

**An evaluation scheme to identify
superior cultivars of winter and spring canola
that are suitable for production in the Pacific Northwest.**

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2001-2002 PACIFIC NORTHWEST WINTER CANOLA TRIAL RESULTS

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ABSTRACT

A winter rapeseed and canola variety trial with 21 *Brassica napus* cultivars or advanced breeding lines and three control varieties was planted at eleven locations in Oregon, Washington, and Idaho. Mean yields from the nine locations that were harvested ranged from 1167 to 4480 lbs. per acre. Mean yields of the cultivars across all locations ranged from 2084 to 3584 lbs. per acre. Mean oil content of the cultivars ranged from 35.4 to 40.5%. 'Baldur' was the highest yielding cultivar.

INTRODUCTION

For many years, winter rapeseed has been grown on a small acreage in the inland Pacific Northwest 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 ten 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. 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 in relatively dry soils and 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 seven years, the project has evaluated 66 winter cultivars representing nine companies. The trial is currently funded in part by the Pacific Northwest Canola Research Program and by fees paid by the commercial companies or universities that submit their cultivars or advanced breeding lines to be tested in the PNWWVT.

MATERIALS AND METHODS

Twenty-one Argentine (*Brassica napus*) canola cultivars and breeding lines were tested during the 2001-2002 crop year. Recrop trials were planted in late September and early October at Moscow and Genesee, ID and near Pendleton, OR. A late fallow site was established at Genesee, ID. All three of the recrop trials and the Nezperce site were direct seeded into wheat or barley stubble. At each location, the trial design used was a randomized, complete block with four replications. Plot size was 3.5 feet by 16 feet at tilled sites, and 4 feet by 16 feet at direct

seed sites. The seeding rate used was approximately 8 lbs. per acre. Of the 11 locations planted, 9 were harvested. The recrop sites at Moscow and Genesee, ID were lost due to poor establishment and winterkill.

Trials were planted during early to mid-September near Pendleton and Hermiston, OR; near Moscow, Genesee, Nezperce and Grangeville, ID; and near Moses Lake, WA (irrigated). All of the above trials except for the Moses Lake site were planted on land that had been previously fallow. Recrop trials were planted in late September or early October at Moscow and Genesee, ID and near Pendleton, OR. In addition, a late fallow site was established at Genesee, ID. Planting dates are listed in the location key at the bottom of Table 1. All three of the recrop trials and the Nezperce site were direct seeded into that season's spring barley stubble. At each location, the trial design used was a randomized, complete block with four replications. Plot size was 3.5 feet by 16 feet at tilled sites, and 4 feet by 16 feet at direct seed sites. The seeding rate used 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 measured on a subsample of seed from each plot at Moscow (fallow), Genesee (conventional fallow and late planted fallow), Nezperce, Grangeville, and Moses Lake.

RESULTS AND DISCUSSION

Of the eleven locations planted, nine were harvested. The recrop sites at Moscow and Genesee, ID were lost due to winterkill and poor establishment. Mean yields from the sites ranged from 1167 lbs. per acre at the Pendleton recrop site to 4480 lbs. per acre at the Moscow fallow site (Table 1). Mean cultivar yields ranged from 2084 lbs. per acre to 3584 lbs. per acre. The cultivar with the highest mean yield was 'Baldur.' Eighteen other cultivars yielded above 3000 lbs. per acre, and were not statistically different from Baldur.

Mean flower date was 139 Julian days, with a range of 133-141 (Table 2). Warm weather in late May/early June ended flower on all cultivars nearly simultaneously, which is not unusual. Mean plant height by cultivar ranged from 54 inches to 64 inches (Table 2). Mean oil content across all varieties and locations was 38.6% and ranged from 35.4 to 40.5% by variety. Seed from the direct seed site at Nezperce had the highest mean oil content, 42.3%, and seed from the late fallow site at Genesee had the lowest, 36.8%.

Most cultivars produced acceptable yields at sites where traditional fallow ground was used. Recrop sites and sites that were planted later than traditional dates produced lower mean yields than those sites where traditional practices were used. In addition, more variation was seen among cultivars at non-traditional sites, indicating that some cultivars are better adapted to late planting or recrop systems than other cultivars. Even though some cultivars show more promise in recrop systems, the lower yields at these sites and total failure of the recrop trials at Moscow and Genesee show that more work is needed to make recrop winter canola a viable option. Data from the PNWWVT has been summarized in a flyer and distributed to interested growers and seed companies to provide information on which to base sound farming decisions.

Table 1. Yield results (lbs per acre) for 24 cultivars in the 2001-2002 PNW Winter Variety Trial.

Cultivar	Mean	Rank	MOSE	MOSC	GENE	GENL	NEZP	GRAN	HERM	PEND	PENL
Trial Controls											
Cascade	2749	20	3986	3558	4620	1901	2306	2578	2932	1810	1053
Debut	2084	24	2189	2211	3295	2048	1890	2567	1870	1939	750
Dwarf Essex	3006	18	4949	3537	4020	2691	2086	2869	2925	2474	1506
University of Idaho											
Athena	3056	17	3755	4302	4318	2812	1940	3691	2951	2552	1179
3WC4153629	3312	10	3963	4451	5257	2663	2414	3689	3230	2972	1166
2WC31342128	3420	5	4183	5189	4576	2524	2646	4163	3110	3110	1282
3WC517321	2626	22	3834	3915	3415	1610	1986	2632	2694	3060	483
4WC56.8227	3108	15	4051	4126	5062	1640	2665	3504	3049	2814	1063
4WC68.16102	3172	14	4210	4753	4883	2259	2215	3645	2970	2746	867
Cenex Harvest States											
Decathlon	3404	6	4137	4766	4955	2056	3063	4447	3058	3048	1103
Croplan Genetics											
Baldur	3584	1	4212	5311	5654	2556	2948	3985	3246	2961	1385
Express	3324	9	3902	4767	3988	2377	3050	4183	3803	2666	1183
Kronos	3440	4	4643	5076	4352	3237	2506	3611	3295	3036	1207
Rasmus	3235	12	4173	4938	4276	1976	2713	3724	3224	2828	1262
Integra Seed Ltd											
Ceres	3282	11	4477	4196	4035	2572	3024	3339	3390	3114	1391
Olsen	3184	13	4272	4772	3938	2436	2434	3463	3355	2637	1351
Int Ex0182	3583	2	4958	4985	5193	3180	2239	3750	3146	3369	1427
Int Ex0177	2928	19	3351	5247	3971	1628	2636	4032	2579	2230	677
Int Ex0127	3551	3	3926	4924	4729	3304	2547	3801	3874	3381	1470
Int Ex0196	3115	16	3931	4654	4321	2869	2040	3713	2751	2655	1102
InterMountain Canola											
Capitol	3346	8	4261	4877	5050	2635	1616	3583	3445	3236	1406
Contact	3382	7	4401	5290	4632	2238	2820	3619	3330	2701	1408
MCH89	2747	21	3591	4078	3456	1791	2386	2721	2741	3017	941
McKay Seed Company											
Ericka	2615	23	3294	3601	2864	2073	1928	2794	2988	2651	1341
Mean	3136		4027	4480	4372	2400	2399	3509	3081	2789	1167
LSD	731		899	931	1096	885	639	622	487	721	298

Location Key:

MOSE	Moses Lake, WA - irrigated	Sept 17	GRAN	Grangeville, ID - fallow	Sept 6
MOSC	Moscow, ID - fallow	Sept 6	HERM	Hermiston, OR - irrigated, fallow	Sept 26
GENE	Genesee, ID - fallow	Sept 6	PEND	Pendleton, OR - fallow	Sept 18
GENL	Genesee, ID - late-plt, fallow	Oct 3	PENL	Pendleton, OR - late-plt recrop, no till	Oct 4
NEZP	Nezperce, ID - no till fallow	Sept 6			

Table 2. Days to flower from Jan. 1, plant canopy height in inches, mean oil content, and oil content by location of 24 cultivars in the 2001-2002 PNW Winter Variety Trial.

Cultivar	Days to Flower	Plant Height	Mean Oil Content	Oil Content by Location					
				MOSE	MOSC	GENE	GE-L	NEZP	GRAN
	days	inches	%	% -----					
Trial Controls									
Cascade	137	61	38.6	39.4	38.0	38.3	36.8	41.6	37.7
Debut	133	61	35.4	37.0	34.5	34.4	34.2	38.2	34.0
Dwarf Essex	139	63	39.6	40.4	37.7	38.8	38.3	42.8	39.6
University of Idaho									
Athena	138	57	39.1	39.4	38.1	38.7	37.8	42.4	38.1
3WC4153629	141	62	39.1	37.2	38.2	38.8	37.6	43.1	39.5
2WC31342128	139	60	39.2	39.2	37.8	38.4	36.4	43.0	40.6
3WC517321	141	64	38.4	38.5	38.4	37.3	35.8	42.2	38.2
4WC56.8227	139	58	38.5	38.5	37.5	38.4	36.9	41.6	38.5
4WC68.16102	140	62	39.0	39.6	37.2	38.6	37.3	42.8	38.5
Cenex Harvest States									
Decathlon	135	55	39.7	39.5	39.1	39.3	37.2	43.0	40.2
Croplan Genetics									
Baldur	139	62	39.7	40.3	39.0	39.2	37.1	42.9	39.6
Express	138	61	39.8	39.8	38.7	39.0	37.4	43.7	40.0
Kronos	139	62	38.3	38.9	37.9	37.1	35.8	42.0	37.8
Rasmus	138	58	39.3	39.1	38.4	38.5	36.7	42.8	40.0
Integra Seed Ltd									
Ceres	140	60	38.8	39.4	37.0	38.2	37.4	42.6	38.1
Olsen	139	60	38.1	37.7	36.8	37.6	36.0	42.3	38.4
Int Ex0182	138	63	38.7	37.7	38.5	38.3	37.4	42.6	37.9
Int Ex0177	137	56	40.5	41.1	39.8	39.8	37.0	44.0	41.1
Int Ex0127	139	62	38.2	37.8	37.3	36.3	36.0	42.5	39.3
Int Ex0196	141	61	38.2	38.8	37.1	37.4	35.2	42.8	37.9
InterMountain Canola									
Capitol	139	61	38.6	39.1	37.2	38.0	37.4	40.7	39.0
Contact	138	59	39.8	40.7	39.0	39.1	38.3	41.0	40.9
MCH89	139	56	40.0	40.9	39.6	39.9	37.3	43.5	38.8
McKay Seed Company									
Ericka	138	54	37.7	37.8	37.0	37.3	36.1	41.6	36.5
Mean	139	60	38.8	39.1	37.9	38.2	36.8	42.3	38.7
LSD	1.9	5.6	1.3	1.9	0.9	0.7	1.1	0.9	2.3

Location Key:

MOSE	Moses Lake, WA - irrigated, recrop	Sept 17
MOSC	Moscow, ID - fallow	Sept 6
GENE	Genesee, ID - fallow	Sept 6
GENL	Genesee, ID - late-planted, fallow	Oct 3
NEZP	Nezperce, ID - chem fallow, no till	Sept 6
GRAN	Grangeville, ID - fallow	Sept 6

