

EFFECT OF TIMING OF TOPDRESSING NITROGEN FERTILIZER RELATIVE TO POSTEMERGENCE APPLICATIONS OF AE F130060 ON WHEAT INJURY. James R. Martin, Charles R. Tutt, and Dorothy L. Call, Extension Professor, Research Specialist, and Technician, Department of Plant and Soil Sciences, University of Kentucky, Princeton, KY 42445.

AE F130060 (proposed common name mesosulfuron methyl) is a relatively new foliar - applied herbicide used to manage weedy grasses after wheat emergence. It is an Acetolactate Synthase (ALS) inhibitor that can injure wheat; consequently, it is formulated with the safener, mefenpyr diethyl. There have been isolated cases in Kentucky where AE F130060 injured wheat, particularly when it was applied near the time of topdressing nitrogen fertilizer. The herbicide label for AE F130060 cautions against making applications within 14 days of topdressing ammonium nitrogen fertilizer due to the risk of crop injury.

The objective of this research was to evaluate crop injury and possible effects on wheat yield relative to using AE F130060 near the same time as nitrogen fertilizer applications.

'Pioneer 25R35' wheat was planted October 12, 2005 using no-tillage practices. A premix of thifensulfuron plus tribenuron was applied January 12, 2006 to keep plots as weed free as possible. In order to help eliminate variability from other pests, lambda cyhalothrin insecticide was applied in the fall and spring and propiconazole fungicide was applied in the spring.

The commercial formulation of AE F130060 with the safener was applied at a rate of 0.21 oz ai/A with a CO<sub>2</sub> back-pack sprayer on March 10, 2006. A non-ionic surfactant at 0.5% v/v plus 28% liquid nitrogen at 1 qt/A were included in the spray mixture as additives for AE F130060. Stream bars were used to apply 28% liquid nitrogen fertilizer at 120 lbs of actual nitrogen /A approximately 2 hours before AE F130060. This treatment was compared with applying liquid nitrogen fertilizer as a split treatment at 40 and 80 lbs/A of nitrogen at approximately 3 weeks before and 3 weeks after AE F130060, respectively. Ammonium nitrate and urea were dry forms of nitrogen fertilizer that were hand applied as a single treatment at 120 lbs of nitrogen/A on the same day as AE F130060, but were not included in split treatments. Each nitrogen treatment that was associated with AE F130060, had the same nitrogen fertilizer treatment but without AE F130060.

Wheat injury in the form of yellow or necrotic leaves and stunted plants tended to be greatest where AE F130060 and 28% liquid nitrogen were applied the same day. Based on Normalized Difference Vegetative Index (NDVI) readings, some discoloration was observed in all treatments where AE F130060 was applied, however the difference in NDVI readings dissipated by five weeks after AE F130060 was applied. Wheat plants that received both AE F130060 and 28% liquid nitrogen fertilizer the same day were 2.6 inches shorter at one week after treatment than those that were not treated with AE F130060 but received liquid nitrogen. This stunting was still obvious by four weeks after treatment but diminished by the time plants matured.

Wheat streak mosaic virus was observed in this study and significantly impacted grain yield in a portion of the field. The plots that were not substantially affected by the virus were used for statistical comparisons for yield. AE F130060 limited yield in nearly every case except where ammonium nitrate was used. The greatest difference occurred where AE F130060 and 28% liquid nitrogen were applied the same day. Applying liquid nitrogen as a split treatment of three weeks before and three weeks after AE F130060 also reduced wheat yield relative to applying liquid nitrogen as a split treatment without AE F130060.

In summary, topdressing nitrogen fertilizer on the same day as spraying AE F130060 has potential to injure wheat and limit grain yield, particularly with 28% liquid nitrogen. Applying 28% liquid nitrogen as split applications seemed to limit injury from AE F130060, yet yields were still low where the herbicide was used compared to where it was not applied.