2010 Canola Production Centre

University of Minnesota

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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*:** ***Roseau, MN

***Cooperator*:** Richard Magnusson

***Previous Crop*:** Perennial Ryegrass

***Soil Test Results*:**

Macronutrient Level*:*	*(0-6", 6-24")*
Nitrogen -	102 lb/ac
Phosphorous -	10 ppm
Potassium -	124 ppm
Sulfur -	56 lb/ac

Target Yield:	2000 lb/ac
Fertilizer Applied:	N – 8 lb/ac P – 62 lb/ac K – 40 lb/ac S – 10 lb/ac
Soil pH:	8.0
Salinity	0.55 mmho (0-6") (medium)

Tillage Operations: The field was chisel plowed in the fall of 2009. Cultivated and packed (rolled) in spring 2010.

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

Herbicides Applied: A) Liberty Link varieties – Ignite 22 fl oz/ac, ammonium sulfate 1 lb/ac, Assure II 5 fl oz/ac, Interlock 4 fl oz/ac

B) Roundup Ready varieties – Roundup PowerMax 16 fl oz/ac, ammonium sulfate 1.7 lb/ac, Interlock 4 fl oz/ac

Comments: Temperatures were warmer than average in the early spring, but persistently wet conditions in late May and early June subjected young canola plants to considerable moisture stress. Roseau received 6.85 inches of rain from May 15 through June 15. The overall growing season was wetter than average, as the observed total rainfall of 19.5 inches from April through September was 3.5 inches higher than the 30-year average in Roseau, MN. The growing season was also warmer than average, with the average temperature from April through August being 2˚F warmer than the 30-year average. Although subjected to early-season moisture stress, favorable mid- to late-season growing conditions resulted in a better-than-expected canola crop.

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, Liberty Link, and Clearfield varieties were grouped separately and bordered on each side to prevent crop damage due to herbicide drift. Swathing commenced on 8/19/2010, and harvest was completed on 8/29/2010. Plot size was 270 x 20 ft.

Results: The trial was seeded on May 17 into warm soils with near ideal seedbed moisture. Emergence was uniform, but persistently wet conditions shortly thereafter led to significant drowned out areas within the trial. Weed pressure was low, and the herbicide application on June 24 provided very good weed control and suppression.

Table 1: Seed yield (lb/acre at 8.5% moisture), test weight, and harvest moisture of canola (Brassica napus) varieties grown in large plots at Roseau in 2010.

Brand	Cultivar	HR*	Maturity**	Blackleg Rating***	Test Wt. (lb/bu)	Harvest Moisture (%)	Yield (lb/ac)
Pioneer	45H29	**RR**	**L**	**R**	49.4	6.4	2292
DEKALB	DKL72-55	**RR**	**M**	**MR**	49.8	6.1	2179
Bayer	InVigor 5440	**LL**	**L**	**R**	51.6	8.4	2136
Pioneer	45S51	**RR**	**M**	**R**	49.4	6.7	2112
Bayer	InVigor 8440	**LL**	**M**	**R**	50.0	7.9	1978
Proseed	50 Caliber	**RR**	**M**	**R**	49.8	6.2	1926
DEKALB	DKL52-41	**RR**	**M**	**R**	49.0	6.4	1901
DEKALB	DKL30-42	**RR**	**E**	**R**	50.2	6.2	1850
Pioneer	45H74	**CL**	**M**	**R**	50.1	7.7	1835
Wilbur-Ellis	Integra 7121R	**RR**	**M**	**R**	49.8	7.0	1758
					Mean		**1997**
					LSD 0.05	**0.0353**	**338**
					CV (%)		**11.5**

*Herbicide Resistance: CL = Clearfield, LL = Liberty Link, RR = Roundup Ready

**Maturity rating provided by seed companies: E = Early, M = Mid, L = Late

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

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 modified RCB design with four replicates. Roundup Ready, Liberty Link, and Clearfield varieties were grouped separately to reduce crop damage due to herbicide drift. Swathing commenced on 8/19/2010, and harvest was completed on 8/28/10. Plot size was 25 x 5 ft.

Results: The trial was seeded on May 18 into warm soils with near ideal seedbed moisture. Emergence was uniform, but persistently wet conditions shortly thereafter led to drowned out areas within the trial. Weed pressure was low, and the herbicide application on June 23 – 24 provided very good weed control and suppression.

Drowned out plots were not included in the data analysis.

Table 2: Seed yield (at 8.5% moisture), oil content (at 8.5% moisture), test weight, harvest moisture, and growth characteristics of canola (Brassica napus) varieties grown in small plots at Roseau in 2010.

Brand	Cultivar	HR*	Mat.**	Blackleg†	% Flower on July 7	Plant Ht. (cm)	Lodging‡	Test Wt. (lb/bu)	Harvest Moist. (%)	Oil Content (%)	Yield (lb/ac)
Bayer	InVigor 5440	LL	L	R	25	56	1.0	51.6	7.5	43.2	3813
BrettYoung	30423-D8	CL	E	R	40	50	1.3	51.1	7.1	45.2	3709
BrettYoung	5525CL	CL	M	R	43	49	1.8	50.8	7.0	45.5	3660
Pioneer	45H74	CL	M	R	43	48	1.0	49.3	7.1	44.9	3484
Bayer	InVigor L130	LL	M	R	30	53	1.0	51.1	7.5	44.3	3412
Pioneer	45H29	RR	L	R	35	46	2.3	50.9	8.2	46.1	3370
Bayer	InVigor L150	LL	L	R	35	51	1.8	51.3	7.4	44.9	3324
Bayer	InVigor Hlth. 1145	LL	L	R	40	50	2.8	50.0	7.4	44.7	3294
Monsanto	G98046	RR	M	R	42	48	2.1	50.2	7.4	43.7	3275
Monsanto	G86382	RR	M	R	45	44	1.5	50.6	6.5	47.0	3273
Croplan	HyCLASS 921	RR	M	R	41	41	3.0	50.5	7.3	46.2	3146
Pioneer	45S51	RR	M	R	38	49	2.0	49.0	7.4	45.8	3136
DEKALB	DKL72-40	RR	L	R	32	45	2.0	50.4	6.6	44.2	3105
Bayer	InVigor 8440	LL	M	R	37	50	2.0	50.1	7.9	43.2	3073
Monsanto	G82746	RR	M	R	45	41	3.3	50.8	6.8	46.8	3073
Monsanto	G99894	RR	M	R	40	45	2.0	50.9	7.1	46.6	3063
Croplan	EXP 988	RR	M	R	33	47	1.5	49.4	7.4	46.1	3049
Monsanto	G98059	RR	M	R	43	43	3.0	50.4	6.8	47.1	3010
Wilbur-Ellis	Integra 7150R	RR	M	R	43	42	3.5	49.7	7.3	46.7	3008
Monsanto	G84602	RR	M	R	40	44	1.8	50.0	7.3	45.8	2998
Monsanto	G72818	RR	M	R	36	42	1.6	52.6	7.1	46.7	2970
Monsanto	G88666	RR	M	R	46	46	1.9	50.2	6.9	46.9	2964
Monsanto	G98022	RR	M	R	47	45	2.5	49.5	7.1	45.5	2958
BrettYoung	30511-D8	RR	L	R	35	44	2.5	50.3	7.5	45.5	2933
BrettYoung	H8111	RR	E	R	35	47	2.1	50.4	6.8	45.0	2908
Monsanto	G98034	RR	M	R	40	48	2.5	50.5	7.2	44.6	2873
BrettYoung	6040 RR	RR	M	R	40	49	2.1	50.2	8.3	43.1	2818
Wilbur-Ellis	Integra 7121R	RR	M	R	45	44	1.8	50.2	7.5	43.4	2655
Monsanto	G89304	RR	M	R	56	43	2.8	50.5	6.6	45.7	2653
Monsanto	G98073	RR	M	R	43	40	2.5	50.2	6.2	46.5	2629
Croplan	HyCLASS 947	RR	L	R	35	42	3.3	50.3	7.5	47.2	2608
DEKALB	DKL30-42	RR	E	R	48	43	2.3	51.1	6.6	46.3	2584
Croplan	HyCLASS 940	RR	E	R	49	41	2.9	49.2	7.1	44.7	2557
DEKALB	DKL51-45	RR	M	R	42	42	4.2	50.9	7.1	46.0	2535
DEKALB	DKL72-55	RR	L	R	42	39	2.8	48.2	6.9	44.6	2504

* Herbicide resistance: CL = Clearfield, LL = Liberty Link, RR = Roundup Ready	***Mean***		**3041**
** Maturity rating provided by seed companies: E = early, M = mid, L = late	***LSD 0.05***	**0.0142**	**508**
† Blackleg resistance rating provided by seed companies: R=Resistant, MR = Moderately Resistant, MS = Moderately Susceptible	***CV (%)***		**10.4**
‡ Plant Lodging score: 1 = no lodging, 5 = plants lying flat			

NITROGEN TOPDRESSING TRIAL

Objective: Evaluate the effectiveness of urea applied at preplant, and topdressed at 6-leaf, as well as ESN (environmentally smart nitrogen) urea at preplant.

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. Several growers have had success with a urea product known as ESN, which is a polymer-coated urea that releases nitrogen based on temperature and moisture. This study was initiated to evaluate the yield potential and economic return of different N fertilizer systems.

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. The entire plot area had a background N fertility of 100 lbs/ac following a urea application in the previous fall. Treatments included Urea (preplant incorporated) at 0, 50, 100, and 150 lb/ac, Urea (topdress at 6-leaf) at 50, 100, and 150 lb/ac, ESN (preplant incorporated) at 50, 100, and 150 lb/ac, as well as urea and ammonium sulfate (preplant incorporated) at 50 lb/ac N + 20 lb/ac S and at 50 lb/ac N + 50 lb/ac S. Swathing commenced when seed color change was 40% on the main stem, and harvest was completed when suitable conditions existed. Plot size was 270 x 20 ft.

Results: The trial was seeded on May 16 into warm soils with near ideal seedbed moisture. Yield differences among most treatments were not significantly different, with yields among these treatments ranging from 2225 lb/ac to 2580 lb/ac. The 50 lb/ac and 100 lb/ac topdress urea treatments had significantly lower yields than the top-yielding treatment, as did the 100 lb/ac spring-applied ESN treatment.

Table 3: Seed yield (at 8.5% moisture), oil content (at 8.5% moisture) test weight, and harvest moisture of Pioneer P45H28 in the nitrogen application trial at Roseau in 2010.

Fall urea	Spring N	Topdress N	N Source	Test Wt. (lb/bu)	Harvest Moisture (%)	Oil Content (%)	Yield (lb/acre)
100	50 + 20S	–	Urea + AMS	50.6	8.0	45.9	2580
100	50 + 50S	–	Urea + AMS	50.7	8.9	45.9	2579
100	100	–	Urea	50.6	8.4	45.8	2558
100	–	150	Urea	51.1	7.7	45.3	2441
100	50	–	Urea	50.7	7.9	46.4	2435
100	50	–	ESN	50.9	8.5	45.4	2332
100	150	–	ESN	51.1	7.7	45.9	2323
100	0	–	Urea	50.7	7.9	46.3	2287
100	150	–	Urea	50.7	8.1	46.1	2225
100	–	50	Urea	50.7	7.8	46.2	2171
100	–	100	Urea	50.9	8.3	45.9	2095
100	100	–	ESN	51.3	8.2	45.5	1991
					Mean		**2335**
					LSD 0.05	**0.0423**	**376**
					CV (%)		**11.2**

STRAIGHT HARVESTING TRIAL

Objective: Evaluate the effectiveness of an anti-shattering agent and a desiccant when straight combining rather than swathing.

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 a desiccant and an anti-shattering agent to aid in straight harvest, as compared to conventionally swathing prior to harvest.

Methodology: The trial was laid out as a modified RCB design with four replicates. Variety Pioneer 45H28 was used. Treatments included swathing, an anti-shattering agent (Pod Ceal) followed by swathing, two straight harvest dates with no desiccant agent, two straight harvest dates with a desiccant agent (Reglone), two straight harvest dates with sequential applications of Pod Ceal and Reglone, and one straight harvest date following an application of Pod Ceal. Application of Pod Ceal commenced on August 9th, when the intense green color of the pods turned to a lighter green color. Application of Reglone commenced on August 19th, at 40% seed color change. Swathing also commenced on August 19th, and harvest of swathed plots was completed when suitable conditions existed. A rate of 1.5 pints/ac was used for Reglone, while a rate of 1 pint/ac was used for Pod Ceal. Plot size was 270 x 20 ft.

Results: The trial was seeded on May 16 into warm soils with near ideal seedbed moisture. Yield differences among most treatments were not significantly different, with yields among these treatments ranging from 2065 lb/ac to 2473 lb/ac. The 'Reglone (8/19), Straight Harvested (8/29)' treatment, 'Reglone (8/19), Straight Harvested (9/5)' treatment, and 'Pod Ceal (8/9), Reglone (8/19), Straight Harvested (9/5)' treatment all had significantly lower yields than the highest-yielding treatment. Reduced yields in these treatments were likely a result of seed loss due to pod shattering and pod drop.

Table 4: Seed yield (at 8.5% moisture), oil content (at 8.5% moisture), test weight, and harvest moisture of Pioneer P45H28 in the straight harvesting trial at Roseau in 2010.

Treatment	Test Wt. (lb/bu)	Harvest Moisture (%)	Oil Content (%)	Yield (lb/acre)
Pod Ceal (8/9), Reglone (8/19), Straight Harvested (8/29)	49.8	7.3	47.0	2473
Pod Ceal (8/9), Swathed (8/19), Harvested (8/29)	48.6	5.6	47.4	2264
Pod Ceal (8/9), Straight Harvested (9/5)	47.9	7.3	46.5	2232
Straight Harvested (8/29)	49.2	12.5	44.3	2191
Straight Harvested (9/5)	48.3	7.9	46.2	2141
Swathed (8/19), Harvested (8/29)	49.0	5.8	47.0	2065
Reglone (8/19), Straight Harvested (8/29)	49.7	7.9	46.6	1931
Pod Ceal (8/9), Reglone (8/19), Straight Harvested (9/5)	47.6	7.2	46.5	1739
Reglone (8/19), Straight Harvested (9/5)	48.4	8.2	45.9	1482
		Mean		**2057**
		LSD 0.10	**0.0644**	**402**
		CV (%)		**0.1**