

Wheat Nitrogen Ramp – (Year 2 of a 6-Year Crop Rotation)

Project duration: Spring 2018 – Fall 2023

Objectives: To assess the economic and agronomic impact of a 6-year rotation, using integrated management practices.

Collaborators: Parkland Crop Diversification Foundation

Project findings

The spring wheat yields shown in Tables 1 indicate a responsiveness to added nitrogen over the amount provided by the green manure in 2018. Table 1 appears to indicate a decrease in yield for treatment 4; however, the reduced yield for that treatment can be attributed to poorer plant establishment in some plots. The dotted, red trend-line shows the general trend for yield.

Background

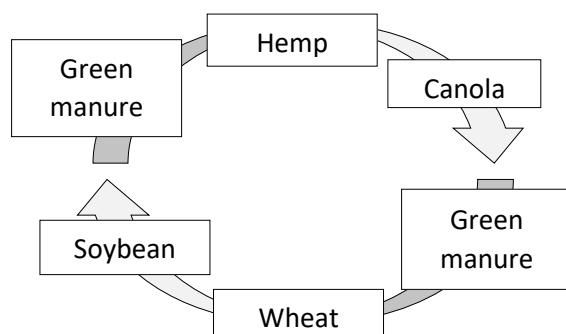
The use of green manures for fertility has the potential to reduce fertilizer inputs during the cropping year. In 2019, wheat was planted after a green manure in 2018. The nitrogen fertility levels between treatments are compared in Table 2, along with the cost of nitrogen additions per treatment.

Table 2: N fertility levels and N costs by treatment

Treatment	Added N	Total N	Cost N/ac at \$0.50/lb
1	0.0	115.0	\$0.00
2	9.7	124.7	\$4.84
3	19.4	134.4	\$9.68
4	38.7	153.7	\$19.35
5	58.1	173.1	\$29.03
6	77.4	192.4	\$38.71
7	96.8	211.8	\$48.38

Figure 1 shows the full six-year rotation for the trial.

Figure 1: Six-Year Rotation Schematic



Materials & Methods

Experimental Design: Random Complete Block Design

Entries: 7 treatments

Seeding: May 14
 Harvest: Sept 11

Agronomic info

Previous year’s crop: Green manure blend – oat, pea, Italian Ryegrass, Japanese Millet, Persian Clover, Common Vetch, Sugar Beet, Phacelia, Chicory, Turnip Rape
 Soil Type: Erickson Loam Clay
 Landscape: Rolling with trees to the east
 Seedbed preparation: Green manure disked into soil fall 2018

Table 2: Treatments

No added Nitrogen	60% added Nitrogen
10% added Nitrogen	80% added Nitrogen
20% added Nitrogen	100% added Nitrogen
40% added Nitrogen	

All treatments seeded with lb/ac actual P

Table 3: Spring 2019 Soil Test

Available	
N	115 lb/ac
P	17 ppm
K	183 ppm

Results

Average yields for spring wheat by treatment are show in Table 1.

Table 1: Yield by treatment (kg per plot, 14% moisture)

