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.

Agrium Inc.
Agricore
Proven Seed
Cyanamid Canada Inc.
Novartis Crop Protection Inc.

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

Agriculture & Agri-Food Canada
AgrEvo Canada Inc.
BASF Canada Inc.
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Cargill Limited
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Grow Tec
Norwest Labs
Rhône-Poulenc Canada Inc.
Simplot Canada Ltd.
Zeneca Agro
ADM Agri-Industries Ltd.
Agricore
Bayer Inc.
Canbra Foods Ltd.
Cyanamid Canada Inc.
DuPont Canada Inc.
Esso
Monsanto Canada Inc.
Proven Seed
Saskatchewan Wheat Pool
Vanthuyne Farms
Zeneca Seeds

This project is supported by the following provincial organisations:

Alberta Canola Producers Commission
Alberta Agriculture - Farming for the Future Program
British Columbia Peace River Grain Industry Development Council
- (Peace River Agricultural Development Fund)
Manitoba Agriculture
Manitoba Canola Growers Association
Saskatchewan Canola Development Commission
Saskatchewan Canola Growers Association

In 1998 the Canola Production Centre program was also supported by the following Contract Research participants:

Agricore
AgrEvo Canada Inc.
CanAmera Foods
Cyanamid Canada Inc.
Inter-Mountain Canola
Monsanto Canada Inc.
Performance Seeds Canada Inc.
Saskatchewan Wheat Pool
Value Added Seeds
AgPro Grain Inc.
BASF Canada Inc.
Cargill Seed
Dow AgroSciences Canada Inc.
Limagrain Canada Seeds
Northstar Seeds Inc.
Rhône-Poulenc Canada Inc.
Ultrabred Seeds
Zeneca Seeds

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I SITE DESCRIPTION

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

MANITOBA REGION – Derwyn Hammond, Agronomist

Location:	**Carman, MB – 80 Acres**

Land: Roy Wood (Co-operator)

Seed and Seed Treatment:

Agricore
Bayer Inc. - Furadan 5G
Canadian Seed Coaters
Cargill Seed
Cyanamid Canada Inc. - Counter 5G
Limagrain Canada Seeds Inc.
Northstar Seeds
Proven Seed
Zeneca Seeds

Fertilizer: Carmagro, Esso, Carman - granular (80 acres)

Herbicides and Fungicides:

AgrEvo Canada Inc. - Liberty (20 acres)
BASF Canada Inc. - Poast Ultra (20 acres), Ronilan EG (80 acres)
Cyanamid Canada Inc. - Odyssey (20 acres)
DuPont Canada Inc. - Muster (60 acres)
Monsanto Canada Inc. - Roundup (45 acres)
Rhône-Poulenc Canada Inc. - Select (60 acres)

Equipment and Labour: Roy Wood, Ken Rutter - cultivation & harrowing, tractors, swather, grain trucks

Photocopying & Faxing: Manitoba Agriculture

Tours: Cargill Seed, Monsanto Canada Inc. - Lunch
Paul Wedderburn & family - bales for tour racks
Thanks also to Murray Froebe (MCGA regional director) for assistance in promoting the tour.

Location:	**Russell/Rossburn, MB - 100 acres**

Land: Lorne Tanasychuk & family (Co-operators)

Gold Level Sponsors ($500 or more)

- The Rural Municipality of Russell
- The Russell Inn Hotel and Conference Centre
- Town of Russell

Silver Level Sponsors ($250 - $499)

- CanAmera Foods, Harrowby
- Keating Seed Farms Inc., Russell
- The Rural Municipality of Silver Creek

Bronze Level Sponsors (less than $250)

- Jackson's Seed Plant, Inglis
- Kaskiw Seeds, Rossburn
- Prairie Concrete, Foxwarren
- Thunder Creek Farms
- Woroneski Seeds

Seed and Seed Treatment:

Agricore
Bayer Inc. - Furadan 5G
Canadian Seed Coaters
Cargill Seed
Cyanamid Canada Inc. - Counter 5G
Limagrain Canada Seed Inc.
Northstar Seeds
Proven Seed
Zeneca Seeds

Fertilizer: Clement Farm Supply Ltd., Agrium Inc., Russell
- granular (7 acres)
Parkland Agra Ltd., Esso, Russell - granular (93 acres)
Twin Valley Co-op, Simplot Canada Ltd., Rossburn
- granular (93 acres)

Herbicides and Fungicides:

AgrEvo Canada Inc. - Liberty (10 acres)
BASF Canada inc. - Poast Ultra (20 acres)
Cyanamid Canada Inc. - Odyssey (20 acres)
Dow AgroSciences Canada Inc. - Lontrel (100 acres)
DuPont Canada Inc. - Muster Gold (100 acres)
Monsanto Canada Inc. - Roundup (15 acres)
Rhône Poulenc Canada Inc. - Rovral Flo (100 acres)

Equipment and Labour: Lorne Tanasychuk - cultivation and harrowing, temporary grain storage
Cam's Aerial Spraying - herbicide and fungicide applications
Greenfields Equip. Ltd. - John Deere 9600 combine
Gordon Hammond - grain truck and auger
Norwest Labs and Enviro-Test labs - soil test analysis
RTM Transport & CanAmera Foods - custom grain hauling
Twin Valley Co-op - Valmar fertilizer spreader

Photocopying & Faxing: Manitoba Agriculture

Tours: AgrEvo Canada Inc., CanAmera Foods - Lunch
Bar C Ranch - tractor for tour racks
Paul Wedderburn and family - bales for tour racks
Thanks also to Jeff Kostuik and the Parkland Crop Diversification Foundation for co-ordinating their tour with ours, to Keating Seed Farms for hosting lunch, and to Luanne Berjian (Ag Rep) for her efforts in promotion and organization.

Comments: As the agronomist responsible for the Canola Production Centre program in Manitoba, I would also like to take the opportunity to thank my technicians **Denise Immerkar, Sherri McAuley and Warren Robak** for their dedicated technical assistance throughout the season!

EASTERN SASKATCHEWAN – David Vanthuyne, Agronomist

Location:	**Whitewood, SK - 80 acres**

Land: Dale & Cheryl Beutler (Co-operator)
Mainline Rural Economic Development Association
District # 5 Agricultural Development and Diversification Board
Town of Whitewood
R.M. of Chester
R.M. of Silverwood
R.M. of Willowdale

Seed and Seed Treatment:
Bayer Inc. - Furadan 5G
Canadian Seed Coaters
Cargill Seed
Cyanamid Canada Inc. - Counter 5G
Limagrain Canada Seed Inc.
Proven Seed
Zeneca Seeds

Fertilizer: Saskatchewan Wheat Pool, Whitewood - granular (80 acres)

Herbicides and Fungicides:

AgrEvo Canada Inc. - Liberty (21 acres)
Cyanamid Canada Inc. - Odyssey (40 acres)
Dow AgroSciences Canada Inc. - Lontrel (60 acres)
DuPont Canada Inc. - Muster (80 acres)
Monsanto Canada Inc. - Roundup Transorb (80 acres)
Rhone Poulenc Canada Inc. - Select (120 acres) and Rovral flo (60 acres)
Zeneca Agro – Venture (20 acres)

Equipment and Labour:

Dale Beutler - grain truck, swath roller, custom seeding and banding, storage, shop use and tools
Les Beutler - grain truck
Saskatchewan Wheat Pool - grain auger, grain and chemical storage

Photocopying & Faxing:

Mainline Rural Economic Development Association
Town of Whitewood

Tours:

CJGX - radio advertisement
DuPont Canada Inc. - sponsored BBQ dinner
Whitewood Auction Barn Inc. - bales for tour
Tour help - Whitewood and District Canola Production Centre committee

Location:	**Watson, SK - 96 acres**

Land: ADM (Co-operators)

Seed and Seed Treatment: Proven Seeds

Fertilizer: No Sponsorship

Herbicides and Fungicides:

BASF Canada Inc. - Poast Ultra (35 acres)
DuPont Canada Inc. - Muster (35 acres)
Dow AgroSciences Canada Inc. - Lontrel (35 acres)
Monsanto Canada Inc. - Roundup Transorb (96 acres)

Equipment and Labour:

Berchiminsky Farms - auger and equipment storage
John Deere - 9610 GPS combine for yield monitoring and technical support
Prairie Agriculture Machinery Institute - 4 ton calibration grain truck and technical support

Location:	**Naicam, SK - 60 acres**

Land:
Eric Cropper (Co-operator)
Naicam Marketing Club (Co-operator)
Ron Loyns (Co-operator)

Seed and Seed Treatment:
Bayer Inc. - Furadan CR5
Canadain Seed Coaters
Cargill Seed
Cyanamid Canada Inc. - Counter 5G
Limagrain Canada Seed Inc.
Northstar Seed
Proven Seed
Zeneca Seeds

Fertilizer:
Pratchler Agro Services, Esso, Naicam - anhydrous ammonia (40 acres) and granular (60 acres)

Herbicides and Fungicides:
AgrEvo Canada Inc. - Liberty (21 acres)
BASF Canada Inc. - Poast Ultra (45 acres), Accord (40 acres) and Ronilan EG (40 acres)
Cyanamid Canada Inc. - Odyssey (40 acres)
Dow AgroSciences Canada Inc. - Lontrel (60 acres)
DuPont Canada Inc. - Muster (80 acres)
Monsanto Canada Inc. - Roundup Transorb (60 acres)
Rhône-Poulenc Canada Inc. - Rovral flo (40 acres)
Zeneca Agro - Venture (20 acres)

Equipment and Labour:
Cropper Motors Ltd. - Ford tractor for banding nitrogen
Dauks Farms - tractors for seeding and harrowing, grain truck and shop use and equipment storage
Hetland Seeds - seed storage
Ron Loyns - sprayer
Pratchler Agro Services - anhydrous ammonium applicator

Tours:
Naicam Marketing Club - tour help and tour wagons
Hetland Seeds - BBQ sponsorship

Comments:
A special **THANK-YOU** to **Barry Hurd** and **Aaron Chicilo** for their hard work, dedication and patience throughout the year. Job well done!

CHINOOK REGION – Doug Moisey, Agronomist

Location:	**Lethbridge, AB - Dryland 45 acres**

Land: Rod & Ike Lanier

Seed and Seed Treatment:
Agricore
Canbra Foods Ltd.
Cargill Seed
Limagrain Canada Seeds Inc.
Proven Seed
Zeneca Seeds

Fertilizer:
Obers Agriservice, Esso Fertilizer, Coaldale - (45 acres) anhydrous ammonia
Southern Ag, Agrium Inc., Coaldale - granular (45 acres)

Herbicides and Fungicides:
BASF Canada Inc. - Poast (30 acres)
Cyanamid Canada Inc. - Odyssey (5 acres)
Dow AgroSciences Canada Inc. - Lontrel (3 acres)
Dupont Canada Inc. - Muster (25 acres)
Monsanto Canada Inc. - Roundup Transorb (10 acres)
Zeneca Agro - Touchdown (45 acres)

Equipment and Labour:
Rod Lanier - custom spraying

Location:	**Lethbridge, AB - Irrigation 73 acres**

Land: Lorne Hickey

Seed and Seed Treatment:
Agricore
Canbra Foods Ltd.
Limagrain Canada Seeds Inc.
Proven Seeds
Zeneca Seeds

Fertilizer:
RTL Esso, Esso Fertilizers, Lethbridge - ganular (73 acres)
Cargill, Alberta Terminals, Lethbridge - granular (73 acres)

Herbicides and Fungicides:

AgrEvo Canada Inc. - Liberty (3 acres)
BASF Canada Inc. - Poast Ultra (66 acres), Ronilan EG (73 acres)
Cyanamid Canada Inc. - Odyssey (3 acres)
Dow AgroSciences Canada - Lontrel (67acres), Edge Granular (73 acres)
DuPont Canada Inc. - Muster (67acres)
Monsanto Canada Inc. - Roundup Transorb (75 acres)

Equipment and Labour:

RTL Esso - custom fertilizer spreading,
Agricore - custom fungicide
Lorne Hickey - custom spraying

Location:	**Innisfail, AB - 83 acres**

Land: Town of Innisfail (rented)

Seed and Seed Treatment:

Agricore
Canbra Foods Ltd.
Cargill Seed
Limagrain Canada Seeds Inc.
Proven Seed
Zeneca Seeds

Fertilizer:

Benalto Agri Services, Agrium Inc., Benalto - granular (83 acres)
TRI S Fertilizers, Agrium Inc., Innisfail, granular - (83 acres)

Herbicides and Fungicides:

BASF Canada Inc. - Poast Ultra (83 acres) Accord (2 acres),
Dow AgroSciences Canada Inc. - Lontrel (83 acres), Lorsban (83 acres) and Edge Granular (83 acres)
DuPont Canada Inc. - Muster (83 acres)
Zeneca Agro - Touchdown (83 acres)

Comments:

A special thanks to **Alan Colic** and **Jamie Burr** for their technical assistance over the summer.

BATTLE RIVER REGION – John Mayko, Western Prairie Regional Manager

Location:	**Andrew, AB - 80 acres**

Land: Steve Blashko

Seed and Seed Treatment: Agricore
Canbra Foods Ltd.
Canadian Seed Coaters
Cargill Seed
Limagrain Canada Seeds Inc.
Proven Seeds
Zeneca Seeds

Fertilizer: Agrium Inc. - 80 acres

Herbicides and Fungicides:
AgrEvo Canada Inc. - Liberty and Fusion (15 acres)
BASF Canada Inc. - Poast (60 acres), Ronilan EG (80 acres)
Cyanamid Canada Inc. - Odyssey (5 acres)
DuPont Canada Inc. - Muster (60 acres)
Monsanto Canada Inc. - Roundup (10 acres)
Rhône-Poulenc Canada Inc. - Select (60 acres)
Zeneca Agro - Gramoxone PDQ (80 aces)

Equipment and Labour: Steve Blashko - fertilizer banding, combining fill area

Tours: Andrew Co-op

Comments: Sincere thanks are extended to Janine Jackson and Scott Holtman for their valued technical assistance over the past season.

PEACE RIVER REGION – Garry Coy, Agronomist

***Location*:**	**Wanham, AB - 65 acres**

Land: Dan Lane (Shane Farms) rented

Seed and Seed Treatment:
Agricore
Canadian Seed Coaters
Cargill Seed
Limagrain Canada Seeds Inc.
Proven Seeds
Zeneca Seeds

Fertilizer: Rycroft Farm Supply, Cargill Canada Inc., Rycroft - granular (65 acres)

Herbicides and Fungicides:
BASF Canada Inc. - Poast (40 acres)
Dow AgroSciences Canada Inc.- Edge granular (65 ac), Lontrel

(40 acres), Lorsban (65 acres)
DuPont Canada Inc. - Muster Gold (10 acres)
Monsanto Canada Inc. - Roundup Transorb (10 acres)

Equipment and Labour: Shane Farms - cultivation and anhydrous ammonia application, grain truck
Leon and Judy Gouchee **-** all terrain vehicle
Orest Melnyk - equipment repairs

Location:	**Rolla, B.C. - 65 acres**

Land: Gene Vipond (Borek Farms) rented

Seed and Seed Treatment:
Agricore
Canadian Seed Coaters
Limagrain Canada Seeds Inc.
Proven Seed
Zeneca Seeds

Fertilizer: Jerri Rude AgriSales, Esso, Dawson Creek - granular (65 acres)

Herbicides and Fungicides:
Dow AgroSciences Canada Inc. - Lontrel (40 acres)
DuPont Canada Inc. - Muster Gold (40 acres)
Monsanto Canada Inc. - Roundup (2 acres)

Equipment and Labour:
Borek Farms - cultivation, anhydrous ammonia application, swather, grain truck, and use of workshop for repairs

Tours: Peace River Soil Conservation Association, B.C Grain Industry Development Council.

Comments: In addition, I wish to thank **Lorraine Harrison** (Plant Pathologist with Alberta Agriculture), **Joanne Anderson, Darlene Bray** and **Marvin Baerg** of PRSCA**, Mike Hall, Elaine Stenbraaten, Dale Seward, and John Huffman,** Crop Specialists with Alberta Agriculture Food & Rural Development, **Richard Lussier** (Westco), **Ken Nickel** Crop Specialist with the BC Ministry of Agriculture Food and Fisheries, and **Jack Dobb (BC Grain Producers Association)** for their valuable help with extension activities over the summer.

Special thanks are extended to **Mills Anderson** (May and June)**, Shelagh Coy** (July and August) and **Michael Coy** (July – September) for their dedicated technical assistance with the Canola Production Program over the year.

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; Tony Zatylny, Jim Bessel, John Mayko, Garry Coy, Derwyn Hammond, Barry Hurd, Doug Moisey, and Dave Vanthuyne. The crop production team would like to thank the Head Office Staff in Winnipeg and in particular Maureen Smit, for their valuable assistance and support. Once again, thanks to all of the Canola Production Centre supporters, both national and local!!!

Thank-You To 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.
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 organisations 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.

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.

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 additional 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 10% error 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 was 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 Standardisation Manual©.

IV ECONOMIC ANALYSIS

A. Canola Pricing System

GRADE	GREEN SEED (%)	TOTAL DAMAGED & GREEN SEED ALLOWED (%)	$/BU
# 1	0 – 2.0	3.0	7.75
# 2	2.1 – 6.0	10.0	7.50
# 3A	6.1 – 10.0	15.0	6.30
# 3B	10.1 – 20.0	20.0	5.80
Sample	Over 20	Over 20.0	4.95

Note 1: The damaged and green, includes all frost, brown and green seed. This was determined by using a 100 seed crush strip test (x 3) done on each sample from every treatment within a particular project trial.

*Note 2: High erucic acid varieties (eg. Castor) are assigned a premium of **$1.00** bu. (premium and discounts may vary, please contact your supplier for specific details).*

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 1998. 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 (*B. NAPUS)* VARIETY SEED COSTS					
B. napus	**$/LB**	**Distributor**	***B. napus***	**$/LB**	**Distributor**
Battleford	1.75	AgPro Grain Inc.	InVigor 2153	4.75	AgrEvo Canada Inc.
Exceed	2.45	Agricore	InVigor 2163	4.75	AgrEvo Canada Inc.
Q2	2.45	Agricore	Quantum	1.95	Agricore
Quest	2.60	Agricore	SW Arrow	2.45	Agricore
AC Excel	1.19	Canadian Seed Coaters	Castor	1.85	CanAmera Foods
Millenium	2.00	CanAmera Foods	Clavet	1.99	Cargill Seed
Synbrid 220	3.29	Cargill Seed	IMC 103	2.25	Inter-Mountain Canola
IMC 104	2.25	Inter-Mountain Canola	IMC 105	2.25	Inter-Mountain Canola
Ebony	2.16	Limagrain Canada Seeds	LG3295	3.43	Limagrain Canada Seeds
LG3333	2.34	Limagrain Canada Seeds	LG3369	1.98	Limagrain Canada Seeds
Trailblazer	2.20	Northstar Seeds	Goliath	1.99	Performance Seeds
Hy-Per Star 100	4.00	Performance Seeds	44A89	2.45	Proven Seed
45A02	2.50	Proven Seed	45A71	3.40	Proven Seed
46A73	3.40	Proven Seed	46A74	3.40	Proven Seed
Battleford	1.75	SK Wheat Pool	Exceed	2.20	SK Wheat Pool
Q 2	2.25	SK Wheat Pool	Quantum	1.95	SK Wheat Pool
Quest	2.50	SK Wheat Pool	SW Arrow	2.75	SK Wheat Pool
Magnum	1.85	Value Added Seeds	Hyola 401	4.10	Zeneca Seeds
Option 500	2.25	Zeneca Seeds			

CANOLA *(B. RAPA)* VARIETY SEED COSTS					
B. rapa	**$/LB**	**Distributor**	***B. rapa***	**$/LB**	**Distributor**
Foothills	1.75	AgPro Grain, SWP	Hysyn 120 CS	2.39	Cargill Seed
41P55	1.95	Proven Seeds	Reward	1.10	Canadian Seed Coaters
Hysyn 101 RR	2.96	Zeneca Seeds	Hysyn 111	2.44	Zeneca Seeds
Hysyn 110	2.34	Zeneca Seeds		2.96	Zeneca Seeds

Note: Seed cost may vary from location to location.

PRODUCT INFORMATION			
Product	**Common Name**	**Manufacturer/ Distributor**	**$/Unit Cost**
Assure	Quizalofop Ethyl	DuPont Canada Inc.	330.00/8L
Benlate 50WP	Benomyl	DuPont Canada Inc.	49.90/Kg
Counter 5G	Terbufos	Cyanamid Canada Inc.	69.20/20Kg
Decis	Deltamethrin	AgrEvo Canada Inc.	219.40/2L
Edge	Ethalfluralin	Dow AgroSciences Canada Inc.	48.75/25Kg
Furadan 5G	Carbofuran	Bayer Inc.	64.00/20kg
Fusion	Fenoxaprop-p-p-ethyl + fluazifop-p-butyl	AgrEvo Canada Inc.	239.00/case
Liberty	Glufosinate ammonium	AgrEvo Canada Inc.	227.50/13.5L
Lontrel 360	Clopyralid	Dow AgroSciences Canada Inc.	498/4.45L
Lorsban	Chlorpyrifos	Dow AgroSciences Canada Inc.	170.50/10L
Malathion 500	Malathion	United Agri Products, IPCO	7.50/L
Muster	Ethametsulfuron methyl	DuPont Canada Inc.	560.00/320g
Muster Gold	Quizalofop Ethametsulfuron methyl	DuPont Canada Inc.	379.00/case
Odyssey	Imazamox+imazethapyr	Cyanamid Canada Inc.	998/case
Poast Ultra	Sethoxydim	BASF Canada Inc.	690.00/case
Pursuit	Imazethapyr	Cyanamid Canada Inc.	796/3.3L
Rival 10G	Trifluralin	AgrEvo Canada Inc.	71.00/22.7Kg
Ronilan EG	Vinclozolin	BASF Canada Inc.	720.12/case
Roundup Regular Roundup Transorb	Glyphosate Glyphosate	Monsanto Canada Inc. Monsanto Canada Inc.	90.00/10L 98.00/10L
Rovral flo	Iprodione	Rhône-Poulenc Can. Inc.	394.00/ca
Select	Clethodim	Rhône-Poulenc Can. Inc.	699.00/ca
Tilt 280E	Propiconazole	Novartis Crop Protection	637.60/ca
Touchdown	Glyphosate	Zeneca Agro	89.50/10L
Venture	Fluazifop-butyl	Zeneca Agro	470.00/case

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

FERTILIZER COSTS			
Fertilizer	**Analysis**	**$/Tonne**	**$/LB.**

Anhydrous Ammonia	82-0-0	398	0.22
Ammonium Nitrate	34-0-0	266	0.35
Ammonium Sulphate	21-0-0-24	281	N=0.28
Ammonium Sulphate	21-0-0-24	281	S=0.29
Elemental Sulphur	0-0-0-90	415	0.21
Liquid Nitrogen	28-0-0	180	0.29
Liquid Phosphate	10-34-0	355	0.39
Liquid Sulphur	15-0-0-20	213	0.27
Phosphate	11-52-0	404	0.29
Potash	0-0-60	175	0.13
Urea	46-0-0	284	0.28

Crop and Hail Insurance:

Prices will vary from site to site.

Machinery Cost:
Base cost $19.50/acre (conventional tillage)

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

Additional Machinery Costs: (Spraying Application)

- Aerial $ 4.50/acre
- Ground $ 4.00/acre

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

Marketing Cost:

In 1998 a put option was purchased at $11.00 per tonne ($.25/bu).

Interest/Opportunity Cost:

Six month cost of money borrowed for crop inputs and machinery operation. Canola Council of Canada assumed 8.5% per annum.

C. Economic Results Report (example)

Site: **Naicam, SK**

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

CALCULATION OF VALUE OF PRODUCTION				
Yield (bu/ac)	**X**	**Price ($/bu.)**	**=**	**Value of Production**
27.0	X	$7.75	=	$209.25

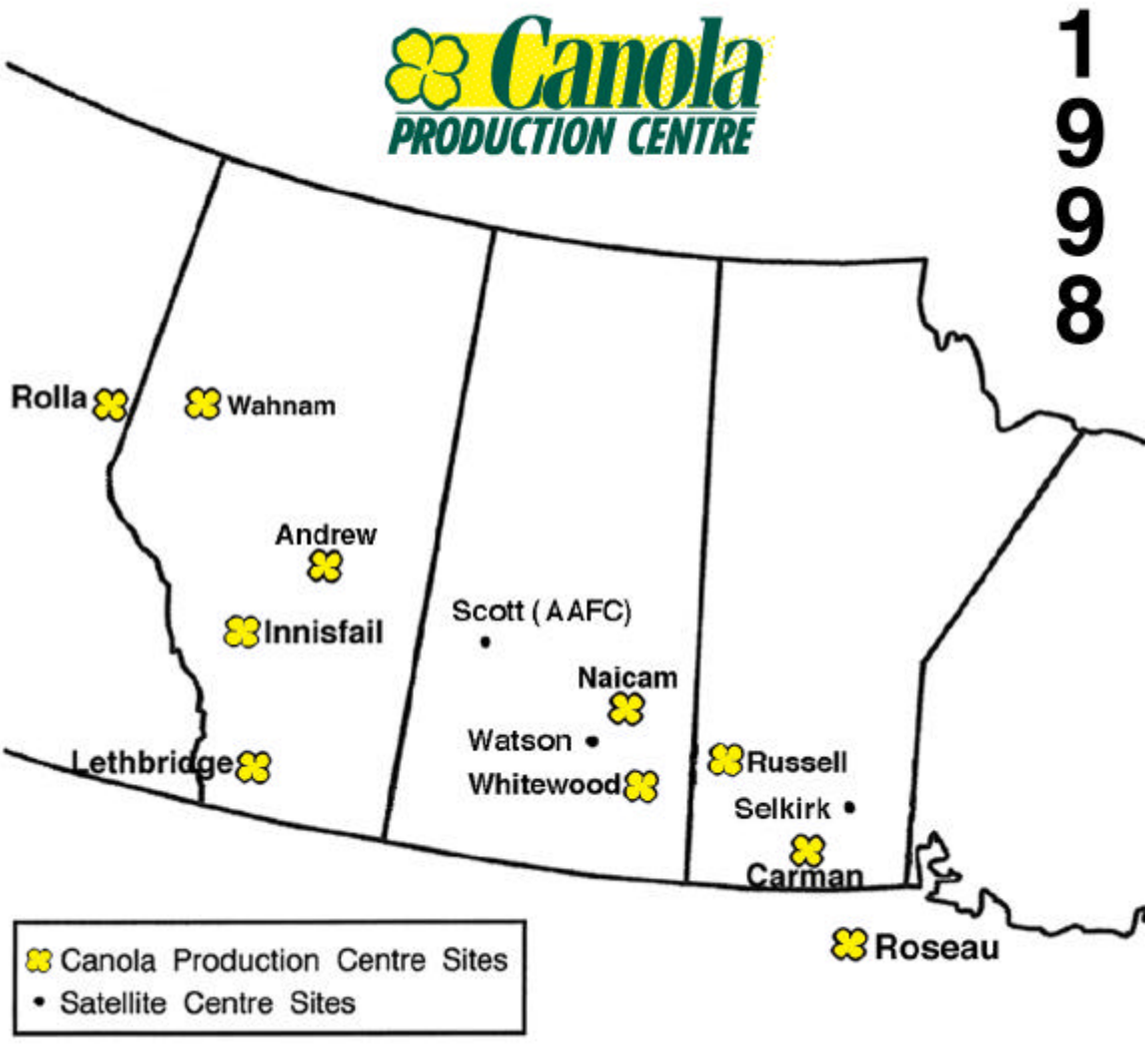
CALCULATION OF VARIABLE COSTS ($/AC)	
Seed	7.73
Fertilizer	40.09
Herbicides/Fungicides	74.60
Insecticides	9.82
Machinery	19.50
Insurance	4.95
Marketing	6.75
Interest/opportunity	6.45
Total Variable Costs	169.98

CALCULATION OF CONTRIBUTION MARGIN				
Value of Production ($/ac)	**-**	**Variable Costs ($/ac)**	**=**	**Contribution Margin ($/ac)**
209.25	-	169.98	=	39.27

Contribution Margin ($/ac)	**/**	**Yield (bu/ac)**	**=**	**Contribution Margin ($/Bu.)**
39.27	/	27.0	=	1.45

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

V SITE LOCATION MAP


Canola
PRODUCTION CENTRE
1998
Rolla
Wahnam
Andrew
Innisfail
Scott (AAFC)
Naicam
Watson
Whitewood
Lethbridge
Russell
Selkirk
Carman
Roseau
Canola Production Centre Sites
Satellite Centre Sites

VI SITE INFORMATION

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

Location: **Carman, MB**

Co-operator: Roy Wood

Previous crop: Wheat

Soil Test Results: Norwest Labs

Organic matter content: 4.4 %

Macronutrient Levels: (0-12")

Nitrogen -	34 lb/ac
Phosphorus-	60 lb/ac
Potassium -	638 lb/ac
Sulphur -	28 lb/ac

Micronutrient Levels: (0-12")

Boron -	1.7 p.p.m.
Copper -	0.8 p.p.m.
Iron -	67 p.p.m.
Zinc -	1.5 p.p.m.
Chlorine -	4.5 p.p.m.
Magnesium -	579 p.p.m.
Manganese -	18.2 p.p.m.
Calcium -	2620 p.p.m.
Sodium -	20 p.p.m.

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

Target Yield bu/ac	Growing Conditions	Nitrogen	Phosphate	Potash	Sulphur
40	Excellent	95	16	0	15
30	Average	82	10	0	13

Target yield: 40 bu/ac

Fertilizer applied: N - 109 lb/ac P - 15 lb/ac K - 20 lb/ac S - 15 lb/ac

Soil Association/Zone: Morden/Black

Soil Texture: Loam

Soil pH: 7.3

Salinity: Non-saline (conductivity 0.6 mS/cm)

Tillage operations: The fertilizer (N, K and S) was spring broadcast and incorporated with a cultivator followed by harrowing to level the seedbed. The field was worked once the previous fall.

Seeding method: The fertility trial and some fill areas were seeded with a Morris MH-3100 hoe press drill with a 7½ inch spacing. The remainder of the trials were seeded with a John Deere 9450 hoe press with a 7 inch row spacing. The phosphate was seed-placed for all trials.

Date:	May 21 - 22
Depth:	¾ to 1”
Rate:	6.5 lb/ac for *B. napus* varieties
Soil Temp:	12°C

Herbicides applied: Preseeding burnoff with Roundup (1.0 L/ac) in crop application with Select (0.09 L/ac), Muster (8 g/ac)

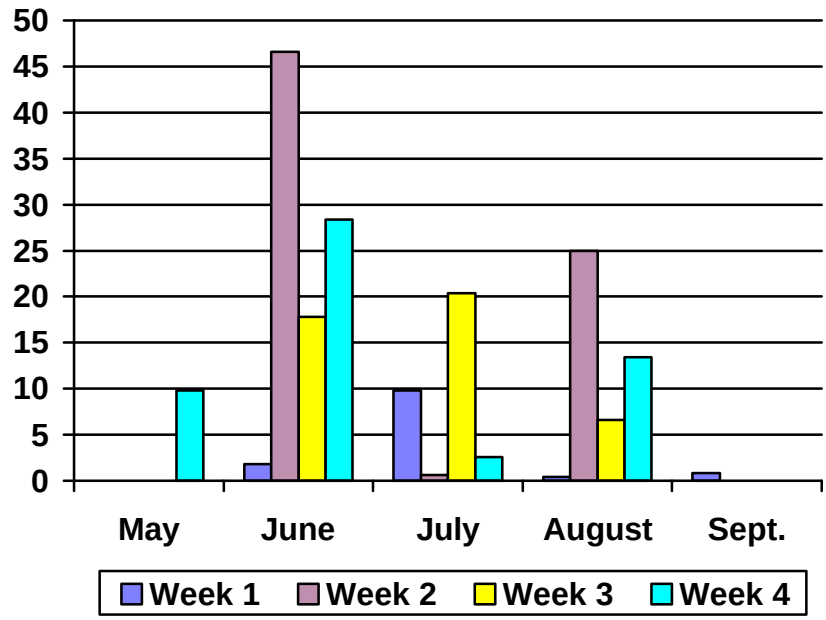
Fungicides applied: Ronilan EG (0.3 kg/ac)

Swathing: Start: August 17 Finished: August 21

Combining: Start: September 4 Finished: September 7

Comments: Conditions at seeding were ideal, with excellent moisture and warm soil temperatures resulting in rapid emergence. Near freezing temperatures in the last week of May did slow crop development although no visible frost damage was observed. More than 50% of the total rainfall received at the site fell during the last 3 weeks of June. This caused plant stress from excessive moisture, localised flooding, and delayed herbicide applications. A shallower rooting system was observed, this may have limited moisture and/or nutrient uptake during the drier periods in late July and early August. In spite of this, some of the varieties were still able to achieve yields in the mid 30 bu/ac range. Dry conditions in early September made for a timely harvest.

Rainfall



Total accumulated moisture = 184.0 mm (7.2 Inches)

Location:	**Russell/Rossburn, MB**

Co-operator: Lorne Tanasychuk

Previous crop: Wheat

Soil Test Results: (Norwest Labs)

Organic matter content: 6.7 %

Macronutrient Levels: (0-12")

Nitrogen -	68 lb/ac
Phosphorus -	68 lb/ac
Potassium -	736 lb/ac
Sulphur -	96 lb/ac

Micronutrient Levels: (0-12")

Boron -	1.4 p.p.m.
Copper -	0.6 p.p.m.
Iron -	27 p.p.m.
Zinc -	1.4 p.p.m.
Chlorine -	5.5 p.p.m.
Magnesium -	652 p.p.m.
Manganese -	9.8 p.p.m.
Calcium -	5230 p.p.m.
Sodium -	25 p.p.m.

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

Target Yield bu/ac	Growing Conditions	Nitrogen	Phosphate	Potash	Sulphur
40	Excellent	79	16	0	0
30	Average	66	10	0	0

Target yield: 40 bu/ac

Fertilizer applied: N - 67 lb/ac P - 21 lb/ac K - 11 lb/ac S – 11 lb/ac

Soil Association/Zone: Erickson/Dark Grey

Soil Texture: Loam

Soil pH: 7.7

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

Tillage operations: The fertilizer (34-0-0) was spring broadcast and incorporated with a cultivator followed by harrowing to level the seedbed. The field was worked once the previous fall.

Seeding method: All trials were seeded with a Morris MH-3100 hoe press drill with a 7½ inch spacing. The P, K and S fertilizer was seed placed.

Date***:*** May 12 - 16
Depth: ¾ to 1”
Rate: 6.5 lb/ac for *B. napus* varieties
5.5 lb/ac for *B. rapa* varieties
Soil Temp: 11°C

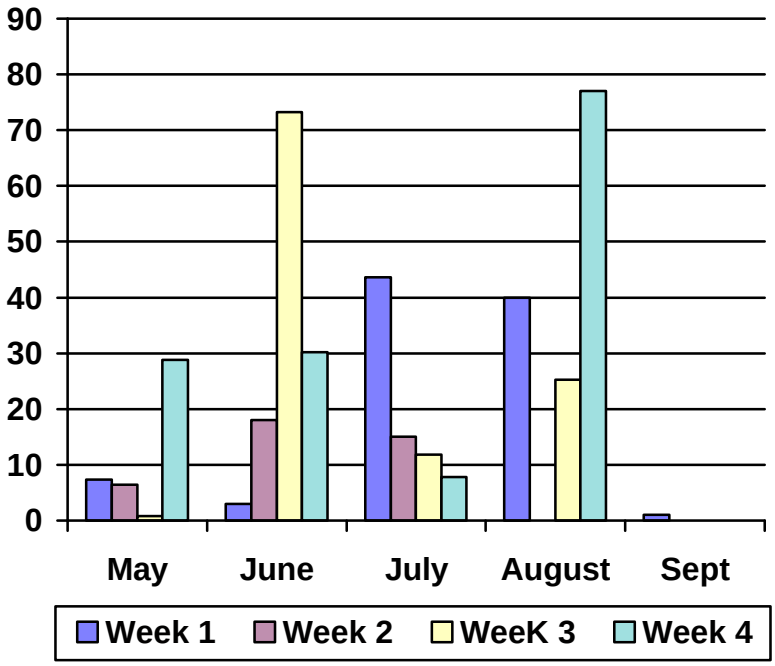
Herbicides applied: In crop application with Assure (0.5 L/ac), Muster (8 g/ac) and Lontrel (0.17 L/ac)

Swathing: Start: August 7 Finished: August 27

Combining: Start: September 9 Finished: September 10

Comments: Conditions at seeding were ideal, with excellent moisture and warm soil temperatures resulting in rapid emergence. A severe frost in the last week of May (approximately -5°C), followed by several days of very cool weather, appeared to delay crop development by over a week. Rainfall was frequent over much of June through August, causing plant stress from excessive moisture in low lying areas and delaying herbicide and fungicide applications. Weeds were present in high numbers and included several types which had no effective chemical control in a conventional system (eg cleavers, chickweed and birdsrape mustard). A hail storm just prior to swathing caused some pod drop, with an estimated 11% yield loss. All of the above plant stress factors contributed to disappointing yields.

Rainfall



Total accumulated moisture = 389.2 mm (15.3 Inches)

Location:	**Whitewood, SK**

Co-operator: Dale and Cheryl Beutler

Previous crop: Barley

Soil Test Results: (Enviro-Test Labs)

Organic matter content: 3.5 % (0-12")

Macronutrient Levels: (0-12")

Nitrogen -	29 lb/ac
Phosphorus -	17 lb/ac
Potassium -	484 lb/ac
Sulphur -	26 lb/ac

Micronutrient Levels:(0-12")

Boron -	3.0 p.p.m.
Copper -	3.8 p.p.m.
Iron -	68 p.p.m.
Zinc -	3.0 p.p.m.
Manganese -	25 p.p.m.
Chlorine -	20 p.p.m.

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

Target Yield (bu./ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur
40	*-25*	*12.8*	*90-100*	*30-35*	*5-15*	*20-25*
32	*25*	*10.2*	*65-75*	*25-30*	*5-15*	*20-25*
28	*50*	*9.0*	*35-45*	*20-25*	*5-15*	*20-25*

Target yield: 32 bu/ac

Fertilizer applied: N - 73 lb/ac P - 22 lb/ac K - 0 lb/ac S - 22 lb/ac

Soil Association/Zone: Oxbow/Black

Soil Texture: Loam

Soil pH: 8.2

Salinity: Non saline (conductivity 0.2mS/cm)

Tillage operations: Urea was applied with 1" openers into standing stubble and then harrowed

Seeding method: Seeded with a JD 9450 Hoe Press Drill on 7 inch row spacing:

Date***:*** May 7 to 9
Depth: ¾ to 1"
Rate: 6.5 lb/ac for *B. napus* varieties
5.0 lb/ac for InVigor *B. napus* varieties
5.5 lb/ac for *B. rapa* varieties
Soil Temp: 4 - 6ºC to a depth of 1 ½ "

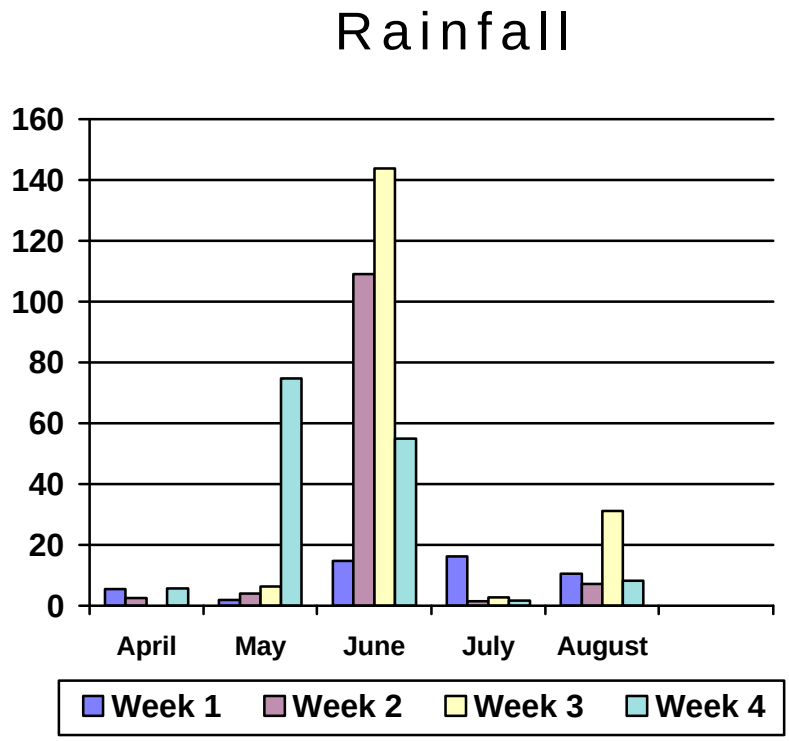
Herbicides applied: Post seeding burn off with Roundup on May 14 at ½ L/ac. In crop application with Select (40 ac/case), Muster (26 ac/pouch) and Lontrel (20 ac/jug) was applied at the 2 to 5 leaf stage over a 6 day period.

Swathing: Started: August 5 Finished: September 4

Combining: Started: August 24 Finished: September 15

Comments: Uneven emergence across seed rows, early June frosts and weed competition, hampered early crop development. Weed competition was from volunteer barley, wild buckwheat and Canada thistle. The site received a tremendous amount of rainfall over the growing season. Excessive moisture resulted in a shallow rooting system. This raised concerns about the possible effects of leaching of nutrients below the root zone. Even with the excessive moisture, petal test results indicated sclerotinia stem rot at moderate infection (41%) levels. Given drier conditions at early flower, a decision not to apply fungicides was made. There was little evidence of blackleg or alternaria black spot. Diamondback moth, bertha army worm and lygus bug levels were low. No apparent

damage was evident. Flea beetles were not found early in the spring, but were observed later in the growing season. Harvest was completed early.



Total accumulated moisture = 488 mm (19.5 inches)

Location:	**Naicam, SK**

Co-operators: Eric Cropper
Naicam Marketing Club
Ron Loyns

Previous crop: Barley

Soil Test Results: (Enviro-Test Labs)

Organic matter content: 6.2% (0-12")

Macronutrient Levels (0-12"):

Nitrogen -	35 lb/ac
Phosphorus -	56 lb/ac
Potassium -	420 lb/ac
Sulphur -	18 lb/ac

Micronutrient Levels:(0-12")

Boron -	3.4 p.p.m.
Copper -	2.7 p.p.m.
Iron -	76 p.p.m.
Zinc -	4.3 p.p.m.
Manganese -	15 p.p.m.
Chlorine -	20 p.p.m.

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

Target Yield (bu./ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur
40	<25	11.0	75-85	20-25	5-15	25-30
35	25	9.5	50-60	20-25	5-15	25-30
26	50	7.0	35-45	15-20	5-15	20-25

Target yield: 40 bu/ac

Fertilizer applied: N - 113 lb/ac P - 20 lb/ac K - 0 lb/ac S - 25 lb/ac

Soil Association/Zone: 70% - Oxbow, 30% - Yorkton/Black to Thick Black

Soil Texture: Loam

Salinity: Non saline (conductivity 0.2mS/cm)

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

Seeding method: Seeded with a JD 9450 Hoe Press Drill with 7 inch row spacing.

Date: May 14 to 22

Depth: ¾ to 1"

Rate: 6.5 lb/ac for *B. napus* varieties
5.0 lb/ac for InVigor *B. napus* varieties
5.5 lb/ac for *B. rapa* varieties

Soil Temp: 14.0ºC to 21.1ºC at a depth of 1 ½"

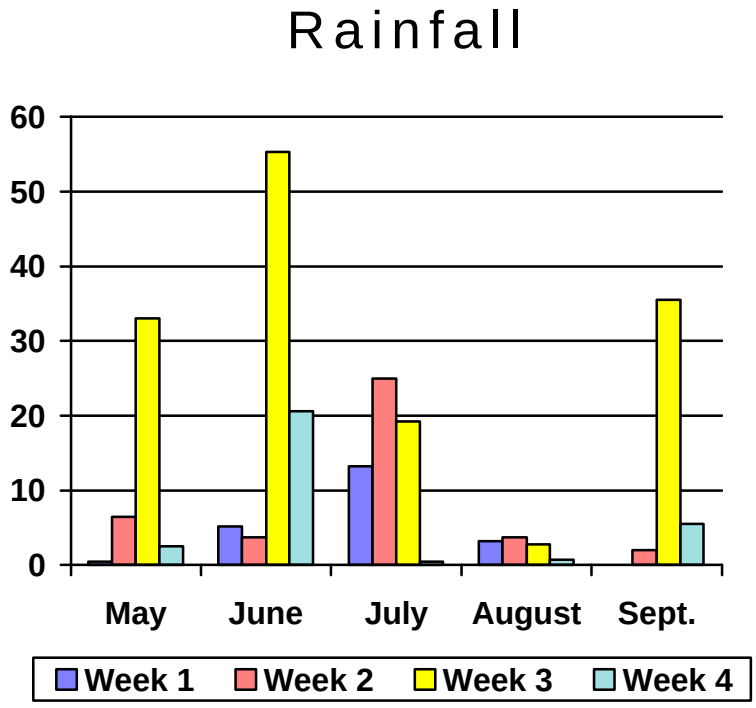
Herbicides applied: Post seeding burn off with Roundup on May 12 at a ½ L/ac. In crop application with a Poast Ultra (40 ac/case), Muster (26 ac/pouch) and Lontrel (20 ac/jug) were applied at the 2 to 5 leaf stage over a 6 day period.

Swathing: Started: August 11 Finished: September 10

Combining: Started: September 8 Finished: September 22

Comments:

Cool soil temperatures under heavy trash conditions and 1 ½" of rain on May 17 resulted in delayed and uneven emergence. This combined with an early June frost and heavy weed pressures hampered early crop development. Volunteer barley and thistle were the predominant weeds. These factors reduced the yield expectations. Petal test results indicated sclerotina stem rot was in the low range. Even with the average amounts of rainfall, no fungicide was applied. There was little evidence of blackleg or alternaria black spot. Diamondback moth, bertha army worm and lygus bug levels were low. No apparent damage was evident. Flea beetles were not found early in the spring, but were observed later in the growing season. Harvest was completed early.



Total accumulated moisture = 238mm (9.5 inches)

Location:	**Watson, SK**

Co-operator: ADM Agri-Industries Ltd.

Previous crop: Canola

Soil Test Results: (Enviro-Test Labs)

Organic matter content: 5.5 % (0-12")

Macronutrient Levels (0 - 12"):

Nitrogen -	25 lb/ac
Phosphorus-	20 lb/ac
Potassium -	738 lb/ac
Sulphur -	38 lb/ac

Micronutrient Levels:(0 - 12")

Boron -	4.2 p.p.m.
Copper -	3.3 p.p.m.
Iron -	80 p.p.m.
Zinc -	5.3 p.p.m.
Manganese -	28 p.p.m.
Chlorine -	19 p.p.m.

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

Target Yield (bu./ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur
40	-25	11.0	60-70	30-35	0-15	10-15
32	25	9.2	45-55	30-35	0-15	0-10
28	50	7.8	35-45	20-25	0-15	0-10

Target yield: 40 bu/ac

Fertilizer applied: N - 70 lb/ac P - 30 lb/ac K - 0 lb/ac S - 10 lb/ac

Soil Association/Zone: 70% - Oxbow, 30% - Yorkton/Black to Thick Black

Soil Texture: Silty Clay Loam to Clay Loam

Salinity: 10% strong salinity occurring throughout depressions and slough edges (conductivity 8 -16 mS/cm) balance of the field non saline (conductivity 0.2 mS/cm)

Tillage operations: Urea was pre-banded with Bourgault air drill into standing stubble then harrowed.

Seeding method: Seeded with a Bourgault air drill
Date: May 25
Depth: Wheat 1 to 2", canola ¾ to 1"
Rate: Wheat 1 ½" bu/ac, canola 6.0 lb/ac
Soil Temp: 21.1ºC to a depth of 1 ½ "

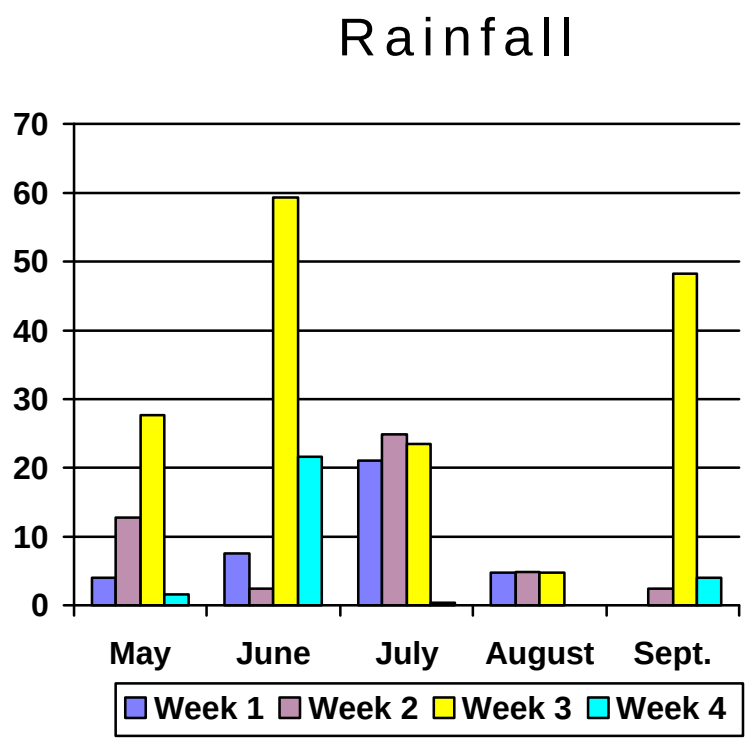
Herbicides applied: Pre-seeding burn off of Roundup was applied on May 16 at 1 L/ac, wheat in crop application with Buctril M (20 ac/jug) applied at the 4 leaf stage, canola in crop application with Poast Ultra (40 ac/case), Muster (40 ac/pouch) and Lontrel (26 ac/jug) tank mix applied at the 4 to 5 leaf stage.

Swathing: Started: August 25 Finished: September 10

Combining: Started: September 11 Finished: September 14

Comments: The site received above average precipitation and heat units. Canada and sow thistle, wild mustard and stinkweed were in

abundance. Harvest conditions were ideal.



Total accumulated moisture = 276 mm (11 inches)

Location:	**Lethbridge, AB - Irrigation**

Co-operator: Lorne Hickey

Previous crop: Wheat

Soil Test Results: (Enviro-Test Labs)

Organic matter content: 4.2% (0-6")

Macronutrient Levels (0 - 12"):

Nitrogen -	66 lb/ac
Phosphorus-	23 lb/ac
Potassium -	600 lb/ac
Sulphur -	27 lb/ac

Micronutrient Levels:(0 -12")

Boron -	1.2 lb/ac
Copper -	3.0 lb/ac
Iron -	93 lb/ac
Zinc -	2.8 lb/ac
Manganese -	37 lb/ac

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

Target Yield (bu./ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur

65	na	24.3	90-100	25-30	0-15	10-15
48	na	18.1	40-50	25-30	0-15	10-15
43	na	16.1	35-45	25-30	0-15	0-15

Target yield: 65 bu/ac

Fertilizer applied: N - 112 lb/ac P - 25 lb/ac K - 10 lb/ac S - 10 lb/ac

Soil Association/Zone: 60% Lethbridge lacustrine, 40% Ready made till/Brown

Soil Texture: Clay Loam

Salinity: Non saline (conductivity 0.8 mS/cm)

Tillage operations: Urea and Edge Granular was spring broadcast and incorporated. The field was harrow packed prior to seeding.

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

Date: May 4, 5 and 6

Depth: ½ to ¾"

Rate: 6.5 lbs/ac *B. napus*
5.0 lbs/ac *B. rapa*

Soil Temp: 12°C at a depth of 1"

Herbicides applied: Fall burn off with ½ L/ac Roundup. Pre-seeding application of Edge Granular (15 lbs/ac), in crop application with Poast Ultra (190 ml/ac), Muster (12 g/ac) and Lontrel (225 ml/ac).

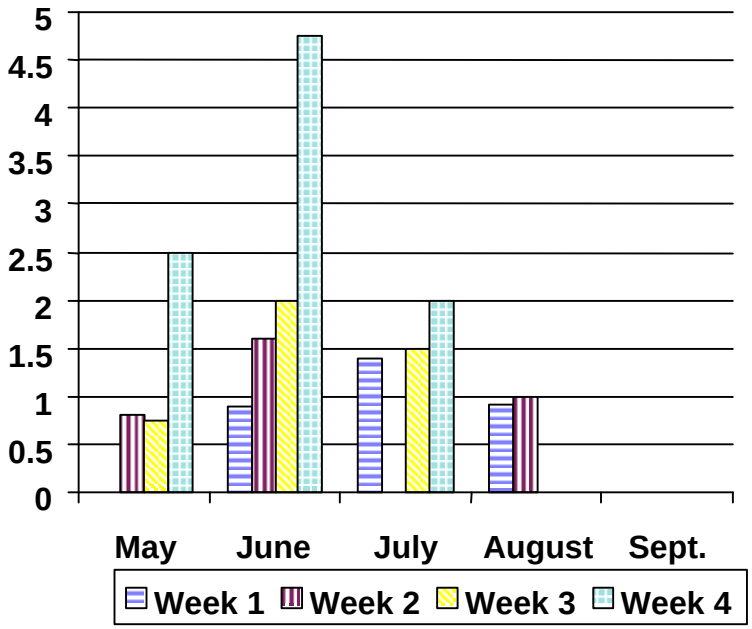
Fungicides/Insecticides: Ronilan (0.4kg/ac), Lorsban (405 ml/ac)

Swathing: Started: August 11 Finished: August 14

Combining: Started: August 31 Finished: September 3

Comments: As a result of dry conditions irrigation was applied early to promote germination. Emergence was rapid and even. This site had approximately 1-1.5" of water applied prior to a 3 day rain which put an additional 3.25" of rain on to the site. This resulted in localised flooding. Humid conditions prevented the soil from drying. Shallow rooting was observed. At swathing the canola crop matured rapidly because of hot dry conditions.

Rainfall



Total accumulated moisture = 16.9 inches (422 mm)

Location:	**Lethbridge, AB - Dryland**

Co-operators: Rod & Ike Lanier

Previous crop: Wheat

Soil Test Results: (Enviro-Test Labs)

Organic matter content: 2.8% (0-6")

Macronutrient Levels: (0-12")

Nitrogen -	74 lb/ac
Phosphorus -	33 lb/ac
Potassium -	600 lb/ac
Sulphur -	27 lb/ac

Micronutrient Levels:(0-12")

Copper -	3.1 lb/ac
Iron -	90 lb/ac
Zinc -	2.6 lb/ac
Manganese -	29 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
18	50	6.1	0	15-20	0-15	5-10
23	25	8.2	0	20-25	0-15	10-15
35	25	12.5	0	20-25	0-15	10-15

Target yield: 35 bu/ac

Fertilizer applied: N - 75 lb/ac P - 22 lb/ac K - 11 lb/ac S - 14 lb/ac

Soil Association/Zone: 85% Lethbridge lacustrine, 15% Ready made till/Brown

Soil Texture: Loam

Salinity: Non saline (conductivity 1.0 mS/cm)

Tillage operations: Anhydrous ammonia at 60 lbs N per acre applied with a coulter into standing stubble applicator

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

Date:	April 22 - May 13
Depth:	½"
Rate:	6.0 lbs/ac *B. napus* 5.0 lbs/ac *B. rapa*
Soil Temp:	1ºC - 12ºC

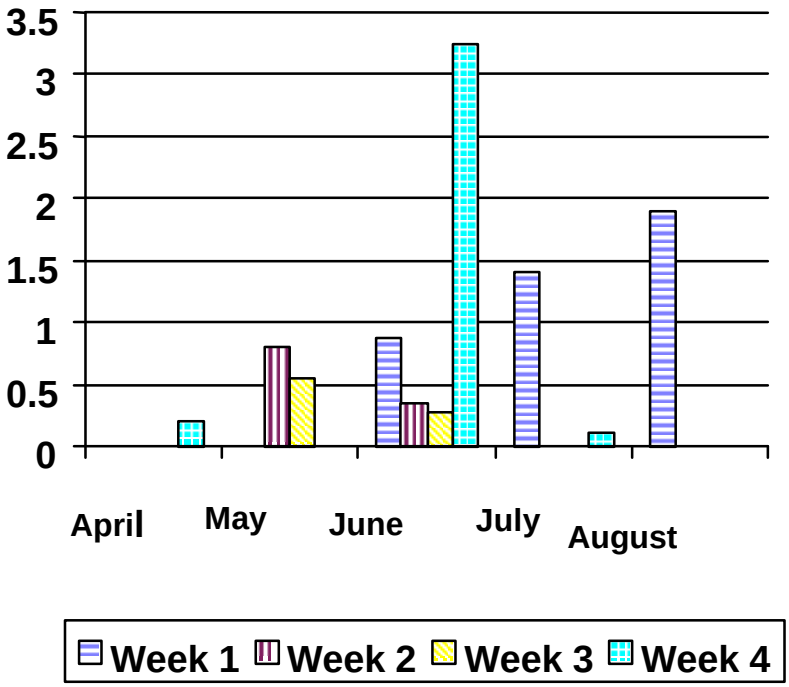
Herbicides applied: Pre-seeding burn off with Touchdown at a rate of 1.0 L/ac. In crop application of Poast Ultra (190ml/ac), Muster (8g/ac)

Swathing: Started: July 21 Finished: August 7

Combining: Stared: August 24 Finished: August 25

Comments: Good spring soil moisture resulted in even emergence. Cool conditions and a frost in early June slowed crop development. Diamondback moths, lygus bugs and cabbage seed pod weevil were observed across the site. Insect damage was monitored and considered to be light early in the season. As the season progressed damage levels increased. Hot dry weather in July and August resulted in rapid maturity.

Rainfall



Total accumulated moisture = 253.3 mm (9.97Inches)

Location:	**Innisfail, AB**

Previous crop: Barley

Soil Test Results: (Enviro-Test Labs)

Macronutrient Levels: (0-12")

Nitrogen -	37 lb/ac
Phosphorus -	16 lb/ac
Potassium -	156 lb/ac
Sulphur -	82 lb/ac

Micronutrient Levels: (0-12")

Copper -	1.1 lb/ac
Iron -	127 lb/ac
Zinc -	6.7 lb/ac
Manganese -	10 lb/ac
Boron -	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
27	75	8.7	35-45	15-20	15-25	0-10
35	50-75	8.2	45-55	25-30	15-25	0-10
46	25	11.2	50-60	30-35	15-25	5-10

Target yield: 35 bu/ac

Fertilizer applied: N - 75 lb/ac P - 26 lb/ac K - 36 lb/ac S - 12 lb/ac

Soil Association/Zone: Wet Black

Soil Texture: Clay

Salinity: Non saline (conductivity 0.9 mS/cm)

Tillage operations: Fall cultivated and harrowed. Spring broadcast of urea (60 lbs N/ac), potash (25 lbs K/ac) and Edge Granular (20 lbs/ac).

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

Date:	May 7, 8 and 9
Depth:	½ - ¾"
Rate:	6 lbs/ac *B. napus* 5 lbs/ac *B. rapa*
Soil Temp:	12ºC

Herbicides applied: Pre-seeding burn off using Touchdown (1.0 L/ac), spring applied Edge Granular (20 lbs/ac). In crop application with Poast Ultra (190 ml/ac), Muster (12 g/ac) and Lontrel (225 ml/ac)

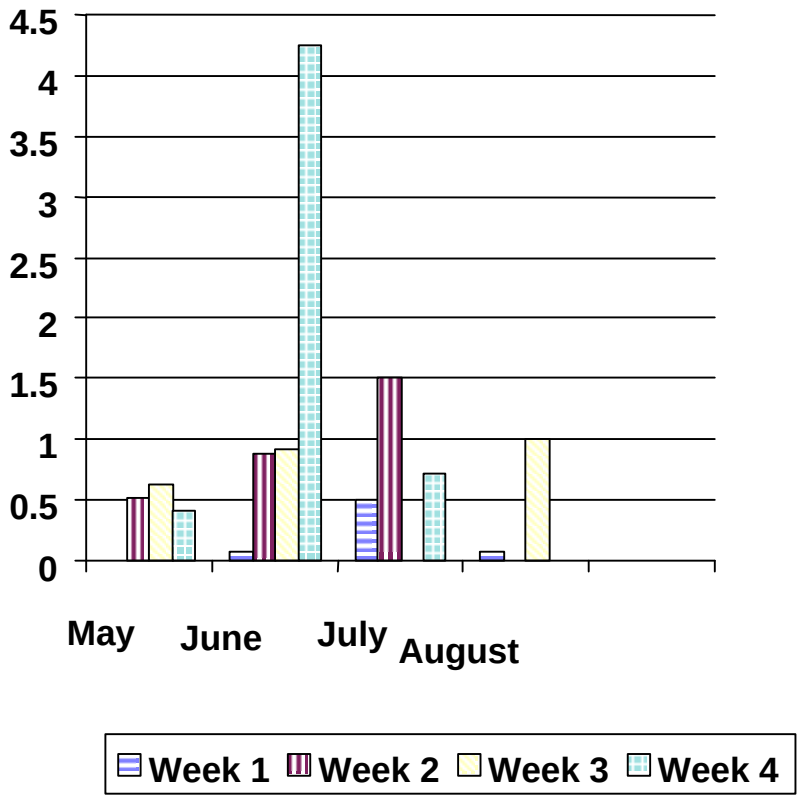
Insecticides applied: Lorsban (405 ml/ac)

Swathing: Started: August 6 Finished: August 19

Combining: Started: September 5 Finished: September 8

Comments: Initial spring soil moisture conditions were poor. Early season weed pressure was high necessitating a pre-seeding burn off with Touchdown. Predominant weeds were volunteer barley, quackgrass, cleavers, and redroot pigweed. Emergence was uneven across the site. Rains after emergence improved crop density but also increased weed pressure. This required an early in crop application of herbicides. A combination of dry conditions, weed pressure and early spraying resulted in crop stress. With favourable moisture and temperatures crop development improved. Ideal conditions resulted in early harvest.

Rainfall



Total accumulated moisture = 11.45 inches (290.83 mm)

Location:	**Andrew, AB**

Co-operator: Steve Blashko

Previous crop: Barley

Soil Test Results: (Enviro-Test Labs) 0 – 6 " sample

Organic matter content: *9.8%*

Macronutrient Levels: (0-6")		*Micronutrient Levels: (0-12")*	
Nitrogen -	28 lb/ac	Copper -	1.3 lb/ac
Phosphorus -	16 lb/ac	Iron -	192 lb/ac
Potassium -	162 lb/ac	Zinc -	7.6 lb/ac
Sulphur -	12 lb/ac	Manganese -	44 lb/ac
		Boron -	2.8 lb/ac
		Chloride -	13 lb/ac

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

Target Yield (bu/ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur
34	25	9.5	40-45	30-35	15-25	20-25
27	50	7.5	35-45	25-30	15-25	15-20
19	75	4.8	20-30	15-20	15-25	10-15

Target yield: 35 bu/ac

Fertilizer applied: Spring: N - 63 lb/ac P - 25 lb/ac K - 18 lb/ac S - 18 lb/ac

Soil Association/Zone: Black North East / Peace Hills sandy loam

Soil Texture: Sandy Loam

Salinity: Non-Saline (conductivity 0.1 mS/cm)

Tillage operations: Fall cultivate, harrow, spring cultivate/banding

Seeding method: Seeded with a Melroe 280 hoe press drill with 7" spacings
Date: May 7-8, except for specific trials noted
Depth: ¾"
Rate: 6 lbs/ac *B. napus*
5 lbs/ac *B. rapa*

Herbicides applied: Pre-seeding burn off with Gramoxone PDQ (0.8 L/ac). In crop application with Poast Ultra (190 ml/ac), Muster (8 g/ac)

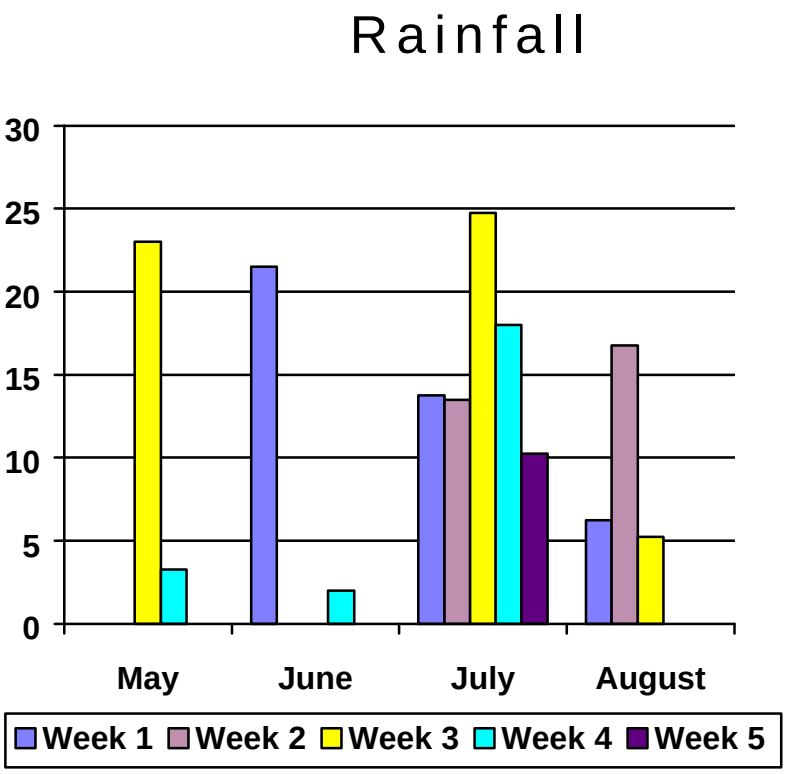
Insecticides applied: Decis (50 ml/ac) was applied on July 31

Swathing: Started: August 11 Finished: August 18

Combining: Started: August 31 Finished: September 1

Comments: This site started out with virtually no rainfall during May and early June. As a result, germination and emergence was slow and patchy throughout the site. Early season weed pressure from wild oats and volunteer barley necessitated spraying when the crop was just emerging. Timely rains throughout late June and early July coupled with warm conditions produced an excellent crop stand for the amount of moisture received. Lygus bugs at mid pod warranted spraying with Decis. The crop was swathed and combined in record time with no rainfall in between. Despite the hot weather

and lack of rainfall during swath curing, there were no problems with green seed.



Total accumulated moisture = 5.18 inches (131 mm)

Location:	**Wanham, AB**

Co-operator: Dan Lane (Shane Farms)

Previous crop: Fallow

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

Macronutrient Levels: (0-12")		*Micronutrient Levels: (0-12")*	
Nitrogen -	121 lb/ac	Copper -	2.4 lb/ac
Phosphorus -	60+ lb/ac	Iron -	400 lb/ac
Potassium -	504 lb/ac	Zinc -	9.8 lb/ac

Macronutrient Levels: (0-24") Boron - 2 lb/ac
Sulphur - 90+ lb/ac Manganese - 32 lb/ac
Chlorine - 53 lb/ac

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

Target Yield (bu/ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur
36	25	9.2	0	10	5	5
29	50	6.9	0	7.5	5	5
20	75	4.2	0	5	5	5

Target yield: 36 bu/ac

Fertilizer applied: Fall: N - 72 lb/ac
Spring: N - 10 lb/ac P - 8 lb/ac K - 5 lb/ac S - 5 lb/ac

Soil Association/Zone: Moist Dark Grey

Soil Texture: Loam (0-6 in), Clay (6-24 in)

Salinity: Non-saline (conductivity 0.4 mS/cm)

Tillage operations: Tillage fallow in 1997. Anhydrous ammonia (72 lbs N/ac) and Edge Granular (22 lbs/ac) were fall applied with a heavy duty cultivator. Field was harrowed twice with a heavy duty harrow in the spring of 1998.

Seeding method: Seeded with a Melroe 280 hoe press drill with 7" spacings.
Date: April 28 to May 5
Depth: ¾"
Rate: 6 lbs/ac *B. napus*
5 lbs/ac *B. rapa*
Soil Temp: 11 to 18ºC

Herbicides applied: Edge granular was fall applied (22 lb/ac). In crop application with Poast Ultra (190 ml/ac), Muster (8 g/ac) and Lontrel (227 ml/ac).

Insecticides applied: Lorsban (500 ml/ac) was applied on July 15

Swathing: Started: July 30 Finished: August 31

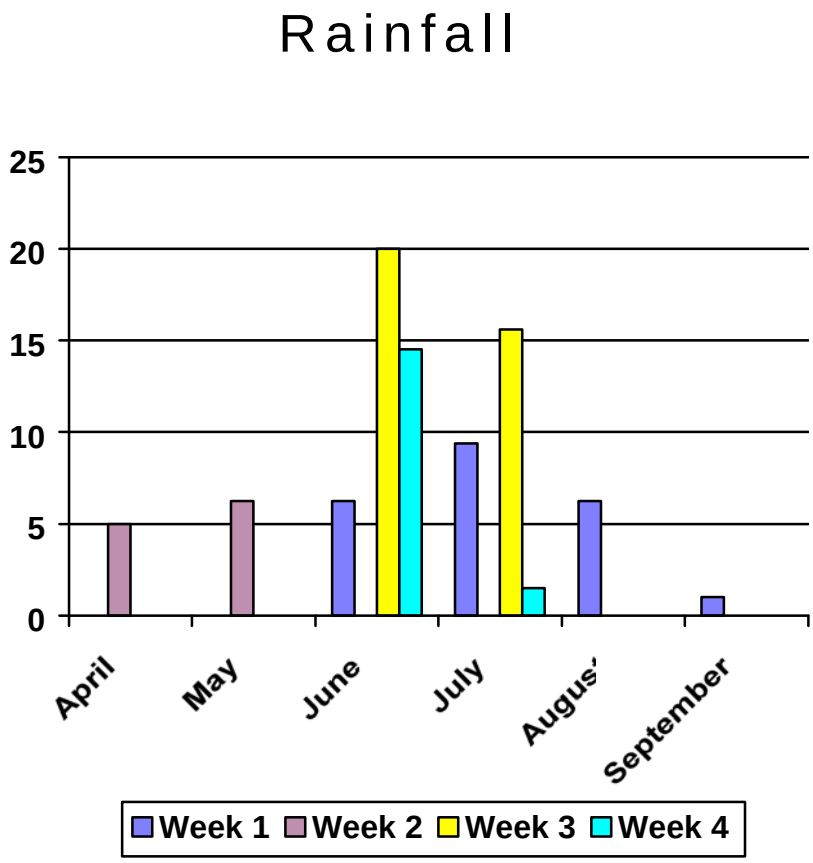
Combining: Stared: August 17 Finished: September 14

Comments: Drought, lygus bugs, bertha armyworms and variability in soil organic matter were 4 major elements influencing crop development during the growing season. In many cases, this resulted in high variability between replicates within the same treatments. Lygus bugs were present early and in large numbers contributing to high levels of bud blasting.

Ordinarily, canola plants would compensate for this damage by producing more buds, but under the dry conditions at this site this

was not possible, and yields suffered. Bertha armyworms (greater than 20/m^2) were observed on the site July 12, and were aerially sprayed with Lorsban on July 15.

A small amount of rainfall in June and July, resulted in additional germination of canola seeds. When the majority of the crop was at 30 to 40% seed colour change the late germinating canola was immature. This contributed to elevated green seed counts and grades were often reduced.



Total accumulated moisture = 79.8mm (3.1 Inches)

Location:	**Rolla, BC**
Co-operator:	Gene Vipond (Borek Farms)
Previous crop:	Wheat

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

Macronutrient Levels: (0-12")		*Micronutrient Levels: (0-12")*	
Nitrogen -	113 lb/ac	Copper -	1.3 lb/ac
Phosphorus -	54+ lb/ac	Iron -	360 lb/ac
Potassium -	292 lb/ac	Zinc -	14.9 lb/ac
		Chlorine -	25 lb/ac
Macronutrient Levels: (0-24")		Manganese -	59 lb/ac
Sulphur -	30 lb/ac	Boron -	2.2 lb/ac

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

Target Yield (bu/ac)	Probability of Precip. (%)	Precip. Required (Inches)	Nitrogen	Phosphate	Potash	Sulphur
35	25	9.2	10	10	10	10
28	50	6.9	10	10	5	5
19	75	4.2	5	5	5	5

Target yield: 35 bu/ac

Fertilizer applied: Fall: 90 lb/ac of N as anhydrous ammonia
Spring: N - 10 lb/ac P - 8 lb/ac K - 10 lb/ac S - 6 lb/ac

Soil Zone: Moist Dark Grey

Soil Texture: (0-6 in) Clay Loam, (6-12 in) Clay Loam

Salinity: Non saline, (conductivity 0.1 mS/cm)

Tillage operations: Anhydrous ammonia (90 lb/ac) was fall applied with a heavy duty cultivator. The field was cultivated in the spring using a vibrashank with mounted harrows.

Seeding method: Seeded with a Melroe 280 hoe press drill with 7" spacings
Date: May 6 and 7
Depth: ¾"
Rate: 6 lbs/ac *B. napus*
5 lbs/ac *B. rapa*
Soil Temp: 15ºC

Herbicides applied: In crop application with Muster Gold (20 ac/cs) and Lontrel (225 ml/ac) sprayed (May 26-28/98).

Swathing: Started: July 30 Finished: August 10

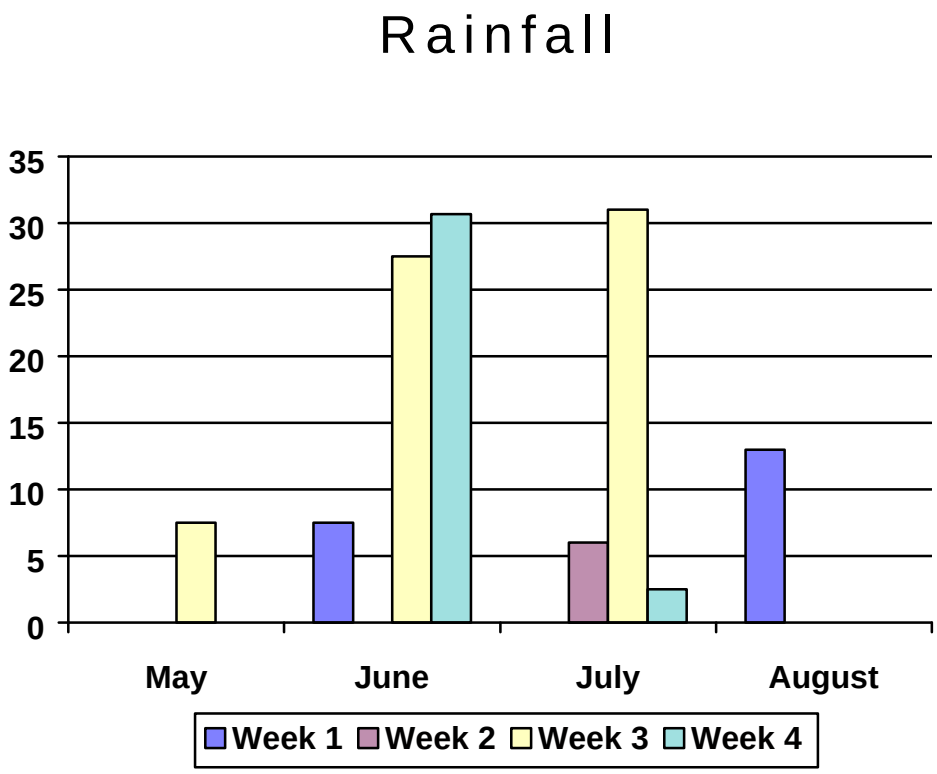
Combining: Started: August 25 Finished: September 27

Comments: Canola emergence was rapid and even at this site. Initial weed pressure was high and predominantly hemp-nettle. Weeds were controlled and subsequent crop development was excellent.

Prior to August 3, rainfall at the site was timely and adequate. No significant numbers of lygus bug were observed and the

expectations were for excellent yields and good quality.

On August 3, a severe hail storm, with strong winds and rain, affected the site in the following ways: swathed canola was shelled and blown across the site. Standing canola had pod striping and stem damage. Stem damage resulted in accelerated dry down and fixation of chlorophyll in the damaged seeds. As a result of the hail storm, yields and grades were reduced.



Total accumulated moisture = 125.7mm (4.9 Inches)

VII VARIETY TRIALS

A 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 increase in numbers 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. *B. napus* varieties are compared against the check AC Excel, and *B. rapa* varieties compared against the check Reward.

Methodology: All varieties were treated pedigreed seed. The trial was made up of four replicates in a randomised block system. *B. rapa* and *B. napus* varieties were in separate trials. Identical agronomic practices were used for all varieties. The entire trial was seeded on the same day. Swathing commenced when seed colour change was 30% to 40% and harvest was completed when suitable conditions existed.

CARMAN

Observations: This trial was seeded on May 21 into excellent soil moisture, and emergence was rapid and uniform. Weed competition was high (green foxtail, barnyard grass, redroot pigweed). Herbicide application was delayed until the 6 leaf stage of the crop by frequent rains. The crop was stressed by excessive moisture. Assessments using the sclerotinia stem rot checklist (Canola Growers Manual, p. 1054), sclerotinia petal test kit, and moist conditions at flowering indicated a need for fungicide application. Ronilan EG was applied at 30 to 40% bloom. Root maggots were present, but caused low levels of damage (see *B. napus* Root Maggot Monitoring Trial).

Results:

B. NAPUS VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Carman, MB							
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**	**Grade**
Hyola 401	127	36.6	95.69	42.4	1171	91	1
Q2	122	35.2	96.36	44.0	1129	88	1
Quantum	120	34.7	96.00	42.3	1129	88	1
Trailbazer	111	32.0	74.06	44.8	1103	86	1
Synbrid 220	111	31.9	65.92	43.7	1118	87	1
Hy-Per Star 100	110	31.6	58.87	43.8	1129	88	1
Option 500	109	31.4	69.22	44.9	1157	90	1
IMC 105	108	31.2	67.72	41.5	1171	91	1
Goliath	106	30.6	58.96	45.9	1187	92	2
Battleford	105	30.3	64.36	43.9	1090	85	1
Castor	102	29.3	85.48	44.3	1077	84	1
AC Excel	**100**	**28.8**	**56.90**	**43.8**	**1077**	**84**	**1**
Millenium	95	27.5	69.17	44.1	1090	85	1
IMC 104	94	27.2	37.72	40.2	1059	83	1
LSD CV %		1.71 4.6		0.59 1.1			

Discussion:

Nine of the 14 varieties tested provided a significant yield advantage compared to the check variety (AC Excel). Hyola 401 gave the highest yield and the advantage was significant above all but Q2. Contribution margins reflected differences in yield, seed cost and in the case of Goliath, grade. The contribution margins for the varieties Castor and Millenium also reflect a premium of $1.00/bu for their high erucic acid content.

The days to maturity ranged from a low of 83 for IMC 104 to a high of 92 for Goliath. Oil contents also varied significantly, with Goliath providing more oil than any of the other varieties at 45.9%. The lowest oil content was 40.2% for IMC 104.

RUSSELL

Observations: The trial was seeded May 15 into good soil moisture which resulted in quick emergence. A hard frost (-5°C) occurred towards the end of May which slowed the progress of the crop. Weed pressure was high, and included wild oats, wild mustard, Canada thistle, sow thistle, cleavers and chickweed, as well as others. Herbicides applied at the 5 leaf stage of the crop resulted in very good control of the targeted weeds. A petal test kit was used and this together with high rainfall and humidity indicated a high potential for sclerotinia infection. Fungicide was applied at approximately 50% bloom, which was later then the recommended 30% bloom stage due to rain delays. No root maggot damage was observed.

Results:

***B. NAPUS* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Russell, MB**							
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**	**Grade**
Hyola 401	138	23.3	8.79	41.9	980	89	1
Quantum	137	23.1	23.10	44.1	1016	92	1
Q2	128	21.7	7.97	44.3	1016	92	1
Synbrid 220	121	20.5	(6.73)	44.1	1037	94	1
IMC 105	117	19.7	(5.68)	42.7	995	90	1
Trailbazer	115	19.5	(6.83)	43.4	1028	93	1
Battleford	109	18.5	(15.91)	44.6	995	90	2
Hy-Per Star 100	108	18.2	(33.33)	42.6	1047	95	2
AC Excel	**100**	**16.9**	**(19.50)**	**43.8**	**995**	**90**	**1**
Castor	99	16.7	(8.77)	42.8	995	90	1
Option 500	97	16.4	(34.53)	43.2	1016	92	2
Millenium	94	15.9	(16.58)	44.2	964	88	1
IMC 104	78	13.2	(54.43)	42.0	946	87	1
Goliath	70	11.9	(65.39)	43.4	1028	93	2
LSD		3.10		1.19			
CV %		14.3		2.3			

Note: Brackets in the contribution margin reflect a negative value

Discussion: Four varieties (Hyola 401, Quantum, Q2 and Synbrid 220) yielded significantly higher than the check variety (AC Excel). Contribution margins reflected yield and seed cost, as well as grade. The downgrading of some of the varieties was a result of a combination of green and damaged seed, the damaged seed being mainly inseparable weed seeds such as cleavers. The poor economic performance of the varieties was a

reflection of low overall yields. Weed pressure at the site was very intense, and the spectrum contained several weeds which were not easily controlled in a conventional system (e.g. Birdsrape mustard, cleavers, chickweed). Herbicide applications were delayed by wet weather, and this had a negative impact on yield (see seeding date and time of weed removal trial). A hail storm (estimated 11% yield loss) also occurred just prior to swathing. All of these stresses took their toll on yield.

Days to maturity (30% seed colour change) ranged from 87 to 95 days. While these values were similar to those at the Carman site, the growing degree day values were much lower, suggesting that the stresses placed on this crop may have hastened maturity prematurely. Oil contents varied significantly, ranging from 44.6% for Battleford down to 41.9% for Hyola 401.

WHITEWOOD

Observations: Variable growing conditions outlined in the Whitewood Site Information Section (page 28) affected the yield potential. Heavy rainfall in the second and third week of June caused localised flooding in some treatments. The plants had a shallow root system, probably due to excessive moisture during early crop development. This shallow root system was unable to access moisture during the hot, dry period of late July and early August. This rapidly advanced the maturity of a number of the varieties. The heat caused the pods on a number of the varieties to appear mature, while the seeds inside these pods remained immature. This observation stresses the importance of determining the proper stage of swathing by evaluating seed colour change, not pod colour change.

Light infestation of the disease blackleg was observed. Some root maggot damage was evident. Sclerotinia stem rot infection levels were low.

Results:

***B. NAPUS V*ARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Whitewood, SK**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**
Trailblazer	112	26.9	24.58	48.3	1094	95
Hyola 401	111	26.8	10.95	46.8	1045	92
Magnum	108	26.1	20.94	46.9	1075	94
IMC 03	108	26.1	18.23	48.1	1059	93
Clavet	107	25.9	18.50	48.2	1075	94
Option 500	107	25.9	16.73	48.4	1111	96
LG3333	106	25.5	13.13	48.2	1075	94
Ebony	104	25.1	11.35	48.9	1126	97
Q2	104	25.1	9.38	48.1	1094	95
Synbrid 220	102	24.6	0.00	47.5	1111	96
LG3369	101	24.3	6.57	48.6	1075	94
Castor	100	24.1	30.04	48.6	1029	91
AC Excel	**100**	**24.1**	**10.43**	**47.4**	**1075**	**94**
IMC 104	95	22.9	(5.77)	45.0	1045	92
LSD		1.92		.78		
CV %		6.4		1.4		

Note: Brackets in the contribution margin reflect a negative value

Discussion: Among the *B. napus* varieties only four varieties (Trailblazer, Hyola 401, Magnum and IMC 03) yielded significantly higher than the check variety (AC Excel). Varieties differing in yield by 1.9 bu/ac or more are significantly different. Contribution margins reflect differences in yield and seed cost. All varieties graded #1. The variety Castor gave the greatest economic return, as a result of the $1.00/bu premium paid on High Erucic Acid Rapeseed (HEAR) varieties.

Days to maturity (30% seed colour change) range from 91 to 97 days. The oil content of varieties ranged from 45.0% to 48.9%.

NAICAM

Observations: Variable growing conditions outlined in the Naicam Site Information section affected the yield potential. Late July and early August heat rapidly advanced the maturity of a number of varieties. This heat caused the pods on a number of the varieties to appear mature, while the seeds inside these pods remained immature. This observation stresses the importance of determining the proper stage of swathing by evaluating seed colour

change not pod colour change. Varieties appeared to be delayed by a combination of high nitrogen rates and low crop density.

Light infestation levels of blackleg were observed. Some root maggot damage was evident. Other insect damage was light. Sclerotinia stem rot infection levels were low.

Results:

***B. NAPUS* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Naicam, SK**							
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**	**Grade**
Ebony	112	30.2	56.69	46.8	1217	105	1
Q2	111	30.1	53.97	45.3	1179	102	1
LG3369	110	29.9	55.66	46.4	1167	101	1
Clavet	109	29.3	51.09	43.6	1179	102	1
IMC 03	107	29.0	47.07	44.0	1167	101	1
Magnum	104	28.1	43.03	42.9	1179	102	1
LG3333	101	27.3	33.72	44.6	1167	101	1
AC Excel	**100**	**27.0**	**39.27**	**43.4**	**1179**	**102**	**1**
Option 500	97	26.3	26.82	45.1	1191	103	1
IMC 104	96	26.0	24.57	41.2	1153	100	1
Goliath	95	25.6	16.94	45.9	1217	105	2
Hy-Per Star 100	94	25.5	8.97	43.8	1217	105	1
Synbrid 220	93	25.3	12.28	45.0	1191	103	1
Castor	87	23.5	32.03	45.7	1144	99	1
LSD		2.41		1.31			
CV %		7.2		2.4			

Discussion:

Varieties differing in yield by 2.4 bu/ac or more are significantly different. Three varieties (Ebony, Q2 and LG 3369) yielded significantly more than the check variety (AC Excel). Castor yielded significantly less than the check. However, because of the $1.00 per bushel premium paid for its high erucic acid content the contribution margin was comparable. Contribution margins reflect differences in yield, seed cost and grade.

Days to maturity (30% seed colour change) range from 99 to 105 days. Oil content of the varieties ranged from 41.2 to 46.8%.

LETHBRIDGE DRYLAND

Observations: The trial was direct seeded into wheat stubble May 1. Seedbed moisture was good. Emergence was rapid and even on all varieties. Environmental conditions at the site promoted more vegetative growth than is normal for this area. Flower blast was observed during mid flower. Lygus bugs, diamondback moths, and cabbage seed pod weevils were noticed on all varieties. Insect sweeps were conducted at regular intervals. As swathing time approached, insect populations climbed near threshold levels. However, with swathing to start within 3-4 days, spraying was unnecessary. Hot weather and dry conditions from mid flower to swathing brought on rapid maturity. Some of the varieties that were assessed as immature during a morning inspection would have been overripe by the following day. To slow the rate of dry down and to minimise the green seed count, swathing was done at night.

Results:

***NAPUS* VARIETY TRIAL**
YIELD, ECONOMIC & QUALITY RESULTS
Lethbridge Dryland, AB

Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)	Growing Degree Days	Days To Maturity	Grade
LG3333	107	33.6	154.46	44.8	1054	96	2
Hyola 401	106	33.3	141.28	44.5	1054	96	2
Battleford	100	31.5	142.95	46.0	1054	96	2
AC Excel	**100**	**31.3**	**145.01**	**45.8**	**1054**	**96**	**1**
Ebony	100	31.2	138.22	45.5	1074	97	2
Synbrid 220	98	30.7	127.53	45.3	1074	97	2
IMC105	93	29.1	126.79	44.8	1054	96	1
IMC104	88	27.7	112.31	44.0	1035	95	2
LSD		1.09		1.16			
CV %		2.9		2.1			

Discussion: LG3333 and Hyola 401 had significantly higher yields than the check (AC Excel) and all other varieties in the trial. The varieties IMC 105 and IMC 104 yielded significantly lower than the check. Contribution margins ranged from $112.31 to $154.46. This is a reflection of yield, seed prices and grade. All varieties with the exception of AC Excel and IMC 105 were graded a #2. The rapid dry down and hot weather following swathing did not allow the crop to cure properly which lead to higher green seed counts. Oil content ranged from 44.0 to 46.0%. The range of maturity was small at this site due to the hot dry weather. This range was much smaller than has been observed at this site in previous years. Varietal maturity differences can be observed year to year and region to region.

LETHBRIDGE IRRIGATION

Observations: This site was seeded May 5 into marginal soil moisture. Pre-seeding tillage to incorporate Edge granular and fertilizer dried out the seedbed. Irrigation water was applied within a week of seeding. Crop emergence on May 22 was generally good with some patchiness. Cool conditions after emergence slowed down crop growth. Plant height generally was shorter than has normally been observed. Irrigation water was applied just prior to a storm that dropped 3.25" of rain in 2 days. This caused moisture stress. Flooded areas did not dry out because of humid conditions after the storm. Water remained on the field for 10 to 14 days. As a result, roots were shallow and poorly developed. The combination of these soil conditions and the restricted root development limited moisture and nutrient uptake. High temperatures caused flower blasting despite application of irrigation water. Stresses during early crop development delayed flowering until July 21. Flowering on the main stem lasted 7 days on average with all flowering complete within 17 days. Swathing began 21 days after first flowering.

Results:

B. NAPUS VARIETY TRIAL
YIELD, ECONOMIC & QUALITY RESULTS
Lethbridge Irrigation, AB

Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)	Growing Degree Days	Days to Maturity	Grade
Hyola 401	117	37.5	74.19	42.4	1107	97	1
Ebony	112	36.1	65.84	45.2	1107	97	1
Synbrid 220	112	36.0	58.03	44.0	1125	98	1
Battleford	109	35.1	61.92	43.7	1125	98	1
Hy-Per Star 100	105	33.7	28.93	42.8	1142	99	2
IMC105	104	33.3	44.31	43.6	1125	98	1
LG3333	101	32.5	37.76	44.0	1089	96	1
AC Excel	**100**	**32.1**	**41.95**	**44.4**	**1107**	**97**	**1**
IMC104	85	27.3	(0.63)	41.2	1107	97	1
LSD		3.36		1.19			
CV %		8.3		2.3			

Note: Brackets in the contribution margin reflect a negative value

Discussion: Ebony, Synbrid 220 and Hyola 401 were significantly higher yielding than the check. Oil contents ranged from 41.2 to 45.2%. Contribution margins reflect relatively low yields grade and high input costs.

INNISFAIL

Observations: Seeding occurred on May 8 into dry soil conditions. High volunteer barley pressure warranted early herbicide application (1 leaf crop stage). Lygus bugs were evident during flowering. Sweeps confirmed the requirement to spray. Environmental conditions were favourable during the growing season, resulting in normal crop development.

Results:

***B. NAPUS* VARIETY TRIAL**
YIELD, ECONOMIC & QUALITY RESULTS
Innisfail, AB

Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)	Growing Degree Days	Days to Maturity
Hyola 401	106	40.3	89.70	45.2	1164	102
Clavet	103	39.3	95.41	46.4	1201	105
Battleford	102	38.9	96.00	46.4	1151	101
Synbrid 220	100	38.3	79.79	46.1	1201	105
AC Excel	**100**	**38.1**	**91.43**	**45.1**	**1151**	**101**
Hy-Per Star 100	94	35.9	59.46	46.1	1201	105
Option 500	87	33.3	50.94	47.9	1201	105
Castor	74	28.3	44.29	45.9	1151	101
LSD		4.80		0.91		
CV %		10.8		2.3		

Discussion: No variety yielded significantly high than the check (AC Excel). However, 2 varieties yielded significantly lower than the check. Oil contents ranged from 45.1 to 47.9%. All varieties had a higher oil content than the check. All varieties graded # 1.

ANDREW

Observations: Because of hot and dry conditions, emergence was slow and uneven. These conditions were compounded by the fact that weed pressure from wild oats and volunteer barley was quite severe. Despite these pressures, the crop advanced rapidly, once rains materialised in early July.

Results:

B. NAPUS VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Andrew, AB						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
IMC 03	110	37.4	158	43.9	1201	98
Optioin 500	109	37.0	155	42.8	1201	98
Clavet	108	36.9	155	42.2	1201	98
Battleford	107	36.5	154	42.7	1201	98
Hyola 401	106	36.0	136	41.6	1201	98
AC Excel	**100**	**34.1**	**139**	**42.0**	**1201**	**98**
Synbrid 220	96	32.8	117	41.5	1201	98
IMC105	95	32.4	120	41.6	1201	98
IMC104	94	32.2	119	41.3	1188	97
Castor	86	29.3	129	43.5	1201	98
LSD		2.74		0.73		
CV %		6.7		1.4		

Discussion: All varieties matured rapidly. IMC 03, Optimum 500 and Clavet yielded significantly higher than the check (AC Excel). Only Castor yielded significantly lower than the check. There were differences in oil contents among the varieties with some of the speciality oil varieties IMC 03 and Castor produced significantly higher oil contents than the check. Because of the premium paid on Castor, the contribution margin was higher then some of the other varieties that produced higher yields.

WANHAM

Observations: See Site Information page 42: Wanham, for effects of climate and insect pests at this site. Plots were seeded May 1 (soil temperature 15.5^{o}C at 1 inch). Emergence was uneven due to dry soil conditions. Weed pressure was moderate. The predominant weeds were volunteer wheat, volunteer barley, stinkweed, hemp-nettle and Canada thistle. The trial was sprayed with Poast (130 ml/ac), Muster (8 g/ac) and Lontrel (227 ml/ac) on June 4. Rainfall was insufficient throughout the growing season. A 20 mm rain on June 19 triggered additional germination, which lead to problems with green plant material at swathing. Combining was delayed by the hot weather which affected chlorophyll clearing. It appeared that the moisture level in the seed was so low that the enzymes that normally clear the chlorophyll were inactivated. Seed moisture content at harvest was in the 6% range (very dry).

Results:

B. NAPUS VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Wanham, AB							
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**	**Grade**
AC Excel	**100**	**20.7**	**38.80**	**41.3**	**1438**	**100**	1
Clavet	84	17.4	(4.09)	41.4	1426	99	2
Option 500	81	16.7	7.69	42.5	1426	99	2
Synbrid 220	73	15.1	(11.42)	41.1	1438	100	2
Hyola 401	72	15.0	(18.51)	39.6	1426	99	1
Castor	67	13.8	(10.03)	41.6	1426	99	1
Goliath	66	13.6	(33.30)	44.1	1426	99	3
Hy-Per Star 100	56	11.5	(42.79)	41.2	1438	100	2
LSD		3.12		0.79			
CV %		16.6		1.6			

Note: Brackets in the contribution margin reflect a negative value

Discussion: Maturities were affected by the hot, dry growing conditions. Green seed contents were elevated in all varieties as a result of chlorophyll fixation. The yield potential of all varieties tested was compromised by the drought. Growing degree days (GDD's) were much higher this year than "normal" for the Peace Region (approximately 1000 GDD's). It appears that AC Excel showed the greatest drought tolerance in this trial.

The check variety AC Excel yielded significantly higher than all varieties tested. Oil contents ranged from 39.6 - 44.1%. These values are lower than normal for the Peace Region. Oil formation is one of the last processes in seed development and can be seriously compromised by hot dry weather during maturity.

ROLLA

Observations: The trial was seeded May 6. Emergence was rapid and even, producing an excellent stand. Weed pressure was moderate. The predominant weeds were hemp-nettle, wild buckwheat, and wild oats. The trial was sprayed with Muster Gold (20 ac/cs) and Lontrel (225 ml/ac) on May 28. Weed control was excellent. The site received timely and adequate rainfall to ensure good growth of the canola. A severe hail storm with high winds and rain occurred on August 3. At that time most of the plants were at Growth Stage 80 (BBCH, beginning of ripening). Estimated yield loss was 35%. Green pods were knocked off the plants and the stems and remaining pods received extensive damage from the hail. This damage reduced the ability of the seed to clear chlorophyll and resulted in a lower grade.

Results:

B. NAPUS VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Rolla, BC							
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**	**Grade**
Hyola 401	113	42.0	117.53	41.3	1041	96	2
Option 500	104	38.8	96.17	42.5	1041	96	2
AC Excel	**100**	**37.2**	**103.47**	**41.3**	**1041**	**96**	2
LSD		1.61		0.82			
CV %		2.9		1.4			

Discussion: Yields and grades were reduced by the hail storm on August 3. In spite of this damage, respectable yields and contribution margins were obtained at harvest. Hyola 401 was significantly higher in yield than AC Excel (check variety). With respect to oil contents Option 500 was significantly higher than both Hyola 401 and AC Excel. Green seed contents did not vary among the three varieties.

B. B. rapa

RUSSELL

Observations: This trial was seeded on May 17 into good soil moisture which resulted in quick emergence. A hard frost (-5°C) occurred at the end of May which slowed the progress of the crop. Weed pressure was high, which consisted mainly of wild oats, wild mustard, Canada thistle, sow thistle, and cleavers. Herbicide applied at the 6 leaf stage resulted in very good control on the target weeds. Fungicide was applied at 60% bloom, which was later then the recommended 30% bloom stage due to rain delays. No root maggot damage was observed.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Russell, MB**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**
Hysyn 111	101	14.6	(39.88)	43.7	851	80
Reward	**100**	**14.5**	**(32.95)**	**43.6**	**837**	**79**
LSD		1.97		1.74		
CV %		6.1		1.8		

Note: Brackets in the contribution margin reflect a negative value

Discussion: There was no significant difference in yield between the check variety (Reward) and Hysyn 111. The overall yields of the Polish varieties were disappointing, probably due to the same combination of stresses outlined for the B. napus varieties at this site (weed pressure, spring frost, hail, and excessive rain). Contribution margins reflected differences in yield and seed cost, and both varieties graded #1. The negative contribution margins resulted from the combination of low yields and high weed and disease control costs.

Days to maturity and growing degree day requirements were slightly higher for the Hysyn 111.

WHITEWOOD

Observations: Uneven emergence, early June frost, excessive early season moisture, and heavy weed pressure hampered crop development. Predominant weeds were volunteer barley, wild buckwheat and Canada thistle. In crop application of Select (40 ac/cs), Muster (8 g/ac) and Lontrel (20 ac/jug) were applied to control target weeds. Heavy rainfall in the second and third

week of June caused localised flooding in some of the treatments. Late July and early August heat rapidly advanced the maturity of all varieties.

Some root maggot damage was evident. Damage from other insects was non-apparent. Alternaria black spot and sclerotinia stem rot infection levels in this portion of the field were moderate.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Whitewood, SK**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Hysyn 110	101	19.5	(27.86)	45.2	898	84
Reward	**100**	**19.3**	**(22.25)**	**46.3**	**898**	**84**
Foothills	98	19.0	(28.23)	46.2	898	84
LSD		1.00		0.35		
CV %		3.8		0.5		

Note: Brackets in the contribution margin reflect a negative value

Discussion: There was no significant yield difference among the varieties. Contribution margins reflect differences in seed costs and yield. All varieties graded #1. The negative contribution margins resulted from the combination of low yields and high input costs.

Days to maturity and growing degree days were equal for all varieties. Oil content of Hysyn 110 was significantly lower than the check (Reward).

NAICAM

Observations: Uneven emergence, early June frost, and heavy weed pressure hampered crop development. Predominant weeds were volunteer barley, stinkweed and Canada thistle. In crop application of Poast Ultra (40 ac/cs), Muster (8 g/ac) and Lontrel (20 ac/jug) were applied to control target weeds. Heavy rainfall in the third week of June caused localised flooding in some of the treatments. Late July and early August heat rapidly advanced the maturity of all varieties.

Some root maggot damage was evident. Other insects damage was non-apparent. Sclerotinia stem rot infection levels in this portion of the field were moderate.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS**

Naicam, SK						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days To Maturity**
Hysyn 110	105	24.7	41.23	42.2	963	87
Foothills	103	24.2	40.86	42.5	963	87
Reward	**100**	**23.5**	**39.34**	**42.6**	**963**	**87**
LSD		1.63		0.62		
CV %		4.9		1.1		

Discussion: There were no significant differences in yield or oil content among the varieties. Contribution margins reflect differences in seed costs and yield. All varieties graded #1.

Days to maturity and growing degree days were equal for all varieties.

LETHBRIDGE DRYLAND

Observations: The trial was direct seeded into wheat stubble May 1. Emergence was rapid and even across all treatments. Weed pressure was light and required only a low rate of Poast Ultra (130 ml/ac). Flowering was similar among all varieties. Flower blast and insect damage from lygus bugs were observed. Hot dry weather brought on rapid maturity, with no differences observed among the varieties.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Lethbridge Dryland, AB**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Reward	**100**	**24.9**	**106.61**	**44.9**	**820**	**85**
Hysyn 111	94	23.5	89.14	43.9	820	85
Foothills	93	23.1	91.07	44.3	820	85
Hysyn120 CS	86	21.4	73.67	44.7	820	85
LSD		1.41		0.41		
CV %		4.7		0.7		

Discussion: Hyson 120 CS was significantly lower in yield than all other varieties. The check variety had the highest oil content. High contribution margins reflect lower herbicide costs.

LETHBRIDGE IRRIGATION

Observations: This site was seeded May 5 into marginal soil moisture. Emergence was slow and uneven. Weed, disease and insect pressures were moderate. In crop application of Poast Ultra (190 ml/ac), Muster (12 g/ac) and Lontrel (220 ml/ac) were applied to control target weeds. Ronilan EG (.4 kg/ac) was applied to control sclerotinia. Lorsban (405 ml/ac) was applied to control lygus bugs. Irrigation water had been applied, just prior to a storm that dropped 3.25" of rain in 2 days. This caused moisture stress. Late season alternaria infection necessitated early swathing (15% seed colour change) to reduce yield loss.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Lethbridge Irrigation, AB**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Reward	**100**	**20.9**	**(45.44)**	**42.6**	**981**	**92**
Hysyn 120 CS	88	18.4	(66.96)	41.9	981	92
LSD		2.44		1.10		
CV %		7.5		1.1		

Note: Brackets in the contribution margin reflect a negative value

Discussion: There were no significant differences in yield or oil content between the varieties. Low yields combined with high input costs resulted in negative contribution margins.

INNISFAIL

Observations: This site was seeded May 8. Growing conditions and herbicides applied are outlined in the Innisfail Site Information page 38. Flowering and maturity was similar for all varieties.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Innisfail, AB**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Hysyn 111	109	25.9	(3.13)	41.7	872	91
Hysyn 120 CS	105	24.8	(11.11)	42.6	872	91
Foothills	102	24.2	(12.27)	42.1	872	91
Reward	**100**	**23.7**	**(12.62)**	**42.7**	**872**	**91**
LSD		3.23		0.81		
CV %		10.1		1.5		

Note: Brackets in the contribution margin reflect a negative value

Discussion: There were no significant differences in yield or oil content among the varieties. Negative contribution margins are a result of high input costs.

ANDREW

Observations: This trial was seeded on May 7. Due to the dry and hot conditions, emergence was slow and somewhat uneven, which was compounded by the heavy weed pressure from wild oats and volunteer barley. The crop began flowering under the drought, and rains did not occur until the crop was well into flower. Consequently, crop height was quite short. This necessitated straight cutting the crop, due to the risk of winds blowing the swaths.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Andrew, AB**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Hysyn 111	109	32.0	121	41.4	962	83
Hysyn 120 CS	101	29.7	104	44.3	962	83
Reward	**100**	**29.4**	**108**	**43.3**	**962**	**83**
Foothills	96	28.3	96	42.1	962	83
LSD		1.79		0.72		
CV %		4.8		1.3		

Discussion: Despite the hot and dry conditions, crop yields were relatively good because of timely rains. Hysyn 111 was the only variety that yielded significantly higher than the check (Reward). Hysyn 120 CS produced higher oil contents than the check and Hysyn 111 and Foothills were significantly lower.

WANHAM

Observations: See Site Information page 42 : Wanham for effects of climate and insect pests at this site. This trial was seeded May 2 (soil temperature 17^{o}C, at 1 inch). Emergence was very poor and uneven due to dry soil conditions. All blocks were roughly equally affected. Weed pressure was light, and the predominant weeds were volunteer wheat, barley, stinkweed, and hempnettle. All plots were sprayed with Poast (130 ml/ac), Muster (8 g/ac), and Lontrel (227 ml/ac) on June 4. No significant rain was ever received at this site during the growing season. The highest rainfall amount was 20mm on June 19 which was immediately followed by hot dry winds, reducing the useful moisture rapidly. This rainfall event did trigger a new flush of germination. Maturities were delayed by the hot weather as it affected chlorophyll clearing. It would appear that the moisture level in the seed was so low that the enzymes that normally clear the chlorophyll were inactivated. Seed moisture content at harvest was in the 6% range (very dry). The plots were at 30-40% seed colour change on August 4. A short thin crop necessitated straight combining to reduce the risk of wind blown swaths. The long period between maturity date and combining (September 4) was due to the extremely slow rate of chlorophyll clearing brought about by the dry conditions. Unlike the *B. napus* varieties, at this site, green seed contents were eventually reduced to less than 2%.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Wanham, AB**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Hysyn 120 CS	137	15.7	9.22	40.6	1381	93
Hysyn 110	130	14.9	(.06)	39.9	1381	93
Foothills	101	11.8	(17.48)	40.0	1381	93
Reward	**100**	**11.4**	**(14.86)**	**39.8**	**1381**	**93**
LSD		2.69		0.87		
CV %		15.8		1.6		

Note: Brackets in the contribution margin reflect a negative value

Discussion: Maturities were affected (93 days versus 85 days at the Rolla site) by the hot dry growing conditions. The yield results were compromised by the

growing conditions and these results are not necessarily indicative of any individual varietys' potential. Note that the growing degree days (GDD's) were much higher this year than has been "normal" for the Peace Region (normal approx. 1000 GDD's), as a result of the hot weather. Both Hysyn 110 and Hysyn 120 CS were significantly higher yielding than either Foothills or the check variety (Reward).

ROLLA

Observations: Plots were seeded May 6 (soil temperture 15^{o} C, at one inch). Emergence was rapid and even. Weed pressure was moderate. Predominant weeds were hemp-nettle, wild buckwheat, and wild oats. The plots were sprayed with Muster Gold (20 ac/cs) and Lontrel (225 ml/ac) on May 28. Weed control was excellent. The site received timely and adequate rainfall to ensure good growth of the canola. On August 3 a severe hail storm with high winds and rain inundated the site. The plots were swathed on July 30. Shelling occurred on the top surface of the swaths. Some swaths were wind blown within the plots. Yield losses were estimated at 10-15%.

Results:

***B. RAPA* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Rolla, BC**						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Reward	**100**	**29.7**	**106.29**	**43.3**	**877**	**85**
Foothills	95	28.2	91.29	42.4	877	85
Hysyn 110	95	28.2	87.94	42.7	877	85
Hysyn 120 CS	90	26.7	75.99	43.0	877	85
LSD		2.15		0.45		
CV %		5.9		0.8		

Discussion: Yields were reduced by the hail storm on August 3. All varieties graded number 1. Nonetheless, the yields are respectable and show good return to investment (contribution margins). Reward (check variety) produced the highest yield, and was significantly higher than Hysyn 120 CS. Differences in oil contents were not significant.

Western Canadian Summary:

Significant differences in yield, contribution margins, 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. Some varieties, common to a number of sites, did however consistently yield lower than the check variety AC Excel. Certain varieties (eg. high erucic acid rapeseed) may have speciality oil contracts. Therefore please check on specific premiums associated with those varieties.

Differences among *B. rapa* varieties were much smaller at most sites in terms of yield, contribution margins, maturity and oil contents.

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

VIII 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 should consider such characteristics as lodging, harvestability and yield. Harvestability is the measurement of swathing and combining ease. Currently, there is no standardised scientific measurement for harvestability. Therefore, a qualitative assessment is used.

Methodology: Harvestability was evaluated as swathing and combining was completed on the variety trial. Each variety was swathed and evaluated on a scale of 1 to 5, compared to the Check which was rated a 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. The check variety for *B. napus* is AC Excel and for *B. rapa* is Reward.

Ratings:
1 = much better than Check
2 = better than Check
3 = Check
4 = Worse than Check
5 = Much worse than Check

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

A. B. napus

CARMAN

Observation: The individual plant heights ranged from 3.5 to 5 feet. The majority of the varieties lodged badly, due to a combination of rains and high winds in late July and early August. This made both swathing and combining difficult due to swath bunching. The plots were swathed with a 22' Versatile 4400 swather equipped with a pickup reel, and harvested with a Gleaner N5 combine.

Results:

HARVESTABILITY TRIAL
B. napus
Carman, MB

Variety	Lodging Ratio	Swathing Rating	Combinability Rating
45A71	.53	3	4
46A73	.47	3	2
46A74	.52	2	2
AC Excel	.46	3	3
Battleford	.38	4	3
Castor	.51	4	3
Exceed	.53	2	2
Goliath	.28	3	2
Hyola 401	.74	2	2
Hy-Per Star 100	.69	3	5
IMC 104	.53	3	1
IMC 105	.51	3	4
InVigor 2153	.39	2	3
InVigor 2163	.43	3	3
Millenium	.38	3	2
Option 500	.42	3	3
Q2	.61	2	4
Quantum	.59	3	3
Quest	.43	4	4
SW Arrow	.53	3	3
Synbrid 220	.69	2	4
Trailblazer	.54	3	2

Discussion: The severity of the lodging at this site is evidenced by the high number of varieties with a lodging ratio less than 0.5. The swathability was largely

related to the degree of lodging, since some of the more severely lodged plots had a canopy height of only 1 foot or less. This made it very difficult to cut under the pods and increased swathing time considerably. The combinability was related more to the amount of plant material which had to be put through the machine.

RUSSELL

Observation:

The plots were swathed with an 18' Versatile 400 swather equipped with a bat reel, and harvested with a John Deere 9600 combine. The crop canopy was moderate to light with no significant amount of lodging. The differences in ratings would be mainly due to the amount of plant material being passed through the equipment.

Results:

HARVESTABILITY TRIAL
B. napus
Russell, MB

Variety	Lodging Ratio	Swathing Rating	Combinability Rating
45A71	.68	3	2
46A73	.86	3	3
46A74	.80	3	3
AC Excel	.73	3	3
Battleford	.80	2	2
Castor	.79	3	2
Exceed	.66	3	3
Goliath	.77	3	3
Hyola 401	.86	2	2
Hy-Per Star 100	.94	3	3
IMC 104	.74	2	3
IMC 105	.78	2	3
InVigor 2153	.49	3	3
InVigor 2163	.60	2	2
Millenium	.69	3	2
Option 500	.74	3	3
Q2	.73	3	3
Quantum	.76	2	3
Quest	.64	3	3
SW Arrow	.60	3	2
Synbrid 220	.90	3	4
Trailblazer	.86	3	3

Discussion: As mentioned the relatively light canopy and little if any lodging made for few problems with swathing or combining. Ratings were generally a reflection of plant height and canopy density.

WHITEWOOD

Observation: Visual characteristics such as height, straw stiffness, branching and initial podding height (refer to drawing) were observed among the *B. napus* varieties. Although pick-up reels were used, there was a distinct leaning of the crop to the east which made swathing in that direction more difficult. Uniformity of the stand did, however, vary within a given treatment. Lower lying areas had considerably more plant material than elevated areas. This resulted in some tendency to clump at swathing and reduced speed at combining.

Results:

HARVESTABILITY TRIAL
B. napus
Whitewood, SK

Variety	Swathing Rating	Combinability Rating
Trailblazer	3	3
Hyola 401	2	3
Magnum	3	3
IMC 03	3	3
Clavet	3	3
Option 500	4	3
LG3333	3	3
Ebony	4	3
Q2	4	3
Synbrid 220	4	3
LG3369	3	3
Castor	2	3
AC Excel	3	3
IMC 104	3	3

Discussion: There were notable differences in the harvestability of a number of the *B. napus* varieties. Crop characteristics such as the amount of plant material, straw stiffness and initial podding height contributed to the differences in swathability. The taller, stiffer stemmed varieties (Synbrid 220, Ebony, Q2 and Option 500) were harder to swath. They had a tendency to hang up in the throat of the swather in low-lying areas. Castor and Hyola 401 were notably shorter with the podding zone lower on the plant. These characteristics resulted in a better swathability rating.
In terms of combinability, ratings were equal. Although excessive plant material, in low-lying areas, slowed the speed of the combine by approximately ½ mile hour, the threshabilty remained relatively constant.

NAICAM

Observation: Differences in characteristics such as height, straw stiffness, branching and initial podding height were observed. Lodging was not an issue. There was a distinct leaning of the crop to the east which made swathing in that direction more difficult. Uniformity of the stand varied within the treatment. Low lying areas had considerably more plant material than elevated areas.

Results:

HARVESTABILITY TRIAL *B. napus* Naicam, SK		
Variety	**Swathing Rating**	**Combinability Rating**
Ebony	4	3
Q2	3	3
LG3369	3	3
Clavet	3	3
IMC03	3	3
Magnum	3	2
LG3333	4	3
AC Excel	3	3
Option 500	3	3
IMC 104	3	2
Goliath	3	3
Hy-Per Star 100	4	3
Synbrid 220	3	3
Castor	3	3

Discussion: There were notable differences in the harvestability of a number of the *B. napus* varieties. Crop characteristics such as the amount of plant material, straw stiffness and initial podding height contributed to the differences in swathability. The taller (Ebony) and stiffer stemmed (Hy-Per Star 100 and LG3333) varieties were harder to swath. They had a tendency to hang up in the throat of the swather in low-lying areas. IMC 104 and Magnum had better combinability ratings due to threshability.

LETHBRIDGE DRYLAND

Observation: Lodging was minimal in this trial. Plant height was taller than in previous seasons at this site. This created flowability problems in all varieties.

Results:

HARVESTABILITY TRIAL *B. napus* Lethbridge Dryland, AB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
AC Excel	.91	3	3
Battleford	.92	2	2
Ebony	.90	2	2
Hyola 401	.85	2	2
IMC 104	.94	2	2
IMC 105	.89	3	3
LG3333	.92	1	2
Synbrid 220	.93	2	2

LETHBRIDGE IRRIGATION

Observation: Lodging at the site was minimal. Most of the varieties had shorter straw, which eased swathing.

Results:

HARVESTABILITY TRIAL *B. napus* Lethbridge Irrigation, AB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
AC Excel	.90	3	3
Battleford	.80	2	3
Ebony	.90	2	2
Hyola 401	.90	2	2
Hy-Per Star 100	.90	2	3
IMC 104	.90	2	2
IMC 105	.90	3	2
LG3333	.90	2	2
Synbrid 220	.90	2	2

INNISFAIL

Observation: Lodging in this trial was variable among the varieties. This created swathing problems with flowability, speed of swathing and clumping. This in turn created combining problems with regards to speed and flowability.

Results:

HARVESTABILITY TRIAL *B. napus* Innisfail, AB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
AC Excel	.64	3	3
Battleford	.73	2	3
Castor	.63	3	3
Clavet	.61	3	2
Hyola 401	.75	2	3
Hy-Per Star 100	.82	2	3
Option 500	.67	3	2
Synbrid 220	.65	3	2

Discussion: The results show that the majority of the newer varieties are better than the check with regards to swathing and combining. All varieties were at least equal to the check.

ANDREW

Observation: Because of the heat and relatively dry conditions over the growing season, all varieties stood up well. Consequently, all varieties were harvested relatively easily.

Results:

HARVESTABILITY TRIAL
B. napus
Andrew, AB

Variety	Lodging Ratio	Swathing Rating	Combinability Rating
AC Excel	.87	3	3
AC Excel Straight Cut			3
Battleford	.88	3	3
Castor	.83	4	3
Clavet	.84	3	3
Hyola 401	.89	2	2
Hyola 401 Straight Cut			2
IMC03	.83	3	3
IMC104	.85	3	3
IMC105	.91	3	3
Option 500	.84	3	3
Synbrid 220	.91	3	3
Synbrid 220 Straight Cut			4

Discussion: Because of the hot and dry growing conditions, all varieties harvested easily during swathing and combining. There was a slight advantage for Hyola 401 due to the short nature of the canopy and less biomass that is processed during harvest. However, 3 varieties (AC Excel, Synbrid 220 and Hyola 401) were also straight cut and there were differences between these varieties. Hyola 401 was superior to AC Excel, which was in turn easier than Synbrid 220. Differences in harvesting during straight cutting were due to the amount of biomass produced, the stiffness of the straw, and the moisture retained in the stems.

WANHAM

Observation: Drought conditions contributed to poor emergence, short plants and a thick uneven plant stand. Plant heights ranged from 56-82 cm which are well below normal for the species. The uneven plant stand made swathing difficult. Uneven swaths made combining a challenge.

Results:

HARVESTABILITY TRIAL
B. napus
Wanham, AB

Variety	Lodging Ratio	Swathing Rating	Combinability Rating
AC Excel	.91	3	3
Castor	.91	3	3
Clavet	.92	3	3
Goliath	.85	4	4
Hyola 401	.84	2	2
Hy-Per Star 100	.91	3	4
Option 500	.95	2	3
Synbrid 220	.91	2	4

Discussion: Lodging ratios are close to 1. This indicates that there was very little lodging, which is a function of the short growth resulting from the drought conditions at this site. The primary problem was the uneven stand due to poor emergence. With the exception of Goliath, all varieties were equal to or better than AC Excel in swathing characteristics. Goliath, Hy-Per Star 100, and Synbrid 220 were more difficult to combine than the check, while Hyola 401 was better than the check.

ROLLA

Observation: Plant heights range 96-125 cm. Tall plant growth at this site lead to increased plant leaning and thus lower lodging ratios.

Results:

HARVESTABILITY TRIAL *B.* Rolla, BC			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
AC Excel	.51	3	3
Hyola 401	.63	2	2
Option 500	.62	2	2

Discussion:

While harvestibility is a very subjective evaluation, there is no disputing the differences in ease of operation, experienced by the operator of the equipment, when swathing and combining. The primary factor in swathing is evenness of stand (height and density). When combining, this evenness of stand usually translates into an even swath that feeds smoothly. Any difficulties when swathing are magnified at combining time. At the Rolla site leaning (away from the prevailing westerly winds) was pronounced, but the stands were even and could be swathed readily without difficulty.

B. B. rapa

RUSSELL

Observation: The growth of the varieties was very similar and no differences were noted. The crop canopy was not very heavy and little lodging occurred which made swathing and combining relatively easy.

Results:

HARVESTABILITY TRIAL *B. rapa* Russell, MB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
Hysyn 111	.79	3	3
Reward	.76	3	3

Discussion: There was little difference in the growth habit of these varieties, and no differences in harvestability were observed.

WHITEWOOD

Observation: There was little difference in terms of plant characteristics among varieties.

Results:

HARVESTABILITY TRIAL *B. rapa* Whitewood, SK		
Variety	**Swathing Rating**	**Combinability Rating**
Hysyn 110	3	3
Reward	3	3
Foothills	3	3

Discussion: There were no differences in harvestablity among the varieties.

NAICAM

Observation: There was little difference in plant characteristics among the varieties. With the crop leaning to the east, swathing was more difficult.

Results:

HARVESTABILITY TRIAL *B. rapa* Naicam, SK		
Variety	**Swathing Rating**	**Combinability Rating**
Hysyn 110	3	3
Reward	3	3
Foothills	3	3

Discussion: There were no differences in harvestablity among the varieties.

LETHBRIDGE DRYLAND

Observation: Lodging was minimal and no problems were observed during swathing and combining.

Results:

HARVESTABILITY TRIAL *B. rapa* Lethbridge Dryland, AB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
Foothills	.98	3	3
Hysyn 111	.98	3	3
Hysyn 120 CS	.98	3	3
Reward	.98	3	3

Discussion: No differences were observed.

LETHBRIDGE IRRIGATION

Observation: Although heavily lodged, no discernible differences could be seen between the check and Hysyn 120 CS when swathed or combined.

Results:

HARVESTABILITY TRIAL *B. rapa* Lethbridge Irrigation, AB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
Hysyn 120 CS	.46	3	3
Reward	.48	3	3

Discussion: No differences were observed.

INNISFAIL

Observation: Although lodging was evident in all treatments no differences were found in swathing or combining.

Results:

HARVESTABILITY TRIAL *B. rapa* Innisfail, AB			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
Foothills	.79	3	3
Hysyn 111	.73	3	3
Hysyn 120 CS	.62	3	3
Reward	.67	3	3

Discussion: No differences were observed.

ANDREW

Observation: Due to the heat and drought in the early growing season, all the varieties were quite short. Consequently, the varieties were left for straight cutting, due to the risk of wind damage to swaths.

Results:

HARVESTABILITY TRIAL *B. rapa* Andrew, AB		
Variety	**Lodging Ratio**	**Combinability Rating**
Foothills	.95	3
Hysyn 111	.93	3
Hysyn 120 CS	.94	3
Reward	.96	3

*Note: All varieties were straight cut at this site because of short crop.

Discussion: The amount of biomass produced was low for all varieties. The crops were erect and harvest was relatively easy, with no differences among the varieties.

WANHAM

Observation: Due to the heat and drought during the growing season, all the varieties were quite short. Consequently, the varieties were left for straight cutting, due to the risk of wind damage to swaths.

Results:

HARVESTABILITY TRIAL *B. rapa* Wanham, AB		
Variety	**Lodging Ratio**	**Combinability Rating**
Foothills	.80	3
Hysyn 110	.80	3
Hysyn 120 CS	.80	3
Reward	.80	3

Discussion: Due to the uneven plant stand, it was not possible to discriminate between the varieties on the basis of combinability ratings. They were all equally affected by the growing conditions. Thus particular variety growth habits were not expressed.

ROLLA

Observation: The *B. rapa* varieties grew well and were reasonably tall (range 108-126 cm., very similar to the *B. napus* varieties). Leaning away from the prevailing winds led to about a 45 degree angle of repose for Reward and Hysyn 120 CS, and about a 30 degree angle for Foothills and Hysyn 110. Initial podding height was typically about 20cm from the ground. Ease of swathing was related to stand density and lodging.

Results:

HARVESTABILITY TRIAL *B. rapa* Rolla, BC			
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**
Foothills	.44	4	3
Hysyn 110	.44	4	3
Hysyn 120 CS	.46	3	3
Reward	.54	3	3

Discussion: At this site lodging was considerable, but the stands were even and could be swathed readily without difficulty. Combining was made difficult due to wind blown swaths.

Western Canadian Summary:

While harvestability is a very subjective evaluation, there is no disputing the differences in ease of operation, experienced by the operator of the equipment, when swathing and combining. Some varieties (eg Hyola 401) were consistently easier to harvest at most locations. The primary factor in swathing is uniformity of stand (height and density). When combining, this usually translates into an even swath that feeds smoothly. Any difficulties when swathing can be magnified at combining time.

IX SEED TREATMENT TRIAL – (FOUNDATION)

Objective: To evaluate the impact of seed treatments on agronomic characteristics of canola such as yield, quality and contribution margins.

Background: Canola producers have been asking a number of questions about seed treatments and polymer coatings with regards to: germination, ease and safety of handling, and the benefits of disease and insect control. Polymers increase the safety to producers, treaters and retailers by reducing dust during handling. The polymer results in a more even seeding rate, due to the smooth flow of seed.

Methodology: The seed treatment trial consisted of 2 treatments:

A) Foundation (Check)
B) Foundation plus Polymer

Variety used was AC Excel (*B. napus*)

RUSSELL

Observations: This trial was seeded May 17 into good soil moisture which resulted in quick emergence. No flea beetles or disease symptoms were evident. There were no visible differences observed during the growing season.

Results:

SEED TREATMENT TRIAL - (FOUNDATION)
Russell, MB

Treatment	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Foundation	18.6	(11.05)	42.7
Foundation + Polymer	18.0	(15.69)	42.7
LSD	3.72		1.22
CV%	12.2		1.7

Note: Brackets in the contribution margin reflect a negative value

Discussion: No significant differences in yield, oil content or economic return were observed. Most of the stresses on this crop were related to environmental conditions and weeds, rather than disease or insect pressure.

WHITEWOOD

Observations: This trial was seeded May 8 at 6.5 lb/ac, with a soil temperature of 14.4ºC. Emergence took place on May 22. Plant counts (m^2) were taken at 4, 13 and 25 days after emergence (DAE).

Results:

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

SEED TREATMENT TRIAL - (FOUNDATION) Whitewood, SK			
Treatment	**4 DAE**	**13 DAE**	**25 DAE**
Foundation	46	84	96
Foundation +Polymer	67	104	101

DAE = Days After Emergence

Table 2. Yield, contribution margin and seed quality

SEED TREATMENT TRIAL - (FOUNDATION) Whitewood, SK			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Foundation	28.6	41.12	46.4
Foundation + Polymer	29.8	49.99	47.1
LSD	1.51		0.91
CV%	3.1		1.2

Discussion: There were no significant differences in yield or oil content. Four days after emergence plant counts were 46% higher for the polymer coating. This advantage dropped to 5%, 23 days after emergence. Contribution margins reflect yield variation and the cost of the polymer coating.

NAICAM

Observations: This trial was seeded May 13 at 6.5 lb/ac, with a soil temperature of 18.0ºC. A heavy rainfall on May 17 caused soil compaction. Emergence took place on May 21. Plant counts (m^2) were taken at 4 and 16 days after emergence (DAE).

Results:

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

SEED TREATMENT TRIAL - (FOUNDATION) Naicam, SK		
Treatment	**4 DAE**	**16 DAE**
Foundation	19	30
Foundation +Polymer	23	36

DAE = Days After Emergence

Table 2. Yield, contribution margin and seed quality

SEED TREATMENT TRIAL - (FOUNDATION) Naicam, SK			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Foundation	22.7	3.96	44.1
Foundation + Polymer	26.4	31.58	44.2
LSD	9.35		0.51
CV%	16.0		0.5

Discussion: There were no significant differences in yield or oil content. Plant counts were 20% higher in the polymer coating up to 16 days after emergence. Contribution margins reflect yield variation and the cost of the polymer coating.

INNISFAIL

Observations: This site was seeded May 7. Emergence was slow and patchy in both treatments due to dry conditions. Once rain was received emergence improved. No visible differences between treatments were observed. Maturity was the same for both treatments.

Results:

SEED TREATMENT TRIAL - (FOUNDATION) Innisfail, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Foundation	30.7	37.25	45.4
Foundation + Polymer	32.0	46.99	46.0
LSD	11.43		0.93
CV%	15.5		1.2

Discussion: There were no significant differences in yield or oil content between treatments. There was no maturity difference between treatments.

ANDREW

Observations: There were no differences in time or rate of crop emergence. Crop growth and development were identical throughout the growing season.

Results:

SEED TREATMENT TRIAL- (FOUNDATION) Andrew			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Foundation	40.5	187	41.5
Foundation + Polymer	39.4	179	40.7
LSD	0.81		1.83
CV%	1.2		2.7

Discussion: Net yield and oil content were slightly lower with the polymer treatment.

WANHAM

Observations: The site was seeded May 2. Emergence began on May 11 and plant counts were carried out 9, 19 and 28 days after emergence. Crop growth and development were limited by dry conditions. (see Site Information: Rainfall). Lygus bugs caused severe bud blasting through the period May 20 to June 19. Bertha armyworms were found to be present at the site in numbers above threshold levels (greater than 20 larvae per sq. metre) and were sprayed on July 15.

Results:

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

SEED TREATMENT TRIAL - (FOUNDATION) Wanham, AB			
Treatment	9 DAE	19 DAE	28 DAE
Foundation	100	106	94
Foundation + Polymer	98	101	95

DAE = Days After Emergence

Table 2. Yield, contribution margin and seed quality

SEED TREATMENT TRIAL - (FOUNDATION) Wanham, AB			
Treatment	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Foundation	17.1	12.44	42.5
Foundation + Polymer	17.7	18.82	42.1
LSD	3.20		0.89
CV%	11.2		1.2

Discussion: Yields were limited by climatic conditions at this site. There were no significant differences in yield or oil content between the treatments.

ROLLA

Observations: The plots were seeded on May 6. Emergence took place on May 17 and plant counts were carried out at 4, 12 and 18 days after emergence. Plant establishment was ideal and good growth of all plots was noted. A hail storm on Aug. 3 damaged the plants while they were still standing.

Results:

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

SEED TREATMENT TRIAL - (FOUNDATION) Rolla, BC			
Treatment	4 DAE	12 DAE	18 DAE
Foundation	178	184	184
Foundation + Polymer	168	180	180

DAE = Days After Emergence

Table 2. Yield, contribution margin and seed quality

SEED TREATMENT TRIAL - (FOUNDATION) Rolla, BC			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Foundation	38.0	93.37	41.7
Foundation + Polymer	39.0	99.12	41.3
LSD	2.18		1.06
CV%	3.4		1.5

Discussion: There were no significant differences in yield or oil content between treatments.

Western Canadian Summary:

There were no significant differences in yield or oil content with the addition of the polymer coating on Foundation treated seed. The polymer coating did not hamper emergence. Yield differences were related to environmental conditions and weed populations, rather than disease and insect pressure. The major benefits of the polymer seed coating are related to safety and ease of handling.

X SEEDING DATE & TIME OF WEED REMOVAL TRIAL

Objective: To compare the effects of various seeding dates and time of weed removal on yield and quality of canola.

Background: High yielding canola varieties require a long growing season to reach their full production potential. Early seeding has not been popular because danger of the increased risk of yield and quality reduction due to spring frost, cold soil temperatures and poor weed control. Cold soil temperatures will reduce and delay germination. Since canola is slow growing and slow to cover the ground in the early growth stages, it is not a strong weed competitor. Research at the University of Manitoba, Agriculture and Agri-Food Canada at Beaverlodge, along with trials conducted by the Canola Council has shown that early seeded canola that has undergone a hardening process can withstand some frost. The advancement of herbicide tolerant canola varieties has increased weed control options. Previously, many winter annual weeds have been controlled by delayed seeding and tillage. Early seeding programs would offer producers in the short season growing areas the opportunity to take advantage of disease, root maggot resistance and other advantages of high yielding canola varieties. Producers in long growing seasons could see the advantage of flowering occurring prior to major heat stress. Weed removal and the proper time to remove them has been a constant source of frustration to producers across western Canada. Work conducted by Harker, et al (Agriculture & Agri-Food Canada), has shown the economic benefits of removing weeds early in the crop's development.

Methodology: The seeding date trial and weed removal trial consisted of the following treatments:

A) Early seeding date and early spray (1 - 3 leaf stage)
B) Early seeding date and normal spray (4 - 6 leaf stage)
C) Normal seeding date and early spray (1 - 3 leaf stage)
D) Normal seeding date and normal spray (4 - 6 leaf stage)
E) Late seeding date and early spray (1 - 3 leaf stage)

Novel Trait Variety Quest was used for all *B. napus* trials

RUSSELL

Observations: The early seeding date was up to 2 ½ weeks ahead of the majority of canola in the area. Fertilizer was banded for the entire trial prior to the early treatment. Emergence was uniform for the early and normal treatments but a little uneven for the late treatment. This was a result of dry conditions throughout the first 3 weeks of May which reduced soil moisture. At the end of May, the site received several nights of frost (approximately -3 to -7°C). The early seeded canola was at the 2-3 leaf stage during this cold period while the normal treatment was at the 1-2 leaf stage. The late treatment had just started to emerge, with most of the plants still just below the soil surface. An assessment was made several days after the frost to see the full extent of the damage. Almost all plants showed signs of leaf damage. However, the growing points of the majority

of the plants survived and eventually recovered, although development was delayed by about a week. Some mortality did occur but plant populations were high enough not to warrant reseeding. As a result, both of the early seeded treatments had the herbicide applied at the 4-6 leaf stage. This herbicide application was delayed to allow the plants to recover from the frost. The majority of the weed pressure came from wild oats, wild mustard and Canada thistle. The weeds seemed to be less affected by the frost and gave considerable pressure until herbicides were applied. Sclerotinia petal test kits were used on each treatment to assess the risk of sclerotinia. Rovral flo was applied at 50% bloom for the normal treatment (target application for 30% was delayed due to rain). The early and late treatments had low petal infections that did not justify the fungicide application. However, due to the arrangement of the plots, the early treatment was sprayed at the latter part of flowering and the late treatment at 10% bloom. At swathing time, no significant levels of sclerotinia were visible in any of the treatments.

Results:

SEEDING DATE & TIME OF WEED REMOVAL TRIAL
Russell, MB

Treatment	Seeding Date	Swath Date	Combine Date	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Early (4-6)	May 1	Aug. 7	Sept. 10	25.7	48.7	63.55
Normal (1-3)	May 13	Aug. 11	Sept. 10	25.4	47.0	61.30
Normal (4-6)	May 13	Aug. 11	Sept. 10	18.0	45.6	5.80
Late (1-3)	May 25	Aug. 27	Sept. 10	13.9	45.6	(24.95)
LSD				2.13	1.03	
CV %				8.4	1.7	

Note: Brackets in the Contribution Margin reflect a negative value

Discussion: Yield, oil content and contribution margin were all reduced by delayed seeding, in spite of the frost damage in the earlier seeded treatments. The differences were significant between each seeding date. The staging of the herbicide application was also critical, since spraying at the 1-3 leaf stage produced significantly higher yield, economic return and oil content than spraying at 4-6 leaves. The heavy weed pressure at this site increased the magnitude of these differences. These results emphasise the importance of timing of management practices. Since there are no additional variable costs related to changes in timing, each additional bushel is more money in your pocket.

WHITEWOOD

Observations: The early seeding treatments were seeded at least two and a half weeks ahead of the majority of canola in the area. No pre-seeding burn off was needed due to the lack of weed pressure in the early seed treatments. A pre-seeding burn off using Roundup (½ L/ac) was need for the late

seeding date treatment. On the day of seeding soil temperatures fluctuated between 5ºC in the morning and 20.1ºC in the late afternoon for the early seeded treatments. Air temperatures dipped below the freezing point for a number of nights in the first week of May. The early seeded treatments did not emerge until May 11. Emergence was poor on the late seeded treatments due to soil compaction and cold soil temperatures. Two days after seeding 1½" of rain fell in a half-hour, which caused soil compaction of the late seeded treatment. It was observed approximately 14 days later that the germinating shoots had grown to within a half inch of the soil surface, grew sideways and then down. These shoots measured up to 3½ inches. Weed pressure was severe at the time of spraying. The predominant weeds were Canada thistle, volunteer barley, wild buckwheat, stinkweed and hemp-nettle. Weed control was good for all treatments. The early seeded treatments flowered for the longest period of time.

Results:

SEEDING DATE & TIME OF WEED REMOVAL TRIAL
Whitewood, SK

Treatment	Seeding Date	Swath Date	Combine Date	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Early (1 - 3)	April 23	Aug 5	Aug 27	33.8	48.7	134.38
Early (4 - 6)	April 23	Aug 5	Aug 27	31.7	48.8	118.93
Normal (1 - 3)	May 8	Aug 10	Aug 27	28.2	47.0	92.68
Normal (4 - 6)	May 8	Aug 10	Aug 27	25.6	47.7	73.18
Late (1 - 3)	May 25	Sept 4	Sept 15	10.2	44.0	(51.60)
LSD				2.30	0.69	
CV %				7.0	1.2	

Note: Brackets in the Contribution Margin reflect a negative value

Discussion: Contribution margins reflect differences in yield and applications of Roundup Transorb. When comparing time of weed removal, weeds removed at the 4-6 leaf stage in the normal seeding date treatments had a significant yield reduction. Early (1-3 leaf stage) time of weed removal treatments were better able to utilise available moisture and nutrients than the late time of weed removal treatments. When comparing dates of seeding, there was a significant difference in yield and oil among all treatments. Yield and oil content was highest in the early seeded treatments.

NAICAM

Observations: The early seeding date treatments were seeded up to 10 days ahead of

the majority of canola seeded in the area. Emergence was even for all treatments. Weed pressure was not an issue until mid May. An application of Roundup (½ L/ac) was applied at this time. The late seeding date treatment received a second application of Roundup on June 10. All treatments received a ½ L/ac in crop application of Roundup Transorb. Predominant weeds included Canada thistle, volunteer barley, wild oats, stinkweed and wild mustard and their densities were low. Weed control was good for all treatments. Early seeded treatments flowered the longest.

Results:

SEEDING DATE & TIME OF WEED REMOVAL TRIAL
Naicam, SK

Treatment	Seeding Date	Swath Date	Combine Date	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Early (1 - 3)	May 4	Aug 11	Sept 8	36.4	47.2	156.86
Early (4 - 6)	May 4	Aug 11	Sept 8	36.2	47.3	155.36
Normal (1 - 3)	May 21	Aug 24	Sept 8	32.9	45.6	130.61
Normal (4 - 6)	May 21	Aug 24	Sept 8	32.5	46.2	127.61
Late (1 - 3)	June 12	Sept 10	Sept 22	20.6	45.2	33.25
LSD				1.63	0.87	
CV %				4.1	1.5	

Discussion: Contribution margins reflect differences in yield and applications of Roundup Transorb. Due to light weed infestation there was no significant advantage to early weed removal. Early dates of seeding gave significantly higher yields and oil content.

LETHBRIDGE DRYLAND

Observation:

A single in crop application of Roundup Transorb was used in all applications at 0.5 L/ac. Prior to spraying, three ¼ m^2 samples of weeds per rep were hand picked, dried and weighed to determine weed biomass.

The weed pressures were light. The predominant weeds were volunteer cereals and stinkweed. The onset of flowering was delayed by 1-2 days in the early seed (4-6) and the normal (1-3). Blossom blast was seen across all treatments. Lygus bugs and diamondback moths were evident in all treatments, but numbers did not warrant spraying. Cabbage seed pod weevil damage was observed in all seeding dates but was highest in the early seeding dates. No threshold levels for the cabbage seed pod weevil have been established at this time.

A difference of 10 days between early and normal seeding dates narrowed to 6 days at harvest. Similarly the 13 day gap between normal and late seeding narrowed to 2 days.

Results:

SEEDING DATE & TIME OF WEED REMOVAL TRIAL
Lethbridge Dryland, AB

Treatment	Seeding Date	Swath Date	Combine Date	Growing Degrees Days	Weed Biomass (lbs/ac)	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Early (1 - 3)	April 21	July 30	Aug 25	1061	26.7	28.1	45.8	109.03
Early (4 - 6)	April 21	July 30	Aug 25	1061	37.0	28.0	45.6	108.06
Normal (1 - 3)	May 1	Aug 5	Aug 25	1035	37.0	25.4	46.8	93.45
Normal (4 - 6)	May 1	Aug 5	Aug 25	1035	44.6	26.4	47.0	96.79
Late (1 - 3)	May 13	Aug 7	Aug 25	993	35.5	25.0	46.7	86.30
LSD						2.07	0.74	
CV %						6.2	1.3	

Discussion:

Spraying stage had no significant impact on yield or oil content within a specific seeding date. Early seeding dates resulted in significantly higher yields. The impact of spray date is less significant under light weed pressure. Oil content increased significantly with later seeding dates.

ANDREW

Observations: Because of the dry conditions, crop emergence was uneven. The normal and late seeding treatments were at a disadvantage because of the progressively drier soil conditions throughout May and June. Differences in crop development were evident among all treatments throughout the growing season.

Results:

SEEDING DATE & TIME OF WEED REMOVAL TRIAL
Andrew, AB

Treatment	Seeding Date	Swath Date	Combine Date	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Early (1 - 3)	April 28	Aug 7	Aug 31	33.8	44.3	140
Early (4 - 6)	April 28	Aug 7	Aug 31	33.3	44.5	137
Normal (1 - 3)	May 8	Aug 9	Aug 31	34.7	43.9	147
Normal (4 - 6)	May 8	Aug 12	Aug 31	34.3	43.8	144
Late (1 - 4)	May 18	Aug 17	Aug 31	32.4	42.1	130
LSD				1.96	0.53	
CV %				4.6	1.0	

Discussion: Although growing conditions throughout the season suggested an advantage for the earlier seeding dates, and the earlier time of weed removal, there was no yield advantage for the early over the normal seeding dates at this site. However, the late seeding was lower yielding than the normal seeding date. Oil contents were highest in the early seeding dates and lowest in the late seeding date.

WANHAM

Observations: (See Site Information page 42 for climate conditions at this site). No spraying took place before seeding. Soil moisture conditions were limiting through all seeding dates. Following the late seeding date, the site received 20 mm of rain, which resulted in better emergence for this treatment (and a new flush of emergence in the other treatments). Prior to the emergence of the late seeding date treatment, large numbers of lygus bugs were observed feeding on the early and normal seeding date treatments. This feeding damage continued on all treatments until the site was sprayed (Lorsban 500 ml/ac) for bertha armyworms and lygus bugs on July 15.

Weed information was gathered just prior to spraying (0.5 L/ac of Roundup Transorb) at the appropriate leaf stage for each treatment. Three ¼ m^2 counts were carried out for grassy and broadleaf weeds for each plot. The counted weeds were bagged and dried (21^oC for 48 hours), and the total dry weight of weeds per square meter recorded.

Weed control was excellent in all cases.
The early and normal seeded plots had adequate emergence numbers, but both sets of plots were held back by drought, lygus bugs, and ultimately bertha armyworms. The rainfall on May 22 resulted in a new flush of emergence in the early and normal seeded plots, which later led to second growth problems and green plant material in the swath.

Results: (a) *Yield and seed quality data*

SEEDING DATE & TIME OF WEED REMOVAL TRIAL Wanham, AB						
Treatment	**Seeding Date**	**Swath Date**	**Combine Date**	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Early (1 - 3)	April 28	Aug 7	Sept 3	19.1	42.0	17.98
Early (4 - 6)	April 28	Aug 7	Sept 3	19.0	41.2	17.48
Normal (1 - 3)	May 12	Aug 7	Sept 3	19.7	41.1	22.51
Normal (4 - 6)	May 12	Aug 7	Sept 3	16.1	40.7	(3.51)
Late (1 - 4)	May 20	Aug 31	Sept 14	35.6	43.4	146.43
LSD CV %				6.33 22.9	0.98 1.8	

Note: Brackets in the Contribution Margin reflect a negative value

Results: ***(b)*** *Weed Data*

SEEDING DATE & TIME OF WEED REMOVAL TRIAL Wanham, AB					
Treatment	**Emerg. Plants/m row**	**Spray Date**	**Broadleaf Weeds # /m^2**	**Grassy Weeds # /m^2**	**Dry Wt. (g/m^2) total**
Early (1 - 3)	135	May 23	32	24	6.2
Early (4 - 6)	125	June 4	20	20	14.9
Normal (1 - 3)	110	June 4	20	24	12.1
Normal (4 - 6)	105	June 10	28	24	27.4
Late (1 - 4)	175	June 10	52	40	47.8

Discussion: Yield differences at this site are primarily due to climatic conditions and insect damage. No conclusion can be drawn with respect to seeding date or time of weed removal.

LETHBRIDGE DRYLAND – B. rapa

Observations: *B. rapa* variety used for this trial was Hysyn 101 RR. Emergence on all treatments was excellent. A single in crop application of Roundup Transorb (½ L/ac) was sprayed on all treatments. Weed pressure was light. A difference of 10 days between early and normal seeding dates narrowed to 3 days at harvest. Similarly the 13 day gap between normal and late seeding narrowed to 2 days. Minimal insect damage was evident on all treatments.

Results:

SEEDING DATE TRIAL
B. rapa
Lethbridge Dryland - Hysyn 101 RR

Treatment	Seeding Date	Swath Date	Combine Date	Growing Degree Days	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Early	April 21	July 21	Aug 26	882	21.1	43.3	60.11
Normal	May 1	July 25	Aug 26	855	16.6	42.1	26.41
Late	May 13	July 27	Aug 26	795	15.9	41.5	21.17
LSD CV %					1.21 5.03	1.27 1.0	

Discussion The early seeding date yielded significantly higher than the normal and late seeding dates. The difference in oil contents was significantly higher in the early seeding treatment as compared to the late seeding treatment.

Western Canadian Summary:

The time of seeding trial showed the trend for yield advantage with early seeding. The exceptions were the Wanham and Andrew sites. Oil content tended to decrease as seeding dates were delayed. These trends have been observed in previous years. Producers considering earlier seeding must realise there are certain risks (eg. cool soil temperatures and frost) and employ appropriate management practices to maximise yield.

The second component of this trial looked at the time of weed removal at various stages of crop development. At low weed densities, there was no yield advantage to early removal. Where densities were higher, there was an economic and yield advantage in removing the weeds early in crop development.

XI FERTILIZER RATE AND VARIETY TRIAL – HYBRID AND OPEN POLLINATED VARIETIES

Objective: To compare various fertilizer rates on yield, quality and contribution margins of hybrid and open pollinated canola using soil test recommendations as a guide.

Background: In a number of field crops, hybrid varieties have a different fertilizer response curve than open pollinated varieties. Growers and researchers suspect that this may also be the case in canola. In the past, fertilizer recommendations were based on research conducted on older open pollinated varieties. The development of high yielding hybrid lines may require additional fertilizer to optimise yield, quality and contribution margin.

Methodology: The fertility treatments for this trial were based on the total nutrient package. (As per protocol provided by AgrEvo). The fertilizer rate trial consisted of 6 treatments:

Hybrid Variety

A) 100% fertility level (available + applied nutrients*)
B) 150% (of treatment A)
C) 200% (of treatment A)

Open Pollinated Varieties

A) 100% fertility level (available + applied nutrients*)
B) 150% (of treatment A)
C) 200% (of treatment A)

* as per soil test recommendations

A. NOVEL TRAIT VARIETIES (HYBRID = INVIGOR 2153 & OPEN POLLINATED = EXCEED)

CARMAN

Observations: For this trial a granular blend of nitrogen, sulphur and part of the phosphate were banded prior to seeding on May 21. The rest of the phosphate was seed-placed (5 lb/ac for the 100% and 150%, 14 lb/ac for the 200%). The amount of nutrients added to achieve each fertility level is as follows:

Fertility Level	Nitrogen		Phosphorus		Potassium		Sulphur	
	Applied	Available +Applied	Applied	Available +Applied	Applied	Available +Applied	Applied	Available +Applied
100%	108	146	18	127	0	1200+	9	91
150%	179	217	18	127	0	1200+	14	96
200%	251	289	27	136	0	1200+	21	103

Note: Available nutrient levels based on soil test results from Enviro-Test Laboratories for consistency with trials in other locations.

The main visual differences were more rapid seedling growth (i.e. faster increase in leaf area) by the hybrid variety. There was also a slight delay in maturity as fertilizer rates increased for both hybrid and open pollinated varieties. Both varieties were Liberty Link varieties and were sprayed with Liberty (1.35 L/ac). The initial weed control was good and some breakthrough of barnyard grass was noted late in the season just prior to swathing. This was likely due to poor crop competition as a result of severe stress from excess moisture at the rosette stage. In fact, the results of only 2 of the 4 reps were salvaged for the report, as flooding caused problems within the other 2 reps.

Results:

FERTILIZER RATE & VARIETY TRIAL Carman, MB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
100% fertility level*			
InVigor 2153	25.4	27.12	43.5
Exceed	23.7	31.65	44.7
150% fertility level			
InVigor 2153	28.0	28.25	41.3
Exceed	21.5	(3.22)	44.1
200% fertility level			
InVigor 2153	26.0	(13.23)	40.2
Exceed	19.4	(45.45)	43.1
LSD for fert. rate	1.24		0.95
LSD for variety	5.05		5.05
CV%	3.4		1.5

Note: Brackets in the Contribution Margin reflect a negative value
* 100% fwertility level = 146N - 127P - 1200+K - 91S

Discussion:

Increasing the levels of available nutrient produced a negative yield response for the variety Exceed. The InVigor 2153 hybrid was better able to take advantage of the additional nutrients, but even its modest yield gains did not increase returns. The InVigor 2153 did consistently out yield the Exceed, though the differences were not statistically significant due to

the variability created by the environmental stresses.

As expected, increases in fertility resulted in significant reductions in oil content. Variety had no significant impact on oil content.

WHITEWOOD

Observations: For this trial, a base application of nitrogen, phosphorous and sulphur was banded (May 4) prior to seeding (May 8), as granular blend. An additional blend of nitrogen, phosphorous and sulphur was seed placed to meet the treatment requirements. Fertility levels are as follows:

Fertility Level	Nitrogen		Phosphorus		Potassium		Sulphur	
	Applied	Available +Applied	Applied	Available +Applied	Applied	Available +Applied	Applied	Available +Applied
100%	73	102	22	39	0	484	15	41
150%	124	153	42	59	0	484	35	62
200%	175	204	59	76	0	484	58	84

Both varieties were Liberty Link varieties. InVigor 2153 was seeded at 5.0 lb/ac and Exceed at 6.5 lb/ac. Two visual ratings, emergence/early season vigour and canopy closure, were evaluated. Emergence/early season vigour was evaluated (InVigor 2153 = 2 and Exceed = 3) on a scale of 1 to 5, with 1 being excellent, 3 being average and 5 being very poor. In terms of canopy closure, on June 4 Exceed covered 10% and InVigor 2153 covered 15% of the ground surface. On June 22, prior to stem elongation, Exceed covered 65% and InVigor 2153 covered 80% of the ground surface. Complete canopy closure occurred on June 25 for InVigor 2153 and June 28 for Exceed. The level of fertility did not have an effect on emergence/early season vigour or canopy closure. A delay in maturity of 2 days (150% treatments) and 4 days (200% treatments) were observed. All treatments were sprayed with a Liberty/Venture tank mix. Initial weed control was good but a second flush of wild oats and volunteer barley was noted midway through the season as the treatments matured.

Results:

FERTILIZER RATE & VARIETY TRIAL Whitewood, SK			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
100% fertility level*			
InVigor 2153	35.4	116.73	47.0
Exceed	26.6	58.21	47.5
150% fertility level			
InVigor 2153	40.3	134.58	44.9
Exceed	32.1	80.57	45.2
200% fertility level			
InVigor 2153	42.3	128.05	44.6
Exceed	35.9	79.66	44.5
LSD for fert. Rate	3.15		0.68
LSD for variety	1.18		0.74
CV%	3.7		1.8

*100% fertility level = 102N – 39P – 484K – 41S

Discussion: Increases in rates of applied fertilizer had a significant impact on yield. InVigor 2153 yielded significantly higher than Exceed at all fertilizer levels. Contribution margins reflect yield differences, seed costs and the cost of applying additional fertilizer. Fertilizer rates were based on the total amount of applied and available nutrients. The 150% above soil test recommendation treatments resulted in the highest economic return. The yield advantages for the 200% above treatments did not compensate for the additional fertilizer cost.

The results also indicate that the increased rates of applied fertilizer have a significant (negative) impact on oil content. This is a commonly observed response to increased fertility.

ANDREW

Observations: The trial was seeded on May 12. All the fertilizer was banded with the drill prior to seeding. Fertility levels were as follows:

Fertility Level	Nitrogen		Phosphorus		Potassium		Sulphur	
	Applied	Available +Applied	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied
100%	70	105	25	40	20	182	20	32
150%	125	160	45	60	36	198	35	47
200%	175	210	65	80	50	212	50	62

Due to the dry conditions, crop emergence was slow and patchy and weed competition from wild oats and volunteer barley was quite severe. Consequently, the trial was sprayed with Fusion to control the grassy weeds prior to spraying with Liberty to control the later emerging broadleaf weeds. There were obvious differences in crop growth in favor of the higher fertility rates with both varieties, even though the site was relatively dry. Visually the InVigor 2153 responded more favourably to the higher fertility rates than the Exceed. Lodging was more severe as the fertility increased with both varieties, but was less obvious with InVigor 2153 than Exceed.

Results:

FERTILIZER RATE & VARIETY TRIAL Andrew, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
100% fertility level*			
InVigor 2153	35.7	125	41.1
Exceed	30.3	99	42.0
150% fertility level			
InVigor 2153	34.9	94	40.4
Exceed	27.4	52	41.2
200% fertility level			
InVigor 2153	32.2	48	40.0
Exceed	25.4	12	41.0
LSD for fert. Rate	1.98		0.43
LSD for variety	1.62		0.35
CV%	7.4		1.2

*100% fertility level = 105N - 40P - 182K - 32S

Discussion: There were no yield advantages for higher fertility rates with either variety. The yields tended to be lower with the higher fertility rates. There was a difference between varieties, with InVigor 2153 producing higher yields than Exceed at all fertility levels. Oil contents were inversely related with the fertility levels. This is in line with the majority of research related to

fertility. Despite the heavier crop canopies produced by higher fertility, there was no difference in maturity, probably due to the hot, dry weather.

WANHAM

Observations: The nutrients added to each fertility are outlined in the table. The soil test values for this site indicated that there was: N 120, P 60, an excess of K (actual value of 500+ lb/ac) and an excess of S (actual value of 160+ lb/ac in 24inches of soil). Therefore, the actual amount of nutrients added to achieve each soil test recommendation level was as shown in the table below.

Fertility Level	Nitrogen		Phosphorus		Potassium		Sulphur	
	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied
100%	0	120	0	60	5	505	0	160
150%	60	180	30	90	10	510	5	165
200%	120	240	60	120	15	515	10	170

All of the added fertilizer was banded prior to seeding. This disturbance led to further drying out of what was already a dry soil. Emergence of all plots was adversely affected by the dry soil conditions, and germination was patchy and uneven.

Results:

FERTILIZER RATE & VARIETY TRIAL
Wanham, AB

Treatment	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)	Grade
100% fertility level*				
InVigor 2153	29.5	65.46	43.4	1
Exceed	20.8	14.62	43.6	2
150% fertility level				
InVigor 2153	28.4	33.20	43.2	1
Exceed	19.7	(19.82)	42.9	2
200% fertility level				
InVigor 2153	25.6	(26.25)	43.2	1
Exceed	19.7	(51.50)	42.5	2
LSD for fert. rate	5.49		0.47	
LSD for variety	4.49		0.38	
CV%	26.4		1.3	

*100% fertility level = 120N – 60P – 505K – 160S
Note: Brackets in the Contribution Margin reflect a negative value

Discussion: Yields did not improve by increasing the rate of applied fertility. Given the extremely dry conditions experienced at this site, this was expected. Yields of InVigor 2153 were significantly better than the yields for Exceed at all rates of applied fertility. The contribution margins show that the 100%

fertility levels gave the best economic returns. Contribution margins decreased at higher rates of fertility. Oil content did not vary significantly with fertility levels for InVigor 2153, but did decrease significantly with increased fertility levels for Exceed. At all fertility levels InVigor 2153 graded higher than Exceed.

B. CONVENTIONAL VARIETIES (HYBRID = HYOLA 401 & OPEN POLLINATED = AC EXCEL)

LETHBRIDGE IRRIGATION

Observations: Emergence was slow on all treatments. After emergence, the higher fertility treatments advanced quicker and grew taller than the 100% fertility level. Although flowering started at the same time among the treatments, the days of flowering increased as fertility levels increased. Subsequently, days to maturity increased as fertility increased. With AC Excel, as fertility levels increased, so did the degree of lodging. At the 200% fertility level AC Excel was completely lodged. With Hyola 401, lodging was slight as fertility increased. Fertility levels are as follows:

Fertility Level	Nitrogen		Phosphorus		Potassium		Sulphur	
	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied
100%	100	166	25	58	10	610	10	37
150%	180	249	54	87	10	610	28	55
200%	266	332	83	116	10	610	47	74

Results:

FERTILIZER RATE & VARIETY TRIAL Lethbridge Irrigation, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
100% fertility level*			
AC Excel	31.2	33.92	44.4
Hyola 401	39.8	80.12	43.5
150% fertility level			
AC Excel	33.0	22.75	43.5
Hyola 401	40.2	58.47	43.6
200% fertility level			
AC Excel	41.1	58.77	43.6
Hyola 401	47.2	86.25	43.1
LSD for fert. rate	2.02		0.46
LSD for variety	1.65		0.38
CV%	**6.0**		**1.2**

***** 100% fertility level **= 166N – 58P – 610K – 37S**

Discussion: Hyola 401 yielded significantly higher than AC Excel. With Hyola 401 and AC Excel, yields were significantly higher at the 200% fertility levels as compared to the other fertility level.

Oil content with AC Excel decreased significantly at the 150% fertility level as compared to the 100% fertility level, but Hyola 401 oil content was unaffected by fertility levels. Although contribution margins increased at the 200% fertility level, there is a risk associated with these increased fertilizer costs.

INNISFAIL

Observations: This trial was seeded May 7. Dry seedbed conditions slowed emergence. Once rain was received, the crop responded to higher levels of fertility. Crop height, days to maturity and lodging of AC Excel increased at higher fertility levels. The actual amount of nutrients added to achieve each fertility level were shown in the table below.

Fertility Level	Nitrogen		Phosphorus		Potassium		Sulphur	
	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied	Applied	Available + Applied
100%	55	92	25	41	25	181	10	92
150%	101	138	46	62	25	181	53	138
200%	147	184	66	82	25	181	102	184

Results:

FERTILIZER RATE & VARIETY TRIAL Innisfail, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
100% fertility level*			
AC Excel	35.7	74.70	45.9
Hyola 401	36.9	68.51	44.7
150% fertility level			
AC Excel	35.5	47.79	45.3
Hyola 401	38	51.35	44.2
200% fertility level			
AC Excel	35.1	19.39	44.4
Hyola 401	40.7	46.16	44.1
LSD for fert. rate	1.22		0.54
LSD for variety	4.25		0.17
CV%	3.4		1.3

*100% fertility level = 92N – 41P – 181K – 92S

Discussion: There were no significant differences in yield between varieties. With Hyola 401 there is a significant difference in yield comparing the 150% and 200% fertility levels. Oil content of AC Excel was significantly higher than Hyola 401 in all fertility treatments. Oil content decreased with increased fertility levels for both varieties.

Contribution margins were highest at the 100% fertility level for both varieties at this site.

Western Canadian Summary:

The most consistent trend among these trials was higher yields from the hybrid varieties, compared to the open-pollinated varieties, at each fertility level. This translated into improved economic returns in most cases. The hybrids appeared to be better able to take advantage of the growing conditions.

Average yields tended to increase only slightly with increased fertility levels, and the trends were similar for both hybrid and open-pollinated varieties. Positive yield increases at some locations were offset by neutral or negative responses at other sites. The neutral to negative responses occurred at sites where the crop was stressed by hot dry weather, or a combination of excess moisture early in the season and dry weather at seed set. It is suggested that the higher fertility levels produced more biomass and depleted moisture levels prior to seed set at the dry locations. Root growth may have been inhibited at the sites suffering from excess moisture early in the season, leading to reduced ability of the plants to utilize moisture and nutrients when the weather turned dry. Higher fertilizer costs for increased fertility generally resulted in reduced economic returns. Oil contents tended to decrease with increases in fertility level, since the increased supply of nitrogen favoured protein formation at the expense of fat synthesis.

While this is only one year of work and several of the sites were stressed by environmental conditions, these results appear to emphasize an old message. Using soil tests, a realistic target yield and a balanced fertility package is still the best bet for producing a successful canola crop.

XII ELEMENTAL VS AMMONIUM SULPHATE SULPHUR TRIAL

Objective: To compare the use efficiency of elemental vs sulphate forms of sulphur fertilizer as it relates to yield and quality of *B. napus* canola.

Background: Maintaining proper levels of sulphur in a balanced fertility program is essential in maximising the yield potential of any given canola variety. Sulphur availability during the growing season is critical during flowering, seed set and protein formation. With different sulphur forms available there are varying results in terms of total amounts of plant available sulphur during the growing season. Questions have been raised as to what the effects of the various forms of sulphur on canola yields are in the year of application.

Methodology: Elemental sulphur vs ammonium sulphate sulphur trial consisted of 3 treatments:

1. Check - no sulphur applied
2. Ammonium sulphate - applied at soil test recommendations
3. Elemental sulphur - applied at soil test recommendations

Both of the sulphur sources were seed-placed

RUSSELL

Observation: This trial was seeded on May 17 into fair soil moisture conditions. This trial was placed on top of a large knoll, since this area of the field showed a lower level of available sulphate. As a result, emergence was not uniform due to lower soil moisture conditions. However, no visible differences were observed among treatments throughout the growing season.

Results*:*

ELEMENTAL VS SULPHATE SULPHUR TRIAL
Russell, MB

Treatment	Yield (bu/ac	Contribution Margin ($/ac)	Oil (%)	Days to Maturity
Sulphate S	19.5	(11.47)	45.2	93
Elemental S	18.4	(15.37)	44.9	90
Check (no S)	17.7	(17.78)	45.0	91
LSD	2.14		0.84	
CV %	8.4		1.4	

Note: Brackets in the Contribution Margin reflect a negative value

Discussion: Yields in this trial were limited as a result of environmental and topographical conditions. This may have lessened the response to the

applied sulphur. Although there were yield increases from applied sulphate, the increases were not statistically significant.

WHITEWOOD

Observation: Uneven emergence, early June frost, excessive moisture and heavy weed pressure slowed crop development early in the growing season. Both elemental sulphur and ammonium sulphate treatments were applied at 22 lb/ac of sulphur. There were no visible differences between treatments in terms of length of flowering, flower formation or seed set.

Results*:*

ELEMENTAL VS SULPHATE SULPHUR TRIAL
Whitewood, SK

Treatment	Yield (bu/ac	Contribution Margin ($/ac)	Oil (%)	Days To Maturity
Sulphate S	28.5	34.54	47.2	94
Check (no S)	24.0	9.56	46.8	93
Elemental S	23.2	(1.00)	46.6	93
LSD	1.79		0.59	
CV %	5.2		0.9	

Note: Brackets in the Contribution Margin reflect a negative value

Discussion: The sulphate sulphur treatment indicated a significant yield advantage over the other treatments. Contribution margins reflect the differences in yield and the cost of applying sulphur fertilizer forms. The addition of ammonium sulphate resulted in a 4.5 bu/ac yield advantage, and a profit of $24.98/ac over the check.

There was no statistical difference in oil content. Days to maturity did vary by 1 day.

NAICAM

Observation: Uneven emergence, early June frost and heavy weed pressure slowed crop development early in the growing season. Soil test results indicated a low level of available sulphur (18 lb/ac). Both sulphur treatments were applied at 25 lb/ac of sulphur to meet the target yield of 40 bu/ac. There were no visible differences between treatments in length of flowering, flower formation or seed set.

Results*:*

ELEMENTAL VS SULPHATE SULPHUR TRIAL Naicam, SK				
Treatment	**Yield (bu/ac**	**Contribution Margin ($/ac)**	**Oil (%)**	**Days To Maturity**
Sulphate S	28.5	41.64	44.5	100
Check (no S)	23.3	10.96	43.9	100
Elemental S	22.7	1.00	43.6	100
LSD	2.29		0.89	
CV %	6.6		1.4	

Discussion: The sulphate sulphur treatment indicated a significant yield advantage over the other treatments. Contribution margins reflect the differences in yield and the cost of applying sulphur fertilizer forms. The addition of ammonium sulphate resulted in a 5.2 bu/ac yield advantage, and a profit of $30.80/ac over the check.

There was no statistical difference in oil content.

ANDREW

Observation: This trial was seeded on May 12. The N, P and K fertilizers were banded with the drill prior to seeding. The sulphur fertilizers were seed placed. Soil moisture conditions were dry from seeding until early July, therefore plant emergence was patchy. These conditions, combined with high weed competition, led to a great deal of crop stress early in the season. Although there were no classic symptoms from sulphur deficiency (leaf cupping and purpling), there was a noticeable difference in overall crop growth in favour of the sulphate treatment.

Results:

ELEMENTAL VS SULPHATE SULPHUR TRIAL Andrew, AB				
Treatment	**Yield (bu/ac**	**Contribution Margin ($/ac)**	**Oil (%)**	**Days To Maturity**
Sulphate S	38.3	150	41.5	92
Elemental S	35.5	130	42.2	92
Check (no S)	33.9	122	42.2	92
LSD	4.21		0.59	
CV %	8.6		0.8	

Discussion: Both sulphur treatments produced higher yields than the check, but only the sulphate treatment was significantly higher than the check. The oil content was significantly lower in the sulphate treatment. Contribution margins were in line with the corresponding yields. Maturities and grades were unaffected by the treatments.

Western Canadian Summary:

High yielding canola crops require sulphur in the sulphate form for plant uptake. All trials showed a positive yield response to applied sulphur in the sulphate form (SO_4^{-2}). Yield responses to elemental sulphur (S^o) were either negative or neutral, demonstrating clearly that elemental sulphur when applied at the time of seeding is inappropriate, as a sulphur source for canola production. Oil contents and days to maturity were unaffected by any treatment in these trials.

Elemental sulphur is a good source of inexpensive, high analysis sulphur fertilizer, but it should be applied at least one year ahead of crop requirements so that the conversion of elemental to the sulphate form, mediated by soil bacteria, can take place.

XIII SYSTEMS COMPARISON TRIAL

Objective: To establish agronomic criteria for choosing between varieties and herbicide options.

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 4 times in an incomplete split plot design. To avoid the impact of spray drift all varieties within the system were seeded in a common block. The canola varieties with novel traits for herbicide tolerance were compared to a conventional variety AC Excel and a conventional herbicide program.
Varieties used were:

- Roundup Ready - Quest, LG3295 and SW Arrow
- Smart - 45A71, 46A73, 46A74
- Liberty Link - InVigor 2153, InVigor 2163 and Exceed
- Conventional - AC Excel

Note: not all varieties were entered at all sites.

CARMAN

Observation: All of the treatments received a pre-seeding burn off with Roundup to control heavy quackgrass patches. Seeding took place on May 21, and emergence was good for all treatments. The weed pressure was high at this site. Predominant weeds were green foxtail, barnyard grass, wild mustard and redroot pigweed. The conventional system (AC Excel) was sprayed with Select (0.09 L/ac) and Muster (10 g/ac). The Smart Canola system was sprayed with Odyssey (17 g/ac), the Roundup Ready system received ½ L/ac of Roundup Transorb and the Liberty Link system was sprayed with Liberty (1.35 L/ac). All treatments were sprayed at the 6 leaf stage of the canola, due to delays resulting from frequent rainfall and extremely wet conditions. While the crop was hampered by the weed competition at spraying, it surged ahead of the weeds within 4 to 5 days after the herbicides were applied. Herbicide activities appeared to be more rapid in the Liberty Link and Roundup Ready systems, but weed control was very good in all treatments. Severe lodging of the entire trial appeared to limit yield potential.

Results:

SYSTEMS COMPARISON TRIAL Carman, MB				
System	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Conventional				
AC Excel	100	27.2	44.90	41.9
Liberty Link				
InVigor 2153	119	32.5	76.92	42.4
InVigor 2163	113	30.7	63.42	43.3
Exceed	106	28.9	67.20	43.9
Smart				
45A71	100	27.2	44.03	41.5
46A74	100	27.1	43.28	41.7
46A73	99	27.0	42.53	42.1
Roundup Ready				
SW Arrow	108	29.4	70.19	41.4
Quest	99	26.8	51.71	42.4
LSD		1.71		0.64
CV%		5.6		1.2

Discussion: The yield potential of the varieties in this trial appeared to be limited more than the varieties in the conventional variety trial, as evidenced by a 1.6 bu/ac lower yield of the same check variety (AC Excel) (refer to page 48). InVigor 2153, InVigor 2163 and SW Arrow achieved significantly higher yields than the check. InVigor 2153 achieved the highest yield, over all other varieties in the trial, which translated into the highest economic return in spite of its higher seed cost. All of the varieties graded #1. Exceed and InVigor 2163 provided significantly higher oil content.

RUSSELL

Observation: This trial was seeded May 14 into good soil moisture which resulted in quick emergence. A hard frost (-5°C) occurred towards the end of May which slowed crop development. Weed pressure was high and included wild oats, wild mustard, Canada thistle, sow thistle, cleavers, chickweed and birdsrape mustard. Herbicides applied at the 2-4 leaf stage resulted in good control of the targeted weeds. AC Excel was sprayed with Muster Gold (20 ac/cs) and Lontrel (0.17 L/ac). The Smart Canola system was sprayed with Odyssey (17 g/ac) and Lontrel (0.17 L/ac). Roundup Ready varieties received 0.5 L/ac of Roundup Transorb and the Liberty Link system received 1.35 L/ac of Liberty. The AC Excel had considerably more cleavers and birdsrape mustard present throughout the growing season due to lack of an effective herbicide. Control of cleavers was good in the herbicide tolerant varieties after herbicide application, but at swathing time

cleavers were still present due to later flushes. The Liberty Link and Roundup Ready systems had more thistles present at swathing time while the Smart system had more grassy weeds.

Results:

SYSTEMS COMPARISON TRIAL Russell, MB					
System	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Grade**
Conventional					
AC Excel	100	20.9	9.59	42.9	2
Liberty Link					
InVigor 2153	131	27.3	54.55	43.4	1
InVigor 2163	126	26.3	47.05	43.7	
Exceed	110	22.9	37.14	45.1	1
Roundup Ready					
Quest	124	26.0	62.35	42.8	1
SW Arrow	109	22.7	38.61	42.5	1
Smart					
46A73	125	26.2	26.78	42.0	2
45A71	116	24.3	19.08	42.3	1
46A74	107	22.4	(0.77)	40.6	2
LSD		2.94		1.92	
CV%		9.0		3.6	

Note: Brackets in Contribution Margin reflect a negative value

Discussion: The 4 bu/ac higher yield of the check (AC Excel) in this trial vs the conventional variety trial at this site shows the much higher yield potential of this trial (see page 49). This was a result of topographic differences and earlier herbicide application. The systems comparison trial was sprayed the day before the rains started, while the remainder of the field was not sprayed until the 5 – 6 leaf stage. As a result please use relative yields (% of AC Excel) when making comparisons between the 2 trials.

All varieties out yielded AC Excel, but the increases were not significant for Exceed, SW Arrow and 46A74. Contribution margins reflected yield, grade, seed costs and herbicide costs. Differences in grade were related more to damaged seed than green seed. Most of the oil contents were similar to the check, with the exception of the highest (Exceed=45.1%) and the lowest (46A74=40.6%).

WHITEWOOD

Observations: This trial was seeded on May 8. Uneven emergence, early June frost and poor spraying conditions hampered early crop development. Heavy weed

pressure from volunteer barley, wild buckwheat, stinkweed and Canada thistle added stress. Emergence was equal for all treatments. The 2 Liberty Link hybrid varieties (InVigor 2153 and 2163) covered the ground more rapidly than the other open pollinated varieties. The Smart variety 45A71 matured 2 days earlier than the check. Although weed control was good for most treatments, Canada thistle control was poor on the Smart system. The Roundup Ready system received 1 in crop application of Roundup Transorb (½ L/ac). The Liberty Link system received a tank mix of Liberty (10.5 ac/cs) and Venture (40 ac/cs). The conventional system was sprayed with Select (40 ac/cs) Muster (26 ac/cs) tank mix followed with Lontrel (20 ac/cs) 3 days later. The Smart system received 1 in crop application of Select (40 ac/cs) followed by Odyssey (40 ac/cs) 3 days later.

Results:

SYSTEMS COMPARISON TRIAL
Whitewood, SK

Treatment	Yield (%/ac)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Conventional				
AC Excel	100	25.4	20.18	46.8
Liberty Link				
InVigor 2163	126	32.0	91.23	48.2
InVigor 2153	124	31.4	86.73	47.4
Exceed	109	27.7	66.46	49.2
Roundup Ready				
SW Arrow	102	26.0	65.20	46.2
LG 3295	100	25.5	56.84	45.9
Smart				
45A71	96	24.4	25.31	47.1
46A74	94	24.0	22.31	46.6
46A73	94	23.8	20.81	46.7
LSD		1.28		0.61
CV%		3.9		1.0

Discussion: The Liberty Link varieties yielded significantly higher than the check while 46A74 and 46A73 yielded significantly lower. Poor Canada thistle control in the Smart system reduced the yield of those varieties.

Oil contents were significantly higher for 3 varieties (InVigor 2163, LG3295 and Exceed) compared to the check (AC Excel).

Contribution margins reflect differences in yield, seed and herbicide costs. Weed control in relation to herbicide costs for each system directly affected contribution margins. The wide range of herbicides needed for the conventional system resulted in the lowest contribution margin.

NAICAM

Observations: This trial was seeded on May 21. Uneven emergence, early June frost and poor spraying conditions hampered early crop development. Weed pressure from volunteer barley, wild mustard, stinkweed and Canada thistle added stress to the developing crop. Emergence was equal for all treatments. The 2 Liberty Link hybrid varieties (InVigor 2153 and 2163) covered the ground more rapidly than the open pollinated varieties. There were no differences in maturity among varieties. The Roundup Ready system received one in crop application of Roundup Transorb (½ L/ac). The Liberty Link system received a tank mix of Liberty (10.5 ac/cs) and Venture (40 ac/cs). The conventional system was sprayed with a Poast Ultra (40 ac/cs), Muster (26 ac/cs) tank mix followed with Lontrel (20 ac/cs) 3 days later. The Smart system received 1 in crop application of Odyssey (40 ac/cs). Canada thistle and volunteer barley control was reduced in the Smart system.

Results:

SYSTEMS COMPARISON TRIAL Naicam, SK				
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Conventional				
AC Excel	100	25.5	28.02	44.1
Liberty Link				
InVigor 2163	107	27.2	54.67	45.0
Exceed	104	26.6	57.87	45.5
InVigor 2153	102	25.9	44.92	44.4
Roundup Ready				
SW Arrow	116	29.7	92.61	44.1
LG 3295	104	26.5	64.00	43.4
Smart				
46A73	112	28.6	74.69	44.9
46A74	103	26.2	55.94	44.3
45A71	89	22.6	29.69	44.0
LSD		2.94		0.58
CV%		9.0		1.1

Discussion: SW Arrow and 46A73 yielded significantly higher than AC Excel.

InVigor 2163, Exceed and 46A73 were significantly higher in oil content than the check, while LG3295 was significantly lower.

Contribution margins reflect differences in yield, seed and herbicide costs. Weed control in relation to herbicide costs for each system directly affected contribution margins. The wide range of herbicides required for the conventional system resulted in the lowest contribution margin.

LETHBRIDGE DRYLAND

Observation: This trial was seeded on May 1. Emergence was rapid and even among all treatments. Weed pressures in the trial were variable, with some moderate to heavy patches.

The conventional system was sprayed with Poast Ultra (190 ml/ac) & Muster (8 g/ac). The Smart system was sprayed with Odyssey (17g/ac). The Roundup Transorb (.6 L/ac) was sprayed on the Roundup Ready system. Weed control on all systems was excellent.

Results:

SYSTEMS COMPARISON TRIAL Lethbridge Dryland, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Conventional			
AC Excel	25.4	87.80	43.8
Roundup Ready			
LG3295	26.4	91.46	43.0
Smart			
45A71	28.6	102.31	44.0
46A74	28.4	100.86	43.0
46A73	27.4	93.62	43.6
LSD	1.53		2.74
CV%	4.5		5.1

Discussion: The Smart system was significantly higher yielding than the conventional and the Roundup Ready systems. Within the Smart system, no significant yield differences among the varieties were observed. There was a slight advantage in contribution margin with the Smart system over the conventional and Roundup Ready systems.

LETHBRIDGE IRRIGATION

Observation: This trial was seeded on May 5. Emergence was slow due to dry seedbed conditions. Improved growing conditions hastened crop development. Edge granular (6.9 kg/ac) was applied prior to seeding.

All post emergent herbicides were applied at the 2 leaf stage of the crop. The conventional system was sprayed with Poast Ultra (190 ml/ac), Muster (12 g/ac) and Lontrel (227ml/ac). The Liberty Link system was sprayed with Liberty (1.45 L/ac). The Smart system was sprayed with Odyssey (17g/ac). The Roundup Ready system was sprayed with Roundup (0.6 L/ac). Weed control for all systems was excellent.

Results:

SYSTEMS COMPARISON TRIAL Lethbridge Irrigation, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Conventional			
AC Excel	29.7	23.98	44.7
Liberty Link			
InVigor 2153	36.7	79.87	44.6
InVigor 2163	36.1	75.98	44.2
Roundup Ready			
LG3295	30.7	52.75	43.5
Smart			
46A74	35.8	76.51	43.6
46A73	35.0	79.87	44.5
45A71	32.0	57.40	43.8
LSD	4.00		1.27
CV%	9.7		2.4

Discussion: The Liberty Link system and Smart canola system (with the exception of 45A71) yielded significantly higher than the conventional and Roundup Ready systems. 45A71 yielded significantly lower than the InVigor varieties. There was no significant differences in oil content among varieties.

Contribution margins favoured the Liberty Link and Smart systems.

ANDREW

Observation: This trial was seeded on May 7 & 8. Emergence was slow and patchy because of the dry soil conditions. Weed pressure from small grasses was high, early in the growing season. Fusion was sprayed in the Liberty Link system to control the grasses at this time. Liberty was applied to control later emerging weeds. Roundup was sprayed early (0-2 leaf stage) in the Roundup Ready system. Odyssey application was delayed about a week upon recommendation. Consequently, the Smart system suffered more severely from the heavy early weed pressure when combined with the dry conditions experienced this past year. All herbicides were effective on the target weeds, but the Roundup and Liberty were faster acting than the Odyssey. This was probably due to the difference in mode of action between products, and to the advanced stage of weeds in the Smart varieties when sprayed.

Results:

SYSTEMS COMPARISON TRIAL Andrew, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Conventional			
AC Excel	28.8	99	43.9
Liberty Link			
InVigor 2153	41.0	165	44.3
InVigor 2163	39.6	154	44.0
Roundup Ready			
LG 3295	36.9	158	43.6
Quest	35.1	150	44.8
Smart			
46A73	31.6	113	44.3
46A74	31.5	112	44.1
45A71	30.2	103	43.0
LSD	2.27		0.94
CV%	5.4		1.8

Discussion: The Liberty Link system produced the highest yields at this site. InVigor 2153 produced the highest contribution margin followed closely by LG3295. This site was a striking example of the advantage of early weed control, especially when moisture conditions were poor. Dockages were highest with the conventional system and lowest with the Liberty Link system.

WANHAM

Observation: (See Site Information page 42 for background on soil and climate conditions). This trial was seeded on May 3. Due to the dry soil conditions and the lack of rainfall (prior to June 19), germination was poor and the plant stand was patchy. Growth staging of individual plants varied substantially. The predominant weeds were horsetail, wild buckwheat, lambsquarters, stinkweed, wild oats, volunteer wheat, alfalfa and volunteer *B. rapa.* All systems were sprayed on June 4. Crop stage and rate of herbicide use was: Liberty Link system was sprayed with Liberty (1.35 L/ac) at the 3-5 leaf stage, Roundup Ready system was sprayed with Roundup Transorb (0.5 L/ac) at the 2-4 leaf stage, Smart canola system sprayed with Odyssey (12 g/ac) at the 2-3 leaf stage. The conventional system was sprayed with Muster Gold (20 ac/cs) and Lontrel (225 ml/ac) at the 2-3 leaf stage. With the exception of the conventional system, weed control was very good. Plants in the conventional system appeared to

exhibit classic symptoms of Group 2 herbicide damage after spraying. Consequently, the conventional system was not included in the comparisons.

Results:

SYSTEMS COMPARISON TRIAL Wanham, AB			
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Smart			
45A71	17.4	(13.95)	42.0
46A73	14.7	(49.35)	41.0
46A74	14.1	(53.43)	41.2
Roundup Ready			
Quest	16.5	(0.57)	42.2
LG 3295	16.5	(7.31)	41.8
Liberty Link			
InVigor 2163	26.9	39.01	44.0
InVigor 2153	25.9	32.23	43.5
LSD	4.71		0.61
CV%	20.2		1.2

Note: Brackets in contribution margin reflect a negative value

Discussion: Differences in contribution margins are primarily a function of yield. All varieties graded #1. The Liberty Link system yielded significantly higher than the other systems. Oil contents varied among the varieties with the Liberty Link varieties having significantly higher oil contents.

ROLLA

Observations: (See Site Information page 44 for background) The trial was seeded on May 6. All plots germinated well and subsequent growth was rapid and vigorous. Weed were: hemp-nettle, wild buckwheat, lambsquarters, stinkweed, wild oats, volunteer wheat, and volunteer *B. rapa.* The trial was sprayed on May 29. Crop stage and rate of herbicide use was: the Liberty Link system was sprayed with Liberty (1.35 L/ac) at the 3-4 leaf stage, Roundup Ready was sprayed with Roundup Transorb (0.5 L/ac) at the 2-3 leaf stage, Smart Canola system was sprayed with Odyssey (12 g/ac) at the 2-3 leaf stage, conventional system was sprayed with Muster Gold (20 ac/cs) and Lontrel (225 ml/ac) at the 2-3 leaf stage. Weed control was excellent for all plots.

As noted previously, a hail storm on August 3 damaged all plots at the site and yields and grades suffered as a result.

Results:

SYSTEMS COMPARISON TRIAL Rolla, BC				
Treatment	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Grade**
Conventional				
AC Excel	43.1	139.69	42.5	3A
Liberty Link				
InVigor 2153	45.2	154.11	42.2	3A
InVigor 2163	41.8	116.46	42.6	3B
Roundup Ready				
LG 3295	41.5	127.80	42.2	3B
Quest	40.7	146.29	42.3	3A
Smart				
46A73	42.5	153.39	41.6	3A
45A71	40.6	141.72	41.5	3A
46A74	39.5	135.30	41.1	3A
LSD CV%	4.59 9.0		1.12 2.2	

Discussion: All systems performed well at this site. Differences in contribution margins are primarily a function of yield and grade. Oil contents did not vary significantly among varieties.

Western Canadian Summary:

Results indicate a yield advantage for the InVigor varieties (2153 or 2163) at 7of 9 locations. This is likely due to the combination of the genetic potential of these hybrids, coupled with the weed control from Liberty. Differences in oil contents varied from variety to variety and from site to site. When contribution margins are considered, the differences between the Liberty Link hybrids and the other systems narrow. Weed conditions and growing conditions vary greatly, and the ideal combination of herbicide system and variety varies accordingly. The ideal system (in terms of variety and herbicide package) for one farmer is not necessarily the best combination for his neighbour. A grower must consider the spectrum of weeds present, typical growing conditions for his area, disease concerns, crop rotation, herbicide rotation and genetic potential of the varieties before making the choice for one particular system for his 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.

XIV WEED CONTROL TRIALS

Objective: To compare the effect of additional weed control products on conventional or novel trait canola systems, with respect to yield, quality and contribution margins of *B. napus* canola.

Background Broad spectrum weed control is an essential part of canola production. Each of the systems currently available, including conventional and novel trait, has their own unique strengths and weaknesses in terms of the spectrum of weeds that they can effectively control. In recognition of this, various trials were conducted to evaluate the addition of herbicides to these systems, in an attempt to improve control of hard to control weeds. These weeds included Canada thistle, sow thistle, grasses (e.g. volunteer barley) and cleavers.

A. Cleaver Control Trials (Accord)

Methodology: Cleavers is a noxious weed and has been a problem for producers and the canola industry for many years. Effective control of cleavers in conventional varieties has been a problem because of the lack of effective herbicides. The development of novel trait canola systems has allowed better control of cleavers within these systems. However for the producer who uses a conventional system, there are no post-emergent herbicides registered at this time. BASF has introduced a new chemical called Accord that controls cleavers. This product is presently registered for use in cereals and its potential use in canola is currently under review. The purpose of these trials was to evaluate the impact of the herbicide Accord, and its control of cleavers in canola. Plant efficacy was also monitored.

Two of four treatments were used to determine control of cleavers:
A) Check treatment
B) Accord treatment
C) Roundup (check)
D) Roundup + Accord
Weed levels were assessed before and after treatment.

NAICAM

Observation: Weed pressure was light for all treatments. Wild oats, volunteer barley, and stinkweed were the predominant weeds. Weed control was good for all treatments. No cleavers were identified in any treatment. There was no visible tissue damage to any of the treatments. Accord was applied at 55 g/ac rate (40 acres/case).

Results:

CLEAVER CONTROL TRIAL Naicam, SK			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Accord & Roundup	33.1	45.7	128.28
Roundup (check)	32.9	45.3	130.61
LSD	1.15	1.43	
CV %	2.1	1.4	

Discussion: There were no significant differences in terms of yield or oil. Contribution margins reflect differences in yield and herbicide costs.

INNISFAIL

Observation: This trial was seeded on May 9. The variety used was LG3333. Emergence was slow as a result of dry soil conditions. Prior to herbicide application, square meter quadrants (3) within the plots were flagged and weed counts including cleaver population numbers were recorded. Cleaver populations averaged 18 - 20 plants/m² across all treatments. Spraying occurred at the 1-2 leaf stage of the crop and the 2-3 whorl stage for cleavers. The check treatment was sprayed with Poast Ultra (190 ml/ac) and Muster (12 g/ac) while the Accord treatment was sprayed with Poast Ultra (190 ml/ac), Muster (12 g/ac) and Accord (55 g/ac). Assessments after spraying was done at 7, 14, 21, and 28 days to determine control of cleavers. No control of cleavers was observed on the check treatment. In the Accord treatment, 95% control of cleavers was achieved. Subsequent dockage results after combining showed that the Accord treatment had 5% less dockage than the check treatment.

Results:

CLEAVER CONTROL TRIAL Innisfail, AB						
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Oil (%)**	**Cleavers /m² before spray**	**Cleavers /m² after spray**	**Contribution Margin ($/ac)**
Check	100	25.4	42.0	20	20	31.98
Accord	131	33.1	46.9	19	1	82.87
LSD		2.08	1.97			
CV %		4.3	2.1			

Discussion: The Accord treatment produced significantly higher yield and oil content than the check treatment. This new chemistry gives producers another option in controlling a hard to control weed. The advantages in controlling

cleavers other than yield are lower dockage levels and lower inseparable weed counts. Increased numbers of cleaver seeds can downgrade the crop resulting in a economic loss.

B. Grassy Weed Control Trials (Liberty and Poast Ultra)

Methodology: These herbicide control trials consisted of some or all of the following three treatments in a randomised block system:

A) Liberty (1.35 L/ac)
B) Liberty (1.1 L/ac) & Poast Ultra (0.09 L/ac) as a tank mix
C) Liberty (1.1 L/ac) & Poast Ultra (0.13 L/ac) as a tank mix

CARMAN

Observations: This trial was seeded with the variety InVigor 2153 on May 20 into excellent moisture conditions. Early stand establishment was very good, but heavy rains in June caused some moisture stress and delayed spraying until the 4-6 leaf stage of the crop. Weed pressure was extremely heavy, from a combination of green foxtail, barnyard grass (>300 grassy weeds/m^2) and a few redroot pigweeds and smartweeds. All treatments appeared to be effective in controlling the weeds present, and control was quite rapid.

Results:

GRASSY WEED CONTROL TRIAL
Carman, MB

Treatment	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Liberty (1.35 L/ac)	30.8	73.55	42.5
Liberty (1.1 L/ac) & Poast Ultra (0.09 L/ac)	31.5	74.80	42.6
Liberty (1.1 L/ac) & Poast Ultra (0.13 L/ac)	31.7	72.55	42.7
LSD	0.61		0.27
CV%	1.4		0.5

Discussion: While the weed control in the treatment with Liberty alone was quite good, the Poast Ultra did appear to improve the grassy weed control slightly, particularly for the barnyard grass. This resulted in a statistically significant, though relatively small, yield advantage for the tank mix treatments. The economic returns were similar for all treatments, as any benefits were offset by added herbicide costs. The tank mixes had no effect on oil content, and all treatments graded #1.

RUSSELL

Observations: The variety Exceed was used to seed this trial on May 17 into optimum moisture conditions, and stand establishment was good. Frost at the end of May caused some leaf tissue damage and delayed crop development. The trial was sprayed on the morning of June 12 at the 2 - 4 leaf stage of the crop. Weeds present included wild oats, redroot pigweed, Canada thistle, sow thistle, chickweed, cleavers and wild mustard. Initial weed control was excellent, but there was substantial thistle re-growth later in the season. This was probably aided by a lack of crop competition due to environmental stresses.

Results:

GRASSY WEED CONTROL TRIAL
Russell, MB

Treatment	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Liberty (1.35 L/ac)	24.8	51.39	46.4
Liberty (1.1 L/ac) & Poast Ultra (0.09 L/ac)	24.9	48.14	48.4
Liberty (1.1 L/ac) & Poast Ultra (0.13 L/ac)	23.6	34.64	47.1
LSD CV%	3.18 9.5		2.45 3.8

Discussion: The Poast Ultra was not effective in improving yields at this location, as compared to the Liberty applied alone. This can be explained by the fact that a substantial portion of the weed pressure was due to broadleaf weeds against which the Poast Ultra would have little effect. The Liberty alone was effective in controlling the wild oats present. As a result, contribution margins declined in the Poast Ultra treatments due mainly to added costs. There was no effect on oil content and all treatments graded #1.

NAICAM

Observation: Weed pressure was light for all treatments. Wild oats, volunteer barley, and stinkweed were the predominant weeds. Weed control was good for all treatments. There was no visible tissue damage (efficacy) to any of the treatments. Liberty was applied at 1.08 L/ac rate (16.8 acre/jug).

GRASSY WEED CONTROL TRIAL
Naicam, SK

Treatment	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Poast Ultra & Liberty	34.9	133.04	47.2
Liberty	34.9	141.93	44.1
LSD	2.37		4.90
CV %	4.1		6.5

Discussion: There were no significant differences in terms of yield or oil. Contribution margins reflect differences in yield and herbicide costs.

C. Thistle Control Trials (Lontrel)

Methodology: This herbicide trial consisted of four treatments in a split plot system:

A) Lontrel and Roundup
B) Roundup
C) Lontrel and Odyssey
D) Odyssey

Where land area was limiting the trial was broken into two smaller trials on the basis of system (Roundup Ready, Smart).

RUSSELL

Observations: The varieties used in this trial were Quest (Roundup Ready) and 45A71 (Smart). The trial was seeded May 17 into good soil moisture providing adequate stand establishment. However two of the four reps were on sandier areas of the field resulting in less available moisture and lower yields. The frost, excessive rainfall and hail discussed in the Site Information (Page 26) all contributed to limited yield potential. Thistle pressure was intense with an average of 9 sow thistle and 4 Canada thistle per square metre. The trial was sprayed June 11 at the 3 leaf stage, and the thistles ranged in height from emerging to 6 inches (most 4" or less). There was little visible difference between the Roundup applied alone and with Lontrel, but the Lontrel included with Odyssey appeared to reduce thistle growth as compared to Odyssey by itself.

Results:

THISTLE CONTROL TRIAL Russell, MB			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Roundup	25.6	45.3	39.52
Roundup	26.3	45.6	62.35
Lontrel & Odyssey	21.9	44.2	1.08
Odyssey	19.7	44.0	4.41
LSD for variety	1.27	1.23	
LSD for herbicide	2.34	0.63	
CV %	10.3	1.5	

Discussion: As suggested by the visual observations, only the Smart Canola system benefited in yield from including Lontrel in the herbicide application. However, even this benefit was not statistically significant or economical, likely due to limitations on yield from other environmental stresses. The Lontrel had no impact on oil content for either variety.

WHITEWOOD

Observation: There was tremendous wild buckwheat pressure in this trial. An average of 193 buckwheat plants/m^2 and 3 to 4 Canada thistle plants/m^2 were recorded for six sample locations. Weed control was good for three of the four treatments. Wild buckwheat, hemp-nettle and thistle control was poor in the treatment that only received Odyssey. Lontrel was applied at .14 L/ac or 32 acres per jug, as a tank mix, with Roundup Transorb and Odyssey.

Results:

THISTLE CONTROL TRIAL Whitewood, SK (TABLE 1)			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Roundup	27.1	48.9	37.32
Roundup	26.6	48.6	53.26
LSD	1.39	0.93	
CV %	3.1	1.2	

THISTLE CONTROL TRIAL Whitewood, SK (TABLE 2)			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Odyssey	28.6	47.4	37.20
Odyssey	24.6	47.6	26.81
LSD	1.71	0.71	
CV %	3.9	0.9	

Discussion: There were no significant differences in terms of yield in Table 1. There was however a significant yield advantage in Table 2. In Table 2 there was an economic advantage to applying Lontrel with Odyssey for the control of Canada thistle and wild buckwheat. Contribution margins for each table reflect differences in yield and herbicide costs.

There was no significant difference in terms of oil for any of the treatments.

NAICAM

Observation: On average there was 1 to 2 Canada thistle plants/m^2. Overall weed pressure was low. Weed control was good for three of the four treatments. The Odyssey treatment had reduced Canada thistle control. Lontrel was applied at .14 L/ac or 32 acres per jug, as a tank mix, with Roundup Transorb and Odyssey.

Results:

THISTLE CONTROL TRIAL Naicam, SK (TABLE 1)			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Roundup	32.3	45.3	106.50
Roundup	32.9	45.1	130.61
LSD	1.27	1.01	
CV %	2.3	1.3	

THISTLE CONTROL TRIAL Naicam, SK (TABLE 2)			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Odyssey	30.1	45.0	78.63
Odyssey	29.9	45.6	96.74
LSD	1.44	0.24	
CV %	2.9	0.3	

Discussion: There were no significant differences in terms of yield. Due to low weed pressure at this location, there was no economic advantage to applying Lontrel with Roundup or Odyssey. Contribution margins reflect differences in yield and the additional herbicide cost of Lontrel.

Table 2 did show a significant difference in terms of oil content for the 2 treatments.

LETHBRIDGE IRRIGATION

Observation: This trial was seeded on May 5. The variety 45A71 was used for the Smart Canola system, and the variety Quest was used for the Roundup Ready system. Emergence was good but slow in all treatments. Spraying of the treatments occurred at the 2 leaf stage of the crop. Sow thistle (2-3 leaf stage) counts taken before and after (averaged across 4 reps) spraying are as follows:

Treatment	Sow Thistle/m² Pre-spray	Sow Thistle/m² Post-spray
Roundup	4	2
Roundup and Lontrel	3	0
Odyssey	3	1.5
Odyssey and Lontrel	4	0.5

Chemical rates applied were as follows:
Roundup Treatment – Roundup (0.6 L/ac)
Roundup & Lontrel – Roundup (0.6 L/ac), Lontrel (227 ml/ac)
Odyssey Treatment – Odyssey (17 g/ac)
Odyssey & Lontrel – Odyssey (17 g/ac) , Lontrel (227ml/ac)
Sow thistle control on all treatments was good, with the Lontrel treatments having the best control.

Results:

HERBICIDE CONTROL TRIAL Lethbridge Irrigation, AB			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Roundup	29.9	46.5	46.50
Roundup	29.6	44.7	68.23
Lontrel & Odyssey	30.5	45.6	39.47
Odyssey	31.3	45.8	69.44
LSD	2.10	4.10	
CV %	5.7	6.5	

Discussion: No significant differences were found comparing yield or oil among the treatments. Sow thistle populations were light in this trial. Control of sow thistle increased by adding Lontrel to the tank mix. Dockage levels were 1% lower, on average, in the Lontrel treatments.

WANHAM

Observations: This trial was set up to be used in the event that thistles proved to be a problem at the site. This was not in fact the case, and thus thistle control was not an issue. This was unavoidable as a reasonable level of thistles was expected. See also Site Information page 42 regarding climatic and insect problems at this site. The plots were seeded May 1 and sprayed with the appropriate herbicide treatment on June 4 (Roundup Transorb @ 0.5 L/ac, Odyssey @ 12 g/ac, and Lontrel @ 227 ml/ac). The plots were at the 3-4 leaf stage at this time. Swathing took place on August 7 for the Roundup plots and August 8 for the Odyssey plots. All plots were combined on September 3.

Results:

THISTLE CONTROL TRIAL Wanham, AB			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Lontrel & Roundup	19.2	40.5	(7.25)
Roundup	20.4	41.1	32.81
Lontrel & Odyssey	17.7	40.0	(53.91)
Odyssey	19.6	39.9	(8.46)
LSD	6.33	0.81	
CV %	25.4	1.5	

Note: Brackets in contribution margin reflect a negative value

Discussion: There were no significant differences in yield among the treatments. Contribution margin differences are primarily due to yield and cost of herbicides used. The only treatment to give a positive contribution margin was the Roundup treatment. Yields were severely depressed by the combination of dry soil conditions, lack of rainfall, and insect infestation (Lygus and Bertha armyworms). As was noted earlier, thistle control was a non-issue. Weed control in all other respects was excellent for all treatments used. The Lontrel was not necessary, and the differences between yields with and without Lontrel are not significant statistically. There were no significant differences in oil content.

Western Canadian Summary:

Yield responses to the various herbicides tested were highly site specific, and were closely correlated to the density of the target weeds. As a result, it is difficult to reach any general conclusions. General trends would not be very useful, since responses would be field specific. It is clear that knowledge of field history in terms of the type and density of weeds present will be invaluable in selecting the right herbicide mix. When weeds are present in sufficient numbers, use of additional herbicides can be economical, as evidenced by the use of Lontrel in the Smart system at Whitewood (on thistles), or Accord in the conventional system at Innisfail (on cleavers). Knowing the weaknesses of a system will also be useful. Company representatives, extension personnel and provincial crop protection guides are all sources of information that will assist in choosing the proper weed control package.

XV SCLEROTINIA STEM ROT CONTROL TRIAL

Objective: To evaluate various sclerotinia control options 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 sclerotinia stem rot varies from year to year, and even from field to field within a region. With the right combination of crop density and weather conditions or irrigation, heavy infections can develop. In some cases half the potential yield of a crop may be lost to sclerotinia.

Methodology: Complete the sclerotinia stem rot check list and petal test kit.
Treatment Options:

A) Check - no treatment
B) ½ rate
C) Split Application
D) Full rate

CARMAN

Observation: Growing conditions were favourable for sclerotinia spore production in late June and early July, as frequent rains and humid conditions persisted. Petal test kits were used to evaluate the level of infection before fungicide applications. An application of Ronilan EG was applied at .30 kg/ac on July 8 at 30 to 40% bloom.

Test 1 Date - July 7 30% bloom

Evaluation Method	Average Infection
Petal Test	56%

A sclerotinia stem rot check list was used to evaluate field and weather conditions prior to and during flowering. This suggested a moderate to high chance of infection. Due to the availability of the custom applicator, we chose to apply the fungicide before the petal test plates finished incubating. However, the petal test results confirmed the conclusions of the check list.

Results:

SCLEROTINIA STEM ROT CONTROL TRIAL Carman, MB				
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**	**Grade**
Check	27.0	44.2	48.58	2
Full Rate	28.6	44.0	48.56	1
LSD	4.08	0.78		
CV %	8.8	1.1		

Discussions: The wet conditions during flowering were replaced by drier conditions in late July and early August. As a result, disease development in the check treatments was not as widespread as expected, although a scattering of infected plants were visible. Yield losses in the check compared to the fungicide treatment were not statistically significant. However, gains in yield and quality from the fungicide application were sufficient to just cover the added cost. There was no effect on oil content as a result of the control measures.

NAICAM

Observation: Growing condition were favourable for sclerotinia spore production in July. Reduced crop canopy, due to poor emergence, would allow for more air movement and dryer conditions. Petal test kits were used to evaluate the level of infection before each application of Ronilan EG. The first application of Ronilan EG was applied at .225 kg/ac on July 8 at 25% bloom. The second application was applied at .200 kg/ac on July 14 at 50% bloom.

Test 1 Date - July 4 10% bloom

Evaluation Method	Location 1	Location 2	Location 3
Petal Test*	38%	48%	40%

*Petal Test average = 42% infection level

Test 2 Date - July 10 35% bloom

Evaluation Method	Location 1	Location 2	Location 3
Petal Test*	27%	40%	29%

*Petal Test average = 32% infection level

A sclerotinia stem rot check list was used to evaluate field and weather conditions prior to and during flowering. Periodic rain showers and humid conditions prevailed for the majority of July.

Results:

SCLEROTINIA STEM ROT CONTROL TRIAL Naicam, SK			
Treatment	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**
Check	26.6	45.8	29.42
Split Application	28.8	44.2	15.07
LSD	2.29	4.39	
CV %	5.0	5.9	

Discussions: There was no significant difference in terms of yield or oil. Although a 2.2 bu/ac advantage was realised for the split application treatment, the contribution margin was less due to the added cost of the fungicide and application costs.

LETHBRIDGE IRRIGATION

Observation: This trial was seeded May 5. The variety used was 45A71. Weather conditions at flowering were humid and warm, which were optimum conditions for the sclerotinia to flourish. A sclerotinia petal test kit was used to determine sclerotinia spore levels. Petal test results revealed a 30% infection level. This result, combined with the environmental and crop conditions, warranted the spraying of a fungicide. Ronilan EG (0.4kg/ac) was sprayed at the 40% bloom stage. Weather conditions became hot and dry after the fungicide application. Even with subsequent water applications by irrigation, environmental conditions for the formation of sclerotinia were not favourable. Examination of stems and leaves near swathing showed no sclerotinia infection in either treatment.

Results:

SCLEROTINIA STEM ROT CONTROL TRIAL Lethbridge Irrigation, AB

Treatment	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Check	37.1	44.2	88.09
Full Rate	36.7	43.9	60.99
LSD	4.15	0.52	
CV %	6.8	0.7	

Discussions: No significant differences in yield or oil content are observed between treatments. Differences in contribution margin are the result of the cost of application of the fungicide.

Western Canadian Summary:

Under appropriate crop and environmental conditions, sclerotinia stem rot can result in substantial yield losses. Although environmental and crop conditions (prior to the application of a fungicide) were favourable for the development of sclerotinia stem rot at all locations, environmental conditions (hot and dry) after fungicide application reduced the level of infection. This resulted in no statistically significant yield response to applied fungicides. Used appropriately, fungicides can assist in reducing the impact of sclerotinia and capture the full yield potential of a canola crop.

XVI DIAMONDBACK MOTH EVALUATION TRIAL

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

***Background*:** Previous work completed by Agriculture & Agri-Food Canada, Environment Canada and the Canola Council of Canada has shown there to be 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:

A) Record moth counts
B) Record other insects
C) Changed lures and trap inserts weekly
D) Phoned in moth counts using ON TAP system.

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. The ON TAP recording system worked very well in terms of user friendliness. 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 feet above ground) and began to deteriorate by the end of July. This made it difficult to keep trap inserts in place under high winds.

Results: Were forwarded to Environment Canada

Discussion: Diamondback moth counts were low at the 10 Canola Production Centres over the growing season. Diamondback moth numbers in excess of 90/week would warrant careful field monitoring. This was not the case in 1998. Our results will be combined with results from Agriculture Canada to develop a comprehensive map of diamondback moth infestation levels this year.

XVII INTEGRATED ROOT MAGGOT CONTROL TRIAL

Objective: To evaluate the effectiveness of cultural options in controlling root maggots.

Background: Root maggots can be a serious pest of cruciferous crops. They were initially thought to be a pest only of *B. rapa* in the parkland region of Alberta. Recent survey results indicate that the root maggot is present in all canola growing regions with the potential to be a serious pest in both *B. napus* and *B. rapa.* Research at the University of Alberta and Alberta Environment Centre has shown that root maggots can reduce canola yields by up to 50%. Root maggots cause physical damage to roots when feeding. Yield reductions can also result from disease entering the plant through the wounds made by root maggots. Although, to date no single control mechanism has been identified, a number of chemical and cultural control options are being studied.

Methodology: Treatments in the Integrated Root Maggot Control Trial were:

B. rapa:

A) Check - Reward at 5 lb/ acre seeding rate
B) Reward at 10 lb/ acre seeding rate

B. napus:

C) AC Excel at 5-6 lb/acre seeding rate
D) AC Excel at 10 lb/acre seeding rate

Seeding equipment was calibrated to ensure accurate seeding rates. All additional management practices were similar for each treatment.

INNISFAIL

Observation: This site was seeded May 8. Emergence was slow due to dry soil conditions. Growth was excellent following rainfall at the site. Seeding rates had no influence on maturity. Root maggot damage was minimal across all treatments.

Results:

INTEGRATED ROOT MAGGOT CONTROL TRIAL Innisfail, AB					
Treatment	**Root Maggot Rating**	**Yield (bu/ac)**	**Yield (%)**	**Oil (%)**	**Contribution Margin ($/ac)**
Reward - 5 lb.	1.5	24.0	100	43.0	(12.46)
Reward - 10 lb.	1.1	26.6	111	43.5	1.28
AC Excel - 5 lb.	1.0	34.6	144	45.7	65.84
AC Excel - 10 lb.	0.8	30.4	127	46.0	28.80
LSD		4.09		0.71	
CV %		10.9		1.2	

Note: Brackets in Contribution Margin reflect a negative value

Discussion: AC Excel (5 lb/ac seeding rate) was significantly higher in yield than the other treatments. There were no significant yield differences when comparing the *B. rapa* treatments. There was a significant difference in oil content favouring *B. napus* over *B. rapa*. There were minimal differences in root maggot damage among treatments.

Contribution margins are a reflection of yield and seed costs.

ANDREW

Observation: There were no noticeable differences in crop development among treatments during the growing season. Crop emergence was patchy due to early season drought.

Results:

INTEGRATED ROOT MAGGOT CONTROL TRIAL Andrew, AB					
Treatment	**Root Maggot Rating**	**Yield (bu/ac)**	**Yield (%)**	**Oil (%)**	**Contribution Margin ($/ac)**
Reward - 5 lb	1.6	29.1	100	43.5	106
Reward - 10 lb	1.5	29.9	103	43.2	106
AC Excel - 6 lb	1.8	29.9	103	40.7	108
AC Excel - 12 lb	1.5	28.5	98	41.7	90
LSD		0.29		0.92	
CV %		14.2		2.4	

Discussion: There were no significant yield advantages for higher seeding rates or variety selection. The higher seeding rate of AC Excel gave a significantly lower yield than the lower seeding rate The higher seeding rate of AC Excel had a significantly lower root maggot damage rating. Oil contents of the *B. rapa* treatments were significantly higher than those of the *B. napus* treatments.

WANHAM

Observation: The plots were seeded on May 2. Due to the dry conditions following seeding, emergence was patchy. The *B. rapa* plots were swathed July 27 (root maggot assessment on same day) and the *B. napus* plots were swathed Aug 8. On Aug. 2, high winds rolled the *B. rapa* plots contributing to further yield reductions due to shattering of the pods. Combining took place on August 21 for the *B. rapa* plots, and Sept 3 for the *B. napus* plots.

Results:

INTEGRATED ROOT MAGGOT CONTROL TRIAL
Wanham, AB

Treatment	Root Maggot Rating	Yield (bu/ac)	Yield (%)	Oil (%)	Contribution Margin ($/ac)	Grade
Reward - 5 lb.	1.6	8.1	100	41.2	(40.88)	1
Reward - 10 lb.	1.4	7.0	86	41.6	(52.81)	1
AC Excel - 7 lb.	1.1	17.6	217	42.6	18.09	2
AC Excel - 14 lb.	1.1	20.4	251	43.0	21.62	2
LSD	0.20	4.75		0.91		
CV %	11.8	27.5		1.7		

Note: Brackets in contribution margin reflect a negative value

Discussion: Yields were reduced as a result of negative climate and insect pest factors. Yield and oil contents for *B. napus* treatments were significantly higher than for *B. rapa* treatments. Root maggot damage was minimal across all treatments.

ROLLA

Observation: All plots for this trial were seeded on May 6 (soil temperature 15^{o}C). Emergence was excellent for all plots with very good plant stand establishment. Weed control was excellent for all plots. Swathing of plots took place on July 30 (*B. rapa*) and August 10 (*B. napus*). Root maggot assessments were done the day following swathing for each species. On Aug. 3 a hail storm, accompanied by strong winds damaged the plot site (as described in Site Information). Estimated yield losses at 30%. All plots were combined on August 26.

Results:

INTEGRATED ROOT MAGGOT CONTROL TRIAL Rolla, BC						
Treatment	**Root Maggot Rating**	**Yield (bu/ac)**	**Yield (%)**	**Oil (%)**	**Contribution Margin ($/ac)**	**Grade**
Reward - 5 lb.	1.5	22.2	100	44.0	49.83	1
Reward - 10 lb.	1.1	20.3	91	44.0	29.48	1
AC Excel - 7 lb.	0.9	35.8	161	42.1	94.90	3A
AC Excel - 14 lb.	0.9	34.2	154	42.1	70.01	3A
LSD	0.15	4.72		0.78		
CV %	10.6	12.9		1.4		

Discussion: Hail and strong winds resulted in yield losses of both *B. napus* and *B. rapa* treatments and grade reductions for *B. napus*. Root maggot damage was minimal across all treatments. Oil contents are significantly higher for *B. rapa* treatments. It is thought that this is a function of the hail damage to the *B. napus* plots.

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

Western Canadian Summary:

Root maggot damage in 1998 was very light across all sites. The dry weather in Alberta and Saskatchewan provided some protection from root maggots since they are slime feeders and require moist soil for maximum activity. Differences in root maggot damage levels between *B. rapa* and *B. napus* forms of canola were small, but often statistically significant. This data confirms earlier work showing lower levels of root maggot damage in *B. napus*.

Doubling the seeding rate, in either canola species, reduces the level of root maggot damage. Increasing the seeding rate is an appropriate measure to reduce damage in areas where root maggot damage is traditionally high.

XVIII ROOT MAGGOT MONITORING TRIAL

A. B. napus

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

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, B. rapa*) 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 root damage,
1 = feeding channels <10% root surface area,
2 = feeding channels 11-25%,
3 = feeding channels 26-50%,
4 = feeding channels 51-75%,
5 = feeding channels 76-100% or root is completely severed.

CARMAN

Observation: Based on past experience at this location and an initial random sampling of plants it was suspected that the damage levels would be low. Therefore, in the interest of time, only 1 bulk sample of 40 plants (10 per plot) was taken for each variety. The samples were taken immediately after swathing, frozen, then thawed and washed at the time of rating.

Results:

ROOT MAGGOT MONITORING TRIAL
B. napus
Carman, MB

Treatment	Rating	Treatment	Rating
45A71	0.6	IMC105	1.1
46A73	0.5	InVigor 2153	1.0
46A74	0.5	InVigor 2163	0.6
AC Excel	0.7	Millenium	1.1
Battleford	0.6	Option 500	0.6

ROOT MAGGOT MONITORING TRIAL *B. napus* Carman, MB			
Treatment	**Rating**	**Treatment**	**Rating**
Castor	0.7	Q2	2.4
Exceed	1.2	Quantum	1.5
Goliath	0.9	Quest	0.6
Hyola 401	1.0	SW Arrow	1.0
Hy-Per Star 100	1.0	Synbrid 220	0.7
IMC 104	0.7	Trailblazer	1.0

Discussion: With the exception of the variety Q2, root maggot damage was low at this site.

RUSSELL

Observation: No damage from root maggots was observed and as a result no damage ratings were taken at this location.

WHITEWOOD

Observation: Root maggot damage was initially assessed in four locations throughout the field. Only 4 plants out of 200 showed any signs of root maggot damage. The damage on the sampled plants rated 2 or less. Sampling took place after swathing.

Results: Root maggot ratings were not recorded due to very low levels of damage.

NAICAM

Observation: Root maggot damage was initially assessed in six locations throughout the field. Only 16 plants out of 300 showed any signs of root maggot damage. The damage on the sampled pants rated 2 or less. Sampling took place prior to swathing.

Results: Root maggot ratings were not recorded due to very low levels of damage.

LETHBRIDGE AND INNISFAIL

Observation: At Innisfail, Lethbridge Irrigation and Dryland sites, root samples were examined in both the *B.napus* and *B.rapa* variety trials. This revealed extremely low levels of root maggot damage.

ANDREW

Observation: Root maggot damage ranged from none to slight (0-2). Therefore, detailed ratings of specific varieties were not undertaken at this site.

WANHAM

Observation: Dry soil conditions may have influenced the level of root maggot infestation. Root maggot assessments were done on the day following swathing for each variety in the trial. It should be noted that although the average root maggot damage value for each variety is less than 1, there were in each case roots having damage values up to level 4 in almost every plot. The heavily damaged roots were very few in number and their impact is thus masked by the average value. This observation indicates that in any field of canola, even when soil conditions are dry, there can still be root maggot damage to a small percentage of the plants.

Results:

ROOT MAGGOT MONITORING TRIAL
B. napus
Wanham , AB

Variety	Rating
AC Excel	0.8
Castor	0.9
Clavet	1.0
Goliath	0.9
Hyola 401	1.0
Hy-Per Star 100	0.9
Option 500	1.0
Synbrid 220	0.9
LSD	0.06
CV %	5.4

Discussion: All the varieties had a very low level of root maggot damage with no significant difference among them.

ROLLA

Observation: Soil moisture conditions were adequate throughout the growing season. Root maggot assessments were done on the day following swathing for each variety in the trial. It should be noted that although the average root maggot damage value for each variety is less than 1, there were in each case roots having damage values up to level 4 in almost every plot. These were very few in number and their impact is thus masked by the average value.

Results:

ROOT MAGGOT MONITORING TRIAL
B. napus
Rolla, BC

Treatment	Rating
AC Excel	1.0
Hyola 401	1.0
Option 500	1.0
LSD	0.11
CV %	7.9

Discussion: All varieties were equally affected by root maggots. Root maggot damage was low and there were no significant differences among varieties.

B. rapa

RUSSELL

Observation: No damage from root maggots was observed. As a result no damage ratings were taken at this location.

WHITEWOOD

Observation: No root maggot damage was evident.

NAICAM

Observation: No root maggot damage was evident.

LETHBRIDGE IRRIGATION

Observation: No root maggot damage was evident.

LETHBRIDGE DRYLAND

Observation: No root maggot damage was evident.

INNISFAIL

Observation: No root maggot damage was evident.

ANDREW

Observation: Root maggot damage ranged from none to slight (0-2). Therefore, detailed ratings of specific varieties were not undertaken at this site.

WANHAM

Observation: Root maggot assessments were done on the day following swathing for each variety in the trial. It should be noted that although the average root maggot damage value for each variety is less than 2, there were in each case, roots having damage values up to level 4 in almost every plot. These were very few in number and their impact is thus masked by the mean value. This observation indicates that in any field of canola, even when soil conditions are dry, there can still be root maggot damage to a small percentage of the plants.

Results:

ROOT MAGGOT MONITORING TRIAL
B. rapa
Wanham, AB

Treatment	Rating
Foothills	1.3
Hysyn 110	1.3
Hysyn 120 CS	1.2
Reward	1.2
LSD	0.12
CV %	7.7

Discussion:

Root maggot damage was light in 1998 and there were no significant differences in root maggot damage between varieties at this site. Note that the average root maggot damage values are higher for the *B. rapa* varieties than for the B. napus varieties at this site.

ROLLA

Observations: Root maggot assessments were done on the day following swathing for each variety in the trial. It should be noted that although the average root maggot damage value for each variety is less than 2, there were in each case roots having damage values up to level 4 in almost every plot. There were very few in number and their impact is thus masked by the mean value. This observation indicates that in any field of canola, even when soil conditions are dry, there can still be root maggot damage to a small percentage of the plants.

Results:

ROOT MAGGOT MONITORING TRIAL
B. rapa
Rolla, BC

Treatment	Rating
Foothills	1.4
Hysyn 110	1.4
Hysyn 120 CS	1.6
Reward	1.5
LSD	0.31
CV %	16.1

Discussion: Root maggot damage was light at this site. The root maggot damage levels were not significantly different between varieties.

Western Canadian Summary:

Root maggot damage in 1998 was very light across all sites. There were no significant differences in root maggot damage among the varieties tested. There were also no differences in root maggot damage between *B. rapa* and *B. napus* varieties, at any one site. This latter observation is not consistent with earlier work, and is likely to be due to the very low level of root maggot damage this year.

XIX STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL

Objective: To determine the effects of swathing and straight combining of selected *B. napus* varieties on yield, quality and contribution margin. A secondary objective will determine what conditions mitigate harvest losses due to straight combining.

Background: Work at Canola Production Centres has shown that straight combining is a viable option to swathing with *B. rapa* varieties on yield, quality and contribution margin. Many growers have asked what criteria will make straight combining *B. napus* canola a viable option to swathing. A secondary objective will determine what conditions mitigate harvest losses due to straight combining.

Methodology: Double seed selected varieties in variety trial and straight combined.

INNISFAIL

Observations:

This trial was seeded May 9. Emergence was slow due to dry conditions at seeding. Once soil moisture conditions became favourable, crop development improved. Straight combined treatments at swathing time were well lodged and knitted. Favourable weather between swathing and combining allowed the crop to dry down with minimal shelling or pod drop. Although all treatments experienced some shelling, the straight combined treatments as a whole showed no signs of excessive loss.

Results

STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL
Innisfail, AB

Treatment	Yield (%)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
AC Excel				
Straight Combined	106	40.5	111.49	46.8
Swathed	100	38.1	91.43	45.1
LSD for harvest method		5.69		1.90
CV%		8.7		2.5

Discussions: No statistically significant differences in yield or oil content were observed between treatments. Straight combining resulted in higher economic returns.

STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL Innisfail, AB				
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Synbrid 220				
Straight Combined	104	39.7	92.36	46.8
Swathed	100	38.3	79.79	46.1
LSD for harvest method		2.17		1.21
CV%		3.3		1.6

Discussions: There are no significant differences in terms of yield or oil content. There is an economic advantage to straight combining in this trial.

STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL Innisfail, AB				
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
Hyola 401				
Straight Combined	99	40.1	90.29	45.8
Swathed	100	40.3	89.70	45.2
LSD for harvest method		5.01		0.89
CV%		7.5		1.2

Discussions: There are no significant differences in terms of yield or oil content between treatments. Contribution margins shows a small advantage for straight combining.

ANDREW

Observation: All varieties were standing well and upright due to the hot and dry conditions at this site. This produced a crop that did not exhibit a great deal of lodging and knitting, which left the crop more prone to wind damage from pod shell and drop. However, winds were not a problem prior to combining.

Results:

STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL Andrew, AB				
Treatment	**Yield (%)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**
AC Excel				
Straight Combined	102	34.7	146	42.9
Swathed	100	34.1	139	42.0
Hyola 401				
Straight Combined	92	33.2	117	42.3
Swathed	100	36.0	136	41.6
Synbrid 220				
Straight Combined	95	31.3	107	43.4
Swathed	100	32.8	117	41.5
LSD for harvest method		2.74		0.73
CV%		6.7		1.4

Discussions: Hyola 401 and Synbrid 220 both suffered slight losses under straight combining as compared to swathing. AC Excel, however, yielded similar under both harvest methods. Oil contents were significantly higher for all three varieties under straight combining. Another difference between the varieties was in harvestability under straight combining, which was discussed in the harvestability section.

Western Canadian Summary:

There was a slight yield and economic advantage to straight combining AC Excel at both locations. Other varieties tested indicated varying results in terms of yield and economic benefits. The data confirms that individual crop and environmental conditions are the deciding factors in the choice of harvest method. In general, straight combining becomes a viable option when crop canopy conditions are relatively heavy, with a canopy that is well knitted. Under these conditions, the risk from shelling and pod drop due to wind decreases. Any decision to straight combine *B. napus* varieties should be examined carefully, by fully assessing the risk potential for yield and economic loss. Oil contents tend to be higher in straight combined treatments.

XX BASF FAX BULLETIN

Objective: To provide timely information to growers and farm supply dealers on the progress of the 1998 canola crop at selected Canola Production Centres.

Background: A good canola crop cannot be obtained without proper management. Management decisions should be based on field observations and monitoring of the development of both crop and canola pests. Canola Council agronomists continuously monitored the progress of the crop and made these observations available to BASF for distribution to their retail network.

Methodology: Completed and recorded growth stage observations on each Monday throughout the growing season. Noted the presence and stage of development of any pests. Identified any unusual weather trends and made recommendations on management opportunities.

Results: Were forwarded to BASF retailers across Western Canada weekly, during the summer.

Discussion: The usefulness of this fax was invaluable to both retailers and producers. It allowed our agronomic staff to give insight to environmental conditions, weed problems, crop stage and insect and disease updates. Extension is a very important part of our work. These fax sheets allow us to reach a broad spectrum of producers and inform them what is taking place on Canola Production Centres over the growing season.

XXI WATSON PRECISION FARMING TRIAL

Objective: To generate a yield map for canola and wheat at the Watson site, using field positioning information derived from Global Positioning Systems and yield monitoring equipment.

Background: Global positioning systems (GPS) are one of the key pieces of technology available that make precision farming a possibility. GPS utilises satellites, and equipment mounted receivers, to determine where you are (latitude, longitude and elevation) on your field. Position can be determined to within one foot, using a Differential GPS system (DGPS). The result is a detailed database of positional information. In combination with sensors (eg yield and grain moisture) on a particular piece of equipment (eg combine), maps can be used to visualise crop variation, and quantify it.

Precision farming technology is a new name for an old concept. It involves combining new farming technology to measure yield and positional information, along with presently available techniques of soil sampling to locate yield variation. When this data is compiled, yield, product moisture, soil nutrient variation, topographical and other maps can be computer generated, allowing the producer to see more clearly the relationships between the various factors. Precision farming is all about finding out what your soil needs, where it needs it, and then putting exactly the right amount of seed, fertilizer, herbicides and insecticide in the right spots. (ref. 1)

Methodology: Canola and wheat crops were grown at the Watson site. A combine, fitted with a yield monitor and GPS receiver (for positional information) was used to combine the swathed crops. The harvested yields of both crops were verified by weighing each hopper load to obtain a total weight of crop removed from the fields. These values were then compared with the yields calculated by the yield monitor. On-the-go yields, (as determined by the yield monitor) were plotted on a field map using positional information from the GPS receiver and GreenStar software.

Observations: This site was seeded May 25. Soil moisture conditions were ideal and emergence was rapid and even for both the wheat and canola. A thirty foot swath was cut to ensure better accuracy of the GPS combine. The yield monitoring equipment was easy to operate. A John Deere representative was on site to aid in operation of the system. Yield was calibrated using a converted 4-ton grain truck, supplied by PAMI, with load cells.

Results: Yield mapping indicated a 50.1 bu/ac average for the wheat, and 18.3 bu/ac average for canola.

Discussion: Accuracy of the yield monitoring equipment was within 3 percent of the four-ton calibration grain truck. Actual gross bushels hauled into the elevator were comparable to the yield monitoring equipment. Yield mapping in combination with global positioning is a useful tool for

establishing a data base for precision farming technology. With further data analysis it is desired to develop a prescription of inputs required using newly developed precision farming technology.

(ref. 1) Ron C. Johnson, Target Farming, A Practical Guide to Precision Agriculture.

XXII SUMMARY

The Canola Production Centre program is a continuing success. In 1998, the program looked not only at new agronomic issues and management techniques brought forward to us by producers and industry, but ongoing trials. New trials included; fertilizer rate and variety (100%, 150% and 200% rates), seed treatment (Foundation + Polymer), herbicide control, time of weed removal and sulphur form trials. Ongoing trials included; variety evaluation, root maggot control and monitoring, and systems comparisons 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 make decisions on a producer's farm.

XXIII FIELD STAFF INFORMATION

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- THE END-

I APPENDIX - Minnesota Canola Production Centre Results

ACKNOWLEDGEMENTS

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.

The Canola Council of Canada is the co-ordinating body of the Canola Production Centre (CPC) program across Canada, and provides expertise and supervisory support for the CPC in Minnesota. Funding for the Minnesota CPC program was appropriated by the Minnesota State Legislature in co-operation with the Minnesota Canola Council and the University of Minnesota.

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

The following cash sponsors supported the Roseau site in 1998.

AgrEvo USA
American Cyanamid
Monsanto

II SITE DESCRIPTION

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

MINNESOTA

ROSEAU, MN - 80 ACRES

Land: Magnusson Farms

Seed and Seed Treatment:

Agri-Tel Grain - LG 3430
Cargill Hybrid Seeds - Roseau
Croplan Genetics - Crown
Interstate Seed Co. - Hyola 401, Hyola 420
ProSeed Inc. - Topscore

Fertilizer: Cenex Land-O-Lakes Agronomy Co. and Allied Signal
- granular fertilizer (80 acres)

Herbicides and Fungicides:

Dow AgroSciences - Treflan, Stinger (80 acres)
Dupont - Assure II (80 acres)
BASF - Ronilan EG (65 acres)

Equipment and Labor:

Carter Honvet and Monte Casavan - swath roller
Cenex West Plant - soil testing, fertilizer spreading, spraying (80 acres)
Danny Howell - field day preparations
Richard Magnusson - combine and operator (harvesting of fill area)
Pioneer Hi-Bred and Cenex West Plant - weigh wagon
Salol Elevator - grain trucks
Steve Dahl - harrow-packer, tractors, press drill, swather

Photocopying & Faxing:

Roseau County Extension Office, Roseau
Polk County Extension Office, Crookston

Tours: Border State Bank - coffee
B&B Plumbing - porta-potties
Land-O-Lakes and Eddie's Dairy - ice cream
Roseau Eagles Aerie 3882 - pig roast and lemonade
Roseau Schools - tables
Wally's Supermarket - cake
Wannaska 4H Club - set up, serving

III INTRODUCTION

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

Following tours of the Canola Production Centre near Carman, MB in 1996 and 1997, the Minnesota Canola Council sought funding for a joint project between the Minnesota Canola Council, University of Minnesota and Canola Council of Canada. The purpose of the project was to establish a Canola Production Centre site in Minnesota, and the role of the Canola Council of Canada was to provide expertise and supervisory support. This would help ensure that activities at this site would be consistent with activities at the Canadian CPCs. 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.

The grand opening of the site was held on July 1, including a barbecue lunch and tour of the site, allowing anyone interested the opportunity to view the various projects. 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 included many agronomic factors such as yield and quality data, early season plant counts, lodging indexes and harvestability ratings on varieties.

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

IV DEFINITIONS

Please refer to the Definitions (Page 16) section of the report for the Canadian CPCs 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	$/BU
0 – 2.0	9.33	4.68
2.1 – 4.0	9.03	4.53
4.1 – 6.0	8.78	4.39
6.1 – 10.0	8.33	4.17

Note 1: The green seed was determined by using three 100 seed crush strip tests done on each sample from every treatment within a particular project trial.

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 spring 1998. 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**
46A65	4.70	Pioneer Hi-Bred	LG 3430	4.06	Agri-Tel Grain
CL2070	5.22	Croplan Genetics	Promark 220	3.80	ProSeed Inc.
Crown	3.58	Croplan Genetics	Quantum	3.48	Interstate Seed Co.
Ebony	4.06	Agri-Tel Grain	Roseau	3.64	Cargill Hybrid Seeds
Hyola 401	5.13	Interstate Seed Co.	SchP015	5.34	Cargill Hybrid Seeds
Hyola 420	5.13	Interstate Seed Co.	Topscore	3.29	ProSeed Inc

Note: Seed cost may vary from location to location. Prices reflect the Minnesota average for spring 1998, and include the cost of seed treatments (Benlate and Gaucho). Gaucho is the U.S. product for flea beetle control.

PRODUCT INFORMATION			
Product	**Active Ingredient**	**Manufacturer/ Distributor**	**$/Unit Cost**
Assure II	Quizalofop-p-ethyl	DuPont	118.30/gal
Ronilan EG	Vinclozolin	BASF	20.25/lb
Stinger	Clopyralid	Dow AgroSciences	479.22/gal
Treflan	Triflualin	Dow AgroSciences	31.83/gal

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	177.25	0.20 (of N)
Ammonium Sulphate	21-0-0-24	177.25	0.19 (of S)
Phosphate	18-46-0	251.80	0.19 (of P_20_5)
Potash	0-0-60	137.60	0.11
Urea	46-0-0	184.00	0.20

Machinery Cost:

- Conventional tillage: $20.00/acre
- Direct seeding: subtract $3.00/acre
- Straight combining: subtract $1.00/acre

Additional Machinery Costs: (Spraying Application)

- Aerial $4.25/acre
- Ground $4.00/acre

Equipment costs were obtained from the Border State Bank of Badger, MN and are estimated equipment variable costs for north-western 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 over six months is 8% per annum.

Site: **Roseau, MN**

B. napus Variety Trial: **Hyola 420**

CALCULATION OF VALUE OF PRODUCTION				
Yield (bu/ac)	**X**	**Price ($/bu)**	**=**	**Value of Production**
43.3	X	4.68	=	202.64

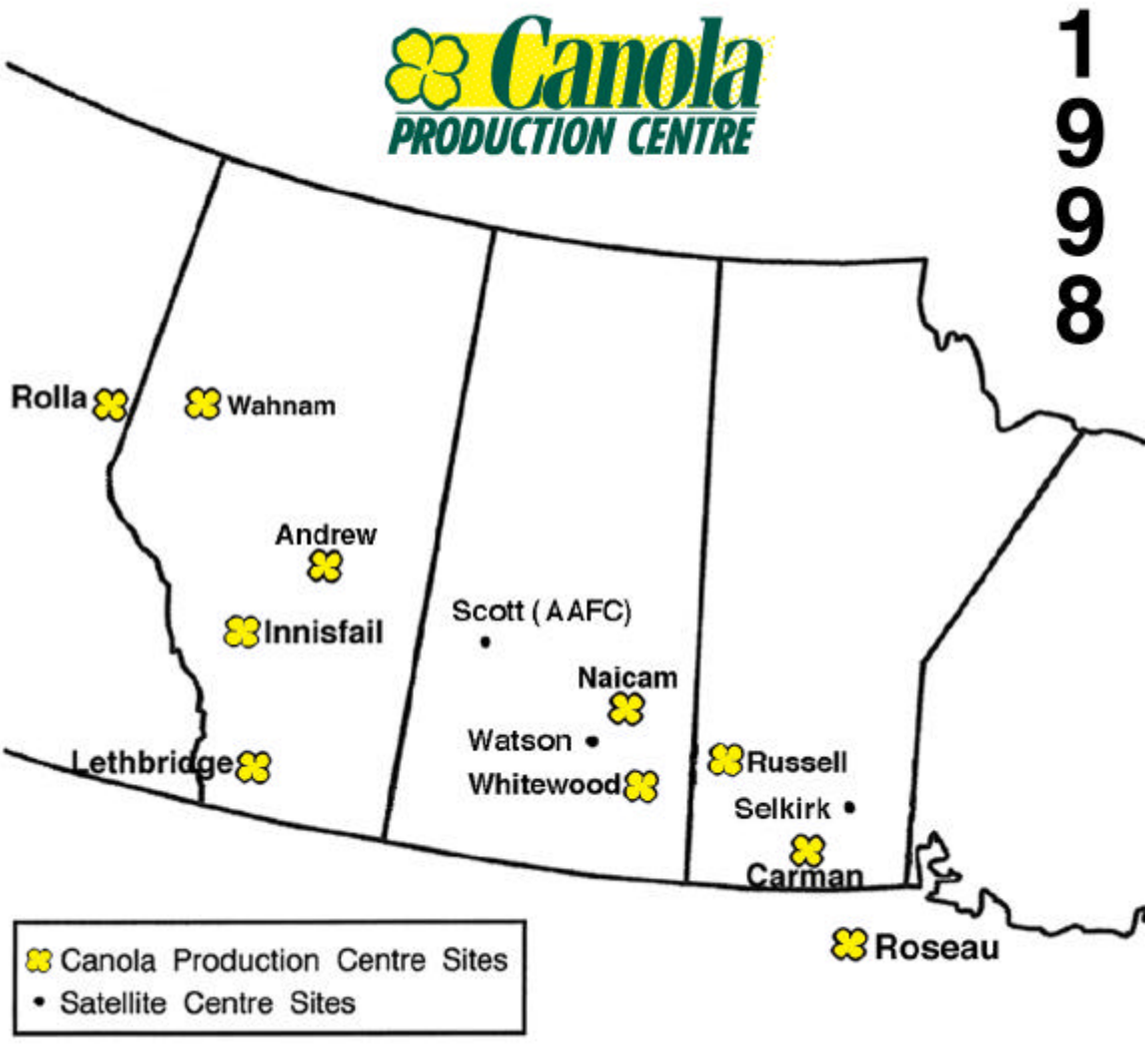
CALCULATION OF VARIABLE COSTS ($/AC)	
Seed	30.78
Fertilizer	19.44
Herbicides/Fungicides	72.94
Machinery	24.00
Insurance	7.00
Check-off	1.08
Interest/opportunity	5.89
Total Variable Costs	161.13

CALCULATION OF CONTRIBUTION MARGIN				
Value of Production ($/ac)	**-**	**Variable Costs ($/ac)**	**=**	**Contribution Margin ($/ac)**
202.64	-	161.13	=	41.52

Contribution Margin ($/ac)	/	Yield (bu/ac)	=	Contribution Margin ($/bu)
41.52	/	43.3	=	0.96

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

VI SITE LOCATION MAP


Canola
PRODUCTION CENTRE
1998
Rolla
Wahnam
Andrew
Innisfail
Scott (AAFC)
Naicam
Watson
Whitewood
Lethbridge
Russell
Selkirk
Carman
Roseau
Canola Production Centre Sites
Satellite Centre Sites

VII SITE INFORMATION

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

Location:	**Roseau, MN**

Co-operator: Richard, John and Bob Magnusson

Previous crop: Barley

Soil Test Results: (AgriSource Laboratories)

Organic matter content: 4.0 %

Macronutrient Levels: 0-6 inches (P and K); 0-24 inches (N and S)
Nitrogen - 18 lb/ac
Phosphorus- 30 lb/ac
Potassium - 316 lb/ac
Sulphur - 27 lb/ac

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

Yield lb/ac	Nitrogen	Phosphate	Potash	Sulphur
2000	0-25	30-50	0	0

Target yield: 2500 lb/ac

Fertilizer applied: N - 50 lb/ac P - 40 lb/ac K - 20 lb/ac S - 10 lb/ac

Soil Association/Zone: Wabanica – Fine Silty, Mixed Calcareous, Frigid Typic Endoaquolls

Soil Texture: Silt Loam (medium)

Soil pH: 8.1

Salinity: 0.5 mmho (slightly saline)

Tillage operations: The site was cultivated in the fall, and twice in the spring to incorporate broadcast fertilizer (50-30-20-10) and Treflan (1.75 pt/ac). Ten pounds of phosphate was seed-placed. The site was harrow-packed once before planting.

Seeding method: Seeded with a JD 9350 double disk press drill
Date: May 6, 7
Depth: ½ to ¾ inch deep
Rate: 6.0 lb/ac *B. napus*

Herbicides applied: Treflan in spring (1.75 pt/ac), Assure II (10 oz/ac) and Stinger (1/3

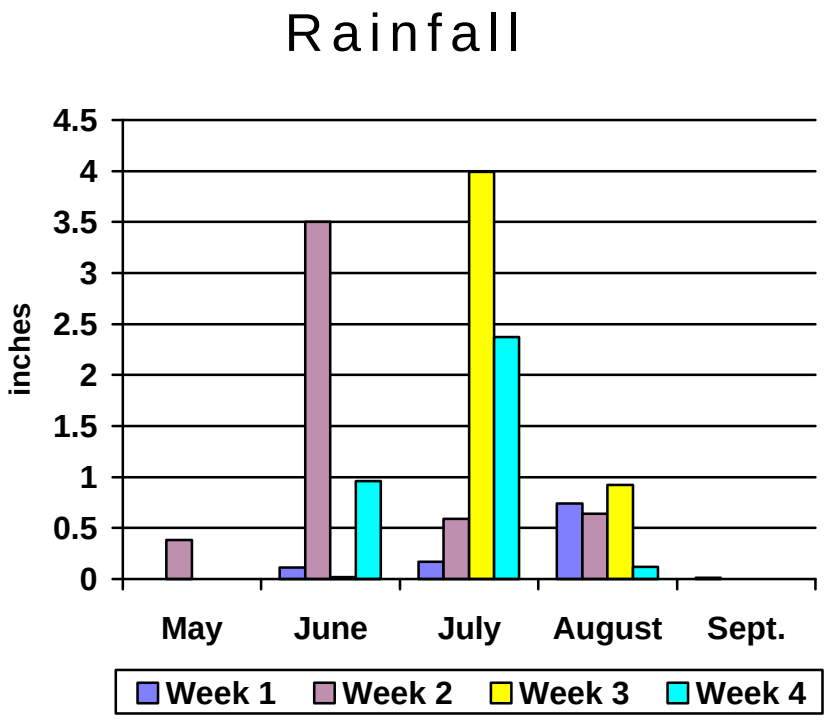
pt/ac) tank mix with crop oil (surfactant) and sprayed at the 4 to 5 leaf stage.

Fungicides applied: Ronilan EG (1.0 lb/ac)

Swathing: Started: August 6 Finished: August 17

Combining: Started: August 31 Finished: September 3

Comments: The site was seeded under ideal moisture conditions and emergence was excellent. The crop was under stress with cold damp conditions in late May and early June. Very wet conditions in late June and early July resulted in standing water on about half of the site. The wet conditions contributed to a shallow root zone, which promoted fast maturity under the hot dry conditions in August. Diamondback moth numbers were recorded but never reached threshold levels.



Total accumulated moisture = 14.52 inches (368.8 mm)

VIII VARIETY TRIALS

A 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 increase in 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.

Methodology: The variety trial was made up of four replicates in a randomized block system. Identical agronomic practices were used for all varieties. The entire trial was seeded on the same day. Swathing commenced when seed color change was 30% to 40% and harvest was completed when suitable conditions existed.

Observations: This trial was seeded on May 6 into good soil moisture, which resulted in even emergence. A thunderstorm in late June dropped hail on half of the trial. The center two-thirds of each plot in the first two replicates was affected. The hail resulted in heavy lodging and broken or damaged main racemes on most of the plants in the affected areas. This created difficulties in judging when to swath, and with the swathing process. Shallow roots from excess moisture combined with hot dry conditions in August hastened maturity. To prevent losses from shattering, the plots were swathed when the hailed portion was about 20% seed color change and the non-hailed portion was about 40% seed color change.

Results:

***B. NAPUS* VARIETY TRIAL YIELD, ECONOMIC & QUALITY RESULTS Roseau, MN**							
Treatment	**Yield (%)**	**Yield (lb/ca)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Growing Degree Days**	**Days to Maturity**
Hyola 420	102	2162	43.3	41.52	43.8	1234	99
Ebony	102	2152	43.1	47.26	44.1	1216	98
Hyola 401*	**100**	**2121**	**42.4**	**37.33**	**43.7**	**1216**	**98**
Quantum	96	2025	40.5	38.78	43.5	1183	96
Roseau	93	1981	39.6	33.59	44.6	1216	98
CL2070	92	1960	39.2	21.87	42.4	1264	101
Topscore	92	1941	38.8	32.05	43.0	1216	98
Promark 220	91	1929	38.6	27.94	43.4	1199	97
46A65	91	1918	38.4	21.39	43.9	1183	96
LG 3430	90	1906	38.1	23.99	43.1	1216	98
SchP015	88	1861	37.2	11.81	44.3	1264	101
LSD		127.2	2.54		0.82		
CV %		5.3	5.3		1.5		

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

Discussion:

There were significant differences in yield and oil content among the varieties. Contribution margins reflect yield and seed costs. Ebony had the highest contribution margin because of the high yield and lower seed costs.

The days to maturity represent the calendar days from the date of seeding to 30% seed color change. The growing degree days, expressed in Celsius, represent the heat accumulation above canola's base temperature of 5°C (41°F). Quantum and 46A65 exhibited the earliest maturity at this site, while CL2070 and SchP015 took the longest to mature.

IX HARVESTABILITY TRIAL

Objective: To compare the harvestability of varieties entered in the variety trial.

Background: A number of varieties had very similar yield and quality traits. In choosing a variety a grower should consider such things as lodging, harvestability and yield. Harvestability is the measurement of swathing and combining ease. Currently, there is no quantitative measurement for harvestability.

Methodology: Harvestability was evaluated as swathing and combining was completed on the variety trial. The check variety was swathed and evaluated on a scale of one to five with the check being three. The following criteria was considered; lodging, height, straw stiffness, straw strength, uniformity of stand, swath fluffiness, tendency to bunch, speed of operation, flowability and feeding. The check variety for *B. napus* was Hyola 401.

Ratings:
1 = much better than Check
2 = better than Check
3 = Check
4 = Worse than Check
5 = Much worse than Check

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

Observation: A late June thunderstorm caused severe lodging to a portion of all varieties in replicates 1 and 2. Swathing was difficult in the lodged area and required swathing and straight combining in one direction. Plots in replicates 1 and 2 were cut at lower heights than normal due to the excessive lodging. This resulted in more stem material in the swath and a greater tendency to bunch during swathing. The harvestability scores reflect the average of all four replicates. Plots were swathed with a 15 foot Versatile 400 and combined with a Massey Ferguson 760. The straight combined plots were harvested using a 20 foot header with a bat reel.

Results:

HARVESTABILITY TRIAL *B. napus* Roseau, MN				
Variety	**Lodging Ratio**	**Swathing Rating**	**Combinability Rating**	**Straight cut Rating**
46A65	.44	2	2	3
CL2070	.46	4	3	4
Ebony	.41	3	4	4
Hyola 401	**.43**	**3**	**3**	**---**
Hyola 420	.41	3	3	---
LG 3430	.48	3	3	---
Promark 220	.50	3	4	3
Quantum	.45	2	3	**3**
Roseau	.38	3	4	---
SchP015	.33	3	3	4
Topscore	.36	3	3	---

Note: The check variety for swathing and combining the swaths was Hyola 401.
The check variety for straight combining was Quantum.

Discussion: The swathing ratings of Quantum and 46A65 were better than the check (Hyola 401) because of smoother feeding with no bunching which allowed for faster ground speed. The variety CL2070 was more difficult to swath than the check because of uneven lodging that slowed ground speed. All the other varieties were similar to the check.

The combinability of 46A65 was better than the check because it fed smoothly into the combine and allowed faster ground. Ebony, Promark 220 and Roseau were more difficult to combine than the check, especially in the hail damaged area. The large amount of straw slowed ground speed. The swaths separated at the pickup and resulted in a portion being fed above the table auger, causing numerous stops.

Ebony, CL 2070 and SchP015 were more difficult to straight combine than Quantum because of uneven lodging in the hailed area and large amounts of tough stem tissue, which reduced ground speed.

X PHOSPHATE FERTILIZER RATE TRIAL

Objective: To compare the effect of various phosphate fertilizer rates on yield, quality and contribution margin of *B. napus* canola.

Background: Phosphate is recognised as an important nutrient for canola production and is necessary for plant growth and health. However, phosphate response in canola can be inconsistent due to the complex interactions between soil type and environmental factors. The purpose of this trial was to demonstrate phosphate response on a soil testing low in available phosphate, and relate these responses to economic return.

Methodology: The phosphate fertilizer rate trial consisted of four reps of five treatments in a randomized complete block design:

1. Check - no phosphate applied.
2. 15 lb/acre of phosphate seed-placed.
3. 30 lb/acre of phosphate seed-placed.
4. 45 lb/acre of phosphate seed-placed.
5. 45 lb/acre of phosphate banded prior to seeding.

Observation: The soil test at this location indicated that levels of available nitrogen, potassium and sulphur should be sufficient to produce a canola crop of nearly 2000 lb/ac (40 bu/ac). Therefore, no additional N, K or S was applied in this trial. The trial was seeded on May 7 into good soil moisture. Each of the above fertilizer treatments was applied with the double disc press drill. The phosphate source used was DAP (18-46-0). Heavy rains in June and early July resulted in flooding throughout the trial. Much of the crop was standing in water for up to two weeks. These conditions contributed to very weak, shallow roots which likely caused reduced access to nutrients and moisture during the hot dry conditions of late July and early August.

***Results**:*

PHOSPHATE FERTILIZER RATE TRIAL Roseau, MN					
Treatment	**Yield (lb/ac)**	**Yield (bu/ac)**	**Oil (%)**	**Contribution Margin ($/ac)**	**Plant Counts (plants/sq ft)**
0 lb/acre	1273	25.5	46.0	(33.54)	8.3
15 lb/acre	1375	27.5	46.0	(27.16)	7.8
30 lb/acre	1510	30.2	45.7	(17.52)	6.7
45 lb/acre	1410	28.2	46.0	(29.74)	5.8
45 lb/ac banded	1423	28.5	46.0	(28.35)	7.9
LSD	161.6	3.23	0.40		
CV %	7.6	7.6	0.6		

Note: Brackets in Contribution Margin reflect a negative value

Discussion: Yields were limited in this trial by stress from excessive moisture. One rep had to be left out of the trial due to flooding in some of the plots. The 30 lb/ac rate of phosphate provided a significant yield increase compared to the 0 lb/ac rate. There was no difference in oil content among the treatments. The contribution margins reflect the yield and costs of fertilizing at the different rates. The 30 lb/ac rate provided the best economic return in this trial. These results demonstrate the importance of phosphate fertilizer for canola production. It is important to note that placing too much phosphate (especially 18-46-0) in the seed row, particularly when using narrow openers such as a double disc, can cause seedling toxicity and poor emergence. Emergence decreased slightly as rate of seed-placed phosphate increased. When high rates of P are required, consider seed placement of a small amount of starter P (eg 10 to 15 lb/ac of P), while placing the rest away from the seed.

XI SEEDING RATE TRIAL

Objective: To evaluate the impact of different seeding rates of *B. napus* canola on agronomic characteristics such as yield, quality and contribution margins.

Background: Canola is a very flexible crop in that variations in seeding rate or plant population over relatively wide ranges normally have very little effect on the final yield, although these variations can affect maturity. Research has shown (Canola Growers Manual-crop establishment section) that as plant populations decline below 5.6 plants/square foot (60 plants/square metre) yields tend to decline. The effect of seeding rates on maturity is more pronounced under cool summer conditions than warm conditions.

Methodology: The variety seeded was Crown. Three seeding rates were selected for below, within and above the recommended range (5 - 7 lb/ac of seed):

A) 3.5 lb/acre
B) 6 lb/acre
C) 9 lb/acre

The treatments were arranged in a randomized complete block design.

Observations: The site was seeded May 7 into good moisture, which resulted in quick emergence. The 9 lb rate reached maturity 1 to 2 days before the 3.5 and 6 lb rates. Lodging was similar among all the seeding rates. The 3.5 lb rate was more difficult to swath than the other treatments due to thin spots which lacked stem material to push the crop across the cutter bar, resulting in some plugging.

Results:

SEEDING RATE TRIAL
Roseau, MN

Treatment	Yield (lb/ac)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)	Plant Counts (plants/sq ft)
Below (3.5 lb/acre)	1884	37.7	34.43	47.6	7.2
Rec. (6 lb/acre)	1971	39.4	33.03	48.2	11.3
Above (9 lb/acre)	1849	37.0	10.69	48.4	20.9
LSD	62.3	1.25		0.48	
CV%	2.4	2.4		0.7	

Discussion: Increasing seeding rate resulted in a corresponding increase in plant density. The recommended seeding rate (6 lb/ac) resulted in a significantly higher yield than the other treatments. This did not improve the contribution margin of the 6 lb/ac rate (compared to the 3.5 lb/ac rate) because the yield difference did not quite compensate for the difference in seed cost. The lower yield and higher cost of seed at the 9 lb/ac rate lowered the contribution margin. The 6 and 9 lb/acre rates had significantly higher oil content than the low rate of 3.5 lb/acre.

XII SEEDING DEPTH AND EQUIPMENT COMPARISON TRIAL

Objective: To compare the effects of seeding depth and seeding equipment (and any interaction between the 2) on stand establishment, yield, quality and contribution margin of *B. napus* canola.

Background: Seeding depth greatly influences the number of seedlings that emerge and their rate of development. Canola seed should be planted no deeper than necessary to reach soil with sufficient moisture for germination. Canola seeds do not have sufficient stored energy to push cotyledons from depths that would be considered normal for cereals. The type of seeding equipment used can also affect emergence through its accuracy of seed placement, type of openers and means of packing. The recommended seeding depth for canola is ¾ to 1 inch.

Methodology: Each treatment was replicated four times in a randomised block system. The canola variety used was LG 3430. The air seeder used was a Concord 3400 with a 10" row spacing, while the double disc press drill was a John Deere 9350 with a 6" row spacing. The treatments were:

A) Broadcast and incorporated
B) 1" depth with press drill
C) 2" depth with press drill
D) 1" depth with air seeder
E) 2" depth with air seeder

Observation: This trial was seeded on May 6 into ample soil moisture resulting in good germination across all treatments. Seed depth in the broadcast and incorporation treatment ranged from the surface to 3 inches deep. There was difficulty obtaining the 2 inch depth with the press drill, and as a result averaged 1.5 inches.

Due to plot orientation, the trial was seeded perpendicular to the normal tillage pattern on the field. This caused a problem with poor emergence in the air seeded plots at the 2 inch depth, due to the undulating field surface. Seeding depth ranged from 0.5 to 2 inches in the 1 inch treatment and from 1 to 3 inches in the 2 inch treatment. As a result, plant density was uneven in the 2 inch treatment, with stands reduced to 6 plants/ft^2 in some areas. These stands remained uneven in growth and maturity throughout the growing season.

Results:

SEEDING DEPTH AND EQUIPMENT COMPARISON TRIAL Roseau, MN					
Treatment	**Yield (lb/ac)**	**Yield (bu/ac)**	**Contribution Margin ($/ac)**	**Oil (%)**	**Plant Counts (plants/sq ft)**
Broadcast & Inc.	1498	30.0	(13.72)	46.2	21.3
1" depth - Press drill	1484	29.7	(15.12)	46.1	17.4
2" depth - Press drill	1505	30.1	(13.12)	45.8	16.4
1" depth - Air seeder	1434	28.7	(19.77)	46.0	20.2
2" depth - Air seeder	1424	28.5	(20.70)	45.1	11.4
LSD	110.7	2.21		0.76	
CV%	6.0	6.0		1.3	

Note: Brackets in contribution margin reflect a negative value

Discussion:

The 2" air seeder treatment had reduced emergence. This was due to two factors. Firstly, we were not able to penetrate to a full 2" with the press drill. Secondly, the undulating surface led to some areas being seeded considerably deeper than 2" with the air seeder. Due to the ideal moisture conditions after planting, we did not see the uneven emergence that we expected in the broadcast and incorporation treatment. With dry conditions, the range in seed depth in the broadcast and incorporation treatment would normally result in multiple flushes of canola. Under crusting conditions, the deep seed would likely run out of energy before emerging. There were no significant differences in yield among treatments. The 1" air seeder treatment was significantly lower in oil content than the other treatments, except the 2" press drill. Contribution margins were indicative of minor yield differences.

Under heavier weed pressure, the thin stands resulting from the 2" air seeder treatment would not compete well. The patchy areas also demonstrated the need for a firm, level seedbed to obtain uniform seed depth.

XIII SCLEROTINIA STEM ROT (WHITE MOLD) CONTROL TRIAL

Objective: To evaluate sclerotinia control using a fungicide on yield, quality and economic return on canola.

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 crop density and weather conditions or irrigation, heavy infections can develop almost anywhere. In some cases half the potential yield of a crop may be lost to sclerotinia.

Methodology: The trial was seeded with the variety Roseau.
Treatments:

A) Check - no treatment
B) Full rate - Ronilan EG (1 lb/ac)

Observation: Petal testing showed a high percentage of infected petals (80%), and this together with the wet weather indicated a high potential for yield loss from sclerotinia stem rot (white mold). Wet conditions in early July prevented a timely application of fungicide on this trial. The variety Roseau was in the variety trial and it was sprayed with Ronilan EG (1 lb/ac) by air on July 3. A comparison of Roseau plots from the treated variety trial was made with four plots of Roseau in the untreated area of the sclerotinia trial. This is not a side-by-side comparison and therefore should not be interpreted as one.

Sclerotinia levels in the untreated area were measured at swathing time by taking random counts of 50 plants in a row and determining the percent of plants infected. Infection levels ranged from 30% to 100%. The average was 60%. Observations in the treated area showed very low levels of sclerotinia infection.

Results:

SCLEROTINIA STEM ROT CONTROL TRIAL
Roseau, MN

Treatment	Yield (%)	Yield (lb/ac)	Yield (bu/ac)	Oil (%)	Contribution Margin ($/ac)
Check	67	1335	26.7	46.3	(5.40)
Full Rate	100	1980	39.6	44.6	33.59

Note: Bracket in Contribution Margin reflect a negative value

Discussion: The yield response from spraying with Ronilan EG more than covered its

cost as shown by the contribution margin. The contribution margin represents the differences in yield and fungicide application costs. Some of the yield difference observed could have been associated with the difference in locations within the field. However, the high infection levels in the untreated block and magnitude of the yield difference clearly demonstrate the benefits of fungicide application when disease pressure is high.

XIV INSECTICIDAL SEED TREATMENT TRIAL

Objective: To evaluate the impact of Gaucho seed treatment with Benlate seed treatment, compared to Benlate alone, as it relates to yield, quality and contribution margin.

***Background*:** The most widespread problem of canola production is poor stand establishment. A seedling disease complex including pathogens such as *Rhizoctonia solani*, along with *Fusarium* and *Pythium* species, can cause poor stand establishment. Seed treatment fungicides (eg Benlate) are used extensively in canola production as the first line of defence to control seedling disease. The application of an insecticidal seed treatment such as Gaucho, in combination with the fungicidal seed treatment, may provide the added benefit of early season flea beetle control in areas where they are a problem.

***Methodology*:** The seed treatment trial consisted of two treatments in a randomised block system. The variety used was Hyola 420.

A) Benlate only

B) Benlate & Gaucho

Seed treatment (Gaucho 75) was applied at 10.67 oz./cwt of seed, while all other management practices were the same.

Observation: This trial was seeded on May 6 into good soil moisture. There were no noticeable differences in emergence between the treatments. Flea beetle pressure at the site was negligible.

Results:

INSECTICIDAL SEED TREATMENT TRIAL
Roseau, MN

Treatment	Yield (lb/ac)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
Benlate	1808	36.2	17.70	46.4
Benlate& Gaucho	1784	35.7	6.14	46.2
LSD	156.6	3.13		0.45
CV%	5.2	5.2		0.6

Note: Seed cost in contribution margin, Hyola 420 with Gaucho and Benlate is $5.13/lb and Hyola 420 with Benlate only is $3.65/lb.

Discussion: There were no significant differences in yield or oil content between the treatments. This is likely a result of favorable conditions at emergence and the lack of flea beetle pressure. Contribution margins reflect the differences in yield and seed treatment costs.

XV DIAMONDBACK MOTH EVALUATION TRIAL

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

***Background*:** Diamondback moth larvae can be a significant pest in canola. Previous work completed by Agriculture & 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:

A) Record moth counts
B) Record other insects
C) Change lures and trap inserts weekly
D) Phone in moth counts using ON TAP system.

Observations: Diamondback moth levels were low at the site. Very few non-target insects were trapped. Trapping started on July 1.

Results:

DIAMONDBACK MOTH EVALUATION TRIAL
Roseau, MN

Date	Number
July 10	52
July 18	31
July 24	12
August 10	13

***Discussion**:* While some moths were present at the site, they were well below threshold levels (90/week). The counts were forwarded to Environment Canada to assist in development of a forecasting model.

XVI STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL

Objective: To determine the effects of swathing and straight combining of selected *B. napus* varieties on yield, quality and contribution margin. A secondary objective will determine what conditions mitigate harvest losses due to straight combining.

Background: Work at Canola Production Centres has shown that straight combining is generally not a viable option compared to swathing *B. napus* varieties. However, success of straight combining will be affected by environmental and crop factors.

Methodology: Two plots of selected varieties were seeded side by side within each replicate of the variety trial. One was swathed at 30-40% seed color change and the other was straight combined.

Observation: A Massey Ferguson 760 was used for harvesting this trial. Straight combining was done with a 20 foot header with a bat reel. All swathed treatments were combined on September 1. All straight combined treatments were harvested on September 3. Seed moisture of the swathed plots was about 6% while seed moisture of the straight combined plots was about 9%. Most of the straight combined plots had green stems, branches and pods at combining time, especially in the lodged area. Straight combining of the lodged plots was difficult because the pods and branches wedged under the table auger before the sickle could cut the stems, but raising the feeder auger improved this. Plots that were standing upright were straight combined quite easily at speeds similar to the swathed plots. This led to higher harvesting rates (ac/hr) with straight combining (20 foot cut) as compared to combining the swaths (15 foot cut). There was little shelling at combining time due to the absence of severe weather during dry down, and the lodging of the crop. The lodged plots had some green pods in them, which contributed to more dockage and higher harvest moisture.

Results:

STRAIGHT COMBINING VS SWATHING *B. NAPUS* TRIAL
Roseau, MN

Treatment	Yield (%)	Yield (lb/ac)	Yield (bu/ac)	Contribution Margin ($/ac)	Oil (%)
46A65					
Straight Combined	104	1991	39.8	28.95	44.7
Swathed	100	1918	38.4	21.39	43.9
CL2070					
Straight Combined	99	1936	38.7	20.58	43.7
Swathed	100	1960	39.2	21.87	42.5
Ebony					
Straight Combined	106	2285	45.7	60.40	44.9
Swathed	100	2152	43.1	47.26	44.1
Promark 220					
Straight Combined	110	2112	42.3	46.20	45.0
Swathed	100	1929	38.6	27.94	43.4
Quantum					
Straight Combined	101	2036	40.7	40.75	43.6
Swathed	100	2025	40.5	38.78	43.5
SchP015					
Straight Combined	108	1998	40.0	25.88	45.6
Swathed	100	1861	37.2	11.81	44.3
LSD for method within variety		98.7	1.97		0.56
CV%		4.0	4.0		1.1

Discussions: Yields were not adversely affected by straight combining. Yield increased significantly when straight combining varieties Ebony, Promark 220, and SchP015. These increases are likely due to the ability of the later formed pods to finish filling after the normal swathing period (30 to 40% seed color change). **Contribution margins reflect differences in yield, seed costs and cost of swathing.** Shattering losses were small due to favorable weather conditions. Higher oil content in the straight combined plots is a common occurrence since oil is the last component produced in the seed. Similar trials done in 1997 by the Canola Council of Canada showed significant losses of 5 to 56% with an average loss of 26%. At one site yields increased 25 to 47 % with straight combining. There were problems with green plant material clumping in the feeder housing and slowing harvest speeds. In 1995 and 1996, all but one location showed significant losses in the straight combined treatments compared to the swathed plots of *B. napus.* Straight combining of *B. napus* varieties appears to work well when weather conditions are favorable (no damaging storms or high winds) and when the plots are lodged and well knitted.

XVII TIME OF SWATHING TRIAL

Objective: To evaluate the impact of swathing at various crop stages on yield, quality and contribution margin of canola.

Background: Work at Canola Production Centres since 1990 has determined that the optimum stage for swathing canola is 30 to 40% seed color change. Oil is one of the last components produced in the canola plant. Stage of swathing can play an important role in yield, oil production and contribution margin for growers.

Methodology: The trial consisted of 5 treatments:

A) Swathing at 0 to 10% seed color change
B) Swathing at 10 to 20% seed color change
C) Swathing at 30 to 40% seed color change
D) Swathing at 50 to 60% seed color change
F) Straight combine

All other management practices were the same across treatments.

Observation: The trial was seeded on May 6 into good moisture with the variety Topscore. The 0-10% seed color change (SCC) treatment was cut as soon as seed color was visible. The hot dry conditions in early August caused rapid seed color change. The 30-40% and 50-60% SCC treatments were swathed in the morning with dew on the crop. The swathed plots were combined on September 1, and the straight combined plots on September 3.

Results:

TIME OF SWATHING TRIAL
Roseau, MN

Treatment	Yield (%)	Yield (lb/ac)	Yield (bu/ac)	Oil (%)	Swath Date	Contribution Margin ($/ac)
0-10% SCC	80	1735	34.7	41.9	Aug. 6	12.96
10-20% SCC	89	1935	38.7	41.8	Aug. 8	25.78
30-40% SCC	100	2165	43.3	42.1	Aug. 13	53.00
50-60% SCC	109	2370	47.4	43.4	Aug. 17	72.08
Straight Combine	106	2290	45.8	44.3	----	65.67
LSD		102.5	2.05	0.76		
CV %		3.6	3.6	1.4		

Discussion: Yields increased significantly between each successive swathing. This was likely due to the ability of the crop to fill more completely before swathing, combined with the lodging of the crop which limited shattering losses. Straight combining also provided significantly higher yields than the 30-40% SCC. There was a small amount of shelling in the straight combined plots. This would explain some of the loss between 50-60% SCC and straight combining. Oil content also increased as swathing was delayed. Higher oil content in the later swathed plots and the straight combined plots was expected since the oil is the last component produced in the seed. **Contribution margins reflect differences in yield, costs of swathing and differences in green seed counts. The 10-20% SCC treatment had 2.3% green seed. All other treatments had less than 2.0% green seed.**

Although there was a positive result from swathing after the 30-40% SCC and from straight combining, there was a risk of losing much of the crop to shattering. This year the shattering was minimal due to favorable weather (no strong storms) and lodging.

XVIII SUMMARY

The first year of the Minnesota Canola Production Centre program has been a great success. The trials at the Roseau site were chosen to demonstrate basic canola production principles. This was done in recognition of the fact that many producers in Minnesota have not had much previous experience in managing this crop. While many of the trends in the trials reflected past results from the Canadian CPC program, others turned out different than long term trends. 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. 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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