INTERCROPPING - CANOLA & PEAS

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INTRODUCTION

Producers in north-east and east-central Saskatchewan are showing keen interest in reducing the number of summerfallow acres and extending rotations by including field peas and other pulse crops. The threat of wheat midge and cereal leaf diseases will restrict the number of times wheat can be grown in rotation. This is in addition to low prices for wheat compared to the early 70's combined with increased freight rates. Herbicides such as Poast and Trifluralin are available to control volunteer cereals in peas and provide good broadleaf weed control. Field pea contracts are available locally. All the above factors combined with adequate moisture and the benefit of pulse gain in rotation makes field peas an ideal crop for this area. Pulse and oilseed crops have been grown in combination locally and also some preliminary research done by Austenson 1971-72 (unpublished data) indicated the need for further field evaluation.

OBJECTIVE

To establish what the pulse gain is when growing peas in rotation and to evaluate the potential for intercropping canola and peas in comparison to peas with respect to yield, harvesting ease and disease problems.

PROCEDURE

1) Pulse Gain

Four 20-acre fields (flax stubble) were sown with a double disc drill in 1982 as follows:

a) Tara peas
b) Tara peas + 11-51-0 @ 45 lbs
c) Wheat
d) Wheat + 27-27-0 @ 97 lbs/acre

In 1983 Bonanza barley was sown across these treatments with and without fertilizer (23-24-0 @ 120 lbs seed placed.) Barley yields were determined using a portable hopper scale weighing grain from the combine over a measured area. Results are shown in Table I.

2) Intercropping

Trapper peas were inoculated and sown on May 6 @ 95 lbs/acre on barley

stubble using a double disc press drill (IHC #100.)

Westar canola was cross seeded at 2½ lbs/acre on May 14. The fertilizer application included:

a) 34-0-0 @ 95 lbs/acre broadcast and incorporated before seeding
b) 50 lbs 11-51-0 seed placed with peas
c) 60 lbs 11-51-0 seed placed with canola

Hoegrass was used for wild oat control.

The crop was straight combined on September 6 using standard reels and cutting bar. The yields were determined by weighing the grain from the combine using a portable weigh scale. The yields were compared to those reported by the co-operator after grain sales.

The peas and canola were separated at a local seed cleaning plant before sale.

RESULTS

Table I. Pulse Gain Study

1981	1982	1983 Yields Bu/Acre		
		Barley No Fertilizer	Barley + 23-24 @ 120 lbs	Average
Flax Stubble	Peas + 11-55-0 at 45 lbs	74	73	69
	Peas	59	72	
	Wheat + 28-28-0 at 97 lbs	47	83	59
	Wheat	48	55	
	Average	57	71	

The extra yield of barley on pea vs wheat stubble was 10 bushels per acre. This is an estimate of the pulse gain factor or the anticipated extra yield of barley the following year on pulse stubble. This gain is attributed to the nitrogen in the pea crop residue and root system. Results also show the benefit of applying phosphate for peas resulting in improved yields, not only in the pea (3 bu/acre) but in the succeeding crop as well.

Table II. Yields and Gross Return per Acre from Intercropping

		YIELDS - BU/ACRE			
Crop	Percent of Total	lbs/acre	Farmer Scale		$/acre*
Canola	100	919		18.4	$138
Peas	100	1827		30.5	$152.50
Intercrop					
- Peas	80	1782	31	29.7	$148.50
- Canola	20	445	10	8.9	$ 66.75
				TOTAL	$215.25

* Peas - $5.00/bu
Canola - $7.50/bu

Table II shows the extra gross return of $62.75 per acre in favour of intercropping over peas alone. This is assuming peas were sold at $5.00/bushel and canola at $7.50/bushel.

The peas represented 80% and canola 20% of the intercrop yield.

In addition, Table II includes data on the similar yields obtained by the farmer after crop sales compared to yield estimates obtained from the portable field hopper scale.

Dual cropping appears to have good potential for this area; however, additional testing will be required. The peas alone probably yielded more than in the dual system; however, harvest losses were greater since pick-up guards were not used.

Harvesting was not a problem in the intercrop system; however, the procedure was time consuming because of the large volume of material being put through a relatively small machine (600 Case.) The co-operator reported that approximately 1.5 - 2 acres were combined per hour. The threshed sample was very clean since the canola pods stayed with the pea vines on the walkers. The extra costs for intercropping are outlined in Table III.

Table III. Extra Costs for Intercropping

	$/ACRE
Seed cleaning - 27¢/bushel	$10.80
Canola seed	2.00
Canola seeding	4.00
Canola phosphate - 30 lbs @ 28¢	8.40
nitrogen - 35 lbs @ 26¢	9.10
TOTAL	$34.30

The extra return of $62.75/acre in the intercropping system easily compensated for the approximate cost of $34.30/acre for sowing canola.

DISCUSSION

Intercropping canola and peas has been successful on a field scale in 1984. Project should be repeated to establish benefit of having peas intercropped under wet harvest conditions. This was not assessed due to the extremely favourable harvesting conditions in 1984.

Other studies should assess the potential for intercropping peas and yellow mustard. Yellow mustard is more resistant to shattering and should provide good support for the pea vines. Reglone should be evaluated as a

dessicant for the intercropping system.

Peas and triazine tolerant canola (O.A.C. Triton) may have some potential especially if Sencor was used for weed control. This would include studies to evaluate the influence of Sencor on nodulation and total nitrogen fixation.