

2008 PACIFIC NORTHWEST WINTER CANOLA VARIETY TRIAL RESULTS

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ABSTRACT

A winter rapeseed and canola variety trial with 19 canola or industrial rapeseed (*Brassica napus*) cultivars or advanced breeding lines was grown at five locations in the inland Pacific Northwest. Mean yield by location ranged from 2587 to 4094 lbs. per acre, and mean yields of individual cultivars across locations ranged from 2916 to 3992 lbs. per acre.

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 15 years the acreage has increased, and most 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. Roundup Ready[®] winter canola cultivars were available commercially on a limited basis for the first time in the PNW in the fall of 2005 and are now widely available, and growers need to know 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 the fall of 1995. Both commercial cultivars and advanced breeding lines have been tested. In the last 13 years, the project has evaluated 117 winter cultivars or advanced lines representing 14 companies. The 2008 trial was currently funded by the University of Idaho 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

Eighteen *Brassica napus* canola or rapeseed cultivars and breeding lines plus one control cultivar, 'Dwarf Essex' rapeseed (*B. napus*), were planted in the fall of 2007 at 10 locations (Table 1). The trial included canola entries from several sources; Croplan Genetics, DL Seeds, Kansas State University, Wilbur-Ellis Company, and the University of Idaho Canola, Rapeseed and Mustard Program.

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 dates of 50% bloom and plant height at maturity were recorded at the Moscow and Genesee sites. A lodging score, where a score of 1 indicates a severely lodged plot and a score of 9 indicates a totally upright plot, was taken at the Genesee site, the only site with lodging. After harvest, the seed from each plot was weighed to determine yield, and a subsample was taken for oil content estimation with a nuclear magnetic resonance (NMR) analyzer.

Table 1. Location, tillage regime, and planting date of trials in the 2006-07 Pacific Northwest Winter Canola Variety Trial.

Location	Tillage Regime	Planting Date
Moses Lake, WA	irrigated conventional till	Sept 6, 2007
Reardan, WA	direct seed, chem fallow	Sept 6, 2007
Rosalia, WA	conventional fallow	Sept 7, 2007
Dayton, WA	direct seed, chem. fallow	Sept 11, 2007
Moscow, ID	conventional fallow	Sept 7, 2007
Genesee, ID (#1)	conventional fallow	Sept 7, 2007
Genesee, ID (#2)	direct seed, chem. fallow	Sept 7, 2007
Grangeville, ID	conventional fallow	Sept 8, 2007
Pendleton, OR	conventional fallow	Sept 11, 2007
Hermiston, OR	irrigated, conventional till	Sept 18, 2007

RESULTS AND DISCUSSION

The plots at five sites established and grew well throughout the growing season. Dry conditions at planting time resulted in no or poor seedling emergence at several sites. The sites at Dayton and Rosalia were extremely dry and were abandoned before winter. Data from several other sites are not reported due to difficulties during the growing season. Both the Pendleton site and the no-till site at Genesee had uneven emergence that caused a high degree of unexplainable variation in the yield data; the Grangeville site was damaged by hail and then sulfonylurea herbicide drift, and the Twin Falls site was damaged just prior to harvest by high winds and hail.

Mean flower date at Moscow was day 142 (days from Jan 1, i.e., May 21), which was approximately two weeks later than in 2007. The earliest cultivars were ‘Sumner’ and ‘Ericka,’ flowering on day 139. The date of flowering ranged from day 139 to day 143 (Table 2). Cooler than normal temperatures during early spring apparently delayed flowering, especially in the early cultivars, resulting in later flowering dates and a compressed range of dates. Mean plant height was 55 inches, with ‘Sumner’ being the shortest cultivar at 51 inches, and ‘HyCLASS 107W RR’ and ‘06UIWH.5.2’ being the tallest at 59 inches. The only site with lodging was the conventional site at Genesee, where some but not all cultivars exhibited some lodging (Table 2). The cultivar with greatest amount of lodging was Dwarf Essex with a score of 4.5 (on a scale of 1 to 9, with 9 given to plots with no lodging). ‘Camas RR’ had the second greatest amount of lodging with a score of 6.5. All other cultivars were scored as 7.0 or greater. Several cultivars exhibited no lodging and received scores of 9.0.

The trial mean was 3265 lbs. per acre, and mean yields from the sites ranged from 2587 lbs. per acre at the Moses Lake site to 4094 lbs. per acre at the Genesee conventional site (Table 2). Individual cultivars yielded from 2916 lbs. per acre to 3992 lbs. per acre when averaged across all locations. The highest yielding line ‘Visby’ at 3992 lbs. per acre, followed by ‘Kronos’ at 3693 lbs. per acre and ‘NPZ.0791 RR’ at 3509 lbs. per acre. The highest yielding University of Idaho breeding line was ‘06UIWC.5’ at 3420 lbs. per

acre. The planned name for this line is 'Amanda', and small amounts of seed for commercial production should be available in the fall of 2009. The relative performance of the new Roundup Ready® cultivars and breeding lines tested this year was better than those tested in years past, with mean yield rank of the three lines tested falling in the top 10 cultivars. Note that the Roundup Ready® cultivars tested in previous years were not entered in the 2008 trial.

Oil content was determined on all plots from selected sites (Table 3). The mean oil content across all varieties at the selected sites was 38.2%. The site with the highest oil content was Reardan at 39.8%, while the Moses Lake site had the lowest oil content, 34.9%. Mean oil contents of the individual varieties ranged from 37.2% to 40.5%. As expected, the industrial rapeseed cultivars had the highest oil content. In general, oil contents were lower this year than in previous years. This was likely caused by the somewhat odd weather experienced in the area during the spring of 2008. Conditions were drier and colder than normal, with a frost and light snowfall in early June.

As with 2006-2007, this crop year demonstrated that in a dry fall season, establishing winter canola can be difficult, especially in direct seed systems. Two sites were abandoned because of the dry conditions, and emergence was highly erratic at several other sites. Cropping systems with traditional fallow or irrigation continue to provide the best chance for establishing a winter canola crop. Progress in cultivar development is being made; new cultivars tested in 2008 showed improved yield potential over those tested in previous years. However, work needs to continue to develop cultivars that are better adapted to direct seed systems and that have increased winter hardiness in the seedling stage to allow later planting during dry falls and in recrop situations.

2007-2008 Pacific Northwest Winter Canola Trial results including mean yield (lbs. per acre), rank by mean yield, and yield by location (lbs. per acre), flower date (days after Jan. 1), plant height (inches), and lodging score (1 to 9, 9 = erect, 1 = completely lodged).

Variety	Mean Yield	Yield Rank	Moscow	Genesee	Moses Lake	Reardan	Hermiston	Flower Date	Plant Height	Lodging Score
Trial Control										
Dwarf Essex Rapeseed	3,275	8	3,185	4,026	2,767	3,486	2,909	140	52	4.5
DL Seeds										
Kronos	3,693	2	3,819	5,230	3,047	3,341	3,028	140	54	7.3
Visby	3,992	1	3,921	5,414	3,258	3,979	3,386	140	57	9.0
HyCLASS 154W RR	3,307	6	4,079	4,139	2,532	2,841	2,945	141	59	9.0
NPZ.0791 RR	3,509	3	3,625	4,291	2,577	3,577	3,473	140	52	8.3
Croplan Genetics										
Baldur	3,472	4	3,826	3,563	2,946	3,232	3,795	141	58	9.0
Virginia	3,161	14	3,950	3,410	2,779	2,465	3,199	140	53	9.0
HyCLASS 107W RR	3,209	9	3,619	4,384	2,299	2,623	3,120	142	55	7.0
Kansas State University										
Sumner	3,003	17	3,275	3,811	2,506	2,486	2,937	139	51	8.0
KS3017	2,961	18	3,538	3,561	2,424	2,375	2,905	142	56	7.8
KS3346	3,181	11	3,672	3,911	2,459	3,111	2,751	142	53	8.0
Wibur Ellis Co.										
Camas RR	3,090	15	3,842	3,476	2,300	2,804	3,026	143	53	6.5
University of Idaho										
Athena	3,049	16	2,840	4,036	2,609	2,689	3,069	141	53	9.0
Ericka	2,916	19	3,302	3,562	2,150	2,750	2,814	139	53	8.7
06UIWC.1	3,289	7	4,194	4,035	2,657	2,902	2,658	140	55	9.0
06UIWC.4	3,186	10	3,668	4,193	2,527	2,679	2,863	142	56	8.5
06UIWC.5 (Amanda)	3,420	5	3,683	4,624	2,391	3,193	3,208	143	55	8.8
06UIWH.5.1	3,161	13	2,819	4,280	2,605	2,788	3,314	141	58	9.0
06UIWH.5.2	3,166	12	3,365	3,842	2,317	2,515	3,789	143	59	7.3
Mean	3,265		3,591	4,094	2,587	2,939	3,115	142	55	8.1
LSD p=0.05	344		NS	908	471	749	NS	1	4	2.1
C.V.			16.8	15.9	13.0	18.2	19.9	0.6	5	17.9

Table 3. Mean oil content and mean oil content (%) by location of cultivars tested in the 2007-2008 Winter Canola Variety Trial.

Variety	Mean Oil Content	Moscow	Genesee	Moses Lake	Reardan	Hermiston
Trial Control						
Dwarf Essex Rapeseed	39.0	39.0	39.0	36.4	42.1	38.5
DL Seeds						
Kronos	37.2	37.5	37.4	32.9	38.9	39.2
Visby	38.2	38.2	38.5	34.4	39.6	40.4
HyCLASS 154W RR	37.5	37.4	37.7	33.7	39.6	39.1
NPZ.0791 RR	38.6	38.8	39.0	35.2	41.0	38.9
Croplan Genetics						
Baldur	38.5	38.0	39.3	34.6	40.1	40.3
Virginia	37.4	37.5	37.9	33.6	39.4	38.6
HyCLASS 107W RR	37.8	37.9	38.5	34.3	39.2	39.1
Kansas State University						
Sumner	37.7	37.0	38.0	35.5	39.2	39.0
KS3017	38.9	38.7	39.0	35.9	39.6	41.4
KS3346	37.9	37.7	38.1	34.4	40.3	38.9
Wibur Ellis Co.						
Camas RR	38.3	38.3	39.0	34.7	39.2	40.2
University of Idaho						
Athena	38.1	38.1	39.0	35.4	39.2	39.1
Ericka	37.4	37.2	37.7	35.2	38.6	38.4
06UIWC.1	37.6	36.9	37.4	34.5	39.1	40.3
06UIWC.4	37.3	37.9	37.9	34.6	38.2	37.9
06UIWC.5 (Amanda)	37.8	38.4	38.6	34.2	40.5	37.2
06UIWH.5.1	40.5	40.3	41.6	37.8	42.3	40.5
06UIWH.5.2	39.6	40.3	40.9	35.8	40.8	40.0
Mean	38.2	38.2	38.6	34.9	39.8	39.3
LSD p=0.05	0.6	0.6	0.6	0.7	1.7	2.6
C.V.		1.2	1.2	1.5	2.9	4.7