

Oat-Cover Crop (Year 1 and 2)

Project duration: May 2020 – September 2021

Objectives: To evaluate intercropping potential for oat and cover crops

Collaborators: PCDF

Background

The Manitoba Agriculture and Resource Development (ARD) [website](#) states that producers may plant cover crops to minimize wind and water erosion. Cover crops can play an important role after low-residue crops, such as soybean and potatoes, or in spring as a new crop is establishing. Another important function is to immobilize excess nutrients, especially nitrogen, and prevent losses. Additionally, cover crops can help to trap snow, enhancing moisture conditions in spring.

Despite these benefits, the limited growing season before or after another crop can make establishing cover crops a challenge. A common practice is to establish a cover crop in-season, with a cash crop. This trial examined the effect of establishing four cover crops with oats (Table 1).

Results

The data presented here are for Years 1 and 2 of a multi-year study. Figure 1 shows a comparison of oat yield (bu/ac) by treatment for 2020 and 2021. Very dry conditions in 2021 resulted in poor oat yield.

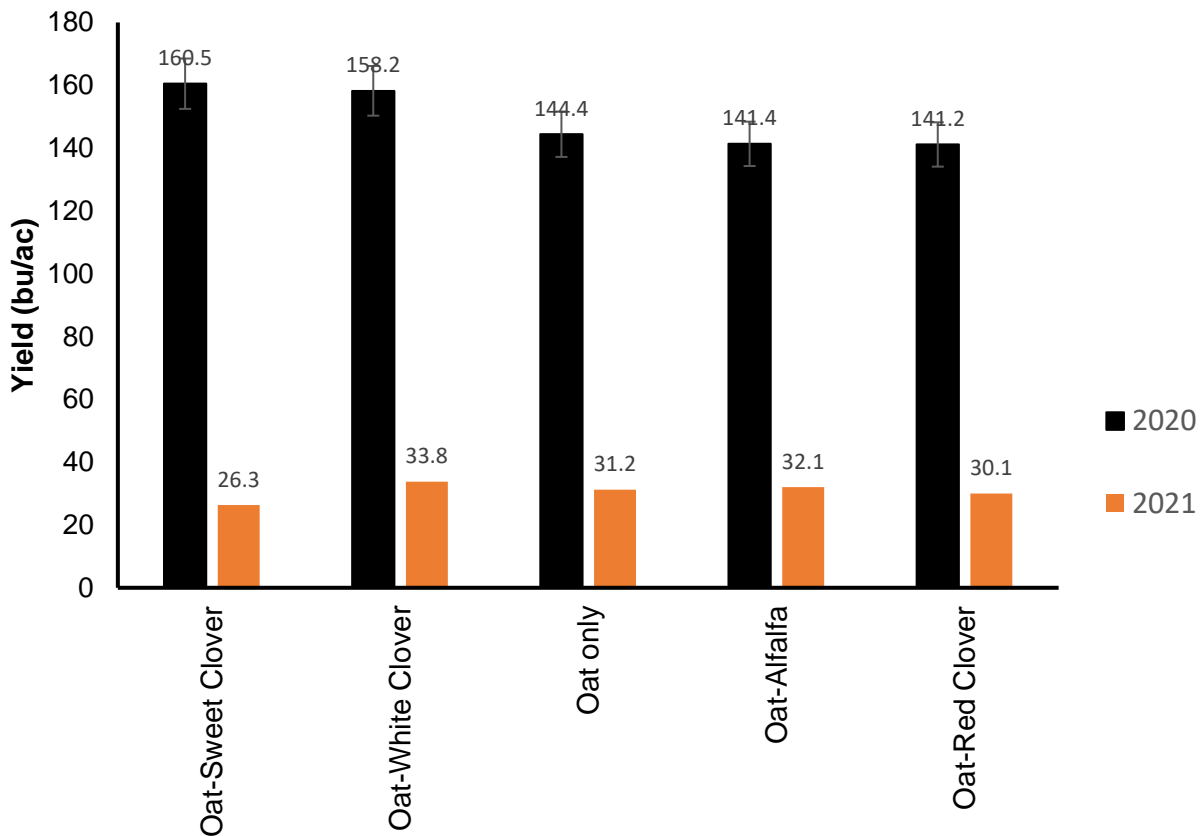


Figure 1: Oat yield (bu/ac) by treatment.

Table 1: Comparison of yield means and statistical difference for oat-cover crop entries for 2020 and 2021 (varieties connected by the same letter are statistically significant)

Variety	Statistical significance for yield		Yield (bu/ac)	
	2020	2021	2020	2021
Oat only	A	A	144.4	33.8
Oat-Alfalfa	A	A	141.4	32.1
Oat-Red Clover	A	A	141.2	31.2
Oat-Sweet Clover	A	A	160.5	30.1
Oat-White Clover	A	A	158.2	26.3
LSD			28.6	13.8
% CV			10.7	27.9

* Treatments not marked with the same letter are statistically different from other treatments.

Figure 2 shows forage July 2021 yields for cover crops seeded in 2020. **Note that yields for white clover are for one rep only, and are included for reference only.** All results are for one year only, and should be interpreted with caution.

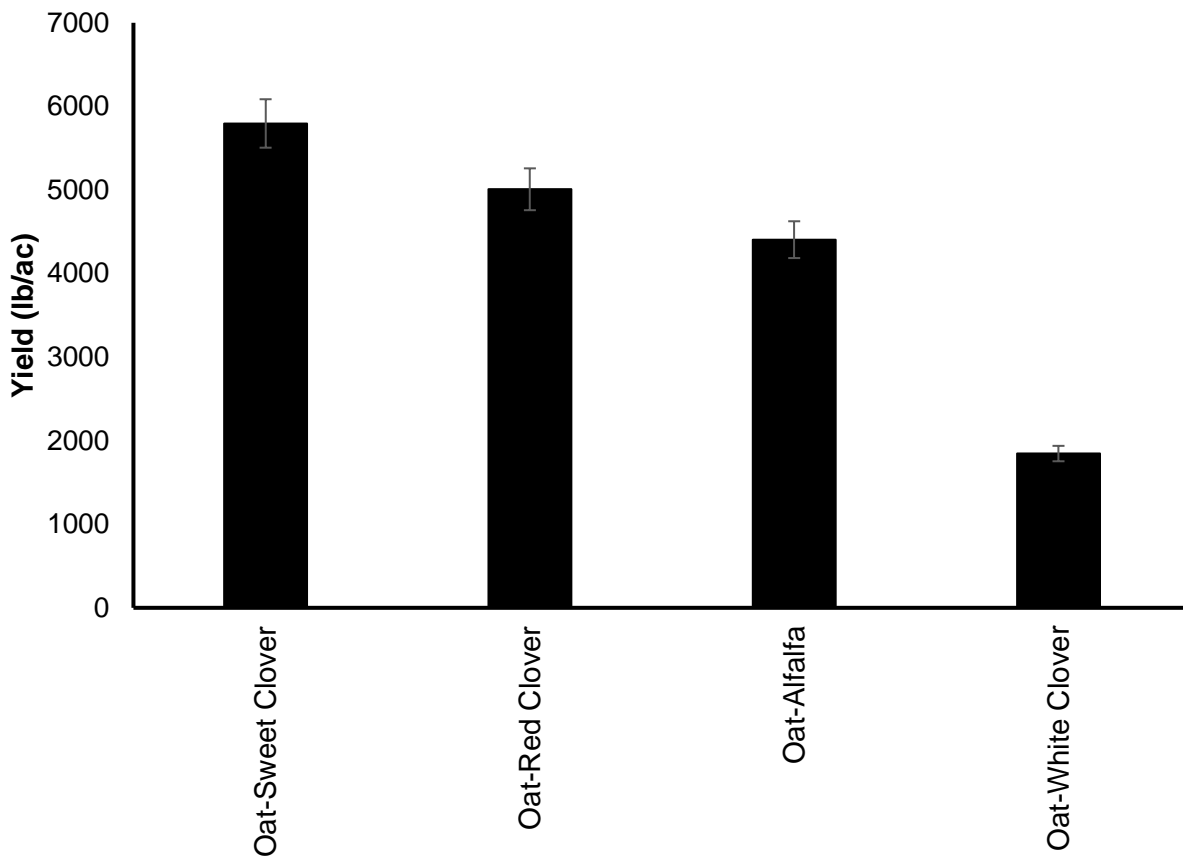


Figure 2: Average forage yield for cover crop by treatment, seeded 2020, harvested July 16, 2021 (lb/ac, 15% moisture).

Figure 3 shows the yield for cover crops in the 2021 growing season (planted with the oat crop). White clover yields were negligible and are not show. **Note that yields are for one rep only, and are included for reference only. The results are for one year only, and should be interpreted with caution.**

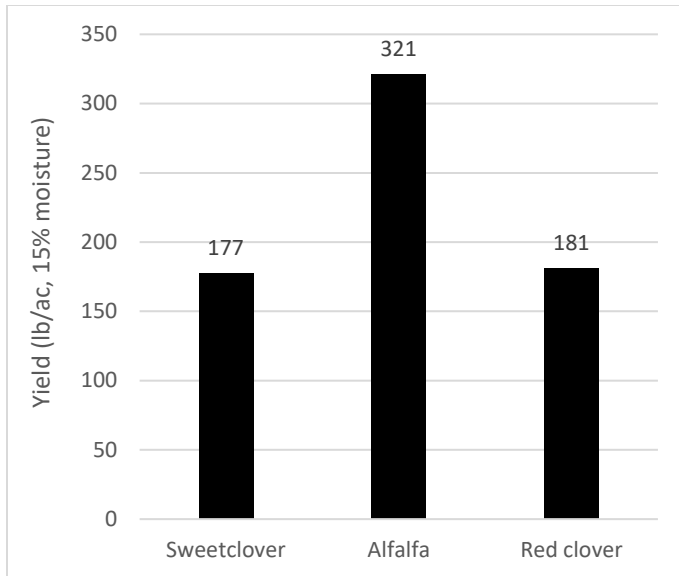


Figure 3: Figure 2: Average forage yield for cover crop by treatment, seeded 2021, harvested Sept 15, 2021 (lb/ac, 15% moisture).

Observations (2020)

The cover crops established slowly in the understory of the oats. At the time of harvest, the yellow sweet clover and alfalfa crops were well established, whereas the red clover and white clover crops appeared to be less successful. The oat crop was cut about 15” above the ground, and the loose straw was removed from the field so that the cover crop could continue to grow for the remainder of the season. The tall stubble appeared to trap more snow during the winter, providing better protection for the crop.

Observations (2021)

Despite the dry conditions in spring, all cover crop treatments produced well (including the white and red clover, which did not appear to have competed well against the canola crop in 2020). The crops broke dormancy in late April and were swathed in mid-July. Because white clover is a very short crop (less than six inches high), swathing and baling presents a challenge. A better option for use as a forage would be to graze the crop in-field. Other uses might include discing the crop into the ground as a green manure, or harvesting the crop for seed.

No herbicides were applied to the 2020 or 2021 crop. Limited herbicide options are available for oat-cover crop intercrops, and the close proximity of the plots (and danger of spray drift) made it more feasible to hand-weed the plots. On a field-scale, careful field selection and pre-emergence herbicide application would be crucial to the establishment of a successful intercrop. Consult a herbicide guide or dealer to determine the best herbicide option for each intercrop.

Materials and methods

Experimental Design: Random Complete Block Design
 Oat Variety: AC Summit
 Treatments: 5
 Replications: 3
 Seeding: May 14
 Harvest: Sep 28

Table 2: Seeding rate (lb/ac)

	Oat	Red Clover	White Clover	Sweet Clover	Alfalfa
Treatment 1	105 lb/ac	-	-	-	-
Treatment 2	105 lb/ac	10lb/ac	-	-	-
Treatment 3	105 lb/ac	-	5lb/ac	-	-
Treatment 4	105 lb/ac	-	-	5lb/ac	-
Treatment 5	105 lb/ac	-	-	-	18lb/ac

Data collected Date Collected
Emergence: Oat: May 21-24, Clover: May 21-31
Stand rating: Jul 1
Vigor Rating: Jul 1
Yield: Sep 28
Moisture: Sep 28

Agronomic info

Previous year's crop: Oat Silage
Soil Type: Erickson Loam Clay
Landscape: Rolling with trees to the east
Seedbed preparation: Heavy harrowed

Table 3: Fertility Information

	Available	Added	Type
N	162 lb/ac	10 lb/ac	46-0-0
P	41 ppm	10 lb/ac	11-52-0-0
K	703 ppm		
Cover crops inoculated; no herbicide applied (hand weeded)			