I ACKNOWLEDGEMENTS

APPENDIX - Minnesota Canola Production Centre Results

The Minnesota Canola Production Centre is a public-private international partnership between the Minnesota Canola Council, the University of Minnesota and the Canola Council of Canada.

Many thanks to all of our local and regional sponsors for their donations of cash, products and services. Their continued support has made the Minnesota Canola Production Centre a reality.

Thank you all!

II SITE DESCRIPTION

The Program was supported locally by the following organizations that have donated products and/or services to the Canola Production Centre:

MINNESOTA - Dave LeGare, Agronomist

Location: Thief River Falls - 95 acres

Land:

Ken and Connie Mehrkens (co-operators)

Gold Level Sponsors ($400 or more)

- Northern State Bank

Silver Level Sponsors ($200-$399)

- Anderson Power and Equipment

Bronze Level Sponsors (Less than $200)

- Cenex Farmer's Union
- Farmer's Co-op Grain and Seed Association
- First National Bank
- Northern Motors
- Westside Motors
- Thune Insurance

Seed and Seed Treatment:

Aventis CropScience USA - InVigor 2663 (2 bags)
Croplan Genetics - HyClass 601
DeKalb - DKL3455 (2 bags)
Gustafson - Gaucho seed treatments
Interstate Seed - Hyola 401, Hylite 201, Q2
Pioneer - 44A89 (2 bags)
Syngenta - Helix seed treatments

Fertilizer:

Agriliance (72 acres)
Northwest Grain (23 acres)

Pesticides:

Agriliance - Class Trust (70 acres)
Aventis CropScience USA - Liberty (38 acres)
BASF - Ronilan (90 acres), Poast (40 acres), Raptor (8 acres)
Dow AgroSciences - Stinger (51 acres)
DuPont Agricultural Products - Assure II (73 acres), Muster (60 acres)
FMC Corporation - Capture (92 acres)
Monsanto - Roundup Ultra Max (98 acres)

Equipment and Labour:

Anderson Power & Equipment - John Deere 6600 combine
Dave Severson - cement mixer
Evergreen Implement - John Deere 9600 combine
Ken and Connie Mehrkens - John Deere 4450 tractor, John Deere 9600 combine, equipment storage, grain truck, shop use
Nelson Equipment - labor for swather repairs

Northwest Grain - fertilizer application, soil testing, pre-plant herbicide application, soil analysis, seed storage
Pioneer Hi-Bred - weigh wagon
Ron's Aerial Spraying - sponsored spraying (22 acres)

Photocopying & Faxing:

Pennington County Extension Office
Polk County Extension Office

Tours:

Agri-Tel Grain
Aventis CropScience USA
Leonard Geske and Tom Koop
Northern State Bank
Pennington County Extension Office
Smiley 4-H Club
UAP Northern Plains (Howard Hoven Family)

Comments:

A special thanks to **Susan Boeddeker, Kristin Johnson, Karen Andol** and **Nycole Erickson** for their dedication and assistance throughout the season. Thanks to **Terry Sonju** for his assistance. Thanks also to the wonderful staff of the Minnesota Canola Council for assisting with our field day. I would also like to thank **Derwyn Hammond** and the rest of the **Crop Production team** of the **Canola Council of Canada** for their assistance and guidance.

III INTRODUCTION

The Canola Council of Canada initiated Canola Production Centres to address the ongoing need for canola production technology transfer as identified during the Grow with Canola program (1985-1990). The Canola Production Centres are a joint effort between producer groups, industry representatives, and government and extension personnel. The continuing co-operation of these groups ensures the ongoing success of the Canola Production Centres. Field scale agronomic trials utilizing commercial farm equipment are conducted at the sites, and the information generated is utilized for extension activities throughout the year.

Following tours of the Canola Production Centre near Carman, MB in 1996 and 1997, the Minnesota Canola Council sought funding for a joint project between the Minnesota Canola Council, University of Minnesota and Canola Council of Canada. The purpose of the project was to establish a Canola Production Centre site in Minnesota, and the role of the Canola Council of Canada was to provide expertise and supervisory support. This would help ensure that activities at this site would be consistent with activities at the Canadian CPC's. This allows the information from all sites to be easily shared. Funding for the project was approved in April 1998, and the Minnesota Canola Production Centre program was born.

During the first two years of the project, the Minnesota Canola Production Centre was located near Roseau, MN. In 2000, the site was moved to Thief River Falls, MN. In 2001, the field day tour was held on July 11 and included a barbeque lunch and tour of the site. All trials were signed and copies of site plans were available at the entrances to allow for self-guided tours at any time other than scheduled tour dates.

Information obtained from the Canola Production Centre includes many agronomic factors such as yield and quality data, early season plant counts, lodging indices and harvestability ratings on varieties.

It should be noted that the material contained in this report is a collection of agronomic information from a specific location and only from one site year. Therefore, it should be observed and understood accordingly.

IV DEFINITIONS

Please refer to the Definitions (Page 16) section of the report for the Canadian CPC's for clarification of any terms you are not familiar with.

V ECONOMIC ANALYSIS

A. *Canola Pricing System (Based on average prices at harvest, in U.S. dollars)*

Green Seed (%)	$/100 lb* At Elevator	Plus $/100 lb LDP**	Final $/100 lb	Final $/bu
0 - 2.0	8.47	0.41	8.88	4.44
2.1 - 2.5	8.24	0.41	8.65	4.33
2.5 - 3.0	8.19	0.41	8.60	4.30
3.1 - 3.5	8.15	0.41	8.56	4.28
3.5 - 4.0	8.10	0.41	8.51	4.26
4.1 - 4.5	8.06	0.41	8.47	4.24
4.5 - 5.0	8.01	0.41	8.42	4.21
5.1 - 5.5	7.97	0.41	8.38	4.19
5.5 - 6.0	7.92	0.41	8.33	4.17
6.1 - 7.0	7.56	0.41	7.97	3.99
7.1 - 8.0	7.33	0.41	7.74	3.87

Note 1: *The green seed was determined by using one 500 seed crush strip test done on each sample from every treatment within a particular trial.*

** Green seed discounts obtained from Harvest States Cooperatives, Velva, ND.*

Note 2: *** LDP = Loan Deficiency Program*

B. *Cost Calculations & Assumptions*

The following costs were used in calculating economic returns for the various trials and treatments, and are expressed in **U.S. dollars**. Fertilizer and crop protection product prices were obtained from various dealers throughout the region. Prices reflect a northwestern Minnesota average for summer 2001.

Equipment costs were obtained from the University of Minnesota Extension Service and are estimated equipment variable costs for Minnesota. There has been no value allocated for capital and fixed costs.

CANOLA ARGENTINE VARIETY SEED COSTS					
B. napus	**$/lb**	**Distributor**	***B. napus***	**$/lb**	**Distributor**
44A89	3.45	Pioneer Hi-Bred	InVigor 2573	5.40	Aventis CropScience
46A76	4.15	Pioneer Hi-Bred	InVigor 2663	5.65	Aventis CropScience
Canterra 1492	5.03	Proseed	LG3311	3.96	Agri-Tel Grain
DKL23-38	3.75	DeKalb	LG3366	3.96	Agri-Tel Grain
DKL3345	4.35	DeKalb	LG3525	4.35	Limagrain
DS Roughrider	3.86	Proseed	LiBred 499RR	5.40	Brett Young Seeds
Gladiator	4.55	Interstate Seed	LS 296RR	4.88	Legend Seed
HyClass 601	4.75	Croplan Genetics	Q2	2.97	Interstate Seed
Hylite 201	3.85	Interstate Seed	RideR	4.45	DeKalb
Hyola 357	5.51	Interstate Seed	SW BadgeRR	4.85	Seeds 2000
Hyola 401	4.81	Interstate Seed			

Note: Seed cost may vary. Prices reflect the Minnesota suggested retail for Spring 2001 with Helix Xtra seed treatment.

PRODUCT INFORMATION			
Product	**Active Ingredient**	**Manufacturer/ Distributor**	**$/Unit Cost**
Assure II	quizalofop-p-ethyl	DuPont Agriculture Products	131.10/gal
Ammonium Sulfate	ammonium sulfate	Agriliance	0.26/lb
Canola Package	fludioxonil + mefenoxam + difenoconazole	Syngenta	0.20/lb seed
Capture	bifenthrin	FMC Corporation	404.90/gal
Class COC	crop oil concentrate - 17 %	Agriliance	5.10/gal
Class Trust	trifluralin	Agriliance	19.00/gal
Folicur	tebuconazole	Bayer	307.25/gal
Gaucho + Clothianidin**	carboxin + thiram + metalaxyl + imidacloprid + clothianidin**	Gustafson	1.56/lb seed**
Gaucho CS	carboxin + thiram + metalaxyl + imidacloprid	Gustafson	0.84/lb seed
Helix Lite	fludioxonil + mefenoxam + difenoconazole + thiamethoxam	Syngenta	0.79/lb seed
Helix XTra	fludioxonil + mefenoxam + difenoconazole + thiamethoxam	Syngenta	1.45/lb seed
Muster	ethametsulfuron	DuPont Agriculture Products	28.95/oz
Liberty	glufosinate ammonium	Aventis CropScience USA	87.60/gal
Poast	sethoxydim	BASF	65.90/gal
Raptor	imazamox	BASF	487.80/gal
Ronilan	vinclozolin	BASF	21.30/lb
Roundup Ultra Max *	glyphosate	Monsanto	51.30/gal
Rovral Flo	iprodione	Aventis CropScience USA	146.23/gal
Stinger	clopyralid	Dow AgroSciences	477.67/gal
Topsin	thiophanate-methyl	Elf Atochem	16.30/lb
Vitaflo 280 + Allegiance	carboxin + thiram + metalaxyl	Gustafson	0.08/lb seed

* Note: $15/ac TUA includes first 13 oz/ac of Roundup Ultra Max.

** Note: Clothianidin is a non-registered product and price is the company's estimate of market value.

Numerous references to pesticide applications will be found in this report. We advise everyone to consult with recommendations and product labels for complete instructions.

CANOLA FERTILIZER COSTS			
Fertilizer	**Analysis**	**$/Ton**	**$/lb of Nutrient**
Ammonium Sulfate	21-0-0-24	165.00	0.28 (of N)
Ammonium Sulfate	21-0-0-24	165.00	0.10 (of S)
Phosphate	18-46-0	230.00	0.14 (of P_2O_5)
Urea	46-0-0	257.00	0.28

Machinery Cost:

- Conventional tillage: $ 11.73/acre
- Extra spray pass: add $ 0.32/acre
- Straight combining: subtract $ 0.71/acre

Additional Machinery Costs: (Custom Application)

- Aerial $ 4.20/acre
- Ground (fungicide) $ 4.25/acre
- Fertilizer application $ 3.75/acre

Note: Machinery costs were obtained from the University of Minnesota Extension Service and are estimated operating costs (such as fuel, lubrication and repairs) for Minnesota.

Minnesota State Check-off:

$ 0.05 per 100 pounds of canola.

Interest/Opportunity Cost:

This cost calculation demonstrates the cost of money borrowed and charged on crop inputs and machinery-operating costs. In 2001, 7.5% per annum over six months was used.

C. *Economic Results Report (example)*

Site: ***Thief River Falls, MN***

B. napus Variety Trial: ***Hyola 401***

CALCULATION OF VALUE OF PRODUCTION				
Yield (bu/ac)	**X**	**Price ($/bu)**	**=**	**Value of Production**
40.8		4.44		181.15

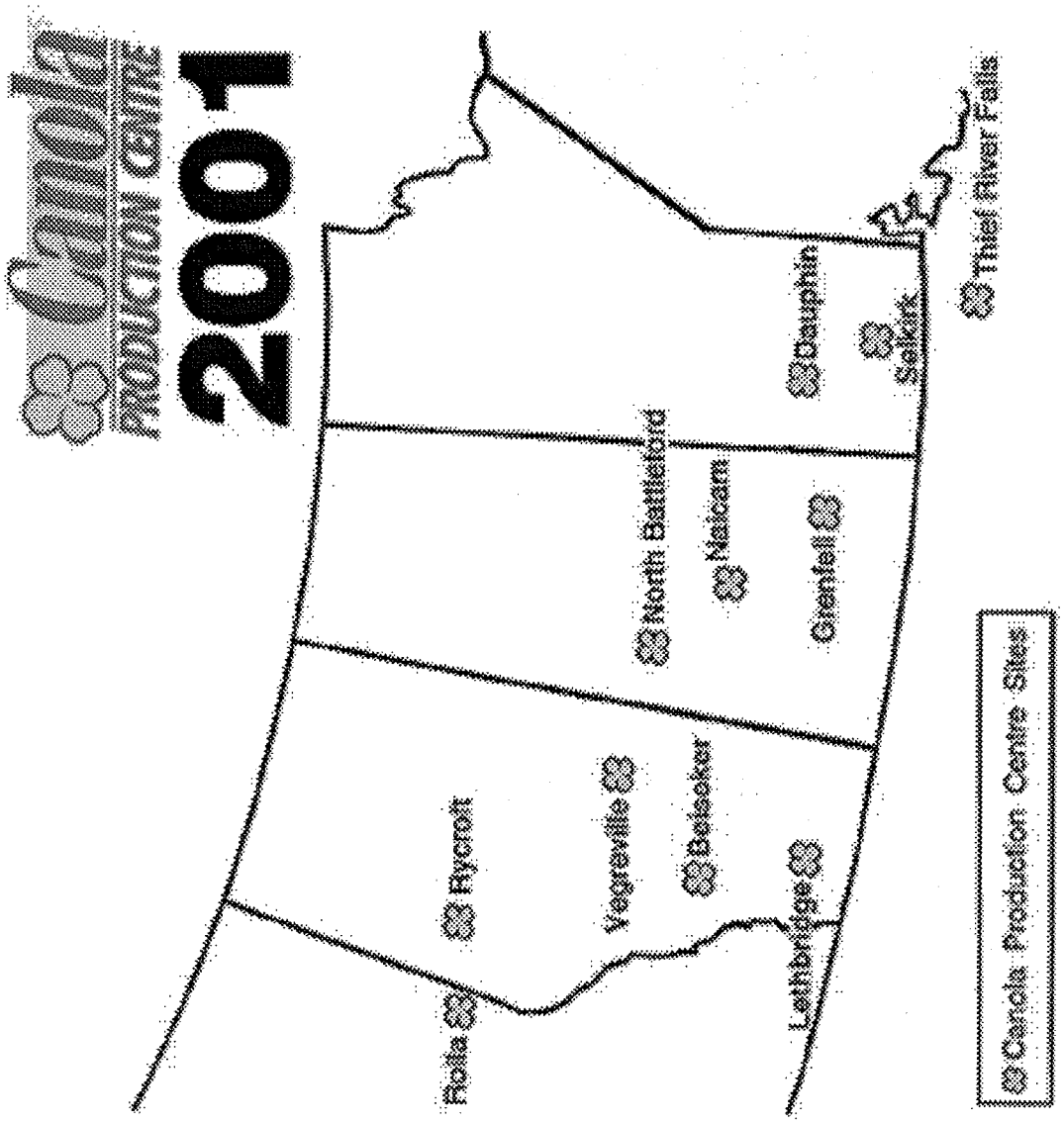
CALCULATION OF VARIABLE COSTS ($/ac)	
Seed	24.05
Fertilizer	37.11
Herbicides	37.80
Fungicides	20.17
Insecticides	8.60
Machinery	11.73
Insurance	0.00
Check-off	1.02
Interest/opportunity	5.23
Total Variable Costs	145.71

CALCULATION OF CONTRIBUTION MARGIN				
Value of Production ($/ac)	**-**	**Variable Costs ($/ac)**	**=**	**Contribution Margin ($/ac)**
181.15		145.71		35.44

Contribution Margin ($/ac)	/	Yield (bu/ac)	=	Contribution Margin ($/bu)
35.44		40.8		0.87

This example was developed and prepared with assistance from Royal Bank of Canada agrologists.

VI SITE LOCATION MAP



VII SITE INFORMATION

THIS IS GENERAL SITE INFORMATION THAT MAY CHANGE FOR SPECIFIC TRIALS.

Location:	**Thief River Falls, MN**	
Co-operator:	Ken and Connie Mehrkens	
	West Field	East Field
Previous crop:	Wheat	Wheat
Soil test results: (AGVISE Laboratories)		
Organic matter content:	2.7 %	3.3 %
*Macronutrient Levels: (*0-6", 6-24")		
Nitrogen - 0-6 inches	11 lb/ac	26 lb/ac
0-24 inches	47 lb/ac	62 lb/ac
Phosphorus - 0-6 inches	20 lb/ac	20 lb/ac
Potassium - 0-6 inches	292 lb/ac	384 lb/ac
Sulphur - 0-6 inches	18 lb/ac	16 lb/ac
0-24 inches	40 lb/ac	38 lb/ac
Micronutrient Levels: (0-6")		
Calcium -	4000 ppm	4300 ppm
Magnesium -	870 ppm	1150 ppm
Boron -	0.6 ppm	0.6 ppm
Zinc -	0.7 ppm	0.6 ppm
Manganese -	1.1 ppm	1.3 ppm
Copper -	0.4 ppm	0.5 ppm
Iron -	19.6 ppm	14.5 ppm
Target yield:	2200 lb/ac	2200 lb/ac
Fertilizer applied:		
Nitrogen -	103 lb/ac	105 lb/ac
Phosphorous -	35 lb/ac	35 lb/ac
Potassium -	30 lb/ac	30 lb/ac
Sulfur -	15 lb/ac	20 lb/ac
Soil association/zone:	Clearwater clay Clearwater loam Espelie fine sandy loam	Clearwater clay Clearwater loam
Soil texture:	Black clay Black loam Black fine sandy loam	Black clay Black loam
Soil pH:	8.0	8.1
Salinity: (slightly saline)	0.4 mmho	0.3 mmho

Tillage operations: The seed treatment and pushing trials had fertilizer applied and incorporated once with a chisel plow in fall of 2000. The remainder of the west field had fertilizer and trifluralin (Trust @ 2 pt/ac) applied in spring. It was then cultivated twice to incorporate the trifluralin, the second time with coil packing. The east field had 80 units (N lb/ac) of anhydrous applied in the spring followed by a single cultivation with coil packing after the remainder of the fertilizer was applied.

Seeding method: Seeded with a John Deere 9350 double disk press drill
Date: May 14 to May 17 and June 5, 2001
Depth: _ to 1" deep
Rate: 5.0 lb/ac - with the following exceptions:
4.0 lb/ac - InVigor 2573 and InVigor 2663
4.5 lb/ac - 46A76, DS Roughrider, SW BadgeRR
5.5 lb/ac - 44A89 in the Fungicide trial

Herbicides applied:
A) Conventional varieties in system trial - Assure II (7 oz/ac), non-ionic surfactant (32 oz/100 gal), Stinger (5 oz/ac), Muster (0.40 oz/ac)
B) Liberty Link varieties in systems trial and Canopy trial - Liberty (34 oz/ac), ammonium sulfate (3.0 lb/ac)
C) Roundup Ready varieties - Roundup Ultra Max (13 oz/ac), ammonium sulfate (1 lb/ac)
D) Clearfield variety - Raptor (4 oz/ac), non-ionic surfactant (3.5 oz/ac), ammonium sulfate (2.5 lb/ac)
E) Seed priming, conventional variety trial, sclerotinia and fungicide trial - Assure II (7 oz/ac), non-ionic surfactant (32 oz/100 gal), Stinger (5 oz/ac), Muster (0.35 oz/ac)

Insecticides applied: Capture (1.4 oz/ac) was applied on July 11 to control an outbreak of diamondback moth larvae. The seed treatment trial was not sprayed.

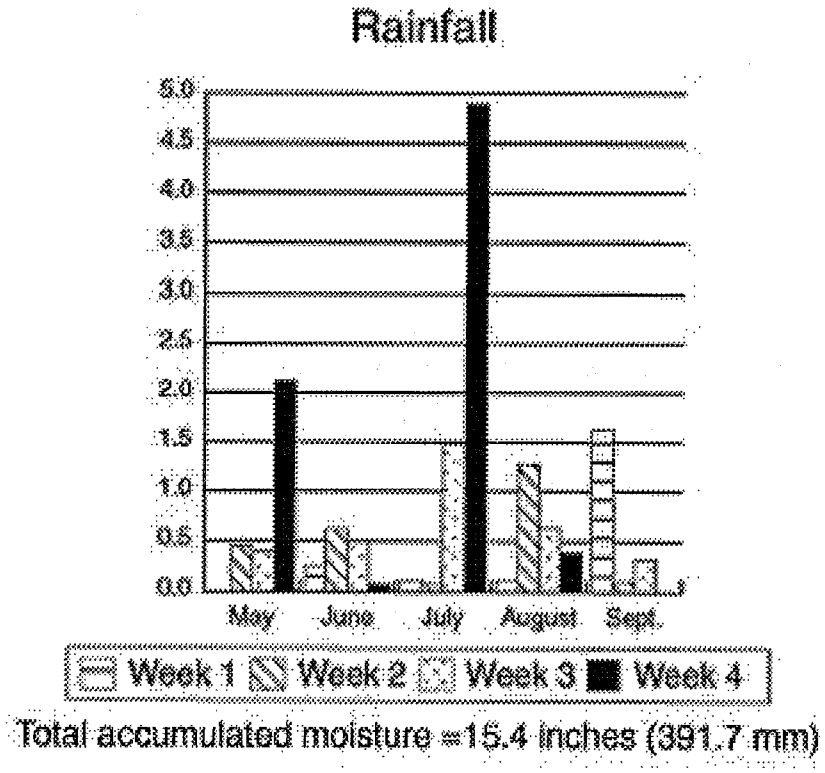
Fungicides applied: Ronilan (12 oz/ac) on July 4 at 20 to 40% bloom

Swathing: Started: August 6 Finished: August 29

Combining: Started: August 24 Finished: September 18

Comments: All trials were located on the west field with the exception of the system comparison trial, which was located on the east field. Frequent light showers during seeding provided excellent moisture conditions for quick emergence. A hot, dry period during late June and early July caused a short bloom period, which may have reduced yields slightly. The hot, dry period also provided a good environment for the increasing diamondback moth population. Weekly trap counts were over 400 in late June and early July. Visual evidence of crop damage from larvae (up to five per plant) in parts of the field required an application of Capture. The seed treatment trial was not sprayed to continue

evaluation of late season insect control from seed treatments. Hot conditions during swathing caused the crop to change seed colour very rapidly. However, improved moisture conditions from the end of flowering to harvest allowed proper curing of swaths. Most of the plots were swathed in a four day period. A thunderstorm on August 17 dropped pea size hail causing 5 to 15 % losses across the site. Most of the damage was done to the system comparison trial and to the first replicate of the other trials. The canopy manipulation trial was on the far end of the field and had minimal hail damage.



VIII SEED PRIMING TRIAL

Objective: To evaluate a novel seed priming system to enhance emergence, maturity and yield of canola.

Background: A method of priming seed has been developed and commercialized by a company named Kamterter II L.L.C. for a number of vegetable crops including some crucifer vegetables. This priming system has shown to improve germination and reduce time to germination of these small seeded vegetable crops. Potential benefits for canola may include faster germination rates, which should reduce the incidence of seedling diseases such as *rhizoctonia, fusarium* and *pythium*, better crop weed competition, shorter days to maturity and higher yields.

Methodology: The four treatments in this trial included primed vs. unprimed Q2 and InVigor 2663. This trial was designed and analyzed as a split-plot with the varieties as the main plot. Seed lots of each variety were identical for both primed and unprimed treatments. Each treatment was replicated four times. Crop development ratings were taken weekly throughout the growing season. Spring stand counts from multiple dates were taken at the exact same locations in the plots for each date.

Observation: This trial was seeded on May 15 into good moisture. The only sign of emergence at four days after planting (DAP) was in the primed Q2 (0.2 plants per square foot). At 9 DAP, the primed InVigor 2663 tended to have a few more emerged plants than the unprimed. There were no stand differences between the primed and unprimed Q2 at 9 or 22 DAP, or in the InVigor 2663 treatments at 22 DAP. For both varieties, the primed treatment reached canopy closure about one day before the unprimed. The primed Q2 bloomed about a day ahead of the unprimed Q2. No bloom differences were visible between the InVigor 2663 treatments.

Results:

SEED PRIMING TRIAL Thief River Falls, MN							
System	**Yield (%)**	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**
InVigor 2663 - Unprimed	100	1914	38.3	19.23	40.6	1169	85
InVigor 2663 - Primed	105	2006	40.1	N/A	41.0	1169	85
Q2 - Unprimed	100	1886	37.7	23.81	40.6	1169	85
Q2 - Primed	99	1863	37.3	N/A	40.8	1149	84
LSD (0.10) for priming within variety		60.6	1.21		0.56		
CV%		2.3	2.3		1.0		

Discussion: The primed InVigor 2663 showed a significant yield advantage over the unprimed. No yield difference was noted with Q2. The cost of priming was not available, therefore contribution margins were not calculated for primed treatments. There were no differences in oil content or maturity between the primed and unprimed treatments for either variety.

IX CONVENTIONAL VARIETY TRIAL - *B. NAPUS*

Objective: To evaluate agronomic differences between newly registered and recommended varieties in a given area as submitted by the seed trade.

Background: The large numbers of canola varieties available can make the task of choosing a variety for a specific farm challenging. Yield, crop quality and disease resistance are important variety traits to consider in the selection process. However, other agronomic factors such as lodging resistance and harvestability are also important factors. Varieties in the trial are selected and submitted by the seed trade and compared against the check (Hyola 401) and the industry standard Q2.

Methodology: The variety trial was conducted with four replicates in a randomized complete block design. Identical agronomic practices were used for the entire trial. This included the same tillage, fertilizer, weed control and post-emergent fungicide treatments. Seed treatments included any treatment that was standard for the variety. The entire trial was seeded on the same day. Canopy closure was determined by the number of days after planting (DAP) required for the variety to reach 95 % ground cover. Swathing commenced when seed colour change was 30 to 40 %, and harvest was completed under suitable conditions.

Observation: The trial was seeded on May 16 into good moisture. Conditions were ideal for crop establishment, but turned hot and dry leading up to bloom (see *Site Information*). Losses from a hailstorm on August 17 ranged from about 10 to 15 % in the first replicate to 0 to 5 % in the fourth replicate.

Results:

B. NAPUS VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Thief River Falls, MN								
Treatment	**Yield (%)**	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Canopy Closure (DAP)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**
Hyola 401	100	2055	41.1	29.20	28	41.5	1167	85
Q2	87	1786	35.7	14.95	30	41.2	1167	85
LG3311	87	1786	35.7	9.79	29	42.2	1135	83
HyClass 601	87	1786	35.7	5.74	28	40.8	1167	85
Canterra 1492	85	1743	34.9	0.48	29	40.8	1155	84
LG3366	85	1742	34.8	5.93	29	41.7	1167	85
LSD (0.10) CV%		107.9 4.8	2.16 4.8		1.5 4.2	0.41 0.8		0.8 0.8

Note: Hyola 401 was used as a check in this trial.

Discussion: The check (Hyola 401) was significantly higher yielding than any of the other varieties. Hyola 401 also had the highest contribution margin compared to all the other varieties. Contribution margins reflect differences in seed cost and yield. LG3311 had the highest oil content while HyClass 601 and Canterra 1492 had the lowest oil content. LG3311 was the earliest maturing. Q2 was the last variety to reach canopy closure.

X HARVESTABILITY TRIAL

Objective: To compare the harvestability of varieties entered in the variety and system comparison trials.

Background: A number of varieties have very similar yield and quality traits. In choosing a variety a grower needs to consider additional traits like lodging and harvestability. Harvestability is the measurement of swathing and combining ease. Currently, there is no meaningful scientific measurement for harvestability. Therefore, a standardized criterion for a subjective measurement was used.

Methodology: A **Lodging score** is a visual score in which 1=erect and 9=flat. Varieties that are standing well and have a 'high yield tip' are given a score of two to three. Varieties that have severe uneven lodging with patches standing upright and patches laying flat are given a seven or eight, depending on the severity. **Lodging ratios** are obtained by dividing the average height of the canopy by the average height of randomly selected plants. **Harvestability** was evaluated as swathing and combining were completed on the *B. napus* variety and system comparison trials. Swathing and combining were each evaluated on a scale of one to five, compared to the check (Hyola 401) which was rated a two to match the rating at the Canola Production Centres in Canada where AC Excel is the standard with a rating of three. The following criteria were considered; lodging, height, straw stiffness, straw strength, stand uniformity, swath fluffiness (pod dispersion), tendency to clump, flowability, feeding and speed of operation.

The following ratings are subjective. The machine operator, crop conditions, weather and time of day can affect the harvestability of a variety.

Ratings:
1 = much better than average
2 = better than average (check)
3 = average
4 = worse than average
5 = much worse than average

Observation: The variety and system comparison trials are reported in separate tables for statistical analysis. Lodging was variable among the varieties. Swathing was more difficult in plots that were lodged unevenly. Combining ease was related closely to flow of the swath into the combine, the amount of clumping in the swath and the ease of picking up the swath. The plots were swathed with an 18 ft Versatile swather equipped with a pick-up reel. They were harvested with a John Deere 9600 combine in the system comparison trial and with a John Deere 8820 combine in the *B. napus* variety trial.

Results:

HARVESTABILITY TRIAL Systems Comparison Trial Thief River Falls, MN				
Variety	**Lodging Ratio**	**Lodging Score**	**Swathing Rating**	**Combining Rating**
46A76	0.55	4.5	3.0	2.6
DKL23-38	0.55	4.8	2.3	2.6
DKL3455	0.70	4.0	3.0	2.9
DS Roughrider	0.57	4.8	2.5	2.6
Gladiator	0.65	4.5	1.9	2.8
Hyola 357	0.61	4.0	2.0	2.6
Hyola 401	0.70	4.0	2.0	2.0
InVigor 2573	0.53	4.5	3.1	3.5
InVigor 2663	0.51	4.0	3.0	3.1
LG3525	0.63	4.3	2.8	3.1
LS 296RR	0.57	5.5	2.8	2.3
LiBred 499RR	0.64	4.3	2.4	2.4
Q2	0.59	4.3	2.9	2.6
RideR	0.56	4.8	3.0	2.9
SW BadgeRR	0.59	4.5	2.5	2.5
LSD (0.10) C.V.	0.091 12.8	0.58 11.1	0.55 17.9	0.46 14.4

HARVESTABILITY TRIAL *B. napus*, Variety Trial Thief River Falls, MN				
Variety	**Lodging Ratio**	**Lodging Score**	**Swathing Rating**	**Combining Rating**
Canterra 1492	0.62	4.5	3.3	2.8
HyClass 601	0.68	3.8	3.1	3.0
Hyola 401	0.74	3.8	2.0	2.0
LG3311	0.63	4.3	3.0	2.8
LG3366	0.60	5.0	3.4	2.8
Q2	0.55	4.3	3.5	3.0
LSD (0.10) C.V.	0.083 10.5	0.65 12.4	0.7 20.5	0.5 13.9

Discussion:

LS296RR had more lodging than most of the other varieties in the systems comparison trial. Gladiator, Hyola 357 and Hyola 401 swathed easier than most of the varieties. Hyola 401 and LS296RR flowed the best into the combine. In the *B. napus* trial, LG3366 had the most lodging. Hyola 401 was the easiest to swath and combine.

XI SEED TREATMENT TRIAL

Objective: To evaluate the impact of new seed treatments on seedling diseases and insect control for canola as it relates to yield, quality and contribution margins.

Background: The most widespread problem of canola production is stand establishment. Poor stand establishment may be caused by a seedling disease complex including pathogens such as *Rhizoctonia solani*, along with *Fusarium* and *Pythium* species. Seed treatment fungicides are used extensively in canola production as a first line of defense to control seedling diseases. In addition, some new insecticide products are being evaluated to determine their effectiveness for control of flea beetles and late season insects such as lygus bug and cabbage seed pod weevil.

Methodology: The seed treatment trial included the following treatments on the same seed lot of the variety DKL3455:

A) Gaucho + Clothianidin
B) Gaucho CS
C) Vitaflo 280 + Allegiance (Gaucho fungicide package)
D) Helix Xtra
E) Helix Lite
F) Canola Package (Helix fungicide package)

All other agronomic practices remained the same. Flea beetle ratings and stand counts were taken at the exact same locations in the plots on three dates (10, 16 and 23 days after planting). This trial was placed up against the side of a conservation reserve program (CRP) field to improve the probability of late season insect infestations. Due to the placement, plots were shortened to 150 ft long by 60 ft wide. This provided less soil uniformity among the treatments. This trial was also conducted with five replicates instead of the standard four.

The following flea beetle damage guide was used to estimate the percentage of (shot hole) damage to leaf area using the following scale:

0 = No leaf damage
1 = Approximately 10 % leaf damage
2 = Approximately 20 % leaf damage
3 = Approximately 30 % leaf damage
(4, 5, 6, etc.)
9 = Approximately 90 to 100 % leaf damage

Observation: The trial was seeded into good moisture on May 14. Heavy rains shortly after seeding caused standing water in much of the trial that caused noticeably delayed emergence and delayed maturity throughout the season. Flowering was very uneven with the hardest hit areas of the trial about four days behind in bloom initiation. Lygus counts were taken

weekly in each plot during bloom. Average counts ranged from 4 to 8 lygus per 10 sweeps with little consistency among treatments. An exception was on July 5 when the Gaucho + Clothianidin treatment had significantly lower lygus bug counts than the Vitaflo 280 + Allegiance treatment. On July 10 and July 18, there were no significant differences in lygus bug counts among treatments.

Results:

SEED TREATMENT TRIAL Thief River Falls, MN							
Treatment	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Seed Cost ($/ac) ***	**Flea Beetle Rating ****	**Plant Stand (Pl/ft^2) *****
Gaucho + Clothianidin	1447	28.9	17.43	42.9	22.30	0	14
Gaucho CS	1559	31.2	31.08	42.6	18.70	0	17
Vitaflo 280 + Allegiance	1592	31.8	37.99	42.4	14.90	1	15
Helix Xtra	1612	32.2	32.62	42.2	21.75	0	18
Helix Lite	1560	31.2	31.49	42.7	18.45	0	17
Canola Package	1481	29.6	27.48	42.8	15.50	1	15
LSD CV%	124.0 7.37	2.50 7.37		0.70 1.5		0.4 100.3	2.1 11.8

Note: Clothianidin is a non-registered product and price is the company's estimate of market value.
Note: *These prices are based on consultation with industry representatives and include the cost of seed and treatment.
** Average flea beetle ratings at 16 days after planting.
*** Stand counts at 16 days after planting.

Discussion: Helix Xtra yielded significantly higher than the Canola Package (fungicide only). The Vitaflo 280 + Allegiance treatment yielded significantly higher than the Gaucho + Clothianidin. Oil was not affected by seed treatment. Flea beetle ratings were low. However, the insecticide treatments had significantly lower flea beetle damage than the fungicide only seed treatments. Helix Xtra treatments significantly improved plant stands at 16 days after planting, compared to the canola package. However, these differences were not evident by 23 days after planting.

XII ROUNDUP RATE / TIMING TRIAL

Objective: To demonstrate the effect of split applications or higher rates of the new formulation of Roundup called Roundup Ultra Max for control of Canada thistle.

Background: Roundup is a non-selective herbicide that is used to control weeds in Roundup Ready canola. Previous research has indicated that the standard rate of Roundup Ultra (16 oz/ac) frequently does not provide effective control of Canada thistle. Split applications or higher rates of Roundup Ultra Max may provide more effective control of the Canada thistle.

Methodology: Roundup Ultra Max was used in this trial. The standard rate for Roundup Ultra Max (13 oz/ac) is equivalent to the 16 oz/ac rate of Roundup Ultra. The Roundup Rate/Timing Trial was conducted using the variety RideR and was integrated into the Systems Comparison Trial. The trial consisted of the following treatments:

A) Roundup standard rate - Roundup Ultra Max (13 oz/ac) + ammonium sulfate (1 lb/ac) applied at the 3 leaf stage
B) Roundup high rate - Roundup Ultra Max (20 oz/ac) + ammonium sulfate (1 lb/ac) applied at the 3-leaf stage
C) Roundup split application - Roundup Ultra Max (13 oz/ac) + ammonium sulfate (1 lb/ac) applied at the 2 and 6-leaf stages

Observation: The site for this trial had a history of Canada thistle problems. However, an application of Curtail in 2000 resulted in good control and few Canada thistles in 2001. Where there were some Canada thistles in the plots, all three treatments gave similar control. The different rates and timings of Roundup Ultra Max had no effect on canopy closure, lodging, or maturity. The split application was noticeably easier to swath than the standard rate of 13 oz/ac.

Results:

ROUNDUP RATE / TIMING TRIAL Thief River Falls, MN					
Treatment	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Swathability Rating (1-5)**
Roundup - high	1685	33.7	17.71	41.3	2.3
Roundup - standard	1632	32.6	15.55	41.3	3.0
Roundup - split	1580	31.6	5.34	41.5	2.0
LSD CV%	78.6 3.5	1.57 3.5		0.76 1.3	0.4 11.9

Discussion: Yield from the high rate of Roundup was significantly higher than the split application. There was no difference in yield between the standard and high rates of Roundup. The contribution margin of the split application was lower than the other two treatments due to the added chemical cost and lower yields.

XIII LIBERTY TANK MIX / TIMING TRIAL

Objective: To demonstrate strategies to improve the efficacy of the contact herbicide Liberty on grassy weeds.

Background: Liberty is a non-selective contact herbicide that is used to control weeds in Liberty Link canola. Previous research has indicated Liberty to be less effective on controlling grasses than other non-selective herbicides. Reducing the rate of Liberty while adding a half rate of a grass herbicide should improve grass control while maintaining control of broadleaf weeds.

Methodology: The Liberty tank mix trial was conducted using the variety InVigor 2573 and was integrated into the Systems Comparison Trial. The trial consisted of the following treatments in a randomized block design:

A) Liberty tank mix - (28 oz/ac) + Poast (6 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 3-leaf stage.
B) Liberty - full rate (34 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 3-leaf stage.
C) Liberty - low rate (20 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 2-leaf stage

The original plan for treatment C was for a split application of 20 oz/ac at the 2 and 6-leaf stages. However, weather conditions were not conducive for the application at the 6-leaf stage, so Liberty was applied at only the 2-leaf stage.

Observation: There were few weeds in this trial. All of the small annual grasses were controlled by all three treatments. Based on visual ratings, quackgrass in the low rate treatment showed approximately 40 % control at seven days after application. Quackgrass was not present in the other two treatments. The tank mix and full rate of Liberty provided approximately 80 % control of Canada thistle compared to 50 % with the low rate of Liberty. Minor crop injury in the form of yellowing, was noted on the tank mix and full rate treatments.

Results:

LIBERTY TANK MIX TRIAL Thief River Falls, MN				
Treatment	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Liberty + Poast	1792	35.8	22.28	41.2
Liberty - full rate	1859	37.2	26.89	41.0
Liberty - low rate	1772	35.4	29.08	40.9
LSD (0.10)	149.8	2.99		1.04
CV%	6.0	6.0		1.9

Discussion: There were no yield or oil differences among the treatments. Contribution margins reflect the differences in yield and chemical costs. The low rate of Liberty gave the highest contribution margin primarily due to approximately $9.00/ac less for chemical. With the light weed pressure that was present this year, the low rate of Liberty performed adequately.

XIV RAPTOR TANK MIX TRIAL

Objective: To demonstrate the effectiveness of Stinger with Raptor for Canada thistle control.

Background: Raptor is a non-selective herbicide that is used to control weeds in Clearfield canola. Previous research has indicated that Raptor is less effective at controlling Canada thistle than other non-selective herbicides. Adding Stinger herbicide to the Raptor should provide additional control of Canada thistle.

Methodology: The Raptor tank mix trial was conducted using the variety 46A76. It was integrated into the Systems Comparison Trial and consisted of the following treatments in a randomized block design:

A) Raptor (4 oz/ac) + ammonium sulfate (2.5 lb/ac) + non-ionic surfactant (3.5 oz/ac) applied at the 3-leaf stage.
B) Raptor (4 oz/ac) + Stinger (4 oz/ac) + ammonium sulfate (2.5 lb/ac) + non-ionic surfactant (3.5 oz/ac) applied at the 3-leaf stage.

Observation: The site for this trial had a history of Canada thistle problems. However, an application of Curtail in 2000 resulted in good control and few Canada thistles in 2001. Where there were some Canada thistles in the plots, Raptor + Stinger gave good control compared to only slight yellowing of the Canada thistle in the Raptor treatments. There were no other agronomic differences between the two treatments.

Results:

RAPTOR TANK MIX TRIAL
Thief River Falls, MN

Treatment	Yield (lb/ac)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Raptor	1679	33.6	31.47	41.5
Raptor + Stinger	1673	33.5	15.38	41.3
LSD	73.7	1.47		1.00
CV%	2.6	2.6		1.65

Discussion: There were no differences in yield or oil content between the treatments. The contribution margin was higher for the Raptor treatment due to the extra cost of the Stinger in the tank mix treatment.

XV SYSTEMS COMPARISON TRIAL

Objective: To establish agronomic criteria for choosing among varieties and herbicide options of novel trait canola varieties.

Background: The introduction of canola with novel traits for herbicide tolerance has given producers many options for herbicide and variety selection. The greatest return will occur by choosing the most appropriate combination of suitable varieties and appropriate herbicides for each field. Factors to consider beyond the performance of the variety include weed population, weed spectrum, tillage system and herbicide rotation.

Methodology: The trial was conducted as a randomized complete block with four replicates. Seeding rates varied according to what the industry recommended (see *Site Information*). The canola varieties with novel traits for herbicide tolerance were compared to the conventional varieties Hyola 401 and Q2 and a conventional herbicide program. All of the herbicide tolerant varieties were sprayed with their respective recommended herbicides at the recommended rates. Canopy closure was determined by the number of days after planting (DAP) required for the variety to reach 95 % ground cover.

Observations: The trial was seeded on May 16 into good moisture. Weed populations were relatively low and patchy with primary weeds including Canada thistle, dandelions, lamb's quarters, foxtails and some patches of quackgrass. Enough weeds of each kind were present in the conventional treatments that a complete weed control mixture (Stinger, Assure II and Muster) was required. All applications were done in the early morning to avoid drift into neighboring plots that were not tolerant to the same herbicide. The Roundup Ready varieties were sprayed the day before the other varieties. The crop was at the 3-leaf stage at the time of herbicide application. Rider and Hyola 357 reached canopy closure at 29 days after planting (DAP). Q2 was the slowest at 37 DAP. All other varieties reached canopy closure at 30 to 32 DAP. Hail damage from the August 17 storm was most severe on the systems comparison trial with damage estimates between 10 and 15 % across all the plots. Yields were not adjusted for hail damage.

Results:

SYSTEMS COMPARISON TRIAL Thief River Falls, MN							
System	**Yield (%)**	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**
Conventional							
Hyola 401	100	2003	40.1	32.17	41.1	1193	87
Q2	90	1805	36.1	24.22	41.1	1193	87
Clearfield (Raptor Tolerant)							
46A76	84	1679	33.6	31.47	41.5	1193	87
Liberty Link							
InVigor 2573	93	1859	37.2	35.98	41.0	1167	85
InVigor 2663	89	1786	35.7	28.50	41.6	1155	84
Roundup Ready							
Hyola 357	97	1942	38.8	46.33	40.9	1179	86
LiBred 499RR	89	1783	35.7	33.12	41.0	1167	85
DKL34-55	86	1726	34.5	33.53	41.6	1155	84
DKL35-25	86	1718	34.4	32.79	41.9	1167	85
DKL23-38	84	1686	33.7	33.04	41.8	1135	83
Gladiator	84	1675	33.5	27.94	41.5	1135	83
LS296RR	83	1669	33.4	25.69	40.6	1135	83
SW BadgeRR	83	1655	33.1	27.13	40.7	1167	85
DS Roughrider	82	1636	32.7	30.13	42.9	1193	87
RideR	81	1632	32.6	24.64	41.3	1135	83
LSD CV%		156.2 7.5	3.12 7.5		0.80 1.6		1.4 1.4

Discussion: Yields for Hyola 401 and Hyola 357 were significantly higher than most of the other varieties tested. Hyola 357 had the best contribution margin. Contribution margins reflect differences in seed costs, yield and herbicide costs. DS Roughrider had significantly higher oil than the other varieties. The hot conditions during swathing appeared to minimize differences in maturity among varieties.

XVI CANOPY MANIPULATION TRIAL

Objective: To compare the effects of various seeding dates and rates on yield, maturity and disease on *B. napus* canola.

Background: European research (Scott et al, 1999) indicates that canola yields can be related to canopy structure after flowering. Thinner canopies allow more light to penetrate lower pods resulting in increased yield due to translocation of photosynthetic light from pod hulls. Also, excessive vegetative growth can deplete soil moisture in dry conditions resulting in poor pod formation and filling.

Seeding rate studies have been carried out throughout western Canada under various weed and disease pressures. The introduction of herbicide tolerant canola varieties has improved weed control, which lessens the need for higher plant populations. Weather conditions often contribute to increased lodging and sclerotinia. Reducing plant stands may lessen the risk of these factors. However lower plant densities bring higher risks due to later maturity, green seed and insects (ex. root maggots).

Recent seeding date research indicated that early spring or fall dormant seeded canola results in fewer and shorter plants. This often leads to lower disease pressure due to a more open canopy, which may result in increased yields.

Methodology: This trial consisted of two main plot treatments and three sub-plot treatments. InVigor 2663 was the variety used.

A) Normal planting date @ 1.0 lb/ac
B) Normal planting date @ 1.0 lb/ac @ 30% SCC whole plant
C) Normal planting date @ 3.0 lb/ac
D) Normal planting date @ 5.0 lb/ac
E) Late planting date @ 1.0 lb/ac
F) Late planting date @ 3.0 lb/ac
G) Late planting date @ 5.0 lb/ac

The 1 lb/ac and 3 lb/ac seeding rates were bulked up by using corn cob grit ($18.00/50 lb bag). Weeds were controlled at the 3-leaf stage with Liberty (34 oz/ac).

Swathing commenced when the main stem was at 30 to 40 % seed colour change (SCC). The second normal planting date @ 1.0 lb/ac treatment was swathed when the SCC was 30 % over the whole plant. Treatments A and B were analyzed as a randomized complete block, separately from the rest of the trial. All treatments other than B were analyzed as a split-plot with planting date as the main plot.

Observation: This trial had two planting dates, May 14 and June 5. Good soil moisture was present on each date. No secondary weed flushes were evident in

the delayed canopy closure of the 1 lb/ac seeding rate. There was more lodging in the late planting date than the normal planting date. However, there was little difference in lodging among the seeding rates within a planting date. This trial was not sprayed with a fungicide. Petal tests indicated 9 % and 7 % infection for the normal and late planting date, respectively. Sclerotinia levels were expected to be low for the normal planting date due to the hot, dry weather up to the end of flowering. Sclerotinia was expected to be high for the late planting date due to high moisture levels during flowering of those treatments. As it turned out, disease levels were opposite from expected.

Results: (a) Swath Staging Comparison

CANOPY MANIPULATION Thief River Falls, MN								
System	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**1000 Kernel Weight (g)**	**Growing Degree Days**	**Days To Swathing**	**Green Seed (%)**
Swath Staging Comparison								
1lb/ac @ 30-40% SCC main stem	1530	30.6	14.54	40.1	3.7	1143	84	0.1
1lb/ac @ 30-40% SCC whole plant	1599	32.0	20.65	40.1	4.0	1196	87	0.1
LSD CV%	112.3 4.3	2.25 4.3		0.65 1.0	1.69 26.6		0.7 0.5	0.38 230.9

Results: (b) Plant stand measurements

CANOPY MANIPULATION Thief River Falls, MN							
System	**Emergence Counts Plants/ft^2**	**Harvest Counts Plants/ft^2**	**Plant Height (inches)**	**Canopy Closure (DAP)**	**Infected Plants (%)**	**# Primary Branches**	**# Secondary Branches**
Normal Planting Date							
1 lb/ac	2.0	2.2	50.1	43	39	10.5	10.2
3 lb/ac	4.9	5.1	50.6	31	23	6.9	1.4
5 lb/ac	8.8	7.8	48.6	29	29	6.0	1.0
Late Planting Date							
1 lb/ac	1.8	1.8	56.7	37	5	12.1	15.9
3 lb/ac	5.1	4.4	55.4	24	4	6.5	4.1
5 lb/ac	9.1	8.2	53.0	21	3	5.2	1.4
LSD1	0.90	1.04	2.12	0.5	14.4	1.13	2.61
LSD2	0.80	1.10	2.50	0.6	6.3	0.80	1.93
CV%	12.1	17.7	3.8	1.6	28.9	8.1	27.0

Note: LSD1 - LSD (0.10) between any two treatments.
LSD2 - LSD (0.10) between any two seeding rates within a planting date.

Results: (c) Yield and Quality Data

CANOPY MANIPULATION Thief River Falls, MN								
System	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**1000 Kernel Weight (g)**	**Growing Degree Days**	**Days To Maturity**	**Green Seed (%)**
Normal Planting Date								
1 lb/ac	1530	30.6	13.10	40.1	3.65	1164	85	0.1
3 lb/ac	1675	33.5	14.92	40.1	3.95	1143	84	0.1
5 lb/ac	1661	33.2	2.62	40.4	4.00	1143	84	0.2
Late Planting Date								
1 lb/ac	1744	34.9	18.85	41.5	4.05	1248	83	5.8
3 lb/ac	1987	39.7	30.15	41.8	4.30	1248	83	5.6
5 lb/ac	2035	40.7	24.36	41.9	3.95	1248	83	5.2
LSD1	130.2	2.61		1.25	0.69		2.3	1.84
LSD2	121.9	2.44		0.44	0.69		0.5	1.63
CV%	5.5	5.5		0.8	13.7		0.42	46.0

Note: LSD1 - LSD (0.10) between any two treatments.
LSD2 - LSD (0.10) between any two seeding rates within a planting date.

Discussion:

The main stems of the 1 lb/ac delayed swathed plots were at 70 % SCC when the whole plant reached 30 to 40 % SCC. Delaying swathing three days in the 1 lb/ac seeding rate did not increase yield or seed weight significantly. Oil content was the same for both swathing dates. The later swathing date was swathed with a heavy dew so very little shattering occurred. The contribution margin was slightly higher for the delayed swathing due to the added yield.

The 5 lb/ac seeding rate had the shortest plants. Canopy closure in the 1 lb/ac seeding rate was nearly two weeks after the 3 and 5 lb/ac seeding rates. Sclerotinia levels were the highest at the 1 lb/ac seeding rate for both planting dates. For both planting dates, the number of primary and secondary branches increased significantly as seeding rate decreased from 3 lb/ac to 1 lb/ac. The tremendous increase in branches from the 3 lb/ac to 1 lb/ac seeding rates did not compensate enough to provide similar yields. The 1 lb/ac seeding rate was significantly lower yielding than the 3 and 5 lb/ac seeding rates for both planting dates. Contribution margins were highest for the 3 lb/ac seeding rate for both planting dates due to the high yield and lower seed cost compared to the 5 lb/ac rate. Contribution margins reflect differences in yield, grade and seed costs.

XVII PUSHING TRIAL

Objective: To evaluate the potential of the "Yield Shield" canola pusher for improving the success of straight combining of *B. napus* canola.

Background: Past research at Canola Production Centres has indicated that shattering losses from straight combining *B. napus* canola generally outweigh any benefits as compared to swathing. However, results have varied from losses as large as 50 % to significant increases in yield. The trials where straight combining has been most successful indicate that lodged crops make the best candidates for straight combining. Ag Shield, a manufacturing company in Benito, Manitoba, has designed a header that can be used to simulate lodging by pushing the crop over. This trial will help assess whether this new technology actually reduces the risks associated with straight combining.

Methodology: Treatments included the following:

A) Swath at 30 to 40 % seed colour change
B) Straight combine without pushing
C) Pushed high (8"), with the lodging (about 20 % seed colour change) then straight combine
D) Pushed low (3"), against the lodging (about 20 % seed colour change) then straight combine

Observation: This trial was seeded on May 15 into good moisture. The original plan for this trial was to push early (15 days prior to swathing) and late (5 days prior to swathing). However, with pusher scheduling problems and hot weather hastening seed colour change, modifications to the treatments were required. High winds and heavy rains in late July had left the canopy leaning heavily in one direction. So a high push with the lodging and a low push against the lodging were substituted for the early and late pushing date. A John Deere 4450 was used to operate the pusher. Even though the pushing process required driving backwards, it was a rather simple procedure for the few plots that were pushed. Pushing was done on August 4, swathing was done on August 7 and all plots were combined on August 29. Hail and high winds after pushing caused a significant amount of shattering in the pushed and straight cut plots.

At harvest, the pushed treatments were much harder to combine due to their closeness to the ground. The possibility of picking up rocks was a concern. The low pushed treatment was cut at about a 2" height, the high pushed treatment was cut at about a 4" height and the straight combine treatment was cut at about a 10" height. Some yield was lost in the pushed treatments where the tractor had driven over the edges of the pushed area, making it impossible to get to with the combine. A 20 ft John Deere flex-head with a pick-up reel was used for the pushed and straight combine treatments.

Results:

PUSHING TRIAL Thief River Falls, MN						
Treatment	**Yield (%)**	**Yield (lb/ac)**	**Yield (bu/ac)**	**Oil (%)**	**Seed size (gms/1000)**	**Contribution Margin ($/ac)**
Swath	100	1559	31.2	43.4	3.4	19.02
Straight Combine	81	1255	25.1	42.7	4.3	(7.15)
Push Low	75	1173	23.5	42.9	3.6	(15.08)
Push High	70	1094	21.9	42.9	3.8	(22.07)
LSD CV%		105.9 6.4	2.12 6.4	0.81 1.5	0.99 20.2	

Note: Brackets in Contribution Margin reflect a negative value.

Discussion:

Swathing yielded significantly higher than the other treatments. Losses from the straight combining and pushing treatments were from the hail and wind damage that occurred prior to combining. Canola in the swath was more protected from damage than the standing canola. Even though the crop was leaning heavily prior to swathing, as it dried down it became more erect and tended to shell out in the straight combining treatment. The pushed plots also straightened up during the maturation process. This may have been a result of pushing them too late. Oil content and seed size were not significantly different among treatments. The swathed treatment had the highest contribution margin. Contribution margins reflect the differences in yield and fuel, lube and repair costs of each of the treatments. The expense of custom pushing was not taken into account here, or the economic losses would have been greater.

XVIII FUNGICIDE TRIAL

Objective: To evaluate the effectiveness of different fungicides at controlling sclerotinia in canola and how they influence yield, quality and economic return.

Background: Sclerotinia stem rot is caused by the fungus *Sclerotinia sclerotiorum* that occurs in most canola growing areas. The disease is usually most severe in wetter areas of the growing region. Severity of stem rot varies from year to year, and even from field to field within a region. With the right combination of thick crop density and wet weather conditions before and during flowering, heavy infections can develop almost anywhere. In some cases half the potential yield of a crop may be lost to sclerotinia. Quadris and Ronilan EG are currently labeled for sclerotinia control on canola in the United States.

Methodology: The trial was seeded with the variety 44A89. A higher seeding rate of 5.5 lb/ac was used to facilitate a microclimate in the canopy to enhance sclerotinia development. Spraying was done using a ground sprayer equipped with twinjet nozzles at 75 psi and 20 gal/ac spray solution. Fungicides were applied at rates and timings suggested by the label or industry representative. Treatments included:

A) Check - no fungicide applied
B) Folicur - 4.0 oz/ac + 0.25 % nonionic surfactant applied at 25 % bloom
C) Ronilan EG - 12 oz/ac applied at 25 % bloom
D) Rovral Flo - 14.4 oz/ac + 1% crop oil concentrate applied at 25 % bloom
E) Rovral Flo - 14.4 oz/ac + 1% crop oil concentrate applied at 50 % bloom
F) Topsin - 16 oz/ac applied at 35 % bloom

Infection readings were taken by recording incidence and average disease level of 100 unswathed plants at three random locations within each plot along the edge of the swathed area. Disease levels were assessed on a scale of 1 to 5 (1 = small branch infected, 5 = the whole plant is dead with substantial yield loss).

Observation: This trial was seeded on May 17 into good moisture. Weather conditions leading up to bloom and during the first half of the bloom period were dry and hot. Petal tests conducted at 25 % bloom on July 3 showed only 9 % infection. Wet conditions during pod fill provided an ideal environment for sclerotinia to develop. The weather was calm and warm on each of the dates the fungicides were applied.

Results:

FUNGICIDE EVALUATION TRIAL Thief River Falls, MN							
Treatment	**Yield (%)**	**Yield (lb/ac)**	**Yield (bu/ac)**	**Oil (%)**	**Plants Infected (%)**	**Infect. Rating (1-5)**	**Contribution Margin ($/ac)**
Check (No Fung.)	100	1468	29.4	40.2	26	4.7	3.69
Folicur	106	1563	31.3	40.4	23	4.8	(3.28)
Ronilan	112	1643	32.9	40.5	8	3.4	(1.79)
Rovral Flo at 25 %	109	1601	32.0	40.8	7	3.9	(7.08)
Rovral Flo at 50 %	116	1703	34.1	40.7	6	3.9	1.96
Topsin	115	1685	33.7	40.5	2	1.7	1.56
LSD (0.10)		80.9	1.62	0.46	11.8	1.29	
CV%		4.1	4.1	0.9	79.9	27.9	

Note: Brackets in Contribution Margin reflect a negative value.

Discussion:

The check yielded significantly lower than any other treatment. The later timing of Rovral Flo provided significantly higher yield than the early timing. This is likely due to the wet weather experienced at the end of flowering and into pod fill, compared to the hot, dry conditions during early flowering. Folicur had significantly higher yield than the check even though the percent of infected plants was similar to the check. The Ronilan, Rovral Flo and Topsin treatments all had significantly fewer infected plants than the check or Folicur. The Topsin treatment not only had the lowest number of infected plants, but the plants that were infected had significantly less severe infections. Both spray timings of Rovral Flo had significantly higher oil contents than the check. Even though the check yielded the lowest, it still had the highest contribution margin. Contribution margins reflect the differences in yield, fungicide costs and application costs for each of the treatments.

XIX SCLEROTINIA TRIAL

Objective: To evaluate the effectiveness of an apetalous variety at avoiding sclerotinia compared to two other petalled varieties that are equal and later in maturity.

Background: Sclerotinia stem rot is caused by the fungus *Sclerotinia sclerotiorum* that occurs in most canola growing areas. The disease is usually most severe in wetter areas of the growing region. Severity of stem rot varies from year to year, and even from field to field within a region. With the right combination of thick crop density and wet weather conditions before and during flowering, heavy infections can develop almost anywhere. In some cases half the potential yield of a crop may be lost to sclerotinia. Differences in disease level can be observed among varieties due to timing of flowering or structure of the plant. Since the spores of sclerotinia infect dead flower petals prior to infecting the healthy plant stem, eliminating the petals from the plant should reduce the potential of infection. Hylite 201, an apetalous variety, uses this technique to reduce infection levels of sclerotinia. In 2000, Hylite 201 provided a higher contribution margin without fungicide than with fungicide. The trial this year is a repeat of last year's to confirm those findings.

Methodology: Spraying was done using twinjet nozzles at 75 psi. Ronilan EG was applied at 12 oz/ac in 20 gal/ac of spray solution at the 20 to 30 % bloom stage of each variety. The trial was set up as a randomized complete block in a 3 x 2 factorial design. Treatments included:

A) Hylite 201 (early maturing apetalous) - no fungicide
B) Hylite 201 (early maturing apetalous) - fungicide
C) 44A89 (early maturing petalled) - no fungicide
D) 44A89 (early maturing petalled) - fungicide
E) HyClass 601 (late maturing petalled) - no fungicide
F) HyClass 601 (late maturing petalled) - fungicide

Infection readings were taken by recording incidence and average disease level of 100 unswathed plants at three random locations within each plot along the edge of the swathed area. Disease levels were assessed on a scale of 1 to 5 (1 = small branch infected, 5 = the whole plant is dead with substantial yield loss).

Observation: This trial was seeded on May 17 into good moisture. Weather conditions leading up to bloom and during the first half of the bloom period were dry and hot. Petal tests conducted at 25 % bloom on July 3 showed only 9 % infection. Not much sclerotinia was expected in the trial because of the hot, dry weather leading up to and during bloom. However, wet conditions during pod fill provided an ideal environment for the sclerotinia to develop. The weather was calm and warm on each of the dates the fungicides were applied. HyClass 601 was sprayed three days after the 44A89 and Hylite 201. The average sclerotinia rating scores were

between 3.6 and 4.1 for all the treatments that had 6 % or more infected plants.

Results:

SCLEROTINIA STEM ROT CONTROL TRIAL Thief River Falls, MN						
Treatment	**Yield (%)**	**Yield (lb/ac)**	**Yield (bu/ac)**	**Oil (%)**	**Plants Infected (%)**	**Contribution Margin ($/ac)**
Hylite 201 - no fungicide	100	1379	27.6	39.7	6	(5.35)
Hylite 201 - fungicide	102	1410	28.2	39.7	1	(22.66)
44A89 - no fungicide	100	1382	27.6	40.1	19	(2.11)
44A89 - fungicide	105	1457	29.1	40.3	10	(16.44)
HyClass 601 - no fung.	100	1504	30.1	40.2	16	1.91
HyClass 601 - fungicide	109	1634	32.7	40.2	0	(7.57)
LSD CV%		42.7 2.4	0.85 2.4	0.36 0.7	5.3 48.4	

Discussion:

Hylite 201 had similar yields with and without fungicide. Both 44A89 and HyClass 601 had significant yield boosts from fungicide applications. There were no differences in oil content between fungicide treatments within a variety. The fungicide application provided significantly less infected plants for both 44A89 and HyClass 601. Despite the increased yield of each of the varieties from the application of fungicide, the contribution margins were all higher for the treatments with no fungicide. Contribution margins reflect the differences in yield, seed costs and fungicide costs. Sclerotinia pressure was low enough this year that the fungicide treatments were not economically beneficial.

XX SUMMARY

The fourth year of the Minnesota Canola Production Centre (CPC) program has been another success. The trials at the Thief River Falls site were chosen to demonstrate basic canola production principles as well as look at new technologies and techniques. While many of the trends in the trials reflected past results from the Canadian CPC program, other trial results differed. Future work will help reveal if these unexpected trends are regionally specific, or if they were just a feature of this year's growing conditions. All of the results will provide good focal points for discussions at extension meetings throughout the winter. This joint project has provided a unique opportunity to share information between Canadian and American growers. Planning for next year's program has already begun with the site for 2002 being 1.5 miles south and 1 mile west of Thief River Falls, Minnesota on County Road 7. A fall dormant seeding trial has already been established with treatments using the "Extender" seed coating. If you have any questions or comments about the Minnesota CPC program please feel free to contact any of the people listed in the following Field Staff Information section.

XXI FIELD STAFF INFORMATION

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