Influence of Pyroxasulfone Rate and Application Timing on Downy Brome Control in Clearfield® Winter Wheat

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Background and Problem

- Downy brome is a troublesome grassy weed in dryland winter wheat in northwestern U.S. (1, 2)
- Causes significant yield reductions. (2)
- Imazamox is an ALS-inhibitor herbicide for POST weed control in Clearfield® (CL) wheat.
- ALS-resistant downy brome evident. (3)
- Pyroxasulfone (Zidua®), a new herbicide for PRE residual weed control, with proven selectivity in wheat. (4)
- Very long chain fatty acid synthesis inhibitor.

Objective

Determine the effect of pyroxasulfone rate and application timing on downy brome control and yield in CL winter wheat in comparison to standard herbicide programs.

Materials and Methods

- Experimental Site: MSU Southern Agricultural Research Center, Huntley, MT
- Year: 2013/2014
- Planting Date: October 2, 2013
- Variety: CL Winter wheat “Brawl”
- Plot Size: 3 by 9 m
- Weed Infestation at the Test Site

Herbicide Application:

- Fall 2013: PRE (immediately after planting); delayed-PRE (DPRE; after 80% of the wheat seed germinated)
- Spring 2014: Early POST at 3- to 4-tiller wheat.
- Herbicides applied with a hand-held boom calibrated to deliver 94 L ha⁻¹ at 276 kPa.

Data Collected

- % Crop injury
- % Downy brome control
- Wheat yield at harvest
- Experimental Design and Data Analyses
  - Randomized Complete Block with four replications.
  - Data subjected to ANOVA.
  - Means separated by Fisher’s Protected LSD test at P < 0.05.

Results and Discussion

- Figure 1. Downy brome control in CL winter wheat at 56 DAA. POST imazamox included MSO and UAN. PRE glyphosate included AMS, POST pyroxasulfam included NIS and UAN. Numbers in parentheses are the herbicide rates (g ai ha⁻¹). Means with the same letters are not significantly different.

- Figure 2. Effect of herbicide programs on CL winter wheat yield. Numbers in parentheses are the herbicide rates (g ai ha⁻¹). Means with the same letters are not significantly different.

Conclusions

- Pyroxasulfone applied PRE effectively controlled downy brome in CL winter wheat, and prevented yield reductions.
- A different mode of action to manage/prevent ALS-resistant downy brome in winter wheat.

References


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