

33Project Title: Wild Oat Control by Beyond Herbicide in Clearfield Spring Wheat:
Dose Response

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Objective: To evaluate the response of wild oat to Beyond in the Clearfield
spring wheat system.

Results:

This experiment was conducted to determine the optimum rate of Beyond for wild oat control in the Clearfield spring wheat system. Clearfield spring wheat (cv. Gunner 2-gene) was planted on April 16, 2007 at a seeding rate of 70 lb/ac in 6" rows to a depth of 1.5 inches. Wild oat was immediately planted between the rows at a rate of 25 plants per square foot.

Beyond was applied at 1X, 1/2X, 1/4X, 1/8X, and 1/16X of the normal use rate. An untreated check also was included. The treatments were applied on May 17, 2007 when spring wheat plants were at the 4-5 main stem leaf stage with 1-2 tillers and were 2-4 inches tall. At the same time, wild oat plants were at 4-5 leaf stage with 1-2 tillers and were 2-4 inches tall. Treatments were applied using a backpack sprayer with Teejet XR11002 nozzles in 20 GPA.

Herbicide rate had a significant effect on wild oat control. As the herbicide rate decreased from 1X to 1/16X, percent wild oat control decreased from 95 to 41 percent. At the same time biomass increased from 0 to 323 g/m². Nevertheless, the 1X and 1/2X rates still provided excellent wild oat control.

Wild oat competition reduced spring wheat spike numbers, biomass and yield, and increased dockage. Spring wheat yields increased from 32 bu/ac in the untreated check to 53 bu/A at the 1X rate, demonstrating the utility of Beyond, as well as the competitive ability of wild oat. Herbicide rate did not affect grain test weight, moisture or protein content.

Summary:

Crop injury from Beyond applications was not observed, demonstrating the durability of the two gene herbicide resistance system. The results of this study also show that product efficacy declines sharply below the 1/2X rate.

[See tables on following pages.]

Table 1. The effect of Beyond herbicide rate on spring wheat injury and wild oat control in 2007 season.

Treatment	Rate lb ai/ac	Spring wheat		% control		Wild oat		
		% injury		5/31/07	6/14/07	Plants	Panicles	Biomass
		5/31/07	6/14/07			No./m ²	7/5/07	g/m ²
Beyond 1X	0.047	0	0	72.5	95.0	0.0	0.0	0.0
Beyond 1/2X	0.0234	0	0	63.8	88.8	69.1	38.7	32.2
Beyond 1/4X	0.0117	0	0	51.3	66.3	110.6	158.6	110.1
Beyond 1/8X	0.00586	0	0	41.3	55.0	130.9	288.5	192.1
Beyond 1/16X	0.00293	0	0	25.0	41.3	179.8	331.9	323.0
Check		0	0	0.0	0.0	134.6	308.8	500.9
LSD (P=.05)		0	0	5.77	5.88	63.49	91.15	60.98
CV		0	0	9.05	6.76	40.45	32.22	20.96
Treatment F		0	0	193.38	317.49	8.78	22.72	88.77
Treatment Prob(F)		1	1	0.0001	0.0001	0.0005	0.0001	0.0001

Table 2. The effect of Beyond herbicide rate on spring wheat plant density, biomass, yield and other agronomic variables in 2007 season.

Treatment	Rate lb ai/ac	Plants	Spikes	Biomass	Height	Yield	Grain moisture	Test weight	Dockage	Protein
		No./m ²		g/m ²	cm	bu/ac	%	lb/bu	%	%
		----- 7/5/07 -----	----- 7/13/07 -----	----- 8/1/07 -----						
Beyond 1X	0.047	120.1	404.8	670.5	85.3	52.8	10.1	58.6	0.47	15.9
Beyond 1/2X	0.0234	187.9	390.4	743.1	84.5	52.8	10.1	59.1	0.64	15.4
Beyond 1/4X	0.0117	146.8	355.8	564.6	85.3	46.7	10.1	58.8	1.62	15.4
Beyond 1/8X	0.00586	146.8	368.1	531.6	85.0	46.4	10.1	58.6	2.16	15.4
Beyond 1/16X	0.00293	141.3	283.6	423.9	87.0	39.3	10.1	59.1	6.62	15.6
Check		116.8	248.0	327.4	88.3	31.5	10.1	59.1	9.33	15.9
LSD (P=.05)		59.24	89.16	126.20	3.98	7.09	0.68	1.05	1.16	0.48
CV		27.44	17.31	15.41	3.07	10.24	4.36	1.16	21.65	1.98
Treatment F		1.69	4.43	13.41	1.19	12.89	0.04	0.52	94.07	2.23
Treatment Prob(F)		0.1982	0.0112	0.0001	0.3608	0.0002	0.9989	0.7571	0.0001	0.119