

Roundup Ready® Alfalfa – Summary of Third-Party Data for Yield, Forage Quality and Crop Safety.

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Roundup Ready® Alfalfa is the first commercial, genetically engineered alfalfa product in the U.S. marketplace. Studies required for regulatory approval of Roundup Ready Alfalfa addressed questions of environmental, food and feed safety and modifications to Roundup® agricultural herbicide labeling. These studies did not evaluate some of commercial aspects of the technology such as crop safety of multiple herbicide applications over the life of the stand.

To evaluate the impact of Roundup agricultural herbicides over the top of Roundup Ready Alfalfa, Monsanto personnel as well as university and contract researchers conducted an extensive testing protocol measuring yield, forage quality and crop safety. Researchers established the same replicated, small plot, multi-year experiment at 7 locations during 2003 (AZ, CO, MO, ND, NE, PA, TN) and 8 locations (AL, CA, GA, KS, IL – 2, MS, WA) during 2004. They planted a Roundup Ready Alfalfa population across the plot area and applied 22 treatments as a randomized complete block of design with 3 replications. Roundup agricultural herbicide (glyphosate) was applied to 21 of the treatments at rates from 0.75 lb acid equivalent (ae)/acre to 3 lb ae/acre prior to each cutting. One treatment was kept glyphosate free. Based on the number of cuttings at each location, annual cumulative glyphosate applications ranged from 1.5 lb ae/acre to as high as 12 lb ae/acre. All locations, annually, included treatments that exceeded the maximum proposed label rate of 4.5 lb ae/acre but the number of treatments exceeding the maximum season label rates varied by location due to the number of cuttings. A blanket weed control, non-glyphosate treatment was applied across all treatments to maintain the site as “weed free”. At each cutting, forage yield, measured as dry weight per acre and quality measurements were made. Quality parameters measured by NIR and wet chemistry included crude protein, ADF, NDF, potassium, phosphorus, sulfur, calcium magnesium and fat. Yield data were combined across locations and summarized graphically. Quality data were combined across sites and analyzed using ANOVA with replications nested within locations.

The combined data from this study indicates that, regardless of glyphosate rate, there were no negative effects of glyphosate application, observed for yield after two and three years of multiple high rate glyphosate applications compared to lower rates or glyphosate or no glyphosate at all. Forage quality parameters varied significantly between locations and cutting but not within locations. No significant differences were noted for stand persistence between treatments at the single location where the number of crowns per m² was measured following two years of glyphosate applications.

This study is on-going and data are currently being collected for year 3 and year 4 from seven remaining locations.

References

Rogan, G and Fitzpatrick, S. 2004. Petition for Determination of Nonregulated Status: Roundup Ready Alfalfa (*Medicago sativa* L.), Events J101 and J163.
http://www.aphis.usda.gov/brs/aphisdocs/04_11001p.pdf

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