**Title:** Spring and Winter Canola Research at the WSU Cook Agronomy Farm

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**Objective:** Evaluate the performance of spring and winter canola as alternative crops in the annual cropping zone of Eastern Washington

**Methods:** Spring and winter canola were evaluated as alternative crop options at the Cook Agronomy Farm (CAF) from 2001 through 2009 (Fig. 1). Canola was grown in rotation with wheat following a three year winter wheat-x-spring wheat rotation where x was spring canola and recrop winter canola (Fig. 2).

![Figure 1. Aerial photograph of the WSU Cook Agronomy Farm (2002) showing three field sections (approximately 30 acres each) in spring wheat (left section of field), winter wheat (middle section of field) and alternative crops including canola (right section of field).](image)

From 2001-2006, both winter and spring canola were no-till planted with a Great Plains™ drill. Spring canola varieties were Roundup Ready® with targeted seeding rates of 6 lbs/ac and were seeded in late March and early April. Applied fertilizer for spring canola was 110 lbs N/ac primarily as solution 32, 10 lbs P₂O₅ as ammonium polyphosphate and 25 lbs S/ac as ammonium thiosulfate. No post-plant insecticides were applied for the 2001-2006 crops. Enterprise budgets were developed from fixed and variable costs.
Results and Discussion: Spring canola yields ranged from 1100 to 2700 lbs/ac averaging 1900 lbs/ac over the six year period (Fig. 3). Although winter canola was planted each fall, it was harvested in only one year (2002). This occurred as seed-zone water was insufficient for germination during September of all years except fall of 2001. In early September 2001, winter canola was planted and emerged, however, late September frosts killed the stand (cotyledon stage) and required replanting. The winter survival of the later seeded winter canola was marginal and resulted in many portions of the field having poor stands and yielding, overall, 600 lbs/ac. Dry falls during September and early October during the remaining years of the study resulted in stands of winter canola that were 4 leaves or less entering the winter. No winter canola was harvested in 2001, however, from 2003-2006, the failed winter canola stands were seeded with broadcast roundup-ready spring canola (Fig. 4) seeded at the same time as the no-till planted spring canola. Broadcast spring canola had similar yields as no-till planted spring canola and may be an option for early seeding of spring canola into winter wheat residue.
No-till and broadcast seeding spring canola into winter wheat stubble has several advantages. The residue helps to maintain seed-zone water throughout the spring, thereby promoting shallow seeded (0-0.5 inches) canola germination. In addition, the standing residue can help protect the emerged crop from spring frosts.

Even spring canola stands established using no-till into winter wheat stubble can be affected by frosts (Fig. 5). Canola seeded with a cross-slot drill was more susceptible to frost as the wheat stubble was laid nearly flat as compared to other no-till drills. In this case, the canola seeded with the cross-slot had begun to emerge and the cotyledons were just above the flat wheat stubble and relatively exposed at the time of frost.

Enterprise budgets are being developed by Dr. Kate Painter and preliminary results show that spring canola compares favorably with other alternative crops with returns over variable costs greater than either peas or barley at the CAF (Fig. 6).
Figure 6. Average returns over variable costs for alternative crops in rotation with wheat (Dr. Kate Painter, preliminary results).

Future Research: Assessment of alternative crop performance (yield and economic returns) during 2001-2009 will be completed in 2011.