The Effect of Grazing and Non-grazing of Annual Green Manures on Following Crops – Establishment Year

Project duration: May 2019 – October 2020
Objectives: To demonstrate the use of an annual green manure crop for grazing by livestock and to provide fertility for the following crop (2019); and to evaluate the performance of three annual field crops after a green manure crop, with and without grazing (2020).
Collaborators: James Frey, Manitoba Agriculture
Jessica Frey, Parkland Crop Diversification Foundation

Results
After establishing the green manure crop on May 14, half of the crop was intensively grazed by sheep, and the other half was mowed. The entire area was disked in October, after freeze-up. Table 1 gives details for the green manure blend.

Table 1: Green manure blend by species, rate and description

Species	Rate (lb/ac)	$/ac	Description
Pea (4010 forage)	40	8.33	Cool season legume; forage type
Oat (Haymaker)	30	7.02	Cool season grass; forage/hay type
Japanese millet	3	5.37	Warm season grass
Italian ryegrass	2	4.38	Cool season grass; limited over-wintering ability
Persian clover	2	8.38	Cool season legume; slow establishment
Chicory	0.5	4.79	Short-lived perennial broadleaf; deep taproot
Turnip	0.3	1.44	Cool season broadleaf; good frost tolerance
Feed beet	0.7	4.19	Cool season broadleaf; quick leaf regrowth
Common vetch	2	5.58	Cool season legume; shade tolerant
Phacelia	0.5	2.50	Warm season broadleaf; attracts pollinators
	Total	**51.98**	

The green manure was grazed on August 19. Based on biomass sampling, hay yield was calculated to be 6.5 1500-lb round bales per acre. Crude protein was 11.6% and TDN was 69%. The stocking rate for animals was 195 sheep per acre for 5 days. This equals 39 animal units (1 animal unit = 1000 lb animal).

In 2020, PCDF will plant spring wheat, barley and canola on the grazed and non-grazed areas, as well as on a control where no green manure was established. This will allow for an evaluation of the effect of growing a crop on the three treatments (grazed, non-grazed, no green manure).

Background
The cost of the seed blend for forage is high relative to simpler cereal-only annual forages, such as barley planted for green feed (estimated at $16.88/ac in the MB Agriculture Cost of Production). However, the blend used here allows for extended in-season grazing, including swath or bale grazing, reducing pressure of perennial pastures. Some livestock producers in Manitoba have successfully used annual green manures to graze livestock in-field into the winter months, reducing feeding and yardage costs. Other benefits in future years to soil health and crop performance may be observed.