

2010

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2010 Winter Canola Variety Trial



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In 2009, the University of Vermont Extension Northwest Crops and Soils Team initiated a winter canola variety trial in Alburgh, VT as a part of the 2009-2010 National Winter Canola Variety Trial. Growing winter canola holds many possible advantages for Vermont farms. Sown in early fall, winter canola can fit well into rotations following short-season grain crops, or short-season corn. Additionally, many farms are engaged in on-farm fuel production endeavors, and canola continues to be a high-yielding oilseed crop in areas where the growing season is relatively short. However, in order for on-farm fuel production to be feasible, farmers must be able to reliably produce a high yielding crop, which is dependent on good agronomic practices including variety selection. Replicated canola variety trials were conducted with an experimental design of randomized complete blocks with four replications. Fifteen varieties were evaluated for fall stand density, yield, and oil quantity.

WEATHER DATA

The winter of 2009-2010 was one of the mildest winters on record in this region. In prior years, canola winter survival rates have been too low to allow for meaningful data collection. Table 1 shows temperature and precipitation data for the fall of 2009. After the canola was planted cooler and slightly wetter than normal temperatures were observed, while the early spring was much warmer and wetter than normal. Despite the mild winter, a persistent lack of snow cover may have accounted for some observed winter-kill. It should be noted that the winter canola varieties were planted in late August resulting in a robust and well-established plant being established prior to the winter months. We believe this factor combined with the mild winter may have led to improved winter survival rates in the canola.

Table 1. Temperature, precipitation, and Growing Degree Days (GDD) data by month for Alburgh, VT.

South Hero (Alburgh)	September 2009	October 2009	February 2010	March 2010	April 2010	May 2010	June 2010	July 2010	August 2010
Avg. Temperature (F)	57.7	44.1	26.2	37.8	49.3	59.6	66.0	74.1	70.4
Departure from Normal	-2.7	-4.7	5.9	7	5.8	3.0	0.2	3.0	1.4
Precipitation (inches)	4.01	5.18	1.85	2.79	2.76	0.92	4.61	4.30	5.48
Departure from Normal	0.55	0.79	0.44	0.73	0.25	-2.01	1.40	0.89	1.63
GDD (base 41)	507.5	178.5	0.0	87.0	276.0	556.5	748.5	993.0	883.5
Departure from Normal	-74.5	-63.3	0.0	87.0	100.5	72.9	4.5	60.5	15.5
GDD (base 32)	771.0	395.5	3.1	229.4	520.5	854.1	1018.5	1305.1	1192.0
Departure from Normal	-81.0	-125.3	3.1	113.3	175.5	91.5	4.5	94.6	45.0

METHODS

Fifteen winter canola varieties were evaluated in collaboration with the 2009-2010 National Winter Canola Variety Trial, managed by Kansas State University. The plots were planted with a Kincaid cone seeder at a rate of 6 lbs. per acre on August 28, 2009. The seed was treated with Herculex, a common in-plant insecticide. The previous crop was wheat, and the seedbed was plowed and disked. Plots were 3' x 20'. The soil was a silt loam. Stand density was measured on September 23, 2009 based on a visual

rating with a 0 – 10 scale, where 10 represents excellent stand density, and 0 represents no stand. In the spring, we measured winter survival percentage, and noted the date when 75% of each variety was in bloom. Plots were harvested on July 15, 2010 with an Almaco SP50 plot combine. At harvest moisture and seed yields were determined. Seeds were then pressed with a Kern Kraft Oil Press KK40, and the amount of oil and meal were measured. All data was analyzed using a mixed model analysis where replicates were considered random effects. The LSD procedure was used to separate treatment means when the F-test was significant ($P < 0.10$).

Table 2. Trial information for the winter canola variety trial

Location	Alburgh, VT Borderview Farm
Soil type	Silt loam
Previous crop	Wheat
Plot size (ft.)	3x20
Seeding rate	6 lbs/acre
Replicates	4
Planting date	8-28-09
Harvest date	7-15-10
Tillage operations	Fall Plow, Disk Harrow

RESULTS AND DISCUSSION

Stand density estimates were taken three weeks after planting. Baldur had the best fall stand density with an average rating of 8.23, and was statistically similar to KS 4475 and Visby. The variety KS 4426 had the poorest stand (Fig. 1, Table 3). Winter survival was similar across most varieties, with the exception of the varieties Virginia, Kronos, and Sitro, and averaged 87% across the whole trial (Table 3).

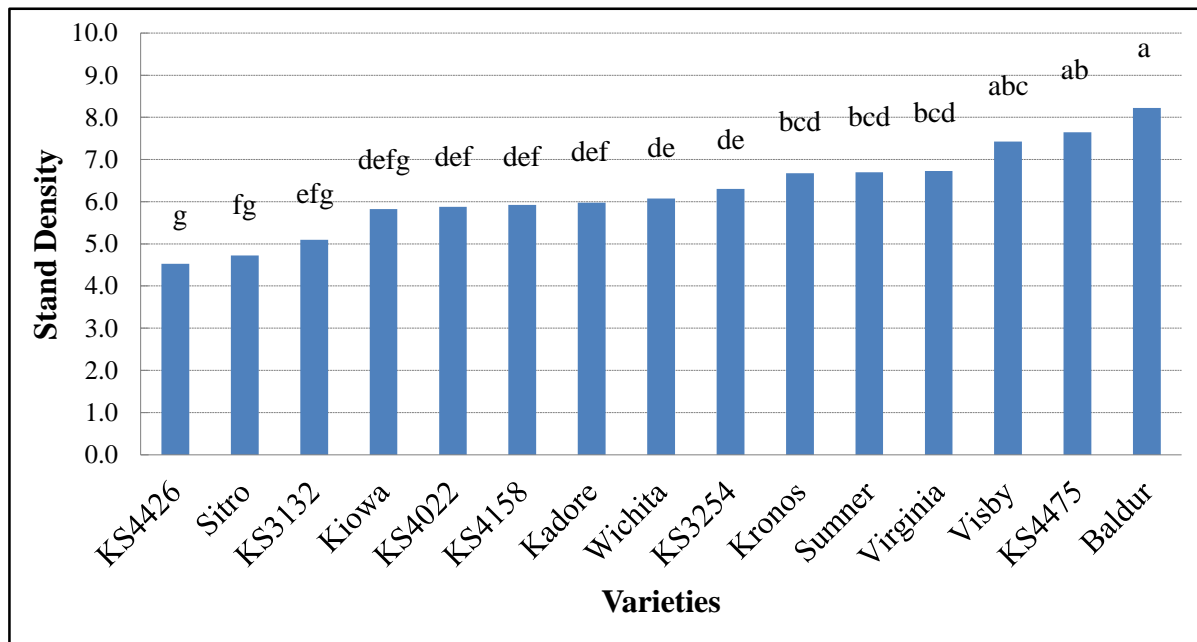


Figure 1. Winter canola variety trial fall stand density by variety, three weeks after planting.

The variety KS 4158, a Kansas State University experimental line, has the highest seed and oil yield. Sitro, Baldur, Wichita, and Kansas State experimental lines KS4022 and KS4426 did not yield significantly different than KS4158.

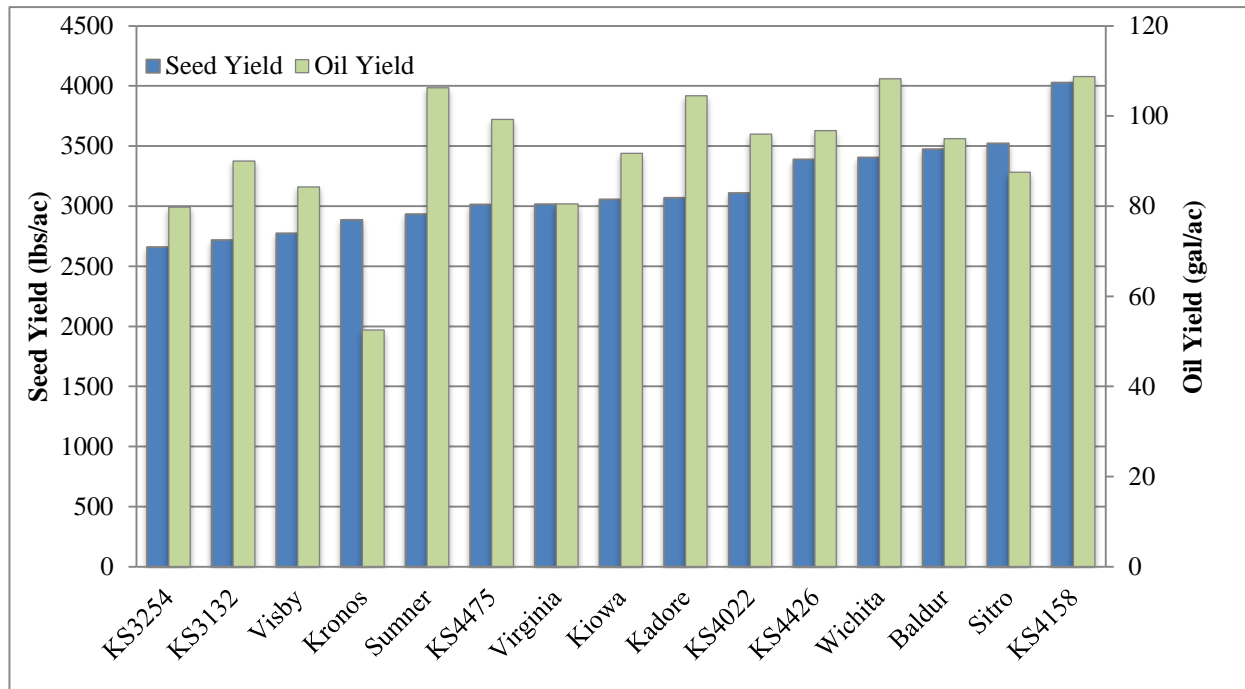


Figure 2. Seed and oil yields of 15 winter canola varieties.

Table 3. Winter canola variety trial general results.

Variety	Stand density	Winter Survival	Harvest moisture	Yield		Oil	Oil yield		Meal yield
				lbs/ac	bu/ac	%	lbs/ac	gal/ac	lbs/ac
Baldur	8.23*	92	11.2	3474*	69	23.5	726	95.0	2535
KS3132	5.10	92	9.8	2717	54	27.8*	688	90.0	1803
KS3254	6.30	85	9.8	2658	53	26.1*	609	79.8	1765
KS4022	5.88	81	9.8	3108*	62	25.4*	732	96.0	2108
KS4158	5.93	87	10.0	4029*	81	23.0	831	108.8	2792
KS4426	4.53	85	10.4	3388*	68	24.2*	740	96.8	2368
KS4475	7.65*	89	10.7	3014	60	27.3*	758	99.3	1983
Kadore	5.98	91	9.0	3070	61	27.8*	798	104.5	2093
Kiowa	5.83	88	10.5	3057	61	24.5*	698	91.8	2148
Kronos	6.68	85	10.9	2886	58	16.3	401	52.5	2132
Sitro	4.73	79	11.0	3522*	70	22.2	668	87.5	2460
Sumner	6.70	93	11.8	2933	59	29.6*	811	106.3	1928
Virginia	6.73	84	10.5	3016	60	23.2	615	80.5	2125
Visby	7.43*	87	12.8	2775	55	26.1*	642	84.3	1943
Wichita	6.08	86	10.0	3405*	68	28.5*	829	108.3	2143
LSD (0.10)	1.30	NS	NS	948	NS	5.7	NS	NS	NS
Trial Mean	6.25	87	10.6	3137	63	25.0	703	92.1	2155

* Treatments that did not perform significantly lower than the top performing treatment in a particular column are indicated with an asterisk.

NS – Treatments were not significantly different from one another.

The oil content of the winter canola ranged from 29.6 to 16.3 % extraction. Of interest is the fact that the highest yielding canola did not necessarily have the highest oil content. For example, Sumner had one of the lowest overall seed yields but the highest oil extraction percentage. It is important to evaluate oilseed varieties on both seed and oil yields. Sumner had the highest percent oil content, and was statistically similar to Wichita, Kadore, KS3132, KS4475, KS3254, Visby, KS4022, Kiowa, and KS4426. However, the oil content was fairly low for this canola trial. Normally 40-42% oil is expected for canola, depending on growing conditions, variety, and efficiency of the press.

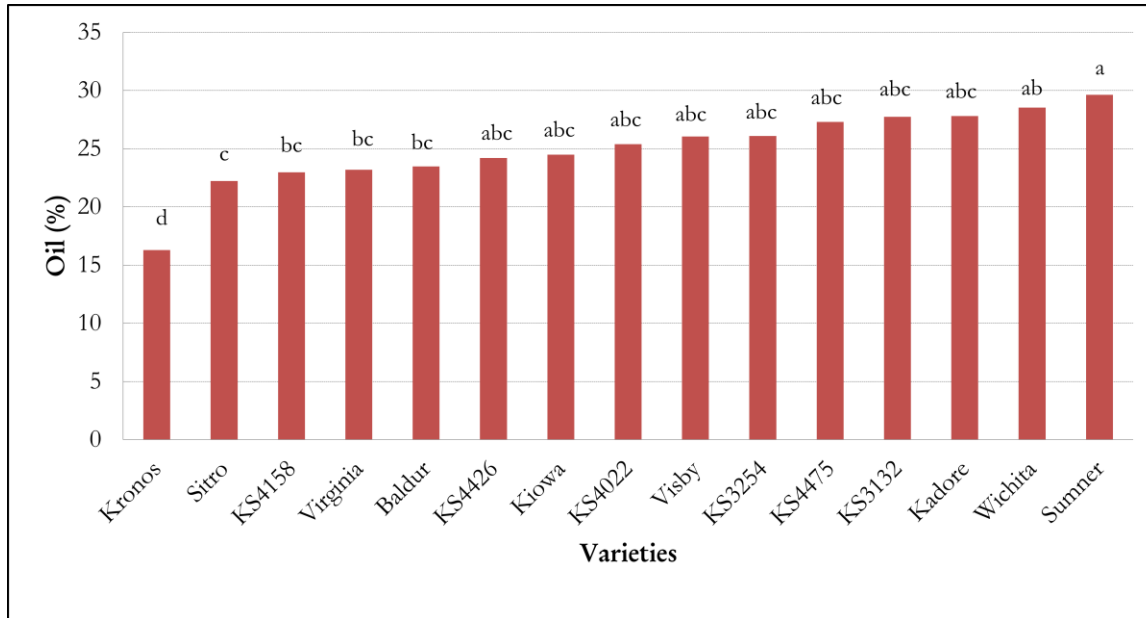


Figure 2. Oil percentage by weight of 15 winter canola varieties.

ACKNOWLEDGEMENTS

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