Dual-Purpose Biennial Canola (*Brassica Napus* L.): Forage, Silage, and Grain Production in the Pacific Northwest

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Figure 1. Loading (left) and packing (right) freshly harvested canola forage into ensiling tubes.

Studies were conducted to investigate the production and quality of winter canola forage, silage, and grain. Winter canola was planted in mid-August of 2014 and 2015. Plots received one of eight nitrogen and sulfur fertilizer combinations with or without Agrotain®, a urease inhibitor. Plots were split in half with a dual-purpose treatment (DPWC) and a grain-only treatment (GOWC). Canola was harvested for forage approximately 60 days after sowing. Canola forage was ensiled with and without alfalfa cubes. Grain harvest took place July 7, 2015 and June 16, 2016. Forage yields averaged 2.1 Mg DM ha^{-1} and forage DM was low, ranging from 90 – 130 g kg^{-1} in 2014 and 150 – 210 g kg^{-1} in 2015. Crude protein levels were higher in 2014 than in 2015. Ensiling canola reduced CP, but when ensiled with alfalfa cubes CP was maintained or increased. On average, the inclusion of alfalfa cubes increased NDF from fresh canola, while the NDF of canola silage without alfalfa remained about the same. Canola forage and silage was also high in ash, and highly digestible. Forage nitrate levels were low (<1.09 g NO3 kg^{-1}). Forage sulfur levels ranged from 3.75 – 6.24 g S kg^{-1} and increased as fertilization increased. In general, ensiling reduced forage sulfur levels. Canola silage had a pH of 4.3 and a lactic acid concentration of 120 g kg^{-1} DM. When canola was ensiled with alfalfa silage pH was 4.6, and lactic acid was 60 g kg^{-1} DM. Large volumes of effluent were produced when canola was ensiled, but the addition of alfalfa cubes significantly reduced effluent. Cropping treatment did not influence winter survivability. Grain yields did not differ between fertilizer treatments, but GOWC grain yield was reduced in 2015 from 2014. Dual-purpose canola yielded around 300 g kg^{-1} less than GOWC in 2014 but was not statistically different, in 2015 DPWC and GOWC yielded similarly. Net incomes were negative for both DPWC and GOWC in both years, however losses were larger for GOWC. Dual-purpose canola produced a high-quality forage and silage with any grain yield losses offset by the value of canola forage.

Cabbage Seedpod Weevil Insecticide Trial in Winter Canola

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Winter canola acreage in central and eastern Washington continues to increase as more producers learn about the rotational benefits and potential profitability of canola in predominantly cereal-based rotations. With more acres in production, insect pests common in other canola-growing regions of the US and Canada are now being observed in the Pacific Northwest (PNW). While many of the pests are not at thresholds to warrant control measures, the cabbage seedpod weevil, *Ceutorhynchus obstrictus* (Marsham), (Fig. 1) is becoming a problem in some areas of Washington state. The cabbage seedpod weevil (CSPW) is an introduced insect pest from Europe and causes damage to members of the

Figure 1. Adult Cabbage Seedpod Weevil.

Brassicaceae or mustard family, including cultivated crops such as canola and brown mustard. When left unmanaged, the CSPW can cause significant damage to ripening canola seeds and impact overall yields by as much as 50% (Fig. 2). Unfortunately, we lack the fundamental knowledge on which insecticide provides the greatest control in our region in order to make sound management recommendations. The goal of this trial is to compare several known insecticides to determine which one will work the best at managing this pest for growers.

The study design consist of randomized complete block with 5 replicates. Five insecticides: Bifenthrin (Tailgunner), Chlorantraniliprole (Altriset, Besiege, Voliam Express), Imidacloprid (Gaucho 600), Lambda-Cyhalothrin (Warrior II) and Zeta-cypermethrin (Mustang Max) were selected for this study. The seed treatment (Imidacloprid (Gaucho 600)) was applied in Fall 2016. The remaining 4 treatments will be applied the summer of 2017.

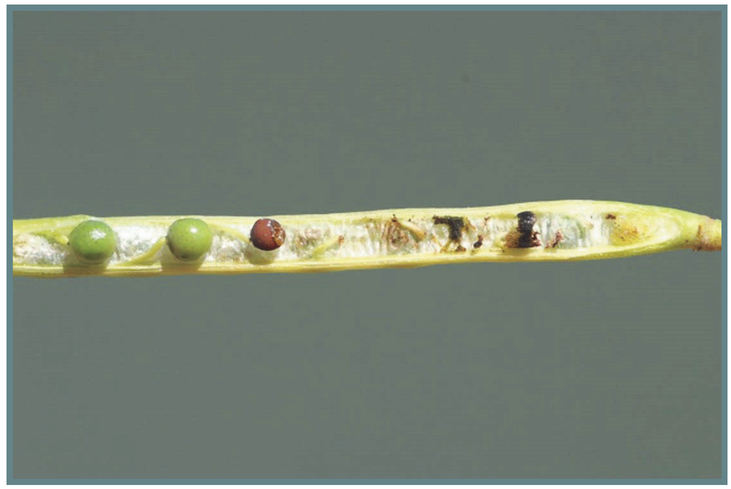

Figure 2. Cabbage Seedpod Weevil larval feeding damage. Photo by Green Thumb Photography.

We will correlate CSPW densities in canola fields with yield losses and cost of insecticide treatment and communicate the results to farmers via our http://css.wsu.edu/oilseeds website, email listservs, online publications, and at workshops and field tours.

Soil Water Dynamics in the Long-Term Camelina Cropping Systems Experiment at Lind

WOCS WASHINGTON OILSEED CROPPING SYSTEMS Part of the Washington State Biofuels Initiative

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We are currently in the ninth year of a long-term cropping systems experiment to evaluate camelina (C) produced in a 3-year winter wheat(WW)-C-summer fallow (SF) rotation compared to the 2-year WW-SF rotation. Camelina is direct drilled into standing WW stubble in late February or early March. Winter wheat is planted into undercut-tillage SF in late August or early September. Soil water content to a depth of six feet is measured in all 20 plots after C and WW harvest in July and again in March, and from the eight SF plots in late August just before planting WW.

The only tillage in the experiment is during fallow and consists of one pass with an undercutter sweep + fertilizer injection in late April–early May and one rodweeding in July. These operations always take place at the same depth and same time. Every year, significantly more soil water evaporates during the summer months from SF after camelina than from SF after winter wheat. An average of 1.08 inch and 0.53 inch of soil water is lost between March and August in SF after camelina and winter wheat, respectively (Table 1). What are the reasons for this loss of an additional 0.55 inch of soil water in SF after camelina?