# ACKNOWLEDGEMENTS

The Canola Council of Canada is the co-ordinating body of the Canola Production Centre program across Canada and is a major contributor to the program.

Each year, sponsors (both locally and nationally), help support the Canola Production Centre program across Canada. With their generous contribution, the Program has become an effective tool in technology transfer to all interested parties.

The program is supported on a national basis by the following cash sponsors:

**Advanta Seeds**
**Agrium Inc.**
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**Novartis Crop Protection Inc.**

The program is supported on a national basis by the following product/service sponsors:

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**Pioneer Grain / JRI**
**Proven Seed**
**Saskatchewan Wheat Pool**
**United Grain Growers**

This program is supported by the following provincial organizations:

**Alberta Canola Producers Commission**
**Alberta Agriculture Food and Rural Development (Farming for the Future Program)**
**British Columbia Peace River Grain Industry Development Council**
- **(Peace River Agricultural Development Fund)**

**Manitoba Canola Growers Association**
**Saskatchewan Canola Development Commission**
**Saskatchewan Canola Growers Association**

In 2000 the Canola Production Centre program was also supported by the following Contract Research participants:

***PLATINUM***
**Aventis CropScience**

***GOLD***
**BASF Canada Inc.**
**Dow AgroSciences Canada Inc.**
**Limagrain Canada Seeds Inc.**

***SILVER***
**Agricore**
**Aventis Seed Treatment**
**Cargill Seed**
**IMC Cargill Ltd.**
**Saskatchewan Wheat Pool**

***BRONZE***
**Advanta Seeds**
**CanAmera Foods**
**Canterra Seeds**
**DuPont Canada Inc.**
**Gustafson**
**Kamterter II L.L.C.**
**Novartis Crop Protection Inc.**
**Stoller / Agritrend**
**Zeneca Agro**
**Phosyn PLC**

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# I SITE DESCRIPTION

The Canola Production Centre program is supported locally by the following individuals and organizations that have donated products and/or services to the Canola Production Centres:

## *MANITOBA REGION* - Derwyn Hammond, Agronomist

### *Location:* Selkirk, MB - 80 acres

***Land:*** Angele and Mark Deprez (Co-operators)

***Seed and Seed Treatment:***
Advanta Seeds
Aventis CropScience
BASF Canada Inc.
Hetland Seeds
Inter-Ag
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:*** Esso (Terraco) - Granular fertilizer (80 acres)

***Herbicides and Fungicides:***
Aventis CropScience - Liberty (25 acres), Compas (20 acres) Select (40 acres)
BASF Canada Inc. - Odyssey (10 acres)
DuPont Canada Inc. - Muster Gold II (80 acres), Freedom Gold (20 acres)
Monsanto Canada Inc. - Roundup Transorb (50 acres)

***Equipment and Labour:***
Enviro-Test Labs - soil test analysis
Leo's Sales and Service Ltd., Winnipeg - IHC 1460 combine

***Tours:***
Dow AgroSciences Canada Inc. - lunch
Tour advertising and promotion - Manitoba Agriculture in Selkirk (Michael Sykes), Stonewall (Stan Stadnyk), Teulon (Hilmar Johnson).

Finally, I would like to thank Angele Deprez for hosting lunch and Concorde Colony for supplying tables and bales for seating.

### *Location:* St. Claude, MB - 5 acres

***Land:*** Gilbert and Liliane Bernard (Co-operators)

***Fertilizer:*** Phosyn PLC - foliar boron and sulphur

***Equipment and Labour:***
Enviro-Test Labs - plant tissue analysis
Gilbert and Liliane Bernard - all equipment required to conduct this satellite trial.

| *Location:* | **Russell, MB - 80 acres** |
|---|---|

***Land:***

Doug Bily (Co-operator)

**Gold Level Sponsors**

- The Rural Municipality of Russell
- Town of Russell

**Silver Level Sponsors**

- CanAmera Foods, Harrowby
- The Rural Municipality of Silver Creek

**Bronze Level Sponsors**

- Jackson Seeds, Inglis
- Prairie Concrete, Foxwarren
- The Russell Inn, Russell
- Thunder Creek Farms

***Seed and Seed Treatment:***

Advanta Seeds
Aventis CropScience
BASF Canada Inc.
Hetland Seeds
Inter-Ag
Keating Seed Farms
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:***

Simplot Canada Inc. (Clement Farm Supply Ltd.) - Liquid (80 acres)

***Herbicides and Fungicides:***

Aventis CropScience - Liberty (25 acres), Compas (20 acres) Select (80 acres)
BASF Canada Inc. - Odyssey (10 acres)
Dow AgroSciences Canada Inc. - Lontrel (78 acres)
DuPont Canada Inc. - Muster (60 acres)
Monsanto Canada Inc. - Roundup Transorb (50 acres)

***Equipment and Labour:***

Clement Farm Supply Ltd. - Bourgault coulter applicator
Enviro-Test Labs - soil test analysis
Greenline Equipment Ltd. - tractor and cultivator, JD 9600 combine
Sharpe's Soil Service (Langenburg) - fungicide application

***Tours:***

Phosyn PLC and Tiger Resources Inc. - lunch
Tour promotion and co-ordination - Manitoba Agriculture (Luanne Berjian)
CJGX radio (Jack Dawes), CKDM radio (Adam Ried) - advertising
Thanks also to Doug Bily and family for hosting the tour lunch and PCDF (Jeff Kostuik) for preparing the food.

***Comments:***

As the agronomist responsible for the CPC program in Manitoba, I would also like to take this opportunity to thank my technicians **Sherri McAuley** and **Warren Robak** for their dedicated assistance throughout the season.

## *EASTERN SASKATCHEWAN* - David Vanthuyne, Agronomist

| ***Location:*** | **Grenfell, SK - 75 acres** |
|---|---|

| | |
|---|---|
| ***Land:*** | Mike Kent (Co-operator)<br>Mainline Rural Economic Development Association |
| ***Seed and Seed Treatment:*** | Advanta Seeds<br>Aventis CropScience<br>BASF Canada Inc.<br>Gustafson<br>Hetland Seeds<br>Saskatchewan Wheat Pool<br>Proven Seed |
| ***Fertilizer:*** | Agricore (Mainline Fertilzers Ltd.) - anhydrous ammonia and granular (55 acres) |
| ***Herbicides and Fungicides:*** | Aventis CropScience - Liberty (20 acres), Decis (5 acres) and Compas (20 acres)<br>BASF Canada Inc. - Poast Ultra (80 acres)<br>Dow AgroSciences Canada Inc. - Lontrel (26 acres)<br>DuPont Canada Inc. - Muster (26 acres)<br>Monsanto Canada Inc. - Roundup Transorb (80 acres) |
| ***Equipment and Labour:*** | Agricore - Mainline Fertilizers Ltd. (Bill Kent) - herbicide storage and anhydrous applicator<br>Bill Kent - seed and equipment storage<br>Bruce and Lorne Loveridge - JD tractor and mower<br>Dave and Marvin Hoffman - MF 1135 tractor<br>Doug and Jack Amy - custom spraying<br>Lee Switzer - three tonne grain truck, grain storage and labour<br>Lloyd Wolfe - harrows<br>Rick Jones - heavy harrows<br>Mike and Doug Kent - cultivator, shop tools and equipment storage |
| ***Tours:*** | CJGX radio (Jack Dawes) - radio advertisement<br>BASF Canada Inc. - sponsored BBQ dinner<br>Monsanto Canada Inc. - sponsored BBQ dinner<br>Town of Grenfell - bleachers for tour<br>Tour help - Grenfell and District Canola Production Centre Committee (Sharon May, Co-ordinator) |

| ***Location:*** | **Naicam, SK - 65 acres** |
|---|---|

| | |
|---|---|
| ***Land:*** | Eric Cropper (Co-operator)<br>Naicam Marketing Club (Co-operator) |

***Seed and Seed Treatment:*** Advanta Seeds
Aventis CropScience
BASF Canada Inc.
Gustafson
Hetland Seeds
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:*** Esso / Imperial Oil Ltd. - anhydrous ammonia and granular (65 acres)

***Herbicides and Fungicides:*** Aventis CropScience - Liberty (20 acres), Decis (45 acres) and Compas (20 acres)
BASF Canada Inc. - Poast Ultra (60 acres)
Dow AgroSciences Canada Inc. - Lontrel (54 acres)
DuPont Canada Inc. - Muster (26 acres) and Freedom Gold (20 acres)
Monsanto Canada Inc. - Roundup Transorb (80 acres)

***Equipment and Labour:*** Cropper Motors - tractor for banding and harrowing
Barry Jordan Trucking - custom trucking
Dauk Farms - tractor, grain truck, shop use and equipment storage
Esso / Imperial Oil (Rodger Hayward) - anhydrous ammonia applicator
Hetland Seeds - seed and equipment storage
Jim Meekins - post hole auger
Ron Loyns - custom spraying and grain storage
Warren Loyns and Stan Rude - swather and swath roller
Naicam Coop Agro Centre - harrows and chemical storage

***Tours:*** Advanta Seeds - sponsored BBQ dinner
CJGX radio (Jack Dawes) - radio advertisement
Naicam Marketing Club - tour help

***Comments:*** I would like to take this opportunity to extend a special thank you to **Barry Hurd** and **Adrienne Wallington** for their dedicated technical assistance throughout the season.

## *BATTLE RIVER REGION* - David Blais, Agronomist

| ***Location:*** | **North Battleford, SK - 90 acres** |
|---|---|

***Land:*** Everett Seib

***Seed and Seed Treatment:*** Advanta Seeds
Aventis CropScience Inc.
BASF Canada Inc.
Hetland Seeds
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:***
Esso / Imperial Oil (Northwest Agro) - anhydrous ammonia (90 acres)
Pioneer Grain/JRI - Field blend (90 acres)

***Herbicides and Fungicides:***
Aventis CropScience Inc. - Compas (10 acres), Liberty (40 acres)
BASF Canada Inc. - Odyssey (20 acres)
Dow AgroSciences Canada Inc. - Lontrel (80 acres)
DuPont Canada Inc. - Assure II (80 acres)
Monsanto Canada Inc. - Roundup Transorb (120 acres)

***Equipment and Labour:***
Enviro-Test Labs - soil test analysis
Everett Seib - spring fertilizer application, harrowing, combine, grain truck and hauling, grain auger, grain storage
Greenstar Equipment Ltd. - combine hauling
Esso/Imperial Oil (Northwest Agro) - anhydruos ammonia applicator

***Tours:***
City of North Battleford - bleachers for tour
Nachtegaele Farms - trailer for tour

## *Location:* Vegreville, AB - 80 acres

***Land:***
Lloyd Boere

***Seed and Seed Treatment:***
Advanta Seeds
Aventis CropScience Inc.
BASF Canada Inc.
Hetland Seeds
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:***
AgPro Grain, Lavoy - 40 acres fall applied fertilizer
United Grain Growers, Vegreville - 40 acres field blend, 80 acres top dressed urea

***Herbicides and Fungicides:***
Aventis CropScience Inc. - Compas (10 acres), Fusion (40 acres), Liberty (20 acres)
BASF Canada Inc. - Odyssey (20 acres)
Dow AgroSciences Canada Inc. - Vantage Plus (80 acres)
DuPont Canada Inc. - Freedom Gold (10 acres), Muster Gold (60 acres)
Monsanto Canada Inc. - Roundup Transorb (20 acres)

***Equipment and Labour:***
Lloyd Boere - combine, grain truck and hauling, grain auger, grain storage, equipment storage
Kent MacDonald, Alberta Agriculture - technical support
Cargill Grain Ltd. (Vegreville) - custom herbicide application
United Grain Growers (Vegreville) - fertilizer spreader

**Comments:** A special **THANK YOU** to **Blair Michaud** for his valued technical assistance throughout the summer. Also, thank you to **Leo Blais** for continued use of shop tools and winter storage of equipment.

## *CHINOOK REGION* - Doug Moisey, Agronomist

### *Location:* Beiseker, AB - 60 acres

***Land:*** Kenton and Bert Ziegler

***Seed and Seed Treatment:***
Enviro-Test Labs - soil test analysis
Advanta Seeds
Aventis CropScience Inc.
BASF Canada Inc.
Gustafson
Hetland Seeds
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:*** DynAgra Fertilizer (Agrium) - 60 acres granular

***Herbicides and Fungicides:***
Aventis CropScience (10 acres Liberty, 14 acres Select, and 4 acres Compas)
Dow AgroSciences Canada Inc. (60 acres Vantage Plus, 45 acres Lontrel, 60 acres Lorsban)
DuPont Canada Inc. (45 acres Muster Gold II)
Monsanto Canada Inc. (10 acres Roundup Transorb)

***Equipment and Labour:***
Cargill AgHorizons (Custom spraying 60 acres)
Kenton Ziegler - tractor
Al Muchka - stubble cutter

### *Location:* Lethbridge, AB (Irrigation) - 60 acres

***Land:*** Tom & Joe Shigehiro

***Seed and Seed Treatment:***
Advanta Seeds
Aventis CropScience Inc.
BASF Canada Inc.
Hetland Seeds
Inter-Ag
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:***
Cargill AgHorizons (60 acres granular)
Phosyn PLC (4 acres liquid Boron)

***Herbicides and Fungicides:*** Aventis CropScience (120 acres Decis, 14 acres Liberty, 14 acres Select, 4 acres Compas)
Dow AgroSciences (60 acres Vantage Plus, 45 acres Lontrel)
DuPont Canada Inc. (45 acres Muster Gold II)
Monsanto Canada Inc. (10 acres Roundup Transorb)

| ***Location:*** | **Lethbridge, AB (Dryland) - 40 acres** |
|---|---|

***Land:*** Rod & Ike Lanier

***Seed and Seed Treatment:*** Advanta Seeds
Aventis CropScience Inc.
BASF Canada Inc.
Hetland Seeds
Saskatchewan Wheat Pool
Proven Seed

***Fertilizer:*** AgPro Grain Ltd. - Wilson Siding (40 acres granular)

***Herbicides and Fungicides:*** Aventis CropScience (30 acres Decis, 4 acres Liberty, 2 acres Compas, 4 acres Select)
BASF Canada Inc. (2 acres Odyssey)
DuPont Canada Inc. (30 acres Muster Gold II)
Monsanto Canada Inc. (45 acres Roundup Transorb)
Zeneca Agro Ltd. (40 acres Reglone)

***Comments:*** A special **Thank You** to **Brad Johnson** and **Leigh McKinnon** for all their technical help over the summer. Also a special **Thank You** to **Lloyd Dosdall**, Provincial Entomologist for Alberta Agriculture, Food and Rural Development and **Robb Dunn**, Cereals and Oil seed Specialist, Lethbridge.

At this time I would like to also give a special **Thank You** to **Scott Horner** of **Advanta Seeds** and **Dale Steele** of **Dow AgroSciences** for their sponsoring the meals of the annual Canola Council of Canada Crop Production Committee Tour held in Lethbridge this past summer.

## *PEACE RIVER REGION* - Cory Feschuk, Agronomist

| ***Location:*** | **Rolla, BC - 80 acres** |
|---|---|

***Land:*** Gene Vipond (Borek Farms)

| | |
|---|---|
| ***Seed and Seed Treatment:*** | Advanta Seeds<br>Aventis CropScience Inc.<br>BASF Canada Inc.<br>Enviro-Test Labs<br>Hetland Seeds<br>Saskatchewan Wheat Pool<br>Proven Seed<br>United Farmers of Alberta<br>Peace Valley Seeds |
| ***Fertilizer:*** | Esso / Imperial Oil (Jerri Rude Agri-Sales, Dawson Creek) |
| ***Herbicides and Fungicides:*** | Aventis - Liberty (3 acres)<br>DuPont Canada Inc. - Muster Gold II (20 acres)<br>Monsanto Canada Inc. - Roundup Transorb (41 acres) |
| ***Equipment and Labour:*** | Borek Farms (cultivation and fall anhydrous ammonia application)<br>Gene Vipond (technical assistance) |
| ***Tours:*** | Sandra Burton - BC Grain Producers Association |

| ***Location:*** | **Rycroft, AB- 80 acres** |
|---|---|

| | |
|---|---|
| ***Land:*** | George Dika |
| ***Seed and Seed Treatment:*** | Advanta Seeds<br>Aventis CropScience Inc.<br>BASF Canada Inc.<br>Hetland Seeds<br>Inter-Ag<br>Saskatchewan Wheat Pool<br>Proven Seed<br>United Farmers of Alberta |
| ***Fertilizer:*** | Cargill AgHorizons |
| ***Herbicides and Fungicides:*** | Aventis CropScience - Liberty (20 acres)<br>DuPont Canada Inc. - Muster Gold II (5 acres), Freedom Gold (2.5 acres)<br>BASF Canada Inc. - Odyssey (5 acres), Poast (80 acres)<br>Monsanto Canada Inc. - Roundup Transorb (45 acres) |
| ***Equipment and Labour:*** | Agricore - application of Poast<br>George Dika - harrowing spring applied nitrogen<br>Rudy Dika - hauling canola to elevators<br>Dika Farms - equipment storage |

***Tours:*** Dow AgroSciences Canada Inc.
DuPont Canada Inc.
Monsanto Canada Inc.
BASF Canada Inc.
United Farmers of Alberta

***Comment:*** I would like to extend a heartfelt thank you to all who gave me support for my first year in the Peace. A special thank-you to **Shelagh Coy** and **Michael Coy** for their technical assistance at the Canola Production Centres.

## *Canola Production Centre Thank You*

The Canola Production Centre program continues to be a success only through the co-operation and collaboration of the entire Crop Production team across the Prairies, including; JoAnne Buth, Jim Bessel, John Mayko, David Blais, Cory Feschuk, Derwyn Hammond, Barry Hurd, Doug Moisey, Warren Robak and David Vanthuyne. The crop production team would like to thank the Head Office Staff in Winnipeg, and in particular Nicole Heroux, for their valuable assistance and support. Once again, thanks to all of the Canola Production Centre supporters, both national and local!!

# Thank-You All !!

# II 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. The Canola Production Centres are a joint effort between producer groups, industry representatives and provincial governments and their extension personnel. The continuing co-operation of these groups, co-ordinated by the Canola Council of Canada, ensures the ongoing success of the Canola Production Centres.

The goal of the Canola Production Centre program is to improve the quality and yield of the Canadian canola crop, thereby improving profitability for both producers and processors. The Canola Production Centres provide a focal point for the transfer of canola production technology, thus enhancing interaction among the various industry participants. The specific goals of the program are to increase the yield of oil and protein, and to increase the margin per unit of production.

The program consists of four components:

1. Canola Production Centres operate on a field scale, addressing a wide range of agronomic topics of regional and national interests. Typical plot sizes are 20-40 feet wide by 300-400 feet long. All trials are replicated and randomized.
2. Satellite locations operate on a field scale, addressing one or two topics of interest to the local community.
3. Communications through distribution of the results from the Canola Production Centres in annual regional reports and multi-year summaries; and extension activities.
4. Agronomic research conducted by either public or private research organizations in conjunction with the activities of the Canola Council at Canola Production Centres.

A series of summer tours were held throughout the growing season at the main Canola Production Centres that allowed the opportunity to view the various projects. All sites 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.

Quantitative information obtained from the Canola Production Centres included many agronomic factors such as early season plant counts, crop yields and lodging ratings on varieties.

***Note: 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.***

# III DEFINITIONS

***Brassica napus varieties***: Argentine varieties

***Brassica rapa varieties***: Polish varieties

***Break-even/cost per bushel***: The price needed per bushel to cover the variable costs at the stated yield per acre of production.

***Co-efficient of variation (CV)***: The standard deviation expressed as a percentage of the mean.

***Contribution margin***: The amount of total revenue less variable costs that directly relate to the business operation available to contribute to fixed costs and return on investment, labour and management.

***Contribution margin per bushel***: The extra revenue per unit of production, which is available to service fixed costs. This illustrates to the producer the importance of a well-planned marketing strategy.

***Contribution margin per acre***: The amount of revenue remaining per acre after variable costs have been serviced, allowing the producer to manage other financial commitments, such as fixed costs.

***Damaged seed***: The percentage of seeds that were damaged, including green and brown seed, determined by a crush strip test.

***Days to maturity***: Actual calendar days from the date of seeding to approximately 30% seed colour change.

***Fixed costs***: Costs that remain relatively unchanged regardless of the volume of production (eg. land taxes, mortgage interest and machinery depreciation).

***Growing degree days (GDD)***: Heat accumulated above canola's base temperature. The heat accumulated each day is determined by adding the maximum and minimum temperatures and dividing the total by two to obtain a daily average. The base temperature for canola of 5°C is subtracted from the average to arrive at the number of growing degree days. The total growing degree days required for Argentine canola on average is 1040 growing degree days. Polish canola on average requires 850 growing degree days.[1]

***Least significant difference (LSD)***: The difference required for one treatment to be statistically different from another at the 90% confidence level, expressed in identical units. For example, if Variety A yielded 30 bu/ac and Variety B yielded 34 bu/ac and the LSD for that trial was 2.25, then Variety A is statistically different from Variety B because 34-30= 4, which is greater than 2.25. If the difference were less than 2.25, then the varieties would not be statistically different from each other.

1 Source: Canola Growers Manual

***Lodging ratio***: Crop canopy height divided by actual plant length. A measure of the lodging resistance of a particular variety.

***Opportunity costs***: The opportunity cost of a resource is the return the resource can earn when put to its best alternative.

***Variable costs***: Costs that vary directly with the volume of production or activity (eg. seed, fertilizer, fuel and repairs).

***Definitions provided by the ROYAL BANK in consultations with the Canola Council with reference from the Farm Accounting Standardization Manual©.***

# IV ECONOMIC ANALYSIS

## *A Canola Pricing System*

| Grade | Green Seed (%) | Total Damaged & Green Seed Allowed (%) | $/bu |
|---|---|---|---|
| # 1 | 0 - 2.0 | 3.0 | 5.00 |
| # 2 | 2.1 - 6.0 | 10.0 | 4.73 |
| # 3A | 6.1 - 10.0 | 15.0 | 4.43 |
| # 3B | 10.1 - 20.0 | 20.0 | 3.87 |
| Sample | Over 20.0 | Over 20.0 | 2.87 |

***Note 1:*** *The damaged and green, includes all frost, brown and green seed. This was determined by using a 500 seed crush strip test done on each sample from every treatment within a particular project trial.*

***Note 2:*** *High erucic acid varieties (eg. Millennium) are assigned a premium of **$.91** bu.*

***Note 3:*** *Specialty oil varieties are assigned a premium as follows:*
- *IMC 105, IMC 204, IMC 205, IMC 106 RR RR = **$0.61** bu*
- *Nex 500 = **$0.16** bu*
- *Nex 705, 710 = **$0.45** bu*

## *B. Cost Calculations & Assumptions*

The following costs were used in calculating economic returns for the various trials and treatments. Fertilizer and crop protection product prices were obtained from various dealers throughout the region. Prices reflect the western Canadian average for spring 2000, except for Aventis CropScience (spring 2001). Equipment costs were obtained from agrologists with the Royal Bank and are actual equipment variable costs from producers across Western Canada. There has been no value allocated for capital and fixed costs.

| CANOLA ARGENTINE VARIETY SEED COSTS | | | | | |
|---|---|---|---|---|---|
| ***B. napus*** | **$/lb** | **Distributor** | ***B. napus*** | **$/lb** | **Distributor** |
| Hyola 428 | 3.61 | Advanta Seeds | Nex 500 | 2.89 | Dow AgroSciences |
| Hyola 454 RR | 5.25 | Advanta Seeds | Nex 705 | 2.89 | Dow AgroSciences |
| Hylite 225 RR | 3.50 | Advanta Seeds | Nex 710 | 2.89 | Dow AgroSciences |
| Hylite 201 | 2.86 | Advanta Seeds | AC Excel | 0.95 | Hetland Seeds |
| Q2 | 2.19 | Agricore | InVigor 2153 | 3.75 | Inter-Ag |
| Zodiak Bx | 2.39 | Agricore | IMC 105 | 2.19 | Inter-Mountain Canola |
| HyCore 601 | 4.49 | Agricore | IMC 204 | 2.19 | Inter-Mountain Canola |
| Foremost | 2.29 | Agricore | IMC 205 | 2.19 | Inter-Mountain Canola |
| Conquest | 3.49 | Agricore | IMC 106 RR | 2.49 | Inter-Mountain Canola |
| LG Dawn | 3.09 | Agricore | LG3235 | 3.40 | Limagrain Canada Seeds Inc. |
| SW RideR | 3.99 | Agricore | LG3455 | 3.60 | Limagrain Canada Seeds Inc. |
| Exceed | 2.25 | Aventis CropScience | LG3525 | 3.60 | Limagrain Canada Seeds Inc. |
| InVigor 2573 | 4.50 | Aventis CropScience | LG3311 | 2.35 | Limagrain Canada Seeds Inc. |
| InVigor 2663 | 4.50 | Aventis CropScience | LG3366 | 2.35 | Limagrain Canada Seeds Inc. |
| Millennium 03 | 2.20 | CanAmera Foods | 45A51 | 3.40 | Proven Seeds |
| Canterra 1492 | 4.65 | Canterra Seeds | 44A89 | 2.45 | Proven Seeds |
| Canterra 1867 | 3.30 | Canterra Seeds | SW RideR | 3.99 | SK Wheat Pool / AgPro |
| Magellan | 2.29 | Cargill Seeds | SW5001 | 3.99 | SK Wheat Pool |
| 2631 LL | 2.27 | Cargill Seeds | Armor Bx | 2.25 | SK Wheat Pool |
| LG3345 | 3.45 | Cargill Seeds | Conquest | 2.95 | SK Wheat Pool |
| Cartier Bx | 2.50 | Cargill Seeds | Hi-Q | 2.25 | SK Wheat Pool |
| 46A73 | 3.15 | BASF | Quantum | 2.00 | SK Wheat Pool |
| 46A76 | 3.60 | BASF | SW Arrow | 1.79 | UFA |

Note: Seed cost may vary from location to location.
The above seed prices reflect prices available in October, 2000. Actual seed prices will depend upon the time of year the seed is purchased and discounts or incentives that may be available. Please check with your local retailer to get current prices for specific seed varieties.

| OTHER PRODUCT COSTS | | |
|---|---|---|
| **Product/Process** | **$** | **Distributor** |
| Calcium 5S | 0.07/lb of seed | Stoller / Agritrend |
| TUA (Technology Use Agreement) | 15.00/ac | Monsanto Canada Inc. |
| Seed Priming | N/A | Kamterter II L.L.C. |

| PRODUCT INFORMATION | | | |
|---|---|---|---|
| **Product** | **Common Name** | **Manufacturer/ Distributor** | **$/Unit Cost** |
| Assail | N/A | Aventis CropScience | N/A |
| Compas | clethodim + bromoxynil | Aventis CropScience | 838.00/ca |
| Decis 5EC | deltamethriin | Aventis CropScience | 160.00/2.0L |
| Fusion | fenoxaprop-p-ethyl + fluazifop-p-butyl | Aventis CropScience | 239.00/ca |
| Foundation | iprodione+thiram+lindane | Aventis CropScience | 0.47/lb |
| Foundation Lite | iprodione+thiram | Aventis CropScience | 0.32/lb |
| Liberty | glufosinate ammonium | Aventis CropScience | 229.00/13.5L |
| Rovral flo | iprodione | Aventis CropScience | 205.00/8.4L |
| Select | clethodim | Aventis CropScience | 630.00/ca |
| Accord | quinclorac | BASF Canada Inc. | 173.00/1.1kg |
| Poast Ultra | sethoxydim | BASF Canada Inc. | 620.00/ca |
| Ronilan EG | vinclozolin | BASF Canada Inc. | 734.50/12kg |
| Counter 5G | terbufos | BASF Canada Inc. | 68/20kg |
| Odyssey | imazamox + imazethapyr | BASF Canada Inc. | 1,048.00/ca |
| Edge | ethalfluralin | Dow AgroSciences Canada Inc. | 50.00/25kg |
| Lontrel 360 | clopyralid | Dow AgroSciences Canada Inc. | 610.00/4.45L |
| Lorsban | chlorpyrifos | Dow AgroSciences Canada Inc. | 177.00/10L |
| Vantage | glyphosate | Dow AgroSciences Canada Inc. | 89.50/10L |
| Vantage Plus | glyphosate | Dow AgroSciences Canada Inc. | 97.90/10L |
| Assure II | quizalofop ethyl | DuPont Canada Inc. | 660.00/ca |
| Benlate 50WP | benomyl | DuPont Canada Inc. | 530.00/10kg |
| Freedom Gold | quizalofop ethyl + thifensulfuron methyl | DuPont Canada Inc. | 878.00/ca |
| Muster | ethametsulfuron methyl | DuPont Canada Inc. | 638.00/320g |
| Muster Gold (40 rate) | ethametsulfuron methyl + quizalofop-ethyl | DuPont Canada Inc. | 798.00/ca |
| Muster Gold II (20 rate) | ethametsulfuron methyl + quizalofop-p-ethyl | DuPont Canada Inc. | 399.00/ca |
| Gaucho CS | imidacloprid + carbathiin + thiram | Gustafson | 1.27/lb seed |
| Gaucho Platinum | imidacloprid + carbathiin + thiram | Gustafson | 2.14/lb seed |
| Vitavax RS Flowable | carbathiin+thiram+lindane | Gustafson | 293.50/4L |
| Roundup Regular | glyphosate | Monsanto Canada Inc. | 89.90/10L |
| Roundup Transorb | glyphosate | Monsanto Canada Inc. | 97.90/10L |
| Helix | fludioxonil+metalaxyl+ difenoconazole+thiamethoxam | Novartis Crop Protection | 1.23/lb |
| Helix XTra | fludioxonil+metalaxyl+ difenoconazole+thiamethoxam | Novartis Crop Protection | 2.27/lb |
| Malathion 500 | malathion | United Agri-Products / IPCO | 120.00/10L |
| Touchdown | glyphosate | Zeneca Agro | 95.00/10L |
| Premiere Z | N/A | Zeneca Agro | N/A |

Note: ca - case, N/A - not available at time of publication

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

| CANOLA FERTILIZER COSTS | | | |
|---|---|---|---|
| **Fertilizer** | **Analysis** | **$/tonne** | **$/lb** |
| Anhydrous Ammonia | 82-0-0 | 498 | 0.28 |
| Ammonium Nitrate | 34-0-0 | 240 | 0.33 |
| Ammonium Sulphate | 21-0-0-24 | 250 | 0.24 |
| Ammonium Sulphate | 21-0-0-24 | 250 | 0.30 |
| Elemental Sulphur | 0-0-0-90 | 380 | 0.19 |
| Liquid Nitrogen | 28-0-0 | 170 | 0.28 |
| Liquid Phosphate | 10-34-0 | 325 | 0.35 |
| Liquid Sulphur | 15-0-0-20 | 190 | 0.22 |
| Phosphate | 11-52-0 | 365 | 0.26 |
| Potash | 0-0-60 | 190 | 0.14 |
| Urea | 46-0-0 | 270 | 0.27 |

| OTHER FERTILIZER COSTS | | |
|---|---|---|
| **Product** | **$/L** | **Distributor** |
| Bortrac 150 (boron) | 7.50 | Phosyn PLC |
| Sulphur F3000 | 4.00 | Phosyn PLC |

***Crop and Hail Insurance:***

Prices will vary from site to site.

***Machinery Cost:***

- Conventional tillage: $15.00/acre
- Direct seeding: subtract $6.00/acre
- Straight combining: subtract $2.00/acre

***Additional Machinery Costs:*** (Spraying Application)

- Aerial $4.25/acre
- Ground $3.75/acre

Note: Machinery costs reflect the average operating cost (such as fuel, lubrication and repairs) across western Canada (source Royal Bank of Canada).

***Marketing Cost:*** ($0.25/bu)

This cost was assigned to the variable cost using the Options Marketing System.

***Interest/Opportunity Cost:***

This cost calculation demonstrates the cost of money borrowed (at the current prime rate +1.5%) and charged on crop inputs and machinery operating costs. In 2000, 9% per annum over six months was used.

## *C. Economic Results Report (example)*

***Site:*** ***Vegreville, AB***

***B. napus Variety Trial:*** ***AC Excel***

| CALCULATION OF VALUE OF PRODUCTION | | | | |
|---|---|---|---|---|
| **Yield (bu/ac)** | **X** | **Price ($/bu)** | **=** | **($) Value of Production** |
| 32.5 | | 4.73 | | 153.73 |

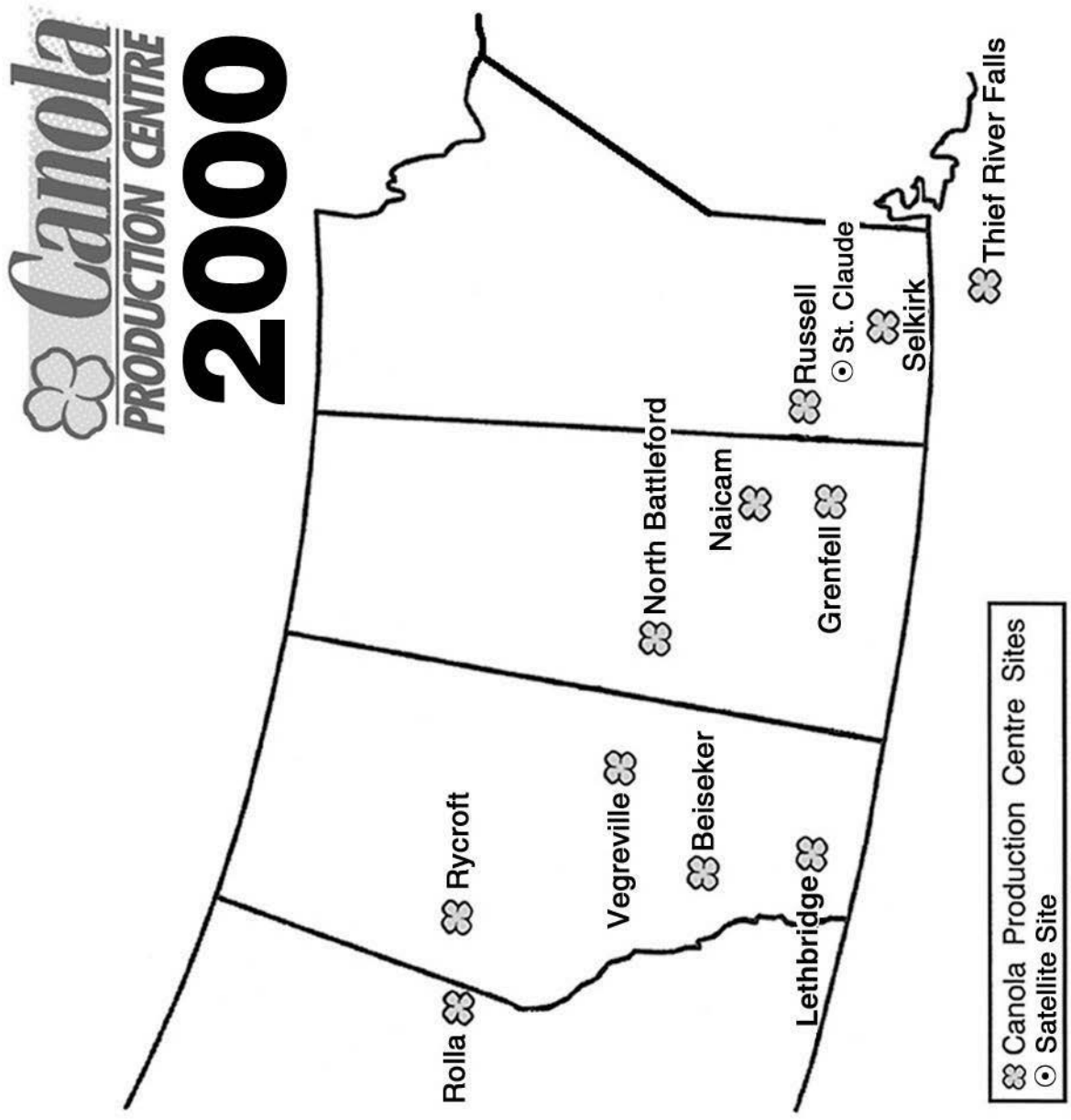
| CALCULATION OF VARIABLE COSTS ($/ac) | |
|---|---|
| Seed | 5.70 |
| Fertilizer | 38.35 |
| Herbicides/Fungicides | 28.60 |
| Insecticides | 0.00 |
| Machinery | 15.00 |
| Insurance | 0.00 |
| Marketing | 8.13 |
| Interest/opportunity | 4.11 |
| **Total Variable Costs** | 99.72 |

| CALCULATION OF CONTRIBUTION MARGIN | | | | |
|---|---|---|---|---|
| **Value of Production ($/ac)** | **-** | **Variable Costs ($/ac)** | **=** | **Contribution Margin ($/ac)** |
| 153.73 | | 99.72 | | 54.01 |

| Contribution Margin ($/ac) | / | Yield (bu/ac) | = | Contribution Margin ($/bu) |
|---|---|---|---|---|
| 54.01 | | 32.5 | | 1.66 |

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

## V SITE LOCATION MAP



# VI SITE INFORMATION

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

## *Location:* Selkirk, MB

***Co-operator:*** Angele and Mark Deprez

***Previous crop:*** Wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 4%

*Macronutrient Levels: (0-6", 6-24")*

| | |
|---|---|
| Nitrogen - | 54 lb/ac |
| Phosphorus - | >102 lb/ac |
| Potassium - | 932 lb/ac |
| Sulphur - | 82 lb/ac |

*Micronutrient Levels: (0-6")*

| | |
|---|---|
| Boron - | 9.5 lb/ac |
| Copper - | 13.3 lb/ac |
| Iron - | 61.5 lb/ac |
| Zinc - | 21.6 lb/ac |
| Chlorine - | 49.6 lb/ac |
| Manganese - | 2 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 46 | 25 | 10.2 | 60-70 | 5-10 | 0-15 | 10-15 |
| 38 | 50 | 7.9 | 55-65 | 5-10 | 0-15 | 10-15 |
| 26 | 75 | 4.5 | 30-40 | 5-10 | 0 | 5-10 |

***Target yield:*** 40 bu/ac

***Fertilizer applied:*** N - 73 lb/ac P - 13 lb/ac K - 0 lb/ac S - 15 lb/ac

***Soil zone:*** Moist Black Central North

***Soil texture:*** Clay

***Soil pH:*** 8.5

***Salinity:*** Non-saline (0.3 - 0.6 mS/cm)

***Tillage operations:*** N, K and S fertilizer was broadcast in granular form, followed by cultivation and harrowing for incorporation and seedbed preparation.

***Seeding method:*** All trials were seeded with a Morris MH-3100 hoe press drill with 7½" spacing. The phosphate fertilizer was seed-placed. Seed was single treated.

| | |
|---|---|
| Date: | May 5-16 |
| Depth: | ½" - 1" (Depending on moisture on date trials were seeded) |
| Rate: | Open-pollinated *B. napus* varieties - 6.1 lb/ac<br>Hybrid *B. napus* varieties - 5.0 lb/ac |
| Soil Temp: | Varied among seeding dates - around 10°C |

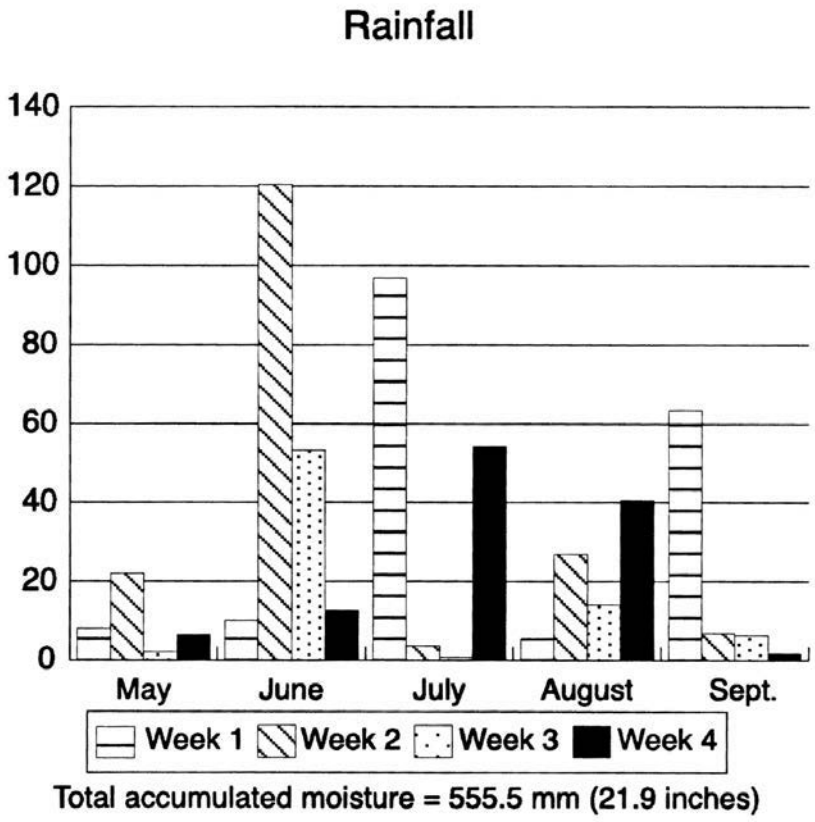
***Herbicides applied:*** Conventional - Muster Gold II (Assure II - 0.2 L/ac, Muster - 8 g/ac)
Freedom Gold - Assure II (0.2 L/ac), Freedom (8 g/ac)
Liberty Link - Liberty (1.35 L/ac), Select (0.025 L/ac)
Navigator/Compas - Select (0.08 L/ac), Compas (0.28 L/ac)
Roundup Ready - Roundup Transorb (0.5 L/ac)
Clearfield Production System - Odyssey (17 g/ac)

***Fungicides applied:*** Ronilan EG (0.3 kg/ac)

***Swathing:*** Started: August 8 Finished: August 15

***Combining:*** Started: September 13 Finished: September 15

***Comments:*** Warm and dry weather in late April resulted in an early start of seeding, with the first trial seeded on May 5. However, frequent rainshowers caused several delays and seeding was not completed until May 16. Emergence was generally good for all trials. The temperature dipped below freezing on May 9, 13-15 and 18, with the lowest temperature of -4.2°C recorded on the 18th. This caused some damage to the cotyledons of plants in the trials that had emerged. Warmer and drier conditions in the last two weeks of May and first week of June allowed the crop to recover. Herbicide applications were completed on a number of the earlier seeded trials of the canola. However, the remainder of June and first week of July brought large amounts of rainfall, which caused severe moisture stress to all trials and delayed herbicide application until the 6-7 leaf stage on the trials seeded last. These trials suffered greatly from the combination of moisture stress and weed competition. While the limited yield potential resulting from the excessive moisture would probably not have warranted a fungicide application, the wet conditions were ideal for disease development. Fungicide was applied to the bulk of the trials in an attempt to salvage as much yield data as possible from the site. The untreated check in the fungicide trial did show considerable sclerotinia development by swathing time. No other disease or insect pests were observed at significant levels.




| ***Location:*** | **St. Claude, MB** |
|---|---|

***Co-operator:*** Gilbert and Liliane Bernard

***Previous crop:*** Oats

***Soil test results: (Norwest)***

*Organic matter content:* N/A

*Macronutrient Levels: (0-12")*
Nitrogen - 40 lb/ac
Phosphorus - 11 lb/ac
Potassium - 182 lb/ac
Sulphur - 113 lb/ac

*Micronutrient Levels: (0-12")* - N/A

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Environmental Conditions | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 43 | Excellent | N/A | 96 | 46 | 52 | 0 |
| 34 | Good | N/A | 82 | 40 | 44 | 0 |

***Target yield:*** 40 bu/ac

***Fertilizer applied:*** N - 94 lb/ac P - 33 lb/ac K - 38 lb/ac S - 15 lb/ac

***Soil zone:*** Manitoba Moist

***Soil texture:*** Sandy loam

***Soil pH:*** 7.9

***Salinity:*** Non-saline (1.7 mS/cm)

***Tillage operations:*** Treflan and 117 lb/ac of a fertilizer blend (5.6-25.6-29.9-1) were incorporated in October of 1999. Anhydrous ammonia was applied at a rate of 75 lb/ac of actual N in April of 2000.

***Seeding method:*** The field was seeded with a double disc press drill, and the balance of the fertilizer was seed-placed at that time.

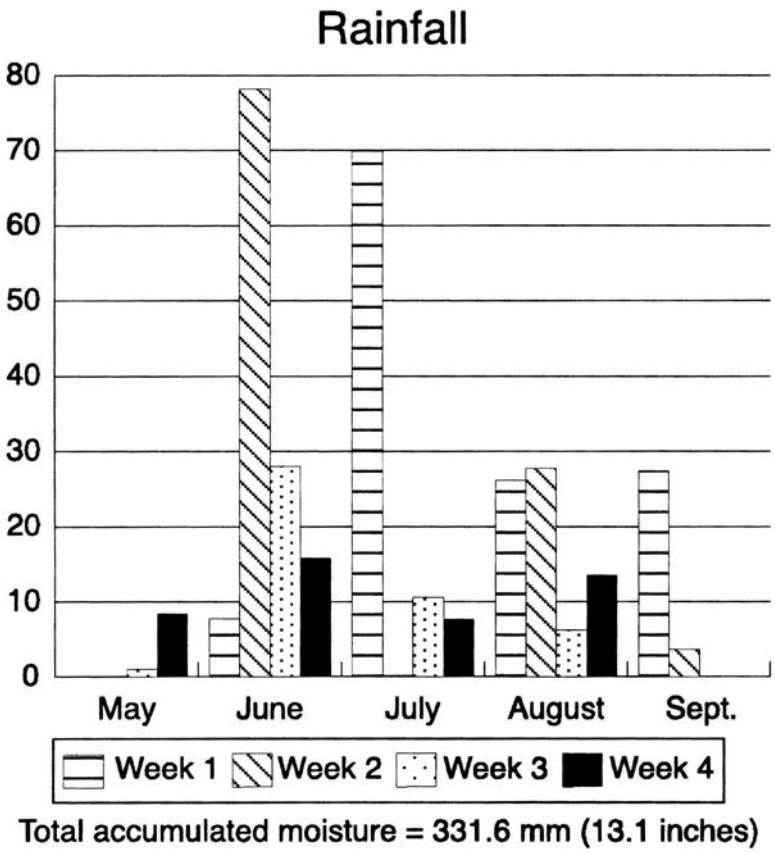
Date: May 9
Depth: ¾ "
Rate: 4.7 lb/ac of seed (46A76)

***Herbicides applied:*** Poast Ultra (0.13 L/ac), Muster (8 g/ac)

***Swathing:*** Started: August 15 Finished: August 15

***Combining:*** Started: September 12 Finished: September 12

***Comments:*** Soil moisture at time of seeding was sufficient for good stand establishment. Poast Ultra and Muster were applied to control some weed escapes from the preplant incorporated herbicide. At about the 5-6 leaf stage it was noted that patches throughout the field were exhibiting symptoms of stunted growth, as well as leaf cupping and purpling. Tissue tests of the stunted plants indicated deficiencies of both boron and sulphur, and a foliar nutrient application trial was established. In spite of large amounts of rainfall at times throughout the summer, moisture stress was minimized as a result of the light soil texture. While the plants recovered well after the foliar applications, the canopy was not particularly dense due to the early stunting of the plants. As a result, no fungicide was applied and no significant sclerotinia was apparent at swathing. Heavy rains between swathing and combining resulted in some damage due to sprouting.




| ***Location:*** | **Russell, MB** |
|---|---|

***Co-operator:*** Doug Bily

***Previous crop:*** Barley

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 3.7%

*Macronutrient Levels: (0-6", 6-24")*

| | |
|---|---|
| Nitrogen - | 41 lb/ac |
| Phosphorus - | 40.8 lb/ac |
| Potassium - | 881 lb/ac |
| Sulphur - | 82 lb/ac |

*Micronutrient Levels: (0-6")*

| | |
|---|---|
| Boron - | 5.1 lb/ac |
| Copper - | 4.2 lb/ac |
| Iron - | 144 lb/ac |
| Zinc - | 6 lb/ac |
| Chlorine - | 49.6 lb/ac |
| Manganese - | 35.4 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 42 | 25 | 9.7 | 50-60 | 20-25 | 0-15 | 10-15 |
| 35 | 50 | 7.7 | 50-60 | 15-20 | 0-15 | 10-15 |
| 24 | 75 | 4.7 | 30-40 | 5-10 | 0 | 5-10 |

***Target yield:*** 40 bu/ac

***Fertilizer applied:*** N - 60 lb/ac P - 25 lb/ac K - 0 lb/ac S - 15 lb/ac

***Soil zone:*** Moist Black Northwest

***Soil texture:*** Clay

***Soil pH:*** 8.0

***Salinity:*** Non-saline (0.4-0.8 mS/cm)

***Tillage operations:*** The field was cultivated with a field cultivator with mounted harrows. All of the fertilizer was banded as liquid in the spring using a Bourgault coulter applicator.

***Seeding method:*** All trials were seeded with a Morris MH-3100 hoe press drill with 7½" spacing. All seed was dual treated with Counter 5G.

Date: May 20-21
Depth: 1"
Rate: Open-pollinated *B. napus* varieties - 5.7 lb/ac of seed
Hybrid *B. napus* - 5.0 lb/ac of seed
Soil Temp: 13°C

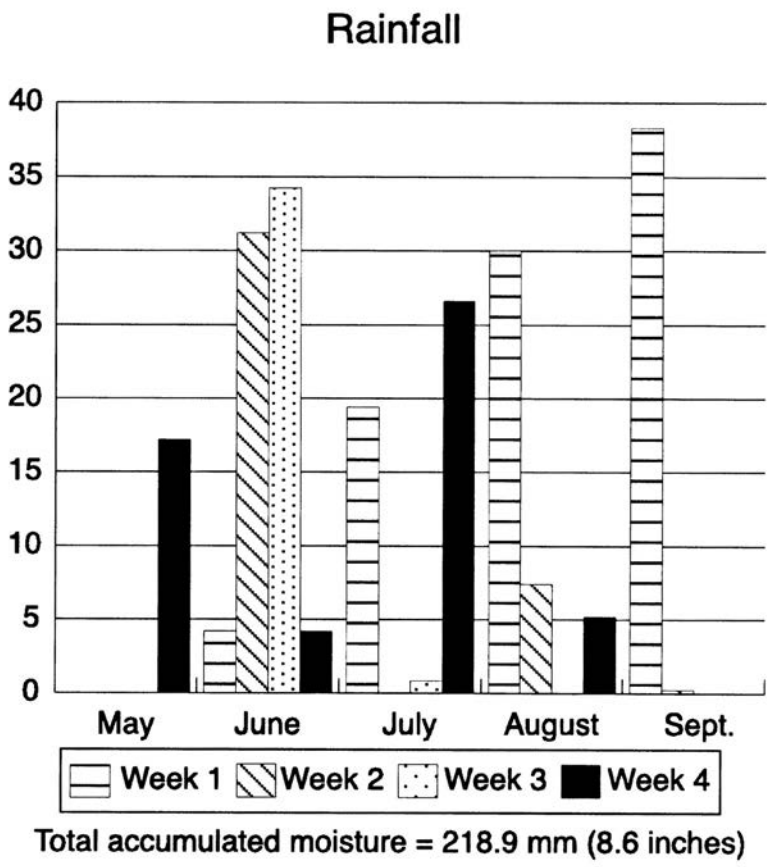
***Herbicides applied:*** Conventional - Select (0.08 L/ac), Muster (8 g/ac), Lontrel (0.17 L/ac)
Liberty Link - Liberty (1.35 L/ac), Select (0.025 L/ac)
Navigator/Compas - Select (0.08 L/ac), Compas (0.28 L/ac)
Roundup Ready - Roundup Transorb (0.5 L/ac)
Clearfield Production System - Odyssey (17 g/ac), Lontrel (0.17 L/ac)

***Fungicide applied:*** Rovral flo (0.8 L/ac)

***Swathing:*** Started: August 18 Finished: August 25

***Combining:*** Started: September 24 Finished: September 26

***Comments:*** Soil moisture conditions were fair to good at the time of seeding, and rain showers the following week resulted in rapid emergence and good stand establishment. Heavy rain showers throughout the summer contributed to some localized flooding of potholes, but conditions were generally good. No significant disease or insect pest damage was noted. Fungicide was applied for sclerotinia prevention on the basis of high yield potential and moist, humid conditions at flowering.




| ***Location:*** | **Grenfell, SK** |
|---|---|

***Co-operator:*** Mike Kent

***Previous crop:*** Hard Red Spring Wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* N/A

*Macronutrient Levels: (0-12")*

| | |
|---|---|
| Nitrogen - | 45 lb/ac |
| Phosphorus - | 44 lb/ac |
| Potassium - | 1080+ lb/ac |
| Sulphur - | 77 lb/ac |

*Micronutrient Levels: (0-12")*

| | |
|---|---|
| Boron - | 5.6 lb/ac |
| Copper - | 6.9 lb/ac |
| Iron - | 168 lb/ac |
| Zinc - | 6.3 lb/ac |
| Manganese - | 48 lb/ac |
| Chlorine - | N/A |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 42 | <25 | 11.6 | 90-100 | 20-25 | 0-15 | 10-15 |
| 35 | 25 | 9.9 | 65-75 | 20-25 | 0-15 | 10-15 |
| 32 | 50 | 9.0 | 50-60 | 20-25 | 0-15 | 10-15 |

***Target yield:*** 40 bu/ac

***Fertilizer applied:*** N - 84 lb/ac P - 20 lb/ac K - 0 lb/ac S - 15 lb/ac

***Soil association/zone:*** Oxbow/Black

***Soil texture:*** Clay Loam

***Soil pH:*** 7.5 at depth of 0-6”

***Salinity:*** Non-saline (conductivity 0.7 mS/cm)

***Tillage operations:*** Anhydrous ammonia was applied with 1” openers to a depth of 4". The standing stubble was cultivated and heavy harrowed twice.

***Seeding method:*** Seeded with a JD 9450 Hoe Press Drill with 7" row spacings.
Date: May 16-17
Depth: ½ to ¾"
Rate: 6.5 lb/ac open pollinated varieties
5.0 lb/ac for hybrid varieties
Soil Temp: 13ºC-15ºC at a depth of 1½"

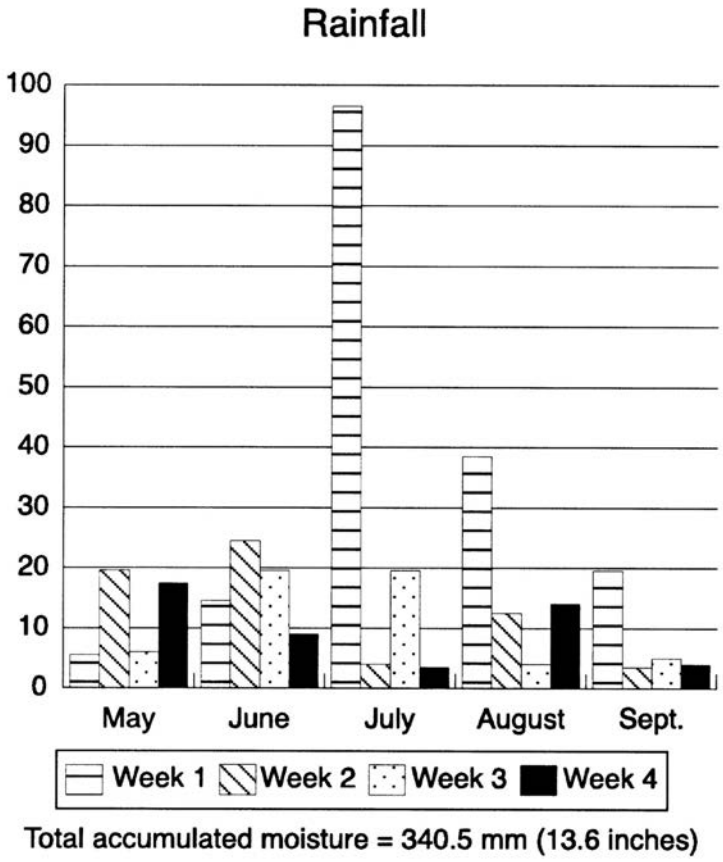
***Pesticides applied:*** Poast Ultra (0.13 L/ac or 60 ac/case) was applied over the entire site at the cotyledon stage on May 29 to control volunteer wheat. The following herbicides were applied at the 3-leaf stage: Muster (8 g/ac or 40 ac/pouch), Poast Ultra (0.13 L/ac or 60 ac/case) and Lontrel (0.17 L/ac or 26 ac/jug) on all conventional *B. napus* treatments. Liberty Link treatments received Liberty (1.35 L/ac or 10 ac/jug). Roundup Ready treatments received Roundup Transorb (0.5 L/ac). Navigator treatments received Compas (40 ac/case).

***Swathing:*** Started: August 17 Finished: August 28

***Combining:*** Started: September 9 Finished: September 11

***Comments:*** Excellent moisture and warm soil temperatures resulted in rapid emergence. Rainfall was frequent over most of the growing season. Growing conditions were ideal for prolific plant growth throughout the summer. Weed pressure was moderate to heavy. Volunteer wheat, stinkweed and buckwheat were predominant weeds. Flea beetle activity was moderate during early plant development (2-6 leaf stage). Treatment involved dual blending (1:1 ratio of Counter 5G to seed) to the perimeters of all trials. No foliar insecticide was applied

due to rapid plant growth during this period. Assessments using the sclerotinia stem rot checklist (*Canola Growers Manual*, page 1054) and the sclerotinia petal test kit results (43% infection) indicated no need to apply a fungicide. A heavy rainfall (74.5 mm) on July 6 combined with an abundance of plant growth resulted in lodging of the crop. Other disease pressure was low. Hail caused minimal damage to swathed treatments on September 4.




| ***Location:*** | **Naicam, SK** |
|---|---|

***Co-operators:*** Eric Cropper
Naicam Marketing Club

***Previous crop:*** Hard Red Spring Wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 7.5% (0-6")

*Macronutrient Levels: (0-12")*

| | |
|---|---|
| Nitrogen - | 33 lb/ac |
| Phosphorus - | 30 lb/ac |
| Potassium - | 275 lb/ac |
| Sulphur - | 29 lb/ac |

*Micronutrient Levels: (0-12")*

| | |
|---|---|
| Boron - | 3.0 lb/ac |
| Copper - | 0.9 lb/ac |
| Iron - | 41 lb/ac |
| Zinc - | 2.8 lb/ac |
| Manganese - | 11 lb/ac |
| Chlorine - | 12 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 50 | <25 | 12.7 | 120-130 | 25-30 | 5-15 | 20-25 |
| 39 | 25 | 9.5 | 70-80 | 25-30 | 5-15 | 20-25 |
| 31 | 50 | 7.0 | 65-75 | 20-25 | 5-15 | 15-20 |

***Target yield:*** 45 bu/ac

***Fertilizer applied:*** N - 102 lb/ac P - 20 lb/ac K - 10 lb/ac S - 15 lb/ac

***Soil association/zone:*** Oxbow/Black

***Soil texture:*** Clay Loam

***Soil pH:*** 7.9 at depth of 0-6"

***Salinity:*** Non Saline (conductivity 0.2 mS/cm)

***Tillage operations:*** Anhydrous ammonia was applied with ¾" knife opener into standing stubble then harrowed.

***Seeding method:*** Seeded with a JD 9450 Hoe Press Drill with 7" row spacings.

Date: May 3-6

Depth: ¾ to 1"

Rate: 6.5 lb/ac open pollinated varieties
5.0 lb/ac hybrid varieties

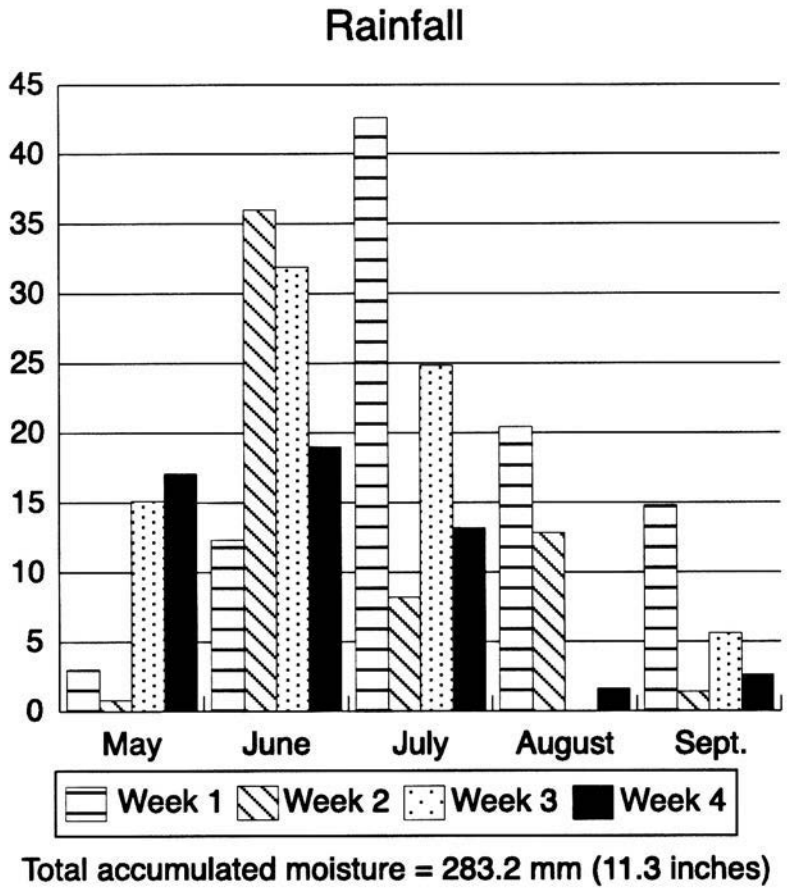
Soil Temp: 7ºC to 9ºC at a depth of 1½"

***Pesticides applied:*** Muster (8 g/ac or 40 ac/pouch), Poast Ultra (0.13 L/ac or 60 ac/case) and Lontrel (0.17 L/ac or 26 ac/jug) were applied to all conventional *B. napus* treatments. Liberty Link treatments received Liberty (1.35 L/ac or 10 ac/jug). Roundup Ready treatments received Roundup Transorb (0.5 L/ac). Odyssey (17 g/ac or 40 ac/case) tank mixed with Lontrel (0.17 L/ac or 26 ac/jug) was applied to Clearfield treatments. Navigator treatments received Compas (40 ac/case). Freedom Gold (Freedom @ 8 g/ac and Assure II @ 0.2 L/ac or 40 ac/case) was applied to the variety 46A73. All herbicides were applied at the 2-3 leaf stage, except Freedom Gold (6-leaf stage). The entire field (except Seed Treatment trial) received Decis 5EC at the rate of 0.05 L/ac, to control flea beetles.

***Swathing:*** Started: August 18 Finished: August 28

***Combining:*** Started: September 13 Finished: September 28

***Comments:*** Cool temperatures (mean daily temperature of 8ºC) and heavy trash conditions from May 5 to emergence on May 23 resulted in delayed and uneven emergence. A killing frost on May 30 (-3.8ºC) and light frost on June 10 (-0.7ºC), combined with moderate to heavy flea beetle activity (June 1-16) reduced plant stands by up to 54% in some areas of the field. Areas hardest hit by frost had heavy trash conditions. An Integrated Pest Management strategy was adopted which involved seeding the perimeter of the field with dual treated seed (1:1 ratio of Counter 5G to seed). Weed pressure was moderate to heavy. Volunteer wheat, stinkweed and Canada thistle were predominant weeds. These factors reduced yield expectations. Assessments using the sclerotinia stem rot checklist (*Canola Growers Manual*, page 1054), sclerotinia petal test kit results (35% infection) and reduced plant stands indicated no need to apply a fungicide. Insect pressure (other than flea beetles) was low. Other disease pressure was low.



| ***Location:*** | **North Battleford, SK** |
|---|---|

***Co-operator:*** Everett Seib

***Previous crop:*** Spring wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 4.1%

*Macronutrient Levels: (0-12")*

| | |
|---|---|
| Nitrogen - | 40 lb/ac |
| Phosphorus - | 41 lb/ac |
| Potassium - | 1016 lb/ac |
| Sulphur - | 74 lb/ac |

*Micronutrient Levels: (0-12")*

| | |
|---|---|
| Copper - | 2.8 lb/ac |
| Iron - | 110 lb/ac |
| Zinc - | 5.3 lb/ac |
| Manganese - | 43 lb/ac |
| Chloride - | 27 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 35 | <25 | 9.9 | 70-80 | 20-25 | 0-15 | 10-15 |
| 32 | 25 | 9.0 | 55-65 | 20-25 | 0-15 | 10-15 |
| 25 | 50 | 6.8 | 45-55 | 15-20 | 0-15 | 10-15 |

***Target yield:*** 35 bu/ac

***Fertilizer applied:*** Spring: N - 80 lb/ac P - 25 lb/ac K - 0 lb/ac S - 15 lb/ac

***Soil zone:*** Black

***Soil texture:*** Loam

***Salinity:*** Non-saline (conductivity 0.2 mS/cm)

***Tillage operations:*** Spring banding, harrow

***Seeding method:*** Seeded with JD 9450 hoe drill with 7" spacings

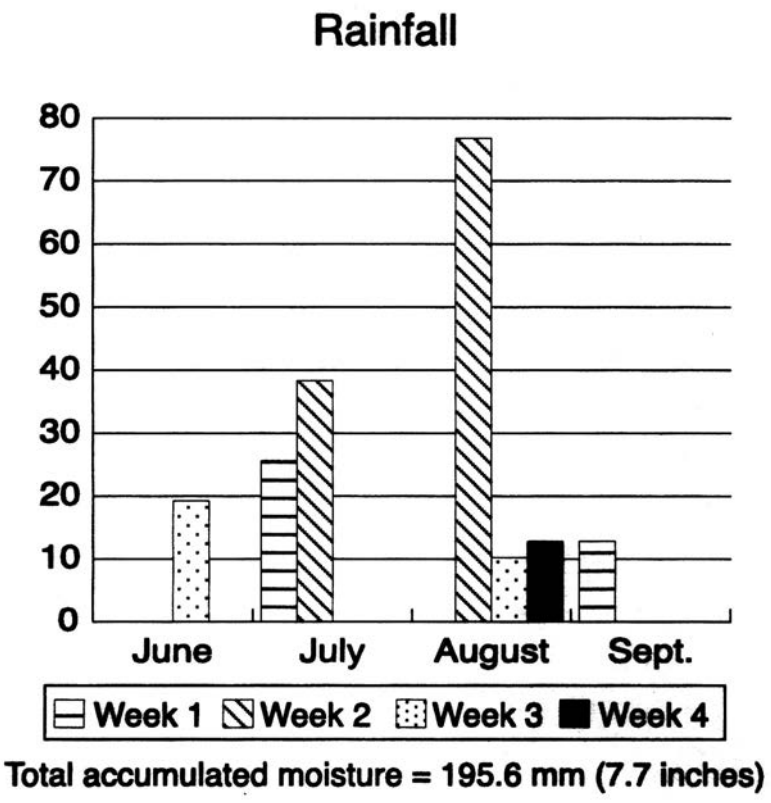
| | |
|---|---|
| Date: | May 17-19 |
| Depth: | 1" |
| Rate: | 6 lb/ac open pollinated, 5 lb/ac hybrid |
| Soil Temp: | 15°C |

***Herbicides applied:*** Pre-burnoff with Roundup Transorb (1 L/ac). In crop application, as per trial.

***Swathing:*** Started: August 24 Finished: September 11

***Combining:*** Started: September 28 Finished: October 2

***Comments:*** Emergence was slow and uneven due to very dry conditions at seeding. Germination was not complete until after the first significant rainfall on June 12. Crop establishment and development was hindered by very dry conditions. Heavy Canada thistle infestation and damage from gophers also caused delays in crop development. The overall crop was thin and short due to low rainfall throughout much of the growing season. A heavy windstorm on September 30 caused extensive damage to unharvested treatments and some trials were lost.




| ***Location:*** | **Vegreville, AB** |
|---|---|

***Co-operator:*** Lloyd Boere

***Previous crop:*** Barley

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 7.2%

*Macronutrient Levels: (0-12")*

| | |
|---|---|
| Nitrogen - | 73 lb/ac |
| Phosphorus - | 34 lb/ac |
| Potassium - | 708 lb/ac |
| Sulphur - | 64 lb/ac |

*Micronutrient Levels: (0-12")*

| | |
|---|---|
| Copper - | 2.6 lb/ac |
| Iron - | 709 lb/ac |
| Zinc - | 17.7 lb/ac |
| Manganese - | 72 lb/ac |
| Boron - | 6.1 lb/ac |
| Chloride - | 11.0 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 35 | <25 | 9.9 | 15-25 | 25-30 | 0-15 | 10-15 |
| 34 | 25 | 9.5 | 10-20 | 25-30 | 0-15 | 10-15 |
| 27 | 50 | 7.5 | 0-10 | 20-25 | 0-15 | 10-15 |

***Target yield:*** 35 bu/ac

***Fertilizer applied:*** Fall - N - 60 lb/ac P - 0 lb/ac K - 0 lb/ac S - 20 lb/ac
Spring - N - 20 lb/ac P - 25 lb/ac K - 0 lb/ac S - 10 lb/ac

***Soil zone:*** Black North East

***Soil texture:*** Loam

***Salinity:*** Non-saline (conductivity 0.2 mS/cm)

***Tillage operations:*** Fall fertilizer application

***Seeding method:*** Seeded with JD 9450 hoe drill with 7" spacings.
Date: May 9-13
Depth: ¾ "
Rate: 6 lb/ac open pollinated, 5 lb/ac hybrid
Soil Temp: 12°C

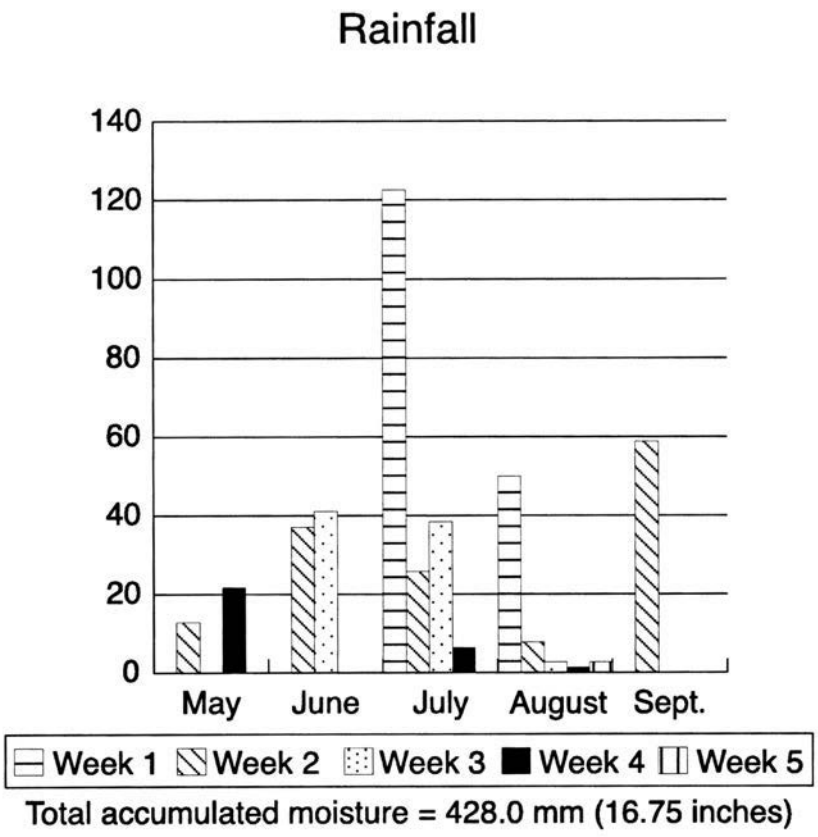
***Herbicides applied:*** Pre-seed burnoff with Vantage Plus (0.5 L/ac) occurred on May 8. Conventional canola was treated with a split application of Muster Gold II (Assure II @ 0.2 L/ac, Muster @ 12 g/ac).

***Swathing:*** Started: August 23 Finished: September 9

***Combining:*** Started: September 25 Finished: September 29

***Comments:*** Conditions were dry when attempting to seed on May 9. Therefore, additional nitrogen was top dressed on June 29 rather than seed-placed. Wild oats were predominant throughout the field and a pre-burnoff using Vantage Plus (0.5 L/ac) was applied. Moisture conditions improved during seeding and conditions became excellent for rapid and uniform germination. Frost occurred at the end of May and damage was observed on approximately 75% of the field. Very few plants were killed by the frost. Moisture was excellent throughout

the remainder of the growing season and a heavy crop developed. A sclerotinia petal test did not indicate high levels of petal infection and therefore no fungicide was applied. Light to moderate sclerotinia infection was noticed throughout the field. Fusarium wilt was also observed in the field and infection levels varied among varieties. A hailstorm in early August caused some damage to parts of the field. Hail damage caused high green seed counts on some treatments.




| ***Location:*** | **Beiseker, AB** |
|---|---|

***Co-operator:*** Kenton & Bert Ziegler

***Previous crop:*** Wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 5.6% (0-6”)

| *Macronutrient Levels: (0-12")* | | *Micronutrient Levels: (0-12")* | |
|---|---|---|---|
| Nitrogen - | 33 lb/ac | Boron - | 2.2 lb/ac |
| Phosphorus - | 24 lb/ac | Copper - | 0.9 lb/ac |
| Potassium - | 600+ lb/ac | Iron - | 78 lb/ac |
| Sulphur (0-6") - | 20 lb/ac | Zinc - | 6.4 lb/ac |
| Sulphur (6-12") - | 16 lb/ac | Manganese - | 14 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 53 | <25 | 17.1 | 110-120 | 25-30 | 0-15 | 5-10 |
| 47 | 25-50 | 15.1 | 105-115 | 25-30 | 0-15 | 0-10 |
| 35 | 50 | 12.9 | 65-75 | 25-30 | 0-15 | 0-10 |

***Target yield:*** 35 bu/ac

***Fertilizer applied:*** N - 68 lb/ac P - 20 lb/ac K - 9 lb/ac S - 10 lb/ac

***Soil zone:*** Moist Dark Brown

***Soil texture:*** Loam/Clay Loam

***Salinity:*** Non-saline

***Tillage operations:*** The site was heavy harrowed prior to the spring broadcasting of urea and ammonium sulphate (65 lb/ac N and 10 lb/ac S actual). The field was harrowed then seeded.

***Seeding method:*** Seeded with a JD9450 Hoe Press Drill with 7" spacing. A blend of 7-36-18-0 was seed-placed at 55 lb/ac.

Date: May 16-17
Depth: ½ - ¾"
Rate: 5.5 lb/ac *B. napus* for all trials unless otherwise stated
Soil Temp: 10ºC

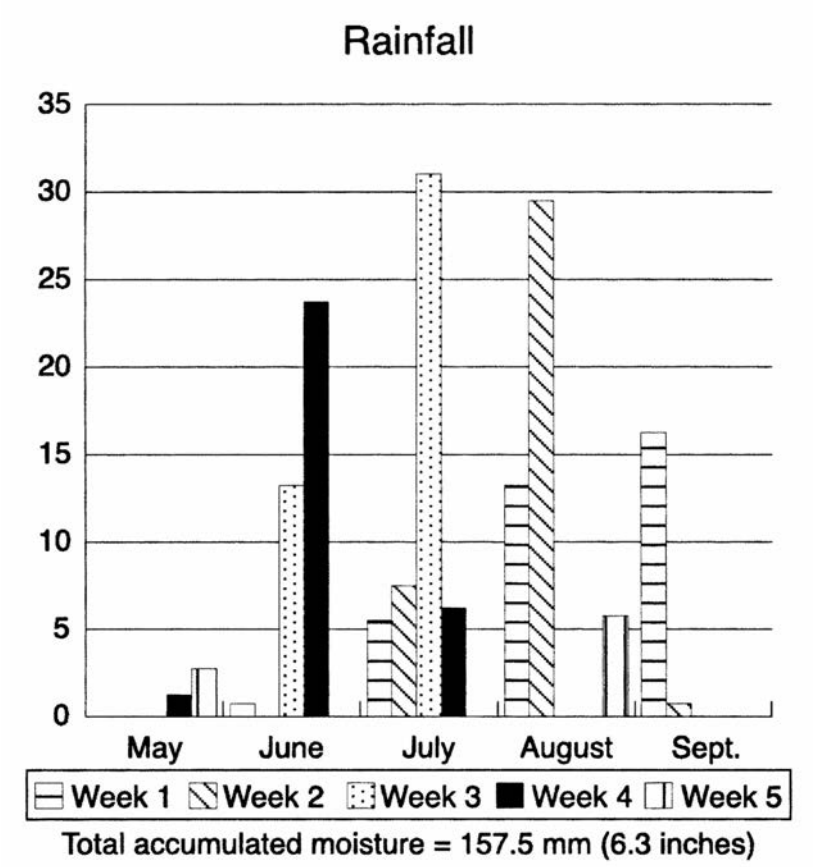
***Pesticides applied:*** Pre-seed burnoff with Vantage Plus was applied at a rate of 750 mL/ac. With the exception of the systems and seed treatment trials, Muster Gold II (Assure @ 200 mL/ac, Muster @ 10 g/ac) and Lontrel @ 227 mL/ac were applied. Lorsban was applied at 400 mL/ac to control lygus bugs.

***Swathing:*** Started: August 29 Finished: September 7

***Combining:*** Started: September 27 Finished: September 29

***Comments:***

Good spring moisture resulted in even emergence. Cool conditions and heavy crop residue kept soil temperatures cool, which resulted in slow growth. Frosts on May 24, 30, and June 1 resulted in variable damage to the crop. Plants growing in areas with heavy crop residue had more visible damage than plants that had more exposed soil surrounding them. Some plant losses were noted. Recovery from the frost was slow. Plants hit hardest by the frost never fully recovered and remained spindly and short. Flowering started in the first week of July. A rainstorm on July 16 resulted in many flower petals being stripped off the buds. Further examination revealed an area of blanks on the main stem that was seen throughout the site. Lygus bug populations were non-existent to very low (one per ten sweeps) until mid flower. At the later stage of flowering numbers reached five per sweep, which exceeded the threshold. The site was sprayed with Lorsban. Efficacy was rated as very good. A hailstorm on August 13 caused an estimated 70% damage. Severity of the damage was dependent on the maturity level of the individual treatments. Examination of the plants revealed split and severely bruised pods on the stems, and many pods lying on the ground. Stem breakage was noted throughout. Seeds in the affected pods were slow to mature, with some seed germinating within the pod. As seeds were maturing on the main stem, new branches formed and most treatments within the trials began to re-flower. Most swathing was completed when seed colour change was 35%.



## *Location:* Lethbridge, AB (Irrigation)

***Co-operators:*** Tom & Joe Shigehiro

***Previous crop:*** Wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 2.3% (0-6")

| *Macronutrient Levels: (0-12")* | | *Micronutrient Levels: (0-12")* | |
|---|---|---|---|
| Nitrogen - | 48 lb/ac | Copper - | 2.1 lb/ac |
| Phosphorus - | 51+ lb/ac | Iron - | 19 lb/ac |
| Potassium - | 510+ lb/ac | Zinc - | 1.5 lb/ac |
| Sulphur (0-6") - | 18 lb/ac | Manganese - | 7 lb/ac |
| Sulphur (6-12") - | 21 lb/ac | Boron - | 0.9 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 43 | N/A | 16.1 | 55-65 | 20-25 | 0-15 | 0-10 |
| 48 | N/A | 18.1 | 60-70 | 20-25 | 0-15 | 5-10 |
| 60 | N/A | 22.4 | 95-105 | 20-25 | 0-15 | 5-10 |

***Target yield:*** 60 bu/ac

***Fertilizer applied:*** N -114 lb/ac P - 22 lb/ac K - 11 lb/ac S - 10 lb/ac

***Soil association/zone:*** 60% Lethbridge lacustrine, 40% Ready-made till/Dark Brown

***Soil texture:*** Clay / Clay Loam

***Salinity:*** Non-saline

***Tillage operations:*** The site was fall cultivated, irrigated and harrowed. Prior to seeding, a blend of 41-0-0-4 (267 lb/ac) was broadcast then harrowed.

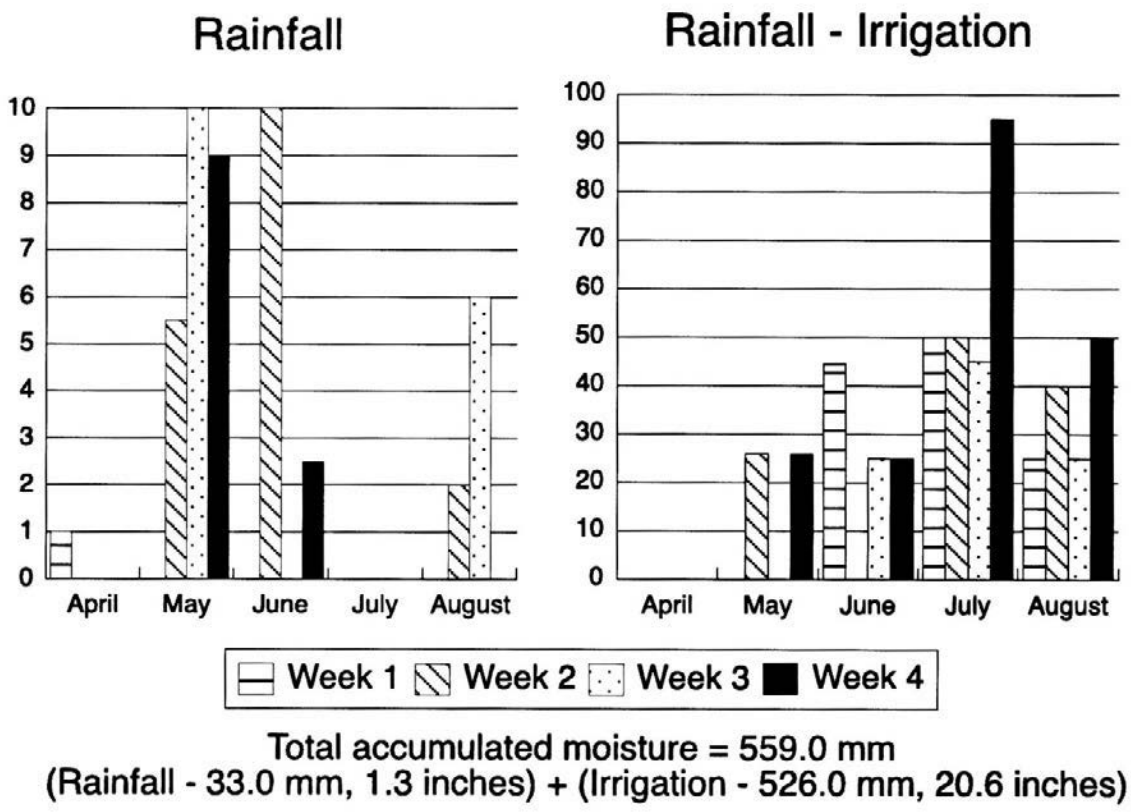
***Seeding method:*** Seed-placed blend of 7-37-18-0 at a rate of 58 lb/ac.
Date: April 28, May 6 and 7
Depth: ½ - ¾"
Rate: 4 lb/ac of *B. napus*, except for specific trials
Soil Temp: 6ºC

***Pesticides applied:*** Vantage Plus (750 mL/ac) was applied as a pre-seed burnoff. With the exception of specific trials, Muster Gold II (200 mL/ac Assure, 8 g/ac Muster) and Lontrel (227 mL/ac) were applied. Decis (70 mL/ac) was applied twice (June 26, July 19) to control the cabbage seedpod weevil.

***Swathing:*** Started: August 12 Finished: August 21

***Combining:*** Started: September 14 Finished: September 16

***Comments:*** Soil moisture prior to seeding was poor to fair even though the field was fall irrigated. To conserve soil moisture, Vantage Plus was sprayed across the site to control weeds that were present prior to seeding. After seeding, ¾" of water was applied to promote even germination. Germination was even and rapid. Post emergent weather conditions (dry and windy), necessitated frequent irrigation to maintain good soil moisture levels. Damage from frost (June 12) was noted in areas where crop residue was left on the soil surface. Plant recovery was excellent in most areas. Few plants were lost. At the beginning of flowering it was discovered that the irrigation pivot was not applying water evenly. Certain areas were receiving adequate irrigation water whereas other areas were not. The affected areas were very noticeable. At swathing, the affected areas were removed from the trials. Cabbage seedpod weevils were noticed feeding on emerging buds early in the season. Sweep net sampling revealed weevil numbers well above threshold levels of three per sweep. Decis was sprayed when the majority of the crop was at 10% bloom. Continued sweep net sampling revealed no pod weevils until twenty days after Decis application. Twenty-two days after the first application of Decis, weevil numbers were above threshold levels, and a second application of Decis occurred. Pod sampling at maturity revealed no larvae or exit holes. Sclerotinia petal testing was conducted and petal infection was extremely low and therefore no fungicide was applied. After swathing was completed, 1" of water was applied to assist the curing process.




| ***Location:*** | **Lethbridge, AB (Dryland)** |
|---|---|

***Co-operator:*** Rod & Ike Lanier

***Previous crop:*** Wheat

***Soil test results: (Enviro-Test Labs)***

*Organic matter content:* 2.3% (0-6")

| *Macronutrient Levels: (0-12")* | | *Micronutrient Levels: (0-12")* | |
|---|---|---|---|
| Nitrogen - | 62 lb/ac | Copper - | 1.7 lb/ac |
| Phosphorus - | 11 lb/ac | Iron - | 24 lb/ac |
| Potassium - | 540+ lb/ac | Zinc - | 2.5 lb/ac |
| Sulphur (0-6") - | 22 lb/ac | Manganese - | 12 lb/ac |
| Sulphur (6-12") - | 18 lb/ac | Boron - | 0.6 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 16 | 50 | 6.1 | 0 | 25-30 | 0-15 | 5-10 |
| 22 | 25 | 8.2 | 0 | 30-35 | 0-15 | 5-10 |
| 35 | <25 | 13.2 | 10-20 | 30-35 | 0-15 | 5-10 |

***Target yield:*** 30 bu/ac

***Fertilizer applied:*** N - 70 lb/ac P - 26 lb/ac K - 11 lb/ac S - 11 lb/ac

***Soil association/zone:*** 85% Lethbridge lacustrine, 15% Ready-made till/Brown

***Soil texture:*** Loam/Clay Loam

***Salinity:*** Non-saline (0.1 mS/cm)

***Tillage operations:*** Anhydrous ammonia at 60 lb N per acre was banded with a coulter applicator into standing stubble in the fall of 1999. The field was spring harrowed then direct seeded. A blend of 13-24-10-10 was seed-placed at a rate of 112 lb/ac.

***Seeding method:***

| | |
|---|---|
| Date: | April 28, May 8 |
| Depth: | ½ - ¾" |
| Rate: | 4.5 lb/ac *B. napus* |
| Soil Temp: | 10ºC |

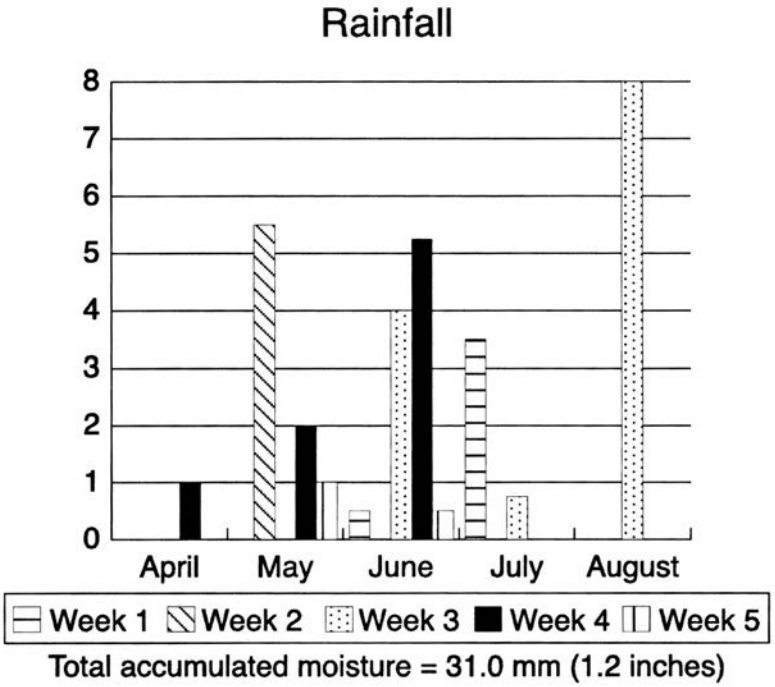
***Pesticides applied:*** Roundup Transorb at 500 mL/ac was applied as a pre-seeding burnoff on April 25. With the exception of the systems trial, Muster Gold II (Assure at 200 mL/ac, Muster at 8 g/ac) and Lontrel at 227 mL/ac were applied. Decis at 70 mL/ac was applied to control the cabbage seedpod weevil. Reglone at 800 mL/ac was applied as a pre-harvest treatment.

***Swathing:*** Straight cut

***Combining:*** September 8

***Comments:*** Seedbed moisture at the time of seeding was poor to fair. Winds further dried out the seedbed, which resulted in variable emergence. Emergence was observed well into June. Lack of moisture through May and June restricted plant growth. Rain showers were isolated and total accumulations were low (the site would receive 2 mm of rain and then it would be windy for three to four days, evaporating any moisture near the surface). A frost on June 12 caused crop damage and some plants were lost. The surviving plants had to re-grow under harsh conditions. Plants stayed short and spindly for the remainder of the year. Cabbage seedpod weevils entered the field early in the season. Populations quickly rose above threshold levels. Decis was applied at the 10% bloom stage of the crop. Lack of moisture (refer to *Rainfall chart*) throughout the growing season resulted in a canola crop less than 16“ tall. At harvest, various options were explored as to which would be the best way to harvest the trials. The decision was made to dessicate using Reglone followed by straight cutting. This decision was based on two factors: crop heights and plant biomass. The overall height of the crop would not allow for enough stubble to anchor a swath. With plants being

thin and spindly, there would not be enough plant material to form a good swath that would have enough weight to prevent rolling from the wind. No shattering or pod drop was observed. Gross yield data was taken from the first rep of every trial and ranged from 1 bu/ac to 4 bu/ac. Based on these results, no further yield data was collected.




| ***Location:*** | **Rycroft, AB** |
|---|---|

***Co-operator:*** George Dika

***Previous crop:*** Barley

***Soil test results: (*Enviro-Test Labs*)***

*Organic matter content:* N/A

| *Macronutrient Levels: (0-6", 6-12")* | | *Micronutrient Levels: (0-6")* | |
|---|---|---|---|
| Nitrogen - | 46 lb/ac | Copper - | 2.1 lb/ac |
| Phosphorus - | 13 lb/ac | Iron - | 400 lb/ac |
| Potassium - | 572 lb/ac | Zinc - | 17.8 lb/ac |
| Sulphur (0-24") - | 30 lb/ac | Manganese - | 21 lb/ac |
| | | Chlorine - | 30.0 lb/ac |
| | | Boron - | 2.3 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (Inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 35 | 25 | 9.2 | 50-60 | 30-35 | 0-15 | 20-25 |
| 28 | 50 | 6.9 | 40-50 | 25-30 | 0-15 | 15-20 |
| 19 | 75 | 4.2 | 20-30 | 15-20 | 0-15 | 10-15 |
| 45 | <25 | 12.3 | 95-105 | 30-35 | 0-15 | 20-25 |

***Target yield:*** 45 bu/ac

***Fertilizer applied:*** N - 90 lb/ac P - 33 lb/ac K - 10 lb/ac S - 20 lb/ac

***Soil zone:*** Moist Dark Gray

***Soil texture:*** Clay Loam

***Salinity:*** Non-saline (0.2 mS/cm)

***Soil pH:*** 6.3

***Tillage operations:*** The site was fall cultivated and harrowed. This was followed by a spring broadcast and incorporation of urea (60 lb/ac), potash (10 lb/ac), and sulphate (15 lb/ac).

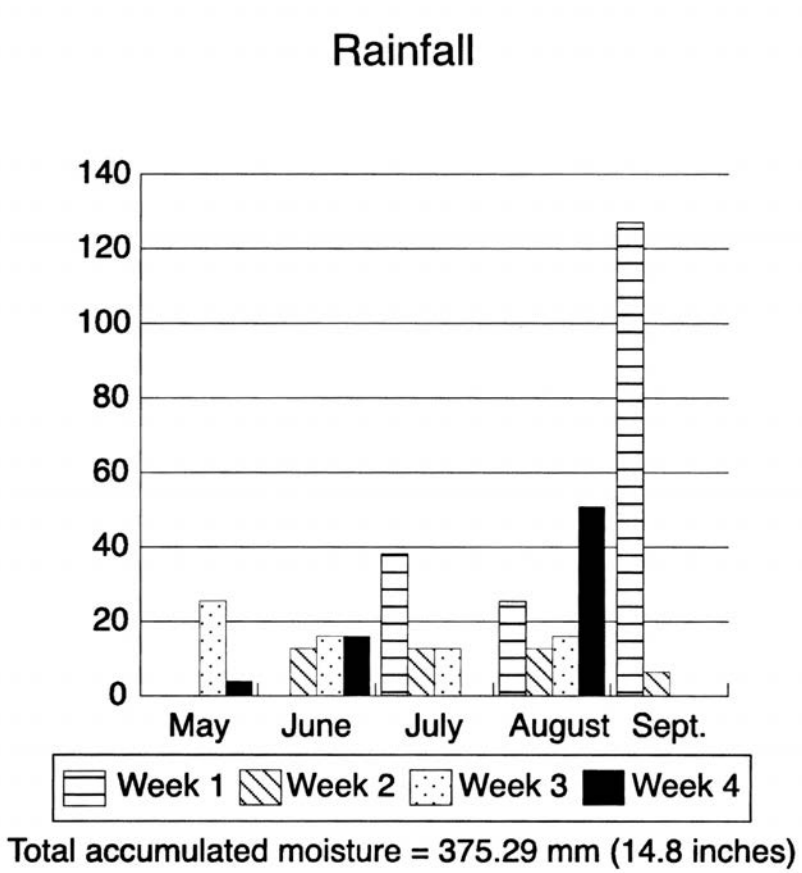
***Seeding method:*** Seeded with a JD 9450 Hoe Press Drill with 7" spacings.
Date: May 24-June 5
Depth: ½ - ¾"
Rate: 6 lb/ac open pollinated, 5 lb/ac hybrids
Soil Temp: 5$^{o}$C at a depth of 1"

***Herbicides applied:*** Poast Ultra was applied (June 15) on the entire site. Herbicide tolerant canolas were sprayed with appropriate herbicides for the varieties (June 26). Conventional canola varieties were sprayed with Muster Gold II (June 26).

***Swathing:*** Started: September 5 Finished: September 23

***Combining:*** Started: October 6 Finished: October 16

***Comments:*** Cool soil temperatures throughout the spring resulted in slow germination and emergence. Dense and unevenly distributed weed populations emerged after seeding necessitating an application of Poast Ultra to ensure unbiased data. Cool growing conditions lasted throughout the growing season and a heavy frost (-10$^{o}$C) on September 19 caused severe green seed problems. Plots that were swathed prior to the heavy frost escaped problems with green seed. Hail occurred on the site on August 16 but resulted in no broken plants. However, damage (estimated at 30%) was noticed on the pods and seeds. There were no serious insect or disease problems.




| ***Location:*** | **Rolla, BC** |
|---|---|

***Co-operator***: Gene Vipond

***Previous crop:*** Wheat

***Soil Test Results: (*Enviro-Test Labs*)***

*Organic matter content:* N/A

*Macronutrient Levels: (0-6", 6-12")*

| | |
|---|---|
| Nitrogen - | 51 lb/ac |
| Phosphorus - | 34 lb/ac |
| Potassium - | 242 lb/ac |
| Sulphur (0-24") - | 15 lb/ac |

*Micronutrient Levels: (0-6")*

| | |
|---|---|
| Boron - | 2.3 lb/ac |
| Copper - | 1.3 lb/ac |
| Zinc - | 15.9 lb/ac |
| Manganese - | 22 lb/ac |
| Chlorine - | 32.0 lb/ac |
| Iron - | 259 lb/ac |

*Recommended Fertilizer Applications - (lb/ac of actual nutrient):*

| Target Yield (bu/ac) | Probability of Precip. (%) | Precip. Required (inches) | Nitrogen | Phosphate | Potash | Sulphur |
|---|---|---|---|---|---|---|
| 35 | 25 | 9.2 | 0 | 20-25 | 10-20 | 20-25 |
| 28 | 50 | 6.9 | 0 | 15-20 | 10-20 | 15-20 |
| 19 | 75 | 4.2 | 0 | 5-10 | 10-20 | 10-15 |
| 45 | 25 | 12.3 | 30-40 | 20-25 | 10-20 | 20-25 |

***Target yield:*** 45 bu/ac

***Fertilizer applied:*** N - 40 lb/ac P - 25 lb/ac K - 10 lb/ac S - 20 lb/ac

***Soil association/zone:*** Moist Dark Gray

***Soil texture:*** Loam

***Salinity:*** Non-saline (0.2 mS/cm)

***Tillage operations:*** Fall banding of anhydrous ammonia

***Seeding method:*** Seeded with a JD 9450 Hoe Press Drill with 7" spacings.
Date: May 10 to May 18
Depth: ½ - ¾"
Rate: 6 lb/ac open pollinated, 5 lb/ac hybrids
Soil Temp: 8$^{o}$C at a depth of 1"

***Herbicides applied:*** Herbicide tolerant canolas were sprayed with appropriate herbicides for the varieties (June 26). Conventional canola varieties sprayed with Muster Gold II (June 26).

***Swathing:*** Started: N/A Finished: N/A

***Combining:*** Started: N/A Finished: N/A

***Comments:*** Seeding was delayed because of excessive rainfalls in May. Warm soil temperatures and excellent soil moisture resulted in fast and even plant germination. There were very few weeds with the exception of small patches of wild oats and toadflax. A severe hailstorm on July 13 devastated the plots. The plots were subsequently sillaged and no yield data was taken.

# VII SEED PRIMING TRIAL

***Objective:*** To evaluate a novel seed priming system in terms of enhancing emergence, maturity and yield of canola.

***Background:*** A method of priming seed (solid matrix priming - SMP) 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 enhanced the germination speed and rates of these small seeded vegetable crops, and the aim of this trial is to see whether primed canola may also exhibit similar advantages. Faster germination rates should reduce the incidence and impact of seedling diseases such as rhizoctonia, fusarium and pythium. Other benefits may include enhanced root development, improved crop uniformity, better crop competitiveness, faster canopy closure, reduced days to maturity and higher yields.

***Methodology:*** This trial was conducted as a subset of the systems trial using AC Excel. The two treatments were primed vs. unprimed (AC Excel) from the same seed lot and were both treated with Vitavax RS.

***Western Canadian Summary:***

At a majority of the sites, an advantage in emergence, early season growth and ground cover was observed with the primed seed. At two of the four sites, the primed treatment started to flower earlier than the unprimed treatment. Yield and maturity differences were not significant at most locations. Potential benefits to seed priming of canola needs to be explored further.

## *RUSSELL*

***Observations:*** The trial was seeded on May 20 at a depth of 1" into fair to good soil moisture. Counter 5G was added to both treatments. Soil temperature was about 13°C, and rain showers during the week following seeding provided for good stand establishment. The unprimed treatment emerged on May 26, while priming reduced time to emergence by about two days. Emergence counts were quite high (about 200 plants/$m^2$) for both treatments as a result of the excellent conditions. Any differences in maturity had disappeared by late July, although the plants in the primed treatments in two of the four reps maintained a more robust appearance. No maturity differences were noted at swathing time.

***Results:***

| SEED PRIMING TRIAL<br>Russell, MB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover (%)** | **Growing Degree Days** | **Days To Maturity** |
| Primed - AC Excel | 101 | 35.8 | N/A | 47.7 | N/A | 1002 | 93 |
| Unprimed - AC Excel | 100 | 35.5 | 31.19 | 47.4 | N/A | 1002 | 93 |
| LSD<br>CV% | | 3.51<br>5.9 | | 0.79<br>1.0 | | | |

***Discussions:*** The quicker emergence of the primed treatment did not translate into a difference in the final days to maturity. It also did not provide a significant advantage in yield or oil content at this location. The warm soil temperatures at seeding resulted in relatively rapid emergence even in the unprimed treatment. The ample but seldom excessive rainfall throughout the growing season, combined with effective weed control and no significant disease or insect pressure, also placed very little stress on the crop. This likely reduced the potential benefits of faster emergence.

## *GRENFELL*

***Observations:*** This trial was seeded on May 17 at 6.5 lb/ac. A fertilizer blend of 16-20-0-15 (actual) was seed-placed for both treatments. Excellent growing conditions (see *Site Information - Comments*) resulted in rapid emergence. Emergence on May 25 was more uniform for the AC Excel primed treatment compared to the unprimed. Emergence counts indicated an advantage for primed (158 plants/$m^2$) compared to unprimed (140 plants /$m^2$). By May 31, the primed treatment was one true leaf ahead in terms of overall plant growth. Conventional herbicides were applied at the 2-3 leaf stage (see *Site Information - Pesticides Applied)*. Height and percent ground cover varied between treatments. These differences in growth continued until approximately the 30-40% bloom stage. Length of flowering, pod filling, and ripening were very similar. Harvestability ratings were equal.

***Results:***

| SEED PRIMING TRIAL<br>Grenfell, SK | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover (%)** | **Growing Degree Days** | **Days To Maturity** |
| Primed - AC Excel | 108 | 34.3 | N/A | 46.0 | 100 | 1093 | 98 |
| Unprimed - AC Excel | 100 | 31.8 | 22.19 | 46.3 | 85 | 1093 | 98 |
| LSD<br>CV% | | 2.04<br>5.2 | | 2.33<br>3.6 | | | |

***Discussions:*** Both treatments graded number one. AC Excel primed yielded significantly greater than AC Excel unprimed. There was no statistical difference in oil content. On June 24, the AC Excel primed treatment had reached 100% ground cover, whereas the unprimed treatment had not.

## *BEISEKER*

***Observations:*** This trial was seeded May 16 at 5 lb/ac. Emergence of the primed seed occurred on May 21. The unprimed treatment had germinated, but not emerged. Emergence counts were completed twenty-one days after seeding. The primed treatment averaged 11.4 plants/ft², and the unprimed 8.4 plants/ft². The primed treatment did not appear to be as damaged by frost as the unprimed (see *Site Information*). Weekly growth staging assessments rated the primed treatment two to four days ahead in growth throughout the growing season. Flowering started four days earlier in the primed treatment. More damage was observed in the primed treatment (which was more advanced in maturity) from the hailstorm on August 13. Plant counts after swathing revealed that the primed seed averaged 11 plants/ft² and the unprimed 8.1 plants/ft².

***Results:***

| SEED PRIMING TRIAL<br>Beiseker, AB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover (%) June 30** | **Growing Degree Days** | **Days To Maturity** |
| Primed - AC Excel | 101 | 11.9 | N/A | 44.8 | 100 | 1047 | 96 |
| Unprimed - AC Excel | 100 | 11.7 | (62.50) | 44.9 | 90 | 1082 | 101 |
| LSD<br>CV% | | 2.26<br>13.8 | | 1.43<br>2.69 | | | |

Note: Brackets in the Contribution Margin reflect a negative value.

***Discussions:*** There were no significant differences in oil or yield between treatments. Frost and hail affected the growth and maturity of the treatments. When reviewing the significance of the data please remember damage from hail affected the yields. The primed treatment achieved 100% ground cover quicker than the unprimed seed and matured earlier.

## *ROLLA*

***Observations:*** Seeding occurred on May 18 into 12$^{o}$C soil. Emergence was rapid and even. Weed pressure was light. Predominant weeds were toadflax, volunteer wheat and stinkweed. Plants emerged seven days after seeding. There were no differences in emergence between the primed and unprimed treatments. There were 96 plants/m$^2$ in both the primed vs. unprimed treatments. The plots were sprayed with Muster Gold II (Muster 8 g/ac, Assure II 0.2 L/ac) on June 24. Weed control was excellent. Golf ball size hail on July 13 destroyed the site.

***Discussions:*** Due to the severe hail damage, no yield or quality data was recorded.

# VIII 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 number of new varieties available over the past several years has made the task of choosing a variety for a specific farm challenging. Yield, crop quality and disease resistances 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 (AC Excel) and the industry standard Quantum.

***Methodology:*** The variety trial was made up of four replicates in a randomized complete block design. Identical agronomic practices were used for the entire trial. Seed treatments included those supplied by the seed distributor. The entire trial was seeded on the same day. Swathing commenced when seed colour change was between 30%-40%, and harvest was completed when suitable conditions existed.

***Western Canadian Summary:***

Differences in yield, contribution margins, growing degree days, maturity and oil content were noted among *B. napus* varieties at most locations. The relative differences among varieties varied from site to site. This is expected, because of the regional adaptability of some varieties. Contribution margins were affected by grade, yield, seed cost and oil premiums that were included for all applicable varieties. Contribution margins tended to be higher with the specialty varieties at many locations. Therefore, check on specific premiums associated with those varieties and the required specifications to obtain the premium.

Weather conditions (frost, excessive moisture, hail and drought) directly affected the yield and related contribution margins at a number of locations.

Refer to summary table (see *Appendix XXII)*.

## *SELKIRK*

***Observations:*** Rain showers delayed seeding until May 9, but allowed us to seed into moisture at a depth of ½"- ¾". Stand establishment was good, but weed competition was high. Wild oats, green foxtail and volunteer wheat were the predominant weeds, but some wild mustard, lady's thumb and wild buckwheat were also present. Muster Gold II (Assure II @ 0.2 L/ac, Muster @ 8 g/ac) was applied at about the 2-leaf stage of the crop. A follow-up with Lontrel was considered for the wild buckwheat, but was not applied due to heavy rainfall. The buckwheat appeared to suffer more from the excess moisture than the canola, as evidenced by greater yellowing and purpling of

the leaves. The wild buckwheat did not appear to be very competitive during the growing season, although there was some regrowth following swathing. There were also some wildoat escapes throughout the trial, probably due to reduced crop competition as a result of the moisture stress. By far the greatest stress on the varieties was the large amount of rainfall at this site.

***Results:***

| ***B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Selkirk, MB** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Nex 500* | 106 | 28.3 | 36.21 | 46.2 | 1002 | 93 | 1 |
| SW5001 | 106 | 28.1 | 23.67 | 45.4 | 1039 | 95 | 1 |
| Quantum | 105 | 27.9 | 35.36 | 45.8 | 972 | 91 | 1 |
| HyCore 601 | 105 | 27.9 | 24.65 | 45.6 | 1039 | 95 | 1 |
| Canterra 1492 | 103 | 27.3 | 15.48 | 47.1 | 972 | 91 | 1 |
| Q2 | 101 | 26.8 | 28.68 | 45.8 | 1050 | 96 | 1 |
| AC Excel | 100 | 26.6 | 35.58 | 45.9 | 1002 | 93 | 1 |
| Millennium 03* | 97 | 25.9 | 47.71 | 47.9 | 972 | 91 | 1 |
| Nex 705* | 97 | 25.7 | 30.31 | 49.1 | 1050 | 96 | 1 |
| Hi-Q | 97 | 25.7 | 22.82 | 46.2 | 1024 | 94 | 1 |
| Nex 710* | 85 | 22.6 | 13.49 | 49.2 | 1024 | 94 | 1 |
| LSD<br>CV % | | 4.02<br>12.6 | | 0.98<br>1.8 | | | |

*Specialty oil varieties

***Discussion:*** None of the varieties yielded significantly different from the check (AC Excel). The only variety that yielded significantly lower than Nex 500 was Nex 710. The differences in contribution margin reflect the yield values, seed costs and premiums associated with the specialty oil varieties. The specialty oil varieties Nex 710 and Nex 705 produced significantly higher oil contents than all of the other varieties. Millennium 03 and Canterra 1492 also produced significantly more oil than AC Excel, but not as much as Nex 705 and Nex 710. Canterra 1492, Millennium 03 and Quantum were the first to mature, while Nex 705 and Q2 were last, and the range was five days.

## *RUSSELL*

***Observations:*** Seeding of this trial took place on May 20. Warm soil temperatures and rain showers shortly after seeding resulted in rapid emergence and excellent stand establishment. The weed spectrum at the site included wild oats, volunteer barley, green foxtail, wild mustard, lamb's quarters, wild buckwheat and Canada thistle. Application of Select (0.08 L/ac), Muster (8 g/ac) and

Lontrel (0.17 L/ac) provided good control of the weeds present. Based on petal tests, the dense canopy and wet weather prior to and during flowering, Rovral flo (0.8 L/ac) was applied to provide protection against sclerotinia. No significant sclerotinia infection was observed at swathing. No other serious disease or insect pressures were noted throughout the growing season.

***Results:***

| ***B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Russell, MB** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Nex 710* | 127 | 42.0 | 70.40 | 50.1 | 1027 | 95 | 1 |
| Nex 705* | 123 | 40.7 | 63.35 | 50.3 | 1056 | 97 | 1 |
| HyCore 601 | 118 | 39.2 | 31.32 | 48.4 | 1027 | 95 | 1 |
| Nex 500* | 117 | 38.8 | 41.79 | 48.1 | 1042 | 96 | 1 |
| Q2 | 115 | 38.2 | 38.36 | 48.4 | 1013 | 94 | 1 |
| Quantum | 107 | 35.3 | 23.46 | 48.4 | 1002 | 93 | 1 |
| SW5001 | 105 | 34.8 | 12.04 | 49.1 | 1027 | 95 | 1 |
| Hi-Q | 105 | 34.7 | 20.64 | 49.3 | 1027 | 95 | 1 |
| Millennium 03* | 100 | 33.1 | 41.45 | 48.6 | 968 | 90 | 1 |
| AC Excel | 100 | 33.1 | 18.77 | 48.8 | 1002 | 93 | 1 |
| LSD<br>CV % | | 3.01<br>6.8 | | 1.70<br>2.9 | | | |

*Specialty oil varieties

***Discussion:*** Five varieties produced significantly greater yields than the check (AC Excel), including Nex 710, Nex 705, HyCore 601, Nex 500 and Q2. None of the varieties produced oil contents that were significantly different from the check. Economic analysis revealed some benefit for the varieties with special oil profiles, as a result of the premiums associated with them. There was a one-week range in maturity among the varieties, with Millennium 03 reaching maturity first and Nex 705 taking the longest.

## *GRENFELL*

***Observations:*** Seeding took place on May 17. Open pollinated varieties were seeded at 6.5 lb/ac and hybrid varieties (SW5001, HyCore 601 and Hyola 428) at 5.0 lb/ac. A fertilizer blend of 16-20-0-15 (actual) was seed-placed. Excellent moisture and warm soil temperatures resulted in rapid emergence. Growing conditions (see *Site Information - Comments*) were excellent throughout the season. Flea beetle damage in excess of 25% was identified in some areas. Plants outgrew damage quickly because of excellent growing conditions. Weed pressure was moderate to heavy in most areas. A tank mix of Muster

(8 g/ac or 40 ac/pouch), Poast Ultra (0.13 L/ac or 60 ac/case) and Lontrel (0.17 L/ac or 26 ac/jug) was applied at the 2-3 leaf stage. Weed control was excellent. Hyola 428 and Millennium 03 were first to reach 100% ground cover. Height and standability (lodging) differences were noted among the varieties (see *Harvestability Trial - Discussion*). Sclerotinia stem rot was more prevalent in varieties with poor standability.

***Results:***

| ***B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Grenfell, SK** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Nex 705* | 134 | 39.8 | 64.92 | 47.5 | 1141 | 101 | 1 |
| Quantum | 126 | 37.6 | 42.61 | 45.8 | 1077 | 97 | 1 |
| Hyola 428 | 123 | 36.7 | 33.06 | 45.5 | 1124 | 100 | 1 |
| Magellan | 116 | 34.7 | 26.86 | 45.6 | 1093 | 98 | 1 |
| Nex 500* | 113 | 33.8 | 23.92 | 46.6 | 1093 | 98 | 1 |
| HyCore 601 | 113 | 33.8 | 14.69 | 46.8 | 1141 | 101 | 1 |
| Foremost | 112 | 33.4 | 20.69 | 45.1 | 1141 | 101 | 1 |
| LG3366 | 112 | 33.4 | 20.28 | 47.7 | 1093 | 98 | 1 |
| SW5001 | 111 | 33.1 | 13.98 | 44.5 | 1141 | 101 | 1 |
| Nex 710* | 109 | 32.5 | 26.96 | 47.6 | 1109 | 99 | 1 |
| LG3311 | 108 | 32.1 | 14.11 | 46.5 | 1077 | 97 | 1 |
| IMC 105* | 105 | 31.4 | 31.02 | 46.0 | 1093 | 98 | 1 |
| Millennium 03* | 102 | 30.4 | 34.72 | 47.0 | 1044 | 95 | 1 |
| AC Excel | 100 | 29.8 | 12.69 | 47.1 | 1093 | 98 | 1 |
| IMC 204* | 100 | 29.7 | 21.91 | 47.4 | 1077 | 97 | 1 |
| LSD | | 2.70 | | 2.33 | | | |
| CV % | | 5.8 | | 3.6 | | | |

*Specialty oil varieties

***Discussion:*** Yield differences of 2.70 bu/ac or more are significant. Among the *B. napus* varieties ten varieties yielded significantly greater than the check variety (AC Excel). In contrast, thirteen *B. napus* varieties yielded significantly lower than the industry check (Quantum). Nex 705 provided the greatest economic return due to specific oil premiums paid on specialty oil varieties and highest yield. All treatments graded number one. Contribution margins reflect differences in yield, seed costs and specific oil premiums.

Days to maturity (30% seed colour change) ranged from 95 to 101 days. Only one variety (SW5001) varied significantly in terms of oil content.

## *NAICAM*

***Observations:***

This trial was seeded on May 6. Open pollinated varieties were seeded at 6.5 lb/ac and hybrid varieties (SW5001, HyCore 601 and Hyola 428) at 5.0 lb/ac. A fertilizer blend of 18-21-11-16 (actual) was seed-placed for all treatments. Variable growing conditions (see *Site Information - Comments)* lowered the overall yield potential. Weed pressure was variable across all treatments. Herbicides were applied at the 1-3 leaf stage and resulted in adequate control of target weeds (see *Site Information - Pesticides Applied* rates). Low crop density increased the number of weeds present later on in the growing season and reduced the risk of sclerotinia (see *Grow with Canola Manual*, page 1054). All varieties matured unevenly due to the combination of high nitrogen rates and low crop density.

Light infestations of blackleg and aster yellows were observed. Flea beetles caused considerable damage during early plant development. Shot hole damage was in excess of 25% in most treatments. As a result, Decis 5EC was applied. Other insect damage was light.

***Results:***

| ***B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Naicam, SK** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| LG3366 | 113 | 35.1 | 39.61 | 46.9 | 1062 | 112 | 1 |
| Nex 500* | 111 | 34.3 | 28.85 | 47.4 | 1071 | 113 | 2 |
| SW5001 | 109 | 33.8 | 19.91 | 46.2 | 1075 | 114 | 2 |
| Nex 710* | 109 | 33.7 | 35.84 | 47.8 | 1075 | 114 | 2 |
| Foremost | 109 | 33.7 | 24.75 | 46.4 | 1075 | 114 | 2 |
| Magellan | 107 | 33.0 | 30.52 | 45.5 | 1046 | 111 | 1 |
| LG3311 | 102 | 31.6 | 24.46 | 46.9 | 1046 | 111 | 1 |
| Millennium 03* | 101 | 31.3 | 51.55 | 48.7 | 1016 | 109 | 1 |
| AC Excel | 100 | 30.9 | 29.65 | 46.5 | 1062 | 112 | 1 |
| HyCore 601 | 98 | 30.4 | (7.06) | 46.6 | 1075 | 114 | 3a |
| IMC 105* | 98 | 30.2 | 28.17 | 45.3 | 1062 | 112 | 2 |
| Nex 705* | 96 | 29.6 | (9.83) | 49.0 | 1078 | 115 | 3b |
| Hyola 428 | 94 | 29.2 | (1.28) | 47.5 | 1075 | 114 | 2 |
| Quantum | 87 | 26.9 | (3.74) | 46.0 | 1062 | 112 | 2 |
| LSD | | 3.15 | | 1.05 | | | |
| CV % | | 8.3 | | 1.9 | | | |

Note: Brackets in the contribution margin reflect a negative value.
*Specialty oil varieties

***Discussion:*** Yield differences of 3.15 bu/ac or more are significant. Two varieties (LG3366 and Nex 500) yielded significantly higher than the check (AC Excel), while eleven varieties yielded significantly higher than the industry standard (Quantum). Quantum yielded significantly less than AC Excel. The highest contribution margin was associated with the variety Millennium 03. This was the result of $0.91/bu premium paid for high erucic acid varieties and #1 grade. Contribution margins reflect differences in yield, seed cost, grade and specific oil premiums.

Days to maturity varied by six days (109 to 115). Oil contents also varied significantly. Nex 710, Millennium 03 and Nex 705 provided significantly more oil than the check AC Excel and IMC 105 provided significantly less oil.

## *NORTH BATTLEFORD*

***Observations:*** See *Site Information*.

***Discussion:*** Due to the high coefficient of variation for this trial, which was caused by environmental conditions, no accurate conclusions could be made. Therefore, the results have not been reported.

## *VEGREVILLE*

***Observations:*** This trial was seeded on May 12. Emergence was rapid and uniform for all treatments. Frost damage in late May was observed throughout the trial but all treatments recovered quickly. Sclerotinia infection was observed throughout the trial and was more severe in lodged varieties (see *Harvestability Trial - Discussion*). Fusarium wilt was also observed and infection was more severe in some varieties. Hail occurred in early August, resulting in approximately 10% yield loss and causing down grading in rep 1 and 2.

***Results:***

| *B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Vegreville, AB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Quantum | 118 | 38.3 | 73.41 | 46.3 | 1000 | 108 | 2 |
| Nex 710* | 103 | 33.5 | 70.44 | 48.3 | 1036 | 113 | 1 |
| HyCore 601 | 102 | 33.3 | 30.10 | 46.3 | 1059 | 117 | 3a |
| AC Excel | 100 | 32.5 | 54.01 | 45.5 | 1014 | 110 | 2 |
| Nex 500* | 99 | 32.3 | 46.11 | 47.0 | 1029 | 112 | 2 |
| IMC 205* | 98 | 32.0 | 63.51 | 47.0 | 1014 | 110 | 2 |
| Magellan | 98 | 31.8 | 51.05 | 44.5 | 1000 | 108 | 1 |
| Hi-Q | 96 | 31.3 | 31.09 | 46.8 | 1036 | 113 | 3a |
| IMC 204* | 94 | 30.5 | 55.88 | 45.8 | 1014 | 110 | 2 |
| Millennium 03* | 91 | 29.5 | 67.54 | 46.5 | 978 | 105 | 1 |
| IMC 105* | 92 | 29.4 | 50.28 | 43.0 | 964 | 103 | 2 |
| SW5001 | 85 | 27.5 | 12.54 | 45.3 | 1053 | 116 | 2 |
| Nex 705* | 72 | 23.5 | 12.10 | 48.0 | 1046 | 115 | 2 |
| LSD | | 2.56 | | 0.72 | | | |
| CV % | | 6.9 | | 1.3 | | | |

*Specialty oil varieties

***Discussion:*** Quantum yielded significantly higher than all other varieties. Nex 705 yielded significantly lower than all other varieties. The low Nex 705 yield was due to significantly higher fusarium wilt infection on this variety. Maturity ranged from 103 days (IMC 105) to 117 days (HyCore 601). Contribution margins reflect differences in yield, grade, seed costs and speciality oil premiums paid for some varieties.

## *BEISEKER*

***Observations:*** The trial was seeded on May 17. Emergence was even, but cool conditions until July hampered growth (see *Site Information*). The degree of damage caused by the hailstorm on August 13 was dependent on the maturity of the variety. Within ten days of the storm, most varieties had sent out new branches and started to re-flower. The varieties with the most re-flowering were the last swathed.

***Results:***

| *B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Beiseker, AB | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover % June 30** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Quantum | 140 | 14.5 | (58.63) | 42.9 | 85 | 1079 | 104 | 2 |
| Millennium 03* | 136 | 14.0 | (49.17) | 45.4 | 85 | 1070 | 103 | 1 |
| IMC 105* | 132 | 13.6 | (55.34) | 44.0 | 85 | 1079 | 104 | 1 |
| Hi-Q | 136 | 13.6 | (63.96) | 45.7 | 95 | 1135 | 113 | 2 |
| Canterra 1492 | 117 | 12.1 | (83.20) | 43.6 | 85 | 1091 | 106 | 2 |
| Nex 500* | 115 | 11.9 | (72.99) | 43.3 | 85 | 1067 | 102 | 2 |
| Magellan | 108 | 11.1 | (75.34) | 42.0 | 85 | 1079 | 104 | 2 |
| IMC 204* | 105 | 10.8 | (69.60) | 45.7 | 80 | 1091 | 106 | 2 |
| Nex 710* | 100 | 10.4 | (76.92) | 44.4 | 100 | 1135 | 113 | 2 |
| AC Excel | 100 | 10.3 | (72.12) | 44.3 | 85 | 1079 | 104 | 2 |
| Nex 705* | 90 | 9.3 | (82.32) | 43.9 | 85 | 1135 | 113 | 2 |
| SW5001 | 89 | 9.2 | (92.71) | 42.9 | 95 | 1135 | 113 | 2 |
| LSD | | 1.97 | | 2.40 | | | | |
| CV % | | 15.0 | | 4.6 | | | | |

Note: Brackets in the contribution margin reflect a negative value.
When reviewing the significance of the data please remember damage from hail has affected the yields.
*Specialty oil varieties

***Discussion:*** There were statistically significant differences in yield and oil among the varieties. However, yield potential of all varieties was affected by hail. Therefore, use caution when making comparisons.

Frost and hail affected maturity of the varieties. Maturity ranged from 102 days to 113 days.

The importance of ground cover by a canola crop is twofold. One, the sooner the canopy closes, the better the crop is able to compete against weeds. Second, canopy closure helps in protecting the soil surface from exposure to wind and sunlight, which helps in moisture conservation. On June 30, only Nex 710 had 100% ground cover.

## *LETHBRIDGE (IRRIGATION)*

***Observations:*** The site was seeded on May 6 at 4 lb/ac. Soil moisture conditions at the time of seeding were poor to fair. To promote even emergence ¾" of water was applied after seeding. Emergence was even and rapid. Frost on June 12 damaged plants, especially in areas with heavy crop residue. Recovery from the frost was good. The affected plants were behind in plant

development until flowering. Cabbage seedpod weevils were controlled using Decis (see *Site Information*). After swathing, 1" of water was applied to help the curing process.

***Results:***

| ***B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Lethbridge, AB (Irrigation)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover % June 14** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Nex 710* | 115 | 59.7 | 156.01 | 48.3 | 96 | 1154 | 101 | 1 |
| IMC 105* | 115 | 59.5 | 151.36 | 46.1 | 100 | 1100 | 97 | 1 |
| HyCore 601 | 115 | 59.5 | 105.44 | 44.5 | 96 | 1228 | 106 | 2 |
| Nex 705* | 113 | 58.4 | 133.49 | 48.5 | 100 | 1228 | 106 | 2 |
| Hi-Q | 105 | 54.1 | 90.67 | 44.8 | 90 | 1154 | 101 | 2 |
| Nex 500* | 103 | 53.3 | 92.95 | 45.0 | 90 | 1165 | 102 | 2 |
| SW5001 | 103 | 53.1 | 78.93 | 43.7 | 100 | 1228 | 106 | 2 |
| Magellan | 102 | 52.7 | 84.25 | 44.7 | 90 | 1154 | 101 | 2 |
| Quantum | 100 | 51.8 | 95.43 | 43.0 | 95 | 1141 | 100 | 1 |
| AC Excel | 100 | 51.7 | 99.17 | 44.7 | 88 | 1100 | 97 | 1 |
| LSD<br>CV % | | 4.72<br>7.2 | | 1.14<br>2.1 | | | | |

*Specialty oil varieties

***Discussion:*** Yield differences of 4.72 bu/ac or more are significant. Nex 705, Nex 710, HyCore 601, IMC 105 yielded significantly higher than the check AC Excel. Oil contents also varied significantly, with the speciality oil variety Nex 705 producing the most oil at 48.5% and Quantum producing the least at 43.0%.

Contribution margins are a reflection of yield, grade, seed costs and premiums for speciality oil varieties.

Days to maturity ranged from a low of 97 days (AC Excel, IMC 105) to a high of 106 days (SW5001, Nex 705, HyCore 601).

## *LETHBRIDGE (DRYLAND)*

***Observations:*** Refer to *Site Information*. Gross yield data was taken from the first rep and ranged from 1-3 bu/ac. Based on these results, no further yield data was collected.

## *RYCROFT*

***Observations:*** The trial was seeded on May 24 into 7°C soil with reasonable moisture. Emergence was slow and uneven. Early weed pressure was heavy but patchy with the predominant weeds being wild oats, spring wheat, stinkweed, field horsetail and cleavers. Wild buckwheat, lamb's quarters, and Canada thistle were relatively light in the plots. The plots were sprayed with Muster Gold II (Muster 8 g/ac, Assure II 0.2 L/ac) on June 26. Weed control was good, except for field horsetail and stinkweed. June to August was cool with adequate moisture. A severe frost on August 14 devastated the plots and resulted in high green seed counts. The plots were swathed on September 13 and combined on October 7.

***Results:***

| ***B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Rycroft, AB** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| HyCore 601 | 108 | 37.4 | 32.96 | 48.1 | 830 | 116 | 3b |
| IMC 105* | 107 | 37.1 | 89.49 | 47.6 | 804 | 110 | 3a |
| Nex 710* | 101 | 35.0 | 50.06 | 49.1 | 798 | 109 | 3b |
| Quantum | 101 | 34.9 | 69.38 | 46.0 | 816 | 112 | 2 |
| AC Excel | 100 | 34.6 | 44.99 | 47.2 | 810 | 111 | 3b |
| IMC 204* | 98 | 33.8 | 74.07 | 48.0 | 804 | 110 | 3a |
| Magellan | 97 | 33.7 | 33.36 | 46.3 | 798 | 109 | 3b |
| Nex 500* | 97 | 33.6 | 34.47 | 47.8 | 810 | 111 | 3b |
| Nex 705* | 74 | 25.8 | (13.30) | 47.8 | 824 | 115 | Sample |
| LSD | | 2.65 | | 1.59 | | | |
| CV % | | 6.4 | | 2.8 | | | |

Note: Brackets in the contribution margin reflect a negative value.
*Specialty oil varieties

***Discussion:*** Differences in yield and oil were significant only if the values differed by 2.65 bu/ac and 1.59%, respectively. HyCore 601 and IMC 105 yielded significantly higher than the check (AC Excel), and Nex 710 produced significantly higher oil. IMC 105 had the highest contribution margin because of yield, grade and a premium of $0.61/bu. Conversely, Nex 705 had the lowest contribution because of low yield and poor grade, even with a premium of $0.45/bu.

# IX HARVESTABILITY TRIAL

***Objective:*** To compare the harvestability of varieties entered in the variety 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 criteria for a subjective measurement was used.

***Methodology:*** 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 with AC Excel (the check) being 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 check
2 = better than check
3 = check
4 = worse than check
5 = much worse than check

***Western Canadian Summary:***

Harvestibility is a very subjective evaluation and there are often differences in the ease of operation experienced by the operator of the equipment. Factors in swathing include the uniformity of stand, plant height, straw stiffness and lodging. When combining, a uniform stand usually translates into an even swath that feeds smoothly. Any difficulties when swathing are usually magnified at combining time.

## *SELKIRK*

***Observation:*** All varieties were stressed by excessive moisture, but the varieties in the systems comparison trial suffered to a greater extent due to the later seeding date, and rain delayed herbicide application. Since the moisture stress tended to limit crop growth, it was actually the taller varieties that were easiest to swath. Varieties that were shorter required cutting very close to the ground to get all the pods, and this required reduced speed. All varieties were cut with an 18 ft Versatile 400 swather with a bat reel. The

conventional *B. napus* variety trial was combined with an IHC 1460 combine, while the systems comparison was combined with a John Deere 6600.

***Results:***

| HARVESTABILITY TRIAL<br>*B. napus*<br>Naicam, SK | | | |
|---|---|---|---|
| **Variety** | **Lodging Ratio** | **Swathability Rating** | **Combinability Rating** |
| 46A73 | 79 | 2 | 3 |
| 46A76 | 88 | 2 | 3 |
| AC Excel | 85* (71) | 3 | 3 |
| Armor Bx | 72 | 3 | 3 |
| Canterra 1492 | 92* | 1 | 3 |
| Canterra 1867 | 67 | 3 | 3 |
| Cartier Bx | 68 | 3 | 3 |
| Conquest | 69 | 3 | 3 |
| Hi-Q | 75* | 2 | 3 |
| HyCore 601 | 83* | 1 | 3 |
| Hyola 454 | 60 | 3 | 3 |
| InVigor 2573 | 74 | 2 | 3 |
| InVigor 2663 | 73 | 2 | 3 |
| LG3235 | 73 | 3 | 3 |
| LG3345 | 68 | 3 | 3 |
| LG3455 | 76 | 3 | 3 |
| LG3525 | 70 | 3 | 3 |
| Millennium 03 | 90* | 4 | 2 |
| Nex 500 | 82* | 2 | 3 |
| Nex 705 | 75* | 2 | 3 |
| Nex 710 | 84* | 2 | 2 |
| Q2 | 67* | 3 | 3 |
| Quantum | 91* (66) | 2 | 3 |
| SW5001 | 87* | 1 | 3 |
| SW RideR | 69 | 2 | 3 |
| Zodiak Bx | 71 | 3 | 3 |

Note: * These ratings were taken from conventional variety trial.

***Discussion:***

There was generally more lodging in the systems comparison trial, as compared to the conventional varieties, as evidenced by the difference in values for the same check varieties. Varieties that were taller in stature and/or less lodged had the best swathability ratings, because speed could be increased if pod height did not require swathing very close to the ground. There were far fewer differences in combinability, since the light crop and weathered condition of the swaths made combining relatively easy for all varieties.

## *RUSSELL*

***Observation:*** While rains were frequent throughout the summer at this site, they were seldom excessive. In spite of the near ideal growing conditions, none of the varieties exceeded 4.5 ft in height. Some lodging was observed but was generally not severe, so the main differences among varieties were in the amount of plant material. The plots were all swathed with an 18 ft Versatile 400 swather with a bat reel, and harvested with a John Deere 9600 combine.

***Results:***

**HARVESTABILITY TRIAL**
***B. napus***
**Russell, MB**

| Variety | Lodging Ratio | Swathability Rating | Combinability Rating |
|---|---|---|---|
| 46A73 | 94 | 3 | 2 |
| 46A76 | 96 | 3 | 2 |
| AC Excel | 77* (86) | 3 | 3 |
| Armor Bx | 76 | 3 | 3 |
| Cartier Bx | 87 | 3 | 3 |
| Conquest | 86 | 2 | 3 |
| Hi-Q | 95* | 3 | 3 |
| HyCore 601 | 93* | 3 | 3 |
| Hyola 454 | 93 | 3 | 2 |
| InVigor 2573 | 84 | 3 | 3 |
| InVigor 2663 | 77 | 4 | 3 |
| LG3235 | 81 | 3 | 2 |
| LG3345 | 78 | 3 | 3 |
| LG3455 | 89 | 3 | 3 |
| LG3525 | 76 | 3 | 3 |
| Millennium 03 | 74* | 2 | 2 |
| Nex 500 | 94* | 3 | 3 |
| Nex 705 | 95* | 3 | 3 |
| Nex 710 | 90* | 3 | 3 |
| Q2 | 91* | 2 | 3 |
| Quantum | 78* (81) | 3 | 3 |
| SW RideR | 89 | 2 | 3 |
| SW5001 | 88* | 3 | 3 |
| Zodiak Bx | 87 | 3 | 3 |

Note: * These ratings were taken from conventional variety trial.

***Discussion:*** The lodging ratios indicate that while there were some minor differences in lodging, none of the varieties were severely lodged. Differences in swathability and combinability were largely a reflection of differences in amount of plant material produced.

## *GRENFELL*

***Observation:*** The treatments were swathed with a 20 ft Versitile 4400 swather equipped with a pick-up reel, and harvested with a New Holland TR 85 combine. Differences in plant characteristics such as height, straw stiffness, stem strength, branching and initial podding height affected harvestability. Varieties that were tall, stiffer stemmed or more severely lodged were considerably more difficult to swath. The level of sclerotinia stem infection was more prevalent in treatments that were more lodged. Low-lying areas had more plant material.

***Results:***

**HARVESTABILITY TRIAL**
***B. napus***
**Grenfell, SK**

| Variety | Lodging Ratio | Swathability Rating | Combinability Rating |
|---|---|---|---|
| AC Excel | .87 | 3 | 3 |
| Armor Bx | .81 | 3 | 3 |
| Cartier Bx | .85 | 3 | 3 |
| Conquest | .84 | 2 | 1 |
| Foremost | .93 | 4 | 4 |
| HyCore 601 | .93 | 3 | 3 |
| Hylite 225 | .81 | 3 | 3 |
| Hyola 428 | .91 | 3 | 3 |
| IMC 105 | .83 | 3 | 3 |
| IMC 106 RR | .87 | 3 | 3 |
| IMC 204 | .73 | 4 | 4 |
| InVigor 2573 | .88 | 4 | 5 |
| InVigor 2663 | .90 | 4 | 4 |
| LG Dawn | .73 | 4 | 4 |
| LG3235 | .88 | 2 | 2 |
| LG3311 | .88 | 2 | 2 |
| LG3366 | .91 | 3 | 3 |
| LG3455 | .90 | 3 | 3 |
| LG3525 | .84 | 3 | 4 |
| Magellan | .86 | 2 | 2 |
| Millennium 03 | .73 | 4 | 3 |
| Nex 500 | .85 | 3 | 3 |
| Nex 705 | .87 | 2 | 2 |
| Nex 710 | .91 | 2 | 3 |
| SW RideR | .89 | 3 | 3 |
| Zodiak Bx | .84 | 3 | 3 |

***Discussion:*** There were notable differences in the harvestability of a number of the *B. napus* varieties. The severity of the lodging ranged from 0.73 to 0.94, where 1.00 would indicate no lodging. Swathability ratings were directly related to plant height, stem stiffness and lodging. Sclerotinia stem infections were higher in varieties (LG Dawn, IMC 204 and Millennium 03) with lower lodging ratios. This resulted in operating the swather table and reel on or near to the ground, making swathing more difficult. Taller varieties (SW5001, Foremost, InVigor 2573 and InVigor 2663) and the stiffer stemmed variety Quantum were also difficult to swath. Taller varieties had a tendency to hang up in the throat of the swather. Shorter, less lodged varieties were easier to swath. Higher combinability ratings (1 and 2) were related to ease of threshability and speed of operation. Poor flowability and reduced speed of operation, due to clumping, resulted in lower (4 and 5) combinability ratings.

## *NAICAM*

***Observation:*** Treatments were swathed with an 18 ft Co-op swather equipped with a bat reel, and harvested with a New Holland TR 85 combine. Differences in plant characteristics such as height, straw stiffness and initial podding height did not vary greatly due to reduced plant stands (see *Site Information - Comments)*. Uniformity of the stand did vary within treatments.

***Results:***

| HARVESTABILITY TRIAL<br>*B. napus*<br>Naicam, SK | | | |
|---|---|---|---|
| **Variety** | **Lodging Ratio** | **Swathability Rating** | **Combinability Rating** |
| 2631 LL | .84 | 3 | 3 |
| 46A73 | .83 | 3 | 3 |
| 46A76 | .85 | 3 | 3 |
| AC Excel | .87 | 3 | 3 |
| Armor Bx | .81 | 3 | 3 |
| Cartier Bx | .85 | 3 | 3 |
| Conquest | .84 | 3 | 3 |
| Foremost | .81 | 3 | 3 |
| HyCore 601 | .73 | 3 | 3 |
| Hylite 225 | .81 | 3 | 3 |
| Hyola 428 | .87 | 3 | 3 |
| IMC 105 | .84 | 3 | 3 |
| IMC 106 RR | .87 | 3 | 3 |
| InVigor 2573 | .88 | 3 | 3 |
| InVigor 2663 | .90 | 3 | 3 |
| LG Dawn | .73 | 3 | 3 |
| LG3235 | .88 | 3 | 3 |
| LG3311 | .88 | 2 | 3 |
| LG3366 | .89 | 3 | 3 |
| LG3455 | .90 | 3 | 3 |
| LG3525 | .84 | 3 | 3 |
| Magellan | .88 | 3 | 3 |
| Millennium 03 | .90 | 2 | 3 |
| Nex 500 | .90 | 3 | 3 |
| Nex 705 | .84 | 3 | 3 |
| Nex 710 | .87 | 3 | 3 |
| Quantum | .89 | 3 | 3 |
| SW RideR | .89 | 3 | 3 |
| SW5001 | .84 | 3 | 3 |

***Discussion:*** There were no dramatic differences in the harvestability of the *B. napus* varieties.

## *NORTH BATTLEFORD*

***Observation:*** Due to the drought conditions (See *Site Information*) this trial was not conducted at this site.

## *VEGREVILLE*

***Observation:*** This trial was harvested using a 14 ft International 4000 swather and a John Deere 7700 combine. Differences in plant heights and lodging ratios were observed among the varieties tested. Plant material in treatments with tall plant heights bridged on the end of the cutting table and required aggressive use of the reel to keep material flowing. Speed of swathing was reduced in treatments that were lodged. Combine speed was relatively constant for most treatments.

***Results:***

| HARVESTABILITY TRIAL<br>*B. napus*<br>Vegreville, AB | | | | |
|---|---|---|---|---|
| **Variety** | **Plant Length (cm)** | **Lodging Ratio** | **Swathability Rating** | **Combinability Rating** |
| **B. napus Trial** | | | | |
| AC Excel | 85 | .68 | 3 | 3 |
| Hi-Q | 96 | .77 | 3 | 4 |
| HyCore 601 | 117 | .89 | 4 | 5 |
| IMC 105 | 92 | .83 | 3 | 1 |
| IMC 204 | 73 | .71 | 3 | 4 |
| IMC 205 | 103 | .86 | 3 | 4 |
| Magellan | 76 | .65 | 3 | 3 |
| Millennium 03 | 62 | .61 | 4 | 3 |
| Nex 500 | 75 | .76 | 3 | 3 |
| Nex 705 | 112 | .92 | 3 | 4 |
| Nex 710 | 79 | .78 | 3 | 2 |
| Quantum | 91 | .72 | 3 | 3 |
| SW5001 | 125 | .93 | 4 | 5 |
| **Systems Comparison Trial** | | | | |
| 2631 LL | 107 | .70 | 3 | 2 |
| 46A73 (Clearfield) | 119 | .79 | 4 | 3 |
| 46A73 (Freedom Gold) | 120 | .75 | 4 | 3 |
| 46A76 | 127 | .86 | 4 | 4 |
| AC Excel | 121 | .64 | 3 | 3 |
| Armor Bx | 115 | .65 | 4 | 2 |
| Cartier Bx | 115 | .65 | 4 | 2 |
| Conquest | 126 | .81 | 4 | 3 |
| Hyola 454 | 122 | .65 | 4 | 4 |
| InVigor 2573 | 133 | .66 | 4 | 4 |
| InVigor 2663 | 129 | .72 | 4 | 3 |
| LG3235 | 115 | .71 | 2 | 2 |
| LG3345 | 116 | .61 | 4 | 3 |
| LG3455 | 116 | .76 | 2 | 2 |
| LG3525 | 116 | .73 | 2 | 2 |
| Quantum | 122 | .63 | 3 | 3 |
| SW RideR | 127 | .63 | 4 | 4 |

***Discussion:*** There were few differences in harvestability among the varieties. Swathing speed was slower and cutting height lower with varieties that were lodged. The amount of plant material put through the combine determined the speed of combining. Taller varieties required slightly slower combining speed. A number of varieties with varying growth characteristics were rated for

sclerotinia infection. Varieties with low lodging ratios had higher sclerotinia infection rates.

## *BEISEKER*

***Observation:*** Hail (see *Site Information*) had damaged the plants to the extent that a fair comparison of differences in lodging, swathing, or combinability could not be done.

## *LETHBRIDGE (IRRIGATION)*

***Observation:*** Lodging was variable in each of the treatments. The lodging did not create any problems at swathing.

***Results:***

| HARVESTABILITY TRIAL<br>*B. napus*<br>Lethbridge, AB (Irrigation) | | | |
|---|---|---|---|
| **Variety** | **Lodging Ratio** | **Swathability Rating** | **Combinability Rating** |
| **B. napus Trial** | | | |
| AC Excel | .88 | 3 | 3 |
| Hi-Q | .88 | 2 | 2 |
| HyCore 601 | .89 | 2 | 3 |
| IMC 105 | .81 | 2 | 2 |
| Magellan | .78 | 2 | 3 |
| Nex 500 | .88 | 2 | 3 |
| Nex 705 | .89 | 2 | 2 |
| Nex 710 | .90 | 2 | 2 |
| Quantum | .84 | 3 | 2 |
| SW5001 | .92 | 2 | 3 |
| **Systems Trial** | | | |
| AC Excel | .79 | 3 | 3 |
| Armor Bx | .78 | 3 | 3 |
| Cartier Bx | .78 | 3 | 2 |
| Hyola 454 | .74 | 1 | 2 |
| InVigor 2573 | .78 | 2 | 3 |
| InVigor 2663 | .72 | 2 | 2 |
| LG3345 | .83 | 2 | 1 |
| LG3235 | .85 | 1 | 2 |
| LG3455 | .85 | 2 | 2 |
| LG3525 | .75 | 2 | 2 |
| Quantum | .85 | 3 | 2 |
| SW RideR | .82 | 2 | 2 |

***Discussion:*** The differences experienced in harvestability were due to the speed of operation.

## *LETHBRIDGE (DRYLAND)*

***Observation:*** A management decision to straight cut the varieties was based on the plant stand (short and spindly). However as the result of low yields, only one rep was combined. A fair analysis of harvestability could not be completed.

## *RYCROFT*

***Observation:*** All of the varieties had good standability.

***Results:***

**HARVESTABILITY TRIAL**
***B. napus***
**Rycroft, AB**

| Variety | Lodging Ratio | Swathability Rating | Combinability Rating |
|---|---|---|---|
| 46A73 (Clearfield) | .96 | 3 | 3 |
| 46A73 (Freedom Gold) | .95 | 3 | 3 |
| 46A76 | .94 | 3 | 3 |
| AC Excel | .98 | 3 | 3 |
| Arrow | .97 | 3 | 3 |
| Conquest | .96 | 3 | 3 |
| Hyola 454 | .95 | 3 | 3 |
| InVigor 2573 | .92 | 3 | 3 |
| InVigor 2631 | .96 | 3 | 3 |
| InVigor 2663 | .93 | 3 | 3 |
| LG3235 | .96 | 3 | 3 |
| LG3345 | .94 | 3 | 3 |
| LG3455 | .94 | 3 | 3 |
| LG3525 | .95 | 3 | 3 |
| Quantum | .97 | 3 | 3 |

***Discussion:*** All of the varieties had good standability and there were no differences among the varieties.

## *ROLLA*

***Observation:*** This site was destroyed due to hail.

# X SEED TREATMENT TRIAL

***Objective:*** To evaluate the impact of new seed treatments on 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. In addition to fungal pathogens of emerging canola, insects may also cause economic yield loss. Harmonization of crop protection chemicals between Canada and the United States has resulted in a voluntary withdrawal of lindane (insecticide) from the market. Four of the seed treatments contain replacement (new*) chemistry for lindane.

***Methodology:*** The seed treatment trial included some or all of the following treatments:

A) Lindane check (Foundation)
B) No Insecticide check (Foundation Lite)
C) Foundation Lite + Decis (if flea beetle pressure warrants control)
D) Foundation Lite + Assail (low rate)
E) Foundation Lite + Assail (high rate)
F) Counter + Gaucho CS
G) Foundation Lite + Counter + Assail (low rate)
H) Helix XTra
I) Gaucho Platinum
J) Premiere Z

All other agronomic practices remained the same.

The seed source was InVigor 2573 (same seed lot for all treatments) treated by each of the respective companies involved in the trial.

The damage ratings used for flea beetle are derived from the "BASF Flea Beetle Rating System", which uses the following criteria:

A) 0 = no damage
B) 1 = 1-25% damage
C) 2 = 26-50% damage
D) 3 = 51-75% damage

***Western Canadian Summary:***

At sites with flea beetle pressure, canola treated with Foundation Lite experienced greater levels of flea beetle damage than treatments containing insecticides. This tended to reduce yields although the losses were not always significant. There were no clear trends among the seed treatments containing insecticides. All “new” seed treatments appear to offer similar or better protection to existing seed treatments containing lindane.

## *SELKIRK*

***Observations:*** This trial was seeded on May 15, following several rain showers. On four occasions around seeding time, overnight temperatures dipped to just below freezing. This resulted in cool, moist soil conditions at seeding, initially delaying emergence. However, temperatures then recovered to highs in the low twenties (°C) and lows around five for the remainder of May, allowing for good stand establishment. Plant counts were taken June 2 and 19. A Liberty (1.35 L/ac) and Select (0.025 L/ac) tank mix was applied at the 2-4 leaf stage and provided good weed control. No notable damage from flea beetles was observed, probably due to the cool, wet conditions. No other significant disease or insect pressures were observed. By far the greatest stress on the crop was excessive rainfall (see *Site Information*), and one rep was dropped due to localized flooding.

***Results:*** ***Table 1. Average number of emerged plants/m$^2$***

| Treatment | 7 DAE | 24 DAE |
|---|---|---|
| Foundation | 119 | 100 |
| Foundation Lite | 91 | 81 |
| Foundation Lite + Assail (low rate) | 111 | 100 |
| Foundation Lite + Assail (high rate) | 113 | 110 |
| Gaucho Canola System + Counter 5G | 145 | 121 |
| Foundation Lite + Assail (low rate) + Counter 5G | 115 | 101 |
| Helix XTra | 118 | 107 |
| Gaucho Platinum | 123 | 113 |
| Premiere Z | 97 | 82 |

DAE = Days After Emergence

***Table 2. Yield and Seed Quality***

| SEED TREATMENT TRIAL<br>Selkirk, MB | | | |
|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** |
| Foundation | 26.2 | 14.26 | 44.3 |
| Foundation Lite | 25.8 | 13.05 | 43.0 |
| Foundation Lite + Assail (low rate) | 25.3 | N/A* | 44.1 |
| Foundation Lite + Assail (high rate) | 29.1 | N/A* | 43.5 |
| Gaucho CS + Counter 5G | 31.0 | 25.90 | 43.5 |
| Foundation Lite + Assail (low rate) + Counter 5G | 24.1 | N/A* | 44.2 |
| Helix XTra | 27.5 | 3.20 | 44.2 |
| Gaucho Platinum | 32.6 | 29.30 | 44.0 |
| Premiere Z | 28.1 | N/A* | 43.2 |
| LSD | 4.09 | | 1.04 |
| CV % | 10.8 | | 1.7 |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:*** The Foundation Lite seed treatment produced the lowest plant density, but it was still within the optimum range for stand establishment. The Gaucho Platinum treatment and Gaucho CS + Counter 5G dual treatment produced the highest plant densities. They were also the only treatments to produce significantly higher yields than the Foundation Lite, but were not significantly higher yielding than Foundation Lite + Assail (high rate). Foundation Lite also produced the lowest oil content, although only the oil contents of Foundation, Foundation Lite + Assail (low rate), Foundation Lite + Assail (low rate) + Counter 5G, and Helix XTra were significantly higher. The significant yield and oil content differences were somewhat unexpected, given the apparent lack of insect pressure.

## *RUSSELL*

***Observations:*** Seeding took place on May 21 into fair soil moisture, and seeding depth was increased to 1" due to the somewhat dry surface soil conditions. Warm soil temperatures and rain showers following seeding resulted in excellent emergence. No notable flea beetle damage was observed, nor was any other significant insect or disease pressure noted throughout the growing season. A Liberty (1.35 L/ac) and Select (0.025 L/ac) tank mix was applied at the 3-4 leaf stage and provided adequate weed control. Some regrowth of Canada thistle was noted by swathing time. Growing conditions were generally very good throughout the growing season (see *Site Information*).

***Results:*** ***Table 1. Average number of emerged plants/m$^2$***

| Treatment | 7 DAE | 15 DAE | 25 DAE |
|---|---|---|---|
| Foundation | 176 | 160 | 148 |
| Foundation Lite | 159 | 149 | 137 |
| Foundation Lite + Assail (low rate) | 178 | 155 | 157 |
| Foundation Lite + Assail (high rate) | 151 | 126 | 126 |
| Premiere Z | 150 | 153 | 143 |

DAE = Days After Emergence

***Table 2. Yield and Seed Quality***

| SEED TREATMENT TRIAL<br>Russell, MB | | | |
|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** |
| Foundation | 39.5 | 69.74 | 48.1 |
| Foundation Lite | 36.6 | 56.10 | 48.8 |
| Foundation Lite + Assail (low rate) | 38.5 | N/A* | 48.9 |
| Foundation Lite + Assail (high rate) | 37.6 | N/A* | 48.7 |
| Premiere Z | 38.4 | N/A* | 48.4 |
| LSD | 2.13 | | 0.61 |
| CV % | 4.8 | | 1.1 |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:*** Initial plant densities were very high due to excellent weather conditions, but some plant mortality did occur over time in all treatments. This commonly occurs in dense plant stands as weaker plants fail to compete with more vigorous ones. The only treatment that yielded significantly higher than Foundation Lite was Foundation. Foundation had the lowest oil content, although only Foundation Lite and Foundation Lite + Assail (low rate) were significantly higher in oil.

## *GRENFELL*

***Observations:*** Seeding took place on May 17 at 5.0 lb/ac. A fertilizer blend of 16-20-0-15 (actual) was seed-placed for all treatments. Excellent moisture and warm soil temperatures resulted in rapid emergence. Plant emergence occurred on May 25. No disease symptoms were evident. Emergence counts and flea beetle damage assessments were taken 8, 15 and 25 days after emergence (DAE). Flea beetle pressure was moderate during early plant development and tapered off by the third week in June. All treatments were sprayed with Liberty (1.35 L/ac or 10 ac/jug) at the 2-3 leaf stage on June 12. Decis was applied on June 11 to the Foundation Lite + Decis treatment. The Foundation Lite treatment was delayed by three to four days during early plant development due to flea beetle damage. All treatments were able to out-grow damage being incurred. There were no differences in maturity (30% seed colour change). Growing conditions (see *Site Information - Comments*) were excellent throughout the season.

***Results:*** ***Table 1. Average number of emerged plants/$m^2$***

| Treatment | 8 DAE | 15 DAE | 25 DAE |
|---|---|---|---|
| Foundation | 139 | 137 | 135 |
| Foundation Lite | 143 | 140 | 137 |
| Foundation + Decis | 138 | 139 | 135 |
| Helix XTra | 156 | 152 | 149 |
| Premiere Z | 147 | 144 | 142 |

DAE = Days After Emergence

***Table 2. Flea beetle damage assessment (% of leaf damage)***

| Treatment | 8 DAE | 15 DAE | 25 DAE |
|---|---|---|---|
| Foundation | 1-25 | 1-25 | 1-25 |
| Foundation Lite | 1-25 | 26-50 | 1-25 |
| Foundation + Decis | 1-25 | 26-50 | 1-25 |
| Helix XTra | 0 | 1-25 | 0 |
| Premiere Z | 1-25 | 1-25 | 1-25 |

DAE = Days After Emergence

***Table 3. Yield and Seed Quality***

| SEED TREATMENT TRIAL<br>Grenfell, SK | | | |
|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** |
| Foundation | 36.9 | 58.51 | 46.8 |
| Foundation Lite | 34.6 | 48.37 | 46.8 |
| Foundation Lite + Decis | 36.3 | 51.37 | 47.0 |
| Helix XTra | 36.5 | 47.20 | 47.1 |
| Premiere Z | 36.4 | N/A* | 46.7 |
| LSD | 1.35 | | 0.54 |
| CV % | 3.0 | | 0.9 |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:*** There were some differences in emergence between treatments, with Helix XTra having the highest plant counts over the growing season. Flea beetle damage was moderate (up to 50%) in Foundation Lite and Foundation Lite + Decis treatments. Reduced leaf area at early plant development from flea beetle damage in the Foundation Lite treatment resulted in a significantly lower yield. Oil content did not vary significantly. All treatments graded number one. Contribution margins reflect yield variation, foliar applied insecticide and seed treatment costs.

## *NAICAM*

***Observations:*** This trial was seeded May 6 at 5.0 lb/ac. A fertilizer blend of 18-21-11-16 (actual) was seed-placed. Climatic conditions (see *Site Description - Comments*) delayed emergence until May 23. No disease symptoms were evident. All treatments were substantially affected by a late May frost. Emergence counts and flea beetle damage assessments were taken 7, 15 and 23 days after emergence (DAE). Emergence counts were adequate and flea beetle pressure was low seven days after emergence. Flea beetle activity increased substantially as temperatures improved. Newly emerging leaves in the Foundation Lite treatment were unable to recover from flea beetle damage. Damage was consistent across all treatments. Treatments were sprayed with Liberty (1.35 L/ac or 10 ac/jug) at the 1-3 leaf stage on June 8. Decis was applied on June 8 to the Foundation Lite + Decis treatment. There were no visible growth differences among treatments, with the exception of Foundation Lite. The Foundation Lite treatment was delayed by four to six days during early plant development due to flea beetle damage. There were no differences in maturity (30% seed colour change).

***Results:***

***Table 1. Average number of emerged plants/$m^2$***

| Treatment | 7 DAE | 15 DAE | 23 DAE |
|---|---|---|---|
| Foundation | 91 | 56 | 52 |
| Foundation Lite | 84 | 47 | 39 |
| Foundation Lite + Decis | 82 | 47 | 45 |
| Foundation Lite + Assail (low rate) | 93 | 56 | 51 |
| Foundation Lite + Assail (high rate) | 91 | 57 | 55 |
| Gaucho CS + Counter | 94 | 59 | 60 |
| Foundation Lite + Counter + Assail (low rate) | 94 | 60 | 59 |
| Helix XTra | 94 | 60 | 58 |
| Gaucho Platinum | 89 | 56 | 51 |
| Premiere Z | 90 | 57 | 50 |

DAE = Days After Emergence

***Table 2. Flea beetle damage assessment (% of leaf damage)***

| Treatment | 7 DAE | 15 DAE | 23 DAE |
|---|---|---|---|
| Foundation | 0 | 1-25 | 1-25 |
| Foundation Lite | 0 | 26-50 | 1-25 |
| Foundation Lite + Decis | 0 | 26-50 | 1-25 |
| Foundation Lite + Assail (low rate) | 0 | 1-25 | 1-25 |
| Foundation Lite + Assail (high rate) | 0 | 1-25 | 1-25 |
| Gaucho CS + Counter | 0 | 0 | 0 |
| Foundation Lite + Counter + Assail (low rate) | 0 | 0 | 0 |
| Helix XTra | 0 | 0 | 0 |
| Gaucho Platinum | 0 | 1-25 | 1-25 |
| Premiere Z | 0 | 1-25 | 1-25 |

DAE = Days After Emergence

***Table 3. Yield and Seed Quality***

| SEED TREATMENT TRIAL<br>Naicam, SK | | | |
|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** |
| Foundation | 31.6 | 49.27 | 44.8 |
| Foundation Lite | 28.8 | 36.76 | 45.0 |
| Foundation Lite + Decis | 32.2 | 47.84 | 45.2 |
| Foundation Lite + Counter + Assail (low rate) | 38.5 | N/A* | 45.7 |
| Foundation Lite + Assail (high rate) | 36.5 | N/A* | 45.5 |
| Gaucho CS + Counter | 36.9 | 62.15 | 45.4 |
| Foundation Lite + Assail (low rate) | 33.5 | N/A* | 44.5 |
| Helix XTra | 36.6 | 63.62 | 45.6 |
| Gaucho Platinum | 35.5 | 59.05 | 45.9 |
| Premiere Z | 33.6 | N/A* | 45.2 |
| LSD | 3.50 | | 0.68 |
| CV % | 7.2 | | 1.1 |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:*** Reduced emergence counts, 15 days after emergence (DAE), were related to a severe frost (-3.8ºC) on May 30. Flea beetle damage was moderate (up to 50%) in Foundation Lite and Foundation Lite + Decis treatments. This resulted in low plant counts (39 plants/$m^2$) at 23 DAE, for the Foundation Lite treatment. Five treatments yielded significantly higher than the check (Foundation). Continuing damage from the flea beetles in the Foundation Lite treatment during early plant development resulted in the lowest yield. Oil content varied significantly for two treatments. All treatments graded number one. Contribution margins reflect differences in yield, foliar applied insecticide and seed treatment costs.

## *NORTH BATTLEFORD*

***Observations:*** This trial was seeded on May 17. Due to unfavorable conditions (see *Site Information*) crop establishment was slow and uneven. No flea beetles or diseases were observed in the trial. Emergence counts were taken on July 5. The trial was harvested on September 28.

***Results:*** ***Table 1. Yield, Seed Quality and Emergence Counts***

| SEED TREATMENT TRIAL<br>North Battleford, SK | | | | |
|---|---|---|---|---|
| **Treatment** | **Emergence Count (plants/m$^2$)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** |
| Foundation | 62 | 22.3 | (7.79) | 49.0 |
| Foundation Lite | 62 | 22.8 | (4.63) | 49.3 |
| Foundation Lite + Assail (low rate) | 56 | 21.8 | N/A* | 49.5 |
| Foundation Lite + Assail (high rate) | 50 | 23.3 | N/A* | 49.5 |
| Foundation Lite + Counter + Assail (low rate) | 56 | 24.5 | N/A* | 49.5 |
| Helix XTra | 56 | 25.8 | (0.57) | 49.3 |
| LSD<br>CV % | | 2.22<br>7.7 | | 0.88<br>1.5 |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:*** There were significant differences in yield among some treatments. However, due to the varying conditions within the trial, no accurate conclusions can be made.

## *BEISEKER*

***Observations:*** The trial was seeded on May 16 at 4.5 lb/ac. Canola emergence was even. No flea beetle damage was observed during the sampling period. There were no significant differences in growth over a four-week period. Root diseases were assessed and no problems were found. Lygus bugs were found in equal numbers (five per sweep on average) across all treatments. All treatments were sprayed with Lorsban to control the lygus bugs. No differences in maturity were observed at swathing time.

***Results:*** ***Table 1. Average number of emerged plants/m$^2$***

| Treatment | 7 DAE | 14 DAE | 21 DAE |
|---|---|---|---|
| Foundation | 72 | 72 | 72 |
| Foundation Lite | 84 | 87 | 87 |
| Foundation Lite + Assail (low rate) | 72 | 72 | 72 |
| Foundation Lite + Assail (high rate) | 90 | 101 | 95 |
| Premiere Z | 67 | 84 | 84 |

DAE = Days After Emergence

***Table 2. Yield and Seed Quality***

| SEED TREATMENT TRIAL<br>Beiseker, AB | | | | | |
|---|---|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover % June 30** | **Grade** |
| Foundation | 15.7 | (37.89) | 44.8 | 100 | 1 |
| Foundation Lite | 16.3 | (34.26) | 44.8 | 100 | 1 |
| Foundation Lite + Assail (low rate) | 15.6 | NA* | 45.7 | 100 | 1 |
| Foundation Lite + Assail (high rate) | 15.2 | NA* | 45.1 | 100 | 1 |
| Premiere Z | 16.4 | NA* | 45.5 | 100 | 1 |
| LSD | 1.42 | | 1.11 | | |
| CV % | 7.6 | | 2.0 | | |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:*** None of the seed treatments provided significant yield or oil increases as compared to the check treatment (Foundation). As a result of the hail, caution should be used when examining the yield and oil data. No flea beetle damage occurred. Any benefits from the insecticide components of the various treatments would be unlikely.

## *LETHBRIDGE (IRRIGATION)*

***Observations:*** This trial was seeded on May 6. Emergence was even but slow (see *Site Information*). Flea beetles were prevalent and caused damage to the Foundation Lite, Premiere Z, and the Foundation Lite + Decis treatments (see *Table 1*). On the Foundation Lite + Decis treatment, 50 mL/ac of Decis was sprayed 14 days after emergence to control flea beetles. Flea beetle control was excellent. The affected plants fully recovered. The Foundation Lite and Premiere Z treatments did not recover from the flea beetle damage until approximately 28 days after emergence. Cabbage seedpod weevils caused damage in all treatments. No differences in the amount of weevils (eight per sweep on average) or damage were observed. Main stem blanks (missing pods) were observed in all treatments. No lygus bugs were found. The entire trial was sprayed with Decis to control the weevils. Weevil control was excellent. Days to flowering were similar with the exception of Foundation Lite (two to three days behind) and Premiere Z (one day behind). Maturity (35% seed colour change) was the same for all treatments.

***Results:*** ***Table 1. Average number of emerged plants/$m^2$***

| Treatment | 7 DAE | 14 DAE | 21 DAE |
|---|---|---|---|
| Foundation | 157 | 174 | 174 |
| Foundation Lite | 168 | 129 | 118 |
| Foundation Lite + Decis | 168 | 140 | 134 |
| Foundation Lite + Assail (low rate) | 157 | 140 | 140 |
| Foundation Lite + Assail (high rate) | 157 | 134 | 123 |
| Counter + Gaucho CS | 117 | 112 | 106 |
| Counter + Foundation Lite + Assail (low rate) | 123 | 112 | 112 |
| Helix XTra | 168 | 140 | 140 |
| Gaucho Platinum | 162 | 145 | 134 |
| Premiere Z | 145 | 123 | 123 |

DAE = Days After Emergence

***Table 2. Flea beetle damage assessment (% of leaf damage)***

| Treatment | 7 DAE | 14 DAE | 21 DAE |
|---|---|---|---|
| Foundation | 0 | 0 | 0 |
| Foundation Lite | 26-50 | 51-75 | 51-75 |
| Foundation Lite + Decis | 1-25 | 26-50 | 1-25 |
| Foundation Lite + Assail (low rate) | 0 | 0 | 0 |
| Foundation Lite + Assail (high rate) | 0 | 0 | 0 |
| Counter & Gaucho CS | 0 | 0 | 0 |
| Counter + Foundation Lite + Assail (low rate) | 0 | 0 | 0 |
| Helix XTra | 0 | 0 | 0 |
| Gaucho Platinum | 0 | 0 | 0 |
| Premiere Z | 1-25 | 26-50 | 1-25 |

DAE = Days After Emergence

***Table 3. Yield and Seed Quality***

| SEED TREATMENT TRIAL<br>Lethbridge, AB (Irrigation) | | | | | |
|---|---|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover % June 14** | **Grade** |
| Foundation | 59.6 | 145.41 | 45.8 | 100 | 1 |
| Foundation Lite | 56.1 | 129.97 | 45.8 | 85 | 1 |
| Foundation Lite + Decis | 60.3 | 146.74 | 46.1 | 93 | 1 |
| Foundation Lite + Assail (low rate) | 59.1 | N/A* | 45.5 | 96 | 1 |
| Foundation Lite + Assail (high rate) | 57.8 | N/A* | 46.1 | 96 | 1 |
| Counter + Gaucho CS | 60.5 | 140.37 | 45.9 | 100 | 1 |
| Counter + Foundation Lite + Assail (low rate) | 58.5 | N/A* | 46.2 | 100 | 1 |
| Helix XTra | 57.6 | 129.89 | 46.4 | 100 | 1 |
| Gaucho Platinum | 58.7 | 136.23 | 46.3 | 100 | 1 |
| Premiere Z | 54.7 | N/A* | 46.1 | 100 | 1 |
| LSD<br>CV % | 3.42<br>5.0 | | 1.16<br>2.1 | | |

Note: *At the time of writing, no cost figures were available for these seed treatments.

***Discussion:***

Foundation Lite and Premiere Z treatments yielded significantly lower than the check treatment (Foundation). No significant differences occurred between the remaining treatments and the check. There were no significant differences in oil content.

Historically, damage from flea beetles in southern Alberta has been isolated. This year flea beetle populations flourished due to warm and dry weather. Populations were high enough to cause damage in the Foundation Lite, Foundation Lite + Decis and the Premiere Z treatments. Among these treatments, damage ranged from 1-75% with the Foundation Lite treatment being highest. The Foundation Lite + Decis treatment had similar amounts of leaf damage within the first 14 days as the Foundation Lite treatment. After spraying with Decis, the plants in the Foundation Lite + Decis treatment were able to recover. Even with good moisture and fertility, the Foundation Lite and Premiere Z treatments never fully recovered.

On June 14, ground cover was similar among all treatments with the exception of Foundation Lite, which had 85% ground cover. Flea beetle damage slowed growth in this treatment.

# XI TIME OF WEED REMOVAL TRIAL

***Objective:*** To compare the effects of time of weed removal on yield and quality of *B. napus* canola using Odyssey herbicide.

***Background:*** Determining the proper time for weed removal has been a constant source of frustration to producers across Western Canada. Producers will often delay post emergent herbicide application in an attempt to avoid late flushes of weeds. The concern is that these late flushes of weeds may add to the bank of weed seeds in the soil or require additional herbicide applications and increased input costs. Work conducted by Harker, et al (Agriculture and Agri-Food Canada) along with Canola Production Centre data has indicated that there are economic benefits to removing weeds early in crop development.

***Methodology:*** The trial consisted of three main treatments based on a normal seeding date.

A) 1-2 leaf stage of the canola
B) 3-5 leaf stage of the canola
C) 6-7 leaf stage of the canola

Odyssey was applied at 17 g/ac. In addition, Lontrel was added in a tank mix if thistle counts warranted spraying.

***Western Canadian Summary:***

In general, delayed spraying reduced yields and contribution margins at most sites. Early spraying did not appear to increase dockage levels. This data supports previous data collected at Canola Production Centres. Early spraying has the potential to increase yields and contribution margins with no increase in expenses.

## *SELKIRK*

***Observations:*** This trial was seeded on May 7 and stand establishment was very good. The plants received a light frost around the middle of May, but mortality appeared to be low. However, this initially appeared to delay growth of both the crop and weeds. Predominant weeds included wild oats, green foxtail, volunteer wheat, wild buckwheat, wild mustard and a scattering of other common broadleaf weeds. Grasses provided the greatest competition. Odyssey provided good control at the early crop stage. Due to the frequent and heavy rainfall during the latter part of June (see *Site Information*), the 3-5 leaf stage for herbicide application was missed. Due to the wet conditions at the later time of weed removal (6-7 leaf stage), plants in the tractor wheel marks never recovered. Efficacy at this stage was adequate, but not quite as good as the early spraying stage, due to the more advanced stage of the weeds.

***Results: (a)*** *Weed Data*

| TIME OF WEED REMOVAL TRIAL<br>Selkirk, MB | | | | | |
|---|---|---|---|---|---|
| **Treatment** | **Emergence Counts Plants/$m^2$** | **Spray Date** | **Broadleaf Weeds (#/$m^2$)** | **Grassy Weeds (#/$m^2$)** | **Weed Biomass ($g/m^2$)** |
| 1-2 leaf | 131* | May 29 | 58 | 77 | 4 |
| 3-5 leaf | 131* | N/A | N/A | N/A | 13 |
| 6-7 leaf | 131* | June 19 | 25 | 89 | 37 |

* Based on random counts throughout the trial.

***Results: (b)*** *Yield and Seed Quality Data*

| TIME OF WEED REMOVAL TRIAL<br>Selkirk, MB | | | | |
|---|---|---|---|---|
| **Treatment** | **Dockage (%)** | **Yield (bu/ac)** | **Oil (%)** | **Contribution Margin ($/ac)** |
| 1-2 leaf | 1.1 | 33.4 | 45.5 | 46.18 |
| 3-5 leaf | N/A | N/A | N/A | N/A |
| 6-7 leaf | 1.6 | 17.8 | 46.6 | (31.43) |
| LSD<br>CV % | | 3.92<br>14.7 | 1.14<br>2.1 | |

Note: Brackets in the contribution margin reflect a negative value.

***Discussion:*** Yield and economic returns were dramatically reduced by delayed herbicide application at this site. While the wheel marks from the tractor may have exaggerated this reduction, it was obvious that the abundant weed competition also played a major role. Allowing the weeds to continue to compete added another stress to the crop.

## *NAICAM*

***Observations:*** This trial was seeded on May 5 at 6.5 lb/ac. A fertilizer blend of 18-21-11-16 (actual) was seed-placed. Climatic conditions (see *Site Description - Comments*) delayed emergence until May 23. Emergence was uniform. Frost damage was not as severe (23% plant loss) as in other areas of the field. Weed pressure and flea beetle damage was variable across all treatments. Shot hole damage was in excess of 25% in most treatments. As a result Decis 5EC was applied. Predominant weeds included volunteer wheat, stinkweed, wild buckwheat and Canada thistle (2-3/$m^2$). Odyssey (17 g/ac or 40 ac/case) was tank mixed with Lontrel (0.17 L/ac or 26 ac/jug) and applied to all treatments. Herbicides were applied at the 2-leaf, 5-leaf and 7-leaf stage of plant development. Weed counts and weed biomass samples were taken prior to spraying each treatment. Weed control was reduced in

later sprayed treatments. There were no differences in maturity among treatments.

***Results: (a)*** *Weed Data*

| TIME OF WEED REMOVAL TRIAL<br>Naicam, SK | | | | | |
|---|---|---|---|---|---|
| **Treatment** | **Emergence Counts Plants/$m^2$** | **Spray Date** | **Broadleaf Weeds (#/$m^2$)** | **Grassy Weeds (#/$m^2$)** | **Dry Wt. (g/$m^2$) total** |
| 1-2 leaf | 74 | June 7 | 5 | 27 | 11.4 |
| 3-5 leaf | 77 | June 16 | 24 | 29 | 23.2 |
| 6-7 leaf | 72 | June 23 | 21 | 32 | 25.7 |

***Results: (b)*** *Yield and Seed Quality Data*

| TIME OF WEED REMOVAL TRIAL<br>Naicam, SK | | | | |
|---|---|---|---|---|
| **Treatment** | **Dockage (%)** | **Yield (bu/ac)** | **Oil (%)** | **Contribution Margin ($/ac)** |
| 1-2 leaf | 2.8 | 40.4 | 47.5 | 59.66 |
| 3-5 leaf | 3.3 | 38.1 | 47.0 | 46.73 |
| 6-7 leaf | 5.5 | 37.0 | 47.5 | 41.51 |
| LSD<br>CV % | | 1.34<br>2.5 | 0.95<br>1.5 | |

***Discussion:*** The 1-2 leaf treatment yielded significantly higher than the other treatments. The early (1-2 leaf) treatment made better utilization of available moisture and nutrients than the later time of weed removal treatments. All treatments graded number one. Contribution margins only reflect differences in yield.

## *VEGREVILLE*

***Observations:*** This trial was seeded on May 12. Emergence was uniform for all treatments. Wild oats were the predominant weeds in the trial but chickweed, hemp nettle, smartweed, stinkweed and wild buckwheat were also present. Weed counts and samples were taken prior to spraying with Odyssey. Wild oats were tillering when the 6-7 leaf treatment was sprayed and were still visible in the stubble at harvest. Some of these wild oats set seed but did not grow above the stubble height of the plots. The trial was swathed on September 6.

***Results: (a)*** *Weed Data*

| TIME OF WEED REMOVAL TRIAL<br>Vegreville, AB | | | | | |
|---|---|---|---|---|---|
| **Treatment** | **Emergence Counts Plants/$m^2$** | **Spray Date** | **Broadleaf Weeds (#/$m^2$)** | **Grassy Weeds (#/$m^2$)** | **Weed Biomass ($g/m^2$)** |
| 1-2 leaf | 116 | June 4 | 7 | 34 | 10 |
| 3-5 leaf | 97 | June 13 | 35 | 147 | 33 |
| 6-7 leaf | 98 | June 26 | 20 | 226 | 792 |

***Results: (b)*** *Yield and Seed Quality Data*

| TIME OF WEED REMOVAL TRIAL<br>Vegreville, AB | | | | |
|---|---|---|---|---|
| **Treatment** | **Dockage (%)** | **Yield (bu/ac)** | **Oil (%)** | **Contribution Margin ($/ac)** |
| 1-2 leaf | 3.6 | 40.0 | 46.3 | 76.05 |
| 3-5 leaf | 2.1 | 40.8 | 46.5 | 79.85 |
| 6-7 leaf | 2.9 | 29.8 | 47.0 | 27.60 |
| LSD<br>CV % | | 5.62<br>11.1 | 0.83<br>1.3 | |

***Discussion:*** The 6-7 leaf treatment yielded significantly lower than the other two treatments. The contribution margin of this treatment was also much lower than the other two treatments. In this trial, timely weed removal made approximately $50 per acre more than delayed spraying.

# XII 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 variety and herbicide for each field. Factors to consider beyond the performance of the variety include weed population, weed spectrum, tillage system and herbicide rotation. Entries in the systems comparison trial were on a contract basis.

***Methodology:*** Each treatment was replicated four times in an incomplete split plot design. To avoid the impact of spray drift, all varieties within a system were seeded in a common block. The canola varieties with novel traits for herbicide tolerance were compared to the conventional varieties AC Excel and Quantum using a conventional herbicide program. All varieties were sprayed with their appropriate herbicide. All hybrid varieties were seeded at 4-5 lb/ac, whereas the open pollinated varieties were seeded at the recommended rate for the area. The Monsanto Technology Use Agreement (TUA) was included in calculating contribution margins for the Roundup Ready system.

***Western Canadian Summary:***

Adverse environmental conditions impacted the performance of the varieties at a number of locations. The differences in yield performance of the varieties among sites are in part a reflection of the systems' ability to control the weed spectrum. Yields tended to be the highest with the Liberty Link hybrids at most locations. Contribution margins were a function of yield, herbicide cost (including TUA for Roundup Ready), seed cost and grade.

Differences in oil contents varied from variety to variety and from site to site. Weed conditions and growing conditions varied greatly, and the ideal combination of herbicide system and variety varied accordingly. The ideal system (in terms of variety and herbicide package) for one grower is not necessarily the best combination for a neighbour. A grower must consider the spectrum of weeds present, typical growing conditions for their area, disease concerns, crop rotation, herbicide rotation and genetic potential of the varieties before making the choice of one particular system for a field.

Also important, is the role of proper record keeping in terms of varieties and herbicide systems used. This is crucial in planning the weed control strategy for the entire rotation, and in reducing the chances of developing weed resistance to specific herbicides or classes of herbicides that may be frequently used in the rotation.

## *SELKIRK*

***Observation:*** Frequent rain showers in the early part of May delayed seeding until May 15. Seed was placed into moisture at a depth of ½". Stand establishment was good, but weed competition was high. Wild oats, green foxtail and volunteer wheat were the predominant weeds, but some wild mustard, lady's thumb, wild buckwheat and the odd lamb's quarters were also present. While herbicide applications were planned for the two-leaf stage of the crop, three days of constant wind in excess of 30 km/hr followed by two weeks of frequent and heavy rainfall (see *Site Information*) delayed applications until the 7-leaf stage.

The combination of weed competition and large amounts of rainfall at this site severely stressed all varieties.

***Discussion:*** Statistical analysis revealed unacceptably high co-efficients of variation (CV greater than 15%). Therefore, yield results were unreliable and have not been reported.

## *RUSSELL*

***Observation:*** Seeding of this trial took place on May 20. Warm soil temperatures and rain showers shortly after seeding resulted in rapid emergence and excellent stand establishment. The weed spectrum at the site included wild oats, volunteer barley, green foxtail, wild mustard, lamb's quarters, wild buckwheat and Canada thistle. Herbicides applied to the various systems at the 3-4 leaf stage of the crop were as follows:

Clearfield Production System - Odyssey (17 g/ac)
Conventional - Select (0.08 L/ac), Muster (8 g/ac) and Lontrel (0.17 L/ac)
Liberty Link - Liberty (1.35 L/ac), Select (0.025 L/ac)
Navigator/Compas - Select (0.08 L/ac), Compas (0.28 L/ac)
Roundup Ready - Roundup Transorb (0.5 L/ac)

Weed control was generally good with the exception of some thistle regrowth in the conventional, Navigator/Compas and Clearfield Production systems. There were also a few wild oat escapes in one rep of the Clearfield system. Based on petal tests, the thick canopy and wet weather prior to and during flowering, Rovral flo (0.8 L/ac) was applied to provide protection against sclerotinia. No significant sclerotinia infection was observed at swathing, and no other serious disease or insect pressures were noted throughout the growing season.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Russell, MB | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| ***Conventional*** | | | | | | |
| Quantum | 104 | 36.9 | 31.42 | 46.4 | 1002 | 93 |
| AC Excel | 100 | 35.5 | 30.71 | 47.4 | 1002 | 93 |
| ***Clearfield Production System*** | | | | | | |
| 46A76 | 112 | 39.6 | 42.64 | 47.1 | 1027 | 95 |
| 46A73 | 101 | 35.7 | 29.36 | 46.7 | 1027 | 95 |
| ***Liberty Link*** | | | | | | |
| InVigor 2573 | 116 | 41.3 | 78.70 | 48.1 | 1013 | 94 |
| InVigor 2663 | 116 | 41.2 | 78.20 | 47.8 | 1013 | 94 |
| ***Navigator / Compas*** | | | | | | |
| Armor Bx | 109 | 38.6 | 72.82 | 47.5 | 1002 | 93 |
| Cartier Bx | 107 | 38.1 | 68.85 | 46.5 | 1002 | 93 |
| Zodiak Bx | 103 | 36.6 | 62.04 | 47.2 | 1002 | 93 |
| ***Roundup Ready*** | | | | | | |
| LG3345 | 114 | 40.5 | 78.47 | 48.4 | 1013 | 94 |
| LG3525 | 110 | 39.0 | 70.12 | 48.4 | 1013 | 94 |
| Conquest | 107 | 38.1 | 69.51 | 48.2 | 1027 | 95 |
| LG3235 | 107 | 38.0 | 66.33 | 47.7 | 1002 | 93 |
| LG3455 | 106 | 37.8 | 64.15 | 48.4 | 1013 | 94 |
| SW RideR | 105 | 37.4 | 59.84 | 48.2 | 1013 | 94 |
| Hyola 454 | 105 | 37.4 | 57.31 | 47.6 | 1013 | 94 |
| LSD<br>CV% | | 3.87<br>8.6 | | 0.95<br>1.7 | | |

***Discussion:*** The check (AC Excel) produced the lowest yield, although only InVigor 2573, InVigor 2663, LG3345 and 46A76 provided a significant yield advantage. Each system had at least one variety exceeding a $70 contribution margin, with the exception of the conventional and Clearfield Production systems. Their economic returns were lower due to additional herbicide costs for Canada thistle control. Only LG3525 and LG3455 produced significantly higher oil contents than AC Excel, while Cartier Bx and Quantum were significantly lower. The range in days to maturity was relatively small (93 to 95 days), due to high temperatures at swathing time.

## *GRENFELL*

***Observations:*** Seeding took place on May 17. A fertilizer blend of 16-20-0-15 (actual) was seed-placed. Excellent moisture and warm soil temperatures resulted in rapid emergence. Growing conditions (see *Site Information - Comments)* were excellent throughout the season. Weed pressure was moderate to heavy in most areas. Herbicides were applied at the 2-3 leaf stage and resulted in good control of target weeds (see *Site Information - Pesticides Applied* for herbicide rates).

Sclerotinia stem rot was more prevalent in varieties with poor standability (see *Harvestability*). Flea beetles caused damage during early plant development. Shot hole damage in excess of 25% was identified in some areas. Plants outgrew damage quickly because of excellent growing conditions. Other insect damage was light. Light infestations of blackleg and aster yellows were observed.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Grenfell, SK | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| ***Conventional*** | | | | | | |
| Quantum | 118 | 37.6 | 42.61 | 45.9 | 1077 | 97 |
| AC Excel | 100 | 31.8 | 22.19 | 46.3 | 1093 | 98 |
| ***Liberty Link*** | | | | | | |
| InVigor 2573 | 128 | 40.6 | 78.54 | 46.1 | 1109 | 99 |
| InVigor 2663 | 120 | 38.1 | 66.66 | 46.6 | 1124 | 100 |
| ***Navigator / Compas*** | | | | | | |
| Cartier Bx | 98 | 31.2 | 37.86 | 45.6 | 1093 | 98 |
| Zodiak Bx | 92 | 29.3 | 29.58 | 46.5 | 1093 | 98 |
| Armor Bx | 82 | 26.1 | 15.33 | 46.0 | 1077 | 97 |
| ***Roundup Ready*** | | | | | | |
| Conquest | 116 | 36.8 | 62.49 | 46.5 | 1124 | 100 |
| SW RideR | 112 | 35.6 | 55.99 | 46.2 | 1109 | 99 |
| LG3455 | 109 | 34.7 | 48.11 | 47.2 | 1093 | 98 |
| LG3235 | 105 | 33.4 | 43.29 | 45.4 | 1055 | 95 |
| LG3525 | 103 | 32.7 | 38.61 | 47.1 | 1109 | 99 |
| LG Dawn | 99 | 31.4 | 35.89 | 46.1 | 1077 | 97 |
| IMC 106 RR | 96 | 30.4 | 58.05 | 46.7 | 1093 | 98 |
| Hylite 225 | 96 | 30.4 | 28.36 | 46.8 | 1077 | 97 |
| LG3345 | 92 | 29.3 | 23.47 | 47.2 | 1065 | 96 |
| LSD<br>CV% | | 2.04<br>5.2 | | 0.81<br>1.5 | | |

***Discussion:*** Yield differences greater than 2.04 bu/ac were statistically significant. Seven varieties yielded significantly higher than the check (AC Excel), while three varieties were significantly lower. However, only one variety (InVigor 2573) yielded significantly higher than Quantum, while twelve varieties were significantly lower. All treatments graded number one. Contribution margins reflect differences in yield, seed costs, herbicide costs and oil premiums (IMC 106 RR). Significant differences in oil content were found. Days to maturity ranged from 95-100.

## *NAICAM*

***Observations:*** This trial was seeded on May 6. A fertilizer blend of 18-21-11-16 (actual) was seed-placed. Variable growing conditions (see *Site Information - Comments)* affected the yield potential. All treatments were substantially affected by a late May frost and flea beetle damage. Plant counts were reduced on average by 40%. Shot hole damage was in excess of 25% in most treatments. As a result Decis 5EC was applied. Weed pressure was variable across all treatments. Herbicides were applied at the 1-3 leaf stage (except Freedom Gold) and resulted in good control of target weeds (see *Site Information - Pesticides Applied*). Herbicide application recommendations combined with poor weather delayed spraying of the Freedom Gold system until the 6-7 leaf stage. Poor crop competition resulted in an increase in the number of weeds present later in the growing season. All varieties matured unevenly due to the combination of high nitrogen rates and low crop density.

Light infestations of blackleg and aster yellows were observed. Other insect damage was light.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Naicam, SK | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| ***Conventional*** | | | | | | | |
| Quantum | 103 | 27.1 | (3.29) | 43.5 | 1064 | 112 | 2 |
| AC Excel | 100 | 26.2 | 0.00 | 44.6 | 1072 | 113 | 2 |
| ***Clearfield Production System*** | | | | | | | |
| 46A76 | 142 | 37.1 | 41.98 | 44.0 | 1072 | 113 | 1 |
| 46A73 | 115 | 30.2 | 4.10 | 43.8 | 1072 | 113 | 2 |
| ***Freedom Gold*** | | | | | | | |
| 46A73 | 75 | 19.7 | (15.82) | 44.7 | 1077 | 114 | 2 |
| ***Liberty Link*** | | | | | | | |
| InVigor 2573 | 132 | 34.6 | 61.77 | 44.6 | 1077 | 114 | 1 |
| InVigor 2663 | 123 | 32.3 | 50.84 | 45.2 | 1077 | 114 | 1 |
| 2631 LL | 90 | 23.6 | 17.61 | 43.6 | 1072 | 113 | 1 |
| ***Navigator / Compas*** | | | | | | | |
| Cartier Bx | 108 | 28.2 | 35.34 | 45.7 | 1047 | 111 | 1 |
| Armor Bx | 103 | 28.2 | 31.81 | 45.3 | 1047 | 111 | 1 |
| ***Roundup Ready*** | | | | | | | |
| LG 3455 | 144 | 37.7 | 74.09 | 45.3 | 1064 | 112 | 1 |
| Conquest | 135 | 35.5 | 64.38 | 45.7 | 1064 | 112 | 1 |
| LG3525 | 127 | 33.4 | 53.67 | 45.0 | 1072 | 113 | 1 |
| LG3235 | 121 | 31.7 | 47.89 | 43.5 | 1047 | 111 | 1 |
| Hylite 225 | 115 | 30.1 | 38.67 | 44.6 | 1064 | 112 | 1 |
| SW RideR | 113 | 29.5 | 38.75 | 45.2 | 1072 | 113 | 1 |
| LG3345 | 111 | 29.1 | 34.25 | 45.0 | 1064 | 112 | 1 |
| LG Dawn | 106 | 27.7 | 30.05 | 43.6 | 1064 | 112 | 1 |
| IMC 106 RR | 103 | 26.9 | 46.73 | 44.6 | 1072 | 113 | 1 |
| LSD<br>CV% | | 2.83<br>8.0 | | 1.63<br>3.1 | | | |

Note: Brackets in the contribution margin reflect a negative value.

***Discussion:*** Yield differences greater than 2.83 bu/ac were statistically significant. Eleven varieties yielded significantly higher than the check (AC Excel), while one treatment (46A73 - Freedom Gold) yielded significantly lower. There were no significant differences in oil content among treatments. Four treatments (46A73 - Freedom Gold, 46A73 - Clearfield, AC Excel and Quantum) graded number two. Contribution margins reflect differences in yield, seed costs,

grade, herbicide costs and oil premiums (IMC 106 RR). Contribution margins for the conventional and Clearfield systems were lower due to additional costs related to thistle control. Days to maturity ranged from 111 to 114.

## *NORTH BATTLEFORD*

***Observations:*** See *Site Information*.

***Discussion:*** Due to the high coefficient of variation for this trial, caused by environmental conditions, no accurate conclusions could be made. Therefore, the results have not been reported.

## *VEGREVILLE*

***Observations:*** This trial was seeded on May 12 and 13. Conditions were excellent (see *Site Information*) for germination and early crop establishment. Conditions were also ideal for weeds. An early flush of wild oats warranted early spraying, but spraying was delayed to allow recovery from a late May frost. Conventional treatments were sprayed with Assure II (0.2 L/ac) on June 3 followed by Muster (12 g/ac) on June 13. Liberty Link treatments were sprayed with Liberty (1.35 L/ac) on June 4 followed by Fusion on June 26 to remove wild oats that were not controlled by Liberty. Roundup Ready treatments were sprayed with Roundup Transorb (0.5 L/ac) on June 4. Wild oats in the sprayer tracks were not controlled because of dust behind the wheels. A second application of Roundup Transorb (0.5 L/ac) was applied on June 26 to control these wild oats. Navigator/Compas treatments were sprayed with Select (80 mL/ac) and Compas (234 mL/ac) on June 4. Clearfield treatments were sprayed with Odyssey (17 g/ac) on June 4. After consultation with a DuPont representative, application of the Freedom Gold components on the Freedom Gold system were split. The Assure II (0.2 L/ac) portion was sprayed on June 3, and the Freedom (8 g/ac) portion was sprayed on June 13. This was done to avoid crop injury from Freedom while removing the early flush of wild oats. Some crop injury was still noticed on one replication of Freedom Gold. Weed control appeared to be most effective in the Roundup Ready and Clearfield systems. Late flushes of wild buckwheat and a few other broadleaf weeds contaminated the other systems. Hail in early August caused green seed problems to some plots.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Vegreville, AB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| ***Conventional*** | | | | | | | |
| Quantum | 116 | 36.3 | 74.25 | 45.3 | 1007 | 109 | 1 |
| AC Excel | 100 | 31.3 | 57.08 | 45.8 | 1007 | 109 | 1 |
| ***Clearfield Production System*** | | | | | | | |
| 46A76 | 119 | 37.3 | 63.23 | 46.5 | 1059 | 117 | 1 |
| 46A73 | 113 | 35.3 | 47.02 | 45.8 | 1059 | 117 | 2 |
| ***Freedom Gold*** | | | | | | | |
| 46A73 | 81 | 25.3 | 5.87 | 45.3 | 1059 | 117 | 2 |
| ***Liberty Link*** | | | | | | | |
| InVigor 2573 | 131 | 41.1 | 80.33 | 45.8 | 1014 | 110 | 1 |
| InVigor 2663 | 122 | 38.3 | 67.03 | 46.0 | 1014 | 110 | 1 |
| 2631 LL | 98 | 30.8 | 40.68 | 45.0 | 993 | 107 | 1 |
| ***Navigator / Compas*** | | | | | | | |
| Cartier Bx | 94 | 29.5 | 29.80 | 43.8 | 993 | 107 | 2 |
| Armor Bx | 86 | 27.0 | 27.46 | 44.0 | 993 | 107 | 1 |
| ***Roundup Ready*** | | | | | | | |
| LG3455 | 120 | 37.5 | 64.84 | 45.8 | 1007 | 109 | 1 |
| LG3235 | 114 | 35.8 | 58.03 | 44.0 | 1000 | 108 | 1 |
| SW RideR | 109 | 34.0 | 36.60 | 44.8 | 1036 | 113 | 2 |
| LG3525 | 101 | 31.5 | 36.35 | 46.0 | 1007 | 109 | 1 |
| LG3345 | 99 | 31.0 | 26.54 | 45.8 | 1007 | 109 | 2 |
| Hyola 454 | 98 | 30.8 | 19.85 | 45.3 | 1053 | 116 | 2 |
| Conquest | 97 | 30.3 | 23.16 | 45.0 | 1053 | 116 | 2 |
| LSD<br>CV% | | 2.57<br>6.6 | | 0.89<br>1.7 | | | |

***Discussion:***

InVigor 2573 yielded significantly higher than all other varieties tested. InVigor 2663, LG3455, 46A76 (Clearfield), Quantum, LG3235, 46A73 (Clearfield) and SW RideR yielded significantly higher than AC Excel. Only InVigor 2573 yielded significantly higher than Quantum. Maturity ranged from 107 to 117 days.

Contribution margins reflect differences in yield, grade, seed and herbicide costs.

## *BEISEKER*

***Observation:*** Quackgrass and volunteer cereals had emerged prior to seeding. A pre-seeding burnoff of Vantage Plus (700 mL/ac) was sprayed May 15. The trial was seeded May 17. The average seeding rate was 5 lb/ac. The InVigor varieties and Hyola 454 were seeded at 4.5 lb/ac. Emergence was even but slow. All post emergent herbicides were applied at the 2-leaf stage of the crop. The conventional system was sprayed with Muster Gold II (Assure II @ 200 mL/ac and Muster @ 8 g/ac) and Lontrel (227 mL/ac). The Liberty Link system was sprayed with a Liberty (1.35 L/ac) and Select (50 mL/ac) tank mix. The Roundup Ready system was sprayed with Roundup Transorb (500 mL/ac). The Navigator system was sprayed with Compas (300 mL/ac) and Select (50 mL/ac). Weed control was excellent for all treatments. Frost and hail (see *Site Information*) affected plant growth and maturity.

***Results:***

**SYSTEMS COMPARISON TRIAL**
**Beiseker, AB**

| System | Yield (%) | Yield (bu/ac) | Contribution Margin ($/ac) | Oil (%) | Grade | Ground Cover % June 30 | Growing Degree Days | Days To Maturity |
|---|---|---|---|---|---|---|---|---|
| ***Conventional*** | | | | | | | | |
| Quantum | 118 | 13.9 | (57.56) | 45.3 | 1 | 100 | 1047 | 96 |
| AC Excel | 100 | 11.7 | (62.50) | 44.9 | 1 | 90 | 1082 | 101 |
| ***Liberty Link*** | | | | | | | | |
| InVigor 2663 | 157 | 18.4 | (21.85) | 45.2 | 1 | 100 | 1082 | 101 |
| InVigor 2573 | 150 | 17.6 | (25.64) | 43.8 | 1 | 96 | 1082 | 101 |
| ***Navigator / Compas*** | | | | | | | | |
| Cartier Bx | 102 | 12.0 | (48.94) | 44.4 | 2 | 90 | 1067 | 98 |
| Armor Bx | 100 | 11.8 | (45.34) | 44.3 | 1 | 90 | 1067 | 98 |
| ***Roundup Ready*** | | | | | | | | |
| Hyola 454 | 137 | 16.1 | (38.51) | 44.0 | 2 | 96 | 1091 | 102 |
| SW RideR | 128 | 15.0 | (38.28) | 44.4 | 1 | 100 | 1079 | 100 |
| LG3235 | 123 | 14.4 | (38.04) | 44.7 | 1 | 100 | 1047 | 96 |
| LG3345 | 119 | 14.0 | (40.20) | 44.7 | 1 | 95 | 1082 | 101 |
| LG3525 | 118 | 13.9 | (41.45) | 45.8 | 1 | 100 | 1067 | 98 |
| Canterra 1867 | 112 | 13.2 | (43.20) | 45.8 | 1 | 90 | 1067 | 98 |
| LG3455 | 112 | 13.2 | (44.77) | 46.0 | 1 | 90 | 1067 | 98 |
| LSD<br>CV% | | 2.26<br>13.9 | | 1.43<br>2.7 | | | | |

Note: Brackets in the contribution margin reflect a negative value.

***Discussion:*** Damage from hail was variable and depended on the maturity of the particular variety. More mature varieties at the time of the storm had more visible damage, therefore when making comparisons caution should be used. Yield differences of 2.26 bu/ac or more are significant. Oil content differences of 1.43% or more are statistically significant.

Contribution margins were a reflection of yield, grade, herbicide and seed costs. The contribution margins of the conventional system were lower due to the additional cost of thistle control.

InVigor 2663, LG3235, LG3525, SW RideR, Hyola 454 and Quantum had reached 100% ground cover by June 30.

## *LETHBRIDGE (IRRIGATION)*

***Observation:*** A pre-seeding burnoff of Vantage Plus (700 mL/ac) was sprayed on May 5 to control volunteer cereals. The trial was seeded on May 6. The average seeding rate was 4 lb/ac. Emergence was even. Frost affected all varieties but recovery was good (see *Site Information*). After seeding another flush of volunteer cereals emerged. Weed pressure was evident in all treatments. All post emergent herbicides were applied at the 2-leaf stage of the crop. The Conventional system was sprayed with Muster Gold II (Assure @ 200 mL/ac and Muster @ 8 g/ac) and Lontrel (227 mL/ac). The Liberty Link system was sprayed with a Liberty (1.35 L/ac) and Select (50 mL/ac) tank mix. The Roundup Ready system was sprayed with Roundup Transorb (500 mL/ac). The Navigator system was sprayed with Compas (300 mL/ac) and Select (50 mL/ac). Weed control was excellent for all treatments. Maturity varied among varieties.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Lethbridge, AB (Irrigation) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Ground Cover % June 14** | **Growing Degree Days** | **Days To Maturity** |
| ***Conventional*** | | | | | | | |
| Quantum | 103 | 59.9 | 133.81 | 42.9 | 100 | 1141 | 99 |
| AC Excel | 100 | 58.3 | 130.45 | 44.6 | 95 | 1100 | 96 |
| ***Liberty Link*** | | | | | | | |
| InVigor 2663 | 117 | 68.4 | 186.38 | 45.8 | 100 | 1189 | 103 |
| InVigor 2573 | 114 | 66.7 | 170.28 | 45.3 | 97 | 1202 | 104 |
| ***Navigator / Compas*** | | | | | | | |
| Armor Bx | 106 | 62.0 | 166.19 | 44.9 | 93 | 1100 | 96 |
| Cartier Bx | 104 | 60.8 | 159.46 | 44.1 | 93 | 1165 | 101 |
| ***Roundup Ready*** | | | | | | | |
| LG3525 | 116 | 67.7 | 188.55 | 46.0 | 97 | 1165 | 101 |
| LG3455 | 114 | 66.2 | 181.44 | 46.6 | 97 | 1165 | 101 |
| Hyola 454 | 112 | 65.3 | 170.28 | 45.9 | 100 | 1213 | 105 |
| LG3345 | 112 | 65.2 | 177.83 | 46.2 | 97 | 1202 | 104 |
| SW RideR | 111 | 64.8 | 173.18 | 45.0 | 100 | 1202 | 104 |
| LG3235 | 106 | 61.6 | 160.48 | 45.8 | 97 | 1100 | 96 |
| LSD<br>CV% | | 3.04<br>4.0 | | 1.02<br>1.9 | | | |

***Discussion:***

Yield differences of 3.04 bu/ac or greater and oil content differences of 1.02% or greater are significant. Contribution margins are a reflection of yield, seed costs, and the individual herbicide costs of the particular system. LG3525 and InVigor 2663 have the highest contribution margins. The lower contribution margins for the conventional system resulted from lower yields and the additional cost of Canada thistle control.

The range in maturity was from 95-105 days. Hyola 454 had the longest maturity at 105 days.

Quantum, Hyola 454, SW RideR, and InVigor 2663 were the first to cover the ground by June 14.

## *RYCROFT*

***Observations:*** The trial was seeded on May 25 into cool (6°C) moist soil. Temperatures remained cool throughout the growing season and moisture was adequate. Crop emergence was slow and uneven allowing the weeds to get a 'jump' on the crop. A blanket application of Poast was applied to all treatments to control grassy weeds (see *Site Information - Comments*). The predominant weeds were volunteer barley, wild oats, stinkweed, cleavers and wild buckwheat, while Canada thistle, wild rose and field horsetail were less prevalent. All treatments were sprayed on June 26 under warm (23°C air temperature), dry, calm conditions. Conventional treatments were sprayed with Muster Gold II (Muster @ 8g/ac and Assure II @ 0.2 L/ac). Liberty Link treatments were sprayed with Liberty (1.35 L/ac). Roundup Ready treatments were sprayed with a single application (0.5 L/ac) of Roundup Transorb. Clearfield treatments were sprayed with Odyssey (17 g/ac). Freedom Gold treatments were sprayed with Freedom Gold (Assure II @ 0.2 L/ac and Freedom @ 8 g/ac). All of the treatments were sprayed when the canola was at the 3-4 leaf stage using 10 gallons of water per acre. Plots sprayed with Freedom Gold showed obvious herbicide injury and were set back for approximately one week. Weed control was excellent for most treatments. However, stinkweed did escape in the conventional treatments.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Rycroft, AB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| ***Conventional*** | | | | | | | |
| AC Excel | 100 | 34.6 | 44.99 | 48.6 | 810 | 111 | 3b |
| Quantum | 94 | 32.6 | 49.47 | 47.1 | 816 | 112 | 3a |
| ***Clearfield Production System*** | | | | | | | |
| 46A76 | 99 | 34.2 | 30.01 | 48.5 | 816 | 112 | 3b |
| 46A73 | 70 | 24.3 | (27.19) | 46.5 | 823 | 113 | Sample |
| ***Freedom Gold*** | | | | | | | |
| 46A73 | 73 | 25.3 | (29.71) | 46.6 | 830 | 116 | Sample |
| ***Liberty Link*** | | | | | | | |
| InVigor 2573 | 127 | 43.9 | 91.91 | 49.8 | 799 | 110 | 2 |
| InVigor 2663 | 125 | 43.2 | 46.17 | 48.9 | 799 | 110 | 3a |
| 2631 LL | 108 | 37.4 | 75.59 | 49.9 | 799 | 110 | 3b |
| ***Roundup Ready*** | | | | | | | |
| LG3455 | 114 | 39.5 | 46.70 | 48.1 | 810 | 111 | 3b |
| LG3525 | 112 | 38.6 | 43.73 | 48.9 | 810 | 111 | 3b |
| LG3235 | 111 | 38.4 | 44.24 | 47.6 | 810 | 111 | Sample |
| LG3345 | 110 | 38.1 | 42.44 | 49.9 | 810 | 111 | 3b |
| SW Arrow | 108 | 37.4 | 52.48 | 48.8 | 780 | 107 | 3b |
| Conquest | 100 | 34.5 | 32.68 | 48.7 | 799 | 110 | 3b |
| Hyola 454 | 97 | 33.6 | 15.28 | 47.6 | 810 | 111 | 3b |
| LSD<br>CV% | | 2.82<br>6.7 | | 0.85<br>1.5 | | | |

Note: Brackets in the contribution margin reflect a negative value.

***Discussion:*** InVigor 2573 and InVigor 2663 yielded significantly higher than any other varieties in the trial. 46A73 within the Clearfield and Freedom Gold systems yielded statistically lower than all other varieties. InVigor 2573 had the highest contribution margin, while 46A73 had the lowest contribution margin. Contribution margins reflect seed cost, herbicide costs, yield and grade.

# XIII CANOPY MANIPULATION TRIAL

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

***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 photosynthates from pod hulls. Also, excessive vegetative growth can deplete soil moisture in dry conditions resulting in poor pod formation and filling. Previous seeding rate recommendations were based on studies carried out throughout western Canada under various weed and disease pressures. The introduction of novel trait canola varieties with herbicide tolerance has improved weed control, which may lessen the need for higher plant populations. Weather conditions often contribute to increased lodging and sclerotinia. Reduced plant stands may lessen the risk of these factors. However, lower plant densities may bring higher risks such as later maturity, green seed and insects (ie. root maggots). Recent seeding date research has indicated that early spring or fall dormant seeded canola produces thinner and shorter plant stands, which have been related to increased yields.

***Methodology:*** The seeding date trial consisted of two seeding dates and three seeding rates. InVigor 2153 from a common seed lot was used at all locations.

A) Early seeding date @ 1.0 lb/ac ** (Peace ~ 2.0 lb/ac)
B) Early seeding date @ 3.0 lb/ac ** (Peace ~ 5.0 lb/ac)
B) Early seeding date @ 6.0 lb/ac ** (Peace ~ 8.0 lb/ac)
C) Normal seeding date @ 1.0 lb/ac ** (Peace ~ 2.0 lb/ac)
D) Normal seeding date @ 3.0 lb/ac ** (Peace ~ 5.0 lb/ac)
E) Normal seeding date @ 6.0 lb/ac ** (Peace ~ 8.0 lb/ac)

This trial was not sprayed with any fungicides.

***Western Canadian Summary:***

There were significant differences between seeding dates and among seeding rates at all sites. Yield and quality were usually optimized at the medium to high seeding rates. Low seeding rates never reached complete canopy closure and resulted in delayed maturity and increased branching at most sites. Low seeding rates had increased lodging at all sites, which was not expected. “The plant grew too big for its branches”. Seed colour change evaluation and swathability were more difficult at the low seeding rates. There were no noticeable differences in sclerotinia infection at two of the three locations, but at the third location (Rycroft), sclerotinia infection was highest in the low seeding rate due to lodging. There were no significant differences in 1000 kernel weights.

## *SELKIRK*

***Observations:*** The seeding dates for this trial were May 5 and May 16. The actual seeding rates achieved were 1.1, 3.0 and 5.7 lb/ac. Plant densities were proportional to seeding rates. Light frosts were recorded after emergence of the early treatments. While some leaf damage was noted, mortality appeared to be low. All treatments were sprayed at about the 2-leaf stage of the crop with a tank mix of Liberty (1.35 L/ac) and Select (0.025 L/ac). Weed control was good, but there were some escapes from late flushes of wild oats in the lower seeding rates due to reduced crop competition. The early treatments were more established when the heavy rains started and appeared to better withstand the excessive moisture. Sclerotinia infection was slightly higher in the early seeded treatments, probably due to a heavier canopy. Levels of infection were generally low.

***Results: (a) Plant stand measurements***

| CANOPY MANIPULATION<br>Selkirk, MB | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Emergence Counts (plants/m$^2$)** | **Plant Height (cm)** | **Lodging Ratio (%)** | **# Primary Branches** | **# Secondary Branches** | **Harvest Counts (plants/m$^2$)** |
| ***Early Seeding Date*** | | | | | | |
| 1 lb/ac | 17 | 116 | 68 | 5.1 | 2.4 | N/A |
| 3 lb/ac | 38 | 111 | 83 | 5.4 | 2.8 | N/A |
| 6 lb/ac | 74 | 122 | 93 | 5.6 | 3.3 | N/A |
| ***Normal Seeding Date*** | | | | | | |
| 1 lb/ac | 25 | 102 | 66 | 5.1 | 2.2 | N/A |
| 3 lb/ac | 36 | 105 | 71 | 6.3 | 3.2 | N/A |
| 6 lb/ac | 81 | 108 | 67 | 5.2 | 0.3 | N/A |

***Results: (b) Yield and Quality Data***

| CANOPY MANIPULATION<br>Selkirk, MB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **1000 Kernel Weight (g)** | **Growing Degree Days** | **Days To Maturity** |
| ***Early Seeding Date*** | | | | | | | |
| 1 lb/ac | 99 | 23.2 | 41.30 | 44.2 | 3.5 | 1051 | 98 |
| 3 lb/ac | 104 | 24.4 | 38.34 | 46.6 | 3.6 | 999 | 95 |
| 6 lb/ac | 122 | 28.5 | 46.04 | 46.8 | 3.5 | 969 | 93 |
| ***Normal Seeding Date*** | | | | | | | |
| 1 lb/ac | 59 | 13.9 | (4.97) | 43.3 | 3.1 | 1047 | 90 |
| 3 lb/ac | 85 | 19.8 | 15.45 | 44.7 | 3.3 | 1031 | 89 |
| 6 lb/ac | 100 | 23.4 | 20.67 | 44.6 | 3.5 | 1004 | 87 |
| LSD<br>CV% | | 3.20<br>8.1 | | 4.72<br>1.9 | 0.59<br>5.1 | | |

***Discussions:*** Large amounts of rainfall throughout the growing season stressed the canola and as a result the increased branching that would have been expected in the lower seeding rates did not occur. The early seeding date treatments produced taller plants than the normal date, which is not the usual trend. Yields declined significantly at both seeding dates when seeding rates were reduced. Contribution margins followed the same trend, though not as dramatically due to savings in seed costs. There were no significant differences in oil content. Maturity was also delayed by reducing seeding rate, regardless of seeding date.

## *LETHBRIDGE (IRRIGATION)*

***Observations:*** This trial was seeded on April 28 and May 6. Seeding rates used were 1, 3 and 5 lb/ac. The 5 lb/ac seeding rate was lowered from 6 lb/ac to accommodate local recommendations for irrigation. To achieve lower seeding rates corn grindings were used to bulk the seed. Emergence was slow in the early seeded treatments. Frost damage (see *Site Information*) was noticed in all treatments. Liberty (1.35 L/ac) and Select (50 mL/ac) were sprayed to control weeds. Weed control was excellent. The 3 lb/ac and 5 lb/ac treatments reached 100% ground cover at the same time within their respective seeding dates. The 1 lb/ac treatments (early and normal) did not achieve 100% ground cover. In the open areas, some weeds germinated and competed with the canola. Plants in the lower seeding rate treatments (1 and 3 lb/ac) had thicker stems and more branches when compared to the 5 lb/ac treatments. Petal testing for sclerotinia was done in all treatments. No infected petals were found in any of the treatments. No lodging was evident in any treatment until a windstorm prior to swathing. The 3 lb/ac treatments (early and normal seeded) lodged but not as severely as the

others. Judging seed colour change in the 1 lb/ac treatments required careful assessment of the primary and secondary branches. Seed colour change on the main raceme was near 60% in the 1lb/ac treatments (early and normal seed dates) when swathing commenced. No shelling occurred. The 3 lb/ac and 5 lb/ac treatments were swathed at 40% and 35% seed colour change, respectively. The 1 lb/ac treatments were more difficult to swath compared to the 3 and 5 lb/ac treatments. Stubble to anchor the swath in the 1 lb/ac treatments was minimal.

***Results: (a) Plant stand measurements***

| CANOPY MANIPULATION Lethbridge, AB (Irrigation) | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Emergence Counts Plants/m²** | **Plant Height (cm)** | **Lodging Ratio (%)** | **# Primary Branches** | **# Secondary Branches** | **Harvest Counts Plants/m²** |
| ***Early Seeding Date*** | | | | | | |
| 1 lb/ac | 17 | 124 | 62 | 8.0 | 10.6 | 13 |
| 3 lb/ac | 60 | 129 | 78 | 6.8 | 9.6 | 54 |
| 5 lb/ac | 86 | 124 | 70 | 5.7 | 5.3 | 86 |
| ***Normal Seeding Date*** | | | | | | |
| 1 lb/ac | 20 | 132 | 70 | 7.5 | 10.7 | 16 |
| 3 lb/ac | 75 | 131 | 79 | 7.5 | 7.3 | 66 |
| 5 lb/ac | 86 | 131 | 74 | 5.8 | 0.5 | 86 |

***Results: (b) Yield and Quality Data***

| CANOPY MANIPULATION Lethbridge, AB (Irrigation) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **1000 Kernel Weight (g)** | **Growing Degree Days** | **Days To Maturity** |
| ***Early Seeding Date*** | | | | | | | |
| 1 lb/ac | 93 | 56.7 | 145.83 | 46.2 | 3.8 | 1240 | 118 |
| 3 lb/ac | 98 | 59.1 | 149.36 | 46.1 | 3.7 | 1191 | 112 |
| 5 lb/ac | 100 | 60.8 | 149.58 | 46.5 | 3.8 | 1191 | 112 |
| ***Normal Seeding Date*** | | | | | | | |
| 1 lb/ac | 101 | 59.7 | 160.04 | 46.3 | 3.7 | 1176 | 104 |
| 3 lb/ac | 105 | 62.1 | 163.58 | 46.6 | 3.7 | 1153 | 102 |
| 5 lb/ac | 100 | 59.2 | 142.00 | 46.7 | 3.8 | 1141 | 101 |
| LSD<br>CV% | | 2.98<br>4.1 | | 0.59<br>1.0 | 0.14<br>3.2 | | |

***Discussions:*** There was a significant difference in yield between the 3 lb/ac normal seeded treatment and the 1 lb/ac early seeded treatment. There were no significant differences in oil content.

Contribution margins are a function of yield and seed costs. The normal seeded 3 lb/ac treatment had the highest contribution margin. The normal seeding date produced higher contribution margins at the 1 and 3 lb/ac seeding rates.

There were no significant differences among 1000 kernel weights. As seeding rates increased, the number of primary and secondary branches decreased. Plant heights were shorter in the early treatments. There were no differences in plant height among seeding rate treatments within the seeding date.

The 3 lb/ac treatments had the least lodging. The 1 lb/ac treatments had thick bushy plants. With low plant populations there was not enough inter-plant support during a windstorm. This resulted in an increased amount of lodging. The 5 lb/ac treatments had thin stems. The stems could not support themselves and as a result, the 5 lb/ac treatments lodged worse than the 3 lb/ac treatments.

The 1 lb/ac early seeded treatment was the longest maturing at 118 days. Maturity ranged from 101 to 118 days. Swathing the 1 lb/ac treatments created two problems. The first was judging seed colour. When the main raceme reached 35% seed colour change, the seeds in the pods on the primary and secondary branches were translucent. Swathing at that stage could result in shriveled and green seed. When seeds in the side branches became firm, the main raceme was at 60% seed colour change. Swathing was conducted at this stage. The second concern with the low plant populations was the amount of stubble left to anchor the swath. Although swathed high enough, there was inadequate stubble to anchor the swath. No windstorms occurred which potentially could have rolled the swath. When dealing with low plant populations, these two factors must be kept in mind.

## *RYCROFT*

***Observations:*** Due to rain delays the normal seeding date was May 24, while the late seeding date was June 5. Cool soil temperature (6$^{o}$C) for the normal seeding date resulted in slow emergence (22 days after seeding), while warmer soil conditions (9$^{o}$C) for the late seeding date resulted in faster emergence (19 days after seeding). The plots were sprayed with Liberty herbicide (1.35 L/ac) on June 26 under warm, sunny, dry and calm conditions. Predominant weeds were stinkweed, wild buckwheat, and field horsetail. Weed control was excellent on stinkweed and wild buckwheat, however, field horsetail was not controlled and suppression was minimal. Secondary branching was substantially higher as the seeding rate was decreased. Higher lodging ratios and disease (sclerotinia) incidence were noticed on the 2 lb/ac seeding rates than on the other two seeding rates for

both dates. Higher green seed percentages were seen on the later seeding dates. As seeding rate increased, green seed percentages decreased.

***Results: (a) Plant stand measurements***

| CANOPY MANIPULATION Rycroft, AB | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Emergence Counts Plants/m²** | **Plant Height (cm)** | **Lodging Ratio (%)** | **# Primary Branches** | **# Secondary Branches** | **Harvest Counts Plants/m²** |
| ***Normal Seeding Date*** | | | | | | |
| 2 lb/ac | 45 | 128 | 64 | 10.1 | 14.3 | 41 |
| 5 lb/ac | 90 | 125 | 87 | 7.0 | 9.2 | 87 |
| 8 lb/ac | 112 | 128 | 97 | 5.0 | 4.3 | 107 |
| ***Late Seeding Date*** | | | | | | |
| 2 lb/ac | 56 | 122 | 72 | 11.2 | 12.4 | 52 |
| 5 lb/ac | 90 | 119 | 90 | 7.4 | 7.5 | 84 |
| 8 lb/ac | 118 | 119 | 98 | 6.9 | 2.4 | 110 |

***Results: (b) Yield and Quality Data***

| CANOPY MANIPULATION Rycroft, AB | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **1000 Kernel Weight (g)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| ***Normal Seeding Date*** | | | | | | | | |
| 2 lb/ac | 90 | 21.0 | 14.89 | 39.8 | 3.5 | 764 | 93 | 1 |
| 5 lb/ac | 100 | 23.2 | 14.65 | 41.3 | 3.7 | 764 | 93 | 1 |
| 8 lb/ac | 108 | 25.1 | 5.85 | 41.8 | 3.5 | 760 | 91 | 2 |
| ***Late Seeding Date*** | | | | | | | | |
| 2 lb/ac | 136 | 31.5 | (2.12) | 47.5 | 3.8 | 799 | 110 | Sample |
| 5 lb/ac | 151 | 35.1 | (3.58) | 49.0 | 3.6 | 799 | 110 | Sample |
| 8 lb/ac | 160 | 37.2 | 27.90 | 48.5 | 3.5 | 799 | 110 | 3b |
| LSD<br>CV% | | 2.91<br>8.2 | | 1.43<br>2.5 | 0.44<br>6.0 | | | |

Note: Brackets in the contribution margin reflect a negative value.

***Discussions:*** The late seeding dates yielded significantly higher than the normal seeding dates. However, green seed levels were much higher in the later seeded material. Green seed levels were inversely proportional to the seeding rate at the late seeding date. The higher contribution margin for the 8 lb/ac (late) seeding rate was achieved because of better grade than the two other (late)

seeding rates. The better grade was probably due to increased interplant competition that resulted in faster maturity, and therefore less green seed.

The decreased contribution margin for the normal 8 lb/ac seeding rate was due to increased cost of seed and lower grade. Contribution margins reflect cost of seed, yield and grade.

# XIV FOLIAR NUTRIENT APPLICATION TRIAL

***Observation:*** To compare the use efficiency of foliar applied nutrients (boron & sulphur) as they relate to yield and quality of B. napus canola.

***Background:*** Canola yields have been reduced in boron deficient soils. As well, sulphur deficiencies have become more numerous with the push to higher yields with other agronomic practices. Companies such as Phosyn have been developing foliar applied nutrient products, which may have a role in enhancing canola yields under deficient conditions.

***Methodology:*** This trial consisted of two or more of the following treatments:

1) Check
2) Foliar applied sulphur
3) Foliar applied boron
4) Foliar applied sulphur and boron

Application rates for treatments were based on soil and tissue tests after consultation with Phosyn regarding rate recommendations.

***Western Canadian Summary:***

Balanced nutrition is important in canola production. As growers target higher yields, micronutrient deficiencies may become more common. Proper soil and tissue testing are important tools in identifying nutrient deficiencies. Foliar application of nutrients should be based on these recommendations.

## *ST. CLAUDE*

***Observations:*** This field was seeded on May 9 (46A76) and stand establishment was good. Symptoms of leaf cupping and severely stunted growth were noticed in patches throughout the field at the 4-5 leaf stage. Tissue testing revealed that these plants were deficient in sulphur and boron. The trial was set up to assess the benefits of foliar applications of boron (Bortrac 150, 0.3 lb B/ac) and sulphur (Sulphur F3000, 1.5 lb S/ac) at early bolting. Subsequent tissue testing of bulk samples from the four plots in each treatment revealed that the sulphur levels had recovered in all treatments, but the boron status had only improved with boron application. While the crop recovered following nutrient applications, the canopy was not particularly dense due to early stunting of the plants. The thinner canopy and soil conditions (well drained, sandy texture) made significant sclerotinia pressure unlikely. No fungicide was applied and no significant levels of the disease were noted at swathing. Two of the four check plots showed visible symptoms of shorter pods and poorer pod set at time of swathing. Heavy rainfall between swathing and combining resulted in some sprouting of the canola seed.

***Results:***

| FOLIAR NUTRIENT APPLICATION TRIAL<br>St. Claude, MB | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Grade** | **Days To Maturity** |
| Foliar boron | 115 | 29.5 | 11.00 | 42.5 | 2 | 98 |
| Foliar sulphur & boron | 112 | 28.7 | 5.93 | 42.5 | 1 | 98 |
| Foliar sulphur | 108 | 27.6 | 0.84 | 41.9 | 2 | 98 |
| Check | 100 | 25.6 | 3.71 | 42.5 | 2 | 98 |
| LSD<br>CV% | | 3.68<br>10.2 | | 0.65<br>1.2 | | |

***Discussions:*** Only the boron applied alone produced a significantly higher yield than the check, and this also translated into an improved economic return. This resulted from large responses in two of the four replicates. This often occurs due to variability of micronutrient levels within a field. The added cost of the combination of both boron and sulphur was offset by a better grade. The poorer grades resulted from damage due to sprouting. Contribution margins for the foliar nutrient treatments also reflected a custom application cost of $3.75/ac. Oil content and maturity were unaffected by the treatments.

## *LETHBRIDGE (IRRIGATION)*

***Observations:*** This trial was seeded on May 6 (InVigor 2663) at 4 lb/ac. Emergence was even for all treatments. The trial was sprayed with Liberty (1.35 L/ac) and Select (50 mL/ac). Weed control was excellent. The trial was conducted on the basis of the soil tests done in the spring (see *Site Description*). At the rosette stage of the crop, tissue analysis assessing macro and micronutrient levels within the plant were completed. Tissue test results indicated a deficiency in boron and recommended an application of 0.3-0.35 lb B/ac. Bortrac 150 was applied at 0.8 L/ac (0.5 lb B/ac) prior to bolting. Both treatments reached 10% bloom at the same time. The foliar boron treatment flowered two days longer and matured one day later than the check.

***Results:***

| FOLIAR NUTRIENT APPLICATION TRIAL<br>Lethbridge, AB (Irrigation) | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| Foliar boron | 103 | 76.8 | 223.18 | 43.7 | 1202 | 104 |
| Check | 100 | 74.4 | 218.08 | 43.4 | 1189 | 103 |
| LSD<br>CV% | | 3.46<br>2.8 | | 0.67<br>0.9 | | |

***Discussions:*** There were no significant differences in yield or oil content between the treatments. Contribution margins favored the foliar applied boron.

# XV CALCIUM 5S SEED TREATMENT TRIAL

***Objective:*** To compare the efficiency of seed applied calcium as it relates to yield and quality of *B. napus* canola.

***Background:*** Calcium is an essential nutrient in plant cell wall structures. Companies such as Stoller have been developing seed applied nutrient products, which may have a role in enhancing canola yields by stimulating root growth, improving vigor and reducing crop stress.

***Methodology:*** This trial was a subset of the *B. napus* variety trial, using Quantum.
1) No Calcium 5S
2) Seed applied Calcium 5S

***Western Canadian Summary:***

There were no advantages to seed placed Calcium 5S at any of the locations this year. No drought stresses were experienced at any of these sites.

## *SELKIRK*

***Observations:*** This trial was seeded on May 9 (see *B. napus Variety Trial - Selkirk*). No notable differences in crop establishment or development were observed between the treatments during the early part of the growing season. At swathing, in two of the four reps, the plant stand in the Calcium 5S treatments was notably taller and thicker than in the check. There was no significant damage from insects or disease observed throughout the season in either treatment. By far the greatest stress on the varieties was excess moisture.

***Results:***

**CALCIUM 5S SEED TREATMENT TRIAL**
**Selkirk, MB**

| System | Yield (%) | Yield (bu/ac) | Contribution Margin ($/ac) | Oil (%) | Growing Degree Days | Days To Maturity |
|---|---|---|---|---|---|---|
| Seed applied Calcium 5S | 101 | 28.3 | 36.89 | 44.7 | 972 | 91 |
| No Calcium 5S | 100 | 27.9 | 35.36 | 45.8 | 972 | 91 |
| LSD | | 1.31 | | 1.14 | | |
| CV% | | 2.8 | | 1.5 | | |

***Discussions:*** The application of Calcium 5S had no significant impact on yield, oil content or economic return. Benefits of calcium have generally been associated with

stress tolerance, but most often the stress has been drought rather than the excessive moisture conditions which occurred at this location.

## *GRENFELL*

***Observations:*** This trial was seeded on May 17 at 6.5 lb/ac. A fertilizer blend of 16-20-0-15 (actual) was seed-placed. Excellent moisture and warm soil temperatures resulted in rapid emergence. Growing conditions were excellent throughout the season. Emergence counts (15 days after emergence) indicated a slight increase for seed applied Calcium 5S (110 plants/$m^2$) compared to no Calcium 5S (106 plants /$m^2$). Weed pressure was moderate to heavy in most areas. Herbicides were applied at the 2-3 leaf stage and resulted in good control of target weeds. Flea beetle damage was light to moderate. Plants outgrew damage quickly because of excellent growing conditions. Days to 100% ground cover were equal. There were no visual differences in plant growth.

***Results:***

**CALCIUM 5S SEED TREATMENT TRIAL**
**Grenfell, SK**

| System | Yield (%) | Yield (bu/ac) | Contribution Margin ($/ac) | Oil (%) | Growing Degree Days | Days To Maturity |
|---|---|---|---|---|---|---|
| No Calcium 5S | 100 | 37.6 | 42.61 | 45.8 | 1077 | 97 |
| Seed applied Calcium 5S | 92 | 34.7 | 28.35 | 45.6 | 1077 | 97 |
| LSD | | 2.70 | | 2.34 | | |
| CV% | | 5.8 | | 3.6 | | |

***Discussions:*** There were no advantages with seed-placed Calcium 5S at this site. This is likely due to excellent growing conditions throughout the season and no evident stresses. Oil content did not vary significantly. Contribution margins reflect differences in yield and seed treatment costs. Treatments graded number one. Days to maturity were equal.

## *VEGREVILLE*

***Observations:*** This trial was seeded on May 9 (see *B. napus Variety Trial - Vegreville*). There were no noticeable differences between the check treatment and the Calcium 5S treatment.

***Results:***

| CALCIUM 5S SEED TREATMENT TRIAL<br>Vegreville, AB | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| No Calcium 5S | 100 | 38.3 | 73.41 | 46.3 | 1000 | 108 |
| Seed applied Calcium 5S | 97 | 37.0 | 64.89 | 46.0 | 1000 | 108 |
| LSD<br>CV% | | 3.18<br>8.52 | | 0.72<br>1.3 | | |

***Discussions:*** There were no significant differences in yield and oil content between the two treatments. The lower contribution margin associated with Calcium treatment reflects the slightly lower yield and additional cost of seed applied calcium.

# XVI SEEDING DATE / OIL QUALITY TRIAL (NEX)

**Objective:** To compare the effects of various seeding dates on yield and quality of Nex 710.

***Background***: The linolenic acid level of canola is primarily influenced by the temperature during seed development, especially up to 30 days after flowering. Deng and Scarth (1998) conducted an experiment in Winnipeg, in 1990 and 1991 to evaluate the effect of environment on the fatty acid profile (FAP) of canola. Early and normal seeding date trials were established to examine if different environments during seed development influenced fatty acid accumulation. Different levels of linolenic acid between seeding dates were not detected probably due to similar environmental conditions during seed maturation.

**Methodology:** The seeding date trial consisted of two treatments.

A) Early seeding date (as early as possible)
B) Normal seeding date (Consistent with accepted practices for the area)

A 70-80 ft border of Nex 710 was seeded around the trial to minimize cross-pollination. Conventional herbicides (including Muster) were used to reduce contamination from wild mustard and stinkweed.

***Western Canadian Summary:***

Frost contributed to longer days to maturity for the early seeded treatments at both locations. There were no significant differences in oil profiles (fatty acid accumulation) at these locations.

## *NAICAM*

***Observations:*** The early seeded treatment was seeded on May 4, while the normal seeded treatment was seeded on May 23. A fertilizer blend of 18-21-11-16 (actual) was seed-placed. Variable growing conditions (see *Site Information - Comments)* hampered early crop development. Emergence occurred approximately on May 21 for the early seeded treatment. The early seeding treatment was affected by a late May frost. Plant counts were reduced by an average of 26%. Emergence occurred on June 5 for the normal seeded treatment. Flea beetle damage was in excess of 25% in both treatments. As a result, Decis 5EC was applied. Weed pressure was variable across all treatments. Conventional herbicides were applied at the 2-3 leaf stage (see *Site Information - Pesticides Applied*). The early seeded treatment was swathed on August 21 and normal seeded treatment on August 30.

***Results:***

| SEEDING DATE / OIL QUALITY TRIAL (NEX)<br>Naicam, SK | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** | **Grade** |
| Early Seeding | 113 | 44.1 | 87.11 | 49.1 | 997 | 108 | 2 |
| Normal Seeding | 100 | 38.9 | 49.80 | 46.6 | 1029 | 97 | 3a |
| LSD<br>CV% | | 4.32<br>6.3 | | 2.45<br>3.1 | | | |

***Discussions:*** Early seeding significantly improved yield and oil content. Contribution margins reflect differences in yield and grade.

## *LETHBRIDGE (IRRIGATION)*

***Observations:*** This trial was seeded on April 28 and May 6 at 4 lb/ac. Emergence on the early treatment was slow but even. The emergence of the normal treatment was rapid and even. The treatments were sprayed with Muster Gold II (Assure II @ 200 mL/ac and Muster @ 8 g/ac) and Lontrel (227 mL/ac). The early seeded treatment was ahead in growth development until the frost (see *Site Information*). The early treatment was damaged more than the normal treatment. Few plants were lost. After the frost, the early treatment was at the same developmental stage as the normal treatment. Flowering and maturity were the same for both treatments.

***Results:***

| SEEDING DATE / OIL QUALITY TRIAL (NEX)<br>Lethbridge, AB (Irrigation) | | | | | | |
|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| Early Seeding | 91 | 54.8 | 130.58 | 47.6 | 1182 | 108 |
| Normal Seeding | 100 | 60.3 | 159.13 | 47.3 | 1128 | 99 |
| LSD<br>CV% | | 3.20<br>3.41 | | 0.58<br>0.74 | | |

***Discussions:*** Normal seeding yielded significantly higher than early seeding. There were no significant differences in oil content. Normal seeding had the highest contribution margin. The effects of the frost on the early treatment contributed to the lower yield.

# XVII SCLEROTINIA CONTROL TRIAL

**Objective:** To evaluate sclerotinia control options, including varieties with reduced susceptibility (apetalous) and fungicides, for their effect on yield, quality and economic return on canola.

***Background:*** Sclerotinia stem rot is caused by the fungus *Sclerotinia sclerotiorum* which occurs in all canola-growing areas of Canada. 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. In some cases half the potential yield of a crop may be lost to sclerotinia. The recent introduction of apetalous canola (Hylite 201) may provide an alternative to fungicide use for reducing potential yield loss from this disease. However, it is unclear which of these tools is most cost effective.

**Methodology:** The sclerotinia stem rot check list was completed and a petal test was done on the petalled variety. This trial consisted of the following four treatments:

A) Hylite 201 - no fungicide
B) Hylite 201 - fungicide applied
C) Petalled - no fungicide
D) Petalled - fungicide applied

The petalled variety used in this trial was 44A89. All other agronomic practices remained the same.

## *SELKIRK*

***Observation:*** This trial was seeded on May 5 and initial stand establishment was good. Several nights of frost ranging from -1 to -4°C were recorded after emergence, and some mortality did occur in some replicates. Remaining plant stands were adequate. Additional stress from large amounts of rainfall also hurt the crop. Weeds were a problem in some plots due to poor crop competition, in spite of herbicide applications at the 2-leaf stage. Agronomic practices were similar to the other conventional varieties at the site (see *B. napus Variety Trial*). In spite of relatively low petal infection and a light canopy, the wet conditions were ideal for sclerotinia. Disease symptoms were clearly evident in the untreated 44A89 plots.

| Evaluation Method | Average Infection |
|---|---|
| Petal Test | 27% |

***Results:***

| SCLEROTINIA STEM ROT CONTROL TRIAL<br>Selkirk, MB | | | |
|---|---|---|---|
| **Treatment** | **Yield (bu/ac)** | **Oil (%)** | **Contribution Margin ($/ac)** |
| Petalled - w/ fungicide | 34.1 | 46.9 | 63.33 |
| Petalled - w/o fungicide | 22.6 | 46.5 | 29.75 |
| Hylite 201- w/ fungicide | 31.4 | 45.8 | 47.53 |
| Hylite 201- w/o fungicide | 26.7 | 45.6 | 47.29 |
| LSD<br>CV % | 5.45<br>7.2 | 1.34<br>1.7 | |

***Discussions:*** As a result of the stresses on some plots, two of the replicates of the Hylite comparison produced unreliable yield data. The net yield values represent the remaining two replicates of the trial. Fungicide only improved yield significantly for the petalled variety. There was no significant impact on oil content. Economic returns for the Hylite 201 fell below the petalled variety with a fungicide applied, but above the petalled variety without a fungicide. There were no differences in contribution margin between the fungicide and no fungicide treatments on Hylite 201.

# XVIII DIAMONDBACK MOTH EVALUATION TRIAL

***Objective:*** To determine the level of diamondback moth information as it relates to establishing a forecasting model.

***Background:*** Previous work completed by Agriculture and Agri-Food Canada, Environment Canada and the Canola Council of Canada has shown there is a need in establishing a migration forecasting model for diamondback moths. The importance of establishing the deposit points and numbers of diamondbacks present are essential in ground truthing this forecasting model. The diamondback moths recorded help establish the migration-forecasting model.

***Methodology:*** Trap counts were completed as follows:

1) Recorded moth counts
2) Recorded other insects
3) Changed lures and trap inserts weekly
4) Forwarded moth counts to Agriculture and Agri-Food Canada

***Observations:*** Low numbers of diamondback moths were caught in the traps. No leaf, bud or pod damage was evident in a number of sample locations. Lures and trap inserts were changed every ten days to two weeks. The trap inserts caught other insects. The traps themselves were difficult to keep in place (4 ft above ground).

***Results:*** All information was forwarded to Agriculture and Agri-Food Canada.

***Discussion:*** Diamondback moth counts were low at the 11 Canola Production Centres over the growing season. Diamondback moth numbers in excess of 90/week were not observed in 2000. Results will be added to Agriculture and Agri-Food Canada's existing database to improve the monitoring and prediction program.

# XIX ROOT MAGGOT MONITORING TRIAL - *B. napus*

***Objective:*** To compare and rate root maggot damage on varieties entered in the variety trial.

***Background:*** Root maggots have been identified as a major pest of *B. rapa* in the parkland area of Alberta. Work at the University of Alberta and the Alberta Environmental Centre has shown that root maggots can reduce canola yield by up to 50%. Susceptibility to root maggot differs between *B. rapa* and *B. napus* types. However, there may also be different degrees of root maggot resistance within each species.

***Methodology:*** The variety trials (*B. napus*) were used in the root maggot monitoring trial. Thirty representative plants were collected from each plot within two days of swathing. Root maggot ratings were made immediately after collection.

**Ratings:**
0 - no damage
1 - feeding channels <10% root surface area
2 - feeding channels 11 - 25%
3 - feeding channels 25 - 50%
4 - feeding channels 51 - 75%
5 - feeding channels 76 - 100% or root is completely severed

***Western Canadian Summary:***

Random sampling of plant roots indicated very low levels of damage at all locations, so no detailed ratings were taken.

# XX CABBAGE SEEDPOD WEEVIL TRIAL

***Objective:*** To evaluate the effectiveness of management tools, such as seeding date and variety choice, to minimize cabbage seedpod weevil damage.

***Background:*** *History:* The cabbage seedpod weevil (*Ceutorhynchus obstrictus*) was first introduced into the lower mainland of British Columbia from Europe in the 1930's. From there, the insect spread into the Pacific Northwest region (PNW) of the United States. Up until 1995, with the exception of a few reports of spraying for the weevil in the Creston valley of British Columbia, it was believed that the insect remained isolated in the PNW region. Yield losses in the Pacific Northwest from the weevil have been as high as 35%. In 1996, the larvae of the weevil were found feeding on seeds during an examination of pods at the Lethbridge Canola Production Centre (Canola Council Agronomist: Doug Moisey). Bob Byers and Rick Butts of Agriculture Canada later identified the larvae *as Ceutorhynchus obstrictus*. Since 1996, pod weevil numbers have steadily increased. According to Alberta Agriculture surveys the weevil has spread as far north as Olds, Alberta and as far east as Medicine Hat, Alberta. In 2000, seedpod weevils were identified in southwestern Saskatchewan.

*Life Cycle:* The cabbage seedpod weevil attacks plants within the *Brassica* family. In the early spring over-wintering adults emerge and begin feeding on stinkweed, flixweed, volunteer canola and wild mustard. The weevils begin to move into the fields once canola reaches the bud stage. Damage is inflicted by both adults and larvae. The adult weevils first feed on the flower by piercing the centre of the bud. The resulting damage can either be an aborted flower or damage to petals on fertile flowers. Feeding continues until females reach sexual maturity.

Adults then begin to search for developing (1-2 cm long) pods and begin egg laying. Each female will lay between 60 - 70 eggs. Eggs are typically laid on one side of the pod, but can be laid on both sides of the septum. The larvae hatch within the pod and begin to feed on developing seeds. Each larva consumes approximately six seeds. They then burrow out of the pod, leaving an exit hole. Infection of the pod from fungal agents can occur depending on environmental conditions.

Larvae migrate to the ground to pupate in the soil. A week to ten days later emergence of the next generation of adults begins. Under normal conditions these new adults feed on late maturing canola and other host plants. If the crop is delayed in maturity, the new adults will begin feeding on the immature seeds within the pods. The adults extract the nutrients from the centre of the seed leaving an outer shell.

*Control:* Presently the only method is to apply an insecticide at early bud or bloom stage. Seed treatments and varietal resistance are being examined.

***Methodology:*** Three varieties, Hylite 201, Hyola 401, and Option 500 were seeded on April 22 and May 4. The trial was made up of four replicates in a randomized complete block design. Each of the treatments was monitored over the growing season for weevil populations and exit holes. Emergence traps were set up within each treatment to monitor populations of new adults.

## *LETHBRIDGE (DRYLAND)*

***Observations:*** This site was not combined due to dry conditions. Exit hole data at the time of this writing was not available. It was observed that the survivability of the larvae inside the pod was low this past year. Dr. Lloyd Dosdall has hypothesized that the environment within the pods was not conducive for larval survival. Emergence trap data this year showed emergence numbers of young adults to be similar to the fall of 1998. The drought did have an effect on the weevil.

# XXI TIME OF SWATHING TRIAL (AVENTIS)

***Objective:*** To compare the effects of various swathing dates on yield and quality of hybrid vs. open pollinated varieties.

***Background:*** Traditionally, the recommended stage of swathing is at 30-40% seed colour change (SCC) on the main stem to maximize yield and quality and minimize green seed and shattering. The introduction of hybrids, with associated lower seeding rates and lower plant densities, can result in extra secondary branching. The secondary branching causes a wider range of seed development and maturation as compared to traditional seeding rates. Therefore, the normal time of swathing (30-40% SCC) may need to be delayed to a later stage to allow for optimum development and pod fill on the secondary side branches.

***Methodology:*** The time of swathing trial consisted of the following treatments, in a split block design with varieties as the main block and swathing timings were the subplots.

A) 30-40% SCC ~ InVigor 2573
B) 40-50% SCC ~ InVigor 2573
C) 50-60% SCC ~ InVigor 2573
D) 60-70% SCC ~ InVigor 2573
E) Straight Combine ~ InVigor 2573
F) 30-40% SCC ~ Exceed
G) 40-50% SCC ~ Exceed
H) 50-60% SCC ~ Exceed
I) 60-70% SCC ~ Exceed
J) Straight Combine ~ Exceed

InVigor 2573 was seeded at approximately 5.0 lb/ac. Exceed was seeded at approximately 6.5 lb/ac. Seed colour change was determined on the main stem.

***Western Canadian Summary:***

There were no clear trends in yield with delayed swathing. Responses in yield, oil, branching and quality varied from location to location. Further research needs to be done in this area.

## *RUSSELL*

***Observations:*** This trial was seeded on May 21 and stand establishment was excellent. Rain throughout the season was frequent but seldom excessive. Weeds in this trial were consistent with those found in the systems comparison trial at this site, with the exception of a few more Canada thistles. Liberty (1.35 L/ac) and Select (0.025 L/ac) were applied at the 3-4 leaf stage and provided good control. Regrowth of Canada thistle was noted at swathing. There were no significant differences in branch counts between the two varieties.

Swathing took place from August 21-28, and the trial was combined on September 26.

***Results:***

| TIME OF SWATHING TRIAL (AVENTIS) Russell, MB | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **1000 Kernel Weight (g)** | **Days To Swathing** |
| ***Open Pollinated Variety - Exceed*** | | | | | | | |
| 30-40% SCC | 100 | 34.6 | 54.33 | 49.8 | 1004 | 3.0 | 93 |
| 40-50% SCC | 105 | 36.2 | 62.29 | 51.2 | 1017 | 3.1 | 94 |
| 50-60% SCC | 110 | 38.1 | 71.74 | 50.8 | 1033 | 3.1 | 95 |
| 60-70% SCC | 111 | 38.4 | 73.24 | 50.3 | 1063 | 3.1 | 97 |
| ***Hybrid Variety - InVigor 2573*** | | | | | | | |
| 30-40% SCC | 100 | 39.6 | 70.24 | 48.6 | 1004 | 3.2 | 93 |
| 40-50% SCC | 101 | 39.8 | 71.23 | 49.2 | 1017 | 3.2 | 94 |
| 50-60% SCC | 104 | 41.1 | 77.70 | 49.4 | 1033 | 3.2 | 95 |
| 60-70% SCC | 105 | 41.6 | 80.19 | 48.5 | 1063 | 3.2 | 97 |
| LSD<br>CV% | | 4.11<br>4.9 | | 1.17<br>2.0 | | 0.11<br>3.3 | |

***Discussion:*** Delaying swathing beyond the normal recommendation had no significant impact on yield. The InVigor 2573 tended to outyield the Exceed. All treatments were graded number one. Economic returns reflected numerical differences in yield and seed costs. Exceed tended to produce higher oil contents. None of the treatments differed in 1000 kernel weights.

## *GRENFELL*

***Observations:*** All treatments were seeded on May 16. The open pollinated variety (Exceed) was seeded at 6.5 lb/ac and the hybrid variety (InVigor 2573) at 5.0 lb/ac. A fertilizer blend of 16-20-0-15 (actual) was seed-placed for all treatments. Excellent moisture and warm soil temperatures resulted in rapid emergence. Growing conditions (see *Site Information - Comments*) were excellent throughout the season. Weed pressure was moderate. Liberty (1.35 L/ac or 10 ac/jug) was applied at the 3-4 leaf stage. Branch counts off the main stem were recorded at 20% seed colour change for all treatments. InVigor 2573 averaged six branches per plant and Exceed averaged three branches per plant. Hot dry weather during maturation caused rapid seed colour change. A hailstorm one-week prior to combining caused considerable damage (51% - Exceed, 33% - InVigor 2573) to the straight combined treatments. Swathed treatments incurred 3% hail damage.

***Results:***

| TIME OF SWATHING TRIAL (AVENTIS) Grenfell, SK | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **1000 Kernel Weight (g)** | **Days To Swathing** |
| ***Open Pollinated Variety - Exceed*** | | | | | | | |
| 30-40% SCC | 100 | 33.9 | 54.94 | 47.7 | 1072 | 3.0 | 97 |
| 40-50% SCC | 96 | 32.6 | 48.76 | 48.2 | 1099 | 2.8 | 99 |
| 50-60% SCC | 96 | 32.5 | 48.29 | 48.0 | 1116 | 2.9 | 100 |
| 60-70% SCC | 92 | 31.3 | 42.59 | 48.2 | 1147 | 3.0 | 102 |
| St.Combined | 64 | 21.7 | 0.00 | 47.6 | 1271 | 2.9 | 118 |
| ***Hybrid Variety - InVigor 2573*** | | | | | | | |
| 30-40% SCC | 100 | 37.2 | 62.39 | 47.1 | 1099 | 3.0 | 99 |
| 40-50% SCC | 103 | 38.3 | 67.61 | 46.5 | 1116 | 3.1 | 100 |
| 50-60% SCC | 107 | 39.7 | 74.26 | 46.8 | 1147 | 3.1 | 102 |
| 60-70% SCC | 108 | 40.0 | 75.69 | 46.5 | 1169 | 3.2 | 104 |
| St.Combined | 82 | 30.4 | 32.18 | 46.1 | 1271 | 3.2 | 116 |
| LSD<br>CV% | | 2.10<br>4.1 | | 0.53<br>0.9 | | 0.14<br>4.2 | |

***Discussion:*** InVigor 2573 significantly out yielded Exceed. In comparing time of swathing, Exceed treatments at 60-70% SCC and straight combining resulted in significantly lower yields. However, swathing InVigor 2573 treatments at 50-60% and 60-70% SCC provided significantly higher yields. The InVigor 2573 straight combined treatment resulted in a significantly lower yield. The risks associated with straight combining *B. napus* varieties are clearly evident by the reduced yields. All treatments graded number one. Contribution margins reflect differences in yield and seed costs. Oil content and 1000 kernel weights also varied between treatments and varieties.

## *VEGREVILLE*

***Observations:*** This trial was seeded on May 13. Plant stands were good for both varieties. A late flush of wild buckwheat infested the Exceed portion of the trial and dockage was as high as 23% for some treatments. Exceed treatments also had extensive hail damage. Hail damage was estimated as high as 40%. Due to location in the field, the InVigor 2573 treatments had minimal hail damage. Primary branching for both varieties was similar (5 per plant). InVigor 2573 produced less secondary branching (1 per plant) than Exceed (5 per plant).

***Results:***

| TIME OF SWATHING TRIAL (AVENTIS) Vegreville, AB | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **1000 Kernel Weight (g)** | **Days To Swathing** | **Grade** | **Green (%)** |
| ***Open Pollinated Variety - Exceed*** | | | | | | | | | |
| 30-40% SCC | 100 | 21.3 | (16.46) | 45.0 | 1000 | 3.5 | 108 | 3a | 7.9 |
| 40-50% SCC | 107 | 22.8 | (10.19) | 44.3 | 1014 | 3.6 | 110 | 3a | 7.2 |
| 50-60% SCC | 108 | 23.0 | (9.35) | 45.5 | 1029 | 3.6 | 112 | 3a | 7.3 |
| 60-70% SCC | 92 | 19.5 | (23.98) | 45.8 | 1059 | 3.7 | 117 | 3a | 9.4 |
| Straight Cut | 100 | 21.3 | (7.98) | 47.0 | 1176 | 3.8 | 140 | 2 | 4 |
| LSD<br>CV% | | 1.73<br>6.4 | | 1.00<br>1.7 | | 0.37<br>5.7 | | | |
| ***Hybrid Variety - InVigor 2573*** | | | | | | | | | |
| 30-40% SCC | 100 | 39.8 | 74.15 | 45.8 | 1014 | 3.6 | 110 | 1 | 1.5 |
| 40-50% SCC | 103 | 41.0 | 79.85 | 46.5 | 1029 | 3.7 | 112 | 1 | 1.5 |
| 50-60% SCC | 100 | 39.8 | 74.15 | 46.8 | 1059 | 3.5 | 117 | 1 | 1.3 |
| 60-70% SCC | 100 | 39.8 | 74.15 | 47.5 | 1069 | 3.6 | 119 | 1 | 1 |
| Straight Cut | 99 | 39.5 | 74.82 | 46.8 | 1176 | 3.9 | 140 | 1 | 1 |
| LSD<br>CV% | | 1.57<br>3.1 | | 0.47<br>0.8 | | 0.37<br>5.7 | | | |

Note: Brackets in the contribution margin reflect a negative value.

***Discussion:*** Within the Exceed portion of this trial, the 60-70% treatment was significantly lower yielding than the other treatments. Delayed swathing leaves the crop vulnerable to shattering which can translate into yield loss. Low yield and grades associated with this portion of the trial were due to extensive hail damage. The straight cut treatment had significantly higher oil content.

Within the InVigor 2573 portion of this trial, there were no significant differences in yield. The 60-70% treatment had significantly higher oil content than the other treatments. The 30-40% treatment had significantly lower oil content than the other treatments.

## *RYCROFT*

***Observations:*** Trials were seeded on May 25 into cool (7$^{o}$C) moist soil. Emergence was slow and uneven. Cleavers were the predominant weed, with some stinkweed and wild buckwheat present. Liberty was applied (1.35 L/ac) on June 26 under warm and sunny conditions and excellent control of cleavers was noticed. Swathing at 30-40% seed colour change was done on August 24. Rainfall from August 30 to September 5 (accumulations of 170 mm) delayed further swathing until September 12. Cool wet conditions delayed further seed colour change and therefore delayed swathing. The remainder

of the plots were standing when a severe frost (-10°C) hit the area on September 19.

***Results:***

| TIME OF SWATHING TRIAL (AVENTIS) Rycroft, AB | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **1000 Kernel Weight (g)** | **Days To Swathing** | **Grade** | **Green (%)** |
| ***Open Pollinated Variety - Exceed*** | | | | | | | | | |
| 30-40% SCC | 100 | 29.3 | 30.79 | 48.2 | 764 | 4.1 | 93 | 3a | 9.5 |
| 40-50% SCC | 124 | 36.3 | 3.65 | 51.1 | 784 | 4.0 | 107 | Sample | 21.0 |
| 50-60% SCC | 118 | 34.5 | (1.19) | 50.2 | 804 | 4.0 | 110 | Sample | 20.5 |
| 60-70% SCC | 133 | 38.8 | 10.11 | 51.6 | 818 | 4.0 | 114 | Sample | 20.8 |
| Straight Cut | 128 | 37.4 | 8.52 | 51.9 | 926 | 3.7 | 132 | 3b | 20.0 |
| ***Hybrid Variety - InVigor 2573*** | | | | | | | | | |
| 30-40% SCC | 100 | 33.4 | 44.96 | 45.8 | 764 | 4.2 | 93 | 2 | 6.0 |
| 40-50% SCC | 124 | 41.4 | 68.14 | 48.4 | 784 | 4.3 | 107 | 3a | 8.8 |
| 50-60% SCC | 124 | 41.5 | 45.47 | 48.4 | 804 | 4.3 | 110 | 3b | 10.3 |
| 60-70% SCC | 127 | 42.6 | 73.30 | 48.5 | 818 | 4.2 | 114 | 3a | 6.8 |
| Straight Cut | 117 | 39.0 | 60.5 | 48.8 | 926 | 4.3 | 132 | 3a | 8.0 |
| LSD | | 3.50 | | 0.78 | | 0.20 | | | 4.7 |
| CV% | | 5.1 | | 1.5 | | 3.8 | | | 32.6 |

Note: Brackets in the contribution margin reflect a negative value.

***Discussion:*** Yield and oil content were significantly lower in the plots that were swathed at 30-40% SCC for both varieties. Swathing Exceed at the 30-40% SCC resulted in the lowest green seed and therefore best grade. Any swathing that was done after the 30-40% SCC resulted in no significant change in green seed content since this swathing was done after the major frost. The frost destroyed enzymes needed for chlorophyll clearing.

# 2000 Canola Production Centre Net Yield and Contribution Margin Data

**Legend:**
( - ) Indicates that treatment was not conducted
NYD - Net Yield Data
CMD - Contribution Margin Data

| CPC Location | Selkirk, MB | | Russell, MB | | St. Claude, MB | | Grenfell, SK | | Naicam, SK | | N. Battleford, SK | | Vegreville, AB | | Beiseker, AB | | Lethbridge (Irr), AB | | Rycroft, AB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD |
| ***B. NAPUS VARIETY TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Variety (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| AC Excel (Check) | 26.6 | 35.58 | 33.1 | 18.77 | - | - | 29.8 | 12.69 | 30.9 | 29.65 | N/A | N/A | 32.5 | 54.0 | 10.3 | -72.12 | 51.7 | 99.17 | 34.6 | 45.0 |
| Canterra 1492 | 27.3 | 15.48 | - | - | - | - | - | - | - | - | N/A | N/A | - | - | 12.1 | -83.20 | - | - | - | - |
| Foremost | - | - | - | - | - | - | 33.4 | 20.69 | 33.7 | 24.75 | N/A | N/A | - | - | - | - | - | - | - | - |
| Hi-Q | 25.7 | 22.82 | 34.7 | 20.64 | - | - | - | - | - | - | N/A | N/A | 31.3 | 31.1 | 13.6 | -63.96 | 54.1 | 90.67 | - | - |
| HyCore 601 | 27.9 | 24.65 | 39.2 | 31.32 | - | - | 33.8 | 14.69 | 30.4 | -7.06 | N/A | N/A | 33.3 | 30.1 | - | - | 59.5 | 105.44 | 37.4 | 33.0 |
| Hyola 428 | - | - | - | - | - | - | 36.7 | 33.06 | 29.1 | -1.28 | N/A | N/A | - | - | - | - | - | - | - | - |
| IMC 105 | - | - | - | - | - | - | 31.4 | 31.02 | 30.2 | 28.17 | N/A | N/A | 29.4 | 50.3 | 13.6 | -55.34 | 59.5 | 151.36 | 37.1 | 89.5 |
| IMC 204 | - | - | - | - | - | - | 29.7 | 21.91 | - | - | N/A | N/A | 30.5 | 55.9 | 10.8 | -69.60 | - | - | 33.8 | 74.1 |
| IMC 205 | - | - | - | - | - | - | - | - | - | - | N/A | N/A | 32.0 | 63.5 | - | - | - | - | - | - |
| LG 3311 | - | - | - | - | - | - | 32.1 | 14.11 | 31.6 | 24.46 | N/A | N/A | - | - | - | - | - | - | - | - |
| LG 3366 | - | - | - | - | - | - | 33.4 | 20.28 | 35.1 | 39.61 | N/A | N/A | - | - | - | - | - | - | - | - |
| Magellan | - | - | - | - | - | - | 34.7 | 26.86 | 33.0 | 30.52 | N/A | N/A | 31.8 | 51.1 | 11.1 | -75.34 | 52.7 | 84.25 | 33.7 | 33.4 |
| Millenium 03 | 25.9 | 47.71 | 33.1 | 41.45 | - | - | 30.4 | 34.72 | 31.3 | 51.55 | N/A | N/A | 29.5 | 67.5 | 14.0 | - | - | - | - | - |
| Nex 500 | 28.3 | 36.21 | 38.8 | 41.79 | - | - | 33.8 | 23.92 | 34.3 | 28.85 | N/A | N/A | 32.3 | 46.1 | 11.9 | -72.99 | 53.3 | 92.95 | 33.6 | 34.5 |
| Nex 705 | 25.7 | 30.31 | 40.7 | 63.35 | - | - | 39.8 | 64.92 | 29.6 | -9.83 | N/A | N/A | 23.5 | 12.1 | 9.3 | -82.32 | 58.4 | 133.49 | 25.8 | -13.3 |
| Nex 710 | 22.6 | 13.49 | 42.0 | 70.40 | - | - | 32.5 | 26.96 | 33.7 | 35.84 | N/A | N/A | 33.5 | 70.4 | 10.4 | -76.92 | 59.7 | 156.01 | 35.0 | 50.1 |
| Q2 | 26.8 | 28.68 | 38.2 | 38.36 | - | - | - | - | - | - | N/A | N/A | - | - | - | - | - | - | - | - |
| Quantum (Check) | 27.9 | 35.36 | 35.3 | 23.46 | - | - | 37.6 | 42.61 | 26.9 | -3.74 | N/A | N/A | 38.3 | 73.4 | 14.5 | -58.63 | 51.8 | 95.43 | 34.9 | 69.4 |
| SW5001 | 28.1 | 23.67 | 34.8 | 12.04 | - | - | 33.1 | 13.98 | 33.8 | 19.91 | N/A | N/A | 27.5 | 12.5 | 9.2 | -92.71 | 53.1 | 78.93 | - | - |

| CPC Location | Selkirk, MB | | Russell, MB | | St. Claude, MB | | Grenfell, SK | | Naicam, SK | | N. Battleford, SK | | Vegreville, AB | | Beiseker, AB | | Lethbridge (Irr), AB | | Rycroft, AB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD |
| ***B. NAPUS VARIETY TRIAL (RELATIVE NET YIELDS AND CONTRIBUTION MARGINS)*** | | | | | | | | | | | | | | | | | | | | |
| **Variety** | | | | | | | | | | | | | | | | | | | | |
| AC Excel (Check) | 100 | 0 | 100 | 0 | - | - | 100 | 0 | 100 | 0 | N/A | N/A | 100 | 0 | 100 | 0 | 100 | 0 | 100 | 0 |
| Canterra 1492 | 103 | -20 | - | - | - | - | - | - | - | - | N/A | N/A | - | - | 117 | -11 | - | - | - | - |
| Foremost | - | - | - | - | - | - | 112 | 8 | 109 | -5 | N/A | N/A | - | - | - | - | - | - | - | - |
| Hi-Q | 97 | -13 | 105 | 2 | - | - | - | - | - | - | N/A | N/A | 96 | -23 | 132 | 8 | 105 | -9 | - | - |
| HyCore 601 | 105 | -11 | 118 | 13 | - | - | 113 | 2 | 98 | -37 | N/A | N/A | 102 | -24 | - | - | 115 | 6 | 108 | -12 |
| Hyola 428 | - | - | - | - | - | - | 123 | 20 | 94 | -31 | N/A | N/A | - | - | - | - | - | - | - | - |
| IMC 105 | - | - | - | - | - | - | 105 | 18 | 98 | -1 | N/A | N/A | 90 | -4 | 132 | 17 | 115 | 52 | 107 | 45 |
| IMC 204 | - | - | - | - | - | - | 100 | 9 | - | - | N/A | N/A | 94 | 2 | 105 | 3 | - | - | 98 | 29 |
| IMC 205 | - | - | - | - | - | - | - | - | - | - | N/A | N/A | 98 | 10 | - | - | - | - | - | - |
| LG 3311 | - | - | - | - | - | - | 108 | 1 | 102 | -5 | N/A | N/A | - | - | - | - | - | - | - | - |
| LG 3366 | - | - | - | - | - | - | 112 | 8 | 114 | 10 | N/A | N/A | - | - | - | - | - | - | - | - |
| Magellan | - | - | - | - | - | - | 116 | 14 | 107 | 1 | N/A | N/A | 98 | -3 | 108.0 | -3 | 102 | -15 | 97 | -12 |
| Millenium 03 | 97 | 12 | 100 | 23 | - | - | 102 | 22 | 101 | 22 | N/A | N/A | 91 | 14 | 136 | 23 | - | - | - | - |
| Nex 500 | 106 | 1 | 117 | 23 | - | - | 113 | 11 | 111 | -1 | N/A | N/A | 99 | -8 | 116 | -1 | 103 | -6 | 97 | -11 |
| Nex 705 | 97 | -5 | 123 | 45 | - | - | 134 | 52 | 96 | -39 | N/A | N/A | 72 | -42 | 90 | -10 | 113 | 34 | 75 | -58 |
| Nex 710 | 85 | -22 | 127 | 52 | - | - | 109 | 14 | 109 | 6 | N/A | N/A | 103 | 16 | 101 | -5 | 115 | 57 | 101 | 5 |
| Q2 | 101 | -7 | 115 | 20 | - | - | - | - | - | - | N/A | N/A | - | - | - | - | - | - | - | - |
| Quantum (Check) | 105 | 0 | 107 | 5 | - | - | 126 | 30 | 87 | -33 | N/A | N/A | 118 | 19 | 141 | 13 | 100 | -4 | 101 | 24 |
| SW5001 | 106 | -12 | 105 | -7 | - | - | 111 | 1 | 109 | -10 | N/A | N/A | 85 | -41 | 89 | -21 | 103 | -20 | - | - |
| ***CALCIUM 5S TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Quantum | 27.9 | 35.36 | - | - | - | - | 37.6 | 42.61 | - | - | - | - | 38.3 | 73.41 | - | - | - | - | - | - |
| Quantum + Calcium 5S | 28.3 | 36.89 | - | - | - | - | 34.7 | 28.35 | - | - | - | - | 37.0 | 64.89 | - | - | - | - | - | - |
| ***FOLIAR NUTRIENT APPLICATION TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Check | - | - | - | - | 25.6 | 3.71 | - | - | - | - | - | - | - | - | - | - | 74.4 | 218.08 | - | - |
| Sulphur | - | - | - | - | 27.6 | 0.84 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sulphur + Boron | - | - | - | - | 28.7 | 5.93 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Boron | - | - | - | - | 29.5 | 11.00 | - | - | - | - | - | - | - | - | - | - | 76.8 | 223.18 | - | - |

| CPC Location | Selkirk, MB | | Russell, MB | | St. Claude, MB | | Grenfell, SK | | Naicam, SK | | N. Battleford, SK | | Vegreville, AB | | Beiseker, AB | | Lethbridge (Irr), AB | | Rycroft, AB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD |
| ***TIME OF SWATHING TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Exceed - 30 to 40% SCC | - | - | 34.6 | 54.33 | - | - | 33.9 | 54.94 | - | - | - | - | 21.3 | -16.46 | - | - | - | - | 28.3 | 20.79 |
| Exceed - 40 to 50% SCC | - | - | 36.2 | 62.29 | - | - | 32.6 | 48.76 | - | - | - | - | 22.8 | -10.19 | - | - | - | - | 35.3 | -7.65 |
| Exceed - 50 to 60% SCC | - | - | 38.1 | 71.74 | - | - | 32.5 | 48.29 | - | - | - | - | 23.0 | -9.35 | - | - | - | - | 33.5 | -11.19 |
| Exceed - 60 to 70% SCC | - | - | 38.4 | 73.24 | - | - | 31.3 | 42.59 | - | - | - | - | 19.5 | -23.98 | - | - | - | - | 37.8 | 0.11 |
| Exceed (Straight Cut) | - | - | - | - | - | - | 21.7 | 0.00 | - | - | - | - | 21.3 | -7.98 | - | - | - | - | 36.4 | -2.52 |
| InVigor 2573 - 30 to 40% | - | - | 39.6 | 70.24 | - | - | 37.2 | 62.39 | - | - | - | - | 39.8 | 74.15 | - | - | - | - | 32.4 | 44.96 |
| InVigor 2573 - 40 to 50% | - | - | 39.8 | 71.23 | - | - | 38.3 | 67.61 | - | - | - | - | 41.0 | 79.85 | - | - | - | - | 40.4 | 68.14 |
| InVigor 2573 - 50 to 60% | - | - | 41.1 | 77.70 | - | - | 39.7 | 74.26 | - | - | - | - | 39.8 | 74.15 | - | - | - | - | 40.5 | 45.47 |
| InVigor 2573 - 60 to 70% | - | - | 41.6 | 80.19 | - | - | 40.0 | 75.69 | - | - | - | - | 39.8 | 74.15 | - | - | - | - | 41.6 | 73.3 |
| InVigor 2573 (Straight Cut) | - | - | - | - | - | - | 30.4 | 32.18 | - | - | - | - | 39.5 | 74.82 | - | - | - | - | 38.0 | 60.5 |
| ***SCLEROTINIA CONTROL TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Hylite 201 - No Fungicide | 26.7 | 47.29 | - | - | - | - | - | - | - | - | - | - | - | - | 10.1 | -82.78 | - | - | - | - |
| Hylite 201 - Fungicide | 31.4 | 47.53 | - | - | - | - | - | - | - | - | - | - | - | - | 9.1 | -87.25 | - | - | - | - |
| 44A89 - No Fungicide | 22.6 | 29.75 | - | - | - | - | - | - | - | - | - | - | - | - | 13.0 | -67.68 | - | - | - | - |
| 44A89 - Fungicide | 34.1 | 63.33 | - | - | - | - | - | - | - | - | - | - | - | - | 12.0 | -72.15 | - | - | - | - |
| ***SEED PRIMING TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Unprimed (AC Excel) | - | - | 35.5 | 31.19 | - | - | 31.8 | 22.19 | - | - | - | - | - | - | 11.7 | -62.50 | - | - | - | - |
| Primed (AC Excel) | - | - | 35.8 | N/A | - | - | 34.3 | N/A | - | - | - | - | - | - | 11.9 | N/A | - | - | - | - |
| ***TIME OF WEED REMOVAL TRIAL (Using Odyssey and 46A76)*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| 1-2 leaf | 33.4 | 46.18 | - | - | - | - | - | - | 40.4 | 59.66 | - | - | 40.0 | 76.05 | - | - | - | - | - | - |
| 3-5 leaf | - | - | - | - | - | - | - | - | 38.1 | 46.73 | - | - | 40.8 | 79.85 | - | - | - | - | - | - |
| 6-7 leaf | 17.8 | -31.43 | - | - | - | - | - | - | 37.0 | 41.51 | - | - | 29.8 | 27.6 | - | - | - | - | - | - |
| ***TIME OF SEEDING TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Early Seeded | - | - | - | - | - | - | - | - | 44.1 | 87.11 | - | - | - | - | - | - | 54.8 | 130.58 | - | - |
| Normal Seeded | - | - | - | - | - | - | - | - | 38.9 | 49.80 | - | - | - | - | - | - | 60.3 | 159.13 | - | - |

| CPC Location | Selkirk, MB | | Russell, MB | | St. Claude, MB | | Grenfell, SK | | Nalcam, SK | | N. Battleford, SK | | Vegreville, AB | | Beiseker, AB | | Lethbridge (Irr), AB | | Rycroft, AB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD |
| ***SEED TREATMENT TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Gaucho Platinum | 32.6 | 29.3 | - | - | - | - | - | - | 35.5 | 59.05 | - | - | - | - | - | - | 58.7 | 136.23 | - | - |
| Premiere Z | 28.1 | N/A | 38.4 | N/A | - | - | 36.4 | N/A | 33.6 | N/A | - | - | - | - | 16.4 | N/A | 54.7 | N/A | - | - |
| Helix | 27.5 | 3.2 | - | - | - | - | 36.5 | 47.20 | 36.6 | 63.62 | 25.8 | -0.57 | - | - | - | - | 57.6 | 129.9 | - | - |
| Foundation | 26.2 | 14.26 | 39.5 | 69.74 | - | - | 36.9 | 58.51 | 31.6 | 49.27 | 22.3 | -7.79 | - | - | 15.7 | -37.89 | 59.6 | 145.41 | - | - |
| Foundation Lite | 25.8 | 13.05 | 36.6 | 56.10 | - | - | 34.6 | 48.37 | 28.8 | 36.76 | 22.8 | -4.6 | - | - | 16.3 | -34.26 | 56.1 | 129.97 | - | - |
| Counter + Foundation Lite + Assail (Low Rate) | 24.1 | N/A | - | - | - | - | - | - | 38.5 | N/A | 24.5 | N/A | - | - | - | - | 58.5 | N/A | - | - |
| Counter + Gaucho CS | 31.0 | 25.9 | - | - | - | - | - | - | 36.9 | 62.15 | - | - | - | - | - | - | 60.5 | 140.37 | - | - |
| Foundation Lite + Assail (Low Rate) | 25.3 | N/A | 38.5 | N/A | - | - | - | - | 33.5 | N/A | 21.8 | N/A | - | - | 15.6 | N/A | 58.5 | N/A | - | - |
| Foundation Lite + Assail (High Rate) | 29.1 | N/A | 37.6 | N/A | - | - | - | - | 36.5 | N/A | 23.3 | N/A | - | - | 15.2 | N/A | 57.8 | N/A | - | - |
| Foundation Lite + Decis | - | - | - | - | - | - | 36.3 | 51.37 | 32.2 | 47.84 | - | - | - | - | 16.2 | -34.26 | 60.3 | 146.74 | - | - |
| ***SYSTEMS COMPARISON TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Variety (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| 2631 LL | - | - | - | - | - | - | - | - | 23.6 | 17.61 | N/A | N/A | 30.8 | 40.68 | - | - | N/A | - | 37.4 | 75.59 |
| 46A73 (Clearfield) | - | - | 35.7 | 29.36 | - | - | - | - | 30.2 | 4.10 | N/A | N/A | 35.3 | 47.0 | - | - | N/A | - | 24.3 | -27.2 |
| 46A73 (Freedom) | - | - | - | - | - | - | - | - | 19.7 | -15.82 | N/A | N/A | 25.3 | 5.87 | - | - | N/A | - | 25.3 | -29.71 |
| 46A76 | - | - | 39.6 | 42.64 | - | - | - | - | 37.1 | 41.98 | N/A | N/A | 37.3 | 63.23 | - | - | N/A | - | 34.2 | 30.01 |
| AC Excel (Check) | - | - | 35.5 | 30.71 | - | - | 31.8 | 22.19 | 26.2 | 0.00 | N/A | N/A | 31.3 | 57.08 | 11.7 | -62.50 | 58.3 | 130.45 | 34.6 | 44.99 |
| Armor Bx | - | - | 38.6 | 72.82 | - | - | 26.1 | 15.33 | 27.1 | 31.81 | N/A | N/A | 27.0 | 27.46 | 11.8 | -45.34 | 62.0 | 166.19 | - | - |
| Canterra 1867 | - | - | - | - | - | - | - | - | - | - | N/A | N/A | - | - | 13.2 | -43.20 | N/A | - | - | - |
| Cartier Bx | - | - | 38.1 | 68.85 | - | - | 31.2 | 37.86 | 28.2 | 35.34 | N/A | N/A | 29.5 | 29.8 | 12.0 | -48.94 | 60.8 | 159.46 | - | - |
| Conquest | - | - | 38.1 | 69.51 | - | - | 36.8 | 62.49 | 35.5 | 64.38 | N/A | N/A | 30.3 | 23.16 | - | - | N/A | - | 34.5 | 32.68 |
| Hylite 225 RR | - | - | - | - | - | - | 30.4 | 28.36 | 30.1 | 38.67 | N/A | N/A | - | - | - | - | N/A | - | - | - |
| Hyola 454 | - | - | 37.4 | 57.31 | - | - | - | - | - | - | N/A | N/A | 30.8 | 19.85 | 16.1 | -38.51 | 65.3 | 170.28 | 33.6 | 15.28 |
| IMC 106 RR | - | - | - | - | - | - | 31.2 | 58.05 | 26.9 | 46.73 | N/A | N/A | - | - | - | - | N/A | - | - | - |
| InVigor 2573 | - | - | 41.3 | 78.70 | - | - | 40.6 | 78.54 | 34.6 | 61.77 | N/A | N/A | 41.1 | 80.33 | 17.6 | -25.64 | 66.7 | 178.32 | 43.9 | 91.91 |
| InVigor 2663 | - | - | 41.2 | 78.20 | - | - | 38.1 | 66.66 | 32.3 | 50.84 | N/A | N/A | 38.3 | 67.03 | 18.4 | -21.85 | 68.4 | 186.38 | 43.2 | 46.17 |
| LG Dawn RR | - | - | - | - | - | - | 31.4 | 35.89 | 27.7 | 30.05 | N/A | N/A | - | - | - | - | N/A | - | - | - |
| LG3235 | - | - | 38.0 | 66.33 | - | - | 33.4 | 43.29 | 31.7 | 47.89 | N/A | N/A | 35.8 | 58.03 | 14.4 | -38.04 | 61.6 | 160.48 | 38.4 | 44.24 |
| LG3345 | - | - | 40.5 | 78.74 | - | - | 29.3 | 23.47 | 29.1 | 34.25 | N/A | N/A | 31.0 | 26.54 | 14.0 | -40.20 | 65.2 | 177.33 | 38.1 | 42.4 |
| LG3455 | - | - | 37.8 | 64.15 | - | - | 34.7 | 48.11 | 37.7 | 74.09 | N/A | N/A | 37.5 | 64.84 | 13.2 | -44.77 | 66.2 | 181.44 | 39.5 | 46.7 |
| LG3525 | - | - | 39.0 | 70.12 | - | - | 32.7 | 38.61 | 33.4 | 53.67 | N/A | N/A | 31.5 | 36.35 | 13.9 | -41.45 | 67.7 | 188.55 | 38.6 | 43.73 |
| Quantum (Check) | - | - | 36.9 | 31.42 | - | - | 37.6 | 42.61 | 27.0 | -3.29 | N/A | N/A | 36.3 | 74.25 | 13.9 | -57.56 | 59.9 | 133.81 | 32.6 | 49.47 |
| SW Arrow | - | - | - | - | - | - | - | - | - | - | N/A | N/A | - | - | - | - | N/A | - | 37.4 | 52.5 |
| SW RideR | - | - | 37.4 | 59.84 | - | - | 35.6 | 55.99 | 29.5 | 38.75 | N/A | N/A | 34.0 | 36.6 | 15.0 | -38.28 | 64.8 | 173.18 | - | - |
| Zodiak Bx | - | - | 36.6 | 62.04 | - | - | 29.3 | 29.58 | - | - | N/A | N/A | - | - | - | - | N/A | - | - | - |

| CPC Location | Selkirk, MB | | Russell, MB | | St. Claude, MB | | Grenfell, SK | | Naicam, SK | | N. Battleford, SK | | Vegreville, AB | | Beiseker, AB | | Lethbridge (Irr), AB | | Rycroft, AB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD | NYD | CMD |
| ***SYSTEMS COMPARISON TRIAL (RELATIVE NET YIELDS AND CONTRIBUTION MARGINS)*** | | | | | | | | | | | | | | | | | | | | |
| **Variety** | | | | | | | | | | | | | | | | | | | | |
| 2631 LL | - | - | - | - | - | - | - | - | 90 | 18 | N/A | N/A | 98 | -16 | - | - | - | - | 108 | 31 |
| 46A73 (Clearfield) | - | - | 101 | -1 | - | - | - | - | 115 | 4 | N/A | N/A | 113 | -10 | - | - | - | - | 70 | -72 |
| 46A73 (Freedom) | - | - | - | - | - | - | - | - | 75 | -16 | N/A | N/A | 81 | -51 | - | - | - | - | 73 | -75 |
| 46A76 | - | - | 112 | 12 | - | - | - | - | 142 | 42 | N/A | N/A | 119 | 6 | - | - | - | - | 99 | -15 |
| AC Excel (Check) | - | - | 100 | 0 | - | - | 100 | 0 | 100 | 0 | N/A | N/A | 100 | 0 | 100 | 0 | 100 | 0.00 | 100 | 0 |
| Armor Bx | - | - | 109 | 42 | - | - | 82 | -7 | 103 | 32 | N/A | N/A | 86 | -30 | 101 | 17 | 106 | 36 | - | - |
| Canterra 1867 | - | - | - | - | - | - | - | - | - | - | N/A | N/A | - | - | 113 | 19 | - | - | - | - |
| Cartier Bx | - | - | 107 | 38 | - | - | 98 | 16 | 108 | 35 | N/A | N/A | 94 | -27 | 103 | 14 | 104 | 29 | - | - |
| Conquest | - | - | 107 | 39 | - | - | 116 | 40 | 135 | 64 | N/A | N/A | 97 | -34 | - | - | - | - | 100 | -12 |
| Hylite 225 RR | - | - | - | - | - | - | 96 | 6 | 115 | 39 | N/A | N/A | - | - | - | - | - | - | - | - |
| Hyola 454 | - | - | 105 | 27 | - | - | - | - | - | - | N/A | N/A | 98 | -37 | 138 | 24 | 112 | 40 | 97 | -30 |
| IMC 106 RR | - | - | - | - | - | - | 96 | 36 | 103 | 47 | N/A | N/A | - | - | - | - | - | - | - | - |
| InVigor 2573 | - | - | 116 | 48 | - | - | 128 | 56 | 132 | 62 | N/A | N/A | 131 | 23 | 150 | 37 | 114 | 48 | 127 | 47 |
| InVigor 2663 | - | - | 116 | 47 | - | - | 120 | 44 | 123 | 51 | N/A | N/A | 122 | 10 | 157 | 41 | 117 | 56 | 125 | 1 |
| LG Dawn RR | - | - | - | - | - | - | 99 | 14 | 106 | 30 | N/A | N/A | - | - | - | - | - | - | - | - |
| LG3235 | - | - | 107 | 36 | - | - | 105 | 21 | 121 | 48 | N/A | N/A | 114 | 1 | 123 | 24 | 106 | 30 | 111 | -1 |
| LG3345 | - | - | 114 | 48 | - | - | 92 | 1 | 111 | 34 | N/A | N/A | 99 | -31 | 120 | 22 | 112 | 47 | 110 | -3 |
| LG3455 | - | - | 106 | 33 | - | - | 109 | 26 | 144 | 74 | N/A | N/A | 120 | 8 | 113 | 18 | 114 | 51 | 114 | 2 |
| LG3525 | - | - | 110 | 39 | - | - | 103 | 16 | 127 | 54 | N/A | N/A | 101 | -21 | 119 | 21 | 116 | 58 | 112 | -1 |
| Quantum (Check) | - | - | 104 | 1 | - | - | 118 | 20 | 103 | -3 | N/A | N/A | 116 | 17 | 119 | 5 | 103 | 3 | 94 | 4 |
| SW Arrow | - | - | - | - | - | - | - | - | - | - | N/A | N/A | - | - | - | - | - | - | 108 | 7 |
| SW RideR | - | - | 105 | 29 | - | - | 112 | 34 | 113 | 39 | N/A | N/A | 109 | -20 | 128 | 24 | 111 | 43 | - | - |
| Zodiak Bx | - | - | 103 | 31 | - | - | 92 | 7 | - | - | N/A | N/A | - | - | - | - | - | - | - | - |
| ***CANOPY MANIPULATION TRIAL*** | | | | | | | | | | | | | | | | | | | | |
| **Treatment (bu/ac)** | | | | | | | | | | | | | | | | | | | | |
| Early 1lb/ac | 23.2 | 41.30 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 56.7 | 145.83 | - | - |
| Early 3lb/ac | 24.4 | 38.34 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 59.1 | 149.36 | - | - |
| Early 6lb/ac | 28.5 | 46.04 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 60.8 | 149.58 | - | - |
| Normal 1lb/ac | 13.9 | -4.97 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 59.7 | 160.04 | - | - |
| Normal 3lb/ac | 19.8 | 15.45 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 62.1 | 163.58 | - | - |
| Normal 6lb/ac | 23.4 | 20.67 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 59.2 | 142.00 | - | - |
| *Late 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 30.5 | -2.12 |
| *Late 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 34.1 | -3.58 |
| *Late 8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 36.2 | 27.9 |
| **Normal 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 20.0 | 14.9 |
| **Normal 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 22.2 | 14.62 |
| **Normal 8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 24.1 | 5.85 |

# XXIII SUMMARY

The Canola Production Centre program was a continuing success in spite of many environmental challenges. These included spring and fall frost, hail, flooding, drought and insect damage. In 2000, the program looked not only at new agronomic issues and management techniques brought forward to us by producers and industry, but ongoing trials. Examples of new trials include; time of swathing, seed priming, foliar applied micronutrients, date of seeding/oil quality and canopy manipulation trials. Examples of ongoing trials include; variety evaluation, root maggot control and monitoring, cabbage seedpod weevil and systems comparison trials. These trials were carried out in a non-biased, in depth, quality driven fashion that the Canola Council of Canada continuously strives for. The information outlined in this report should be used as a part of a complete information gathering process to assist producers in making decisions on their farms.

# XXIV FIELD STAFF INFORMATION

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# 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.

## 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 & Equipment

**Bronze Level Sponsors (Less than $200)**

Cenex Farmers Union
Evergreen Implement
Farmer's Co-op Grain and Seed Association
First National Bank
Northern Motors
West Side Motors
Thune Insurance

***Seed and Seed Treatment:***

Croplan Genetics - CL2078
Gustafson - Gaucho and Benlate
Interstate Seed - Hyola 357 (three bags), Hylite 201, Hyola 401, Quantum
Pioneer Hi-Bred - 44A89 (two bags), 45A51 (three bags)

***Fertilizer:***

Agriliance (78 acres)
Northwest Grain (17 acres)

***Herbicides and Fungicides:***

Agriliance - Class Trust (60 acres), Class COC 17% (7.5 gal), Ammonium Sulfate (102 lb)
Aventis CropScience USA - Liberty (38 acres)
BASF - Ronilan (89 acres), Poast (35 acres), Raptor (16 acres)
Dow AgroSciences - Stinger (64 acres)
DuPont Agricultural Products - Assure II (51 acres)
Monsanto - Roundup Ultra (80 acres)

***Equipment and Labor:***

Ken and Connie Mehrkens - John Deere pick-up header, equipment storage, grain truck, shop use
Evergreen Implement - John Deere 24 ft straight cut header
Nelson Equipment - John Deere 8820 combine
Northwest Grain - five soil tests, fertilizer spreading, preplant herbicide application
Pioneer Hi-Bred - weigh wagon

***Photocopying & Faxing:*** Pennington County Extension Office

***Tours:*** Dale Nelson
KKAQ Radio of Thief River Falls
Land O' Lakes
Northern State Bank
Pennington County Extension Office
Seeds 2000 (Howard Hoven family)
Smiley 4-H Club

***Comments:*** A special thank you to **Andy Hedlund**, **Karen Andol, Nycole Erickson** and **Ryan Casavan** for their dedication and technical assistance. Thanks also to the staff of the Minnesota Canola Council for assisting with field day.

# III INTRODUCTION

The Canola Council of Canada initiated Canola Production Centres (CPC) 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 (CPC) 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.

In 2000, the field day tour was held on June 26 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 15) 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 | 6.17 | 3.65 | 9.82 | 4.91 |

***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 project trial.*
***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 2000.

Equipment costs were obtained from the Border State Bank of Badger, MN and are estimated equipment variable costs for northwestern 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 | 3.30 | Pioneer Hi-Bred | InVigor 2663 | 5.14 | Aventis CropScience |
| 45A51 | 4.00 | Pioneer Hi-Bred | KC-701 | 4.70 | Kaystar Seed |
| 46A65 | 3.30 | Pioneer Hi-Bred | LG3235 | 4.09 | Agri-Tel Grain |
| 46A76 | 3.70 | Pioneer Hi-Bred | LG3311 | 3.65 | Agri-Tel Grain |
| Canterra 1492 | 4.78 | Proseed | LG3345 | 4.20 | Cargill Seeds |
| CL2078 | 4.32 | Croplan Genetics | LiBred 280 | 3.30 | Vandaele Seeds |
| Golden Ready RR | 4.20 | Seeds 2000 | Minot | 3.40 | Croplan Genetics |
| Hylite 201 | 2.70 | Interstate Seed | Phoenix | 3.00 | Aventis CropScience |
| Hyola 357 | 5.10 | Interstate Seed | Q2 | 2.70 | Interstate Seed |
| Hyola 401 | 4.50 | Interstate Seed | Quantum | 2.70 | Interstate Seed |
| Hyper 5001 | 4.56 | Integra Seed | RideR | 4.20 | Monsanto |
| InVigor 2573 | 5.14 | Aventis CropScience | | | |

Note: Seed cost may vary from location to location. Prices reflect the Minnesota average for spring 2000 and include the cost of seed treatments (Benlate and Gaucho). Gaucho ($60 per 50/lb bag of seed) is the U.S. product for flea beetle control.

| PRODUCT INFORMATION | | | |
|---|---|---|---|
| **Product** | **Active Ingredient** | **Manufacturer/ Distributor** | **$/Unit Cost** |
| Assure II | quizalofop-p-ethyl | DuPont Agriculture Products | 119.36/gal |
| Ammonium Sulphate | ammonium sulphate | Agriliance | 0.37/lb |
| Benlate | benomyl | DuPont Agriculture Products | 16.38/lb |
| Class COC | crop oil concentrate - 17% | Agriliance | 5.28/gal |
| Class Trust | trifluralin | Agriliance | 22.67/gal |
| Gaucho 600 | imidacloprid | Gustafson | 1.32/lb seed |
| Helix XTra | fludioxonil + mefenoxam + difenoconazole + thiamethoxam | Syngenta | 1.44/lb seed |
| M. A. D. | fludioxonil+mefenoxam difenoconazole | Syngenta | N/A |
| Muster | ethametsulfuron | DuPont Agriculture Products | 27.02/oz |
| Liberty | glufosinate ammonium | Aventis CropScience | 96.37/gal |
| Quadris | azoxystrobin | Syngenta | 284.98/gal |
| Raptor | imazamox | BASF | 461.89/gal |
| Ronilan | vinclozolin | BASF | 21.00/lb |
| Roundup Ultra * | glyphosate | Monsanto | 40.61/gal |
| Rovral flo | iprodione | Aventis CropScience | 137.78/gal |
| Stinger | clopyralid | Dow AgroSciences | 477.67/gal |

*Note: $15/ac TUA includes first pint of Roundup Ultra. Second application includes a $4/gal rebate.

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 Sulphate | 21-0-0-24 | 155.00 | 0.18 (of N) |
| Ammonium Sulphate | 21-0-0-24 | 155.00 | 0.17 (of S) |
| Phosphate | 18-46-0 | 174.96 | 0.19 (of $P_2 0_5$) |
| Urea | 46-0-0 | 170.00 | 0.18 |

***Machinery Cost:***

- Conventional tillage: $15.00/acre
- Extra spray pass: add $0.32/acre
- Straight combining: subtract $0.71/acre

***Additional Machinery Costs:*** (Custom Application)

- Aerial $4.00/acre
- Ground (fungicide) $4.25/acre
- Top dress fertilizer $3.50/acre

Note: Machinery costs were obtained from the Border State Bank of Badger, MN and are estimated operating costs (such as fuel, lubrication and repairs) for northwestern 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 2000, 11.0% 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** |
| 49.9 | | 4.91 | | 245.01 |

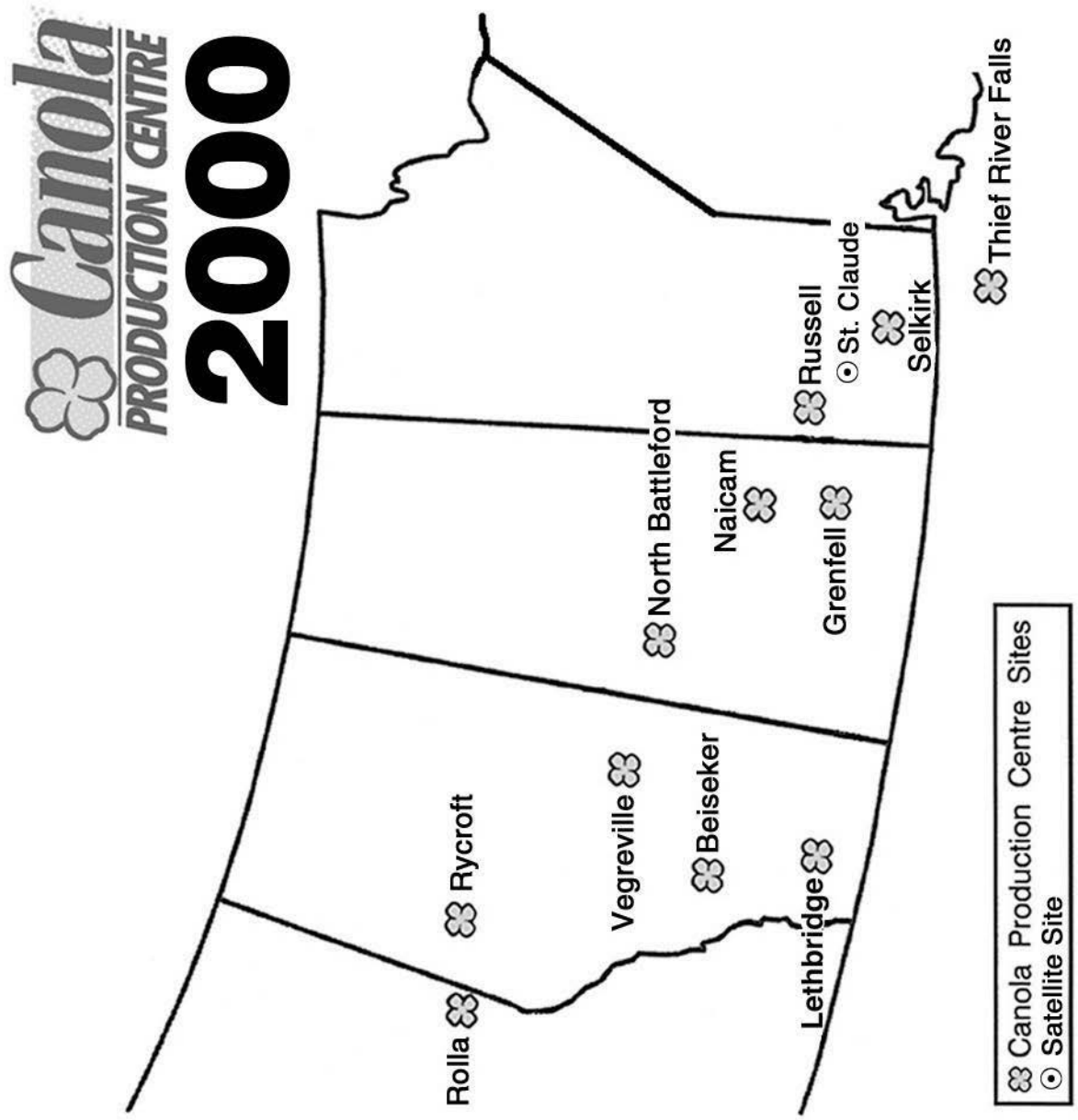
| CALCULATION OF VARIABLE COSTS ($/ac) | |
|---|---|
| Seed | 23.40 |
| Fertilizer | 10.83 |
| Herbicides | 31.30 |
| Fungicides | 18.90 |
| Insecticides | 0.00 |
| Machinery | 19.00 |
| Insurance | 0.00 |
| Check-off | 1.25 |
| Interest/opportunity | 5.69 |
| **Total Variable Costs** | 110.37 |

| CALCULATION OF CONTRIBUTION MARGIN | | | | |
|---|---|---|---|---|
| **Value of Production ($/ac)** | **-** | **Variable Costs ($/ac)** | **=** | **Contribution Margin ($/ac)** |
| 245.01 | | 110.37 | | 134.64 |

| **Contribution Margin ($/ac)** | **/** | **Yield (bu/ac)** | **=** | **Contribution Margin ($/bu)** |
|---|---|---|---|---|
| 134.64 | | 49.9 | | 2.70 |

**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 Stubble | West Fallow | East Fallow |
|---|---|---|---|---|
| ***Previous crop:*** | | Wheat | Fallow | Fallow |
| ***Soil test results: (AgriSource Laboratories)*** | | | | |
| *Organic matter content*: | | N/A | 3.2% | 4.7% |
| *Macronutrient Levels: (*0-6", 6-24") | | | | |
| Nitrogen - | 0-6 inches | 6 lb/ac | 128 lb/ac | 65 lb/ac |
| | 0-24 inches | 12 lb/ac | 200 lb/ac | 140 lb/ac |
| Phosphorus - | 0-6 inches | 42 lb/ac | 26 lb/ac | 30 lb/ac |
| Potassium - | 0-6 inches | 518 lb/ac | 360 lb/ac | 594 lb/ac |
| Sulphur - | 0-6 inches | 28 lb/ac | 40 lb/ac | 68 lb/ac |
| | 0-24 inches | 24 lb/ac | 98 lb/ac | 120 lb/ac |
| *Micronutrient Levels:* (0-6") | | | | |
| Calcium - | | N/A | 3300 ppm | 3200 ppm |
| Magnesium - | | N/A | 680 ppm | 1120 ppm |
| Boron - | | N/A | 0.7 ppm | 0.8 ppm |
| Zinc - | | N/A | 0.5 ppm | 0.8 ppm |
| Manganese - | | N/A | 1.5 ppm | 2.4 ppm |
| Copper - | | N/A | 0.5 ppm | 0.6 ppm |
| Iron - | | N/A | 13.3 ppm | 37.2 ppm |
| ***Target yield:*** | | 2200 lb/ac | 2400 lb/ac | 2200 lb/ac |
| ***Fertilizer applied:*** | | | | |
| Nitrogen - | | 143 lb/ac | 12* lb/ac | 23 lb/ac |
| Phosphorous - | | 25 lb/ac | 40 lb/ac | 40 lb/ac |
| Potassium - | | 0 lb/ac | 0 lb/ac | 0 lb/ac |
| Sulfur - | | 10 lb/ac | 10 lb/ac | 10 lb/ac |
| ***Soil association/zone:*** | | Clearwater loam | Hilaire very fine sandy loam | Clearwater clay loam |
| ***Soil texture:*** | | Loam | Sandy loam | Clay loam |
| ***Soil pH:*** | | 7.8 | 7.6 | 7.0 |
| ***Salinity:*** | (slightly saline) | 0.3 mmho | 0.6 mmho | 0.5 mmho |

*** Note:** Additional nitrogen (10 lb/ac) was applied to the *Fall-seeding trial* on the west fallow.

***Tillage operations:*** The stubble field was cultivated lightly in the fall to maintain residue and incorporate fertilizer. The fallow fields were cultivated once in the fall to incorporate fertilizer and control weeds. The west fallow field was cultivated and coil packed once in the spring prior to seeding. The east fallow field was cultivated twice to incorporate trifluralin, the second time also using a coil packer. Spring-seeded plots on the fall dormancy trial were cultivated once prior to seeding.

***Seeding method:*** Seeded with a John Deere 9350 double disk press drill

Date: October 15 and November 16, 1999; April 29 to May 2, 2000

Depth: ½" - ¾"

Rate: 5.2 lb/ac - *B. napus* for most of the site
6.0 lb/ac - Fall-seeded plots and fungicide trial
4.3 lb/ac - InVigor 2573 in swathing trial

***Herbicides applied:***

A) Conventional varieties in system trial - Assure II (10 oz/ac), crop oil concentrate (1.5 pt/ac), Stinger (4 oz/ac), Muster (0.28 oz/ac).
B) Sclerotinia and conventional variety trial - Stinger (4 oz/ac), Muster (0.3 oz/ac), non-ionic surfactant (0.25 % v/v), ammonium sulfate (3/4 lb/ac)
C) Fungicide trial - Stinger (4 oz/ac), Muster (0.28 oz/ac), crop oil concentrate (1.5 pt/ac)
D) Liberty Link varieties - Liberty (34 oz/ac), ammonium sulfate (3.0 lb/ac)
E) Clearfield varieties - Raptor (4 oz/ac), non-ionic surfactant (0.25% v/v), ammonium sulfate (2.5 lb/ac)
F) Roundup Ready varieties - Roundup Ultra (1 pt/ac), ammonium sulfate (1.0 lb/ac)

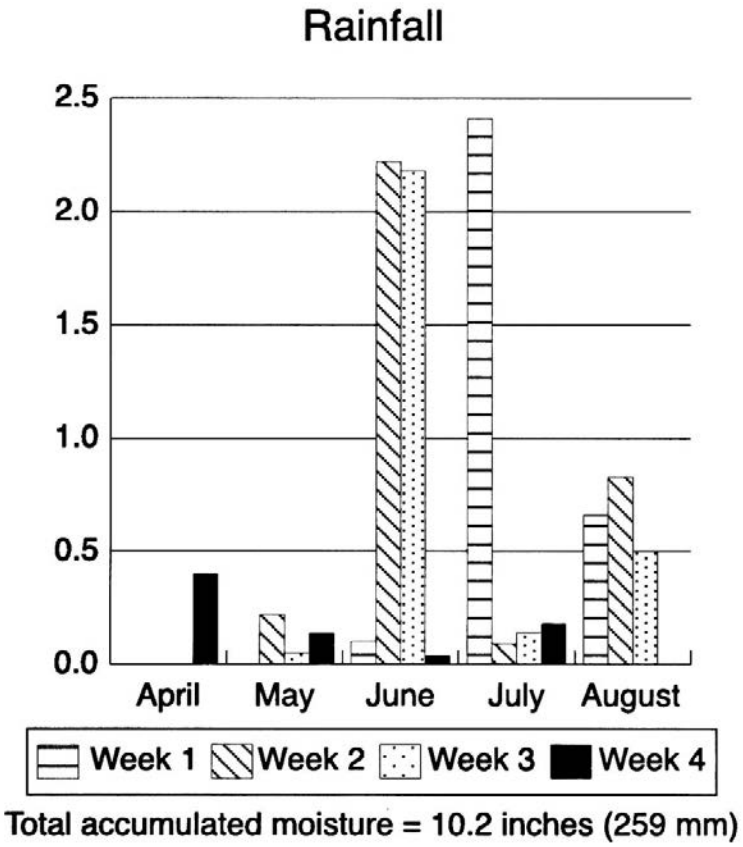
***Fungicides applied:*** Ronilan (14.5 oz/ac) at about 20-40% bloom.

***Swathing:*** Started: July 26 Finished: August 7

***Combining:*** Started: August 24 Finished: August 29

***Comments:*** The east and west fallow fields were not seeded in 1999 due to excess moisture. The west fallow field had 100 lb N/ac of anhydrous ammonia applied in the spring of 1999 in anticipation of seeding wheat. No value was assigned in the contribution margins toward the anhydrous ammonia application due to the extended period between the anhydrous ammonia application and this year's crop. Note the high levels of residual nitrogen in the soil test results. Flea beetles were present on the fall-seeded canola but not on the spring-seeded. The growing season was ideal with good moisture before and after seeding, followed by a dryer period up to flowering. This was ideal for the fallow fields because there was plenty of moisture available to sustain the crop and it encouraged deep root development. Frequent rains occurred during flowering providing ideal conditions for sclerotinia development. A severe thunderstorm pelted the site on

July 7 causing severe lodging on the west fallow field. The high nitrogen levels on that field also contributed to the severe lodging. Conditions during swathing were warm and dry, which hastened seed colour change. A two-week period of wet cool weather after swathing allowed for slow curing of the swaths and minimal green seed in the harvested canola.




Total accumulated moisture = 10.2 inches (259 mm)

# VIII 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 increased number of new varieties available over the past several years has made 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 Quantum.

***Methodology:*** The variety trial was made up of 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. Swathing commenced when seed colour change was 30-40%, and harvest was completed when suitable conditions existed.

***Observations:*** The trial was located on the east fallow field and seeded on May 2 into good moisture. Growing conditions were ideal throughout the summer. The back half of the fourth replicate was lodged and later maturing than the rest of the trial. Conditions at swathing were dry and warm. To prevent shattering in the lodged plots, swathing was done when the average of the plot was between 30-40% seed colour change.

***Results:***

| *B. NAPUS* VARIETY TRIAL<br>YIELD, ECONOMIC & QUALITY RESULTS<br>Thief River Falls, MN | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| Hyola 401 | 100 | 2495 | 49.9 | 134.64 | 45.4 | 1019 | 92 |
| 46A65 | 87 | 2172 | 43.4 | 109.67 | 46.9 | 1019 | 92 |
| Canterra 1492 | 84 | 2107 | 42.1 | 101.75 | 46.2 | 1032 | 93 |
| Quantum | 82 | 2043 | 40.9 | 100.31 | 44.2 | 1032 | 93 |
| CL2078 | 81 | 2019 | 40.4 | 89.08 | 44.7 | 1032 | 93 |
| LG3311 | 80 | 2007 | 40.1 | 91.60 | 45.0 | 1004 | 91 |
| Q2 | 77 | 1926 | 38.5 | 88.85 | 44.9 | 1048 | 94 |
| LiBred 280 | 77 | 1920 | 38.4 | 85.03 | 46.0 | 1032 | 93 |
| Hyper 5001 | 74 | 1855 | 37.1 | 71.77 | 45.3 | 1048 | 94 |
| KC-701 | 71 | 1778 | 35.6 | 63.50 | 44.7 | 1032 | 93 |
| LSD (0.10)<br>CV% | | 90.1<br>3.7 | 1.80<br>3.7 | | 1.33<br>2.4 | | |

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

***Discussion:*** The check (Hyola 401) yielded significantly higher than the other varieties. 46A65 had higher oil content than all other varieties except Canterra 1492 and LiBred 280. Days to maturity represent the calendar days from the date of seeding until the crop reached 30% seed colour change. The growing degree days, expressed in Celsius, represent the heat accumulation above canola's base temperature of 5°C (41°F). The warm dry conditions at swathing hastened seed colour change and reduced the differences in maturity that are common among varieties.

# IX SYSTEMS COMPARISON TRIAL

***Objective:*** To establish agronomic criteria for choosing between 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 variety and herbicide for each field. Factors to consider beyond the performance of the variety includes weed population, weed spectrum, tillage system and herbicide rotation. Entries in the systems comparison trial were on a contract basis.

***Methodology:*** Each treatment was replicated four times in a randomized complete block. The canola varieties with novel traits for herbicide tolerance were compared to the conventional varieties Hyola 401 and Quantum in a conventional herbicide program.

***Observations:*** The trial was seeded on the west fallow field on May 1 into good moisture. Weed pressure was light to moderate with patches of quackgrass, dense patches of green smartweed (cotyledon), red root pigweed, large field pennycress and Canada thistle scattered throughout the trial. All applications were done at the 2-leaf stage. Roundup Ready and Clearfield systems were applied after sunset, when the wind was calmer (below 3 mph), to reduce risks of drift onto neighboring plots. Liberty was applied the following morning before the wind increased. High levels of residual nitrogen, along with good growing conditions provided for a tall thick crop, which lodged severely during flowering. Most of the lodging occurred during a thunderstorm on July 7 when the trial was at full bloom. The trial was sprayed with Ronilan EG when most of the plots were at 20-40% bloom. The exceptions were 46A76, InVigor 2573 and InVigor 2663 which were at 5-10% bloom. Sclerotinia levels were taken by scoring 50 random plants in each plot.

***Results:***

| SYSTEMS COMPARISON TRIAL<br>Thief River Falls, MN | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Contrib. Margin ($/ac)** | **Sclerotinia (%)** | **Oil (%)** | **Growing Degree Days** | **Days To Maturity** |
| ***Conventional*** | | | | | | | | |
| Hyola 401 | 100 | 2772 | 55.4 | 160.55 | 11 | 43.8 | 1041 | 94 |
| Quantum | 78 | 2165 | 43.3 | 111.13 | 19 | 41.6 | 1057 | 95 |
| ***Clearfield (Raptor Tolerant)*** | | | | | | | | |
| 46A76 | 77 | 2137 | 42.7 | 120.75 | 18 | 43.6 | 1057 | 95 |
| ***Liberty Link*** | | | | | | | | |
| InVigor 2573 | 74 | 2042 | 40.8 | 91.93 | 13 | 42.7 | 1057 | 95 |
| InVigor 2663 | 70 | 1932 | 38.6 | 81.21 | 35 | 43.5 | 1057 | 95 |
| ***Roundup Ready*** | | | | | | | | |
| Hyola 357 | 94 | 2613 | 52.3 | 160.09 | 9 | 43.6 | 1041 | 94 |
| LG3455 | 84 | 2333 | 46.7 | 137.71 | 23 | 44.2 | 1041 | 94 |
| LG3235 | 84 | 2328 | 46.6 | 137.75 | 29 | 44.3 | 1013 | 92 |
| Minot | 82 | 2263 | 45.3 | 135.25 | 32 | 43.5 | 1028 | 93 |
| RideR | 76 | 2114 | 42.3 | 116.27 | 22 | 43.7 | 1041 | 94 |
| Golden Ready RR | 73 | 2019 | 40.4 | 107.01 | 16 | 43.8 | 1041 | 94 |
| 45A51 | 69 | 1902 | 38.0 | 96.70 | 22 | 44.3 | 1041 | 94 |
| LSD<br>CV% | | 85.7<br>3.2 | 1.71<br>3.2 | | 11.6<br>47.3 | 1.09<br>2.1 | | |

***Discussion:*** The check (Hyola 401) and Hyola 357 had significantly higher yields than any other variety. The severe lodging (see *Harvestability*) during flowering likely prevented many of the varieties from reaching their full yield potential. Differences in sclerotinia levels did not directly relate to yield differences. Contribution margins reflect differences in seed cost, yield and chemical weed control costs. Quantum had significantly lower oil than all other varieties. The warm dry conditions at swathing hastened seed colour change and reduced the differences in maturity that are common among varieties.

# X HARVESTABILITY TRIAL

***Objective:*** To compare the harvestability of varieties entered in the variety and systems trials.

***Background:*** A number of varieties have very similar yield and quality traits. In choosing a variety a grower should also consider such characteristics as lodging and harvestability. Harvestability is the measurement of swathing and combining ease. Currently, there is no standardized scientific measurement for harvestability. Therefore, a qualitative assessment is used.

***Methodology:*** **Lodging scores** are a visual score in which 1=erect and 9=flat. Varieties that are standing good and have a 'high yield tip' are given a score of 2 to 3. Varieties that have severe uneven lodging with patches standing upright and patches laying flat are given a score of 7 or 8 depending on the severity. **Lodging ratios** are taken 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. Each variety was swathed and evaluated in ½ increments on a scale of 1 to 5, compared to the check (Hyola 401) which was rated a 2 to match ratings at the Canola Production Centres in Canada where AC Excel is the standard with a rating of 3. The following criteria were considered: lodging, height, straw stiffness, straw strength, uniformity of stand, swath fluffiness, tendency to clump, flowability, speed of operation and feeding.

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

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

***Observation:*** The variety and system comparison trials are reported in separate tables due to the extreme differences between the two trials. The systems trial was on a field with much higher nitrogen levels than the variety trial. Consequently, the systems trial had much more lodging and more difficulty swathing and combining than the variety trial. Lodging was variable among the varieties. Swathing was most difficult in the varieties with the uneven lodging. Combining ease was related closely to the amount of clumping in the swath and ease of picking up the swath. The plots were swathed with an 18' Versatile 400 swather equipped with a pick-up reel, and harvested with a John Deere 8820 combine.

***Results:***

| HARVESTABILITY TRIAL<br>Systems Comparison Trial<br>Thief River Falls, MN | | | | |
|---|---|---|---|---|
| **Variety** | **Lodging Score** | **Lodging Ratio** | **Swathing Rating** | **Combining Rating** |
| 45A51 | 8.8 | .53 | 4.1 | 3.3 |
| 46A76 | 5.5 | .58 | 3.8 | 3.4 |
| Golden Ready RR | 8.5 | .50 | 3.3 | 2.9 |
| Hyola 357 | 3.0 | .72 | 2.0 | 2.0 |
| Hyola 401 | 2.8 | .76 | 1.8 | 2.0 |
| InVigor 2573 | 8.5 | .46 | 4.9 | 4.5 |
| InVigor 2663 | 7.8 | .39 | 4.3 | 4.0 |
| LG3235 | 7.5 | .55 | 3.9 | 2.8 |
| LG3455 | 4.3 | .69 | 3.6 | 2.9 |
| Minot | 8.5 | .58 | 4.1 | 3.1 |
| Quantum | 5.0 | .60 | 3.0 | 3.3 |
| RideR | 5.5 | .63 | 4.1 | 3.0 |
| LSD (0.10)<br>C.V. | 1.31<br>17.4 | 0.123<br>17.6 | 0.53<br>12.4 | 0.36<br>9.8 |

| HARVESTABILITY TRIAL<br>*B. napus,* Variety Trial<br>Thief River Falls, MN | | | | |
|---|---|---|---|---|
| **Variety** | **Lodging Score** | **Lodging Ratio** | **Swathing Rating** | **Combining Rating** |
| 46A65 | 4.5 | .71 | 2.0 | 2.1 |
| Canterra 1492 | 2.8 | .88 | 3.0 | 3.1 |
| CL2078 | 2.0 | .92 | 2.8 | 3.0 |
| Hyola 401 | 1.5 | .86 | 2.3 | 2.0 |
| Hyper 5001 | 1.3 | 1.00 | 2.6 | 3.6 |
| KC-701 | 1.5 | .94 | 2.6 | 3.0 |
| LG3311 | 3.8 | .86 | 3.3 | 2.4 |
| LiBred 280 | 5.8 | .62 | 3.8 | 2.9 |
| Q2 | 5.8 | .67 | 3.6 | 3.0 |
| Quantum | 3.5 | .78 | 3.4 | 3.0 |
| LSD (0.10)<br>C.V. | 1.46<br>37.5 | 0.089<br>8.9 | 0.61<br>17.3 | 0.42<br>12.5 |

***Discussion:*** Lodging in the variety trial was not as severe as the systems comparison trial. LiBred 280, Q2 and 46A65 had more lodging than most of the other varieties. However, 46A65 was one of the easiest to swath and combine. Hyola 401 and 46A65 flowed much easier through the swather and combine than the other varieties.

There was a wide range of lodging in the systems comparison trial. Hyola 401 and Hyola 357 had the least lodging and were the easiest to swath and combine. InVigor 2573, InVigor 2663, Minot and 45A51 were lodged the most and were difficult to swath. The seeding rate of 5.2 lb/ac together with the high nitrogen levels on this field caused most of the varieties to lodge heavily.

The variety 45A51 was also used in the fall dormant seeding trial, which was on the same field as the systems trial. The spring-seeding date of that trial was seeded at the same 5.2 lb/ac rate as the systems trial. It lodged heavily with a stand count of 9.0 plants/$ft^2$ (lodging score of 8), but the fall-seeded stood up nice and swathed easy with stand counts of 1.5-2.2 plants/$ft^2$ (lodging score of 3).

# 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 wide spread problem of canola production is stand establishment. Poor stand establishment may be caused by seedling disease complex including pathogens such as *Rhizoctonia solani* along with *Fusarium* and *Pythium* species. In addition to fungal pathogens of emerging canola, insects may also cause economic yield loss.

***Methodology*:** The seed treatment trial included the following treatments:

A) Standard seed treatment - Gaucho 600 + Benlate
B) No insecticide check - Benlate
C) Gaucho Platinum - [Gaucho 600 + Allegiance + Vitaflow 280]
D) Helix XTra - [Adage + Maxim + Apron XL + Dividend]
E) M. A. D. - [Maxim + Apron XL + Dividend]

All other agronomic practices remained the same.

***Observation:*** The trial was located near an alfalfa field to enhance the probability of insect pressure throughout the season. The soil was cloddy from being tilled when wet prior to seeding. The trial was seeded on May 2 into marginal moisture. Stand counts and flea beetle pressure ratings were taken in three 0.5 $m^2$ quadrants per plot. The same quadrants were used each time at 15, 22 and 31 days after seeding. Stand counts declined marginally in all treatments during the first month after seeding. Much of stand loss was due to high winds, which caused plants to twist just below the soil surface and die. Stand counts in the Benlate treatment declined the most from 11.0 plants/$ft^2$ at 15 days after seeding to 9.6 plants/$ft^2$ at 31 days after seeding. Plots were checked periodically during the summer for insects with no significant levels detected. Lygus bug levels were highest on July 13 (5-7 lygus per 10 sweeps). However, they were well below the threshold (15 lygus per 10 sweeps).

***Results:***

| SEED TREATMENT TRIAL<br>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$^2$)** |
| Benlate | 2105 | 42.1 | 108.61 | 45.2 | 20.28 | 1.6 | 9.6 |
| Gaucho + Benlate | 2083 | 41.7 | 99.89 | 45.3 | 26.52 | 0.8 | 9.0 |
| Gaucho Platinum | 2289 | 45.8 | N/A | 43.9 | N/A | 0.5 | 9.0 |
| Helix XTra | 2149 | 43.0 | 105.56 | 45.2 | 27.77 | 0.8 | 9.9 |
| M. A. D. | 2154 | 43.1 | N/A | 44.8 | N/A | 1.3 | 8.2 |
| LSD<br>CV% | 154.6<br>5.7 | 3.09<br>5.7 | | 1.37<br>2.4 | | 0.29<br>24.0 | 1.51<br>13.1 |

Note: Prices for Gaucho Platinum and M. A. D. were not available (N/A) from the company at press time.
* These prices are based on consultation with industry representatives and include the cost of seed and treatment.
** Flea beetle ratings at 22 days after seeding. 0 = no pressure, 9 = leaves completely chewed off.

***Discussion:*** The Gaucho Platinum seed treatment yielded significantly higher than the Benlate and Gaucho + Benlate seed treatments. Even though flea beetle pressure was low, seed treatments with insecticide had significantly less flea beetle damage than the Benlate and M.A.D. treatments, which did not have insecticide. However, the differences in feeding did not influence yield. There was no significant difference in plant stand among any of the treatments at 31 days after planting. Gaucho Platinum had lower oil content than Gaucho + Benlate. Contribution margins reflect differences in yield and seed costs.

# XII 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.

***Methodology:*** Spraying was done using twinjet nozzles at 75 psi. Ronilan EG was applied at 0.9 lb/ac in 20 gal of spray solution at the 30-40% 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) CL 2078 (late maturing petalled) - no fungicide
F) CL 2078 (late maturing petalled) - fungicide

Infection readings were taken by sampling 100 unswathed plants in three random areas of each plot along the edge of the swathed area.

***Observation:*** The trial was seeded in the east fallow field on May 1 into good moisture. Early season moisture enabled a dense stand. The weather was dry leading up to flowering at this site, but was wet during flowering. Petal tests taken at 30% bloom indicated a 12% infection level.

***Results:***

| SCLEROTINIA STEM ROT CONTROL TRIAL<br>Thief River Falls, MN | | | | | | |
|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Oil (%)** | **Plants Infected (%)** | **Contribution Margin ($/ac)** |
| Hylite 201 - no fungicide | 100 | 2031 | 40.6 | 43.7 | 30 | 123.29 |
| Hylite 201 - fungicide | 104 | 2123 | 42.5 | 43.4 | 13 | 108.18 |
| 44A89 - no fungicide | 100 | 1591 | 31.8 | 44.3 | 63 | 77.06 |
| 44A89 - fungicide | 137 | 2176 | 43.5 | 44.8 | 29 | 110.01 |
| CL2078 - no fungicide | 100 | 1701 | 34.0 | 44.4 | 45 | 82.14 |
| CL2078 - fungicide | 128 | 2174 | 43.5 | 44.2 | 3 | 104.19 |
| LSD (0.10)<br>CV% | | 107.9<br>4.4 | 2.16<br>4.4 | 1.10<br>2.0 | 10.00<br>26.2 | |

***Discussion:*** Fungicide significantly increased yield of 44A89 and CL 2078, but not of Hylite 201. Hylite 201 (no fungicide) had the highest contribution margin. Contribution margins reflect differences in yield, seed and fungicide costs. Without the significant yield boost, the fungicide treatment did not pay for itself with the apetalous line (Hylite 201). The fungicide treatment significantly decreased disease levels and improved contribution margins for the petalled varieties. Oil content was not affected by fungicide treatment.

# XIII 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 44A89. A higher seeding rate of 6.0 pounds per acre 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) Benlate - 1.0 lb/ac applied at 30% bloom
C) Quadris - 10 oz/ac applied at 10-25% bloom
D) Ronilan EG - 14.4 oz/ac applied at 30-40% bloom
E) Rovral flo - 14.4 oz/ac + 1% crop oil concentrate applied at 20-30% bloom

Infection readings were taken by sampling 100 unswathed plants in three random areas of each plot along the edge of the swathed area.

***Observation:*** The trial was seeded in the east fallow field on April 29 into good moisture. Early moisture enabled a good crop stand. The 6.0 lb/ac seeding rate provided a thick crop canopy, which enhanced disease development. The weather was dry leading up to flowering at this site, but was wet during flowering. Petal tests taken at 30% bloom indicated a 12% infection level. The Quadris treatment was applied on June 19 when the trial was at 5-10% bloom. Winds that day were about 15 mph. It started raining seven hours after application and rained 1.5" by the next morning. It rained another 0.5" on June 21. The soonest the other treatments could be applied was June 24 when the canola was at 35-40% bloom. Wind that day was about 6 mph. There was no rain for the next 10 days.

***Results:***

| FUNGICIDE EVALUATION TRIAL<br>Thief River Falls, MN | | | | | | |
|---|---|---|---|---|---|---|
| **Treatment** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Oil (%)** | **Plants Infected (%)** | **Contribution Margin ($/ac)** |
| Check (No Fungicide) | 100 | 1341 | 26.8 | 44.9 | 62 | 50.09 |
| Benlate | 162 | 2168 | 43.4 | 45.1 | 19 | 109.38 |
| Quadris | 102 | 1369 | 27.4 | 44.7 | 73 | 25.11 |
| Ronilan | 150 | 2007 | 40.1 | 44.2 | 37 | 91.07 |
| Rovral flo | 138 | 1857 | 37.1 | 45.2 | 43 | 79.92 |
| LSD (0.10)<br>CV% | | 193.1<br>8.8 | 3.86<br>8.8 | 1.16<br>2.1 | 14.4<br>24.5 | |

***Discussion:*** Benlate, Ronilan and Rovral flo all provided significantly lower disease levels and higher yields compared to Quadris and the check. Quadris is not rain fast for eight hours and rain occurred seven hours after application. The combination of earlier than recommended application time of Quadris, high winds during application, rain seven hours after application, and high inoculum pressure later in flowering, resulted in Quadris not providing any protection from sclerotinia.

# XIV LIBERTY TANK MIX 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 consisted of the following treatments in a randomized block design:

A) Liberty (28 oz/ac) + Assure II (5 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 2-leaf stage.
B) Liberty - full rate (34 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 2-leaf stage.
C) Liberty - split application (20 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 2-leaf stage and (20 oz/ac) + ammonium sulfate (3 lb/ac) applied at the 5-leaf stage.

***Observation:*** This trial was integrated with the Systems Comparison Trial. Weed pressure was light to moderate with patches of quackgrass, dense patches of green smartweed (cotyledon) and red root pigweed, large field pennycress and Canada thistle scattered throughout the trial. Applications at the 2-leaf stage were done at sunrise when the temperature was 40°F. The weather turned warm, sunny and windy the rest of the day.

***Results:***

**LIBERTY TANK MIX TRIAL**
**Thief River Falls, MN**

| Treatment | Yield (lb/ac) | Yield (bu/ac) | Contribution Margin ($/ac) | Oil (%) |
|---|---|---|---|---|
| Liberty + Assure II | 2042 | 40.8 | 91.93 | 42.7 |
| Liberty - full rate | 2044 | 40.9 | 92.33 | 43.3 |
| Liberty - split application | 1956 | 39.1 | 77.43 | 42.5 |
| LSD (0.10) | 145.6 | 2.91 | | 1.23 |
| CV% | 5.3 | 5.3 | | 2.1 |

***Discussion:*** There were no yield or oil differences among the different tank mix combinations of Liberty. Weed control was good for all treatments. The first 20 oz application of the split treatment gave good weed control. Contribution margins were lower with the split application of Liberty due to slightly lower yield and an additional $5.80 for the extra chemical and second application.

# XV TIME OF WEED REMOVAL TRIAL

***Objective:*** To compare the effects of time of weed removal on yield and quality of *B. napus* canola using conventional, Roundup Ready and Clearfield systems.

***Background:*** Weed removal and proper time to remove them has been a constant source of frustration to producers. Producers will often delay post emergent herbicide application in an attempt to avoid late flushes of weeds. The concern is that these late flushes of weeds may add to the bank of weed seeds in the soil or require additional herbicide applications and increased input costs. Work conducted by Harker, et al (Agriculture and Agri-Food Canada) along with Canola Production Centre data has shown there are economic benefits to removing weeds early in crop development.

***Methodology***: The trial consisted of the following varieties and stages of herbicide application in a split-plot design:

A) Conventional system - Quantum
   - Assure II + Stinger + Muster at the 2-leaf stage of the canola
   - Assure II + Stinger + Muster at the 5-leaf stage of the canola

B) Clearfield system - 46A76
   - Raptor at the 2-leaf stage of the canola
   - Raptor at the 5-leaf stage of the canola

C) Roundup Ready system - RideR
   - Roundup Ultra at the 2-leaf stage of the canola
   - Roundup Ultra at the 5-leaf stage of the canola

See *Site Description* for details on rates of chemicals.

***Observations:*** The trial was seeded on the west fallow field on May 1 as part of the systems trial. Weed pressure was light to moderate with patches of quackgrass, dense patches of green smartweed (cotyledon), red root pigweed, large field pennycress and Canada thistle scattered throughout the trial. All applications were done after sunset when the wind was lower (3 mph), to reduce risks of drift onto neighboring plots.

***Results:***

| TIME OF WEED REMOVAL TRIAL<br>Thief River Falls, MN | | | | |
|---|---|---|---|---|
| **Treatment** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** |
| ***Conventional System*** | | | | |
| 2-leaf | 2165 | 43.3 | 111.13 | 41.6 |
| 5-leaf | 2112 | 42.2 | 105.90 | 42.3 |
| ***Clearfield System*** | | | | |
| 2-leaf | 2137 | 42.7 | 120.75 | 43.6 |
| 5-leaf | 2136 | 42.7 | 120.65 | 43.7 |
| ***Roundup Ready System*** | | | | |
| 2-leaf | 2114 | 42.3 | 116.27 | 43.7 |
| 5-leaf | 2186 | 43.7 | 123.35 | 43.7 |
| LSD spray time within a variety<br>CV% | 55.9<br>2.0 | 1.12<br>2.0 | | 0.97<br>1.8 |

***Discussion:***

Results from this trial are mixed. Yield was slightly higher when sprayed at the 2-leaf stage compared to the 5-leaf stage in the conventional system. Yield was significantly higher when sprayed at the 5-leaf stage compared to the 2-leaf stage in the Roundup Ready system. Time of weed removal had no effect on yield in the Clearfield system. Contribution margins reflect differences in yield, seed costs and chemical weed control costs. These mixed results are likely due to the low weed pressure and the patchiness of the weeds in the trial. With heavy weed pressure, early weed removal is important to reduce early competition for moisture and nutrients. Oil content was not affected by time of weed removal.

# XVI TIME OF SWATHING (AVENTIS)

***Objective:*** To compare the effects of various swathing dates on yield and quality of hybrid vs. open pollinated varieties.

***Background:*** Traditionally, the recommended stage of swathing is at 30-40% seed colour change (SCC) on the main stem to maximize yield and quality and minimize green seed and shattering. The introduction of hybrids, with associated lower seeding rates and lower plant densities, can result in extra secondary branching. The secondary branching causes a wider range of seed development and maturation as compared to traditional seeding rates. Therefore, the normal time of swathing (30-40% SCC) may need to be delayed to a later stage to allow for optimum development and pod fill on the secondary side branches.

***Methodology:*** The time of swathing trial consisted of the following treatments, in a split plot design with varieties as the main plot and swath timing as sub-plots.

A) 30-40% SCC ~ InVigor 2573
B) 40-50% SCC ~ InVigor 2573
C) 50-60% SCC ~ InVigor 2573
D) 60-70% SCC ~ InVigor 2573
E) Straight Combine ~ InVigor 2573
F) 30-40% SCC ~ Phoenix
G) 40-50% SCC ~ Phoenix
H) 50-60% SCC ~ Phoenix
I) 60-70% SCC ~ Phoenix
K) Straight Combine ~ Phoenix

InVigor 2573 was seeded at 4.3 lb/ac. Phoenix was seeded at 5.2 lb/ac. Seed colour change was determined on the main stem.

***Observation:*** The trial was seeded in the east fallow field on April 29 into good moisture. Weather at swathing time was very warm and dry. Seed colour change occurred rapidly at a rate of about 10% per day. All swathing was done in the early evening. Average stand counts were 11.6 plants/$ft^2$ for Phoenix and 9.6 plants/$ft^2$ for InVigor 2573. Primary branch counts were similar between the Phoenix and InVigor 2573 with 4.6 and 4.8 branches per plant, respectively. Secondary branch counts were also not significantly different between the Phoenix and InVigor 2573 with 0.7 and 0.3 secondary branches per plant respectively. Straight cut treatments were harvested with a 24 ft flex-header with a pick-up reel. Green seed counts were below 0.3% for all treatments due to frequent rains after swathing, which allowed the swaths to dry slowly.

***Results:***

| TIME OF SWATHING TRIAL (AVENTIS)<br>Thief River Falls, MN | | | | | | | |
|---|---|---|---|---|---|---|---|
| **System** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Contribution Margin ($/ac)** | **Oil (%)** | **Growing Degree Days** | **Days To Swathing** |
| ***Open Pollinated Variety – Phoenix*** | | | | | | | |
| 30-40% SCC | 100 | 1896 | 37.9 | 81.22 | 49.3 | 1025 | 94 |
| 40-50% SCC | 102 | 1925 | 38.5 | 84.02 | 49.9 | 1039 | 95 |
| 50-60% SCC | 108 | 2045 | 40.9 | 95.72 | 48.8 | 1052 | 96 |
| 60-70% SCC | 109 | 2072 | 41.4 | 98.41 | 49.2 | 1069 | 97 |
| Straight Cut | 79 | 1253 | 25.1 | 19.11 | 47.9 | 1376 | 119 |
| ***Hybrid Variety - InVigor 2573*** | | | | | | | |
| 30-40% SCC | 100 | 2047 | 40.9 | 89.12 | 46.5 | 1025 | 94 |
| 40-50% SCC | 101 | 2059 | 41.2 | 90.29 | 46.3 | 1039 | 95 |
| 50-60% SCC | 103 | 2104 | 42.1 | 94.63 | 47.3 | 1052 | 96 |
| 60-70% SCC | 105 | 2156 | 43.1 | 99.78 | 46.2 | 1069 | 97 |
| Straight Cut | 91 | 1863 | 37.3 | 71.80 | 47.2 | 1376 | 119 |
| LSD for method within variety<br>CV% | | 88.2<br>3.8 | 1.76<br>3.8 | | 1.25<br>2.2 | | |

***Discussion:*** Yield was significantly increased over the standard 30-40% SCC by delaying the time of swathing to 50-60% SCC on the Phoenix and 60-70% SCC on the InVigor 2573. Yield was significantly decreased for both varieties by waiting to straight combine the crop. The crop was very erect and not well knitted together, so the winds that occurred near harvest time likely caused shelling. Wind speeds of 10-25 mph were recorded on three days during the week prior to straight combining. Unlike previous studies conducted by the Canola Production Centres, oil content did not significantly increase with delayed swathing. This is possibly due to the very warm and dry conditions during the week of swathing. Oil content was significantly lower on the straight cut Phoenix compared to three of the swathed treatments.

# XVII FALL DORMANT SEEDING

***Objective:*** To compare the effectiveness of seeding canola in spring versus fall (with and without 'Extender' polymer seed coating) on soils with different levels of crop residue.

***Background:*** Fall dormant seeding has become another management tool that growers can use when planting canola to spread out the workload and hopefully capture higher yields. Research in Canada and in the United States has shown mixed results. With good spring stand establishment, fall-seeded canola generally flowers sooner and longer than spring-seeded canola and often produces a better yield by avoiding the hot weather during flowering. Thin and uneven stands can cause problems with weed control and harvest timing due to many late maturing branches. One of the difficulties of fall dormant seeding is judging when to plant it. The soil must be cool enough and/or dry enough to prevent germination in the fall. Early snow or rains late in the season can prevent a grower from seeding fall dormant canola. "Extender", a product from Grow Tec Inc. out of Nisku, AB, Canada provides an extended period in the fall in which the grower can seed the canola up to two weeks before freeze-up. Without Extender the grower needs to plant a day or two before winter freeze-up. The introduction of herbicide tolerant canola has provided a better means of weed control in fall-seeded canola, especially for the winter annual weeds.

***Methodology:*** The fall dormant seeding trial was conducted as two separate trials, side by side, on wheat stubble and on fallow. Different seed treatment combinations and various seeding dates included:

A) October 15 - Extender (Benlate seed treatment)
B) November 16 - Extender (Benlate seed treatment)
C) November 16 - No Extender (Benlate seed treatment)
D) May 2 - (Gaucho + Benlate seed treatment)

October 15 was the date targeted for seeding two weeks prior to the projected freeze-up date. Just prior to freeze-up was seeded November 16. Spring-seeding was on May 2. All fertilizer was broadcast and incorporated prior to seeding with the exception of a seed placed starter fertilizer and 100 lb/ac of 21-0-0-24 (N-P-K-S), which was top-dressed on the fall-seeded plots at bolting. Stand counts on the fall and spring-seeded plots were taken by counting three random 1 $m^2$ and 0.5 $m^2$ quadrants, respectively, per plot.

***Observation:*** The Roundup Ready variety 45A51 was used for this study. The trials were seeded in the west fallow and west stubble fields on the dates indicated. Soil conditions at seeding of the fall-seeded treatments were dry and cloddy on the stubble field, and marginal moisture on the fallow field. The soil temperature on November 16 was 41°F at 1" deep and 38°F at 4" deep. The soil froze around November 20. Warm temperatures in early March likely broke dormancy on some of the seed in the trial. Soil temperatures at 1"

deep reached 45-60° F each afternoon from March 3-7 and then dropped to 18°F on March 16.

Flea beetles were present in spring on the fall-seeded plots at near threshold levels. Plots were not sprayed because cool weather allowed the canola to outgrow the damage. Weeds were controlled with a single application of Roundup Ultra (1 pt/ac) for most of the treatments. The October seeding on the stubble field required a second Roundup application (1 pt/ac) at the end of bolting to control a dense late flush of redroot pigweed because the crop would not canopy in time to provide competition. Bloom started in the fall-seeded treatments on May 30 and continued flowering for about 35 days. The spring-seeded treatments started to bloom on June 20 and continued flowering for about 25 days. Both trials were sprayed with Ronilan EG on June 24. The fall-seeded plots were at 70-80% bloom when sprayed, so the fungicide would not have provided much protection from sclerotinia. Therefore, the fungicide cost was not included in the contribution margins of the fall-seeded plots. Very little lodging occurred on the stubble field or the fall-seeded plots on the fallow. However, the spring-seeded plots on the fallow laid down flat during flowering. Swathing was easy for most plots except the severely lodged spring-seeded plots on the fallow, which were very difficult. The October seeded treatments were also difficult to swath due to branches lying on the ground along open areas in the plots. April 20 was the chosen start date for growing degree days (GDD) and days to maturity for the fall-seeded plots because that is when the mean temperature stayed consistently above 5°C, which is the base line temperature for canola. Sixty-eight GDD had accumulated by May 2, which was the spring planting date.

***Results:***

| FALL DORMANT SEEDING - FALLOW<br>Thief River Falls, MN | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Seeding Date** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Contrib. Margin ($/ac)** | **Spring Stand (plt/ft$^2$)** | **Height (in)** | **Growing Degree Days** | **Days To Maturity** |
| Oct. 15 - Extender | 110 | 2021 | 40.4 | 125.56 | 0.6 | 46 | 1107 | 104 |
| Nov. 16 - Extender | 129 | 2370 | 47.4 | 159.65 | 2.3 | 43 | 1008 | 98 |
| Nov. 16 - No Extender | 130 | 2377 | 47.5 | 167.90 | 1.5 | 45 | 1008 | 98 |
| May 2 | 100 | 1835 | 36.7 | 90.15 | 9.1 | 57 | 1080 | 96 |
| LSD (0.10)<br>CV% | | 95.4<br>3.4 | 1.91<br>3.4 | | 0.61<br>14.0 | 3.1<br>5.0 | | |

| FALL DORMANT SEEDING - WHEAT STUBBLE<br>Thief River Falls, MN | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Seeding Date** | **Yield (%)** | **Yield (lb/ac)** | **Yield (bu/ac)** | **Contrib. Margin ($/ac)** | **Spring Stand (plt/ft$^2$)** | **Height (in)** | **Growing Degree Days** | **Days To Maturity** |
| Oct. 15 - Extender | 84 | 1644 | 32.9 | 69.93 | 1.1 | 41 | 1041 | 100 |
| Nov. 16 - Extender | 90 | 1766 | 35.3 | 87.02 | 1.6 | 43 | 1008 | 98 |
| Nov. 16 - No Extender | 90 | 1771 | 35.4 | 95.10 | 2.0 | 41 | 1008 | 98 |
| May 2 | 100 | 1959 | 39.2 | 88.66 | 10.4 | 52 | 1032 | 93 |
| LSD (0.10)<br>CV% | | 112.8<br>4.9 | 2.26<br>4.9 | | 0.61<br>12.4 | 3.0<br>5.2 | | |

***Discussion:***

Fall-seeded yields were significantly lower on the wheat stubble compared to spring-seeded as a result of reduced stands. However, fall-seeded yields on the fallow were significantly higher compared to spring-seeded. This was likely due to reduced lodging in the fall-seeded treatments. The October seeding date provided the lowest yield and plant stand of all the fall-seeded treatments on both stubble and fallow. The October seeding also took longer to mature, especially on the fallow due to the low stands and extensive branching. The late freeze-up in 1999 was beyond the two-week protection window that the Extender seed treatment provides. Some fall germination occurred which resulted in the lower stands compared to the November seeding date. Mixed results with stand counts on the Extender versus no-Extender on the November seeding date are likely due to freeze-up shortly after seeding. Stands of all the fall-seeded treatments were reduced by the warm weather in early March, which likely induced premature germination. Contribution margins reflect differences in yield, seed treatments, fungicide costs for sclerotinia control, fertilizer application costs and weed control. The lower contribution margin of the November 16 - Extender compared to the November 16 - No Extender is mostly due to the extra cost of the Extender seed treatment ($7.02 per acre at the 6.0 lb/ac seeding rate).

# XVIII SUMMARY

The third 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 2001 being 1.5 miles south of the John Deere dealership in Thief River Falls, Minnesota. 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.

## XIX FIELD STAFF INFORMATION


| | | | |
|---|---|---|---|
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# - THE END -