

Identifying Strategies Suitable for the North Peace Region of Alberta to Improve Soil Health and Promote Their Adoption by Producers

An Intercropping Study at North Peace Applied Research Association

A Project under the Environmental Stewardship & Climate

Change Group of the Canadian Agricultural Partnership

Cooperator: North Peace Applied Research Association (NPARA)

Project Description:

NPARA seeded 8 intercrop treatments on May 29, 2018, and used monoculture plots of the same cereal, pulse and oilseed varieties for comparison. A herbicide burndown treatment was made before seeding and no further herbicides were used on the intercrop trial area. To report actual financial costs and returns to each of the methods and treatments, it is reasonable to use treatments from the NPARA variety trials for comparison. In any case the comparisons must be separate. The variety trials are conducted annually at NPARA under conventional agricultural methods. The monocrop barley variety trial was seeded on May 14, 2018, wheat on May 11, canola on May 16, and the monocrop canola variety trial was seeded May 16, 2018. The barley, wheat, pea and canola varieties are widely used in the north Peace region.

Procedures and data capture followed this plan:

- Soil sample prior to seeding
- Seed intercrop treatments (i.e. peas & canola)
- Seed plots of each species in monoculture
- Monitor plots
- Harvest and measure productivity
- Evaluate use of Near Infrared Variability Index (NDVI) imagery

Note that some intercrop treatments were not appropriate for the study. Sunflower/hairy vetch and sunflower/lentil intercrop failed as we did not access an appropriate commercial sunflower seed variety. Corn and hairy vetch, which NPARA has experience with as a grazing system, was not appropriate for this study. We will report on five intercrop treatments with good potential for crop production study. NPARA will use this initial trial information to improve the agronomic results of the treatments and to identify additional intercrops for subsequent studies (figure 1).

Figure 1	
TRT	DESCRIPTION
1	Lacombe Peas Monoculture
2	Synergy Barley Monoculture
3	CS2400 Canola Monoculture
4	Stettler Wheat Monoculture
5	Synergy Barley Lacombe peas
6	CS2400 Canola Lacombe Peas
7	Synergy Barley lentils
8	CS2400 Canola chickling vetch (greenfix pea)
9	Stettler Wheat red clover

The intercrop plots were seeded into medium residue with minimum disturbance, using a disc drill. The monocrop plots had somewhat less residue. Intercrop species were seeded in separate rows on 9" centers; for example, 3 rows of barley and 3 rows of peas in each plot, allowing for distinct seeding depths of each crop. This has provided a new subject for evaluation; in the future both species will probably be seeded in all rows, using an acceptable depth for the largest-seeded component of the intercrop treatment. It is thought that even if small-seeded crops are placed with the larger seeds at greater depth, the emergence process of large seeds will encourage/enable small seed germination and emergence. Observations by NPARA staff, visiting researchers and producers were consistent, that the seed should be mixed and seeded together in all rows.

The monoculture plots were chosen to reflect performance of the crop varieties used in the intercrop plots. Treatment 5 was selected to closely match maturity of the two species for easy harvest. Canola and peas (treatment 6) is the most

commonly seen intercrop in Alberta. Barley is also paired with lentils (treatment 7), a crop with limited successful production in the Peace region.

Relative seeding rates of each crop is also a concern. A literature search and consultations with researchers yielded some rules of thumb, which NPARA utilized in planning the trial:

1. More legume, less oilseed or cereal seed
2. 50% or less normal seeding rate for oilseed
3. 2/3 to ¾ normal seeding rate for pulse or legume.

Results

2018 NPARA Intercrop Study - CAP				
TRT	DESCRIPTION	YIELD	% of monocrop production	% of monocrop net revenue
1	Lacombe Peas Monoculture	35.7		
2	Synergy Barley Monoculture	97		
3	CS2400 Canola Monoculture	39.4		
4	Stettler Wheat Monoculture	70		
5	Synergy Barley	66.4	68%	116%
	Lacombe peas	17.1	48%	381%
6	CS2400 Canola	23.4	59%	98%
	Lacombe Peas	10.4	29%	268%
7	Synergy Barley	98.5	102%	135%
	lentils			
8	CS2400 Canola	19.2	49%	57%
	chickling vetch (greenfix pea)			
9	Stettler Wheat	41.8	60%	58%
	red clover			

figure 4

2018 NPARA Intercrop Study - CAP

TRT	DESCRIPTION	YIELD	COMMODITY PRICE	CROP VALUE	TOTAL VALUE	INPUTS	NET
1	Lacombe Peas Monoculture	35.7	6.85	244.55	244.55	163.5	81.04
2	Synergy Barley Monoculture	97	4.31	418.07	418.07	152.7	265.42
3	CS2400 Canola Monoculture	39.4	9.88	389.27	389.27	166.3	222.94
4	Stettler Wheat Monoculture	70	6.95	486.50	486.50	119.7	366.81
5	Synergy Barley	66.4	4.31	286.18	403.32	94.86	308.46
	Lacombe peas	17.1	6.85	117.14			
6	CS2400 Canola	23.4	9.88	231.19	302.43	85	217.43
	Lacombe Peas	10.4	6.85	71.24			
7	Synergy Barley	98.5	4.31	424.54	424.54	66.9	357.64
	lentils						
8	CS2400 Canola	19.2	9.88	189.70	189.70	62.54	127.16
	chickling vetch (greenfix pea)						
9	Stettler Wheat	41.8	6.95	290.51	290.51	77.44	213.07
	red clover						





