

## 2008 PACIFIC NORTHWEST SPRING CANOLA VARIETY TRIAL RESULTS

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### ABSTRACT

A spring canola and rapeseed variety trial with 31 cultivars or advanced breeding lines plus five control cultivars was grown at eight locations in Oregon, Washington, and Idaho. Cultivar mean yields ranged from 1319 to 2203 lbs. per acre when averaged across eight sites. Mean yields for individual locations ranged from 913 to 2728 lbs. per acre, and the overall mean was 1737 lbs. per acre.

### INTRODUCTION

Growers in the Pacific Northwest continue to show a strong interest in spring canola (*Brassica napus* and *B. rapa*). Spring canola offers growers an alternative crop for rotation in an agricultural system predominated by small cereal grains. Comprehensive yield trials are needed to evaluate new cultivars and to determine which areas of the Pacific Northwest (PNW) are best suited to the available cultivars. With this objective in mind, researchers at the University of Idaho established the Pacific Northwest Canola Variety Trial (PNWCVT) during 1994. This trial has successfully attracted cultivar entries from a number of seed companies marketing canola in the PNW. During the 15 years of spring canola testing, the project has evaluated 199 different spring cultivars representing 22 companies. In 2008, the trial was funded in part by the Idaho Oilseed Association and by fees paid by the commercial companies that submit their cultivars or advanced breeding lines to be tested in the PNWCVT.

### MATERIALS AND METHODS

The *B. napus* or Argentine canola cultivars ‘Hyola 401’, ‘Profit’ and ‘Westar’ and the *B. rapa* or Polish cultivar ‘Goldrush’ were used as controls in the trial. In addition, the *B. napus* industrial rapeseed cultivar ‘Hero’ was included as a control for industrial cultivars. All test entries are *B. napus* types with canola-quality except for ‘Sterling’, ‘Gem’, ‘UISH00.3.19.23,’ and the two “03.IH” entries, which are industrial rapeseed (*B. napus*) cultivars with low levels glucosinolates in the seed meal. Entries ending in “RR” are Roundup Ready<sup>®</sup> types (resistant to glyphosate herbicide), while “CL” denotes Clearfield<sup>®</sup> canola (resistant to imazamox herbicide) or other cultivars that are resistant to the imidazolinone class of herbicides. The companies that entered cultivars are listed with the yield data in Table 2. Note that ‘HyCLASS 940 RR’ was tested in 2007 as ‘MB52140 RR’, and ‘DKL30-42 RR’ was tested as ‘MB52142 RR’ in 2007

The 2008 trials were planted at 10 locations: Dayton, WA; Colfax, WA; Fairfield, WA; Davenport, WA; Bonners Ferry, ID; Moscow, ID; Genesee, ID; Craigmont, ID; Hermiston, OR; and Pendleton, OR. Location codes, tillage regimes, and planting dates are shown in Table 1.

At each location, the trial design used was a randomized, complete block with four replications. The seeding rates were approximately 8 lbs. of seed per acre for *B. napus* cultivars and 6 lbs. per acre the *B. rapa* cultivar; although lower seeding rates were used for some cultivars as requested by the entering company. Plot size was 4 feet by 16 feet. All trials were grown on recrop ground and were fertilized according to local practice.

**Table 1.** Location, location code, tillage regime, and planting date of trials in the 2008 Pacific Northwest Spring Canola Variety Trial.

Location	Location Code	Tillage Regime	Planting Date
Bonnors Ferry, ID	BONF	tilled	May 1
Moscow, ID	MOSC	tilled	April 28
Genesee, ID	GENE	tilled	May 5
Craigmont, ID	CRAG	direct seed	April 26
Davenport, WA	DAVE	direct seed	April 25
Fairfield, WA	FAIR	direct seed	May 8
Colfax, WA	COLF	direct seed	April 9
Dayton, WA	DAYT	direct seed	April 24
Pendleton, OR	PEND	tilled	March 25
Hermiston OR	HERM	tilled	March 31

The dates of flower onset and plant height at maturity were recorded at the Genesee site. Lodging is usually scored at one or two sites each year where it is a problem, but little lodging was observed this year, so no notes were taken. After harvest, the seed was weighed to determine yield, and cleaned subsamples from each plot were saved for oil content analyses. Oil content was estimated using a Nuclear Magnetic Resonance (NMR) analyzer after the samples were uniformly dried to 2% moisture.

## RESULTS AND CONCLUSIONS

Of the 10 sites planted, data from two are not reported. Those two sites are Moscow and Colfax. The Colfax site had very low yields and a high amount of variation. This problem was caused by a number of stresses related to weather, apparent soil variation, and weed competition. At planting, the weather was colder and drier than normal, which was followed by a cold, wet period, a brief unseasonably hot few days in May, a frost and a snow storm in June, and generally dry conditions for the remainder of the growing season. These conditions reduced seedling vigor substantially and exacerbated the effects of varying soil conditions, which were not apparent at planting time. The reduced vigor of the crop allowed wild oats to become established and competitive at a time when herbicide application was impractical due to weather conditions and work load.

The Moscow site showed symptoms of imidazolinone herbicide damage, likely caused by Pursuit® herbicide (imazethapyr) residue. A Pursuit® application had been made six years prior to planting, and enough residue apparently remained to slightly stunt cultivars that were not resistant to

imidazolinone herbicide. Clearfield® canola cultivars and other “imi” resistant breeding lines were unaffected. The susceptible cultivars still produced reasonable yields, but they were at a disadvantage compared to the resistant cultivars, and the yield data were biased because of this.

The earliest cultivar, Goldrush, began flowering 48 days after planting (Table 2). Flowering dates for the remainder of the cultivars ranged from 52 to 58 days. Several cultivars flowered at 52 days after planting, and most were in flower by 55 days. The latest cultivar was ‘InVigor 5440’. Mean plant height ranged from 37 to 46 inches. Individual cultivar and average height this year was shorter than in previous years, likely due to the cool spring and dry growing season.

The overall mean seed yield across all reported sites was 1661 lbs. per acre. Yields of individual cultivars averaged across the six locations that had a complete compliment of cultivars ranged from 1319 to 2203 lbs. per acre (Table 2). Note that the mean yields shown in Table 2 are for only the Idaho and Washington sites. Locations included in this mean were Bonners Ferry, Genesee, Craigmont, Davenport, Fairfield, and Dayton. The Pendleton and Hermiston sites in Oregon were not included in the mean yield, because those sites had an incomplete set of entries due to their early planting dates. The Davenport site had the highest mean yield, 2728 lbs. per acre (Table 2), and the Pendleton site had the lowest, 913 lbs. per acre.

Mean oil content at each site ranged from 33.8% at Pendleton to 41.2 % at Davenport (Table 3). Note that these sites also had the lowest and highest seed yield, respectively. Oil content by cultivar averaged across the eight locations that had a uniform number of entries ranged from 36.3% to 40.5%.

Once again, practically all of the cultivars tested in this year’s trial produced acceptable to excellent yields at most locations, and 10 cultivars yielded over 1900 lbs. per acre when averaged across the six locations in Idaho and Washington. This range of high yielding spring canolas allows growers to also weigh other considerations such as seed price, contract terms, and herbicide resistance packages when choosing a cultivar. However, the yields of some cultivars were more reduced by stress than others at some locations. Growers and plant breeders should carefully examine the data from individual sites when making selections. In addition, growers need to focus on sites that have growing conditions similar to their own farms rather than relying on the overall mean yields presented.

**Table 2.** Results of the 2008 PNWCVT including mean yield (lbs./acre) of the ID and WA sites (does not include PEND and HERM), yield rank, yield by location (lbs./acre), flowering date (days after planting) and plant height (inches).

Company	Variety	Mean	Rank	BONF	GENE	CRAG	DAVE	FAIR	DAYT	PEND	HERM	Flower	Plant
		Yield										Date	Height
		<i>lbs/acre</i>	----- <i>lbs /acre</i> -----									<i>d.a.p.</i>	<i>In.</i>
<b>Trial Controls</b>	Hyola 401	1932	11	2499	2290	1664	2718	2119	1740	1073	1354	52	37
	Westar	1656	22	1520	1682	1017	3005	1739	1247	850	2188	56	41
	Profit	1536	27	1614	1725	595	2667	1646	1085	843	2109	56	43
	Hero	1431	33	1405	1446	729	2611	1492	1201	807	1753	55	40
	Goldrush	1389	35	1164	2071	966	1933	1133	1179	706	1959	48	37
<b>Bayer CropScience</b>	InVigor 5550 LL	2203	1	2323	2588	2304	3425	2399	1340	991	2252	56	43
	InVigor 5440 LL	2139	2	2398	2740	1801	3388	1946	1485	1245	2108	58	46
	InVigor 5630 LL	1876	12	1912	2011	1179	3643	1881	1325	955	2104	56	42
	InVigor 8440 LL	2050	4	1975	3279	1645	2879	2063	1250	1132	2179	55	43
<b>Cargill Specialty Canola Oils</b>	V1035 RR (631)	2052	3	2290	2336	1438	3280	2275	1621	1041	2136	56	42
	V2010 RR (252)	1770	15	1707	2024	1457	2859	1939	1234	868	2070	57	42
<b>Croplan Genetics</b>	HyCLASS 940 RR	1981	8	2339	2036	1263	3570	1839	1421	1064	2319	55	39
	HyCLASS 924 RR	1737	17	1787	2458	1054	2433	1881	1427	892	1963	55	42
<b>Helena Chemical</b>	4362 RR	1640	24	1849	1702	839	2552	1776	1123	*	*	57	45
	4414 RR	1650	23	1782	1842	684	2957	1627	1007	*	*	56	43
<b>Monsanto Co.</b>	Hyola357Magn RR	1976	9	2262	2292	1313	2696	2168	1779	1005	2294	52	39
	DKL30-42 RR	2007	7	2105	2797	1418	2993	2100	1616	1007	2016	54	38
	DKL52-41 RR	2011	6	2051	2400	1779	2761	2333	1796	1032	1935	56	39
	IS3057 RR	1869	13	1977	2153	1707	2905	1956	1371	901	1979	52	37
	IS7145 RR	2050	5	2435	2363	1614	2990	2045	1343	1128	2480	56	41
<b>Wilbur-Ellis Co.</b>	RangeRR	1796	14	2021	2046	1366	2754	1901	1268	940	2075	54	43
	INT 3789 RR	1937	10	2140	2452	1272	2828	2105	1387	1121	2193	54	42
<b>University of Idaho Canola</b>	Premier	1547	26	1473	1876	933	2638	1695	1081	912	1765	55	37
	Clearwater CL	1516	30	1459	1601	902	2906	1758	872	788	1844	57	42
	03.II.1 CL	1708	18	1682	2502	1488	2116	1693	1372	960	1853	55	39
	03.II.4 CL	1522	29	1607	2251	918	2150	1498	893	792	2069	54	39
	03.II.5 CL	1747	16	1707	2477	1022	2711	1730	1473	811	2046	54	43
	03.II.5.3 CL	1691	20	1737	2283	1162	2723	1961	1285	825	1549	54	40
	UISC00.1.3.5	1558	25	1752	1770	1409	1952	1810	1193	922	1654	53	39
	UISC00.3.1.17	1706	19	1815	2675	918	2456	1628	1522	770	1860	52	39
UISC00.3.8.DE	1679	21	1729	2481	945	2588	1688	1484	702	1818	52	38	
<b>University of Idaho Industrial Rapeseed</b>	Sterling	1390	34	1223	1867	745	2563	1432	828	737	1724	55	38
	Gem CL	1319	36	1431	1526	602	2184	1688	959	696	1464	55	38
	03.IH.1 CL	1458	32	1194	1737	768	2280	1588	1142	850	2102	56	40
	03.IH.4 CL	1464	31	1408	1643	857	2747	1517	1188	800	1553	56	39
	UISH00.3.19.23	1525	28	1568	1772	1000	2334	1727	1191	875	1734	55	39
<b>MEAN</b>		1737		1815	2144	1188	2728	1827	1298	913	1956	55	40
<b>LSD (p=0.05)</b>		122		241	463	440	509	301	251	139	408	1	3
<b>C.V.</b>				9.9	14.8	18.5	13.4	12.0	14.0	10.8	14.8	1.6	5

**Table 3.** Results of the 2008 PNWCVT including mean oil content (%) of the Idaho and Washington sites (does not include Pendleton and Hermiston due to missing cultivars) and oil content by location (%).

Variety	Mean	BONF	GENE	CRAG	DAVE	FAIR	DAYT	PEND	HERM
<b>Trial Controls</b>									
Hyola 401	37.2	40.4	38.3	36.2	38.7	38.5	38.1	32.1	35.6
Westar	38.5	40.3	40.1	36.1	41.2	39.1	38.7	33.7	39.1
Profit	39.5	40.9	40.5	39.7	42.9	39.9	38.5	34.8	39.1
Hero	38.5	39.8	40.6	37.8	41.7	38.9	39.0	33.4	37.0
Goldrush	37.9	39.2	38.3	36.8	40.6	39.1	36.8	34.0	38.1
<b>Bayer CropScience</b>									
InVigor 5550 LL	39.1	41.5	39.4	38.7	41.9	39.8	37.7	35.2	38.6
InVigor 5440 LL	38.4	40.6	39.9	36.8	41.2	39.5	37.6	34.4	37.3
InVigor 5630 LL	39.3	42.0	40.2	37.9	42.6	40.2	38.8	34.4	38.0
InVigor 8440 LL	38.8	41.6	40.0	37.8	42.0	40.3	38.0	33.3	37.3
<b>Cargill Specialty Canola Oils</b>									
V1035 RR (631)	40.1	42.5	41.5	38.6	41.7	41.9	39.7	34.8	39.9
V2010 RR (252)	39.0	40.5	40.5	38.2	41.9	39.2	39.1	34.6	38.3
<b>Croplan Genetics</b>									
HyCLASS 940 RR	39.6	42.0	41.1	38.2	42.1	40.7	39.8	35.0	38.5
HyCLASS 924 RR	38.2	40.1	39.7	36.4	40.3	39.7	38.9	32.7	38.0
<b>Helena Chemical</b>									
4362 RR	38.8	40.9	38.5	37.1	39.9	39.3	37.3	*	*
4414 RR	40.5	42.2	40.7	38.5	41.8	41.3	38.5	*	*
<b>Monsanto Co.</b>									
Hyola357 Magnum RR	37.8	39.9	38.9	37.3	39.3	38.2	38.5	33.1	36.9
DKL30-42 RR	39.8	42.8	41.1	38.2	41.5	40.6	40.3	33.9	39.8
DKL52-41 RR	38.9	39.9	39.9	38.2	41.0	39.8	39.4	34.3	38.6
IS3075 RR	40.2	42.6	41.7	38.3	41.7	42.3	40.6	35.0	39.6
IS7145 RR	40.5	43.0	41.5	39.0	43.4	41.8	41.0	34.6	40.1
<b>Wilbur-Ellis Co.</b>									
RangeRR	38.5	40.9	39.9	37.0	41.2	39.4	38.6	33.5	37.9
INT 3789 RR	37.9	40.1	39.1	37.1	40.7	39.5	37.4	32.7	36.9
<b>University of Idaho Canola</b>									
Premier	37.9	39.5	39.8	37.4	41.2	38.8	37.6	32.1	37.3
Clearwater CL	37.6	38.7	39.6	37.3	40.9	38.2	35.3	32.9	38.0
03.II.1 CL	36.3	38.0	38.0	35.3	38.4	37.2	36.0	31.7	35.9
03.II.4 CL	37.4	38.7	39.1	36.3	40.2	37.8	37.0	32.6	37.9
03.II.5 CL	38.9	40.9	40.4	37.4	40.9	40.5	40.6	32.3	38.0
03.II.5.3 CL	38.6	40.4	39.9	38.2	41.3	40.1	39.7	32.7	37.0
UISC00.1.3.5	36.7	38.0	38.5	36.1	38.9	37.2	37.1	31.8	36.3
UISC00.3.1.17	39.6	40.8	40.4	38.4	42.3	40.6	41.1	33.9	39.4
UISC00.3.8.DE	38.7	40.2	39.5	36.5	41.4	40.0	39.7	34.0	38.6
<b>University of Idaho Industrial Rapeseed</b>									
Sterling	38.9	40.9	39.9	38.8	41.7	40.6	37.4	34.5	37.8
Gem CL	39.6	41.8	40.4	39.6	41.8	41.5	38.0	35.6	38.3
03.IH.1 CL	38.6	38.8	40.1	38.8	40.7	38.6	38.7	34.9	38.7
03.IH.4 CL	38.9	40.2	40.4	38.8	41.1	39.3	39.2	35.1	37.4
UIH00.3.16.23	39.1	40.1	40.1	38.7	41.8	40.0	39.1	35.7	37.6
<b>Mean</b>	38.7	40.6	39.9	37.7	41.2	39.7	38.6	33.8	38.0
<b>LSD (p=0.05)</b>	0.5	0.8	0.9	1.4	1.7	1.3	1.3	1.2	1.6
<b>C.V.(%)</b>		1.4	1.7	1.8	3.0	2.4	2.5	2.5	2.8