

Evaluation of Avadex® Microactiv™ herbicide for the control of downy brome and Italian ryegrass

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Triallate is an inhibitor of lipid biosynthesis; not ACCase inhibition (Group 8). Triallate is primarily absorbed by the emerging grass coleoptile, not as much through the roots. Triallate is sold in three products: Avadex MicroActiv, Avadex MinTill and Far-GO®. All three products are labeled for the control of wild oats and suppression of *Bromus* species in winter wheat. The Avadex granular



formulations are not labeled for the control or suppression of Italian ryegrass, but the Far-GO formulation is labeled for the control of annual ryegrass in Oregon. The objectives of this study were twofold: 1) Determine the level of control that Avadex MicroActiv provides against downy brome and Italian ryegrass in a direct seed winter wheat production system, and 2) Ascertain if the combination of Avadex MicroActiv with either Zidua (Group 15), Zidua + Sencor (Group 5), Beyond (Group 2) or PowerFlex HL (Group 2) provides better grass weed control than the products applied individually.

This study was conducted on land owned and farmed by the late Mark James near Dixie, WA. The soil at this site is an Athena silt loam with 2.9% organic matter and a pH of 5.2. Winter wheat was the previous crop. Crop residue remaining after harvest was burnt just prior to planting. The field was sprayed with glyphosate on October 6, 2019 and Avadex MicroActiv was applied with a 50 ft Valmar applicator on October 7th at 15 lb/A to half of the trial area by CHS Primeland. Two, 50 ft by 200 ft strips received Avadex MicroActiv and two strips did not. Herbicide treatments were randomized and replicated four times within the respective strips. On October 8th, the trial area received 0.47 inch of rainfall that aided in the activation and incorporation of the Avadex MicroActiv. Mechanical incorporation of the Avadex MicroActiv occurred at planting on October 10th with a Horsch high disturbance direct-seed drill with paired rows on a 15-inch row spacing. The cultivar UI Magic CL+ was seeded at a depth of 1.5 inches and a rate of 110 lb seed/acre. Zidua and Zidua + Sencor preemergence treatments were applied on October 11th with a CO₂-powered backpack sprayer set to deliver 10 gpa at 52 psi at 2.3 mph. The air temperature was 59°F, relative humidity was 29% and the wind was out of the west at 4 mph. Beyond and PowerFlex HL were applied postemergence in the fall, November 18th, and in the late winter, February 28, 2020. On November 18, 2019 the air temperature was 61°F, relative humidity was 85% and the wind was out of the southwest at 6 mph. On February 28, 2020 the air temperature was 65°F, relative humidity was 32% and the wind was out of the southwest at 4 mph. Annual grass identification was difficult when the postemergence applications were made. On November 18, 2019 there was an average of 24 annual grass plants per square foot in the four, nontreated check plots. In general, annual grass weeds were 1- to 2-leaf and 2 to 3 inches in height and 3-leaf to 5-tiller and 2 to 3.25 inches in height at the fall and late winter application

timings, respectively. Wheat was 2-leaf and 2- to 4-tillers at the fall and late winter application timings, respectively.

In the early spring, it became easier to distinguish that there was a good density of both downy brome and Italian ryegrass plants in the trial area. None of the herbicides applied caused any crop injury. Avadex MicroActiv and Zidua each provided some control of downy brome and Italian ryegrass. Avadex MicroActiv provided slightly better downy brome control, whereas Zidua provided slightly better Italian ryegrass control. Neither product provided commercially acceptable control of either annual grass weed when applied alone. The combination of Avadex MicroActiv plus Zidua provided the best control of downy brome and Italian ryegrass and increased yield by 18 bu/A when compared to the nontreated check. The addition of Sencor to Zidua did not increase the control of either annual grass weed when compared to Zidua alone or in combination with Avadex MicroActiv. The group 2 herbicides (Beyond and PowerFlex HL) provided very little control of either downy brome or Italian ryegrass when applied on their own. However, when combining Beyond or PowerFlex HL with Avadex MicroActiv, downy brome control was better than Italian ryegrass control. This study demonstrated that as resistance to the postemergence Group 2 herbicides increases in both downy brome and Italian ryegrass, it will be important to use preplant and preemergence herbicides with at least two different sites of action to control these two troublesome annual grass weeds in wheat.

Treatment and Application Timing	Rate	-----6/5/20-----		7/18/20
		Downy brome control	Italian ryegrass control	Yield
		%	%	bu/a
Avadex MicroActiv ¹	15 lb/a	60 bc ⁵	48 b	113 ab
Avadex MicroActiv ¹ fb Zidua ²	15 lb/a fb 1.5 oz/a	90 a	88 a	117 a
Avadex MicroActiv ¹ fb Zidua + Sencor ²	15 lb/a fb 1.5 oz/a + 2.0 oz/a	83 ab	83 a	113 ab
Avadex MicroActiv ¹ fb Beyond ³	15 lb/a fb 5.0 fl oz/a	85 a	54 b	115 ab
Avadex MicroActiv ¹ fb PowerFlex HL ³	15 lb/a fb 2.0 oz/a	78 ab	53 b	110 a-d
Avadex MicroActiv ¹ fb Beyond ⁴	15 lb/a fb 5.0 fl oz/a	74 ab	55 b	112 a-c
Avadex MicroActiv ¹ fb PowerFlex HL ⁴	15 lb/a fb 2.0 oz/a	61 bc	48 b	108 b-d
Zidua ²	1.5 oz/a	44 cd	60 b	108 b-d
Zidua + Sencor ²	1.5 oz/a + 2.0 oz/a	46 cd	61 b	110 a-d
Beyond ³	5.0 fl oz/a	33 de	15 c	104 de
PowerFlex HL ³	2.0 oz/a	15 ef	24 c	105 c-e
Beyond ⁴	5.0 fl oz/a	26 d-f	15 c	105 c-e
PowerFlex HL ⁴	2.0 oz/a	5 f	13 c	100 e
Nontreated Check	--	--	--	99 e

¹preplant (October 7, 2019), ²preemergence (October 11, 2019), ³postemergence fall (November 8, 2019) and

⁴postemergence late winter (February 28, 2020)

⁵Means, based on four replicates, within a column, followed by the same letter are not significantly different at P = 0.05 as determined by Fisher's protected LSD test, which means that we are not confident that the difference is the result of treatment rather than experimental error or random variation associated with the experiment.