

Enterprise Budgets: 3-Year Wheat and Canola Rotations in Eastern Washington Intermediate Rainfall Regions (12" to 16")



Adapted for 2011-2015 Average Farmgate Crop Prices

These budgets were constructed for the Washington Oilseed Cropping Systems (WOCS) project,
part of the Washington state biofuels initiative.

<http://css.wsu.edu/biofuels/>

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Introduction

The 2013 budgets for 3-year wheat and canola rotations in eastern Washington with intermediate rainfall (12 to 16 inches) were developed to estimate enterprise costs and returns for farm operations currently growing or considering growing canola. The budgets are available in two forms: an interactive Excel workbook and a PDF document showing the default cost and return scenarios. Default budget data are based on a model farm, designed to reflect a “typical” dryland farm operation in the 12 to 16 inch intermediate rainfall regions of Washington (see Budget Assumptions below). Users can adapt the Excel workbook budgets to compare costs and returns between canola and non -canola rotations.

Inserting canola into traditional rotations may affect overall farm costs and returns due to changes in chemical use, weed control in subsequent crops, machinery operations to handle stubble, and the like. Some farmers have experienced increases in wheat yields after growing canola. To allow costs and returns to reflect canola’s rotational impacts, separate budgets are included in the Excel workbook for crops in a “canola rotation” or a (non -canola) “wheat rotation” (see Excel workbook tabs 1 through 8).

- Canola Rotation: Fallow – Winter Wheat – Spring Canola
- Wheat Rotation: Fallow – Winter Wheat – Spring Wheat or Spring Barley

Crops included are Soft White Winter Wheat (SWWW), Hard Red Winter Wheat (HRWW), Soft White Spring Wheat

How to Use the Excel Workbook Budgets

Review the Budget Assumptions sections (listed below) that were used to create the budgets. You may need to adjust these budgets as follows in order to accurately reflect your situation.

Adjust crop budgets in the Excel workbook for your specific farm operation:

Inputs

Update costs on the **green Input Costs tab** and the cost will update throughout the budgets. If you use a product that is not listed on the Input Costs tab, you can add (or remove) inputs and adjust quantities used on the individual crop budgets (tabs numbered 1 through 8).

Machinery operations

Update machinery operations on the **blue Machinery Costs tab** (scroll right through the tabs at the bottom of the Excel workbook to reach the Machinery Costs tab) and the costs will update throughout the budgets. You can adjust the number and type of machinery operations for each crop or fallow cycle (Tables 5 through 16) by adjusting the Number of Passes marked in red text for the operation that most closely matches your equipment.

The machinery information on the Machinery Complement tab (Table 3), was entered into the University of Idaho's Crop Machinery Cost Calculator to estimate cost per acre for common operations. Machinery values, depreciation, repairs, etc. for individual pieces of machinery cannot be directly adjusted in the Excel workbook for these crop budgets at this time. However, costs per acre can be overwritten in Table 4 of the Machinery Costs tab, if you know your own cost per acre for a particular operation.

Enter yield and price values in Table 1 on the **purple Summary tab**. Wheat yields can be different in the canola rotation versus the wheat rotation. Yield and price values changed on the Summary tab will update throughout the budgets.

Choose rotation scenarios and compare returns between rotations in Table 2 on the **purple Summary tab**. Make sure you have updated the individual crop budgets (tabs numbered 1 through 8) used in the rotations you have chosen (wheat and/or canola rotations) as needed.

Color Coding

The text color coding system below is used to indicate the source of the data for each budget and to show which data can be adjusted by the user.

- **Red text** can be changed without affecting the underlying equations in this cost calculator.
- **Purple text** indicates that the information is from the purple Summary tab (Table 1). For example, yield values appear on the Summary tab in red text but on the crop budget (tabs 1 through 8) in purple text; updating yields on the Summary tab will automatically update yields on the crop budgets tabs. This allows you to quickly compare net returns under different yield and price scenarios without leaving the Summary tab.
- **Green text** indicates that the information is from the green Input Cost tab and can only be adjusted in the Input Cost tab.
- **Blue text** indicates that the information is from the blue Machinery Cost tab. Please see below for more

Budget Assumptions

Since farming is inherently variable and constantly changing, we hope that the Excel workbook format will be helpful in adjusting these budgets to reflect your particular operation. Enterprise costs and returns vary from one location to the next, and over time, for any particular farming operation. Variability stems from differences in the following:

- Capital, labor, and natural resources
- Type and size of machinery complement
- Cultural practices
- Size of farm enterprise
- Crop yields
- Input prices
- Commodity prices
- Management skill

These budgets were created in an Excel workbook format in order to facilitate adjustments for different farming operations. Please note that these budgets will help you estimate future profitability, however, they cannot predict future conditions, both in the marketplace and on your own operation.

Production practices most closely represent those in the 12 to 16 inches intermediate rainfall regions of Washington based on grower input. Seasonal operations are detailed in the **Calendar** tabs. Production practices may be similar among individual farms, but each farm has a unique set of resources with varying levels of productivity and production problems and, therefore, slightly different costs. Farm size, crop rotation, age and type of equipment, soils, and quality of management are crucial factors that influence production costs.

Economic costs are used for these costs and returns estimates. All resources are valued based on market price or opportunity cost. An opportunity cost is determined based on the next most valuable use of the resource. For example, the opportunity cost of farming land you own would be estimated as the highest rental value for that land. The cost and return estimates shown here are typical for growing grain and rotational crops in the intermediate rainfall region in Washington.

Specific Budget Assumptions

The Model Farm

These budgets represent a 3500-acre farm that follows a typical 3-year rotation of winter wheat, spring crop, followed by fallow. Spring canola may be grown in place of a spring wheat or barley. In a typical year, equal proportions would be devoted to each crop in a rotation.

Crop choices will vary by year, depending on relative crop prices and other management considerations. Average annual returns for typical rotations are listed in Table 1, Summary of Returns by Crop (\$/acre) and Table 2, Summary of Returns by Rotation (\$/acre) in the Summary tab.

Crop Prices

Crop prices are calculated as three-year average prices received by Washington growers based on Portland prices less an off-coast adjustment for transportation and handling.

Input Costs

Input costs (green tab) are based on the University of Idaho's annual survey of agricultural supply companies, or retail prices shared by regional distributors. Input costs in the 2013 Idaho Crop Input Price Summary are considered close estimates for input costs in Washington State. This report is available online at: <http://web.cals.uidaho.edu/idoagbiz/files/2014/01/IDInputCosts20131.pdf>.

Machinery Costs

The machinery complement and per acre machinery cost estimates are in the last two tabs in the Excel workbook. A "machinery complement" is a set of common machinery and implements that would be sufficient for performing standard operations in crop production on a farm in a given region.

The machinery complement used in these budgets was constructed based on farmer and expert input, and is intended to be representative of a typical dryland farm in the 12 to 16 inches intermediate rainfall regions of Washington.

The machinery complement was entered into the University of Idaho's Crop Machinery Cost Calculator to obtain per acre machinery costs in Table 4 on the Machinery Costs (blue) tab. The per acre machinery costs for each crop and fallow cycle (Tables 5 through 16) feed into the individual crop budgets (tabs numbered 1 through 8).

Machinery fixed costs include depreciation, interest, property taxes, insurance, and housing for all machinery used by the operation. Given ownership of a specific machinery complement, these fixed costs are incurred by the overall farm operation and are incurred whether or not crops are grown. **The user's machinery costs will vary if farm size, equipment size and value, or annual hours of use differ significantly from the values used in these budgets.**

Machinery cost files are available upon request. The University of Idaho Crop Machinery Cost Calculator is available at: <http://web.cals.uidaho.edu/idaohobiz/management-tools/>

Labor Costs

Labor to operate machinery is valued at \$20.00 per hour. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor and 30 percent for machinery labor. The base wage is based on average hourly wages reported by the Washington State Employment Security Department in the 2011 Agricultural Workforce Report.

Storage and Transportation Costs

These budgets assume all crops are sold at harvest, so no storage costs are incurred. However, monthly storage costs can be added on individual crop budget tabs if relevant to an operation. Storage rates from the Input Cost tab are per bushel, per month, based on regional elevator storage rates.

Harvest transportation costs from field to local elevator/storage (average 10 miles one-way) are included in per acre machinery cost estimates. Some farmers may own or hire larger trucks for longer distance hauling. Long-distance hauling costs can be added by the user on individual crop budget tabs by entering the hauling distance, rate per mile, and load volume. The default scenario for wheat and barley assumes a 100-mile roundtrip to either a rail or river sub-terminal, based on hired truck rates as quoted by several regional companies.

Land Costs

Land costs are based on a typical lease agreement for this region. While the owner-operator will not actually experience a land rental cost, this cost represents the minimum return owner-operators must receive to justify growing the crop themselves. To determine the profitability of crop production relative to other activities, the owner-operator may want to consider these forgone rental returns along with the usual production expenses.

A typical lease agreement in this region is a one-third land owner and two-thirds tenant crop share, with the land owner paying land taxes, one-third of the fertilizer cost, one-third of the chemical cost, and one-third of the crop insurance. The tenant covers all other production expenses.

To approximate rental cost or forgone rental returns, the default land cost is calculated as one-third gross revenue minus one-third fertilizer, pesticide, and crop insurance costs. The crop-share percentage can be adjusted by crop on the individual crop budget tabs.

This valuable tool reveals how different factors affect revenue for landlords and operators differently, such as crop and input price increases, as well as cropping choices. Note that pea, lentil, and garbanzo crop-share arrangements are typically split with a one-fourth, three-fourths cost share.

Interest Costs

Interest on operating capital is charged on total operating costs for nine months and calculated at a nominal rate of 5.75 percent. The operating interest rate can be changed on the Input Costs tab.

Other Costs

A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated costs such as office expenses, phone service, legal and accounting fees, and utilities. A management fee is charged at the rate of 5 percent of gross revenue, rounded to the nearest dollar, to cover management labor. Both overhead and management fee rates can be changed on the Input Costs tab.

Conclusions

Growers using this budget should closely examine the budget assumptions and make adjustments in the Excel workbook to reflect their particular operation. Adjustments in the variable costs can easily be made without affecting the overall accuracy of the budget information.

Machinery costs are more difficult to adjust, due to the underlying complexity of machinery cost calculations. A separate machinery cost calculator program is used to develop the costs used in these budgets, which are based on specific machinery values, years of life, repair costs, machine widths, tractor horsepower, etc. The machinery cost program and datasets specific to this budget are available upon request.

References

- Patterson, P.E. and K. Painter. 2013. 2013 Crop Input Cost Summary. Agriculture Economics Extension Series No. 13-03. University of Idaho. <http://web.cals.uidaho.edu/idaohoagbiz/files/2014/01/IDInputCosts20131.pdf>.
- Washington State Employment Security Department. 2012. 2011 Agriculture Work Force Report. Labor Market and Economic Analysis. <https://fortress.wa.gov/esd/employmentdata/docs/industry-reports/ag-annual-2011.pdf>.
- University of Idaho. 2015. Crop Machinery Cost Calculator. Extension Software. University of Idaho. <http://web.cals.uidaho.edu/idaohoagbiz/management-tools/>.

Acknowledgements

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We thank Kate Painter and Hilary Donlon at the University of Idaho for allowing their budgets to be adapted for this project and for sharing data from complementary work from the Regional Approaches to Climate Change, Pacific Northwest Agriculture (REACCH) project, funded through award #2011-68002-30191 from USDA National Institute for Food and Agriculture (NIFA). We also thank the reviewers for their edits and comments.

We take full responsibility for any errors in these budgets. Please feel free to contact us with any comments or suggestions.

The Excel workbook and PDF are available online:

<http://css.wsu.edu/biofuels/>

Table 1. Summary of Average Annual Returns by Crop (\$/acre)

Adjust costs on the individual crop budgets in tabs numbered 1-5 and totals will update here on the Summary tab.

Budget:	By Crop:	Unit	Yield per acre	Price per unit	Revenue per acre (\$/acre)	Variable Costs (VC) (\$/acre)	Fixed Costs (FC) (\$/acre)	Total Cost (TC) of Operation (\$/acre)	Returns over VC (\$/acre)	Returns over TC (\$/acre)	Crop & Cost Share Cost (\$/acre)	Share Percentage Owner Share	Operator Share
Oilseed Rotation: Fallow--Winter Wheat--Spring Canola													
1	Soft White Winter Wheat (SWWW) <i>Preceding fallow year costs*</i>	bu	86	\$6.44	\$554 \$0	\$164 \$109	\$332 \$27	\$496 \$136	\$390 -\$109	\$58 -\$136	\$130	33%	67%
2	Spring Canola (SC)	lb	1500	\$0.21	\$312	\$198	\$115	\$313	\$114	-\$2	\$64	33%	67%
Cereal Rotation: Fallow--Winter Wheat--Spring Barley/Spring Wheat													
3	Soft White Winter Wheat (SWWW) <i>Preceding fallow year costs*</i>	bu	78	\$6.44	\$502 \$0	\$161 \$109	\$311 \$27	\$473 \$136	\$341 -\$109	\$30 -\$136	\$112	33%	67%
4	Soft White Spring Wheat (SWSW)	bu	50	\$6.44	\$322	\$177	\$127	\$304	\$145	\$18	\$74	33%	67%
5	Hard Red Spring Wheat (HRSW)	bu	45	\$8.41	\$378	\$186	\$146	\$331	\$193	\$47	\$90	0%	0%
6	Spring Barley (SB)	ton	1.50	\$188	\$282	\$164	\$115	\$278	\$118	\$4	\$64	33%	67%

*Fallow costs are included as a fixed cost in the following winter wheat crop. Fallow costs are listed here for informational purposes only.

Table 2. Summary of Average Annual Returns by Rotation (\$/acre)

Click on the rotations below (red text) to select and compare alternative rotations from the drop down menu.

Select the Rotation:	Budget(s):	Revenue per acre (\$/acre)	Variable Costs (VC) (\$/acre)	Fixed Costs (FC) (\$/acre)	Total Cost (TC) of Operation (\$/acre)	Returns over VC (\$/acre)	Returns over TC (\$/acre)	Crop-Share Land Cost (\$/acre)
F-SWWW-HRS	3 and 5	\$294	\$116	\$152	\$268	\$178	\$25	\$67
F-SWWW-SC	1 and 2	\$288	\$121	\$149	\$270	\$168	\$19	\$65

Input Costs by Year

Item	Unit	2013 cost/unit
Fuel:		
Diesel, offroad, bulk	gal	\$3.40
Gas	gal	\$3.50
Seed:		
Soft White Winter Wheat	lb	\$0.24
Hard Red Winter Wheat	lb	\$0.30
Soft White Spring Wheat	lb	\$0.25
Dark Northern Spring	lb	\$0.27
Barley	lb	\$0.24
Spring Canola	lb	\$3.50
Spring Canola - Roundup Ready	lb	\$9.55
Fertilizer:		
Nitrogen (liquid)	lb	\$0.77
Phosphorous (liquid)	lb	\$0.66
Sulfur (liquid)	lb	\$0.56
Potassium (dry)	lb	\$0.36
Boron	lb	\$8.20
Adjuvants:		
Ammonium Sulfate	lb	\$0.42
Ammonium Sulfate (liquid)	oz	\$0.07
Crop Oil Concentrate	oz	\$0.10
In-Place	oz	\$0.28
M90	oz	\$0.19
Methylated seed oil	pt	\$5.04
Non-ionic Surfactant	oz	\$0.14
Custom Rental/Services:		
Custom Aerial	acre	\$8.70
Fertilizer Applicator	acre	\$1.00
26' Rental Shredder	acre	\$10.00
36' Ripper Shooter	acre	\$2.50
90' Rental Sprayer	acre	\$2.00
Crop Insurance¹:		
Hard Red Winter Wheat	acre	\$18.60
Soft White Winter Wheat	acre	\$19.40
Soft White Spring Wheat	acre	\$8.50
Dark Northern Spring Wheat	acre	\$8.00
Spring Barley	acre	\$12.70
Spring Canola	acre	\$14.60

Pesticides:		
2,4-D amine	oz	\$0.15
2,4-D ester	oz	\$0.20
Assure II EC	oz	\$0.84
Axial XL	oz	\$1.10
Axiom	oz	\$2.14
Banvel	oz	\$0.58
Bronate Advanced	pt	\$7.88
Brox 2EC	oz	\$0.27
Brox M	oz	\$0.27
Finesse	oz	\$17.00
Glyphosphate (R-up Power Max.)	oz	\$0.20
Harmony GT	oz	\$20.15
Huskie	oz	\$0.88
MCPA amine	oz	\$0.22
MCPA ester	oz	\$0.20
Maverick	oz	\$18.25
Orion	oz	\$0.51
Osprey	oz	\$3.90
Poast 1.5 EC	pt	\$13.81
Powerflex	oz	\$4.68
Pursuit	oz	\$3.37
Quadris Flowable	oz	\$2.72
Quilt	oz	\$1.39
Tilt	oz	\$3.63
Warrior II	oz	\$3.78
Widematch	oz	\$0.63
Other:		
Spodnam	pt	\$14.25
Storage costs:		
Wheat storage	per 60lb bu, per mo.	\$0.02
Canola storage	per 50lb bu, per mo.	\$0.03
Barley storage	per 48lb bu, per mo.	\$0.02
Labor²:		
Hourly machine labor	hour	\$20.00
Other labor	hour	\$17.00
Overhead:		
Overhead ³	percent	2.50%
Management fee:		
Management fee ⁴	percent	5.00%
Cash rent:		
Cash rent	acre	\$0.00
Interest:		
Operating Loan	percent	5.75%
Intermediate Loan (Machinery)	percent	6.00%

¹Crop insurance estimates cost of premium for 75% of estimated revenue based on typical regional yields.

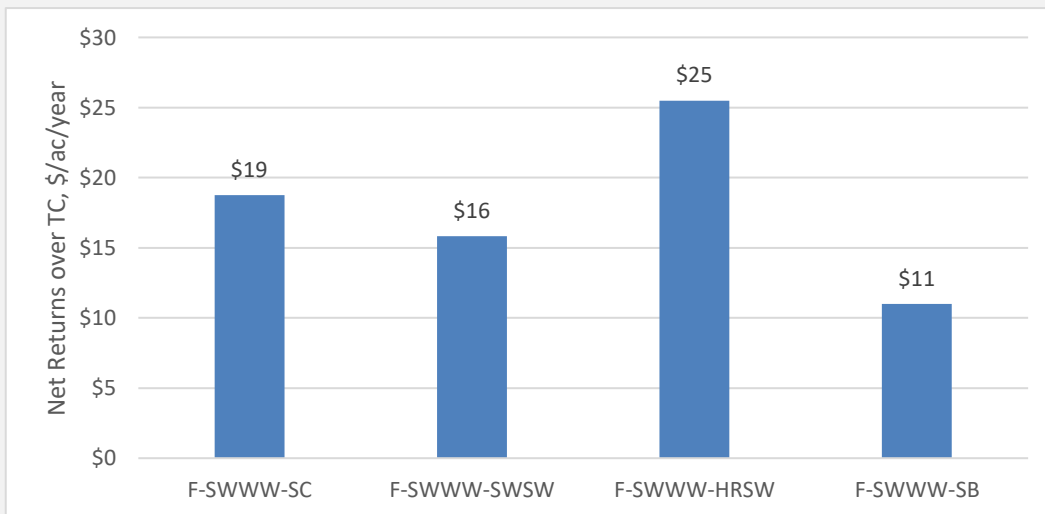
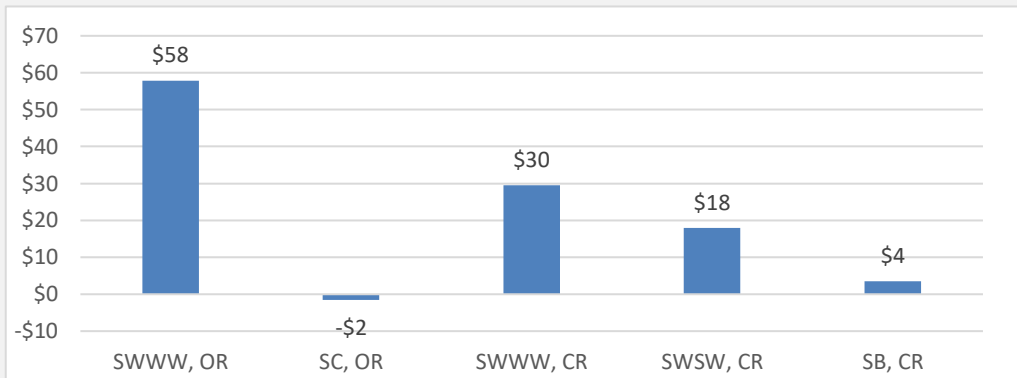
²Includes all applicable state and federal taxes.

³Calculates legal, accounting, and utility fees as a percentage of operating expenses.

⁴Calculated as a percentage of gross revenue.

Input cost reports are available on the University of Idaho AgBiz website under "Annual Input Cost Surveys":

<http://web.cals.uidaho.edu/idahoagbiz/enterprise-budgets/>



Calendars for Canola Rotation: F - HRWW/SWWW - SC

Default cost scenarios are based on these calendars for a reduced-till system.

Year 1: Schedule of Operations for Fallow (Rotation: after SC, before WW)

Month	Operation	Times	Tooling	Materials/Service (per acre)
October	Chisel/Sweep	1	35' Chisel & 480HP Tractor	
April/May	Spray weeds	1	90' Self-propelled sprayer	24 oz RoundUp, 4 oz Banvel, 1.7 lb ammonium sulfate
May/June	Cultiweed/Fertilize	1	36' Cultiweeder w/tankcart & 480HP Tractor	HRWW: 77lb N, 17lb P, 10lb S SWWW: 70lb N, 15lb P, 10lb S
June/July	Rodweed	2	48' Rodweeder & 480HP Tractor	

Year 2: Schedule of Operations for Winter Wheat

Month	Operation	Times	Tooling	Materials/Service (per acre)
Sept/Oct	Pre-plant weed control	1	90' Self-propelled sprayer	10 oz Axiom
Sept/Oct	Plant	1	36' seed drill & 480HP tractor	HRWW: 80lb SWWW: 80lb
April	Spray weeds & rust	1	90' Self-propelled sprayer	4.75 oz Osprey, 6.4 oz non-ionic surfactant, 1.5 lbs ammonium sulfate, 13.5 oz Huskie, 1 pt MCPA ester, 4 oz Tilt
August	Harvest	1	Combine & 30' header @ 4mph	HRWW: 73bu SWWW: 78bu
August	Harvest	1	Bankout wagon & 200HP tractor	
August	Harvest	1	Tandem axle truck	10-20 mile roundtrip to elevator or storage

Year 3: Schedule of Operations for Spring Canola

Month	Operation	Times	Tooling	Materials/Service (per acre)
October	Chisel/Sweep	1	35' Chisel & 480HP tractor	
October/March	Spray weeds	1	90' Self-propelled sprayer	24 oz RoundUp, 1.7 lb ammonium sulfate
April	Cultiweed & fertilize	1	36' Cultiweeder & 480HP Tractor	75lb N, 15lb P, 15lb S, 1lb Boron
April	Plant	1	36' seed drill & 480HP tractor	5lb canola seed
June/July	Custom aerial	1	Custom aerial, pod sealant	1 pt Spodnam
August	Harvest	1	Combine & 30' header @ 2mph	Yield: 1500lb
August	Harvest	1	Bankout wagon & 200HP tractor	
August	Harvest	1	Tandem axle truck	10-20 mile roundtrip to elevator or storage

Calendars for Wheat Rotation: F - HRWW/SWWW - SWSW/DNS/Barley

Default cost scenarios are based on these calendars for a reduced-till system.

Year 1: Schedule of Operations for Fallow (Rotation: after spring cereal, before WW)

Month	Operation	Times	Tooling	Materials/Service (per acre)
October	Chisel/Sweep	1	35' Chisel & 480HP Tractor	
April/May	Spray	1	90' Self-propelled sprayer	24 oz RoundUp, 4 oz Banvel, 1.7 lb ammonium sulfate
May/June	Cultiweed/Fertilize	1	36' Cultiweeder w/tankcart & 480HP Tractor	HRWW: 77lb N, 17lb P, 10lb S SWWW: 70lb N, 15lb P, 10lb S
June/July	Rodweed	2	48' Rodweeder & 480HP Tractor	

Year 2: Schedule of Operations for Winter Wheat

Month	Operation	Times	Tooling	Materials/Service (per acre)
Sept/Oct	Pre-plant weed control	1	90' Self-propelled sprayer	10 oz Axiom
Sept/Oct	Plant	1	36' seed drill & 480HP tractor	SWWW: 80lb
April	Spray Weeds	1	90' Self-propelled sprayer	4.75 oz Osprey, 6.4 oz non-ionic surfactant, 1.5 lbs ammonium sulfate, 13.5 oz Huskie, 1 pt MCPA ester, 4 oz Tilt
August	Harvest	1	Combine & 30' header @ 4mph	SWWW: 78bu
August	Harvest	1	Bankout wagon & 200HP tractor	
August	Harvest	1	Tandem axle truck	10-20 mile roundtrip to elevator or storage

Year 3: Schedule of Operations for Spring Wheat or Spring Barley
(Soft White Spring Wheat or Dark Northern Spring Wheat or Spring Barley)

Month	Operation	Times	Tooling	Materials/Service (per acre)
October	Chisel/Sweep	1	35' Chisel & 480HP tractor	
April	Spray Weeds	1	90' Self-propelled sprayer	24 oz RoundUp, 1.7 lb ammonium sulfate
April	Cultiweed & Fertilize	1	36' Cultiweeder & tankcart & 480HP Tractor	SWSW: 45lb N, 10lb P, 1lb S HRSW: 55lb N, 11lb P, 1lb S Barley: 45lb N, 10lb P, 1lb S
May	Plant	1	36' seed drill & 480HP tractor	SWSW: 80lb seed HRSW: 80lb seed Barley: 70lb seed
May/June	Spray weeds	1	90' Self-propelled sprayer	SWSW: 16.4 oz Axial XL, 17 oz Orion, 1 pt Brox 2EC, 4 oz Tilt HRSW: 16.4 oz Axial XL, 17 oz Orion, 1 pt Brox 2EC, 4 oz Tilt Barley: 16.4 oz Axial XL, 17 oz Orion, 1 pt Brox 2EC
August	Harvest	1	Combine & 30' header @ 4 mph	SWSW: 50 bu HRSW: 45 bu Barley: 1.5 tons
August	Harvest	1	Bankout wagon & 200HP tractor	
August	Harvest	1	Tandem axle truck	10-20 mile roundtrip to elevator or storage

Canola Rotation: Soft White Winter Wheat

Costs for Preceding Fallow Year

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<u>Variable Costs</u>				
Fertilizer:				\$69.40
Nitrogen	70	lb	\$0.77	\$53.90
Phosphorus	15	lb	\$0.66	\$9.90
Sulfur	10	lb	\$0.56	\$5.60
				\$0.00
Pesticides:				\$7.83
Glyphosate	24.00	oz	\$0.20	\$4.80
Banvel	4.00	oz	\$0.58	\$2.32
Ammonium sulfate	1.70	lb	\$0.42	\$0.71
				\$0.00
				\$0.00
				\$0.00
				\$0.00
Machinery:				\$27.60
Go to machinery operations				
Fuel	1	acre	\$11.55	\$11.55
Lubricants	1	acre	\$1.74	\$1.74
Machinery Repairs	1	acre	\$4.71	\$4.71
Machinery Labor	0.48	hour	\$20.00	\$9.60
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
				\$0.00
				\$0.00
Other:				\$0.00
				\$0.00
				\$0.00
				\$0.00
Operating Interest ¹				\$4.52
Total Variable Costs				\$109.35

1. SWWW (canola rotation) EnterpriseBudget-5-year average crop prices, 2013 input costs_21Oct2016

Ownership Costs:

Machinery depreciation	acre	\$11.07	\$11.07
Machinery interest	acre	\$8.29	\$8.29
Machinery insurance, taxes, housing, licenses	acre	\$4.30	\$4.30
Cash Rent	acre	\$0.00	\$0.00
Overhead ²	acre	\$3.00	\$3.00
Total Fixed Costs			\$26.66
Total Costs per Acre			\$136.01

Notes:

¹Calculated as 5.75% interest on operating capital for 9 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

Canola Rotation: Soft White Winter Wheat

Production Costs for Soft White Winter Wheat

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Soft White Wheat	86	bu	\$6.44	\$553.84
Variable Costs				
Seed:				\$19.20
Wheat Seed	80	lb	\$0.24	\$19.20
Fertilizer:				\$0.00
Nitrogen	0	lb	\$0.77	\$0.00
Sulfur	0	lb	\$0.56	\$0.00
				\$0.00
				\$0.00
Pesticides:				\$68.05
Axiom	10.00	oz	\$2.14	\$21.40
Osprey	4.75	oz	\$3.90	\$18.53
Ammonium sulfate	1.50	lb	\$0.42	\$0.63
Non-ionic surfactant	6.40	oz	\$0.14	\$0.90
Huskie	13.50	oz	\$0.88	\$11.88
MCPA ester	1.00	pt	\$0.20	\$0.20
Tilt	4.00	oz	\$3.63	\$14.52
Machinery:				\$27.20
Go to machinery operations				
Fuel	1	acre	\$8.88	\$8.88
Lubricants	1	acre	\$1.35	\$1.35
Machinery Repairs	1	acre	\$6.37	\$6.37
Machinery Labor	0.53	hour	\$20.00	\$10.60
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	0	acre	\$2.50	\$0.00
Custom Aerial	0	acre	\$8.70	\$0.00
Post-harvest storage and transportation³:				\$22.96
Storage	0	month(s)	\$0.86	\$0.00
Storage rate, share stored:				
Rate per bu, per month:	\$0.02			
Percentage of crop stored:	50%			
Long-haul transportation	86	bu	\$0.27	\$22.96
Transportation distance and volume:				
Roundtrip distance (miles):	100			
Rate per mile:	\$2.67			
Load volume (60lb bu):	1000			
Other:				\$19.40
Crop insurance	1	acre	\$19.40	\$19.40
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ⁴				\$6.76
Total Variable Costs				\$163.57
Net Returns Above Variable Costs				\$390.27

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$10.88	\$10.88
Machinery interest	acre	\$9.77	\$9.77
Machinery insurance, taxes, housing, licenses	acre	\$5.95	\$5.95
Fallow cost plus interest	acre	\$143.84	\$143.84
Land cost	acre	\$130.00	\$130.00
Land cost based on crop share percentage:			
Landlord		33%	
Tenant		67%	
Cash rent	acre	\$0.00	\$0.00
Overhead ⁵	acre	\$4.00	\$4.00
Management fee ⁶	acre	\$28.00	\$28.00
Total Fixed Costs			\$332.44
Total Costs per Acre			\$496.01
Net Returns over Total Costs (Returns to Risk)			\$57.83

Notes:

³Storage rates based on regional elevator rates. Transportation cost based on hired rates for tractor+40' grain trailer, 100 mile roundtrip. Short distance (10-20 miles roundtrip) transportation to local elevator is included in machinery costs for the tandem axle trucks.

⁴Calculated as 5.75% interest on operating capital for 9 months.

⁵Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

⁶The management fee is calculated as a 5% of gross revenue, rounded to the nearest dollar.

Cost Summary	Total	Cost Per Unit	
Variable Cost	\$164	\$1.90	
Fixed Cost	\$332	\$3.87	
Total Cost	\$496	\$5.77	
Breakeven Analysis:			
	-		+
	10%	Base	10%
		Yield	
Price	77.40	86	94.60
Operating Cost Breakeven	\$2.11	\$1.90	\$1.73
Ownership Cost Breakeven	\$4.30	\$3.87	\$3.51
Total Cost Breakeven	\$6.41	\$5.77	\$5.24
	-		+
	10%	Base	10%
		Price	
Yield	\$5.80	\$6.44	\$7.08
Operating Cost Breakeven	28.2	25.4	23.1
Ownership Cost Breakeven	57.4	51.6	46.9
Total Cost Breakeven	85.6	77.0	70.0

Canola Rotation: Spring Canola

Production Costs for Spring Canola

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Spring Canola	1500	lb	\$0.21	\$311.55
Variable Costs				
Seed:				\$17.50
Canola Seed	5	lb	\$3.50	\$17.50
Fertilizer:				\$84.25
Nitrogen	75	lb	\$0.77	\$57.75
Phosphorus	15	lb	\$0.66	\$9.90
Sulfur	15	lb	\$0.56	\$8.40
Boron	1	lb	\$8.20	\$8.20
Pesticides:				\$19.76
Glyphosate	24.00	oz	\$0.20	\$4.80
Ammonium sulfate	1.70	lb	\$0.42	\$0.71
Spodnam	1.00	pt	\$14.25	\$14.25
				\$0.00
				\$0.00
				\$0.00
Machinery:				\$37.73
Go to machinery operations				
Fuel	1	acre	\$14.45	\$14.45
Lubricants	1	acre	\$2.18	\$2.18
Machinery Repairs	1	acre	\$7.90	\$7.90
Machinery Labor	0.66	hour	\$20.00	\$13.20
Custom & Consultants:				\$8.70
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	0	acre	\$2.50	\$0.00
Custom Aerial	1	acre	\$8.70	\$8.70
Post-harvest storage and transportation³:				\$7.28
Storage	0	month(s)	\$22.50	\$0.00
Storage rate, share stored:				
Rate per (50lb) bu, per month:	\$0.03			
Percentage of crop stored:	50%			
Long-haul transportation	30	bu	\$0.24	\$7.28
Transportation distance and volume:				
Roundtrip distance (miles):	100			
Rate per mile:	\$2.67			
Load volume (50lb bu):	1100			
Other:				\$14.60
Crop insurance	1	acre	\$14.60	\$14.60
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ⁴				\$8.19
Total Variable Costs				\$198.01
Net Returns Above Variable Costs				\$113.54

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$13.48	\$13.48
Machinery interest	acre	\$10.95	\$10.95
Machinery insurance, taxes, housing, licenses	acre	\$5.72	\$5.72
Land cost	acre	\$64.00	\$64.00
Land cost based on crop share percentage:			
Landlord		33%	
Tenant		67%	
Cash rent	acre	\$0.00	\$0.00
Overhead ⁵	acre	\$5.00	\$5.00
Management fee ⁶	acre	\$16.00	\$16.00
Total Fixed Costs			\$115.15
Total Costs per Acre			\$313.16
Net Returns over Total Costs (Returns to Risk)			-\$1.61

Notes:

³Storage rates based on regional elevator rates. Transportation cost based on hired rates for tractor+40' grain trailer, 100 mile roundtrip. Short distance (10-20 miles roundtrip) transportation to local elevator is included in machinery costs for the tandem axle trucks.

⁴Calculated as 5.75% interest on operating capital for 9 months.

⁵Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

⁶The management fee is calculated as a 5% of gross revenue, rounded to the nearest dollar.

Cost Summary	Total	Cost Per Unit	
Variable Cost	\$198	\$0.13	
Fixed Cost	\$115	\$0.08	
Total Cost	\$313	\$0.21	
Breakeven Analysis:	-		+
	10%	Base	10%
		Yield	
<u>Price</u>	1350	1500	1650
Operating Cost Breakeven	\$0.15	\$0.13	\$0.12
Ownership Cost Breakeven	\$0.09	\$0.08	\$0.07
Total Cost Breakeven	\$0.23	\$0.21	\$0.19
	-		+
	10%	Base	10%
		Price	
<u>Yield</u>	\$0.19	\$0.21	\$0.23
Operating Cost Breakeven	1059.3	953.3	866.7
Ownership Cost Breakeven	616.0	554.4	504.0
Total Cost Breakeven	1675.3	1507.8	1370.7

Wheat Rotation: Soft White Winter Wheat

Costs for Preceding Fallow Year

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Variable Costs				
Fertilizer:				\$69.40
Nitrogen	70	lb	\$0.77	\$53.90
Phosphorus	15	lb	\$0.66	\$9.90
Sulfur	10	lb	\$0.56	\$5.60
				\$0.00
Pesticides:				\$7.83
Glyphosate	24.00	oz	\$0.20	\$4.80
Banvel	4.00	oz	\$0.58	\$2.32
Ammonium sulfate	1.70	lb	\$0.42	\$0.71
				\$0.00
				\$0.00
				\$0.00
				\$0.00
Machinery:				\$27.60
Go to machinery operations				
Fuel	1	acre	\$11.55	\$11.55
Lubricants	1	acre	\$1.74	\$1.74
Machinery Repairs	1	acre	\$4.71	\$4.71
Machinery Labor	0.48	hour	\$20.00	\$9.60
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
				\$0.00
				\$0.00
Other:				\$0.00
				\$0.00
				\$0.00
				\$0.00
Operating Interest ¹				\$4.52
Total Variable Costs				\$109.35

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$11.07	\$11.07
Machinery interest	acre	\$8.29	\$8.29
Machinery insurance, taxes, housing, licenses	acre	\$4.30	\$4.30
Cash Rent	acre	\$0.00	\$0.00
Overhead ²	acre	\$3.00	\$3.00
Total Fixed Costs			\$26.66
Total Costs per Acre			\$136.01

Notes:

¹Calculated as 5.75% interest on operating capital for 9 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

Wheat Rotation: Soft White Winter Wheat

Production Costs for Soft White Winter Wheat

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Soft White Wheat	78	bu	\$6.44	\$502.32
Variable Costs				
Seed:				\$19.20
Wheat Seed	80	lb	\$0.24	\$19.20
Fertilizer:				\$0.00
Nitrogen	0	lb	\$0.77	\$0.00
Sulfur	0	lb	\$0.56	\$0.00
				\$0.00
				\$0.00
Pesticides:				\$68.05
Axiom	10.00	oz	\$2.14	\$21.40
Osprey	4.75	oz	\$3.90	\$18.53
Ammonium sulfate	1.50	lb	\$0.42	\$0.63
Non-ionic surfactant	6.40	oz	\$0.14	\$0.90
Huskie	13.50	oz	\$0.88	\$11.88
MCPA ester	1.00	pt	\$0.20	\$0.20
Tilt	4.00	oz	\$3.63	\$14.52
Machinery:				\$27.20
Go to machinery operations				
Fuel	1	acre	\$8.88	\$8.88
Lubricants	1	acre	\$1.35	\$1.35
Machinery Repairs	1	acre	\$6.37	\$6.37
Machinery Labor	0.53	hour	\$20.00	\$10.60
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	0	acre	\$2.50	\$0.00
Custom Aerial	0	acre	\$8.70	\$0.00
Post-harvest storage and transportation³:				\$20.83
Storage	0	month(s)	\$0.78	\$0.00
Storage rate, share stored:				
Rate per bu, per month:	\$0.02			
Percentage of crop stored:	50%			
Long-haul transportation	78	bu	\$0.27	\$20.83
Transportation distance and volume:				
Roundtrip distance (miles):	100			
Rate per mile:	\$2.67			
Load volume (60lb bu):	1000			
Other:				\$19.40
Crop insurance	1	acre	\$19.40	\$19.40
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ⁴				\$6.67
Total Variable Costs				\$161.35
Net Returns Above Variable Costs				\$340.97

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$10.88	\$10.88
Machinery interest	acre	\$9.77	\$9.77
Machinery insurance, taxes, housing, licenses	acre	\$5.95	\$5.95
Fallow cost plus interest	acre	\$143.84	\$143.84
Land cost	acre	\$112.00	\$112.00
Land cost based on crop share percentage:			
Landlord		33%	
Tenant		67%	
Cash rent	acre	\$0.00	\$0.00
Overhead ⁵	acre	\$4.00	\$4.00
Management fee ⁶	acre	\$25.00	\$25.00
Total Fixed Costs			\$311.44
Total Costs per Acre			\$472.78
Net Returns over Total Costs (Returns to Risk)			\$29.54

Notes:

³Storage rates based on regional elevator rates. Transportation cost based on hired rates for tractor+40' grain trailer, 100 mile roundtrip. Short distance (10-20 miles roundtrip) transportation to local elevator is included in machinery costs for the tandem axle trucks.

⁴Calculated as 5.75% interest on operating capital for 9 months.

⁵Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

⁶The management fee is calculated as a 5% of gross revenue, rounded to the nearest dollar.

Cost Summary	Total	Cost Per Unit	
Variable Cost	\$161	\$2.07	
Fixed Cost	\$311	\$3.99	
Total Cost	\$473	\$6.06	
Breakeven Analysis:			
	-		+
	10%	Base	10%
		Yield	
Price	70.20	78	85.80
Operating Cost Breakeven	\$2.30	\$2.07	\$1.88
Ownership Cost Breakeven	\$4.44	\$3.99	\$3.63
Total Cost Breakeven	\$6.73	\$6.06	\$5.51
	-		+
	10%	Base	10%
		Price	
Yield	\$5.80	\$6.44	\$7.08
Operating Cost Breakeven	27.8	25.1	22.8
Ownership Cost Breakeven	53.7	48.4	44.0
Total Cost Breakeven	81.6	73.4	66.7

Wheat Rotation: Soft White Spring Wheat

Production Costs for Soft White Spring Wheat

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Soft White Wheat	50	bu	\$6.44	\$322.00
Variable Costs				
Seed:				\$20.00
Wheat seed	80	lb	\$0.25	\$20.00
Fertilizer:				\$41.81
Nitrogen	45	lb	\$0.77	\$34.65
Phosphorus	10	lb	\$0.66	\$6.60
Sulfur	1	lb	\$0.56	\$0.56
Pesticides:				\$49.46
Glyphosate	16.00	oz	\$0.20	\$3.20
Ammonium sulfate	1.70	lb	\$0.42	\$0.71
Axial XL	16.40	oz	\$1.10	\$18.04
Orion	17.00	oz	\$0.51	\$8.67
Brox EC	16.00	oz	\$0.27	\$4.32
Tilt	4.00	oz	\$3.63	\$14.52
Machinery:				\$36.66
Go to machinery operations				
Fuel	1	acre	\$13.98	\$13.98
Lubricants	1	acre	\$2.11	\$2.11
Machinery Repairs	1	acre	\$7.57	\$7.57
Machinery Labor	0.65	hour	\$20.00	\$13.00
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	0	acre	\$2.50	\$0.00
Custom Aerial	0	acre	\$8.70	\$0.00
Post-harvest storage and transportation³:				\$13.35
Storage	0	month(s)	\$0.50	\$0.00
Storage rate, share stored:				
Rate per (60lb) bu, per month:	\$0.02			
Percentage of crop stored:	50%			
Long-haul transportation	50	bu	\$0.27	\$13.35
Transportation distance and volume:				
Roundtrip distance (miles):	100			
Rate per mile:	\$2.67			
Load volume (60lb bu):	1000			
Other:				\$8.50
Crop insurance	1	acre	\$8.50	\$8.50
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ⁴				\$7.32
Total Variable Costs				\$177.10
Net Returns Above Variable Costs				\$144.90

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$14.47	\$14.47
Machinery interest	acre	\$12.10	\$12.10
Machinery insurance, taxes, housing, licenses	acre	\$6.34	\$6.34
Land cost	acre	\$74.00	\$74.00
Land cost based on crop share percentage:			
Landlord		33%	
Tenant		67%	
Cash rent	acre	\$0.00	\$0.00
Overhead ⁵	acre	\$4.00	\$4.00
Management fee ⁶	acre	\$16.00	\$16.00
Total Fixed Costs			\$126.91
Total Costs per Acre			\$304.01
Net Returns over Total Costs (Returns to Risk)			\$17.99

Notes:

³Storage rates based on regional elevator rates. Transportation cost based on hired rates for tractor+40' grain trailer, 100 mile roundtrip. Short distance (10-20 miles roundtrip) transportation to local elevator is included in machinery costs for the tandem axle trucks.

⁴Calculated as 5.75% interest on operating capital for 9 months.

⁵Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

⁶The management fee is calculated as a 5% of gross revenue, rounded to the nearest dollar.

Cost Summary	Total	Cost Per Unit	
Variable Cost	\$177	\$3.54	
Fixed Cost	\$127	\$2.54	
Total Cost	\$304	\$6.08	
Breakeven Analysis:			
	-		+
	10%	Base	10%
		Yield	
<u>Price</u>	45.00	50	55.00
Operating Cost Breakeven	\$3.94	\$3.54	\$3.22
Ownership Cost Breakeven	\$2.82	\$2.54	\$2.31
Total Cost Breakeven	\$6.76	\$6.08	\$5.53
	-		+
	10%	Base	10%
		Price	
<u>Yield</u>	\$5.80	\$6.44	\$7.08
Operating Cost Breakeven	30.6	27.5	25.0
Ownership Cost Breakeven	21.9	19.7	17.9
Total Cost Breakeven	52.5	47.2	42.9

Wheat Rotation: Hard Red Spring Wheat

Production Costs for Hard Red Spring Wheat

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Hard Red Spring Wheat	45	bu	\$8.41	\$378.45
Variable Costs				
Seed:				\$21.60
Wheat seed	80	lb	\$0.27	\$21.60
Fertilizer:				\$50.17
Nitrogen	55	lb	\$0.77	\$42.35
Phosphorus	11	lb	\$0.66	\$7.26
Sulfur	1	lb	\$0.56	\$0.56
Pesticides:				\$49.46
Glyphosate	16.00	oz	\$0.20	\$3.20
Ammonium sulfate	1.70	lb	\$0.42	\$0.71
Axial XL	16.40	oz	\$1.10	\$18.04
Orion	17.00	oz	\$0.51	\$8.67
Brox EC	16.00	oz	\$0.27	\$4.32
Tilt	4.00	oz	\$3.63	\$14.52
Machinery:				\$36.66
Go to machinery operations				
Fuel	1	acre	\$13.98	\$13.98
Lubricants	1	acre	\$2.11	\$2.11
Machinery Repairs	1	acre	\$7.57	\$7.57
Machinery Labor	0.65	hour	\$20.00	\$13.00
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	0	acre	\$2.50	\$0.00
Custom Aerial	0	acre	\$8.70	\$0.00
Post-harvest storage and transportation³:				\$12.02
Storage	0	month(s)	\$0.45	\$0.00
Storage rate, share stored:				
Rate per (50lb) bu, per month:	\$0.02			
Percentage of crop stored:	50%			
Long-haul transportation	45	bu	\$0.27	\$12.02
Transportation distance and volume:				
Roundtrip distance (miles):	100			
Rate per mile:	\$2.67			
Load volume (50lb bu):	1000			
Other:				\$8.00
Crop insurance	1	acre	\$8.00	\$8.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ⁴				\$7.67
Total Variable Costs				\$185.58
Net Returns Above Variable Costs				\$192.87

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$14.47	\$14.47
Machinery interest	acre	\$12.10	\$12.10
Machinery insurance, taxes, housing, licenses	acre	\$6.34	\$6.34
Land cost	acre	\$90.00	\$90.00
Land cost based on crop share percentage:			
Landlord		33%	
Tenant		67%	
Cash rent	acre	\$0.00	\$0.00
Overhead ⁵	acre	\$4.00	\$4.00
Management fee ⁶	acre	\$19.00	\$19.00
Total Fixed Costs			\$145.91
Total Costs per Acre			\$331.49
Net Returns over Total Costs (Returns to Risk)			\$46.96

Notes:

³Storage rates based on regional elevator rates. Transportation cost based on hired rates for tractor+40' grain trailer, 100 mile roundtrip. Short distance (10-20 miles roundtrip) transportation to local elevator is included in machinery costs for the tandem axle trucks.

⁴Calculated as 5.75% interest on operating capital for 9 months.

⁵Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

⁶The management fee is calculated as a 5% of gross revenue, rounded to the nearest dollar.

Cost Summary	Total	Cost Per Unit	
Variable Cost	\$186	\$4.12	
Fixed Cost	\$146	\$3.24	
Total Cost	\$331	\$7.37	
Breakeven Analysis:			
	-		+
	10%	Base	10%
		Yield	
<u>Price</u>	40.50	45	49.50
Operating Cost Breakeven	\$4.58	\$4.12	\$3.75
Ownership Cost Breakeven	\$3.60	\$3.24	\$2.95
Total Cost Breakeven	\$8.18	\$7.37	\$6.70
	-		+
	10%	Base	10%
		Price	
<u>Yield</u>	\$7.57	\$8.41	\$9.25
Operating Cost Breakeven	24.5	22.1	20.1
Ownership Cost Breakeven	19.3	17.3	15.8
Total Cost Breakeven	43.8	39.4	35.8

Wheat Rotation: Spring Barley

Production Costs for Spring Barley

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Spring Barley	1.50	ton	\$188.00	\$282.00
Variable Costs				
Seed:				\$16.80
Barley seed	70	lb	\$0.24	\$16.80
Fertilizer:				\$41.81
Nitrogen	45	lb	\$0.77	\$34.65
Phosphorus	10	lb	\$0.66	\$6.60
Sulfur	1	lb	\$0.56	\$0.56
Pesticides:				\$34.94
Glyphosate	16.00	oz	\$0.20	\$3.20
Ammonium sulfate	1.70	lb	\$0.42	\$0.71
Axial XL	16.40	oz	\$1.10	\$18.04
Orion	17.00	oz	\$0.51	\$8.67
Brox EC	16.00	oz	\$0.27	\$4.32
Machinery:				\$36.66
Go to machinery operations				
Fuel	1	acre	\$13.98	\$13.98
Lubricants	1	acre	\$2.11	\$2.11
Machinery Repairs	1	acre	\$7.57	\$7.57
Machinery Labor	0.65	hour	\$20.00	\$13.00
Custom & Consultants:				\$0.00
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	0	acre	\$2.50	\$0.00
Custom Aerial	0	acre	\$8.70	\$0.00
Post-harvest storage and transportation³:				\$13.91
Storage	0	month(s)	\$0.63	\$0.00
Storage rate, share stored:				
Rate per (48lb) bu, per month:	\$0.02			
Percentage of crop stored:	50%			
Long-haul transportation	63	bu	\$0.22	\$13.91
Transportation distance and volume:				
Roundtrip distance (miles):	100			
Rate per mile:	\$2.67			
Load volume (48lb bu):	1200			
Other:				\$12.70
Crop insurance	1	acre	\$12.70	\$12.70
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ⁴				\$6.76
Total Variable Costs				\$163.58
Net Returns Above Variable Costs				\$118.42

Fixed (Ownership) Costs:			
Machinery depreciation	acre	\$14.47	\$14.47
Machinery interest	acre	\$12.10	\$12.10
Machinery insurance, taxes, housing, licenses	acre	\$6.34	\$6.34
Land cost	acre	\$64.00	\$64.00
Land cost based on crop share percentage:			
Landlord		33%	
Tenant		67%	
Cash rent	acre	\$0.00	\$0.00
Overhead ⁵	acre	\$4.00	\$4.00
Management fee ⁶	acre	\$14.00	\$14.00
Total Fixed Costs			\$114.91
Total Costs per Acre			\$278.49
Net Returns over Total Costs (Returns to Risk)			\$3.51

Notes:

³Storage rates based on regional elevator rates. Transportation cost based on hired rates for tractor+40' grain trailer, 100 mile roundtrip. Short distance (10-20 miles roundtrip) transportation to local elevator is included in machinery costs for the tandem axle trucks.

⁴Calculated as 5.75% interest on operating capital for 9 months.

⁵Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses, rounded to the nearest dollar.

⁶The management fee is calculated as a 5% of gross revenue. rounded to the nearest dollar.

Cost Summary	Total	Cost Per Unit	
Variable Cost	\$164	\$109	
Fixed Cost	\$115	\$77	
Total Cost	\$278	\$186	
Breakeven Analysis:			
	-		+
	10%	Base Yield	10%
<u>Price</u>	1.35	1.5	1.65
Operating Cost Breakeven	\$121	\$109	\$99
Ownership Cost Breakeven	\$85	\$77	\$70
Total Cost Breakeven	\$206	\$186	\$169
	-		+
	10%	Base Price	10%
<u>Yield</u>	\$169	\$188	\$207
Operating Cost Breakeven	0.97	0.87	0.79
Ownership Cost Breakeven	0.68	0.61	0.56
Total Cost Breakeven	1.65	1.48	1.35

Table 3. Machinery Complement for 12-16" Intermediate Rainfall Region in Washington State

Type of Machine	Replacement Value \$	Age When Purchased	Years of Life	Annual Hours of Use	Salvage Value \$	Annual Repairs (Materials & Labor) \$	Taxes, Housing, Insur., Licenses %	Labor Multiplier	Field Speed (mph)	Width (ft)	Field Efficiency %	Gallons of Fuel/Hr.	Acres per Hour	
Tractors, ATVs:														
200HP 4WD Wheel Tractor	20,000	5	10	200	5,000	500	1.2	1.2				6.5		
480HP Quadtrac	220,000	5	10	575	75,000	3,000	1.2	1.1				9		
4WD ATV	7,000	5	10	200	2,000	100	1.2	1.2				1.2	10	
Equipment:														
90' Self-propelled sprayer	200,000	5	15	70	75,000	2000	3.1	1.2	8	90	75	3	65	
200HP Tractor + 90' Boom Sprayer	30,000	5	15	100	10,000	1700	0.6	1.1	5.5	90	60	9	36	
480HP Tractor + 48' Rodweeder	15,000	5	15	125	3,500	850	0.6	1.1	4	48	80	9	19	
480HP Tractor + 26' Shredder	30,000	5	15	80	10,000	1000	2.5	1.1	6	26	80	9	15	
480HP Tractor + 34' Tandem disk	30,000	5	15	60	15,000	1650	0.6	1.1	6	34	80	9	20	
480HP Tractor + 36' Cultiweeder	18,000	5	15	100	3,000	500	0.6	1.1	5	48	85	9	25	
480HP Tractor + 35' Chisel plow	18,500	5	15	160	4,000	1000	0.6	1.1	4	35	85	9	14	
480HP Tractor + 36' Cultivator	18,000	5	15	125	3,000	500	0.6	1.1	5	36	85	9	19	
480HP Tractor + 48' Spring tooth harrow	9,000	5	15	80	1,500	550	0.6	1.1	6	48	85	9	30	
480HP Tractor + 36' Grain drill	40,000	5	15	200	20,000	2,000	3.0	1.1	4	36	70	9	12	
Combine & 30' header	125,000	5	10	200	60,000	6,000	2.6	1.2	3 to 4	30	90	7	9.8 to 13	
200HP Tractor + Bankout wagon	15,000	5	15	180	3,000	500	0.6	1.1					13	
Trucks:														
				Miles/year:							MPG:		Miles/acre	
Tandem Axle Truck	35,000	5	15	1500	14,500	2000	10.1	1.2		6		6	0.43	
Tandem Axle Truck	35,000	5	15	1500	14,500	2000	10.1	1.2		6		6	0.43	
2-Ton Truck	20,000	5	15	1000	9,000	1000	2.6	1.2		6		6	0.29	
Trap Wagon	15,000	5	10	1000	3,000	400	3.8	1.2		12		12	0.29	
3/4-Ton Pickup	34,000	5	7	12000	13,000	600	6.8	1.2		12		12	2.4	

Note: A "machinery complement" is a set of common machinery and implements that would be sufficient for performing standard operations in crop production on a farm in a given region. In these budgets, farm size is assumed to be 3500 acres for the purposes of machinery cost calculations.

Table 4. Total Annual Machinery Costs (\$/acre) from the University of Idaho Machinery Cost Calculator

Operation	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
	Depreciation	Interest	Taxes, housing, insurance,	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
							Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>												
Self-propelled sprayer	\$ 1.82	\$ 1.88	\$ 0.93	\$ 4.63	\$ 0.44	\$ 0.02	0.04	\$ 0.14	0.02	\$ 0.40	\$ 1.00	\$ 5.63
300HP Tractor & 90' sprayer	\$ 1.07	\$ 0.80	\$ 0.12	\$ 1.99	\$ 0.61	\$ 0.19	0.38	\$ 1.29	0.03	\$ 0.60	\$ 2.69	\$ 4.68
300HP Tractor & 48' rodweeder	\$ 1.68	\$ 1.11	\$ 0.19	\$ 2.98	\$ 0.65	\$ 0.37	0.73	\$ 2.48	0.06	\$ 1.20	\$ 4.70	\$ 7.68
300HP Tractor & 26' shredder	\$ 2.77	\$ 2.09	\$ 0.61	\$ 5.47	\$ 1.17	\$ 0.46	0.91	\$ 3.09	0.07	\$ 1.40	\$ 6.12	\$ 11.59
300HP Tractor & 34' tandem disk	\$ 2.11	\$ 1.99	\$ 0.27	\$ 4.37	\$ 0.63	\$ 0.35	0.69	\$ 2.35	0.06	\$ 1.20	\$ 4.53	\$ 8.90
300HP Tractor & 36' cultiweeder	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	\$ 5.85
300HP Tractor & 35' chisel plow	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	\$ 9.92
300HP Tractor & 36' cultivator	\$ 1.79	\$ 1.14	\$ 0.20	\$ 3.13	\$ 0.50	\$ 0.38	0.74	\$ 2.52	0.06	\$ 1.20	\$ 4.60	\$ 7.73
300HP Tractor & 48' spring tooth harrow	\$ 1.06	\$ 0.68	\$ 0.11	\$ 1.85	\$ 0.41	\$ 0.23	0.46	\$ 1.56	0.04	\$ 0.80	\$ 3.00	\$ 4.85
300HP Tractor & 36' grain drill	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	\$ 10.63
Combine & 30' header *4 mph harvest speed*	\$ 2.48	\$ 2.21	\$ 0.92	\$ 5.61	\$ 2.29	\$ 0.27	0.52	\$ 1.77	0.09	\$ 1.80	\$ 6.13	\$ 11.74
Combine & 30' header *3 mph harvest speed*	\$ 3.31	\$ 2.94	\$ 1.23	\$ 7.48	\$ 3.06	\$ 0.36	0.70	\$ 2.38	0.12	\$ 2.40	\$ 8.20	\$ 15.68
300HP Tractor & Bankout wagon	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	\$ 5.67
<i>Annual Costs:</i>												
Tandem axle truck	\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	\$ 2.91
Tandem axle truck	\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	\$ 2.91
2-ton truck	\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	\$ 1.83
Trap wagon	\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	\$ 1.43
3/4-ton pick-up	\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	\$ 1.94
ATV	\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	\$ 2.82
Cost \$/Acre	\$ 26.44	\$ 20.97	\$ 8.14	\$ 55.55	\$ 14.16	\$ 4.43		\$ 29.51		\$ 20.74	\$ 68.84	\$ 124.39

Note: Per acre machinery costs are calculated in the University of Idaho Machinery Cost Program using the values in the Machinery Complement tab.

Canola Rotation

Increase or decrease the number of passes for each operation by changing the numbers in **red text**

Green indicates the crop's place in the full rotation

Table 5. Annual Machinery Costs (\$/acre) for Fallow after Spring Canola, before Soft White Winter Wheat Canola Rotation: **F - SWWW - SC**

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost	Total Variable Costs	
<i>Seasonal operations:</i>													
Self-propelled sprayer	1	\$ 1.82	\$ 1.88	\$ 0.93	\$ 4.63	\$ 0.44	\$ 0.02	0.04	\$ 0.14	0.02	\$ 0.40	\$ 1.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	2	\$ 3.36	\$ 2.22	\$ 0.38	\$ 5.96	\$ 1.30	\$ 0.74	1.46	\$ 4.96	0.12	\$ 2.40	\$ 9.40	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *4 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 11.07	\$ 8.29	\$ 4.30	\$ 23.66	\$ 4.71	\$ 1.74	3.39	\$ 11.55	0.48	\$ 8.94	\$ 26.94	

Table 6. Machinery Costs (\$/acre) for Soft White Winter Wheat Canola Rotation: **F - SWWW - SC**

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost	Total Variable Costs	
<i>Seasonal operations:</i>													
Self-propelled sprayer	2	\$ 3.64	\$ 3.76	\$ 1.86	\$ 9.26	\$ 0.88	\$ 0.04	0.08	\$ 0.28	0.04	\$ 0.80	\$ 2.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 35' chisel plow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	1	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	
Combine & 30' header *4 mph harvest speed*	1	\$ 2.48	\$ 2.21	\$ 0.92	\$ 5.61	\$ 2.29	\$ 0.27	0.52	\$ 1.77	0.09	\$ 1.80	\$ 6.13	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	1	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 10.88	\$ 9.77	\$ 5.95	\$ 26.60	\$ 6.37	\$ 1.35	2.60	\$ 8.88	0.53	\$ 9.94	\$ 26.54	

Table 7. Machinery Costs (\$/acre) for Fallow after Spring Canola, before Hard Red Winter Wheat

Canola Rotation: F - HRWW - SC

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	1	\$ 1.82	\$ 1.88	\$ 0.93	\$ 4.63	\$ 0.44	\$ 0.02	0.04	\$ 0.14	0.02	\$ 0.40	\$ 1.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	2	\$ 3.36	\$ 2.22	\$ 0.38	\$ 5.96	\$ 1.30	\$ 0.74	1.46	\$ 4.96	0.12	\$ 2.40	\$ 9.40	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *4 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 11.07	\$ 8.29	\$ 4.30	\$ 23.66	\$ 4.71	\$ 1.74	3.39	\$ 11.55	0.48	\$ 8.94	\$ 26.94	\$ 50.60

Table 8. Machinery Costs (\$/acre) for Spring Canola

Canola Rotation: **F - HRWW - SC**

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	1	\$ 1.82	\$ 1.88	\$ 0.93	\$ 4.63	\$ 0.44	\$ 0.02	0.04	\$ 0.14	0.02	\$ 0.40	\$ 1.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	1	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	
Combine & 30' header *4 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *3 mph harvest speed*	1	\$ 3.31	\$ 2.94	\$ 1.23	\$ 7.48	\$ 3.06	\$ 0.36	0.70	\$ 2.38	0.12	\$ 2.40	\$ 8.20	
300HP Tractor & Bankout wagon	1	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 13.48	\$ 10.95	\$ 5.72	\$ 30.15	\$ 7.90	\$ 2.18	4.24	\$ 14.45	0.66	\$ 12.54	\$ 37.07	

Wheat Rotation

Table 9. Machinery Costs (\$/acre) for Fallow after Spring Cereal, before Soft White Winter Wheat

Wheat Rotation: **F - SWWW -SWSW/DNS/SB**

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	1	\$ 1.82	\$ 1.88	\$ 0.93	\$ 4.63	\$ 0.44	\$ 0.02	0.04	\$ 0.14	0.02	\$ 0.40	\$ 1.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	2	\$ 3.36	\$ 2.22	\$ 0.38	\$ 5.96	\$ 1.30	\$ 0.74	1.46	\$ 4.96	0.12	\$ 2.40	\$ 9.40	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *4 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 11.07	\$ 8.29	\$ 4.30	\$ 23.66	\$ 4.71	\$ 1.74	3.39	\$ 11.55	0.48	\$ 8.94	\$ 26.94	

Table 10. Machinery Costs (\$/acre) for Soft White Winter Wheat

Wheat Rotation: F - SWWW -SWSW/DNS/SB

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	2	\$ 3.64	\$ 3.76	\$ 1.86	\$ 9.26	\$ 0.88	\$ 0.04	0.08	\$ 0.28	0.04	\$ 0.80	\$ 2.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 35' chisel plow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	1	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	
Combine & 30' header *4 mph harvest speed*	1	\$ 2.48	\$ 2.21	\$ 0.92	\$ 5.61	\$ 2.29	\$ 0.27	0.52	\$ 1.77	0.09	\$ 1.80	\$ 6.13	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	1	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 10.88	\$ 9.77	\$ 5.95	\$ 26.60	\$ 6.37	\$ 1.35	2.60	\$ 8.88	0.53	\$ 9.94	\$ 26.54	\$ 53.14

Table 11. Machinery Costs (\$/acre) for Soft White Spring Wheat

Wheat Rotation: F - HRWW -SWSW/DNS/SB

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	2	\$ 3.64	\$ 3.76	\$ 1.86	\$ 9.26	\$ 0.88	\$ 0.04	0.08	\$ 0.28	0.04	\$ 0.80	\$ 2.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	1	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	
Combine & 30' header *4 mph harvest speed*	1	\$ 2.48	\$ 2.21	\$ 0.92	\$ 5.61	\$ 2.29	\$ 0.27	0.52	\$ 1.77	0.09	\$ 1.80	\$ 6.13	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	1	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 14.47	\$ 12.10	\$ 6.34	\$ 32.91	\$ 7.57	\$ 2.11	4.10	\$ 13.98	0.65	\$ 12.34	\$ 36.00	\$ 68.91

Table 12. Machinery Costs (\$/acre) for Dark Northern Spring Wheat

Wheat Rotation: F - HRWW -SWSW/DNS/SB

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	2	\$ 3.64	\$ 3.76	\$ 1.86	\$ 9.26	\$ 0.88	\$ 0.04	0.08	\$ 0.28	0.04	\$ 0.80	\$ 2.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	1	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	
Combine & 30' header *4 mph harvest speed*	1	\$ 2.48	\$ 2.21	\$ 0.92	\$ 5.61	\$ 2.29	\$ 0.27	0.52	\$ 1.77	0.09	\$ 1.80	\$ 6.13	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	1	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 14.47	\$ 12.10	\$ 6.34	\$ 32.91	\$ 7.57	\$ 2.11	4.10	\$ 13.98	0.65	\$ 12.34	\$ 36.00	\$ 68.91

Table 13. Machinery Costs (\$/acre) for Spring Barley

Wheat Rotation: F - HRWW -SWSW/DNS/SB

Operation	Number of Passes	Fixed (Ownership) Costs				Variable Costs							Total Cost (\$/Acre)
		Depreciation	Interest	Taxes, housing, insurance, licenses	Total Fixed Costs	Repairs	Lube Cost	Fuel		Labor		Total Variable Costs	
								Fuel Use gal/acre	Fuel Cost	Labor hrs/acre	Labor Cost		
<i>Seasonal operations:</i>													
Self-propelled sprayer	2	\$ 3.64	\$ 3.76	\$ 1.86	\$ 9.26	\$ 0.88	\$ 0.04	0.08	\$ 0.28	0.04	\$ 0.80	\$ 2.00	
300HP Tractor & 90' sprayer	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' rodweeder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 26' shredder	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 34' tandem disk	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' cultiweeder	1	\$ 1.42	\$ 0.92	\$ 0.15	\$ 2.49	\$ 0.41	\$ 0.28	0.55	\$ 1.87	0.04	\$ 0.80	\$ 3.36	
300HP Tractor & 35' chisel plow	1	\$ 2.17	\$ 1.41	\$ 0.24	\$ 3.82	\$ 0.79	\$ 0.48	0.95	\$ 3.23	0.08	\$ 1.60	\$ 6.10	
300HP Tractor & 36' cultivator	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 48' spring tooth harrow	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & 36' grain drill	1	\$ 1.54	\$ 1.40	\$ 0.49	\$ 3.43	\$ 1.02	\$ 0.57	1.12	\$ 3.81	0.09	\$ 1.80	\$ 7.20	
Combine & 30' header *4 mph harvest speed*	1	\$ 2.48	\$ 2.21	\$ 0.92	\$ 5.61	\$ 2.29	\$ 0.27	0.52	\$ 1.77	0.09	\$ 1.80	\$ 6.13	
Combine & 30' header *3 mph harvest speed*	0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.00	\$ -	0.00	\$ -	\$ -	
300HP Tractor & Bankout wagon	1	\$ 0.92	\$ 0.54	\$ 0.08	\$ 1.54	\$ 0.41	\$ 0.25	0.49	\$ 1.67	0.09	\$ 1.80	\$ 4.13	
<i>Annual Costs:</i>													
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
Tandem axle truck		\$ 0.39	\$ 0.44	\$ 0.72	\$ 1.55	\$ 0.57	\$ 0.04	0.07	\$ 0.24	0.03	\$ 0.51	\$ 1.36	
2-ton truck		\$ 0.32	\$ 0.26	\$ 0.42	\$ 1.00	\$ 0.29	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.83	
Trap wagon		\$ 0.35	\$ 0.16	\$ 0.26	\$ 0.77	\$ 0.12	\$ 0.03	0.05	\$ 0.17	0.02	\$ 0.34	\$ 0.66	
3/4-ton pick-up		\$ 0.60	\$ 0.42	\$ 0.45	\$ 1.47	\$ 0.17	\$ 0.02	0.03	\$ 0.11	0.01	\$ 0.17	\$ 0.47	
ATV		\$ 0.25	\$ 0.14	\$ 0.03	\$ 0.42	\$ 0.05	\$ 0.06	0.12	\$ 0.42	0.11	\$ 1.87	\$ 2.40	
Cost \$/Acre		\$ 14.47	\$ 12.10	\$ 6.34	\$ 32.91	\$ 7.57	\$ 2.11	4.10	\$ 13.98	0.65	\$ 12.34	\$ 36.00	\$ 68.91