



Nutrient cycling potential of camelina (*Camelina sativa* L. Crantz.) as a cover crop in the US Northern Great Plains

Marisol Berti and Dulan Samarappuli

Department of Plant Sciences, North Dakota State University, United States (marisol.ber ti@ndsu.edu)

Camelina [*Camelina sativa* (L.) Crantz.] is an industrial oilseed crop in the Brassicaceae family with multiple uses. Currently, camelina is not used as a cover crop, but it has the potential to be used as such in maize-soybean-wheat cropping systems. The objectives of this study were to determine the agronomic performance and nutrient scavenging potential of winter camelina in comparison with other common cover crops. Experiments were conducted in Fargo, ND in 2015 and 2016, and in Prosper, ND in 2015. The experimental design was a randomized complete block design with a split-plot arrangement with three replicates. The main plot was the sowing date and the subplot were camelina cultivars as well as other common cover crops in the area. Sowing dates were targeted to 15 August and September 1, although the final dates varied slightly each year. Biomass yield, N content of the biomass N uptake and P uptake was evaluated. Winter camelina N and P uptake ranged between 21 and 30.5 kg N ha⁻¹ and 3.4 to 5.3 kg P ha⁻¹. The nutrient scavenging potential of winter camelina was similar to other cover crops although slightly lower than turnip (*Brassica rapa* L.), radish (*Raphanus sativus* L.), and rape (*Brassica napus* L.) cultivars which had significantly higher P uptake than winter camelina and the other cover crops in the study. An evaluation of spring regrowth and cover indicated that only rye, winter camelina, and pennycress (*Thlaspi arvense* L.) survived the winter, although a few plants of triticale (*x Triticosecale* Witt.) and rape were found on a few plots. Because of the high variability on the plots there were no significant differences among the surviving cover crops on soil coverage. The soil coverage for rye cultivars was 25 and 35% and for camelina cv. Bison was 27%. In 2016, biomass yield was not significant for sowing date, cultivars, or their interaction. Winter camelina cultivars biomass yield fluctuated between 1.15 and 2.33 Mg dry matter ha⁻¹ on the first sowing date while pennycress biomass yield was 1.40 Mg ha⁻¹. In the second sowing date all crops had about half the biomass yield than the first sowing date.

In conclusion, even though winter camelina may not provide much soil cover in the fall, the ability to survive the winter and scavenge nutrients in the autumn and spring gives this crop an excellent potential to be integrated as a cover crop in maize-soybean-wheat cropping systems in the US Midwest.