SK-1

MAXIMUM YIELD CANOLA PRODUCTION

1988 DATA

(Year Three Of A Three Year Program)

Sponsored by:

Potash & Phosphate Institute
of Canada

in Cooperation with

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&

Tim Crossley

Abstract

The primary objective of this project was to determine the maximum yield of canola on a commercial farm using field scale equipment.

The climatic conditions of the 1988 growing season were, to say the least, devastating. Drought severely affected plant development thus resulting in reduced yields.

Where fertility was made available, developing plants were able to make efficient use of limited moisture. These areas showed a better yield response.

The quality analysis which was done at the Canadian Grain Commission indicated that the chlorophyll and protein levels appear to increase with higher fertility levels. Oil content of the seed seems to be lower with increased levels of fertility. This concurs with quality data from previous years of this project.

Title: Maximum Yield Canola Production

Objective: The primary objective of this project was to determine the maximum yield of canola on a commercial farm using field scale equipment. Secondly, we wished to determine the response of present canola varieties to high levels of fertility and other management practices.

Work Plan: Two locations were selected. The Lorne Christopherson farm at Weldon was our primary site. At this location we used three different varieties of canola namely Tobin, Westar and Delta (WW1449). The secondary site was located in the Moosomin area of the province at the Tim Crossley farm. The variety seeded at this location was Westar.

At each location a plot with a fertilizer rate equal to or greater than that recommended by the Soil Testing Lab was compared to plots fertilized at a rate considerably higher than that recommended.

At the Moosomin location CanOcote seed was used in all three plots. The Weldon site did not use coated seed in the plots but the seed was treated with a fungicide/insecticide.

The plots were monitored for disease. At neither location did the situation warrant the spraying of fungicide for Sclerotinia. Also, levels of Blackleg did not appear to greatly effect yields. Plant tissue analysis was not taken this year. Situations arose at the proper sampling time (early flowering) which prevented us from acquiring the plants needed for interpretation of the nutrient level within the canola plants.

Observations Recorded: The plots in both locations had excellent emergence and seemed to be off to an excellent start at the beginning of the growing season.

Slides were taken at the Moosomin site during the early stages of crop development. The slides illustrate the plant's ability to utilize available nutrients when provided at higher amounts.

Observations continued:

Observations took place at the 4 to 6 leaf stage of development at the Moosomin site. The leaf area index was much larger in the high fertility plot than it appeared to be in the other two plots. There also seemed to be a leaf color distinction between the plots. The high fertility plot showed a much darker green color within its leaves as compared to the bluish green color of leaves within the other two plots.

The drought conditions affected both locations at Weldon and Moosomin during later plant development. The Tobin located at the Weldon site suffered quite extensively from excessive heat during its flowering period thus decreasing its yield potential.

The height of the canola crop at both site locations was very limited by the effects of the drought conditions. The Westar & Delta (WW1449) varieties at the Weldon site were able to take advantage of better moisture conditions later in the growing season, therefore filling out more but not gaining much in height. Yield potential was also increased over the Tobin variety.

Maturity of Westar did not appear to be effected by the higher levels of fertilizer. The variety Delta (WW1449) did take longer to mature, with a difference of five days between swathing dates. The Delta did bloom longer by approximately 4 days.

Data Analysis and Interpretation

Because of the devastating drought conditions during this past year we were not able to witness the yields that potentially could have occurred if moisture conditions had been adequate for plant development.

Data analysis and interpretation continued:

What we did experience was that if nutrients are made available to a developing plant even under drought conditions that plant has a better chance of survival. If soil fertility levels are appropriate this enables the plant to make the most efficient use of available moisture and thus increase the odds of a potentially higher yield.

Data from the quality analysis indicates, as in previous years, that with increased fertilizer rates we can expect lower levels of oil within the seed. The ppm of chlorophyll was also higher in the higher fertility plots. There was a difference between ppm of chlorophyll in the Delta canola compared to Westar which may indicate a genetic difference between the two varieties.

The protein levels were higher in the high fertility plots at the Weldon site but they were lower at the Moosomin site. This does not concur with previous years' data analysis and may be the result of the extreme drought conditions in the Moosomin area.

Conclusion: This was the last year of a three year project. Results indicate that fertility is very critical in canola production not only under optimum moisture conditions but also within an extremely dry growing environment.

These plots were set out to illustrate the maximum yield of canola that could be attained under high inputs of fertilization. Economics were not the major consideration. The project was able to show that each individual producer must set his own potential yield goals and then adjust economically to his or her own financial and management capabilities.

Lorne Christopherson

Weldon, Sask.

Pertinent Data:

Variety:	Westar, Tobin & Delta (WW1449)
Seeded:	May 24, 1988 on flax stubble IHC hoe press drill All varieties seeded at 10 lbs/ac.
Chemicals:	Seed treated with Rovral ST at recommended rate
	Herbicide: Rival, applied May 17/88 Lontrel for thistle control
Fertilizer:	The fertilizer was applied with a combination of methods which included deep banding (liquid), broadcasting granular and seed placing fertilizer to attain the proper amounts for each plot.
Soil Test:	NorWest Labs 0" - 6"
	N - 20 lbs/ac P - 29 lbs/ac K - 590 lbs/ac S - 20 lbs/ac
Swathing:	Tobin & Westar - Aug. 25/88 Delta (WW1449) - Sept. 1/88
Harvest:	Tobin & Westar - Sept. 10/88 Delta (WW1449) - Sept. 15/88

Comparative Data

Lorne Christopherson

	Tobin		Delta	Westar	
	Soil Test Recom.	High Fertility	High Fertility	High Fertility	Soil Test Recom.
Fertilizer lbs/ac	N - 77 P - 25.5	N - 189 P - 100 K - 56 S - 23.5 B - 1	N - 189 P - 100 K - 56 S - 23.5 B - 1	N - 189 P - 100 K - 56 S - 23.5 B - 1	N - 77 P - 25.5
Plants/m2					
-Emergence	153	132	91	109	108
-Harvest	118	77	79	101	94
-Weed/m2	25	15	24	14	20
Dockage	4%	4%	4%	4%	4.5%
Net Yield Bu/Ac	15.9	20.8	34.6	33.8	27.9
% of Check Yield	100%	131%	124%	121%	100%
Can. Grain Comm. Grade	#1 Cda	#1 Cda	#1 Cda	#2 Cda	#2 Cda
PPM Chlorophyll	9.0	10.8	17.8	27.5	21.8
% Green Seed	1.0	2.0	2.0	3.0	2.5
% Oil	40.9	38.5	38.8	40.0	42.6
% Protein	39.8	42.8	45.1	45.9	43.9

Tim Crossley

Moosomin, Sask.

Pertinent Data

Variety:	Westar
Seeded:	May 17/88 Morris MH310 hoe press drill 7.5 lbs/ac
Chemicals:	Vitavax Rs seed treatment (CanOcote) Herbicide: Rival (fall applied)
Fertilizer:	Fertilizer was applied through deep banding (Anhydrous Ammonia) and banding granular fertilizer through the seed drill before any seed was planted.
Soil Test:	Sask. Soil Testing Lab. 0" - 24" N - 144 lbs/ac P - 15 lbs/ac K - 280 lbs/ac S - 96+ lbs/ac Cu - 1.88 lbs/ac Fe - 26.12 lbs/ac Zn - 3.28 lbs/ac Mn - 24.28 lbs/ac B - 2.56 lbs/ac Organic Matter Content = 3.8%
Swathing Date:	Aug. 2/88
Harvest Date:	Aug. 10/88

Comparative Data

Tim Crossley

	No Fertilizer	Soil Test Recommendations	High Fertility
Fertilizer lbs/ac	Nil	N - 4.4 P - 20.8	N - 200 P - 100 K - 100 S - 30 B - 2
Plants/m2			
-Emergence	114	126	103
-Post Harvest	90	101	72
-Weed Count/m2	9	5	8
Dockage	2.5	3.0	3.5
Net Yield Bu/Ac	14.9	18.0	20.1
% of Yield Check	83%	100%	112%
Can. Grain Comm. Grade	#1 Cda	#1 Cda	#2 Cda
PPM Chlorophyll	24.7	26.7	40.3
% Green Seed	1.5	2.0	4.0
% Oil	41.5	41.4	37.8
% Protein	42.3	42.4	39.2