

Spring Canola and Mustard Variety Trial, 2007

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Abstract

The production of oil seeds has gathered interest in recent years due to rising fuel prices and interest in reducing the country's dependence on foreign oil import. This study was conducted to determine grain and oil yield of spring brassica oilseed crops. Five canola (*Brassica napus*), one brown mustard (*B. juncea*), and one yellow mustard (*Sinapsis alba*) cultivars were trialed at two locations in central Oregon.

Introduction

With gasoline and diesel prices approaching \$4/gal, there has been considerable interest locally and nationally in the production of renewable energy fuels. Canola is often put forward as an ideal temperate crop that can be grown for its oil, which can then be processed into biodiesel. Current regulations prohibit the growing of canola in central Oregon because of 1) out-crossing with the brassica seed crops (e.g., Chinese green vegetables, cabbage, etc.) grown in the area; 2) attracting bees and other pollinating insects away from other specialty seed crops (e.g., hybrid carrot and onion seed crops); and 3) contamination of specialty seed lots. A special permit from the Oregon Department of Agriculture (ODA) was obtained so this experiment could be conducted. The objective of this study is to determine the yield potential of a non-transgenic spring canola crop grown under irrigation in central Oregon. Yield, as well as flowering date, height at maturity, oil content, and oil yield were determined.

Methods and Materials

Two variety trials were conducted at the Central Oregon Agricultural Research Center in Madras (44.68°N, 121.15°W, 2,424ft elevation) and Powell Butte (44.15°N, 120.57°W, 3,175 ft elevation). Five *Brassica napus* cultivars ('Sterling', 'Clearwater', 'Gem', 'Premier', and 'Sunrise'), one *B. juncea* ('Pacific Gold') and one *Sinapsis alba* ('IdaGold') were supplied by the brassica research group at the University of Idaho. 'Clearwater' and 'Gem' are imadizolinone tolerant while 'Sterling' and 'Gem' both produce industrial rapeseed quality oil. Both trials were organized as randomized complete blocks with four reps. Plots measured 20 ft long by 4 ft wide. The *B. napus* cultivars were all treated with Helix[®] XTra (Syngenta). Treflan[®] TR-10 (Dow AgroSciences) at 5 lb/acre to control weeds and 350 lb/acre of 30-10-0-7 fertilizer were incorporated into the soil prior to sowing. Sowing took place on 10 April, 2007 at Madras and 17 April, 2007 at Powell Butte. Plots were sown 1 inch deep with a 6-row double-disk plot drill on 8-inch centers. The first and sixth rows and 2 ft on each end of 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 14 and 23 August, respectively, at Madras, and on 22 and 17 August, respectively, at Powell Butte. Days to flowering 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 conducted by the University of Idaho's brassica breeding team using nuclear magnetic resonance (NMR) spectroscopy.

Results and Discussion

Yield and heights at Madras were considerably greater than in 2006 (Table 1) and this is almost certainly due to the timeliness of sowing and harvest. The yields at Powell Butte were, however, disappointing (Table 2). Germination and subsequent establishment were poor. It appears as though the soil was too 'light and fluffy' and contact between the soil and seed was either not sufficient or, when watered, the soil packed around the seed too tightly and reduced germination. Differences existed in the heights of the various cultivars examined in these trials and the rankings were consistent between the two sites. Both IdaGold and Pacific Gold matured several days earlier than the canola cultivars.

Oil content was also higher in 2007 than in 2006 and this may also be due to the earlier planting (Gunasekera et al. 2006). Due to the low yields, oil content was not determined for Powell Butte.

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)	Days to flower	Height (cm)	Oil %	Oil yield (gal/ac)
Clearwater	1694	61	142	40.5	87.29
Gem	1567	58	133	42.2	84.13
IdaGold	1676	55	146	27.7	59.07
Pacific Gold	1975	56	163	37.7	94.73
Premier	1566	59	141	41.2	82.08
Sterling	1960	59	129	41.9	104.48
Sunrise	1217	61	150	37.9	58.68
LSD (0.05)	674	1	13	4.1	-

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)	Days to flower	Height (cm)
Clearwater	226	62	135
Gem	39	61	128
IdaGold	213	56	138
Pacific Gold	36	59	164
Premier	50	60	129
Sterling	266	60	121
Sunrise	51	61	144
LSD (0.05)	231	2	16

Early to mid-April appears to be the preferred time for sowing spring canola in central Oregon. That said, spring canola, or at least the lines trialed here, does not appear to be a viable option for central Oregon. Even if producers could consistently produce yields of 1,700 lb/acre, they would do better to produce winter canola. The yields reported here would also not be profitable given that canola grain is currently around \$0.15/lb and even with the state government's additional \$0.05/lb bonus for oilseeds to be used for biodiesel, there are more economically attractive options available to growers.

References

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