

Winter Canola and Camelina Variety Testing Trials

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Canola and camelina have good potential as rotation crops for wheat in Eastern Washington. Stand establishment of winter canola can be difficult, especially when emerging through hot surface soils or following emergence with hot air temperatures. To examine the adaptation of winter canola varieties to various production regions, we are testing varieties from both local and international breeding programs in multiple cropping systems. We planted 64 winter canola varieties, including all those entered in the National Winter Canola Variety Trials, at Othello (irrigated), Ralston (summer fallow), Reardan (direct seeded on chem fallow), and Pullman (direct seeded into spring wheat stubble). Good stands were easily established with most varieties at Othello and Reardan, where planting depth was shallow and moisture was plentiful. Alternatively, none of the varieties emerged well through the deep summer fallow tillage mulch with limited soil moisture at Ralston. The Pullman site was planted after spring wheat harvest into dry soil and did not germinate until after October 3 when the first significant rain occurred. A hard frost on October 20 killed the seedlings of all the varieties in the trial. Altering furrow depths and residue levels did not noticeably increase seedling survival at this site.

Spring or fall planted camelina has advantages over winter canola in stand establishment. Available varieties are typically spring planted, but fall plantings of experimental lines at Pullman and Lind were not damaged by early frosts or winter temperatures. Spring plantings can be drilled in like canola if planted shallow ~1/2' or broadcast in late winter or early spring. Yield potential is not as high as winter canola in high rainfall regions but preliminary data suggest camelina may perform well in lower rainfall environments. Yields of ~1400 lbs/acre were achieved with several varieties at Ralston when planted in the spring after a previous spring wheat crop. A trial to compare 18 spring varieties has been planted at Lind, Lacrosse and Pullman in 2008.

Winter Canola as a Rotation Crop in the Low and Intermediate Precipitation Zones

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Multiple-year experiments are being conducted in the low and intermediate precipitation regions to document the rotation benefits of winter canola (WC) in wheat-based cropping systems. Farmers in both the low and intermediate precipitation zones have reported economically viable winter canola yields. In addition, some farmers have reported that the winter wheat (WW) crop following winter canola often has less disease and weed pressure and produces considerably higher grain yield compared to monoculture winter wheat in the traditional 2-year WW-summer fallow (SF) rotation or spring cereal (either wheat or barley) in the 3-year WW-SW-SF rotation. Additionally, it has been observed that water runoff from frozen agricultural soils does not occur following a winter canola crop, presumably because the deep tap root provides open channels for water to penetrate through the frozen surface soil layer. Neither the boost in subsequent wheat grain yield or the soil physical, biological, or pathological factors, that may account for better water infiltration and increased wheat yield as affected by having winter canola in the



Replicated strips of winter canola and winter wheat at the Ritzville study site located on the Ron Jirava farm.

crop rotation have been documented. In the low-precipitation zone on Ron Jirava's farm near Ritzville, we are comparing the 2-year WW-SF rotation to a 4-year WC-SF-WW-SF rotation. In the intermediate precipitation zone on Hal Johnson's farm near Davenport, a 3-year WC-spring wheat (SW)-SF rotation is compared to WW-SW-SF. We will determine the effects of having winter canola in the rotation on soil microbial changes, water infiltration into frozen soils, plant health of the wheat crop following winter canola, winter wheat grain yield, and farm economics compared to checks (i.e., rotations without WC in the rotation). The scientists involved in this study are a research agronomist, soil microbiologist, plant pathologist, and agricultural economist. Three rotational years of data will be obtained from each site.

Camelina Agronomy Research in the Pacific Northwest

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Passage of the renewable fuel standard for biodiesel in the State of Washington has heightened the need to significantly increase oilseed acreage in the region. Camelina (*Camelina sativa*) is a broadleaf crop in the mustard family that can be sown at low seeding rate, is competitive with weeds, and has a modest requirement for nitrogen and water. A 3-year experiment was initiated in 2007 at four sites in Washington, Idaho, and Oregon to evaluate camelina varieties, seeding rates, planting dates, planting methods, and nitrogen rates. The goal of the research is to develop agronomic practices to incorporate camelina into PNW crop production systems and assist the fledgling oilseed industry to understand and utilize this crop. We have selected representative areas in the PNW that include all the major cropping systems throughout the region. Sites are: (i) Lind, WA, (ii) Pendleton, OR, (iii) Moscow, ID, and (iv) Corvallis, OR, where average annual precipitation is 9.5, 16, 24, and 40 inches, respectively. These four sites represent all the major cropping zones in the PNW. Specific procedures and experimental designs are consistently used at all sites. Although preliminary studies show potential adaptability of camelina, there is not yet sufficient information to provide general crop production practices or indicate the geographic adaptability of the crop. Limited work in Montana and North Dakota suggests that camelina has potential in marginal production areas with low precipitation and shallow soils. This research project will be shown and discussed at the major university field days in 2008 at Lind, Pendleton, Moscow, and Corvallis.



Farmers, agricultural industry personnel, government officials, and the general public learn about camelina at the 2007 Lind Field Day.

Camelina Cropping Systems Research at Lind

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A 6-year dryland cropping systems experiment was initiated at the WSU Dryland Research Station October 2007 to evaluate camelina in wheat-based systems. Camelina is a Brassica oilseed crop that has shown good potential in low-precipitation regions in the Northern Great Plains and (with limited testing) in the Pacific Northwest. The cropping systems experiment will test the feasibility of a 3-year winter wheat-camelina-summer fallow rotation versus the standard 2-year winter wheat-summer fallow rotation. Experimental design is a randomized complete