EVALUATION OF HERBICIDES IN OPTIMUM GAT CORN. Dean M. Grossnickle*, Micheal D.K. Owen, James F. Lux, and Damian D. Franzenburg. Iowa State University, Ames, IA.

In 2009, Iowa State University conducted research evaluating weed control and herbicide injury in corn with traits that convey tolerance to glyphosate and acetolactate synthase inhibitor herbicides. The weeds that were evaluated were giant foxtail, velvetleaf, common lambsquarters, common waterhemp, and ivyleaf morningglory and the trial was established on the Curtiss Farm research facility in Ames, IA. Corn was planted on May 31 in ground that was prepared with field cultivation. Three herbicide application timings with combinations of herbicides were evaluated at 0, 7, 14, 21, and 28 days after application (DAA). One pass preemergence (PRE) applications were applied on May 31. Two pass PRE followed by (fb) postemergence (POST) applications were applied on May 31 PRE and June 29 POST when weeds were 5-21 cm tall. The third timing was a one pass POST application that was applied on June 27 to 10-21 cm tall weeds. All treatments were applied in a carrier volume of 187 l ha^{-1} and POST applications were applied with ammonium sulfate at 2.24 kg ha^{-1}. Herbicides that were evaluated were combinations and rates of rimsulfuron (2.87 and 3.73 g ai ha^{-1}), chlorimuron-ethyl (.95 and 3.73 g ai ha^{-1}), mesotrione (14.35 and 24.68 g ai ha^{-1}), atrazine (183.70 and 229.63 g ai ha^{-1}), s-metolachlor and atrazine (378.89 and 631.48 g ai ha^{-1}), glyphosate 142.37 g ae ha^{-1}, tribenuron (1.43 and 2.16 g ai ha^{-1}), acetochlor 146.96 g ai ha^{-1}, thifensulfuron-methyl 1.43 g ai ha^{-1}, and dicamba 22.96 g ai ha^{-1}.

None of the herbicide treatments exhibited injury symptoms when evaluated 7 DAA. In the one pass POST programs 14 DAA, all herbicide treatments provided equal control of giant foxtail, velvetleaf, and ivyleaf morningglory. One treatment that included atrazine at 183.70 g ai ha^{-1} had significantly less (6%) control of common lambsquarters and one treatment with thifensulfuron-methyl was also significantly reduced by 3% for the control of common waterhemp. The PRE fb POST treatments provided equal control for all weeds evaluated. When comparing the one pass PRE to the one pass POST and PRE fb POST treatments, s-metolachlor and atrazine control declined significantly 10-50% for giant foxtail, velvetleaf, and ivyleaf morningglory than other POST and PRE fb POST treatments. The PRE rimsulfuron at 3.73 g ai ha^{-1} provided 13-21% less control of giant foxtail than all other POST and PRE fb POST treatments but provided equal control for all other weeds. At 28 DAA, all treatments demonstrated only a 0-3% decline in control when compared to the 14 DAA evaluations.