

XVII OPTIMIZING CANOLA PRODUCTION TRIAL

Objective: To measure the individual and combined effects of varying levels of fertilization and crop protection on canola yield, quality and profitability.

Background: Research in the past has generally focused on a single component of canola production, be that a product or a management decision. While this allows the researcher to isolate the benefit of that single component, it is clear that benefits determined in this way cannot simply be added together to determine the overall benefit in a cropping system. Several small plot research trials are being conducted by a team of researchers, headed by Dr. Don Flaten at the University of Manitoba. The purpose of these experiments is to focus on the combined effects of varying levels of fertilization, crop protection and genetics, in order to determine how the choice of a certain level of one (eg. genetics) affects the profitability of different levels of the others (eg. fertility, crop protection levels).

While their experiments focused on three general "packages" of inputs including fertilization, crop protection and genetic yield potential, the trial at the Canola Production Centre in Selkirk, MB focused only on the interaction between fertilization and crop protection levels. This allowed the trial to be conducted in the larger field scale format commonly used at the CPC sites.

Methodology: The optimizing canola production trial consisted of two main treatments and three sub-treatments. InVigor 2663 was the variety used.

- A) Medium level of crop protection, low level of fertilization
- B) Medium level of crop protection, medium level of fertilization
- C) Medium level of crop protection, high level of fertilization
- D) High level of crop protection, low level of fertilization
- E) High level of crop protection, medium level of fertilization
- F) High level of crop protection, high level of fertilization

Low level of fertilization = no fertilizer applied

Medium level of fertilization = fertilizer applied to 35 bu/ac target yield

High level of fertilization = fertilizer applied to 50 bu/ac target yield

Medium level of crop protection = Foundation seed treatment, one application of Liberty (1.35 L/ac)

High level of crop protection = medium level of crop protection plus sequential application of Liberty (1.08 L/ac) and fungicide application (Ronilan EG @ 0.4 kg/ac)

SELKIRK

Methodology:

The nitrogen and sulphur fertilizer was broadcast on the treatments receiving fertilizer, prior to cultivation and harrowing of the entire trial. The phosphate fertilizer was seed-placed. Seeding took place on May 21, at a rate of 4 lb/ac. The first application of Liberty was done at the 2-leaf stage of the canola, with the sequential application on the high level of pest control treatments applied at the 6-leaf stage. The fungicide was applied to the high level of pest control treatments at 40 to 50 % bloom.

Observations:

Emergence was very good and plant counts were similar for all treatments. Wild oats were the predominant weed with a scattering of various broadleaf weeds. Weed control was good in all treatments, and although there were some 1-leaf wild oats emerging at the time of the sequential application, this second application probably would not have been necessary. The higher fertility treatments were taller and suffered greater lodging than the low fertility treatment in both pest control regimes. In the medium level of pest control this led to increasing levels of sclerotinia infection as fertility increased (15, 30 and 43 % of plants infected in the low, medium and high fertility treatments, respectively). The fungicide application to the high pest control regime limited infection levels to near zero.

Results:

OPTIMIZING CANOLA PRODUCTION TRIAL						
Selkirk, MB						
Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin (\$/ac)	Oil (%)	Growing Degree Days	Days To Maturity
Medium Level of Pest Control						
Low Fertility	100	31.1	152.45	44.4	1044	82
Medium Fertility	100	31.2	121.47	42.9	1044	82
High Fertility	95	29.4	97.90	42.2	1053	83
High Level of Pest Control						
Low Fertility	121	37.5	161.10	44.5	1031	81
Medium Fertility	134	41.7	157.79	44.0	1044	82
High Fertility	144	44.9	167.97	42.6	1053	83
LSD		4.99		1.26		
CV%		4.7		2.1		

Discussion:

Yields increased with increasing fertility under the high pest control regime, but there was no increase in yield under the medium level of pest control. The yield increases in this regime were probably offset by the increasing levels of sclerotinia, as a result of the lack of fungicide and denser canopies. Higher levels of pest management improved yield in the low fertility treatments, and this spread widened as fertility increased.

Contribution margins were a function of yield, fertilizer costs and pest control costs, and all treatments graded #1. Increased pest control improved economic returns in all cases. Increased fertility decreased returns with lower levels of pest control, but increased returns slightly under the high pest control regime. Pest control had little impact on oil content or maturity. Increasing fertility decreased oil content and lengthened maturity for both levels of pest control.