

## Pullman Site, Conventional Tillage



Photo: Dennis Pittmanr

### 2009 Crop Rotation Budgets, Over 18" Precipitation Zone Under Conventional Tillage Dryland Grain Producing Region of the NW Wheat & Range Region

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Budget spreadsheets are available at the following link:  
<http://www.uidaho.edu/~kpainter>  
<http://csanr.wsu.edu/publications/Farmmgmt/FarmMgmtEconomics.html>



## INSTRUCTIONS AND ASSUMPTIONS

### General Instructions:

can be adjusted. Orange cells can be changed without affecting the underlying equations in this cost calculator. Data in yellow cells are from the Summary sheet (click on yellow Summary tab or select it from the TabSelect drop-down menu). In the Summary sheet both crop price and yield are in orange cells. Adjusting any of those numbers will automatically update all calculations throughout the spreadsheet. You can quickly compare price and yield changes by crop and rotation on net returns and land costs. You can also see rotational impacts. For example, if you know that a crop will have a higher yield in a particular sequence, adjust the crop yield in the upper table and see the rotational impact in the second

### Input Prices:

calculations will be automatically updated. Input cost changes can also be made on individual crop price sheets, over-riding the input cost formulae on that particular crop budget. Fertilizer prices are based on current (Apr 09) quotes, but they are subject to uncertainty. Chemical input prices are based on February, 2009, quotes from chemical and seed dealers. These prices are subject to change, however, and will affect

### Crop Prices:

throughout all the budgets. (Yields can be adjusted similarly.) Grain prices are based on futures prices for August 2009, as of July 2009, FOB Lind, Washington. (Source: Union Elevator,

### Machinery Costs:

hourly machinery cost data are used to create the individualized machinery cost data for each budget, located in a separate tab for each crop. In the crop budget sheets, entries in blue cells are calculated by the machinery cost program and come from the associated Machinery Cost sheet for that crop. Machinery fixed costs include capital recovery costs, 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

### Land Costs:

Land costs, included either as real or as opportunity costs, are based on a typical share rental arrangement. We calculate net land rental cost as a cost share as follows:

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

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.** If the percentage is adjusted on the Summary tab, it is changed for all crops. If you want different crop-share percentages for different crops, adjust the percentage on the budget sheet for that crop. This valuable tool reveals how factors such as crop and minimum return owner-operators must realize 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.

### General Assumptions:

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

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 widths, tractor horsepower, type of

**Acknowledgments:**

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. However, I take responsibility for any errors in these budgets.

**Budget spreadsheets are available at the following link:**

<http://www.uidaho.edu/~kpainter/>

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

<u>By Crop:</u>	<u>Unit</u>	<u>Yield per acre</u>	<u>Price* per unit</u>	<u>Revenue per acre</u>	<u>Total Cost (TC) of Operation</u>	<u>Returns over TC (\$/acre)</u>	<u>Total Variable Costs (VC) (\$/acre)</u>	<u>Returns over VC (\$/acre)</u>	<u>Crop &amp; Cost Share**</u>	
									<u>Cost (\$/acre)</u>	<u>67% Share to operator</u>
<a href="#">Winter Wheat (WW)</a>	bu	100	\$4.99	\$499	\$370	\$129	\$211	\$288	\$116	
<a href="#">Spring Barley (SB)</a>	ton	2	\$125.84	\$252	\$267	-\$15	\$183	\$68	\$43	
<a href="#">Soft White Spring Wheat (SWSW)</a>	bu	65	\$4.99	\$324	\$323	\$2	\$219	\$105	\$58	
<a href="#">Peas (P)</a>	lb	2000	\$0.10	\$196	\$232	-\$36	\$158	\$38	\$34	75/25

\*August 2009 farmgate prices for grains, posted by the Union Elevator, Lind, WA, [www.unionelevator.com](http://www.unionelevator.com), accessed July 2009.

USDA ag market news prices for garbanzos, peas, and lentils for Nov 08. Canola cash prices from [northerncanola.com](http://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.

<u>By Rotation:</u>	<u>Revenue per acre (\$/acre)</u>	<u>TC of Operation (\$/acre)</u>	<u>Returns over TC (\$/acre)</u>	<u>Total Variable Costs (\$/acre)</u>	<u>Returns over VC (\$/acre)</u>	<u>Land Cost (\$/acre)</u>
WW, SB, SW	\$358	\$320	\$39	\$205	\$154	\$72
WW, SW, P	\$340	\$308	\$32	\$196	\$144	\$69

Budget spreadsheets are available at the following link:

<http://www.uidaho.edu/~kpainter>

## Input Prices

Item	Unit	2009 Price/unit
<b>Fuel:</b>		
Diesel, offroad, bulk (gal)	gal	\$2.25
Gas (gal)	gal	\$2.75
<b>Seed:</b>		
Wheat Seed (lb)	lb	\$0.15
Barley Seed (lb)	lb	\$0.12
Hard Red Spring Wheat	lb	\$0.22
Spring Pea Seed	lb	\$0.27
Lentil Seed	lb	\$0.50
Garbanzo Seed	lb	\$0.51
Canola Seed	lb	\$6.00
<b>Fertilizer:</b>		
Nitrogen	lb	\$0.52
Phosphorous	lb	\$0.65
Sulfur	lb	\$0.44
Potassium	lb	\$0.81
<b>Adjuvants:</b>		
Amm. Sulf. (20-0-0-24)	lb	\$0.40
Amm. Sulf. (liquid)	oz	\$0.02
Crop Oil Concentrate	pt	\$1.83
Excel 90	oz	\$0.20
In-Place	oz	\$0.21
M90	oz	\$0.15
R-11	oz	\$0.94
Surfactant	oz	\$0.08
Syltac Sticker	pt	\$6.25
Ultra Pro	oz	\$0.02
<b>Custom Rental:</b>		
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

Item	Unit	2009 Price/unit
<b>Pesticides:</b>		
2,4-D	oz	\$0.16
Achieve SC	oz	\$2.00
Ally	oz	\$14.52
Assure II	oz	\$1.19
Axial	oz	\$1.63
Bronate	pt	\$8.16
Brox M	oz	\$0.39
Capture	acre	\$10.17
Dimethoate	pt	\$0.38
Discover	oz	\$1.05
FarGO	qt	\$14.40
Finesse	oz	\$19.97
Glyphosphate	oz	\$0.42
Imidan 70	lb	\$0.69
Maverick	oz	\$19.82
Osprey	oz	\$3.84
Poast	pt	\$10.40
Prowl	oz	\$0.30
Pursuit	oz	\$4.33
Quadris	oz	\$3.17
Quilt	oz	\$1.30
Starane	oz	\$0.63
Starane + Salvo	oz	\$0.51
Starane + Sword	oz	\$0.51
<b>Labor:</b>		
Hourly machine labor*	hour	\$20.00
<b>Cash rent:</b>		
Cash rent	acre	\$0.00
<b>Land Tax:</b>		
Land Tax	acre	\$5.50
<b>Interest:</b>		
Operating Loan	percent	7.50%
Machinery Loan/investment	percent	7.50%

\*Includes all applicable state and federal taxes.

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

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<b>Gross Returns</b>				
Wheat	100	bu	\$4.99	\$499.00
<b>Variable Costs</b>				
Seed:				\$13.50
Wheat Seed	90	lb	\$0.15	\$13.50
Fertilizer:				\$88.90
Nitrogen (dry)	125	lb	\$0.52	\$65.00
Phosphorous (dry)	30	lb	\$0.65	\$19.50
Sulfur (dry)	10	lb	\$0.44	\$4.40
				\$0.00
Pesticides:				\$30.72
Osprey	4.75	oz	\$3.84	\$18.24
Starane+Salvo	22	oz	\$0.51	\$11.22
Excel 90	3.2	oz	\$0.20	\$0.64
Brox M	1.6	oz	\$0.39	\$0.62
				\$0.00
Machinery:				\$44.77
Fuel	6.08	gal	\$2.25	\$13.68
Lubricants	1	acre	\$2.05	\$2.05
Machinery Repairs	1	acre	\$10.71	\$10.71
Machinery Labor	0.92	acre	\$20.00	\$18.33
				\$0.00
Custom & Consultants:				\$1.75
Rental Sprayer	1	acre	\$1.75	\$1.75
				\$0.00
Other:				\$10.34
Crop insurance	1	acre	\$10.34	\$10.34
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Overhead <sup>1</sup>				\$9.50
Operating Interest <sup>2</sup>				\$11.40
<b>Total Variable Costs</b>				<b>\$210.87</b>
Variable Costs per Unit				\$2.11
<b>Net Returns Above Variable Costs</b>				<b>\$288.13</b>

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

### Fixed Costs:

Machinery depreciation				\$20.64
Machinery interest				\$12.11
Machinery insurance, taxes, housing, licenses				\$4.43
Land Cost*	1	acre	\$116.28	\$116.28
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
<b>Total Fixed Costs</b>				<b>\$158.96</b>
Fixed Costs per Unit				\$1.59
<b>Total Costs per Acre</b>				<b>\$369.83</b>
Total Cost per Unit				\$3.70
<b>Returns to Risk</b>				<b>\$129.17</b>

### Notes:

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

<sup>2</sup>Calculated 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:

	- 10%	Base Yield	+ 10%
<u>Price</u>	90.00	100	110.00
Operating Cost Breakeven	\$2.34	\$2.11	\$1.92
Ownership Cost Breakeven	\$1.77	\$1.59	\$1.45
Total Cost Breakeven	\$4.11	\$3.70	\$3.36
	10%	Base Price	10%
<u>Yield</u>	\$4.49	\$4.99	\$5.49
Operating Cost Breakeven	47.0	42.3	38.4
Ownership Cost Breakeven	35.4	31.9	29.0
Total Cost Breakeven	82.3	74.1	67.4



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

Month	Operation	Tooling	Materials/Service
September	Fertilize	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 125 lb N, 30 lb P, 10 lb S
September	Rodweed	350HP-WT, 40' Rodweeder	
September	Harrow	350HP-WT, 60' Flex Harrow	
September	Drill	350HP-WT, 36' JD-455 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 Brox M
August	Harvest	30' Combine	
September	Plow	350HP-WT, 10-Bottom Plow	

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

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<b>Gross Returns</b>				
Soft White Wheat	65	bu	\$4.99	\$324.35
<b>Variable Costs</b>				
Seed:				
Soft White Wheat Seed	90	lb	\$0.15	\$13.50
Fertilizer:				
Nitrogen (dry)	89	lb	\$0.52	\$46.43
Phosphorous (dry)	15	lb	\$0.65	\$9.75
Potassium (dry)	20	lb	\$0.81	\$16.20
Sulfur (dry)	10	lb	\$0.44	\$4.40
Pesticides:				
Roundup	24	oz	\$0.42	\$10.08
Surfactant	6.4	oz	\$0.08	\$0.52
Ammonium Sulfate	1.7	lb	\$0.40	\$0.68
Axial	8.2	oz	\$1.63	\$13.37
Brox M	12	oz	\$0.39	\$4.63
Starane	8	oz	\$0.63	\$5.04
InPlace	5	oz	\$0.21	\$1.05
Ammonium Sulfate	3.2	oz	\$0.02	\$0.05
Fungicides:				
Quilt <sup>1</sup>	7	oz	\$1.30	\$9.10
Syltac	0.5	pt	\$6.25	\$3.13
Machinery:				
Fuel	5.83	gal	\$2.25	\$13.12
Lubricants	1	acre	\$1.96	\$1.96
Machinery Repairs	1	acre	\$11.15	\$11.15
Machinery Labor	0.99	acre	\$20.00	\$19.73
Custom & Consultants:				
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial	0.5	acre	\$3.25	\$1.63
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Other:				
Crop insurance	1	acre	\$10.34	\$10.34
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Overhead <sup>2</sup>				\$9.94
Operating Interest <sup>3</sup>				\$7.45
<b>Total Variable Costs</b>				<b>\$219.23</b>
Variable Costs per Unit				\$3.37
<b>Net Returns Above Variable Costs</b>				<b>\$105.12</b>

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

<b>Fixed Costs:</b>				
Machinery depreciation				\$21.95
Machinery interest				\$12.73
Machinery insurance, taxes, housing, licenses				\$5.06
Land Cost*	1	acre	\$58.10	\$58.10
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
<b>Total Fixed Costs</b>				<b>\$103.33</b>
Fixed Costs per Unit				\$1.59
<b>Total Costs per Acre</b>				<b>\$322.56</b>
Total Cost per Unit				\$4.96
<b>Returns to Risk</b>				<b>\$1.79</b>

### Notes:

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

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

<sup>3</sup>Calculated 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 Wheat Machinery Costs table](#).

### Breakeven Analysis:

	- 10%	Base Yield	+ 10%
<u>Price</u>	58.50	65	71.50
Operating Cost Breakeven	\$3.75	\$3.37	\$3.07
Ownership Cost Breakeven	\$1.77	\$1.59	\$1.45
Total Cost Breakeven	\$5.51	\$4.96	\$4.51
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$4.49	\$4.99	\$5.49
Operating Cost Breakeven	48.8	43.9	39.9
Ownership Cost Breakeven	23.0	20.7	18.8
Total Cost Breakeven	71.8	64.6	58.8

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

Month	Operation	Tooling	Materials/Service
March	Cultivate	350HP-WT, 36' Cultivator	
March	Cultivate	350HP-WT, 36' Cultivator	
April	Fertilize	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 89 lb N, 15 lb P, 20 lb K, 10 lb S
April	Rodweed	350HP-WT, 40' Rodweeder	
April	Drill	350HP-WT, 36' JD-455 Drill	90 lb Seed
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*	Airplane	Custom Aerial, 14 oz Quilt, 1 pt Syltac Sticker
August	Harvest	30' Combine	
September	Chisel	350HP-WT, 23' Chisel Plow	

\*Spraying for rust is assumed to occur about half the time. Budget values are 50% of actual cost to reflect this fact.

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

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<b>Gross Returns</b>				
Barley	2	ton	\$125.84	\$251.67
<b>Variable Costs</b>				
Seed:				\$10.20
Barley Seed	85	lb	\$0.12	\$10.20
Fertilizer:				\$60.58
Nitrogen (dry)	89	lb	\$0.52	\$46.43
Phosphorous (dry)	15	lb	\$0.65	\$9.75
Sulfur (dry)	10	lb	\$0.44	\$4.40
				\$0.00
Pesticides:				\$40.90
Roundup	24	oz	\$0.42	\$10.08
Surfactant	6.4	oz	\$0.08	\$0.52
Ammonium Sulfate	1.7	lb	\$0.40	\$0.68
Achieve SC	9.2	oz	\$2.00	\$18.40
Starane+Sword	22	oz	\$0.51	\$11.22
				\$0.00
Machinery:				\$44.72
Fuel	5.78	gal	\$2.25	\$13.00
Lubricants	1	acre	\$1.95	\$1.95
Machinery Repairs	1	acre	\$9.97	\$9.97
Machinery Labor	0.99	acre	\$20.00	\$19.81
				\$0.00
Custom & Consultants:				\$7.75
Rental Sprayer	3	acre	\$1.75	\$5.25
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
				\$0.00
Other:				\$4.50
Crop insurance	1	acre	\$4.50	\$4.50
Storage Facility & Equip. Repairs				\$0.00
				\$0.00
Overhead				\$8.43
Operating Interest				\$6.32
<b>Total Variable Costs</b>				<b>\$183.41</b>
Variable Costs per Unit				\$91.71
<b>Net Returns Above Variable Costs</b>				<b>\$68.26</b>

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

<b>Fixed Costs:</b>				
Machinery depreciation				\$19.69
Machinery interest				\$11.54
Machinery insurance, taxes, housing, licenses				\$4.39
Land Cost*	1	acre	\$42.58	\$42.58
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash rent				\$0.00
Land taxes				\$5.50
<b>Total Fixed Costs</b>				<b>\$83.70</b>
Fixed Costs per Unit				\$41.85
<b>Total Costs per Acre</b>				<b>\$267.11</b>
Total Cost per Unit				\$133.55
<b>Returns to Risk</b>				<b>-\$15.44</b>

### Notes:

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

<sup>2</sup>Calculated 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](#).

<b>Breakeven Analysis:</b>	-	Base	+
	10%	Yield	10%
<u>Price</u>	1.8	2	2.2
Operating Cost Breakeven	\$101.89	\$91.71	\$83.37
Ownership Cost Breakeven	\$46.50	\$41.85	\$38.05
Total Cost Breakeven	\$148.39	\$133.55	\$121.41
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$113.25	\$125.84	\$138.42
Operating Cost Breakeven	1.6	1.5	1.3
Ownership Cost Breakeven	0.7	0.7	0.6
Total Cost Breakeven	2.4	2.1	1.9

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

Month	Operation	Tooling	Materials/Service
April	Cultivate	350HP- WT, 36' Cultivator	Rental Sprayer, 1.25 qt FarGO
April	Cultivate	350HP- WT, 36' Cultivator	
April	Fertilize	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 89 lb N, 15 lb P, 10 lb S
April	Rodweed	350HP-WT, 40' Rodweeder	
April	Drill	350HP-WT, 36' JD-455 Drill	85 lb Seed
May	Crop Insurance		
May	Spray Weeds	350HP-WT, 90' Sprayer	Rental Sprayer, 9.2 oz Achieve SC, 22 oz Starane+Sword
July	Harvest	30' Combine	
September	Chisel	350HP-WT, 23' Chisel Plow	

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

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<b>Gross Returns</b>				
Peas	2000	lb	\$0.10	\$195.80
<b>Variable Costs</b>				
Seed:				\$54.00
Pea Seed	200	lb	\$0.27	\$54.00
Fertilizer:				\$0.00
				\$0.00
Pesticides:				\$34.21
Pursuit	3	oz	\$4.33	\$12.99
Prowl	24	oz	\$0.30	\$7.20
Ammonium Sulfate	50	oz	\$0.02	\$0.75
M90	1.5	oz	\$0.15	\$0.23
Imidan 70	16	oz	\$0.69	\$11.04
Dimethoate	5.28	oz	\$0.38	\$2.01
				\$0.00
Machinery:				\$43.86
Fuel	5.62	gal	\$2.25	\$12.64
Lubricants	1	acre	\$1.89	\$1.89
Machinery Repairs	1	acre	\$9.70	\$9.70
Machinery Labor	0.98	acre	\$20.00	\$19.63
				\$0.00
Custom & Consultants:				\$8.25
Rental Sprayer	1	acre	\$1.75	\$1.75
Custom Aerial	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				\$7.24
Operating Interest				\$5.43
<b>Total Variable Costs</b>				<b>\$157.54</b>
Variable Costs per Unit				\$0.08
<b>Net Returns Above Variable Costs</b>				<b>\$38.26</b>



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

<b>Fixed Costs:</b>				
Machinery depreciation				\$19.45
Machinery interest				\$11.46
Machinery insurance, taxes, housing, licenses				\$4.36
Land Cost*	1	acre	\$33.76	\$33.76
*Based on Share Rent Percentage:				
Landlord	25.00%			
Tenant	75.00%			
Cash rent				\$0.00
Land taxes				\$5.50
<b>Total Fixed Costs</b>				<b>\$74.53</b>
Fixed Costs per Unit				\$0.04
<b>Total Costs per Acre</b>				<b>\$232.07</b>
Total Cost per Unit				\$0.12
<b>Returns to Risk</b>				<b>-\$36.27</b>

### Notes:

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

<sup>2</sup>Calculated 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](#).

	-		+	
	10%	Base Yield	10%	
<u>Price</u>	1800	2000	2200	
Operating Cost Breakeven	\$0.09	\$0.08	\$0.07	
Ownership Cost Breakeven	\$0.04	\$0.04	\$0.03	
Total Cost Breakeven	\$0.13	\$0.12	\$0.11	
<u>Yield</u>	\$0.09	\$0.10	\$0.11	
Operating Cost Breakeven	1788.0	1609.2	1462.9	
Ownership Cost Breakeven	845.9	761.3	692.1	
Total Cost Breakeven	2633.9	2370.5	2155.0	

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

Month	Operation	Tooling	Materials/Service
April	Cultivate/harrow/spray	350HP- WT, 36' Cultivator	Rental Sprayer, 3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate
April	Cultivate	350HP- WT, 36' Cultivator	
April	Rodweed	350HP-WT, 40' Rodweeder	
April	Harrow	350HP-WT, 50' Spike Harrow	
April	Drill	350HP-WT, 36' JD-455 Drill	200 lb Seed
April	Pack	350HP-WT, 36' Cultipacker	
June	Aerial Spray	Airplane	Custom Aerial, 1 lb Imidan 70, 0.33 pt Dimethoate
August	Harvest	30' Combine	
Sept	Chisel	350HP-WT, 23' Chisel Plow	

### 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	Taxes, Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$1.04	\$0.52	\$0.50	\$2.05	\$0.75	\$0.88	\$0.13	\$1.76	\$4.80	0.24	0.39	\$8.61
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.19	\$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	0.19	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.09	\$6.58
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.08	\$0.01	\$0.12	\$0.88	0.04	0.04	\$1.23
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.13	\$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	4.09	\$20.95
36' JD455 Drill	\$1.53	\$1.00	\$0.31	\$2.84	\$1.41	\$2.38	\$0.36	\$4.15	\$1.52	0.08	1.06	\$8.51
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$1.44	\$0.22	\$3.19	\$2.20	0.11	0.64	\$17.51
60' Flex Harrow	\$0.99	\$0.74	\$0.08	\$1.81	\$0.63	\$0.80	\$0.12	\$1.55	\$0.51	0.03	0.36	\$3.87
40' Rodweeder	\$0.78	\$0.59	\$0.08	\$1.45	\$0.59	\$1.73	\$0.26	\$2.58	\$1.10	0.06	0.77	\$5.13
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
36' Cultipacker	\$1.38	\$0.99	\$0.11	\$2.48	\$0.78	\$1.55	\$0.23	\$2.56	\$0.99	0.05	0.69	\$6.03
23' Chisel Plow	\$2.84	\$1.98	\$0.22	\$5.04	\$1.88	\$2.88	\$0.43	\$5.19	\$1.83	0.09	1.28	\$12.06
10-Btm Plow	\$4.20	\$3.26	\$0.39	\$7.85	\$4.94	\$6.20	\$0.93	\$12.07	\$3.95	0.20	2.76	\$23.87
50' Spike Harrow	\$0.55	\$0.41	\$0.06	\$1.02	\$0.34	\$0.77	\$0.12	\$1.23	\$0.68	0.03	0.34	\$2.93
40' Heavy Harrow	\$1.65	\$1.12	\$0.12	\$2.89	\$1.02	\$1.48	\$0.22	\$2.72	\$0.95	0.05	0.66	\$6.56
36' Ripper Shooter	\$0.84	\$0.68	\$0.12	\$1.64	\$0.51	\$1.45	\$0.22	\$2.18	\$0.93	0.05	0.64	\$4.75
90' Sprayer (Rental)	\$0.17	\$0.14	\$0.02	\$0.33	\$0.10	\$0.69	\$0.10	\$0.89	\$0.48	0.02	0.31	\$1.70
<b>Total:</b>	<b>\$31.47</b>	<b>\$20.34</b>	<b>\$5.50</b>	<b>\$57.28</b>	<b>\$19.69</b>	<b>\$34.48</b>	<b>\$5.17</b>	<b>\$59.34</b>	<b>\$31.74</b>	<b>1.59</b>	<b>15.33</b>	<b>\$148.36</b>

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations. In the spreadsheet version of this bulletin, per hour machinery costs can be changed in this

### Costs by Crop:

<b>Click on crop to see machinery costs by crop.</b>
<a href="#">Soft White Winter Wheat</a>
<a href="#">Soft White Spring Wheat</a>
<a href="#">Spring Barley</a>
<a href="#">Spring Peas</a>

Machinery Costs for Conventional Tillage <b>Soft White Winter Wheat</b> (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$1.04	\$0.52	\$0.50	\$2.05	\$0.75	\$0.88	\$0.13	\$1.76	\$4.80	0.24	0.39	\$8.61
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.19	\$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	0.19	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.09	\$6.58
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.08	\$0.01	\$0.12	\$0.88	0.04	0.04	\$1.23
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.13	\$1.84
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$1.44	\$0.22	\$3.19	\$2.20	0.11	0.64	\$17.51
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.53	\$1.00	\$0.31	\$2.84	\$1.41	\$2.38	\$0.36	\$4.15	\$1.52	0.08	1.06	\$8.51
40' Rodweeder	\$0.78	\$0.59	\$0.08	\$1.45	\$0.59	\$1.73	\$0.26	\$2.58	\$1.10	\$0.06	\$0.77	\$5.13
36' Ripper Shooter	\$0.84	\$0.68	\$0.12	\$1.64	\$0.51	\$1.45	\$0.22	\$2.18	\$0.93	0.05	0.64	\$4.75
60' Flex Harrow	\$0.99	\$0.74	\$0.08	\$1.81	\$0.63	\$0.80	\$0.12	\$1.55	\$0.51	\$0.03	\$0.36	\$3.87
90' Sprayer (Rental)	\$0.17	\$0.14	\$0.02	\$0.33	\$0.10	\$0.69	\$0.10	\$0.89	\$0.48	0.02	0.31	\$1.70
23' Chisel Plow	\$2.84	\$1.98	\$0.22	\$5.04	\$1.88	\$2.88	\$0.43	\$5.19	\$1.83	\$0.09	\$1.28	\$12.06
<b>Total:</b>	<b>\$20.64</b>	<b>\$12.11</b>	<b>\$4.43</b>	<b>\$37.15</b>	<b>\$10.71</b>	<b>\$13.68</b>	<b>\$2.05</b>	<b>\$26.44</b>	<b>\$18.33</b>	<b>0.92</b>	<b>6.08</b>	<b>\$81.92</b>

[Back to Costs by Crop](#)

Machinery Costs for Conventional Tillage <b>Soft White Spring Wheat</b> (\$/acre) from the University of Idaho Machinery Cost Calculator												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$1.04	\$0.52	\$0.50	\$2.05	\$0.75	\$0.88	\$0.13	\$1.76	\$4.80	0.24	0.39	\$8.61
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.19	\$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	0.19	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.09	\$6.58
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.08	\$0.01	\$0.12	\$0.88	0.04	0.04	\$1.23
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.13	\$1.84
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$1.44	\$0.22	\$3.19	\$2.20	0.11	0.64	\$17.51
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.53	\$1.00	\$0.31	\$2.84	\$1.41	\$2.38	\$0.36	\$4.15	\$1.52	0.08	1.06	\$8.51
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
40' Rodweeder	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	\$0.04	\$0.09	\$6.58
23' Chisel Plow	\$1.42	\$0.99	\$0.11	\$2.52	\$0.94	\$1.44	\$0.22	\$2.60	\$0.92	0.05	0.64	\$6.03
36' Ripper Shooter	\$0.84	\$0.68	\$0.12	\$1.64	\$0.51	\$1.45	\$0.22	\$2.18	\$0.93	0.05	0.64	\$4.75
90' Sprayer (Rental)	\$0.17	\$0.14	\$0.02	\$0.33	\$0.10	\$0.69	\$0.10	\$0.89	\$0.48	0.02	0.31	\$1.70
<b>Total:</b>	<b>\$21.95</b>	<b>\$12.73</b>	<b>\$5.06</b>	<b>\$39.71</b>	<b>\$11.15</b>	<b>\$13.12</b>	<b>\$1.96</b>	<b>\$26.23</b>	<b>\$19.73</b>	<b>0.99</b>	<b>5.83</b>	<b>\$85.67</b>

[Back to Costs by Crop](#)

<b>Machinery Costs for Conventional Tillage Spring Barley (\$/acre) from the University of Idaho Machinery Cost Calculator</b>												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$1.04	\$0.52	\$0.50	\$2.05	\$0.75	\$0.88	\$0.13	\$1.76	\$4.80	0.24	0.39	\$8.61
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.19	\$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	0.19	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.09	\$6.58
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.08	\$0.01	\$0.12	\$0.88	0.04	0.04	\$1.23
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.13	\$1.84
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$1.44	\$0.22	\$3.19	\$2.20	0.11	0.64	\$17.51
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.53	\$1.00	\$0.31	\$2.84	\$1.41	\$2.38	\$0.36	\$4.15	\$1.52	0.08	1.06	\$8.51
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
40' Rodweeder	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.08	\$0.01	\$0.12	\$0.88	\$0.04	\$0.04	\$1.23
23' Chisel Plow	\$1.42	\$0.99	\$0.11	\$2.52	\$0.94	\$1.44	\$0.22	\$2.60	\$0.92	0.05	0.64	\$6.03
36' Ripper Shooter	\$0.84	\$0.68	\$0.12	\$1.64	\$0.51	\$1.45	\$0.22	\$2.18	\$0.93	0.05	0.64	\$4.75
90' Sprayer (Rental)	\$0.17	\$0.14	\$0.02	\$0.33	\$0.10	\$0.69	\$0.10	\$0.89	\$0.48	0.02	0.31	\$1.70
<b>Total:</b>	<b>\$19.69</b>	<b>\$11.54</b>	<b>\$4.39</b>	<b>\$35.60</b>	<b>\$9.97</b>	<b>\$13.00</b>	<b>\$1.95</b>	<b>\$24.92</b>	<b>\$19.81</b>	<b>0.99</b>	<b>5.78</b>	<b>\$80.32</b>

[Back to Costs by Crop](#)

<b>Machinery Costs for Conventional Tillage Spring Peas (\$/acre) from the University of Idaho Machinery Cost Calculator</b>												
	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance, License	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$1.04	\$0.52	\$0.50	\$2.05	\$0.75	\$0.88	\$0.13	\$1.76	\$4.80	0.24	0.39	\$8.61
2-Ton Truck	\$1.20	\$0.77	\$0.42	\$2.39	\$1.00	\$0.42	\$0.06	\$1.48	\$1.20	0.06	0.19	\$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	0.19	\$5.06
Trap Wagon	\$2.40	\$1.26	\$0.68	\$4.34	\$1.20	\$0.21	\$0.03	\$1.44	\$0.80	0.04	0.09	\$6.58
4WD-ATV	\$0.15	\$0.07	\$0.01	\$0.23	\$0.03	\$0.08	\$0.01	\$0.12	\$0.88	0.04	0.04	\$1.23
50HP Wheel Tractor	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	0.04	0.13	\$1.84
30' Combine	\$7.45	\$3.41	\$1.27	\$12.12	\$1.53	\$1.44	\$0.22	\$3.19	\$2.20	0.11	0.64	\$17.51
<i>350HP Wheel Tractor with:</i>												
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
36' Cultivator	\$1.05	\$0.84	\$0.11	\$2.00	\$0.70	\$1.60	\$0.24	\$2.54	\$1.56	0.08	0.71	\$6.10
40' Rodweeder	\$0.23	\$0.26	\$0.04	\$0.53	\$0.08	\$0.30	\$0.05	\$0.43	\$0.88	\$0.04	\$0.13	\$1.84
50' Spike Harrow	\$0.55	\$0.41	\$0.06	\$1.02	\$0.34	\$0.77	\$0.12	\$1.23	\$0.68	\$0.03	\$0.34	\$2.93
36' JD455 Drill	\$1.53	\$1.00	\$0.31	\$2.84	\$1.41	\$2.38	\$0.36	\$4.15	\$1.52	0.08	1.06	\$8.51
36' Cultipacker	\$1.38	\$0.99	\$0.11	\$2.48	\$0.78	\$1.55	\$0.23	\$2.56	\$0.99	\$0.05	\$0.69	\$6.03
90' Sprayer (Rental)	\$0.17	\$0.14	\$0.02	\$0.33	\$0.10	\$0.69	\$0.10	\$0.89	\$0.48	0.02	0.31	\$1.70
23' Chisel Plow	\$1.42	\$0.99	\$0.11	\$2.52	\$0.94	\$1.44	\$0.22	\$2.60	\$0.92	0.05	0.64	\$6.03
<b>Total:</b>	<b>\$19.45</b>	<b>\$11.46</b>	<b>\$4.36</b>	<b>\$35.25</b>	<b>\$9.70</b>	<b>\$12.64</b>	<b>\$1.89</b>	<b>\$24.23</b>	<b>\$19.63</b>	<b>0.98</b>	<b>5.62</b>	<b>\$79.11</b>

[Back to Costs by Crop](#)

### Machinery Complement for Conventional 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	600	20,000	3,000	15	1.2	1.1	
<i>Equipment:</i>										
10-Bottom Plow	22,000	0	15	80	2,500	600	15	0.6	1.1	6
23' Chisel Plow	17,500	0	15	40	2,000	700	15	0.6	1.1	12
36' Cultivator	18,000	5	15	150	3,500	750	14	0.6	1.1	17
36' Cultipacker										
40' Heavy Harrow	20,000	0	15	40	2000	750	15	0.6	1.1	23
10-Bottom Plow	22,000	0	15	80	4000	1,800	15	0.6	1.1	6
60' Flex Harrow	15,500	0	15	25	2500	550	10	0.6	1.1	33
40' Rodweeder	15,500	5	15	125	2000	850	10	0.6	1.1	20
36' JD 455 Drill	35,000	0	12	180	5,000	2,800	15	3.0	1.2	15
30' Combine	225,000	5	10	240	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	