.0. Fertilizer was broadcast applied prior to planting at a rate of 120, 20 and 20 lb/acre of N:P:S on October 1, 2013. Three varieties of Clearfield wheat were planted: ORCF-102 (single gene), WB-1081 CL+, and AP503 CL2. Wheat was planted on October 3, 2013 at a rate of 100 lb/acre to a soil depth of 1.5 inches using a Monosem vacuum planter with 10-inch row spacing. Herbicide treatments were applied on April 29 when all varieties of wheat were at the 2- to 3-leaf stage and had 3 to 4 tillers. Herbicides were applied using a CO_2 backpack sprayer set to deliver 15 gpa at 34 psi and 3 mph. The air temperature at the time of application was 71°F with 23% relative humidity and the wind out of the SE at 3 mph.

One week after the herbicide treatments were applied, some visual crop injury was noted in all treatments. By one month after application, this visual injury had pretty much disappeared in the two-gene varieties, but was still visible in the one-gene variety (ORCF-102) when Beyond was tank-mixed with either of the SU herbicides. Within varieties, there were no significant differences in head count due to herbicide treatment. Plant height shortly after head emergence was not significantly affected in the two-gene wheat varieties, but ORCF-102 exhibited a reduction in plant height for all herbicide treatments containing an SU herbicide when compared to the nontreated check.

Unfortunately, we had harvest issues that resulted in unacceptable data error, so we are unable to determine if grain yield was affected by the herbicide treatments. Based on visual injury symptoms one month after application and plant height measurements taken shortly after heading, it does appear that the two-gene Clearfield varieties may have greater tolerance than

one-gene varieties to tank mixes of Beyond and SU herbicides such as Ally Extra or Affinity BroadSpec; however, without grain yield data we are unable to feel confident about this statement.

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			May 6	May 30	June 20	June 20
		Rate	Crop injury		Head count	Plant height
Variety	Treatment[a]	oz pr/a	---------%---------		#/ ft row	inches
ORCF-102	Nontreated	--	--	--	25	34
ORCF-102	Beyond	6	13	1	24	31
ORCF-102	Beyond	6	9	14	23	28
	Ally Extra	0.5				
ORCF-102	Beyond	6	8	9	25	29
	Affinity BroadSpec	0.8				
WB-1081 CL+	Nontreated	--	--	--	33	35
WB-1081 CL+	Beyond	6	5	0	32	33
WB-1081 CL+	Beyond	6	6	0	35	32
	Ally Extra	0.5				
WB-1081 CL+	Beyond	6	6	1	33	33
	Affinity BroadSpec	0.8				
AP503 CL2	Nontreated	--	--	--	36	29
AP503 CL2	Beyond	6	3	0	33	29
AP503 CL2	Beyond	6	6	1	38	29
	Ally Extra	0.5				
AP503 CL2	Beyond	6	6	1	38	28
	Affinity BroadSpec	0.8				
LSD (5%)			ns	6	7	ns

[a] All treatments were tank mixed with MSO and AMS at 2.0% v/v and 2.0 lb/A, respectively and were applied POST on April 29.

Some of the pesticides discussed in this presentation were tested under an experimental use permit granted by WSDA. Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to $7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance.