

Project Title: Evaluation of Reduced Rates of Achieve for Wild Oat Control

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Objective: To evaluate the effects of reduced herbicide rates on wild oat control and spring wheat yield.

Results:

The soft white spring wheat cultivar 'Nick' was seeded to a depth of two inches on April 13, at a rate of 16 plants/ft². Prior to planting spring wheat, wild oat seeds were broadcasted over the study area and then incorporated to a depth of three inches using a field cultivator. The herbicide treatments were applied on May 15, using a CO₂ backpack sprayer with Teejet XR11002 nozzles in 20 GPA of water. Achieve was applied at 0.178 (1X), 0.089 (1/2X), 0.045 (1/4X), 0.022 (1/8X), and 0 lb ai/ac. At application, spring wheat plants were at the 4-leaf stage with 1-2 tillers, while the wild oat plants were at the 4-5-leaf stage with 2 tillers. Broadleaf weeds were controlled after crop emergence with Harmony Extra (0.6 oz/ac) on May 17. Wild oat control was evaluated at two and four weeks after application. Spring wheat yield components and wild oat parameters were determined prior to wild oat shattering by harvesting two 1.46 ft² quadrats per plot. Spring wheat yield, test weight, dockage and grain protein were determined at crop maturity.

Rates as low as 1/8th of the labeled rate produced a herbicidal response, reducing wild oat plant density, panicles, biomass, and seed production as compared to the non-treated control. Wild oat control improved with each incremental increase in herbicide rate such that the most complete control was afforded by the highest rate applied. Nonetheless, the 1/2X rate did provide commercially acceptable control (>80%).

Wild oat competitive effects declined as herbicide rate increased, improving yields in the process. Spring wheat spike production, biomass, yield, test weight and grain moisture all increased as Achieve rates increased. In contrast, wheat protein decreased with herbicide rate. This response is a result of reduced competition for soil moisture, which likely extended the grain filling period, increasing seed size, and percent starch content.

Summary:

Wild oat control and grain yield declined as herbicide rates were reduced. Although grain protein may increase as herbicide rates decline, the most economical treatment is to use the labeled rate of Achieve.

Future plan:

Continued to evaluate and explore economically viable herbicide systems.

Table 1. Effects of Achieve rate on wild oat control, plant density, panicles, biomass and seed production in 2007 at Kalispell, MT.

Herbicide rate	Wild oat control		Plants ----- No./m ² -----	Panicles ----- No./m ² -----	Biomass			Seeds No./m ²
	5/29/07 ----- % -----	6/12/07 ----- % -----			Stems ----- g/m ² -----	Panicles ----- g/m ² -----	Total ----- g/m ² -----	
0	0.0	0.0	117.1	271.0	372.5	221.0	593.5	11048.2
1/8X	16.3	30.0	107.9	236.0	287.6	153.3	440.9	8446.5
1/4X	40.0	58.8	61.8	124.5	149.3	86.1	235.4	4376.9
1/2X	55.0	82.5	13.8	28.6	37.0	23.3	60.2	1099.2
1X	73.8	91.3	3.7	10.2	10.4	5.1	15.5	249.8
Mean	37.0	52.5	60.9	134.0	171.4	97.7	269.1	5044.1

Table 2. Effects of Achieve rate on spring wheat plant density, spikes, biomass, yield and grain quality in 2007 at Kalispell, MT.

Herbicide rate	Plants	Spikes	Biomass	Yield	Test weight	Grain moisture	Dockage	Protein
	----- No./m ² -----	----- No./m ² -----	g/m ²	bu/ac	lb/bu	----- % -----	----- % -----	----- % -----
0	126.8	260.2	329.8	23.7	55.2	8.5	16.8	15.0
1/8X	112.4	349.2	553.5	31.2	55.2	8.4	11.3	15.0
1/4X	141.2	417.0	705.4	47.0	57.7	9.4	7.0	13.8
1/2X	152.4	457.1	889.6	59.5	58.2	9.6	1.9	13.4
1X	141.3	458.2	920.6	63.5	59.1	9.4	0.9	13.3
Mean	134.8	388.3	679.8	44.9	57.1	9.1	7.6	14.1