WEED MANAGEMENT IN GLYPHOSATE TOLERANT ALFALFA IN KENTUCKY: FOUR YEARS OF OBSERVATIONS. Sara K. Carter, Charles H. Slack, Bernard F. Hicks and Glen P. Murphy, Research Analyst, Research Specialist, Research Analyst, Department of Plant and Soil Sciences, University of Kentucky, Lexington, KY 40546, Technical Development Representative, The Monsanto Company, Coxs Creek, KY 40013.

Alfalfa with genetically modified qualities to exhibit tolerance to glyphosate herbicide was evaluated by the University of Kentucky for weed control and overall crop tolerance. The establishment of alfalfa at the University of Kentucky's Spindletop Research Facility began May 6, 2004. The experimental tolerant variety was drilled at 12.5 lbs/A to a depth of ¼" and spaced at 7" between rows. This trial was established on a Maury Silt Loam soil in a conventionally prepared seed bed. Plot size was 10 feet wide by 25 feet long and all applications were made at 24 gal/A of water with any necessary adjuvant. Herbicides evaluated were glyphosate (0.75 lbs ae/A), imazamox (0.047 lb ai/A), and clethodim (0.125 lb ai/A). The addition of surfactants and adjuvants was based on label recommendations. An application of paraquat was added to the clethodim plots between harvests. Visual ratings of weed pressure or control and crop tolerance were evaluated before each harvest. First year harvest data will be presented as establishment year is primarily when the weed pressure is greatest.

First harvest data showed that weed pressure was greatest in the untreated control plots where the primary species were giant foxtail, smooth pigweed and velvetleaf. The first application of all herbicides was made on May 27, 2004. The first harvest took place July 1, 2004. Both imazamox and glyphosate provided ≥ 90% control of all weed species present while, clethodim controlled only foxtail at 100%. No crop injury was observed. The second application took place July 21, 3 weeks after the first harvest. Only foxtail and pigweed were present and rated following the second application. As before, foxtail was controlled completely by all treatments, while glyphosate only controlled pigweed. Crop injury was present following this application where clethodim was followed by paraquat and where imazamox was followed by clethodim. Data from the first harvest showed that applications of glyphosate and imazamox yielded at least 30% alfalfa. By the second harvest, all plots were yielding some alfalfa with the largest percentage being 77 where glyphosate was applied alone. These were expected results. As the trial continued over several years, the weed pressure virtually disappeared. Stand counts were taken at the end of the first season. These counts reflected the same result as the weed control data. Counts were taken again in the spring of the following year and were found to increase slightly in most cases.

Glyphosate tolerant alfalfa showed excellent tolerance to multiple applications of glyphosate and moderate tolerance to the standard herbicides used for conventional alfalfa production. Excellent weed control was achieved during the establishment phase of this trial, thus allowing it to continue over many years. Though the widespread adaptation of this technology is still evolving, there are producers who have converted their crops to tolerant varieties only. Longevity of the original stand is yet to be determined. There are other traits that should be evaluated to determine the overall quality of the tolerant crop in relation to a conventional type.

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