

2001 PACIFIC NORTHWEST SPRING CANOLA VARIETY TRIAL RESULTS

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ABSTRACT

A canola variety trial with 22 cultivars or advanced breeding lines and four control cultivars was planted at 14 locations in Oregon, Washington, and Idaho. Cultivar mean yields ranged from 1612 to 2465 lbs. per acre when averaged for all locations. Mean yields for individual location yields ranged from 169 to 2985 lbs. per acre. Mean oil content of the cultivars ranged from 39.4 to 41.7%.

INTRODUCTION

The farming community in the Pacific Northwest continues to show a strong interest in spring canola, (*Brassica napus* and *B. rapa*). Spring canola offers growers an alternate, spring-planted 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 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. The trial is 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 PNWCVT.

MATERIALS AND METHODS

The *B. napus* or "Argentine" cultivars 'Profit' and 'Westar' and the *B. rapa* or "Polish" cultivar 'Goldrush' were used as controls in the trial. In addition, the industrial rapeseed cultivar 'Hero' was included as a control for industrial cultivars. All entries are *Brassica napus* (Argentine) types with canola-quality except for 'Sterling', 'Garnet', and 'ULSH.00.3', which are industrial rapeseed (*B. napus*) cultivars. Entries ending in "RR" are RoundupReady® types (resistant to glyphosate), while "CF" denotes Clearfield® Canola (resistant to imazemox), and "LL" indicates those varieties that are tolerant to Liberty® herbicide (glufosinate). Companies entering cultivars are listed along with the performance data in Table 1.

The 2001 trials were planted at 14 locations: Colfax WA (direct seed), Dayton WA, Davenport WA (tilled and direct seed), Moscow ID (tilled and direct seed), Genesee ID (tilled and direct seed), Genesee Rim ID, Grangeville ID (direct seed), Nezperce ID (tilled and direct seed), and Pendleton OR. 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 for *B. rapa* cultivars. Plot size was 3.5 feet by 16 feet at tilled sites, and 4 feet by 16 feet at direct seed sites. All trials were grown on recrop ground and were fertilized according to local practice. The date of flower

onset and plant height at maturity was recorded at Moscow and Genesee. After harvest, the seed was weighed to determine yield. Oil content was estimated on a subsample from each plot at every location except for Pendleton with a Nuclear Magnetic Resonance Analyzer (NMR).

RESULTS AND CONCLUSIONS

The mean yield of the trial varied widely across locations. The trial at the tilled site at Genesee, ID had the highest yield, 2985 lbs. per acre (Table 1). The Pendleton site had the lowest mean yield at only 169 lbs. per acre, while the next lowest site, Davenport direct seed, had a mean yield of 1272 lbs. per acre. Yields of cultivars averaged across 12 locations varied from 1612 to 2465 lbs. per acre. Many cultivars performed well in the trial, with 11 cultivars yielding over 2100 lbs per acre and an additional seven yielding between 2000 and 2100 lbs. per acre. The best performing cultivars were two PHS lines, Invigor 2663 (all three entered by Aventis CropScience), Hyola 401 and 233RR (both entered by Interstate/Payco Seed).

The earliest cultivar, 'Goldrush,' began flowering 48 days after planting, and the earliest Argentine cultivar, Hyola 401, began flowering at 51 days (Table 2). The latest cultivar, 'Hylite 243', began flowering 57 days after planting. Hylite 243 was also the lowest yielding line in the trial, and its poor performance is likely caused in part by its late flowering time. Earlier cultivars tended to be shorter than later cultivars, with mean plant height ranging from 41 to 53 inches.

Mean oil content at of each site ranged from 44.1% at the direct seed site at Nezperce, ID to 36.3% at Colfax WA (Table 2). Cultivar oil content, averaged across all locations ranged from 37.4 to 40.3%. The industrial cultivar UI.SH.00.3 had the highest mean oil content, 42.7%, and control cultivar 'Profit' had the second highest with 40.3%.

Nearly all cultivars showed acceptable performance; although some are better adapted to the PNW than others. Progress made by spring canola breeders during the last decade is evident with over 18 of 22 cultivars producing mean plot yields of over 2000 lbs. per acre. Data from the PNWCVT has been summarized in a flyer and distributed to interested growers and seed dealers.

Table 1. Yield results for 26 cultivars in the 2001 PNW Canola Variety Trial

Variety	Mean	Rank	DAYT	DAVE	DA-N	COLF	POTL	MOSC	MO-N	GENE	GE-N	GENR	NEZP	NE-N	GRAN	PEND
	Yield															
			lbs. / acre													
Trial Controls																
WESTAR	2054	15	2409	1364	1279	1621	1680	2389	2334	2923	2287	2325	2472	2387	1592	185
PROFIT	1998	19	2287	1228	1210	1585	1415	2260	2148	3000	2236	2504	2602	2239	1546	105
HERO	1709	25	2513	1133	896	1446	986	2132	1964	2511	1784	2038	2199	2157	1267	114
GOLDRUSH	1777	24	3037	1551	1314	1453	1465	1706	1599	2486	1850	1938	2478	2285	1193	163
Aventis Crop Science																
InVigor.2643 LL	2277	6	2040	1492	1464	1647	1923	2793	2262	3367	2451	2523	2789	2886	1727	*
InVigor.2663 LL	2414	3	2709	1450	1501	1987	2011	2875	2501	3323	2629	3043	2847	3008	1798	*
PHS.00.833 LL	2465	1	2187	1633	1338	1709	1947	2952	2431	3461	2782	3315	3015	3197	1805	*
PHS.00.858 LL	2428	2	2650	1585	1477	1945	1858	2911	2395	3084	2751	3188	3085	3073	1782	*
InterMountain Canola																
IMC.105	2076	12	2583	1392	1205	1557	1376	2605	2200	2800	2276	2643	2845	2403	1608	142
IMC.106-RR	1881	23	1275	1211	1119	1017	1312	2163	2108	2520	1986	2873	2645	2177	1440	176
Interstate/Payco Seed																
HYOLA.401	2373	5	2746	1681	1461	1871	2052	2887	2356	3240	2431	3037	2903	2865	1688	294
HYOLA.357 RR	2269	7	2883	1576	1485	1666	1882	2448	2235	3055	2720	2798	2847	2690	1832	209
HYLITE.243 CF	1612	26	1560	983	756	998	1126	2144	1591	2370	1709	1980	2252	1988	1442	94
A99.46NR RR	1956	21	2669	1347	1206	1356	1450	2075	2320	3060	2299	2586	2310	2218	1250	239
223-RR	2398	4	3346	1663	1560	1733	1822	2755	2479	3357	2880	2900	3095	2790	1747	281
HYSYN5034 RR	2185	8	2348	1364	1317	1800	1816	*	2392	3201	2421	2854	2788	2632	1454	292
Pioneer Hi-Bred / BASF																
46A76 CF	2052	16	2145	1276	1212	1552	1461	2335	2391	2712	2031	3199	2481	2483	1488	19
45A71 CF	2046	17	2128	1288	1198	1773	1506	2170	1970	2982	2170	2965	2523	2520	1483	123
45A55 RR	2070	13	2218	1540	1436	1317	1649	2223	1976	2991	2386	2583	2804	2463	1474	198
University of Idaho																
PREMIER	1980	20	2542	1232	1134	1536	1503	2584	1942	2868	2235	2305	2625	2243	1557	114
SUNRISE	2125	11	2122	1226	1266	1456	1697	2452	2328	3343	2478	2547	2628	2614	1468	112
STERLING	1933	22	1769	1163	1184	1276	1391	2357	1842	2688	2180	2417	2777	2498	1427	103
UI.SC.00.1	2129	10	2487	1375	1285	1584	1700	2221	2318	3134	2401	3061	2498	2552	1421	194
UI.SC.00.3	2166	9	2125	1503	1436	1626	1844	2795	1906	3114	2155	2529	2801	2781	1495	222
UI.SC.00.5	2038	18	2371	1258	1066	1314	1527	2389	2522	3117	2093	2520	2735	2475	1443	199
UI.SH.00.3	2061	14	2080	1188	1264	1458	1521	2670	2175	3004	2377	2620	2472	2391	1594	131
Mean	2094		2415	1378	1272	1556	1612	2489	2108	2985	2308	2667	2674	2539	1539	169
LSD (p=0.05)	355		710	205	219	507	269	234	483	371	367	551	352	355	341	98
C.V.			17.5	10.5	12.3	23.1	11.8	6.6	15.7	8.8	11.3	14.7	9.3	9.9	15.7	41.2

Location Key:

DAYT Dayton WA (Not included in overall mean and rank due to irregular and severe deer damage.)

DAVE Davenport WA

DA-N Davenport WA Direct Seed

COLF Colfax WA Direct Seed

rank

POTL Potlatch ID

MOSC Moscow ID

MO-N Moscow ID Direct Seed

GENE Genesee ID

GE-N Genesee ID Direct Seed

GENR Genesee Rim ID

NEZP Nezperce ID

NE-N Nezperce ID Direct Seed

GRAN Grangeville ID Direct Seed

PEND Pendleton OR (Not included in overall mean and

due to irregular stand establishment.)

Table 2. Days to flowering from planting date, plant canopy height, lodging score, mean oil content, and oil content by location of 26 cultivars in the 2001 PNW Canola Variety Trial.

Variety	Days to Flowering - days -	Plant Height - inches -	Mean Oil Content - % -	----- Oil Content by Location -----												
				DAYT	DAVE	DA-N	COLF	POTL	MOSC	MO-N	GENE	GE-N	GENR	NEZP	NE-N	GRAN
Trial Controls																
WESTAR	54	47	41.0	40.0	40.5	41.6	36.9	39.2	42.9	40.1	41.3	42.1	44.1	41.9	44.0	38.9
PROFIT	54	48	41.7	41.8	41.0	41.9	38.2	39.3	43.0	40.2	42.0	43.4	43.9	43.2	44.9	39.3
HERO	54	46	40.8	39.8	39.7	41.4	37.5	36.9	43.0	40.6	40.7	42.1	44.1	42.2	43.4	38.4
GOLDRUSH	48	44	40.8	39.8	40.2	40.3	35.5	40.0	42.4	40.6	41.9	42.1	42.6	43.1	43.9	37.4
Aventis Crop Science																
InVigor.2643 LL	54	49	40.2	36.8	40.5	40.5	35.9	37.7	42.2	39.3	40.0	42.3	42.7	42.3	44.0	38.7
InVigor.2663 LL	55	53	40.7	39.8	40.3	40.9	37.6	38.6	42.4	39.7	40.4	41.6	42.9	41.2	44.4	39.6
PHS.00.833 LL	55	50	39.5	38.1	39.6	39.6	35.0	36.7	41.3	38.7	39.7	41.8	41.7	40.6	43.9	37.5
PHS.00.858 LL	54	48	39.4	38.4	40.3	40.1	35.7	37.1	41.6	39.6	39.3	41.8	43.0	33.3	43.9	37.9
InterMountain Canola																
IMC.105	54	47	40.7	41.0	40.5	40.5	36.7	37.9	42.1	38.8	40.3	42.1	44.0	40.8	43.8	39.9
IMC.106-RR	55	46	41.4	39.3	42.3	41.7	36.9	39.2	43.5	40.1	41.5	43.3	44.6	42.6	45.0	38.9
Interstate/Payco Seed																
HYOLA.401	51	40	40.0	39.1	40.1	39.4	35.4	37.7	41.2	39.9	40.3	41.3	42.1	41.5	43.6	38.2
HYOLA.357 RR	52	42	39.8	38.8	39.7	39.6	35.0	38.1	41.2	39.0	39.6	41.6	42.5	41.5	43.0	38.1
HYLITE.243 CF	57	48	39.9	39.1	40.4	39.4	36.8	36.6	42.4	38.8	39.3	41.4	42.7	40.1	43.5	38.7
A99.46NR RR	53	41	40.0	41.5	39.1	40.7	34.2	37.2	41.5	39.4	40.1	41.4	43.5	41.9	43.4	36.7
223-RR	52	44	40.3	40.3	40.7	40.4	35.1	38.2	41.0	39.4	40.3	42.4	42.7	41.6	43.3	39.0
HYSYN5034 RR	53	48	41.3	40.8	42.3	41.7	37.3	39.8	*	41.2	40.8	42.5	44.0	42.5	45.1	38.1
Pioneer Hi-Bred / BASF																
46A76 CF	55	49	40.6	40.5	40.0	41.9	37.7	38.1	42.4	38.9	40.1	41.6	43.0	41.7	43.9	38.2
45A71 CF	54	48	41.0	41.4	40.6	41.5	37.7	38.6	43.3	40.0	40.6	41.5	43.9	40.7	43.7	39.3
45A55 RR	52	43	40.0	38.5	39.5	41.2	35.2	37.7	41.7	39.8	40.5	41.1	43.2	41.2	43.5	37.5
University of Idaho																
PREMIER	54	44	40.8	40.0	40.7	40.5	36.1	37.8	42.4	40.4	40.7	42.4	44.5	41.9	43.5	38.9
SUNRISE	54	47	40.7	39.5	40.6	41.8	35.6	38.6	42.6	39.8	40.5	42.0	43.7	41.6	44.2	38.5
STERLING	54	45	41.3	39.9	41.6	42.9	36.9	38.8	43.8	39.7	40.4	42.1	44.0	42.9	45.1	39.3
UI.SC.00.1	54	49	40.8	40.3	40.3	40.7	36.5	38.1	41.1	40.3	41.4	42.8	43.8	42.0	44.1	38.4
UI.SC.00.3	52	45	41.6	40.4	40.9	43.1	36.0	39.7	42.9	40.5	41.8	43.4	44.6	42.7	44.9	39.5
UI.SC.00.5	53	48	41.1	41.1	40.4	41.2	35.3	39.2	43.1	40.7	41.2	42.6	44.6	42.1	45.0	38.0
UI.SH.00.3	53	44	42.7	42.3	41.4	41.9	37.6	40.3	43.5	42.2	42.2	43.0	44.6	43.2	45.1	47.3
Mean			40.7	39.9	40.5	41.0	36.3	38.3	42.3	39.9	40.6	42.1	43.5	41.5	44.1	38.8
LSD (p=0.05)			1.7	2.1	1.1	1.2	1.8	1.1	1.0	1.1	0.7	1.0	1.2	NS	0.8	NS
C.V.				3.7	2.0	2.1	3.6	2.0	1.7	2.0	1.3	1.7	2.0	7.5	1.2	7.8

Location Key:

DAYT	Dayton WA	POTL	Potlatch ID	NEZP	Nezperce ID
DAVE	Davenport WA	MOSC	Moscow ID	NE-N	Nezperce ID Direct Seed
DA-N	Davenport WA Direct Seed	MO-N	Moscow ID Direct Seed	GRAN	Grangeville ID Direct Seed
COLF	Colfax WA Direct Seed	GENE	Genesee ID		
GE-N	Genesee ID Direct Seed	GENR	Genesee Rim ID		