Winter Canola Variety Trial, 2007

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Abstract

There is strong interest in central Oregon in farms becoming self sustainable in fuel, namely biodiesel. Given this interest, winter canola trials were sown in the autumn of 2006. The yields were considerably higher at Madras for the winter than for the spring trials, although still not sufficient to justify growing the crop. At Powell Butte the yield was considerably lower due to poor seedling emergence and stand establishment. Although oil content was high, especially at Madras, producing winter canola for grain or for producing oil for biodiesel use on farms would not be financially viable.

Introduction

In 2006 and again in 2007, spring canola variety trials were conducted in central Oregon. Winter canola is commonly grown in northern Europe, where yields are generally higher than spring canola, but we did not know if it is adapted to the cool winters experienced in central Oregon. Aside from higher yields, winter canola would have an advantage over spring canola in that it should flower considerably earlier than many of the specialty seed crops, such as carrots and onions, which are grown in the area. This is of concern because flowering canola may attract bees away from flowering specialty seed crops. The aim of this experiment was to determine the flowering date, yield, and oil content of several commercial winter canola cultivars. This experiment was part of the National Winter Canola Variety trial, which is organized through Kansas State University.

Methods and Materials

Two variety trials were conducted at the Central Oregon Agricultural Research Center in Madras (44.68°N, 121.15°W, 2,424 ft elevation) and Powell Butte (44° 25.409'N, 120° 94.749'W, 3,175 ft elevation). The trial consisted of 13 *Brassica napus* cultivars and hybrid lines ('Abilene', 'Athena', 'Baldur' (hybrid), 'Casino', 'Ceres', 'Ericka', 'Jetton', 'Kronos' (hybrid), 'Plainsman', 'Sumner', 'Virginia' and 'Wichita'), and two *Brassica campestris* cultivars ('Largo' and 'Salut'). Both trials were organized as randomized complete blocks with four reps. Plots measured 20 ft long by 4 ft wide. The seed of all cultivars and lines were treated with Helix® XTra (Syngenta). Treflan® TR-10 (Dow AgroSciences) was applied at 5 lb/acre to control weeds. Sowing took place on August 31, 2006 at Madras and September 8, 2006 at Powell Butte. Plots were sown 1 inch deep with a 6-row double-disk plot drill on 8-inch centers. Fertilizer at 200 lb/acre of 16-16-16-7 was top-dressed onto the field on October 19 and a further 250 lb/acre of 30-10-0-7 was top-dressed onto the field on March 16 at Madras. The first and sixth rows and 2 ft on each end of the plots were removed prior to harvest. Plots were swathed using a sickle-bar mower and the windrows were threshed in the field. Swathing and harvesting occurred on July 2 and 13, respectively, at Madras, and on July 17 and 24, respectively, at Powell Butte. Flowering date was defined as the period from sowing to when the first flowers opened (Stage 4.1, Harper and Berkenkamp 1975). Heights were measured just

prior to swathing. Oil content was determined by the University of Idaho's brassica breeding team using nuclear magnetic resonance (NMR) spectroscopy.

Results and Discussion

The *B. napus* lines and cultivars out-yielded the *B. campestris* cultivars at both locations (Tables 1 and 2). *B. campestris* is usually suited to dry areas on account of its earlier maturity. At both trials it flowered several days earlier than most of the *B. napus* lines and cultivars. The yield and oil percentage were much higher at Madras than at Powell Butte. Germination was poor at Powell Butte and there was heavy weed competition from filaree (*Erodium* sp.) even after hand weeding plots in the early spring. The hybrid lines Kronos and Baldur were among the top ranking lines for yield and oil percentage and there was no winter kill observed in any line at either location. All lines were tall enough that they could be difficult to irrigate with hand or wheel lines, with only Virginia at Madras shorter that 1m (4 ft). Most cultivars tended to be taller at Powell Butte than at Madras, although Kronos, Largo and Salut reversed this trend.

Canola yields from the winter variety trial were higher than spring canola yields at Madras, but they were still considerably less than yields from the growth inhibitor trial that was adjacent to this trial. Why this was the case is unclear, but it may be that the nitrogen nutrition, particularly prior to winter, was insufficient to maximize yield potential. A 3-acre field of canola was adjacent to these trials and there was a noticeable difference in yield in this crop at the same part of the field. That said, even canola for grain production was allowed, and yields of around 4,000lb/ac were achievable, as was achieved in the winter growth inhibitor trial, the crop would not be as profitable as other crops, such as wheat, at current prices. Average winter wheat yields in central Oregon are around 100bu/ac and at $10/bu it is a more attractive option than winter canola if it were to produce 4,000lb/ac at $0.15/lb. However, depending on the contract, hybrid winter canola seed production may be a viable option for central Oregon.

Acknowledgements

This project was funded by the Agricultural Research Fund (Oregon), project ARF7011. The technical assistance of Rhonda Simmons and Hilma Samayoa is greatly appreciated, as is the assistance of farm managers Bob Crocker in Madras and Gerry Baker in Powell Butte.

References

Harper, F.R., and B. Berkenkamp. 1975. Revised growth-stage key for *Brassica campestris* and *B. napus*. Canadian Journal of Plant Science 55:657-658.

Table 1. Yield, days to flower, height, oil percent, and oil yield of spring oil seed brassica cultivars grown at Central Oregon Agricultural Research Center, Madras, 2007.

Cultivar	Yield (lb/ac)	Flowering date[1]	Height (cm)	Oil %	Oil yield (gal/ac)
Abilene	1,566	23 Apr	112	41.73	83.14
Athena	2,024	23 Apr	108	43.55	112.14
Baldur	2,101	24 Apr	118	44.40	118.68
Baros	2,199	24 Apr	112	43.68	122.20
Casino	1,700	26 Apr	112	42.55	92.03
Ceres	2,122	27 Apr	109	44.08	119.00
Ericka	2,154	19 Apr	104	42.43	116.28
Jetton	1,712	24 Apr	107	41.63	90.68
Kronos	2,448	25 Apr	130	44.33	138.07
Largo	845	18 Apr	108	40.63	43.68
Plainsman	1,335	28 Apr	124	40.23	68.33
Salut	965	20 Apr	111	41.63	51.11
Sumner	1,878	21 Apr	110	43.98	105.08
Virginia	1,897	24 Apr	99	43.13	104.09
Wichita	2,184	24 Apr	115	43.23	120.95
LSD $_{(0.05)}$	705		13	1.59	

[1]Flowering date defined as when 50 percent of plants in the plot had at least one flower open.

Table 2. Yield, days to flower, height, oil percent, and oil yield of spring oil seed brassica cultivars grown at Central Oregon Agricultural Research Center, Powell Butte, 2007.

Cultivar	Yield (lb/ac)	Flowering date[1]	Height (cm)	Oil %	Oil yield (gal/ac)
Abilene	452	7 May	125	29.83	17.15
Athena	442	5 May	117	32.08	18.04
Baldur	490	5 May	131	21.15	13.19
Baros	447	6 May	114	30.73	17.48
Casino	472	4 May	130	31.85	19.13
Ceres	529	5 May	125	31.05	20.90
Ericka	576	4 May	119	32.15	23.56
Jetton	541	5 May	124	31.95	21.99
Kronos	680	5 May	126	30.60	26.47
Largo	155	3 May	103	28.18	5.56
Plainsman	357	8 May	136	29.20	13.26
Salut	147	2 May	99	27.73	5.19
Sumner	444	4 May	118	30.55	17.26
Virginia	576	5 May	118	31.78	23.29
Wichita	608	6 May	115	30.05	23.24
LSD $_{(0.05)}$	237		17	2.32	

[1] Flowering date defined as when 50 percent of plants in the plot had at least one flower open