

EFFECT OF AMMONIUM SULFATE AS AN ADDITIVE TO GLYPHOSATE FOR SPRING BURNDOWN CONTROL OF ITALIAN RYEGRASS (UKREC –2004)

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The labels of most, if not all, glyphosate products imply that weed control may be enhanced by including ammonium sulfate as an adjuvant in the tank mixture. Since Italian ryegrass is especially difficult to control in early spring prior to planting rotational crops such as no-till corn, research was conducted to evaluate the effect of AMS as an additive with different formulations of glyphosate.

METHODS:

Liquid AMS was included in the appropriate treatments at a rate of 3.7% v/v. This is equal to 3.75 gal per 100 gal of spray mixture.

Roundup WeatherMAX and ClearOut 41 Plus were the two glyphosate products used in this research due to differences in their formulations. Roundup WeatherMAX contains 4.5 lb acid equivalent (ae) of glyphosate per gallon of product and is formulated as a potassium salt at a concentration of 5.5 lb active ingredient (ai) per gallon of glyphosate acid plus potassium salt. Because of its unique proprietary adjuvant system, Roundup WeatherMAX label does not recommend using additional surfactants, yet AMS may be included. In contrast, ClearOut 41 Plus contains 3 lb ae of glyphosate per gallon of product and is formulated as the isopropylamine at a concentration of 4 lb ai per gallon of glyphosate acid plus the ammonium salt. The ClearOut 41 Plus label also does not recommend additional surfactant when it is used alone.

The amounts of glyphosate included in the treatments were 0.75 and 1.125 lb ae/A. These rates were equivalent to 22 and 32 oz/A for Roundup WeatherMAX, respectively, and 2 and 3 pt/A for ClearOut 41 Plus, respectively.

Treatments were applied March 15 in a spray volume of 20 GPA with a hand-held CO₂ powered back pack sprayer. Ryegrass plants ranged from 4 to 10 inches tall with an average height of 6 inches. Ryegrass control was evaluated at 3 to 5 day intervals during the first 512 days after application.

RESULTS:

Figure 1 shows the general trend in ryegrass control over time. The level of ryegrass control from glyphosate ranged from 0 to 13 % within 7 days after application, with few differences due to treatment. However, by 11 days after treatment, differences became more evident, with the high rate of 1.125 lb ae/A providing 35 to 50% control compared with 0 to 33% control with the 0.75 lb ae/A rate. Although AMS tended to enhance control with the low rate of both Roundup WeatherMAX and ClearOut 41 Plus, the differences were not significant until 20 days after application. Roundup WeatherMAX at 22 oz/A applied without and with AMS resulted in 53% and 70% ryegrass control, respectively, at 20 days after treatment. The levels of control observed at 20 days after treatment with ClearOut 41 Plus at 2 pt/A without and with AMS was only 33% and 40%, respectively, and were significantly less than the control with equivalent rate of Roundup Weather MAX.

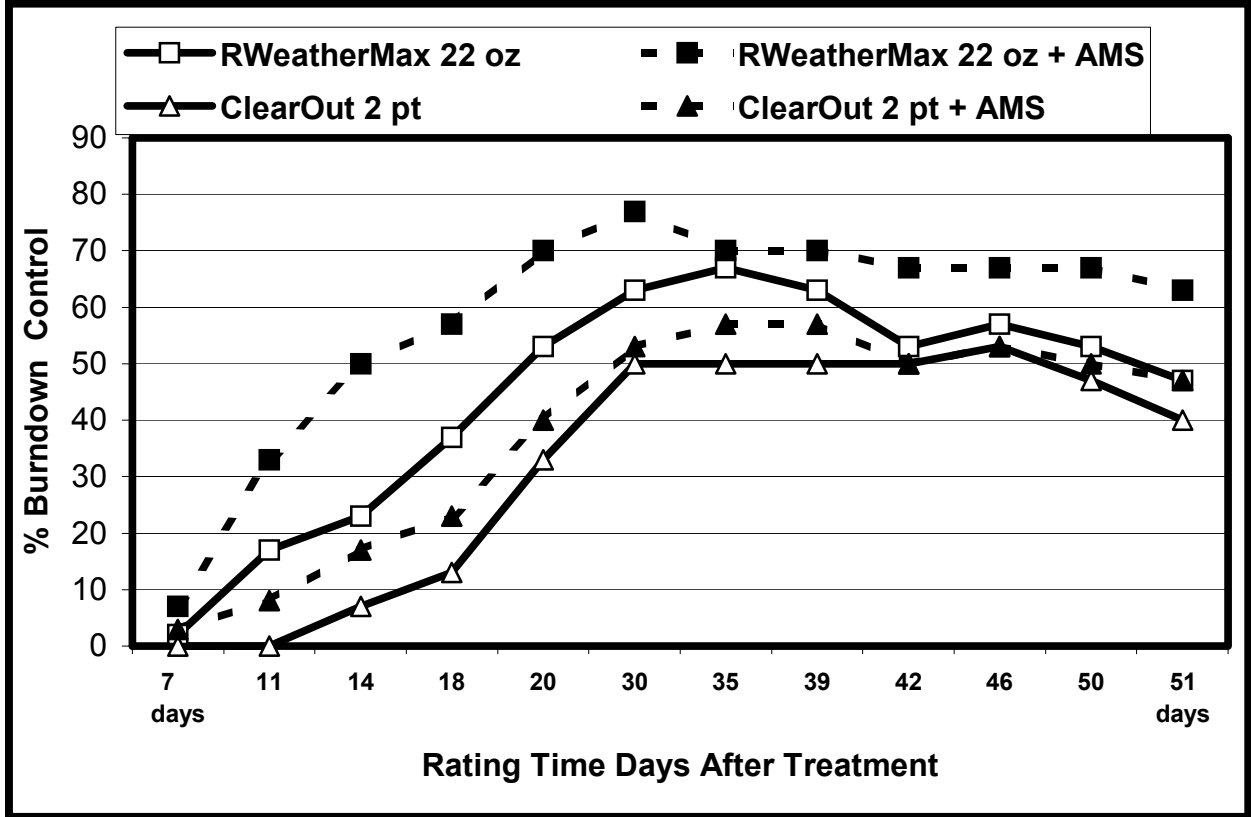
Ryegrass control for all treatments peaked at approximately 30 days after application. The level of control was at least 80% for all glyphosate treatments at 1.125 lb ae/A and was not affected by AMS. The 1.125 rate of glyphosate provided greater ryegrass control than 0.75 lb ae of glyphosate, except when AMS was included with Roundup Weather MAX at 22 oz/A.

The gradual decline in control after 30 days following application was largely due to newly emerging ryegrass plants. It also appeared that some of the treated plants were initiating new tillers.

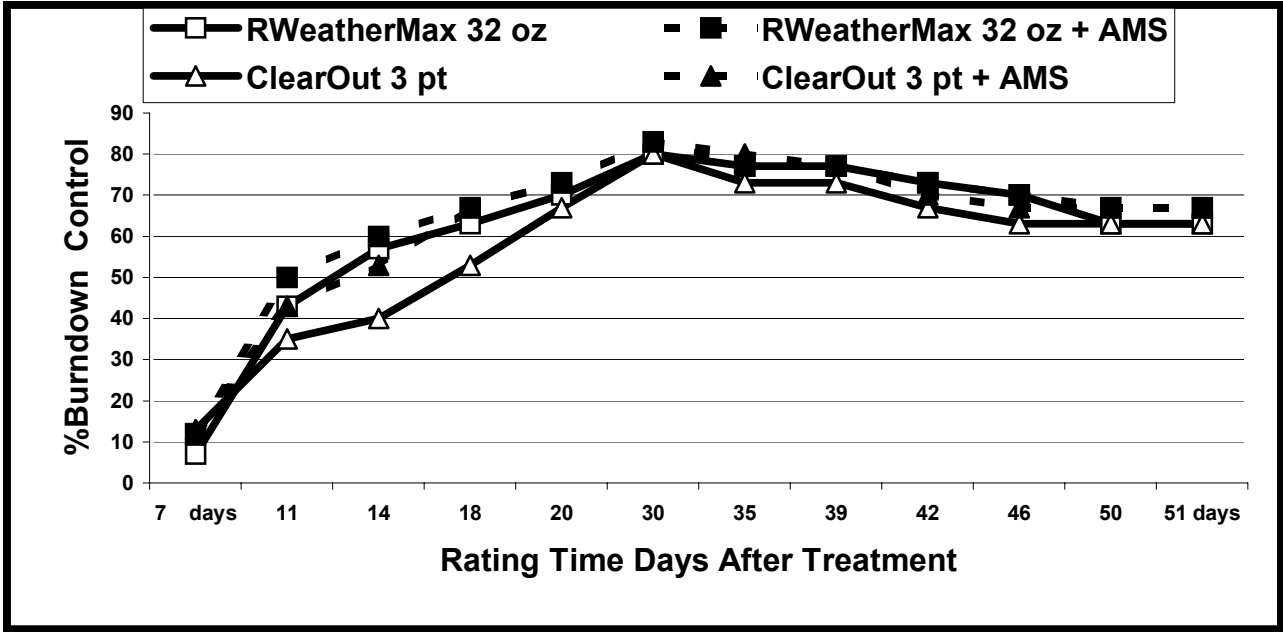
In summary, AMS tended to enhance burndown control of ryegrass with glyphosate at 0.75 lb ae/A, especially with Roundup WeatherMAX. This trend was less evident when the glyphosate rate was increased to 1.125 lb ae/A. Increasing the rate of glyphosate from 0.75 to 1.125 lb ae/A tended to enhance control better than AMS, particularly for ClearOut 41 Plus.

FIGURE 1. EFFECT OF AMS ON AS AN ADDITIVE ON BURNDOWN CONTROL OF ITALIAN RYEGRASS OVER TIME WITH DIFFERENT RATES AND FORMULATIONS OF GLYPGOSATE * (UKREC 2004)

(0.75 LB ACID EQUIVALENT GLYPHOSATE)



(1.125 LB ACID EQUIVALENT GLYPHOSATE)



* Treatments were applied March 15, 2004. Ryegrass was 4-10" tall with average height of 6".

