

Effect of Glyphosate on Removal of Alfalfa and Growth and Yield Parameters of Subsequent Rhodes Cultivation

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U. D. Belpagoda Gamage^{1(*)}, Andrew Carver¹, M. M. K. Prema kumara²

¹Department of Northern Arable Farms, Almarai Company, P. O. Box 8524, Riyadh, Saudi Arabia, ²Dept. of Animal Science, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka

(*)Email: udesdharmasiri@yahoo.com

Increasing prices of agrochemicals and environmental pollution due to their intensive usage are major issues in agriculture. The objective of this study was to carry out a preliminary cost-benefit analysis of the application of glyphosate on removal of alfalfa for subsequent establishment of Rhodes grass. Two plots of alfalfa, 35ha each, were selected. The tight side (RS) plot was sprayed with glyphosate [6l of glyphosate/ha + surfactant (100 ml/ha of Captain) + 1kg/ha of urea] before 3 days of the final harvest, while the left side plot (LS) remained untreated. Following the final harvest of alfalfa, primary and secondary land preparation for subsequent establishment of Rhodes grass were practiced. Cost of agrochemicals prior to the establishment of grass was 0\$/ha and 183.2\$/ha for LS and RS, respectively. Additional cost for chemicals (MCPA, 2/4D and Captain) for the removal of post emerge weed or alfalfa were 132.75\$/ha for LS and 103.5\$/ha for RS. Total costs of land preparation (machinery + labour) were 80\$/ha in LS and 42.5 \$/ha in RS. Total costs of cultivation were 212.75/ha and 328.95/ha for LS and RS respectively. Average number of seedlings /m² (sample size 1m² with 20 plots per side) at 5 leaves stage (21 days old) were 128 in LS and (range 98-142) and 130 in RS (range 91-139). Average numbers of tillers per plant were 5 in LS and 4.5 in RS at 9 leaf stage. Yields of Rhodes in first year (total in 3 consecutive cuts) were 21.6t/ha/yr in LS and 21t/ha/yr in RS. The percentage of crude protein (CP) was 12.03% and 12.31% in LS and RS, respectively whereas acid detergent fibre (ADF) was 39.62% and 39.61% in LS RS, respectively. Despite the significantly higher cost incurred for the application of glyphosate to the RS, no significant differences were observed in growth and yield parameters and in chemical compositions of Rhodes between RS and LS. While the application of glyphosate resulted in increasing the total cost of establishing grass in plot RS, preliminary results indicate that there were no differences in the germination, tillering and hay quality of Rhodes grass in the absence of glyphosate.

Keywords: Glyphosate, Alfalfa, Rhodes grass, non-glyphosate cultivation