Evaluation of Avadex® Microactiv™ herbicide for the control of 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 conventional winter wheat production system, and 2) Ascertain if the combination of Avadex MicroActiv with either Zidua® (Group 15), Zidua + Amber® (Group 2), Axiom® DF (Group 5 + 15) or PowerFlex® HL (Group 2) provides better grass weed control than the products applied individually.

This study was conducted on land leased and farmed by Andrew and Richard Forgarty off Five Mile Road near Walla Walla, WA. The soil at this site is an Athena silt loam with 2.8% organic matter and a pH of 5.0. Winter wheat was the previous crop. Crop residue remaining after harvest was burnt just prior to planting. The trial area was sprayed with RT 3® and Spray Prep™ at 32 fl oz/A and 2.0 qt/100 gal on October 15, 2020 and Avadex MicroActiv was applied with a CHS Primeland-owned 50 ft Valmar applicator, with a harrow behind the applicator for incorporation of the granules, on October 15th at 15 lb/A to half of the trial area by Andrew. 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 23rd & 24th, the trial area received 0.49 and 0.19 inch of rainfall that aided in the activation and additional incorporation of the herbicides. The field was seeded to the cultivar 'LCS Jet' with a John Deere 455 disk drill with a row spacing of 7.5-inches on October 19th. Zidua, Zidua + Amber and Axiom DF preemergence treatments were applied on October 22nd with a CO_2-powered backpack sprayer set to deliver 10 gpa at 58 psi at 2.3 mph. The air temperature was 50°F, relative humidity was 45% and the wind was out of the west at 4 mph. At that time, it appeared that additional Italian ryegrass germinated, possibly from harrowing the trial area when the Avadex MicroActiv was incorporated. Thus, the entire trial area was sprayed with RT 3® and Spray Prep™ at 32 fl oz/A and 2.0 qt/100 gal. PowerFlex HL was applied postemergence on November 24th with an air temperature of 54°F, relative humidity was 48% and the wind was out of the southwest at 4 mph. Italian ryegrass was the predominant annual grassy weed in this field. On November 24th there were an average of 58 Italian ryegrass plants per square foot in the four,

nontreated check plots. Italian ryegrass was 1-leaf and 1 inch in height and wheat was 1 to 2-leaf and 3 inches in height.

There was adequate precipitation prior to and post planting, resulting in plenty of Italian ryegrass emergence in the fall. There was no evidence of winterkill in the Italian ryegrass population. Late winter visual evaluation of the trial showed that treatment differences were very distinct because the Italian ryegrass population was so dense. Avadex MicroActiv did not control Italian ryegrass in this study (Table). Nor did it significantly improve control when applied preplant followed with either of the two best performing treatments of Zidua or Zidua + Amber. There was not a significant difference between the level of Italian ryegrass control between Zidua and Zidua + Amber, suggesting that pyraxosulfone was the active ingredient providing the best control in this study. Axiom DF and PowerFlex HL both provided poor control of Italian ryegrass. The preplant application of Avadex MicroActiv prior to the application of Axiom DF and PowerFlex HL, did not improve the level of Italian ryegrass control.

March was the beginning of reduced precipitation and April was very dry. Random areas in the trial exhibited reduced wheat growth. The plants may have been under moisture stress due to dry soil conditions. There may have been herbicide carryover, but it seemed unlikely since the previous crop was wheat. There were four days in early April that the minimum temperatures were at or slightly below freezing. This trial was situated in a swale and possibly some of the injury was from cold air stress, with the cold air settling into the trial area for a longer duration as opposed to the surrounding areas. The decision was made not to take this trial to harvest because the wheat stand was not uniform.

			4/30/21
		Application	Italian ryegrass
Treatment	Rate	Date	control
	lb/a	2020	%
Avadex MicroActiv[1]	15	10/14	5 c[5]
Avadex MicroActiv[1]	15	10/14	78 a
Zidua[2]	1.5 oz/a	10/22	
Avadex MicroActiv[1]	15	10/14	78 a
Zidua[2]	1.5 oz/a	10/22	
Amber[2]	0.56 oz/a	10/22	
Avadex MicroActiv[1]	15	10/14	13 b
Axiom[2]	10 oz/a	10/22	
Avadex MicroActiv[1]	15	10/14	18 b
PowerFlex HL[3,4]	2.0 oz/a	11/24	
Zidua[2]	1.5 oz/a	10/22	73 a
Zidua[2]	1.5 oz/a	10/22	75 a
Amber[2]	0.56 oz/a	10/22	
Axiom[2]	10 oz/a	10/22	10 b
PowerFlex HL[3,4]	2.0 oz/a	11/24	13 b
Nontreated Check	--	--	--

[1] preplant (October 15, 2020), [2]preemergence (October 22, 2020), [3]postemergence (November 24, 2020) and
[4] PowerFlex HL was tank mixed with NIS (0.5% v/v) and UAN (2.0 qt/a).
[5] Means, 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.