



Photo: Dennis Pittmann

**2009 Crop Rotation Budgets, Over 18" Precipitation Zone
Under Reduced Tillage, Eastern Washington**

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INSTRUCTIONS AND ASSUMPTIONS

Since farming is inherently variable and constantly changing, we hope that this spreadsheet 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

Please examine closely the assumptions we have used and make adjustments to reflect your particular operation. Adjustments in the variable costs can easily be made without affecting the overall accuracy of the budget information. Fixed costs in these budgets are based on a budget generator program that incorporates detailed information on the machinery complement and performs complex calculations based on machinery width, tractor horsepower, type of operation, etc. In the variable costs section, fuel and machinery repair costs will be affected by changes in machinery usage. The fixed costs section of the budget presents costs that are incurred regardless of crop production practices. These costs will change if your machinery complement differs from those in the worksheet.

Machinery Costs:

The machinery complement and associated hourly machinery costs used in these calculations are presented in the last two tabs of this worksheet. Machinery fixed costs include depreciation, interest on the investment, property taxes, insurance, and housing. For the overall farm operation, these costs do not vary by crop, given the ownership of a specific machinery complement, and are incurred whether or not crops are grown. Machinery fixed costs for a specific field operation are determined by multiplying the machine hours per acre times per hour fixed cost. Per hour fixed costs are determined by dividing the total fixed cost by the annual hours of machinery use.

Machinery interest costs are calculated on the average annual investment in the machine. The formula used to calculate the average machine investment is:

$$(\text{Purchase Cost} + \text{Salvage Value})/2$$

The machinery interest charge represents an opportunity cost (returns forgone by investing in a given machine implement rather than in an alternative investment) or interest paid on money borrowed to finance machine purchases, or both. Machinery interest cost for one acre of the crop enterprise being analyzed is determined by multiplying the respective machine hours per acre times the per hour interest costs shown in the machinery complement worksheet.

Land Costs:

Costs of production among producers tend to be somewhat similar for any particular production system, regardless of production level, when land costs are not taken into consideration. Since the net land rental value is based on production level, land cost varies directly with production level, which in turn directly affects total cost. Land costs, included either as real or as opportunity costs, are based on the share rental arrangement typical in the area. In our study, net land rental cost was calculated as:

$$1/3 \text{ Crop Value} - (1/3 \text{ Fertilizer Cost} + 1/3 \text{ Chemical Cost} + 1/3 \text{ Crop Insurance} + \text{Land Taxes})$$

Land fixed costs include taxes and net rent, which are based on rental agreements typical for the area minus expenditures typically covered by the landlord. The typical lease agreement in the areas surveyed is a one-third land owner and two-third 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. **This crop-share percentage can be adjusted in the crop worksheets**, thanks to Herb Hinman's contribution. This valuable tool reveals how factors such as crop and input price increases as well as cropping choices affect revenue for landlords and operators differently.

While the owner-operator will not actually experience a land rental cost, this cost represents the minimum return owner-operators must realize to justify growing the crop themselves. This net rent return represents the income the owner-operator forgoes by producing the crop rather than renting to a tenant who produces the crop. As a result of owning land, the farmer receives both current returns from the farming operation and any long-term appreciation in land value. However, the farmer would continue to realize land value appreciation even if the land is rented out. Consequently, the appropriate land charge for growing the crop is only the forgone net rent. As used in this publication, for land that is owned and not rented, land cost is termed an opportunity cost to indicate that it is not an out-of-pocket expense, but rather a return that is forgone as a result of choosing to use the land to grow this crop. To determine the profitability of crop production relative to other activities, the owner-operator may want to consider these forgone returns, or opportunity costs, along with the usual production expenses.

Input Prices:

Fertilizer prices are based on current (Nov 08) quotes, but they are subject to uncertainty. Chemical input prices are based on February, 2008, quotes from chemical and seed dealers. These prices are subject to change, however, and will affect profitability of different crops. Input price changes can be made on the Input Costs tab (located after the crop budgets). If changes are made on this tab, all of the cost calculations will be automatically updated. If input cost changes are made on individual crop price sheets, the input cost formulas will be over-ridden and this function will no longer work.

Crop Prices:

Grain prices are based on futures prices for July and August 2009, as of Nov. 2008, FOB Lind, Washington. (Source: Union Elevator, <http://www.unionelevator.com>) . Garbanzos, peas, and lentils prices are from USDA ag market news for Nov. 08. Canola cash prices are from northerncanola.com for Nov 2008.

Acknowledgments:

I wish to thank everyone who helped gather all of the information needed to create these worksheets. First and foremost, I thank the farmers who were willing to take the time to share their enterprise information in order to create this worksheet. Without their assistance we would not be able to provide this critical information to others. Several colleagues at Washington State University helped as well, including Herbert Hinman (collaborator, reviewer), Doug Young (reviewer), Richard Koenig, Dennis Roe, and Steve Van Vleet. Sherri Van Vleet and Ellen Miller also provided vital assistance in creating these budgets. In addition, I wish to acknowledge the generous assistance of Robert Smathers, formerly at the University of Idaho. With his permission, we have used the UI spreadsheet format to present our budget information. However, I take responsibility for any errors in these budgets.

Budget spreadsheets are available at the following links:

<http://www.farm-mgmt.wsu.edu/WhatsNew.htm>

<http://csanr.wsu.edu/Publications/FarmMgmtEconomics.htm>

Legend: Follow directions below to preserve equations in this spreadsheet.
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Blue Cells: Data are from Machinery page (blue tab).

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

By Crop:	Unit	Yield per acre	Price* per unit	Revenue per acre	Total Cost (TC) of Operation	Returns over TC (\$/acre)	Total Variable Costs (VC) (\$/acre)	Returns over VC (\$/acre)	Crop & Cost Share**	
									Operator:	Owner:
Winter Wheat (WW)	bu	90	\$5.28	\$475	\$379	\$96	\$231	\$244	\$107	67% Operator 33% Owner
Spring Barley (SB)	ton	2	\$107.00	\$214	\$240	-\$26	\$164	\$50	\$35	
Soft White Spring Wheat (SWSW)	bu	50	\$5.28	\$264	\$304	-\$40	\$228	\$36	\$35	
Hard Red Spring Wheat (HRSW)	bu	50	\$7.87	\$394	\$367	\$26	\$254	\$140	\$72	
Peas (P)	lb	2000	\$0.14	\$280	\$248	\$32	\$154	\$126	\$53	75/25
Lentils (L)	lb	1200	\$0.34	\$408	\$246	\$162	\$119	\$289	\$87	75/25
Garbanzos (G)	lb	1200	\$0.38	\$456	\$314	\$142	\$178	\$278	\$96	75/25
Spring Canola (SC)	lb	1800	\$0.14	\$243	\$288	-\$45	\$209	\$34	\$38	
Camelina (CML)	lb	2000	\$0.18	\$360	\$253	\$107	\$117	\$243	\$97	

*August 2009 farmgate prices for grains, posted by the Union Elevator, Lind, WA, www.unionelevator.com, accessed Dec 2008.

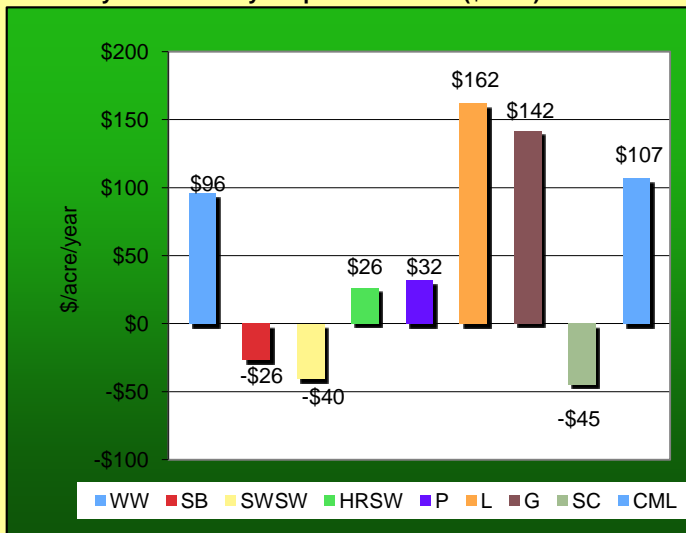
USDA ag market news prices for garbanzos, peas, and lentils for Nov 08. Canola cash prices from northerncanola.com for Nov 2008.

**In a crop- and cost-share arrangement, the landowner and the farm manager split the crop and the specified costs, typically fertilizer, chemicals and crop insurance. Shares are 67% to the operator and 33% to the owner except as noted for peas, lentils, and garbanzos.

By Rotation:	Revenue per acre (\$/acre)	Total Cost (TC) (\$/acre)	Returns over TC (\$/acre)	Total Variable Costs (VC) (\$/acre)	Returns over VC (\$/acre)	Crop-Share Land Cost (\$/acre)
WW, SWSW, P	\$316	\$305	\$11	\$206	\$110	\$58
WW, HRSW, P	\$383	\$332	\$51	\$213	\$170	\$78
WW, SB, P	\$323	\$289	\$34	\$183	\$140	\$65
WW, SWSW, L	\$382	\$310	\$72	\$193	\$190	\$76
WW, HRSW, L	\$426	\$331	\$95	\$201	\$224	\$89
WW, SB, L	\$366	\$289	\$77	\$171	\$194	\$76
WW, SWSW, G	\$398	\$333	\$66	\$212	\$186	\$79
WW, HRSW, G	\$442	\$354	\$88	\$221	\$221	\$92
WW, SB, G	\$382	\$311	\$70	\$191	\$191	\$79
WW, SWSW, SC	\$327	\$324	\$3	\$223	\$105	\$60
WW, HRSW, SC	\$371	\$345	\$26	\$231	\$139	\$72
WW, SB, SC	\$311	\$303	\$8	\$201	\$109	\$60
WW, SWSW, CML	\$366	\$312	\$54	\$192	\$174	\$80
WW, HRSW, CML	\$410	\$333	\$76	\$201	\$209	\$92
WW, SB, CML	\$350	\$291	\$59	\$171	\$179	\$80

Budget spreadsheets are available at the following link
<http://www.csanr.wsu.edu/Publications/FarmMgmtEconomics.htm>

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

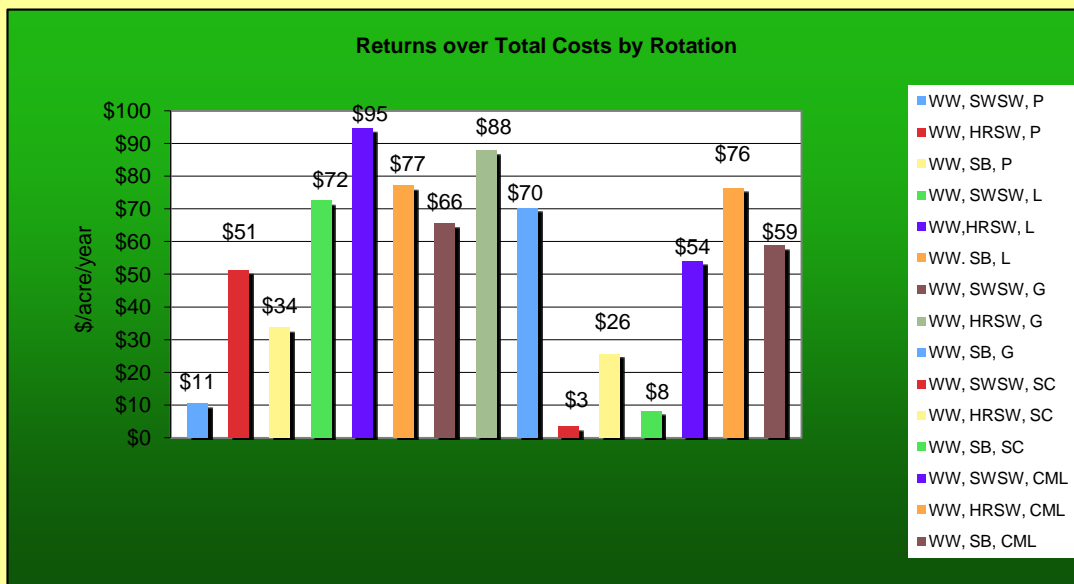


Crop Prices:

LEGEND:

Winter Wheat (WW)	\$5.28
Soft White Spring Wheat (SWSW)	\$5.28
Dark Northern Spring Wheat (DNSW)	\$7.87
Spring Barley (SB)	\$107.00
Peas (P)	\$0.14
Lentils (L)	\$0.34
Garbanzos (G)	\$0.38
Spring Canola (SC)	\$0.14
Camelina (CML)	\$0.18

Returns over Total Costs by Rotation



Legend: Follow directions below to preserve equations in this spreadsheet.

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Orange Cells: Revise this data here to reflect your situation.

Green Cells: Data is from Input Costs page (green tab).

Blue Cells: Data is from the Machinery page (blue tab).

Input Prices

		2009
	Unit	Price/unit
Fuel:		
Diesel (gal)	gal	\$1.75
Gas (gal)	gal	\$2.25
Seed:		
Wheat Seed (lb)	lb	\$0.15
Barley Seed (lb)	lb	\$0.12
Hard Red Spring Wheat	lb	\$0.22
Spring Pea Seed	lb	\$0.21
Lentil Seed	lb	\$0.33
Garbanzo Seed	lb	\$0.45
Canola Seed	lb	\$6.00
Camelina Seed	lb	\$2.99
Fertilizer:		
Nitrogen	lb	\$0.55
Phosphorous	lb	\$1.17
Sulfur	lb	\$0.23
Potassium	lb	\$0.46
Adjuvants:		
Ammonia Sulfate (liquid)	oz	\$0.02
Amm. Sulf. (20-0-0-24)	lb	\$0.12
Crop Oil Concentrate	pt	\$1.00
Excel 90	oz	\$0.20
In-Place	oz	\$0.24
M90	oz	\$0.01
Surfactant	oz	\$0.08
Syltac Sticker	pt	\$6.25
Ultra Pro	oz	\$0.02
Custom Rental:		
Custom Aerial	acre	\$6.50
Fertilizer Applicator	acre	\$1.00
26' Rental Shredder	acre	\$10.00
36' Ripper Shooter	acre	\$2.50
90' Rental Sprayer	acre	\$1.75

Input Prices

Pesticides:		
2,4-D	oz	\$0.13
Achieve SC	oz	\$2.00
Ally	oz	\$24.81
Assure II	oz	\$1.20
Axial	oz	\$1.81
Bronate	pt	\$5.68
Brox M	oz	\$0.30
Capture	acre	\$10.17
Dimethoate	oz	\$7.00
Discover	oz	\$4.41
Fargo	qt	\$12.52
Finesse	oz	\$17.40
Glyphosphate	oz	\$0.39
Imidan	oz	\$9.85
Maverick	oz	\$17.45
Osprey	oz	\$3.55
Poast	pt	\$9.38
Prowl	oz	\$0.25
Pursuit	oz	\$4.15
Quadris	oz	\$2.23
Quilt	oz	\$1.22
R-11	oz	\$0.94
Starane	oz	\$0.93
Starane + Salvo	oz	\$0.43
Starane + Sword	oz	\$0.43
Labor:		
Hourly machine labor*	hour	\$20.00
Cash Rent:		
Cash Rent	acre	\$0.00
Land Tax:		
Land Tax	acre	\$5.50
Interest:		
Operating Loan	percent	7.50%
Machinery Loan/investment	percent	7.50%

*Includes all applicable state and federal taxes.

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Production Costs for Reduced Tillage Soft White Winter Wheat, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Wheat	90	bu	\$5.28	\$475.20
Variable Costs				
Seed:				\$13.50
Wheat Seed	90	lb	\$0.15	\$13.50
Fertilizer:				\$88.05
Nitrogen (dry)	90	lb	\$0.55	\$49.50
Phosphorous (dry)	30	lb	\$1.17	\$35.10
Sulfur (dry)	15	lb	\$0.23	\$3.45
				\$0.00
Pesticides:				\$35.48
Roundup	18	oz	\$0.39	\$7.02
Ammonium Sulfate	50	oz	\$0.02	\$1.00
M90	1.5	oz	\$0.01	\$0.02
Osprey	4.75	oz	\$3.55	\$16.86
Starane+Salvo	22	oz	\$0.43	\$9.46
Excel 90	3.2	oz	\$0.20	\$0.64
Brox M	1.6	oz	\$0.30	\$0.48
				\$0.00
Machinery:				\$49.91
Fuel	8.17	gal	\$1.75	\$14.29
Lubricants	1	acre	\$4.08	\$4.08
Machinery Repairs	1	acre	\$8.24	\$8.24
Machinery Labor	1.16	acre	\$20.00	\$23.30
				\$0.00
Custom & Consultants:				\$11.00
Rental Sprayer	2	acre	\$1.75	\$3.50
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Rental Stubble Shredder	0.5	acre	\$10.00	\$5.00
				\$0.00
Other:				\$10.34
Crop insurance	1	acre	\$10.34	\$10.34
Storage Facility & Equip. Repairs				\$0.00
				\$0.00
Overhead ¹				\$10.41
Operating Interest ²				\$12.50
Total Variable Costs				\$231.19
Variable Costs per Unit				\$2.57
Net Returns Above Variable Costs				\$244.01

Production Costs for Reduced Tillage Soft White Winter Wheat, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$20.52
Machinery interest				\$10.25
Machinery insurance, taxes, housing, licenses				\$4.83
Land Cost*	1	acre	\$107.14	\$107.14
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$148.23
Fixed Costs per Unit				\$1.65
Total Costs per Acre				\$379.42
Total Cost per Unit				\$4.22
Returns to Risk				\$95.78

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Winter Wheat Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%		10%
	Yield		
<u>Price</u>	81.00	90	99.00
Operating Cost Breakeven	\$2.85	\$2.57	\$2.34
Ownership Cost Breakeven	\$1.83	\$1.65	\$1.50
Total Cost Breakeven	\$4.68	\$4.22	\$3.83
	Price		
<u>Yield</u>	\$4.75	\$5.28	\$5.81
Operating Cost Breakeven	48.7	43.8	39.8
Ownership Cost Breakeven	31.2	28.1	25.5
Total Cost Breakeven	79.8	71.9	65.3

Schedule of Operations for Reduced Tillage Winter Wheat, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
September	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90 50 oz Ammonium Sulfate
September	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 90 lb N, 30 lb P, 15 lb S
September	Drill	350HP-WT, 35' Direct Seed Drill	90 lb Seed
April	Crop Insurance		
April	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 4.75 oz Osprey, 22 oz Starane+Salvo, 3.2 oz Excel 90, 1.6 oz BroxM
August	Harvest	30' Combine	
September	Shred Stubble	350HP-WT, 26' Rental Stubble Shredder	We assume that approximately half of the straw is shredded (bottom lands).

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Production Costs for Reduced Tillage Soft White Spring Wheat, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Soft White Wheat	50	bu	\$5.28	\$264.00
Variable Costs				
Seed:				
Soft White Wheat Seed	100	lb	\$0.15	\$15.00
Fertilizer:				
Nitrogen (dry)	100	lb	\$0.55	\$55.00
Phosphorous (dry)	15	lb	\$1.17	\$17.55
Potassium (dry)	20	lb	\$0.46	\$9.20
Sulfur (dry)	10	lb	\$0.23	\$2.30
Pesticides:				
Roundup	18	oz	\$0.39	\$7.02
M90	1.5	oz	\$0.01	\$0.02
Ammonium Sulfate	53.2	oz	\$0.02	\$1.06
Axial	8.2	oz	\$1.81	\$14.84
Brox M	12	oz	\$0.30	\$3.60
Starane	8	oz	\$0.93	\$7.44
InPlace	5	oz	\$0.24	\$1.20
Fungicides:				
Quilt ¹	7	oz	\$1.22	\$8.54
Syltac Sticker	0.5	pt	\$6.25	\$3.13
Machinery:				
Fuel	8.18	gal	\$1.75	\$14.31
Lubricants	1	acre	\$4.08	\$4.08
Machinery Repairs	1	acre	\$9.13	\$9.13
Machinery Labor	0.97	acre	\$20.00	\$19.34
Custom & Consultants:				
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial	0.5	acre	\$6.50	\$3.25
Other:				
Crop insurance	1	acre	\$10.34	\$10.34
Storage Facility & Equip. Repairs				\$0.00
Overhead ²				\$10.49
Operating Interest ³				\$7.87
Total Variable Costs				\$228.20
Variable Costs per Unit				\$4.56
Net Returns Above Variable Costs				\$35.80

Production Costs for Reduced Tillage Soft White Spring Wheat, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$20.26
Machinery interest				\$11.00
Machinery insurance, taxes, housing, licenses				\$4.43
Land Cost*	1	acre	\$35.01	\$35.01
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$76.19
Fixed Costs per Unit				\$1.52
Total Costs per Acre				\$304.40
Total Cost per Unit				\$6.09
Returns to Risk				-\$40.40

Notes:

¹Spraying for rust is assumed to occur about half the time. Budget values are 50% of actual cost.

²Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

³Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Soft White Spring Wheat Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%		10%
		Yield	
	107.00	50	66.00
Operating Cost Breakeven	\$5.07	\$4.56	\$4.15
Ownership Cost Breakeven	\$1.64	\$1.52	\$1.39
Total Cost Breakeven	\$6.76	\$6.09	\$5.53
		Price	
	\$7.00	\$5.28	\$6.00
Operating Cost Breakeven	48.0	43.7	39.3
Ownership Cost Breakeven	16.0	14.4	13.1
Total Cost Breakeven	64.0	57.7	52.4

Schedule of Operations for Reduced Tillage Soft White Spring Wheat, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 M90 50 oz Ammonium Sulfate
April	Harrow	350HP-WT, 40' Heavy Harrow	
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Drill	350HP-WT, 35' Direct Seed Drill	100 lb Seed, 100 lb N, 15 lb P, 20 lb K, 10 lb S
May	Crop Insurance		
May	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 8.2 oz Axial, 8 oz Starane, 12 oz BroxM, 5 oz InPlace, 3.2 oz Ammonium Sulfate
June	Aerial Spray*	Custom	Custom Aerial, 14 oz Quilt, 1 pt Syltac Sticker
August	Harvest	30' Combine	

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Production Costs for Reduced Tillage Hard Red Spring Wheat, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Hard Red Wheat	50	bu	\$7.87	\$393.50
Variable Costs				
Seed:				\$22.00
Hard Red Wheat Seed	100	lb	\$0.22	\$22.00
Fertilizer:				\$100.55
Nitrogen (dry)	130	lb	\$0.55	\$71.50
Phosphorous (dry)	15	lb	\$1.17	\$17.55
Potassium (dry)	20	lb	\$0.46	\$9.20
Sulfur (dry)	10	lb	\$0.23	\$2.30
				\$0.00
Pesticides:				\$35.18
Roundup	18	oz	\$0.39	\$7.02
M90	1.5	oz	\$0.01	\$0.02
Ammonium Sulfate	53.2	oz	\$0.02	\$1.06
Axial	8.2	oz	\$1.81	\$14.84
Brox M	12	oz	\$0.30	\$3.60
Starane	8	oz	\$0.93	\$7.44
InPlace	5	oz	\$0.24	\$1.20
				\$0.00
Fungicides:				\$11.67
Quilt ¹	7	oz	\$1.22	\$8.54
Syltac Sticker	0.5	pt	\$6.25	\$3.13
				\$0.00
Machinery:				\$46.85
Fuel	8.18	gal	\$1.75	\$14.31
Lubricants	1	acre	\$4.08	\$4.08
Machinery Repairs	1	acre	\$9.13	\$9.13
Machinery Labor	0.97	acre	\$20.00	\$19.34
				\$0.00
Custom & Consultants:				\$6.75
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial	0.5	acre	\$6.50	\$3.25
				\$0.00
Other:				\$10.34
Crop insurance	1	acre	\$10.34	\$10.34
Storage Facility & Equip. Repairs				\$0.00
				\$0.00
Overhead ²				\$11.67
Operating Interest ³				\$8.75
Total Variable Costs				\$253.76
Variable Costs per Unit				\$5.08
Net Returns Above Variable Costs				\$139.74

Production Costs for Reduced Tillage Hard Red Spring Wheat, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$20.26
Machinery interest				\$11.00
Machinery insurance, taxes, housing, licenses				\$4.43
Land Cost*	1	acre	\$72.30	\$72.30
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$113.48
Fixed Costs per Unit				\$2.27
Total Costs per Acre				\$367.24
Total Cost per Unit				\$7.34
Returns to Risk				\$26.26

Notes:

¹Spraying for rust is assumed to occur about half the time. Budget values are 50% of actual cost.

²Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

³Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Hard Red Spring Wheat Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%	Yield	10%
<u>Price</u>	45.00	50	55.00
Operating Cost Breakeven	\$5.64	\$5.08	\$4.61
Ownership Cost Breakeven	\$2.52	\$2.27	\$2.06
Total Cost Breakeven	\$8.16	\$7.34	\$6.68
		Price	
<u>Yield</u>	\$7.08	\$7.87	\$8.66
Operating Cost Breakeven	35.8	32.2	29.3
Ownership Cost Breakeven	16.0	14.4	13.1
Total Cost Breakeven	51.8	46.7	42.4

Schedule of Operations for Reduced Tillage Hard Red Spring Wheat, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90 50 oz Ammonium Sulfate
April	Harrow	350HP-WT, 40' Heavy Harrow	
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Drill	350HP-WT, 35' Direct Seed Drill	100 lb Seed, 130 lb N, 15 lb P, 20 lb K, 10 lb S
May	Crop Insurance		
May	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 8.2 oz Axial, 8 oz Starane, 12 oz BroxM, 5 oz InPlace, 3.2 oz Ammonium Sulfate
June	Aerial Spray*	Custom	Custom Aerial, 14 oz Quilt, 1 pt Syltac Sticker
August	Harvest	30' Combine	

Legend: Follow directions below to preserve equations in this spreadsheet.

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Blue Cells: Data are from Machinery page (blue tab).

Production Costs for Reduced Tillage Spring Barley, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Barley	2	ton	\$107.00	\$214.00
Variable Costs				
Seed:				\$9.60
Barley Seed	80	lb	\$0.12	\$9.60
Fertilizer:				\$50.49
Nitrogen (dry)	60	lb	\$0.55	\$33.00
Phosphorous (dry)	12	lb	\$1.17	\$14.04
Sulfur (dry)	15	lb	\$0.23	\$3.45
				\$0.00
Pesticides:				\$35.91
Roundup	18	oz	\$0.39	\$7.02
Ammonium Sulfate	50	oz	\$0.02	\$1.00
M90	3	oz	\$0.01	\$0.03
Achieve SC	9.2	oz	\$2.00	\$18.40
Starane+Sword	22	oz	\$0.43	\$9.46
				\$0.00
Machinery:				\$46.85
Fuel	8.18	gal	\$1.75	\$14.31
Lubricants	1	acre	\$4.08	\$4.08
Machinery Repairs	1	acre	\$9.13	\$9.13
Machinery Labor	0.97	acre	\$20.00	\$19.34
				\$0.00
Custom & Consultants:				\$3.50
Rental Sprayer	2	acre	\$1.75	\$3.50
				\$0.00
Other:				\$4.50
Crop insurance	1	acre	\$4.50	\$4.50
Storage Facility & Equip. Repairs				\$0.00
				\$0.00
Overhead ¹				\$7.54
Operating Interest ²				\$5.66
Total Variable Costs				\$164.05
Variable Costs per Unit				\$82.03
Net Returns Above Variable Costs				\$49.95

Production Costs for Reduced Tillage Spring Barley, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$20.26
Machinery interest				\$11.00
Machinery insurance, taxes, housing, licenses				\$4.43
Land Cost*	1	acre	\$35.12	\$35.12
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$76.31
Fixed Costs per Unit				\$38.15
Total Costs per Acre				\$240.36
Total Cost per Unit				\$120.18
Returns to Risk				-\$26.36

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Spring Barley Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%		10%
	Yield		
Price	1.80	2	2.20
Operating Cost Breakeven	\$91.14	\$82.03	\$74.57
Ownership Cost Breakeven	\$42.39	\$38.15	\$34.68
Total Cost Breakeven	\$133.53	\$120.18	\$109.25
	Price		
Yield	\$96.30	\$107.00	\$117.70
Operating Cost Breakeven	1.7	1.5	1.4
Ownership Cost Breakeven	0.8	0.7	0.6
Total Cost Breakeven	2.5	2.2	2.0

Schedule of Operations for Reduced Tillage Spring Barley, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90, 50 oz Ammonium Sulfate
April	Harrow	350HP-WT, 40' Heavy Harrow	
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Drill	350HP-WT, 35' Direct Seed Drill	80 lb Seed, 60 lb N, 12 lb P, 15 lb S
May	Crop Insurance		
May	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 9.2 oz Achieve SC, 22 oz Starane+Sword
August	Harvest	30' Combine	

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Production Costs for Reduced Tillage Spring Peas, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Peas	2000	lb	\$0.14	\$280.00
Variable Costs				
Seed:				
Pea Seed	200	lb	\$0.21	\$42.50
Fertilizer:				
				\$0.00
				\$0.00
Pesticides:				
Roundup	18	oz	\$0.39	\$7.02
Pursuit	3	oz	\$4.15	\$12.45
Prowl	24	oz	\$0.25	\$6.00
Ammonium Sulfate	100	oz	\$0.02	\$2.00
M90	3	oz	\$0.01	\$0.03
Imidan 70	1	lb	\$9.85	\$9.85
Dimethoate	0.33	pt	\$7.00	\$2.31
				\$0.00
Machinery:				
Fuel	7.74	gal	\$1.75	\$13.55
Lubricants	1	acre	\$3.96	\$3.96
Machinery Repairs	1	acre	\$8.74	\$8.74
Machinery Labor	0.95	acre	\$20.00	\$18.90
				\$0.00
Custom & Consultants:				
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial	1	acre	\$6.50	\$6.50
				\$0.00
Other:				
Crop insurance	1	acre	\$4.54	\$4.54
Storage Facility & Equip. Repairs				\$0.00
				\$0.00
Overhead ¹				\$7.09
Operating Interest ²				\$5.32
Total Variable Costs				\$154.26
Variable Costs per Unit				\$0.08
Net Returns Above Variable Costs				\$125.74

Production Costs for Reduced Tillage Spring Peas, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$19.92
Machinery interest				\$10.79
Machinery insurance, taxes, housing, licenses				\$4.40
Land Cost*	1	acre	\$53.45	\$53.45
*Based on Share Rent Percentage:				
Landlord	25.00%			
Tenant	75.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$94.05
Fixed Costs per Unit				\$0.05
Total Costs per Acre				\$248.31
Total Cost per Unit				\$0.12
Returns to Risk				\$31.69

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Spring Peas Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%		10%
		Yield	
<u>Price</u>	1800	2000	2200
Operating Cost Breakeven	\$0.09	\$0.08	\$0.07
Ownership Cost Breakeven	\$0.05	\$0.05	\$0.04
Total Cost Breakeven	\$0.14	\$0.12	\$0.11
		Price	
<u>Yield</u>	\$0.13	\$0.14	\$0.15
Operating Cost Breakeven	1224.2	1101.8	1001.7
Ownership Cost Breakeven	746.4	671.8	610.7
Total Cost Breakeven	1970.7	1773.6	1612.4

Schedule of Operations for Reduced Tillage Spring Peas, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90, 50 oz Ammonium Sulfate
April	Harrow	350HP-WT, 60' Flex Harrow	
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cultivate/Spray/Harrow	350HP-WT, 36' Cultivator with Harrow, 90' Sprayer	Rental Sprayer, 3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate, 1.5 oz M90
April	Drill	350HP-WT, 35' Direct Seed Drill	200 lb Seed
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, 1 lb Imidan 70, 0.33 pt Dimethoate
August	Harvest	30' Combine	

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Production Costs for Reduced Tillage Spring Lentils, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Lentils	1200	lb	\$0.34	\$408.00
Variable Costs				
Seed:				
Lentil Seed	45	lb	\$0.33	\$14.85
Fertilizer:				
				\$0.00
				\$0.00
Pesticides:				
Roundup	18	oz	\$0.39	\$7.02
Pursuit	3	oz	\$4.15	\$12.45
Prowl	24	oz	\$0.25	\$6.00
Ammonium Sulfate	100	oz	\$0.02	\$2.00
M90	3	oz	\$0.01	\$0.03
Dimethoate	1	pt	\$7.00	\$7.00
				\$0.00
Machinery:				
Fuel	7.74	gal	\$1.75	\$13.55
Lubricants	1	acre	\$3.96	\$3.96
Machinery Repairs	1	acre	\$8.74	\$8.74
Machinery Labor	0.95	acre	\$20.00	\$18.90
				\$0.00
Custom & Consultants:				
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial Spray	1	acre	\$6.50	\$6.50
				\$0.00
Other:				
Crop insurance	1	acre	\$4.54	\$4.54
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Overhead ¹				\$5.45
Operating Interest ²				\$4.09
Total Variable Costs				\$118.57
Variable Costs per Unit				\$0.10
Net Returns Above Variable Costs				\$289.43

Production Costs for Reduced Tillage Spring Lentils, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$19.92
Machinery interest				\$10.79
Machinery insurance, taxes, housing, licenses				\$4.40
Land Cost*	1	acre	\$86.74	\$86.74
*Based on Share Rent Percentage:				
Landlord	25.00%			
Tenant	75.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$127.34
Fixed Costs per Unit				\$0.11
Total Costs per Acre				\$245.92
Total Cost per Unit				\$0.20
Returns to Risk				\$162.08

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Spring Lentils Machinery Costs table](#).

Breakeven Analysis:

	- 10%	Base	+ 10%
		Yield	
<u>Price</u>	1080	1200	1320
Operating Cost Breakeven	\$0.11	\$0.10	\$0.09
Ownership Cost Breakeven	\$0.12	\$0.11	\$0.10
Total Cost Breakeven	\$0.23	\$0.20	\$0.19
		Price	
<u>Yield</u>	\$0.31	\$0.34	\$0.37
Operating Cost Breakeven	387.5	348.7	317.0
Ownership Cost Breakeven	416.2	374.5	340.5
Total Cost Breakeven	803.7	723.3	657.5

Schedule of Operations for Reduced Tillage Spring Lentils, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90, 50 oz Ammonium Sulfate
April	Harrow	350HP-WT, 60' Flex Harrow	
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cultivate/Spray/Harrow	350HP-WT, 36' Cultivator with Harrow, 90' Sprayer	Rental Sprayer, 3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate, 1.5 oz M90
April	Drill	350HP-WT, 35' Direct Seed Drill	45 lb Seed
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, 1 pt Dimethoate
August	Harvest	30' Combine	

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Production Costs for Reduced Tillage Garbanzos, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Garbanzos	1200	lb	\$0.38	\$456.00
Variable Costs				
Seed:				\$58.50
Garbanzo Seed	130	lb	\$0.45	\$58.50
Fertilizer:				\$0.00
				\$0.00
Pesticides:				\$27.50
Roundup	18	oz	\$0.39	\$7.02
Pursuit	3	oz	\$4.15	\$12.45
Prowl	24	oz	\$0.25	\$6.00
Ammonium Sulfate	100	oz	\$0.02	\$2.00
M90	3	oz	\$0.01	\$0.03
				\$0.00
Fungicide:				\$17.84
Quadris	8	oz	\$2.23	\$17.84
				\$0.00
Machinery:				\$45.14
Fuel	7.74	gal	\$1.75	\$13.55
Lubricants	1	acre	\$3.96	\$3.96
Machinery Repairs	1	acre	\$8.74	\$8.74
Machinery Labor	0.95	acre	\$20.00	\$18.90
				\$0.00
Custom & Consultants:				\$10.00
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial Spray	1	acre	\$6.50	\$6.50
				\$0.00
Other:				\$4.54
Crop insurance	1	acre	\$4.54	\$4.54
Storage Facility & Equip. Repairs				\$0.00
				\$0.00
Overhead ¹				\$8.18
Operating Interest ²				\$6.13
Total Variable Costs				\$177.83
Variable Costs per Unit				\$0.15
Net Returns Above Variable Costs				\$278.17

Production Costs for Reduced Tillage Garbanzos, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$19.92
Machinery interest				\$10.79
Machinery insurance, taxes, housing, licenses				\$4.40
Land Cost*	1	acre	\$96.03	\$96.03
*Based on Share Rent Percentage:				
Landlord	25.00%			
Tenant	75.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$136.63
Fixed Costs per Unit				\$0.11
Total Costs per Acre				\$314.46
Total Cost per Unit				\$0.26
Returns to Risk				\$141.54

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Garbanzos Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%		10%
	Yield		
<u>Price</u>	1080	1200	1320
Operating Cost Breakeven	\$0.16	\$0.15	\$0.13
Ownership Cost Breakeven	\$0.13	\$0.11	\$0.10
Total Cost Breakeven	\$0.29	\$0.26	\$0.24
	Price		
<u>Yield</u>	\$0.34	\$0.38	\$0.42
Operating Cost Breakeven	520.0	468.0	425.4
Ownership Cost Breakeven	399.5	359.6	326.9
Total Cost Breakeven	919.5	827.5	752.3

Schedule of Operations for Reduced Tillage Garbanzos, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90, 50 oz Ammonium Sulfate
April	Harrow	350HP-WT, 60' Flex Harrow	
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cultivate/Spray/Harrow	350HP-WT, 36' Cultivator with Harrow, 90' Sprayer	Rental Sprayer, 3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate, 1.5 oz M90
April	Drill	350HP-WT, 35' Direct Seed Drill	130 lb Seed
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, 8 oz Quadris Fungicide
August	Harvest	30' Combine	

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Blue Cells: Data are from Machinery page (blue tab).

Production Costs for Reduced Tillage Spring Canola, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Canola	1800	lb	\$0.14	\$243.00
Variable Costs				
Seed:				\$24.00
Canola Seed	4	lb	\$6.00	\$24.00
Fertilizer:				\$76.00
Nitrogen (dry)	100	lb	\$0.55	\$55.00
Phosphorous (dry)	15	lb	\$1.17	\$17.55
Sulfur (dry)	15	lb	\$0.23	\$3.45
Pesticides:				\$31.22
Roundup	18	oz	\$0.39	\$7.02
Ammonium Sulfate	100	oz	\$0.02	\$2.00
M90	3	oz	\$0.01	\$0.03
Assure II	10	oz	\$1.20	\$12.00
Capture	1	acre	\$10.17	\$10.17
Machinery:				\$46.85
Fuel	8.18	gal	\$1.75	\$14.31
Lubricants	1	acre	\$4.08	\$4.08
Machinery Repairs	1	acre	\$9.13	\$9.13
Machinery Labor	0.97	acre	\$20.00	\$19.34
Custom & Consultants:				\$10.00
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial Spray	1	acre	\$6.50	\$6.50
Other:				\$3.88
Crop insurance	1	acre	\$3.88	\$3.88
Storage Facility & Equip. Repairs				\$0.00
Overhead ¹				\$9.60
Operating Interest ²				\$7.20
Total Variable Costs				\$208.75
Variable Costs per Unit				\$0.12
Net Returns Above Variable Costs				\$34.25

Production Costs for Reduced Tillage Spring Canola, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$20.26
Machinery interest				\$11.00
Machinery insurance, taxes, housing, licenses				\$4.43
Land Cost*	1	acre	\$38.03	\$38.03
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$79.21
Fixed Costs per Unit				\$0.04
Total Costs per Acre				\$287.96
Total Cost per Unit				\$0.16
Returns to Risk				-\$44.96

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Spring Canola Machinery Costs table](#).

Breakeven Analysis:				
	-	Base	+	
	10%		10%	
		Yield		
<u>Price</u>	1620	1800	1980	
Operating Cost Breakeven	\$0.13	\$0.12	\$0.11	
Ownership Cost Breakeven	\$0.05	\$0.04	\$0.04	
Total Cost Breakeven	\$0.18	\$0.16	\$0.15	
		Price		
<u>Yield</u>	\$0.12	\$0.14	\$0.15	
Operating Cost Breakeven	1718.1	1546.3	1405.7	
Ownership Cost Breakeven	651.9	586.7	533.4	
Total Cost Breakeven	2370.0	2133.0	1939.1	

Schedule of Operations for Reduced Tillage Spring Canola, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Harrow	350HP-WT, 40' Heavy Harrow	
October	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 18 oz Roundup, 1.5 oz M90, 50 oz Ammonium Sulfate
April	Cultivate	350HP-WT, 40' Cultivator	
April	Cult/Har/Sprayer	350HP-WT, 36' Cultivator with Harrow, 90' Sprayer	Rental Sprayer, 10 oz Assure II, 50 oz Ammonium Sulfate, 1.5 oz M90
April	Drill	350HP-WT, 35' Direct Seed Drill	4 lb Treated Canola Seed, 100 lb N, 15 lb P, 15 lb S
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, Capture \$10.17/Acre
August	Harvest*	30' Combine	

*Harvest canola at 1.5 mph (half as fast as grain crops).

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Blue Cells: Data are from Machinery page (blue tab).

Production Costs for Reduced Tillage Camelina, More Than 18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Camelina	2000	lb	\$0.18	\$360.00
Variable Costs				
Seed:				\$13.46
Camelina Seed	4.5	lb	\$2.99	\$13.46
Fertilizer:				\$29.80
Nitrogen (dry)	50	lb	\$0.55	\$27.50
Sulfur (dry)	10	lb	\$0.23	\$2.30
Pesticides:				\$16.07
Poast	1.5	pt	\$9.38	\$14.07
Crop Oil Concentrate	2	pt	\$1.00	\$2.00
Machinery:				\$42.39
Fuel	6.95	gal	\$1.75	\$12.17
Lubricants	1	acre	\$3.76	\$3.76
Machinery Repairs	1	acre	\$8.39	\$8.39
Machinery Labor	0.90	acre	\$20.00	\$18.08
Custom & Consultants:				\$1.75
Rental Sprayer	1	acre	\$1.75	\$1.75
Other:				\$3.88
Crop insurance	1	acre	\$3.88	\$3.88
Storage Facility & Equip. Repairs				\$0.00
Overhead ¹				\$5.37
Operating Interest ²				\$4.03
Total Variable Costs				\$116.74
Variable Costs per Unit				\$0.06
Net Returns Above Variable Costs				\$243.26

Production Costs for Reduced Tillage Camelina, More Than 18" Precipitation

Fixed Costs:				
Machinery depreciation				\$19.30
Machinery interest				\$10.30
Machinery insurance, taxes, housing, licenses				\$4.33
Land Cost*	1	acre	\$96.88	\$96.88
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
Total Fixed Costs				\$136.31
Fixed Costs per Unit				\$0.07
Total Costs per Acre				\$253.05
Total Cost per Unit				\$0.13
Returns to Risk				\$106.95

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the [Camelina Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%		10%
	Yield		
<u>Price</u>	1800	2000	2200
Operating Cost Breakeven	\$0.06	\$0.06	\$0.05
Ownership Cost Breakeven	\$0.08	\$0.07	\$0.06
Total Cost Breakeven	\$0.14	\$0.13	\$0.12
	Price		
<u>Yield</u>	\$0.16	\$0.18	\$0.20
Operating Cost Breakeven	720.6	648.6	589.6
Ownership Cost Breakeven	841.4	757.3	688.4
Total Cost Breakeven	1562.0	1405.8	1278.0

Schedule of Operations for Reduced Tillage Camelina, More Than 18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Harrow	350HP-WT, 40' Heavy Harrow	
April	Cult/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Drill	350HP-WT, 35' Direct Seed Drill	4-5 lb Camelina Seed, 50 lb N, 10 lb S
May	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 1.5 pt Poast, 2 pt COC
May	Crop Insurance		
August	Harvest*	30' Combine	3 mph harvest speed

*Harvest camelina at 3 mph (2/3 as fast as grain crops).

Machinery Costs (\$/acre) from the University of Idaho Machinery Cost Calculator

Note: Per hour machinery costs can be changed in this master table and they will update throughout. Per acre costs are calculated in the Machine Cost program using the values listed in the Machinery Complement tab.

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
350HP Wheel Tractor	\$2.00	\$1.61	\$0.28	\$3.89	\$1.20	\$9.20	\$1.38	\$11.78	\$5.28	0.26	5.26	\$20.95
<i>Equipment:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
40' Heavy Harrow	\$1.33	\$0.95	\$0.11	\$2.39	\$1.02	\$1.65	\$0.25	\$2.92	\$0.95	0.05	0.94	\$6.26
60' Flex Harrow	\$0.99	\$0.74	\$0.08	\$1.81	\$0.63	\$0.89	\$0.13	\$1.65	\$0.51	0.03	0.51	\$3.97
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
36' Ripper Shooter	\$0.94	\$0.75	\$0.13	\$1.82	\$0.56	\$1.79	\$0.27	\$2.62	\$1.03	0.05	1.02	\$5.47
26' Stubble Shredder	\$0.44	\$0.36	\$0.06	\$0.86	\$0.27	\$2.04	\$0.31	\$2.62	\$1.17	0.06	1.17	\$4.65
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$26.58	\$14.88	\$5.46	\$44.80	\$12.46	\$29.14	\$6.31	\$42.26	\$31.76	1.59	16.65	\$118.83

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations.

Costs by Crop:

Click on crop to see machinery costs by crop.
Soft White Winter Wheat
Soft White Spring Wheat
Hard Red Spring Wheat
Spring Barley
Spring Peas
Spring Lentils
Garbanzos
Spring Canola
Camelina

Machinery Costs for Reduced Tillage Soft White Winter Wheat (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
36' Ripper Shooter	\$0.94	\$0.75	\$0.13	\$1.82	\$0.56	\$1.79	\$0.27	\$2.62	\$1.03	0.05	1.02	\$5.47
26' Stubble Shredder	\$0.22	\$0.18	\$0.03	\$0.43	\$0.14	\$1.02	\$0.16	\$1.31	\$0.59	0.03	0.58	\$2.33
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$20.52	\$10.25	\$4.83	\$33.48	\$8.24	\$14.29	\$4.08	\$20.97	\$23.30	1.16	8.17	\$77.75

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Machinery Costs for Reduced Tillage Soft White Spring Wheat (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
40' Heavy Harrow	\$1.33	\$0.95	\$0.11	\$2.39	\$1.02	\$1.65	\$0.25	\$2.92	\$0.95	0.05	0.94	\$6.26
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$20.26	\$11.00	\$4.43	\$34.62	\$9.13	\$14.31	\$4.08	\$21.87	\$19.34	0.97	8.18	\$75.84

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Machinery Costs for Reduced Tillage Hard Red Spring Wheat (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
40' Heavy Harrow	\$1.33	\$0.95	\$0.11	\$2.39	\$1.02	\$1.65	\$0.25	\$2.92	\$0.95	0.05	0.94	\$6.26
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$20.26	\$11.00	\$4.43	\$34.62	\$9.13	\$14.31	\$4.08	\$21.87	\$19.34	0.97	8.18	\$75.84

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Machinery Costs for Reduced Tillage Spring Barley (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
40' Heavy Harrow	\$1.33	\$0.95	\$0.11	\$2.39	\$1.02	\$1.65	\$0.25	\$2.92	\$0.95	0.05	0.94	\$6.26
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$20.26	\$11.00	\$4.43	\$34.62	\$9.13	\$14.31	\$4.08	\$21.87	\$19.34	0.97	8.18	\$75.84

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Machinery Costs for Reduced Tillage Spring Peas (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
60' Flex Harrow	\$0.99	\$0.74	\$0.08	\$1.81	\$0.63	\$0.89	\$0.13	\$1.65	\$0.51	0.03	0.51	\$3.97
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$19.92	\$10.79	\$4.40	\$34.04	\$8.74	\$13.55	\$3.96	\$20.60	\$18.90	0.95	7.74	\$73.55

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Machinery Costs for Reduced Tillage Spring Lentils (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
60' Flex Harrow	\$0.99	\$0.74	\$0.08	\$1.81	\$0.63	\$0.89	\$0.13	\$1.65	\$0.51	0.03	0.51	\$3.97
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$19.92	\$10.79	\$4.40	\$34.04	\$8.74	\$13.55	\$3.96	\$20.60	\$18.90	0.95	7.74	\$73.55

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Machinery Costs for Reduced Tillage Garbanzos (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
60' Flex Harrow	\$0.99	\$0.74	\$0.08	\$1.81	\$0.63	\$0.89	\$0.13	\$1.65	\$0.51	0.03	0.51	\$3.97
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$19.92	\$10.79	\$4.40	\$34.04	\$8.74	\$13.55	\$3.96	\$20.60	\$18.90	0.95	7.74	\$73.55

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Machinery Costs for Reduced Tillage Spring Canola (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Tractors, ATVs:</i>												
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84
<i>Equipment:</i>												
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57
<i>350HP Wheel Tractor with:</i>												
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49
40' Cultivator	\$0.83	\$0.60	\$0.08	\$1.51	\$0.66	\$1.55	\$0.23	\$2.44	\$0.89	0.04	0.89	\$4.84
40' Heavy Harrow	\$1.33	\$0.95	\$0.11	\$2.39	\$1.02	\$1.65	\$0.25	\$2.92	\$0.95	0.05	0.94	\$6.26
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38
<i>Trucks:</i>												
				Miles/year:				MPG:				
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33
Total	\$20.26	\$11.00	\$4.43	\$34.62	\$9.13	\$14.31	\$4.08	\$21.87	\$19.34	0.97	8.18	\$75.84

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Machinery Costs for Reduced Tillage Camelina (\$/acre) from the University of Idaho Machinery Cost Calculator													
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)	
	Depreciation	Interest	Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)		
<i>Tractors, ATVs:</i>													
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.12	\$0.02	\$0.17	\$0.88	0.04	0.07	\$1.28	
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.17	\$1.84	
<i>Equipment:</i>													
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$2.20	\$2.25	\$0.34	\$4.11	0.21	1.26	\$16.57	
<i>350HP Wheel Tractor with:</i>													
36' Cultivator with Harrow	\$0.95	\$0.75	\$0.09	\$1.79	\$0.73	\$1.72	\$0.26	\$2.71	\$0.99	0.05	0.98	\$5.49	
40' Heavy Harrow	\$1.33	\$0.95	\$0.11	\$2.39	\$1.02	\$1.65	\$0.25	\$2.92	\$0.95	0.05	0.94	\$6.26	
35' Direct Seed Drill	\$2.36	\$1.52	\$0.51	\$4.39	\$0.97	\$3.04	\$0.46	\$4.47	\$1.90	0.10	1.74	\$10.76	
90' Sprayer (Rental)	\$0.13	\$0.10	\$0.02	\$0.25	\$0.08	\$0.59	\$0.09	\$0.76	\$0.37	0.02	0.34	\$1.38	
<i>Trucks:</i>													
	Miles/year:				MPG:								
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.07	
Tandem Axle Truck	\$1.02	\$0.69	\$0.67	\$2.38	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.24	\$5.06	
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.12	\$6.58	
0.75-Ton 4WD Pickup	\$2.08	\$0.52	\$0.50	\$2.05	\$0.75	\$1.50	\$0.23	\$2.48	\$4.80	0.24	0.86	\$9.33	
Total	\$19.30	\$10.30	\$4.33	\$32.86	\$8.39	\$12.17	\$3.76	\$18.67	\$18.08	0.90	6.95	\$69.62	

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Machinery Complement for Reduced Tillage, Over 18" Precipitation, Eastern Washington

Type of Machine	Replacement Value \$	Age When Purchased	Years of Life	Annual Hours of Use	Salvage Value \$	Annual Repairs (Materials & Labor) \$	Gallons of Fuel/Hr.	Taxes, Housing, Insur., Licenses %	Labor Multiplier	Acres per Hour
<i>Tractors, ATVs:</i>										
4WD-ATV	6,500	0	10	150	1,000	100	1.2	1.2	1.1	
50HP-WT w/Bucket	15,000	15	20	100	3,500	200	3	1.2	1.1	
350HP-WT	95,000	5	15	500	20,000	3,000	15	1.2	1.1	
<i>Equipment:</i>										
36' Cultivator w/Harrow	18,000	5	15	75	3,500	850	14	0.6	1.1	22
40' Cultivator	15,500	5	15	75	2,000	850	12	0.6	1.1	25
40' Heavy Harrow	20,000	0	15	40	2000	750	15	0.6	1.1	23
60' Flex Harrow	15,500	0	15	25	2500	550	10	0.6	1.1	43
35' Direct Seed Drill	40,000	0	10	200	10,000	1,000	15	3	1.2	13
30' Combine	225,000	5	15	330	30,000	4,000	7	2.6	1.2	11
<i>Trucks:</i>										
				Miles/year:			MPG:			
2-Ton Truck	20,000	15	15	1,000	2,000	1,000	6		1.2	
Tandem Axle Truck	35,000	15	15	2,000	4,500	2,000	6	10.1	1.2	
Trap Wagon	15,000	10	10	500	3,000	400	12	3.8	1.2	
3/4-Ton Pickup	22,000	5	7	12,000	7,500	1,500	12	6.8	1.2	

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations.