Preemergence Weed Management Systems in Oklahoma Winter Wheat

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Introduction
The use of preemergence herbicides in Oklahoma winter wheat may improve the control of acetolactate synthase (ALS) and acetyl coA carboxylase (ACCase) herbicide resistant Italian ryegrass [Lolium perenne L. spp. multiflorum (Lam.) Husnot]. Two studies were conducted at the Cimarron Valley Research Station near Perkins, OK during the 2016-2017 field season to evaluate weed management systems that included pyroxasulfone and pyroxasulfone + carfentrazone applied preemergence and/or very early postemergence.

Materials and Methods

• Hypothesis: Pyroxasulfone and pyroxasulfone + carfentrazone would successfully manage Italian ryegrass with minimal crop response.
• All trials were arranged in a randomized complete block design with four replications.
• Applications were made preemergence (PRE), very early postemergence (VPOST), and/or mid-postemergence (MPOST).
• Treatments were applied using a CO₂ pressurized backpack sprayer calibrated to deliver 140 L ha⁻¹.
• Visual weed control and crop injury were evaluated 4, 6, 9, 13, 21, and 24 weeks after planting (WAP).
• Herbicide Abbreviations: Car, Carfentrazone; Flu, flufenacet; Met, metribuzin; Pyr, pyroxasulfone; Pin, pinoxaden.
• Recommended rates were used for all herbicides. Pyroxasulfone + carfentrazone was applied at various rates, depending on application timing and tank-mix partners.
• Data sets were analyzed using PROC MIXED with pdmix 800 macro included.
• Means were separated using Fisher’s Protected LSD at P = 0.05.

Results & Discussion
• In both trials, VPOST treatments that included metribuzin (105 g ai ha⁻¹) or axiom (286 g ai ha⁻¹) had the highest levels of injury (7 to 14%) 9 WAP (Fig. 1/data not shown).
• Italian ryegrass control 9 WAP was at least 98% for all treatments with the exception of pinoxaden + metribuzin applied VPOST (data not shown).
• Twenty four WAP, all treatments that included pyroxasulfone controlled Italian ryegrass 97 to 100% (Fig. 2).
• In the pyroxasulfone + carfentrazone study, Italian ryegrass was controlled 95 to 100% 13 WAP for all treatments with the exception of pyroxasulfone + carfentrazone at 35 g ai ha⁻¹ applied alone PRE (data not shown). Similar trends were observed 21 WAP (Fig. 3).
• Overall, several successful systems were identified using pyroxasulfone and pyroxasulfone + carfentrazone. Wheat response to these products is influenced by planting depth, application timing, herbicide rate, soil type, and rainfall following application. Proper planting depth and timely rains (Fig. 4) aided in the success of these trials.
• Complimentary greenhouse studies will be conducted to confirm ALS and ACCase resistant biotypes in the state of Oklahoma.