Economic Returns to Canola Rotations in Eastern Washington

Nathan Skuza and Vicki McCracken

School of Economic Sciences,
Washington State University, Pullman, WA 99164

Abstract

Inclusion of canola into cropping systems may offer agronomic benefits to farms that translate into improved overall farm profitability over time. We compare economic returns of cropping systems that incorporate canola with the returns to traditional cropping systems appropriate to each region. Returns are based on typical yields and costs of production for each cropping region, refer to figure 1. In the annual cropping region (region 1) , we evaluate a three year winter wheat-- spring wheat-- spring canola rotation against a three year winter wheat – spring wheat-- spring legume (peas or garbanzos) system. We also evaluate the potential returns of a three year rotation system consisting of winter wheat – winter canola forage—winter canola. In the low rainfall western edge of region 1, we compare the economic returns of a three year rotation system in which spring canola replaces the usual chemical fallow year. We also consider a three year winter wheat- spring canola-chemical fallow system as an alternative to conventional two year winter wheat—chemical fallow systems. In region 2, we compare the conventional two year winter wheat – chemical fallow system with an alternative system in which winter canola is substituted for winter wheat every second cycle. In all the rotations considered, the addition of canola increased input costs, and tended to decrease overall returns. The exception was the intermediate rainfall area of Whitman county (Table 3), which yielded slightly higher returns.

Methodology

- Economic returns of rotations estimated using enterprise budgets
- Valuations used current market prices and average yields for the crop region
- Rotational impacts on yield and inputs were incorporated when data was available
- Used projected yields and inputs costs for non-traditional systems
- Assumed all canola is roundup ready
- Rotation returns computed assuming equal acreage of each rotation phase

Results

Table 1 – Region 1: WW – SW – SC

Summary of Returns by Crop and Rotation ($/acre)

By Crop:	Unit	Yield (unit/acre)	Price* ($/unit)	Revenue ($/acre)	Total Cost of Operation (TC) ($/acre)	Returns over TC ($/acre)	Total Variable Costs (VC) ($/acre)
Winter Wheat (WW)	bu	85	$6.00	$510	$356	$154	$190
Soft White Spring Wheat (SWSW)	bu	65	$6.00	$390	$324	$66	$190
Spring Peas (P)	lb	2000	$0.14	$280	$229	$51	$131
Winter Wheat (WW)	bu	85	$6.00	$510	$353	$157	$186
Soft White Spring Wheat (SWSW)	bu	65	$6.00	$390	$324	$66	$190
Spring Canola (SC)	lb	1900	$0.16	$295	$291	$3	$187

By Rotation:	Revenue ($/acre)	TC of Operation ($/acre)	Returns over TC ($/acre)	Total VC ($/acre)
WW, SWSW, SP	$393	$303	$90	$170
WW, SWSW, SC	$398	$323	$76	$187

Table 1

- High rainfall area of Whitman County
- Winter wheat given 20 lb N credit for spring pea
- Spring canola rotation underperformed relative to spring pea rotation due to higher input costs associated with spring canola

Table 2 – Region 1: WW – WC/SP (Forage) – WC

Summary of Returns by Crop and Rotation ($/acre)

By Crop:	Unit	Yield (unit/acre)	Price* ($/unit)	Revenue ($/acre)	Total Cost of Operation (TC) ($/acre)	Returns over TC ($/acre)	Total Variable Costs (VC) ($/acre)
Winter Wheat (WW)	bu	$85.00	$6.00	$510.00	$356.00	$154.00	$190.00
Soft White Spring Wheat (SWSW)	bu	65	$6.00	$390.00	$324.01	$65.99	$189.53
Spring Peas (P)	lb	2,000	$0.14	$280.00	$229.34	$50.66	$130.52
Winter Wheat (WW)	bu	85	$6.00	$510.00	$352.55	$157.45	$185.69
Winter Canola/Spring Pea Forage (F)	ton	3	$88.00	$264.00	$333.61	-$69.61	$209.98
Winter Canola (WC)	lb	3,500	$0.16	$542.50	$370.50	$172.00	$183.52

By Rotation:	Revenue ($/acre)	TC of Operation ($/acre)	Returns over TC ($/acre)	Total VC ($/acre)
WW, SWSW, SP	$393.33	$303.02	$90.31	$170.08
WW, F, WC	$438.83	$352.22	$86.61	$193.06

Farmsize is assumed to be 2500 acres for the purposes of machinery cost calculations.

Table 2

- High rainfall area of Whitman County
- High yield potential of winter canola increases overall revenue, but relatively high input costs lead to decreased returns

Table 3 – Region 1: WW – SW - SC

Summary of Returns by Crop and Rotation ($/acre)

By Crop:	Unit	Yield (unit/acre)	Price* ($/unit)	Revenue ($/acre)	Total Cost of Operation (TC) ($/acre)	Returns over TC ($/acre)	Total Variable Costs (VC) ($/acre)
Spring Canola Rotation							
Winter Wheat (WW)	bu	78	$6.00	$468	$251	$217	$141
Hard Red Spring Wheat (HRSW)	bu	42	$6.80	$286	$254	$32	$169
Spring Canola (SC)	lb	2000	$0.16	$320	$273	$47	$181
Chemical Fallow Rotation							
Chemical Fallow (CF)***				$0	$138	-$138	$129
Winter Wheat (WW)	bu	78	$6.00	$468	$352	$116	$72
Hard Red Spring Wheat (HRSW)	bu	42	$6.80	$286	$254	$32	$169
or							
Spring Barley (SB)	ton	1.5	$160.00	$240	$231	$9	$160

By Rotation:	Revenue ($/acre)	TC of Operation ($/acre)	Returns over TC ($/acre)	Total VC ($/acre)
WW, HRSW, SC	$358	$259	$99	$164
WW, HRSW, CF	$251	$202	$49	$80
WW, SB, CF	$236	$194	$42	$77

*Nov 2010 farmgate prices for grains, posted by the Union Elevator, Lind, WA. www.unionelevator.com, accessed Oct/Nov 2010.
***All summer fallow costs are included in the costs for producing winter wheat, plus one year's interest. These figures are for informational purposes only.

Table 3

- Intermediate rainfall area of Whitman County
- Spring canola replaces fallow in 3 year rotation
- Extra revenue from spring canola increases returns despite higher cost

Table 4 – Region 1: WW – SC - Fallow

Summary of Returns by Crop and Rotation ($/acre)

By Crop:	Total Cost of Operation (TC) ($/acre)	Unit	Yield (unit/acre)	Price* ($/unit)	Revenue ($/acre)	Returns over TC ($/acre)	Total Variable Costs (VC) ($/acre)
Conventional Tillage							
2 Year							
Conv. Tillage Winter Wheat (CTWW)	$236	bu	50	$6.00	$300	$64	$49
Summer Fallow (SF)***							$76
3 year							
Conv. Tillage Winter Wheat (CTWW)	$236	bu	50	$6.00	$300	$64	$49
Spring Canola	$247	lb	1500	$0.16	$240	-$7	$161
Summer Fallow (SF)***							$76
Reduce Tillage							
2 Year							
Red. Tillage Winter Wheat (RTWW)	$277	bu	50	$6.00	$300	$23	$100
Chemical Fallow (CF)***							$65
3 year							
Red. Tillage Winter Wheat (RTWW)	$236	bu	50	$6.00	$300	$64	$49
Spring Canola	$277	bu	1500	$0.16	$240	-$37	$100
Chemical Fallow (CF)***							$65

By Rotation:	TC of Operation ($/acre)	Revenue ($/acre)	Returns over TC ($/acre)	Total VC ($/acre)
SF-WW-SF-WW-SF-WW	$118	$150	$32	$63
SF-WW-SC,SF-WW-SC	$161	$180	$19	$70
CF-WW-CF-WW-CF-WW	$138	$150	$12	$50
CF-WW-SC,CF-WW-SC	$171	$180	$9	$50

Table 4

- Low rainfall area of Whitman county
- Increased costs of spring canola decreases returns

Table 5 – Region 2: WW – Fallow – WC – Fallow

Summary of Returns by Crop and Rotation ($/acre)

By Crop:	Unit	Yield (unit/acre)	Price* ($/unit)	Revenue ($/acre)	Total Cost of Operation (TC) ($/acre)	Returns over TC ($/acre)	Total Variable Costs (VC) ($/acre)
Conv. Tillage Winter Wheat (CTWW)	bu	40	$6.00	240	$217	$23	$50
Winter Canola (CTWW)	lb	1500	$0.16	240	$236	$4	$68
Summer Fallow (SF)***							$76
Red. Tillage Winter Wheat (RTWW)	bu	40	$6.00	240	$257	-$17	$100
Winter Canola (RTWW)	lb	1500	$0.16	240	$253	-$13	$95
Chemical Fallow (CF)***							$65

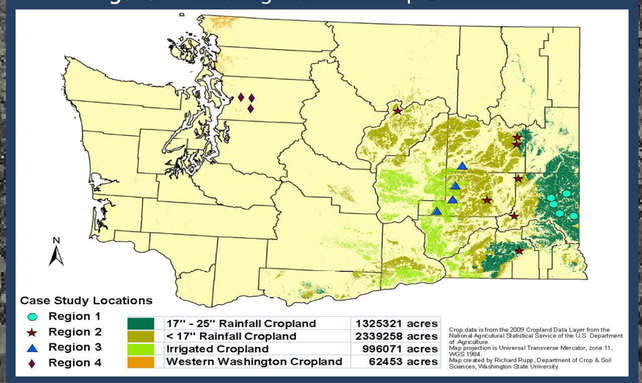
***Fallow costs are included in costs for winter wheat and winter canola

By Rotation:	Revenue ($/acre)	TC of Operation ($/acre)	Returns over TC ($/acre)	Total VC ($/acre)
SF-WW-SF-WW	$160	$151	$9	$39
CF-WW-CF-WW	$120	$170	$2	$67
SF-WW-SF-WC	$120	$113	$7	$29
CF-WW-CF-WC	$160	$170	-$10	$65

Table 5

- Winter wheat yields are reduced 20% to account for typical price dockage for weeds
- Winter canola returns are similar to winter wheat

Figure 1: Washington State Crop Locations



Conclusions

- Inclusion of canola increased input costs of all rotation systems considered
- Roundup ready canola can potentially decrease overall input costs through improved weed control
- The impacts of RR canola were not included in the budgets
- Future budgets should include rotational impacts such as decreased herbicide use
- The winter canola offers high yield potential and high potential returns