2008

Canola Research

University of Minnesota

Table 7: Survival of winter canola when fungicide was applied prior to overwintering (lb/acre at 8% moisture) at Wannaska in 2008.

Treatment	Survival
Folicur 8 oz	**59%**
Folicur 4 oz	**41%**
Proline 9 oz	**34%**
Proline 4.5 oz	**28%**
Untreated	**14%**
LSD	**17%**
CV	**34**

TABLE OF CONTENTS

MINNESOTA CANOLA PRODUCTION CENTRE RESULTS

ACKNOWLEDGEMENTS

Minnesota Canola Production Centre

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

Many thanks to all of our local and regional sponsors for their donations of cash, products and services. Their continued generous support has made the Minnesota Production Centre a research project that benefits all growers of canola in this region.

SITE INFORMATION

Location*:** ***Wannaska, MN

***Cooperator*:** Kraig Lee

***Previous Crop*:** Timothy

***Soil Test Results*:**

Macronutrient Level*:*	*(0-6", 6-24")*
Nitrogen -	4, 8 lb/ac
Phosphorous -	28 ppm
Potassium -	283 ppm
Sulfur -	60, 480 lb/ac
Target Yield:	2000 lb.ac
Fertilizer Applied:	N – 90 lb/ac
Soil pH:	6.5
Salinity	0.41 mmho (0-6") (low)

Tillage Operations: The field was chisel plowed in the fall of 2007.

Seeding Method: The field was seeded with a John Deere 9350 double disc press drill.

Herbicides Applied: A) Liberty Link varieties – Liberty 34 oz/ac, ammonium sulfate 2 lb/ac.

B) Roundup Ready varieties – Roundup Weather Max 22 oz/ac, ammonium sulfate 2 lb/ac.

Comments: The 2008 growing season began on a cold note, and stayed on that theme all year long. Growing degree units ended up almost 600 behind the season of 2007. Rainfall during the season was 3 inches less than 2007, and close to normal at 17 inches. Despite the cool season, canola yields in the region were very good, and on average, 300 lb/ac higher than 2007 yields.

VARIETY EVALUATION OF WINTER CANOLA TRIAL

Objective: Evaluate winter canola varieties for their ability to survive the winter and produce grain yield in Northern Minnesota.

Background: A collection of 54 winter canola varieties were seeded into Timothy stubble on August 28, 2007 as a part of the National Winter Canola Variety Trials. Unfortunately, survival of plots was very poor and subsequently not a usable trial for 2008. However, this circumstance provided an excellent environment for a study that was initiated in the fall of 2007.

In Europe, the survival of winter canola has been shown to be enhanced when a fungicide is applied in the fall prior to overwintering. This study was initiated to determine the influence of fungicide application on survival and subsequent yield of winter canola.

Methodology: All varieties were seeded at 5 lb/ac. The trial was laid out as a RCB design with four replicates. Treatments included 2 fungicides at 2 different rates. Folicur at 4oz and 8oz, and Proline at 4.5oz and 9oz were applied with 20 gal of water/ac at 25 p.s.i. on October 5, 2007. An untreated area was used as the check. Three varieties were evaluated. Survival was calculated by counting the number of plants sprayed and recounting the survival of sprayed plants in the spring. Plot size was 5 ft x 5 ft.

Results: The results concluded that fungicides provided significantly greater survival than the untreated check regardless of variety. Similar experiments will be conducted in future research efforts in the ongoing effort to discover varieties and methods to successfully produce winter canola at this latitude.

Table 6: Seed yield of four varieties planted in a tilled and non-tilled environment (lb/acre at 8% moisture) at Wannaska in 2008.

Variety and Treatment	Yield	Difference
Conventional Proseed 50 Caliber	2285	814
No-till Proseed 50 Caliber	1471	
Conventional Integra IX087121	2178	530
No-till Integra IX087121	1648	
Conventional Pioneer P45H26	2205	400
No-till Pioneer P45H26	1805	
Conventional Cargill V2010	1867	29
No-till Cargill V2010	1838	

LARGE PLOT VARIETY COMPARISON TRIAL

Objective: ***To establish agronomic criteria for choosing among variety options.***

Background: The availability of many canola varieties has given producers many options for variety selection. Yield, lodging resistance, maturity, and crop quality are important variety traits for growers to consider when making variety selections. Companies were invited to submit their varieties for entry in large plot trials that would simulate conditions in a grower's field.

Methodology: All varieties were seeded at 5 lb/ac. The trial was laid out as a modified RCB design with four replicates. Roundup Ready varieties were grouped together to facilitate timely herbicide application and to reduce drift to InVigor varieties. Swathing commenced when seed color change was 40% on the main stem, and harvest was completed when suitable conditions existed. Plot size was 150 x 18 ft.

Results: The trial was seeded on May 22 into cool and moist soils. Emergence was uniform however on the slow side. Weed pressure was high, but weather conditions at herbicide application provided very good weed control and suppression. Excessive water pressure in early June impacted overall yields in this area of the Production Centre.

Table 1: Seed yield, growth characteristics and oil content of canola (Brassica napus) varieties (lb/acre at 8% moisture) at Wannaska in 2008.

Brand	Cultivar	Blackleg Rating*	Seedling Vigor	Days to Flower	Days to Maturity	Plant Height	Plant Lodging**	Oil %	Yield lb/ac
DeKalb	52-41	R	1	43	88	33	2	47.1	2008
DeKalb	72-55	MR	1	43	90	35	2	47.1	2000
DeKalb	30-42	R	1	43	87	34	2	48.2	1975
Bayer	8440	R	1	42	88	34	1	46.5	1942
Pioneer	45H26	R	1	42	89	35	2	48.7	1858
Proseed	50 Caliber	R	1	41	88	31	3	45.3	1858
Cargill	1035	R	1	41	87	28	2	47.7	1817
Bayer	5440	R	1	42	86	30	1	45.3	1708
DeKalb	7145	MR	1	42	87	33	3	45.7	1675
Canterra	SWK5325RR	R	1	45	87	31	2	46.9	1642
Canterra	1818	R	1	45	87	28	1	47.2	1592
Cargill	1037	R	1	43	90	30	5	47.4	1517
Cargill	2010	MR	1	44	91	33	2	46.4	1425
Cargill	2018	MR	1	44	92	31	2	45.9	1208
							Mean		1730
							LSD 0.05	<.0001	311
							CV (%)		12.6

***** Blackleg resistance rating provided by seed companies: R=Resistant, MR = Moderately Resistant, MS = Moderately Susceptible

****** Plant Lodging score: 0 = no lodging, 9 = plants lying flat

******* Seedling vigor score: 1 = vigorous, 9 = no vigor

NO-TILL SEEDING INTO GRASS FIELD TRIAL

Objective: Evaluate the effectiveness of direct seeding of canola into standing grass seed stubble when compared to conventional tillage preparation.

Background: Grass seed production occurs on over 50,000 acres of land in Northern Minnesota. Many of these growers produce canola. The high price of fuel cost has growers wondering of the feasibility of directly seeding canola into grass field stubble. This study was initiated to determine the influence of direct seeding canola on emergence and subsequent yield.

Methodology: All varieties were seeded at 5 lb/ac. The trial was laid out as a split block design with four replicates. Treatments included conventional tillage and untilled Timothy stubble. Each of four varieties were planted into each main treatment. Swathing commenced when seed color change was 40% on the main stem, and harvest was completed when suitable conditions existed. Plot size was 25 x 6 ft.

Results: The trial was seeded on May 16 into cool and moist soils. Yields of the varieties Proseed 50 Caliber, Integra IX087121, and Pioneer P45H26 were significantly different when compared on no-till versus conventional tillage plots. Yields were significantly higher on the conventionally tilled plots. However, the variety Cargill V2010 was not significantly different when treatments were compared. This experiment thus provided initial evidence that certain varieties may perform more poorly in a no-till situation, while others may not have any negative effects on yields. We will conduct more research with this basic no-till study in 2009.

Table 5: Seed yield of variety Pioneer 45H28 in the straight harvesting trial (lb/acre at 8% moisture) at Wannaska in 2008.

Treatment	Date of Harvest	Yield
Swath	**August 26 (swathed)**	**2207**
Straight	**September 17**	**2182**
Biovital	**September 17**	**2094**
Biovital	**October 3**	**1791**
Biovital	**October 20**	**1707**
LSD		**292**
CV		**9.5**

SMALL PLOT VARIETY COMPARISON TRIALS

Objective: To establish agronomic criteria for choosing among existing and forthcoming variety options.

Background: The availability of many canola varieties has given producers many options for variety selection. Yield, lodging resistance, maturity, and crop quality are important variety traits for growers to consider when making variety selections. Companies were invited to submit their current and pending varieties for entry in the trials to compare against similar varieties in a small plot setting.

Methodology: All varieties were seeded at 5 lb/ac. The trial was laid out as a RCB design with four replicates. Roundup Ready varieties were grouped together to facilitate timely herbicide application and to reduce drift to InVigor varieties. Swathing commenced when seed color change was 40% on the main stem, and harvest was completed when suitable conditions existed. Plot size was
25 x 6 ft.

Results: The trial was seeded on May 18 into cool and moist soils. Emergence was uniform however on the slow side. Weed pressure was high, but weather conditions at herbicide application provided very good weed control and suppression. Overall yields were exceptional.

Table 2: Seed yield, growth characteristics and oil content of Non Roundup-Ready canola (Brassica napus) varieties (lb/acre at 8% moisture) at Wannaska in 2008.

Brand	Cultivar	Blackleg Resistance*	Days to Flower	Plant Lodging**	Plant Height cm	Days to Maturity	Seedling vigor***	Oil %	Yield lb/ac
Bayer	5440	R	50	1	45	95	2	45.3	3101.8
Bayer	5550	R	45	2	38	94	1	44	2964.4
Bayer	8440	R	46	0	30	91	1	46.5	2935.7
Bayer	953	N/A	43	2	35	89	1	43.2	2734.4
Bayer	5630	R	52	3	38	93	1	45.8	2707.3
Mycogen	DN051874	R	49	3	34	95	1	45.8	2576.2
Mycogen	845CL	MR	49	0	30	94	1	47.1	2411.8
Mycogen	DN051692	R	48	1	33	91	1	48.7	2339.9
Mycogen	DN051535	R	45	6	41	94	1	47	2336.7
Mycogen	DN051607	R	50	3	36	93	1	50	2255.2
Mycogen	830CL	R	49	5	43	95	1	45.3	2245.7
Mycogen	DN051493	R	47	6	43	95	1	44.3	2191.4
Mycogen	DN051505	R	50	7	39	93	1	45.3	2065.2
							Mean		2528.1
							LSD 0.05	<.0001	307.75
							CV (%)		8.49

***** Blackleg resistance rating provided by seed companies: R=Resistant, MR = Moderately Resistant, MS = Moderately Susceptible

****** Plant Lodging score: 0 = no lodging, 9 = plants lying flat

******* Seedling vigor score: 1 = vigorous, 9 = no vigor

STRAIGHT HARVESTING TRIAL

Objective: Evaluate the effectiveness of straight combining versus swathing using an anti-shattering agent.

Background: Canola has conventionally been swathed prior to harvest to eliminate shattering loss, reduce moisture content, and reduce green count. However many growers are interested in ways to eliminate the swathing procedure and find a way to direct harvest canola. This study was initiated to determine the usefulness of an anti-shattering agent versus conventionally swathing prior to harvest.

Methodology: The trial was laid out as a RCB design with four replicates. Variety Pioneer 45H28 was used. Treatments included swathing, straight harvest with no anti-shattering agent, and straight harvest with an anti-shattering agent (Biovital). Application of Biovital commenced when the intense green color of the pods turned to a lighter green color. A rate of 0.5 liters/ac of Biovital was applied at 20 liters of water/ac at 45 p.s.i. Swathing commenced when seed color change was 40% on the main stem, and harvest was completed when suitable conditions existed. Straight harvest occurred when seed moisture reached 10%. Plot size was 100 x 18 ft.

Results: The trial was seeded on May 22 into cool and moist soils. Yields of the swathed, straight harvest with Biovital, and straight harvest without Biovital were not significantly different. However, the plots of straight harvested Biovital treatments were significantly lower when harvested 3 weeks later than the first harvest date. This experiment will provide further thoughts on experimentation of methods conducive to straight harvesting canola on a large-plot basis in 2009.

Table 4: Seed yield and growth characteristics of Nitrogen application trial (lb/acre at 8% moisture) at Wannaska in 2008.

Treatment	Maturity	Height (inches)	Lodging (0-9)	Yield
90 46-0-0 4leaf	August 21	34	4	3242
60 34-0-0 4leaf	August 21	37	2	3204
60 46-0-0 ppi	August 21	41	3	3133
90 46-0-0 ppi	August 21	43	2	3119
0 Nitrogen	August 21	42	3	3093
60 46-0-0 4leaf	August 21	38	4	3076
30 46-0-0 4leaf	August 21	41	3	3042
30 46-0-0 ppi	August 21	45	3	3021
			CV	7.9

Table 3: Seed yield, growth characteristics and oil content of Roundup-Ready canola (Brassica napus) varieties (lb/acre at 8% moisture) at Wannaska in 2008.

Brand	Cultivar	Blackleg Resistance*	Days to Flower	Plant Lodging **	Plant Height cm	Days to Maturity	Seedling vigor score***	Oil%	Yield lb/ac
Cargill	V1035	R	45	3	36	92	2	47.7	2841.4
Mycogen	G2X0039	R	47	6	47	95	2	46.4	2804.7
Croplan	Hyclass 924	R	43	2	39	91	1	47.2	2726.4
Brett Young	6051	MR	44	3	46	94	1	46.9	2686.5
Integra	IX087121	R	43	4	37	91	1	44.5	2672.1
Brett Young	6235	MR	47	1	46	95	1	47.2	2616.2
Mycogen	G2X0042	R	47	6	41	94	2	46.9	2605
Croplan	940	R	45	2	38	91	2	45.9	2573.1
Pioneer	45H28	R	46	3	42	95	2	49.1	2563.5
Mycogen	G2X0023	R	46	2	38	95	1	47.9	2545.9
Cargill	V2018	MR	48	3	40	91	1	45.9	2542.7
Mycogen	G2X0054	R	47	2	40	93	2	46.3	2514
Mycogen	G2X0024	R	49	4	38	93	1	50.2	2509.2
Cargill	V1037	R	46	3	44	93	1	47.4	2477.3
Cargill	04H272	MR	48	4	43	93	2	46.8	2464.5
Mycogen	G2X0044	R	46	2	38	95	2	46.8	2464.5
Proseed	30 Caliber	R	49	3	38	100	2	47.9	2459.7
Proseed	50 Caliber	R	45	3	40	94	2	45.3	2454.9
Cargill	V2010	MR	48	3	42	93	2	46.4	2432.5
Mycogen	G2X0022	R	51	2	47	95	2	50.5	2272.8

Brand	Cultivar	Blackleg Resistance*	Days to Flower	Plant Lodging **	Plant Height cm	Days to Maturity	Seedling vigor score***	Oil%	Yield lb/ac
Proseed	2030	R	44	3	41	94	2	46.6	2208.9
Proseed	2066	MR	49	3	39	93	2	45.9	2146.6
Dekalb	DKL30-42	R	47	1	32	91	1	48.2	2862.2
Dekalb	IS3057	R	44	3	36	91	1	46.4	2827
Monsanto	G72021	R	44	1	28	88	1	51.5	2798.3
Dekalb	DKL72-55	MR	47	2	37	94	1	47.1	2783.9
Dekalb	DKL52-41	R	47	3	35	94	2	47.1	2697.7
Dekalb	DKL52-41Plus	R	46	1	29	91	1	47.1	2688.1
Monsanto	G75011	R	44	1	43	95	1	46.7	2645
Dekalb	IS7145	MR	46	5	42	90	1	45.7	2645
Monsanto	G72003	R	46	1	34	93	1	48	2630.6
Monsanto	G75449	R	44	1	38	92	1	45	2627.4
Monsanto	G64034	R	44	1	33	92	1	48.5	2593.9
Monsanto	Z4409	R	44	2	34	94	2	48.5	2514
Monsanto	G72061	R	45	1	39	94	1	47.8	2432.5
Monsanto	G67012	R	46	2	32	93	1	51.5	2127.5
							Mean		2572.8
							LSD 0.05	<.1395	447
							CV (%)		12

***** Blackleg resistance rating provided by seed companies: R=Resistant, MR = Moderately Resistant, MS = Moderately Susceptible

****** Plant Lodging score: 0 = no lodging, 9 = plants lying flat

******* Seedling vigor score: 1 = vigorous, 9 = no vigor

NITROGEN TOP DRESSING TRIAL

Objective: Evaluate the effectiveness of top dressing urea compared to ammonium nitrate fertilizer.

Background: Canola requires high levels of N and usually shows increased yields with an N fertilizer application. The high N requirement of canola is one reason why canola acreage in Minnesota is being replaced with soybeans or sunflowers which require substantially lower N amounts. This study was initiated to see if fertilizer type and timing might be able to reduce the amount of N fertilizer used, while maintaining canola yields.

Methodology: The variety Pioneer P45H28 was used and seeded at 5 lb/ac. The trial was laid out as a RCB design with four replicates. Treatments included Urea (preplant incorporated) at 0, 30, 60, and 90 lb/ac, Urea (topdress at 4-leaf) at 30, 60, and 90 lb/ac, and Ammonium Nitrate (topdress at 4-leaf) at 60 lb/ac. Fertilizer application was made at appropriate timing, preplant incorporated, and at 4-leaf stage. Swathing commenced when seed color change was 40% on the main stem, and harvest was completed when suitable conditions existed. Plot size was 100 x 12 ft.

Results: The trial was seeded on May 16 into cool and moist soils. Although yield differences were not significantly different, it was noted that the treatment of Ammonium Nitrate had a yield very similar to 90 lb/ac of Urea. At current prices, the application of Ammonium Nitrate would have provided a savings of $16.00 per acre. This will provide further experiments using topdressing of Ammonium Nitrate and Urea on a large-plot basis in 2009.