

Do Higher Alfalfa Seeding Rates Increase Forage Yield And Quality In The Seeding Year?

Marisol T. Berti^{1*}, Robert Nudell¹, Dan Undersander², and Mark Zarnstorff³

¹Dep. of Plant Sciences, North Dakota State Univ., NDSU Dept. 7670, Fargo, ND 58108-6050

²Extension and Research Forage Agronomist, University of Wisconsin, 1575 Linden Drive, Madison, WI 53706

³Mark Zarnstorff, Ph.D., National Crop Insurance Services, Director of Ag Research and Technolog, 8900 Indian Creek Parkway, Ste. 600, Overland Park, KS, 66210-1567

*Corresponding author: phone 1-701-231-6110; fax: 1-701-231-8474; e-mail: marisol.berti@ndsu.edu

Many alfalfa growers in the North Central Region are being encouraged to increase alfalfa seeding rate to obtain higher forage yield the seeding year and benefit of the current high hay prices. Previous research indicates that seeding rate above 10 kg/ha does not increase forage yield in the seeding year, nor has an impact in plant density, stand persistence, or forage quality. The objectives of this study were: 1) to determine the relationship between plants and stem density, and forage yield and quality in glyphosate-tolerant alfalfa in the seeding year, and 2) to determine the optimal and economical seeding rate to maximize forage yield in the seeding year. A replicated experiment was established at three locations Fargo, Prosper, and Carrington in 2013. The experimental design was a RCBD with six seeding rates (1, 5, 10, 15, 20, and 25 kg pure live seed/ha), three replicates, and the cultivar used was RR Prezeed. Each plot was 6.5 m long and 8 rows spaced 15 cm apart. Once established the plots, plant density, and stem density was evaluated at the end of the season after the last harvest in 2013. Evaluations were conducted in the 6-center rows of the plots in a 1-m² quadrant. Forage yield was taken from 0.6 x 6 m area with a flail harvester. Two harvests were conducted in the seeding year. Forage quality was conducted with the NIRS at the Forage Lab, University of Wisconsin. An economic analysis was conducted to determine the optimum economical seeding rate calculating the incremental forage yield with each seeding rate. The data was analyzed by location and cut and then combined using the procedure mixed of SAS. Location was a random effect and cut and seeding rate were analyzed as fix effects. Seasonal forage yield (sum of two cuts) fluctuated between 4.45 and 6.78 Mg/ha all locations combined. The driest location, Carrington, had the lowest forage yield. As seeding rate increased, forage yield increased, but only up to 15 kg seed/ha. The plant and stem density also increased only to 15 kg seed/ha. Maximum plant and stem density was 70 to 80 plants/m² or 400 to 500 stems/m². Increasing seeding rate to 25 kg seed/ha did not increase yield, plant density, or forage quality as it has been reported previously with conventional cultivars. Alfalfa plants self-thin soon after emergence when seedling density is high. The economic analysis indicated that there is little justification for seeding rates above 10 kg/ha because the cost of additional seed is greater than the incremental increase in forage yield. The recommendation is to put your time and effort into preparing a good seedbed rather than increasing the seeding rate to compensate for a poor seedbed.