

2006 PACIFIC NORTHWEST WINTER CANOLA VARIETY TRIAL RESULTS

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ABSTRACT

A winter rapeseed and canola variety trial with 16 canola or industrial rapeseed (*Brassica napus*) cultivars or advanced breeding lines and three control varieties was grown at eight locations in Oregon, Washington, and Idaho. Mean yield by location ranged from 1672 to 4521 lbs. per acre, and mean yields of individual cultivars across all locations ranged from 2093 to 5399 lbs. per acre. Mean oil content of the cultivars across all locations ranged from 36.9 to 42.6%. The highest yielding commercial cultivar was 'Athena' canola at 3056 lbs. per acre, followed closely by 'Dwarf Essex' industrial rapeseed with 3033 lbs. acre. Several University of Idaho breeding lines, both canola and industrial types, had yields greater than the yield of Athena.

INTRODUCTION

For many years, winter rapeseed has been grown on a few thousand acres in the inland Pacific Northwest (PNW) region of the U.S.A. Until the last decade, this production had been exclusively industrial rapeseed with high levels of erucic acid in its oil. During the last fifteen years the acreage has increased, and much of this new production has been with cultivars that produce canola-quality oil and meal. Many new cultivars are now available, and yield trials throughout the region are needed to evaluate these new cultivars and to identify more areas in the region that are suited to winter canola or rapeseed production. RoundupReady[®] winter canola cultivars were available commercially on a limited basis for the first time in the PNW in the fall of 2005, and growers are interested in how their performance compares to standard cultivars. In addition, many growers would like to plant winter canola in a recrop situation rather than planting in early August onto summer fallow as is traditional. Late planting is necessitated by recrop production and for a winter canola or rapeseed cultivar to be successful under such conditions, it must be able to establish when planted at a later date, and it must over-winter as a small plant. Pressure from increased flea beetle populations has also pushed optimum planting times to later dates. Plant breeders at the University of Idaho have been working to develop cultivars that are suited to production in a recrop situation, and these new cultivars and other available cultivars need to be tested under recrop and late planted conditions. In addition, cultivars need to be tested using new direct seed technology to determine varietal responses to tillage method.

To address these issues, the University of Idaho founded the Pacific Northwest Winter Canola Variety Trial (PNWWVT) in fall of 1995. Both commercial cultivars and advanced breeding lines have been tested. In the last ten years, the project has evaluated 102 winter cultivars or advanced lines representing 11 companies. The trial is currently funded in part by the Pacific Northwest Canola Research Program and by fees paid by the commercial companies that submit their cultivars or advanced breeding lines to be tested in the PNWWVT.

MATERIALS AND METHODS

Sixteen *B. napus* canola or rapeseed cultivars and breeding lines plus three controls, 'LEI-3' rapeseed (*B. napus*), 'Dwarf Essex' rapeseed (*B. napus*), 'Salut' canola (*B. rapa*), were

tested during the 2005-2006 crop year at eight locations (Table 1). At each location, the trial design was a randomized, complete block with four replications. Plot size was 4 by 16 ft., and the seeding rate was approximately 8 lbs. per acre. Trials were fertilized according to local practice. The date of 50% bloom and plant height at maturity was recorded at the Moscow and Genesee sites. After harvest, the seed was weighed to determine yield. Oil content was estimated using a Nuclear Magnetic Resonance Analyzer (NMR) on a subsample of seed from each plot harvested.

Table 1. Location, tillage regime, and planting date of trials in the 2005 Pacific Northwest Winter Canola Variety Trial

Location	Tillage Regime	Planting Date
Moses Lake, WA	irrigated recrop	Sept 8, 2005
Moscow, ID	conventional fallow	Sept 2, 2005
Genesee, ID (#1)	conventional fallow	Sept 7, 2005
Genesee, ID (#2)	direct seed, chem. fallow	Sept 26, 2005
Grangeville, ID	conventional fallow	Sept 12, 2005
Pendleton, OR (#1)	conventional fallow	Oct 4, 2005
Pendleton, OR (#2)	direct seed, chem. fallow	Sept 10, 2005
Hermiston, OR	conventional, irrigated	Sept 22, 2005

RESULTS AND DISCUSSION

Mean flower date at Moscow was day 132 (days from Jan 1 *i.e.* May 12). The industrial rapeseed cultivar LEI-3 was the earliest, flowering on day 126. The date of flowering ranged from day 126 to day 136 (Table 2). Mean plant height was 50 inches, with Athena and Ericka being the shortest commercial cultivars at 47 and 48 inches, respectively, and Dwarf Essex being the tallest at 57 inches. All University Idaho breeding lines were relatively short, with heights ranging from 46 to 51 inches. Plant heights at the conventional sites were taller than at the late planted, direct seed sites. Moscow and Genesee conventional sites both had a mean plant height of 52 inches, while the Genesee direct seed had a mean plant height of 47 inches.

All the sites that were planted produced viable crops and were harvested. Mean yields from the sites ranged from 1672 lbs. per acre at the Pendleton direct seed site to 4521 lbs. per acre at the Grangeville site (Table 2). The trial mean was 2953 lbs. per acre, and individual cultivars yielded from 1880 lbs. per acre to 3543 lbs. per acre when averaged across all locations. The highest yielding commercial cultivar was ‘Athena’ canola at 3056 lbs. per acre, followed closely by ‘Dwarf Essex’ industrial rapeseed with 3033 lbs. per acre. All five of the University of Idaho canola breeding lines yielded above 3200 lbs. per acre, as did two of the five University of Idaho industrial rapeseed breeding lines. These lines have performed better than the trial controls for several years, and new cultivars from this material should be released within the next year. The new RoundupReady® cultivars entered by Monsanto yielded somewhat less than the University of Idaho material, but were still respectable with mean yields in the 2700 to 2800 lbs. per range.

Mean oil content across all varieties and locations was 40.0% and ranged from 36.9% to 42.6% by variety (Table 3). Seed from the Genesee and the Moses Lake sites had the highest mean oil content, 41.2%, and seed from the site at Hermiston had the lowest, 38.3%. As is typical, the industrial rapeseed cultivars tended to have higher oil content (40.8% to 42.6%) than the canola cultivars (36.9%-40.5).

Table 2. Yield results for 19 cultivars in the 2006 Winter Canola Variety Trial including mean yield (lbs. per acre), rank by mean yield, yield by location (lbs. per acre), mean days to flower start from Jan. 1, and mean plant heights (inches).

Variety	Mean	Yield Rank	Moses Lake	Moscow	Genesee	Genesee NoTill	Grangeville	Pendleton	Pendleton NoTill	Hermiston	Flower Start	Plant Height
Controls												
Salut	1880	19	1834	2283	1610	2300	3686	1135	837	1356	132	55
LEI-3	2630	16	4666	2720	1829	2487	4025	1839	1376	2100	126	53
Dwarf Essex	3033	9	4431	3465	2046	2935	4435	2502	2032	2418	131	57
Cargill Specialty Canola Oils												
Contact	2491	17	3785	2365	1708	1561	4687	1717	1948	2157	133 132	50
Monsanto												
DKW 13-62 RR	2763	15	4226	2841	1892	2798	4504	2100	1394	2346	133	52
DKW 13-86 RR	2908	12	4708	3168	1490	3102	5244	1820	1483	2247	133	52
SW O13154 RR	2915	11	4645	3518	2246	3350	3968	2150	1301	2140	132	49
U of I Canola*												
Athena	3056	8	4609	2693	2703	3400	5087	1928	1216	2811	131	47
Ericka	2866	13	4444	3456	2164	2603	4078	2039	1806	2339	127	48
06.UIWC.1/UIC.04.8	3385	2	5072	3154	3710	3521	4429	2271	2434	2490	131	49
06.UIWC.2/UIC.04.4	3350	3	4964	3871	3246	3172	4760	2277	2018	2492	133	49
06.UIWC.3/UIC.04.3	3233	6	4922	2737	3119	3006	5053	2756	1677	2595	132	46
06.UIWC.4	3291	4	5156	3404	2840	3415	4488	2705	1906	2412	132	49
06.UIWC.5/UIC.03.1	3543	1	5157	3495	3219	4327	5058	2294	1887	2904	132	49
U of I Industrial Rapeseed*												
06.UIWH.1/UIR.03.1	2417	18	3174	2992	2436	2287	3328	1909	1190	2016	136	51
06.UIWH.2/UIR.05.1a	3016	10	4530	3272	2591	3409	4647	1895	1507	2274	130	49
06.UIWH.3/UIR.05.1b	3207	7	5090	2967	3035	3586	4591	2002	1937	2444	131	50
06.UIWH.4/UIR.05.3	2851	14	4489	3356	1529	3011	4443	2001	1863	2113	132	49
06.UIWH.5/UIR.03.5	3279	5	5159	3454	2677	3003	5383	2431	1959	2168	132	50
Mean	2953		4477	3116	2426	3014	4521	2093	1672	2306	132	50
LSD (p = 0.05)			605	549	998	697	843	348	543	515	1.1	4.5

* former identifier shown after slash

Table 3. Mean oil content and oil content (percent) by location of 19 cultivars in the 2006 Pacific Northwest Winter Canola Variety Trial.

Variety	Mean	Moses Lake	Moscow	Genesee	Genesee NoTill	Grange- ville	Pendleton	Pendleton NoTill	Hermiston
Controls									
Salut	36.9	37.3	36.9	37.4	34.9	36.9	39.2	37.2	35.3
LEI-3	40.8	41.7	40.8	41.6	39.9	40.2	41.8	42.0	38.6
Dwarf Essex	40.9	41.9	40.0	42.0	39.9	41.2	42.0	42.1	37.9
Cargill Specialty Canola Oils									
Contact	40.0	40.5	39.0	41.1	38.5	40.6	39.8	41.1	39.3
Monsanto									
DKW 13-62 RR	39.3	40.9	38.0	41.1	38.8	39.1	39.1	40.1	37.6
DKW 13-86 RR	39.3	40.7	38.1	40.5	38.2	40.0	38.7	39.8	38.3
SW 013154 RR	39.0	40.2	38.5	40.7	38.4	38.4	39.4	39.0	37.2
U of I Canola*									
Athena	39.5	41.3	38.5	40.5	38.5	40.0	39.3	39.4	38.2
Ericcka	38.5	38.9	39.5	39.7	37.0	38.3	39.7	37.9	36.8
06.UIWC.1/UIC.04.8	38.9	40.1	39.3	40.2	37.3	38.9	39.6	39.4	36.6
06.UIWC.2/UIC.04.4	39.2	40.9	39.5	40.5	38.0	38.5	40.1	39.3	36.6
06.UIWC.3/UIC.04.3	39.4	40.6	38.8	40.4	38.5	39.4	39.2	40.2	38.5
06.UIWC.4	39.5	41.5	38.7	41.3	38.6	39.2	39.5	39.8	37.3
06.UIWC.5/UIC.03.1	40.5	40.9	40.4	42.3	39.8	39.8	41.2	40.7	38.8
U of I Industrial Rapeseed*									
06.UIWH.1/UIR.03.1	41.1	43.1	41.4	42.8	39.5	40.4	43.1	41.1	37.9
06.UIWH.2/UIR.05.1a	41.6	42.8	40.9	42.2	40.8	40.8	42.1	42.6	40.3
06.UIWH.3/UIR.05.1b	42.3	43.3	42.4	42.5	41.8	40.9	42.8	42.9	41.5
06.UIWH.4/UIR.05.3	41.8	42.8	42.0	42.7	40.5	41.1	43.1	42.2	39.9
06.UIWH.5/UIR.03.5	42.6	43.6	41.9	42.7	41.9	42.5	43.4	43.7	40.9
Mean	40.0	41.2	39.7	41.2	39.0	39.8	40.7	40.5	38.3
LSD (p = 0.05)		1.0	1.3	0.7	0.9	1.2	1.2	1.5	1.0

* former identifier shown after slash