



Photo: Terry Day

2009 Crop Rotation Budgets for 15" to 18" Precipitation Zone Under Reduced Tillage, Eastern Washington

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

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 used in these calculations is presented in the last tab 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 7% interest charge made against this average investment 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>).

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 (reviewer), Doug Youg (reviewer) Richard Koenig (fertility), Dennis Roe (machinery), 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>

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

By Crop:	Total Cost of Operation		Yield (unit/ac)	Price* per unit	Revenue per acre (\$/acre)	Returns over TC (\$/acre)	Total Variable Costs (VC) (\$/acre)	Returns over VC (\$/acre)	Fixed Costs (\$/acre)	Labor (\$/acre)	Crop & Cost Share** Operator: Owner:	67% Share to operator 33% Share to owner
	(\$/ac/yr)	Unit										
Winter Wheat (WW)	\$326	bu	78	\$5.15	\$402	\$76	\$136	\$266	\$190	\$12	\$92	
Hard Red Spring Wheat (HRSW)	\$238	bu	42	\$6.34	\$266	\$29	\$157	\$109	\$80	\$15	\$54	
Spring Barley (SB)	\$183	ton	1.5	\$107.00	\$161	-\$23	\$134	\$26	\$49	\$15	\$23	
Chem Fallow (CF)**	\$69				\$0	-\$69	\$58	-\$58	\$10	\$9	\$0	

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

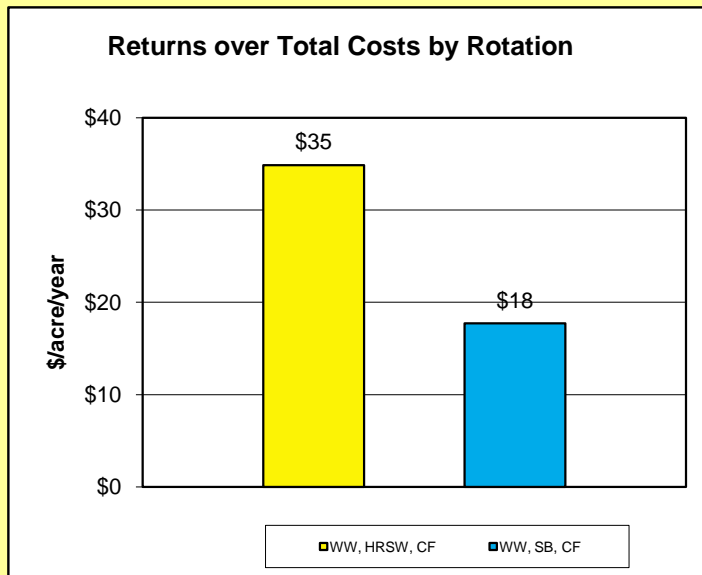
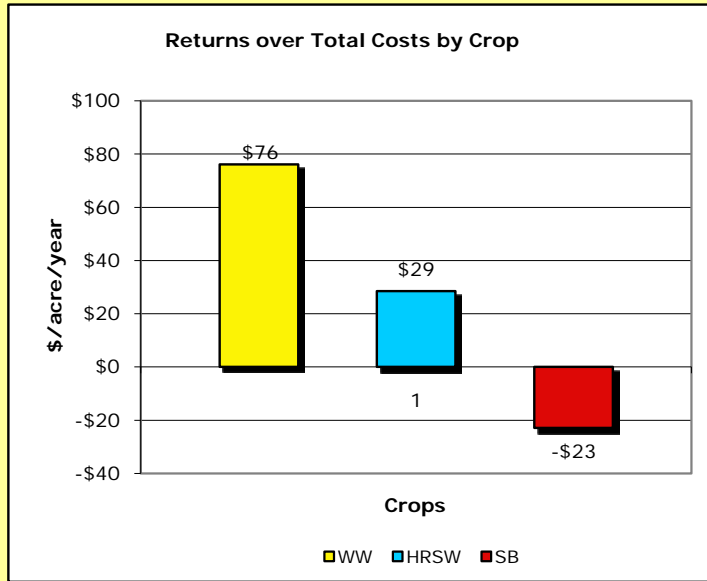
**In this crop- and cost-share arrangement, the landowner and the farm manager split the crop and the specified costs: fertilizer, chemicals and crop insurance.

***All chem fallow costs are included in the costs for producing winter wheat, plus one year's interest. These figures are for informational purposes only.

By Rotation:	Total Cost of Operation (\$/ac/yr)	Revenue per acre (\$/ac/yr)	Returns over TC (\$/ac/yr)	Total Variable Costs (VC) (\$/ac/yr)	Returns over VC (\$/ac/yr)	Fixed Costs (\$/ac/yr)	Labor (\$/ac/yr)	Land Payment (Cost-Share) (\$/ac/yr)
WW, HRSW, CF	\$188	\$223	\$35	\$117	\$125	\$94	\$12	\$49
WW, SB, CF	\$170	\$187	\$18	\$109	\$97	\$83	\$12	\$38

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

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



LEGEND:
 WW = Winter Wheat
 HRSW = Hard Red Spring Wheat
 SB = Spring Barley

Crop Prices (\$/bu):
 \$5.15
 \$6.34
 \$107.00

Input Prices

	Unit	2009 Price/unit
Fuel:		
Diesel	gal	\$1.75
Gas	gal	\$2.25
Seed:		
Wheat Seed	lb	\$0.15
Barley Seed	lb	\$0.12
Hard Red Spring Wheat	lb	\$0.22
Fertilizer:		
Nitrogen	lb	\$0.55
Phosphorous	lb	\$1.17
Sulfur	lb	\$0.23
Adjuvants:		
Crop Oil Concentrate	pt	\$1.00
Excel 90	oz	\$0.20
Ultra Pro	oz	\$0.02
Pesticides:		
2,4-D	oz	\$0.16
Ally	oz	\$10.00
Bronate	pt	\$7.68
Glyphosphate	oz	\$0.39
Maverick	oz	\$18.00
Poast	pt	\$9.38
Custom Rental:		
90' Rental Sprayer	acre	\$1.75
Fertilizer Applicator	acre	\$1.00
Cash Rent:		
	acre	\$0.00
Land Tax:		
	acre	\$3.90
Labor:		
Hourly machine labor*	hour	\$20.00
Interest:		
Operating Loan	%	7.50%
Machinery Loan/investment	%	7.50%

*Includes all applicable state and federal taxes.

Production Costs for Chemical Fallow, 15-18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Variable Costs				
Fertilizer:				\$0.00
				\$0.00
Pesticides:				\$31.17
Roundup	66	oz	\$0.39	\$25.74
Excel 90	9.6	oz	\$0.20	\$1.92
Ultra Pro	150	oz	\$0.02	\$3.51
				\$0.00
Machinery:				\$16.73
Fuel	1.70	gal	\$1.75	\$2.98
Lubricants	1	acre	\$0.71	\$0.71
Machinery Repairs	1	acre	\$4.40	\$4.40
Machinery Labor	0.43	acre	\$20.00	\$8.65
				\$0.00
Custom & Consultants:				\$5.25
Rental Sprayer	3	acre	\$1.75	\$5.25
				\$0.00
Other:				\$0.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
				\$0.00
Overhead ¹				\$2.66
Operating Interest ²				\$2.33
Total Variable Costs				\$58.14
Fixed Costs:				
Machinery depreciation				\$3.04
Machinery interest				\$2.94
Machinery insurance, taxes, housing, licenses				\$0.57
Land Taxes				\$3.90
Total Fixed Costs				\$10.45
Total Costs per Acre				\$68.59

Notes:

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

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

Cost of producing chemical fallow, plus a 9% interest charge, are added to the cost of wheat production.

Details on variable and fixed machinery costs, including fuel, repairs, and machine labor, are located in the

[Chemical Fallow Machinery Costs table.](#)

Schedule of Operations for Chemical Fallow Preceding Winter Wheat, 15-18" Precipitation

Month	Operation	Tooling	Materials/Service
March	Spray Weeds	350HP CHAL, 90' Sprayer	Rental Sprayer, 22 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro
May	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 22 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro
August	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 22 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro

Production Costs for Direct-Seeded Winter Wheat, 15-18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Wheat	78	bu	\$5.15	\$401.70
Variable Costs				
Seed:				\$12.00
Wheat Seed	80	lb	\$0.15	\$12.00
Fertilizer:				\$62.81
Nitrogen (dry)	93	lb	\$0.55	\$51.15
Phosphorous (dry)	8	lb	\$1.17	\$9.36
Sulfur (dry)	10	lb	\$0.23	\$2.30
				\$0.00
Pesticides:				\$9.14
2,4-D	20	oz	\$0.16	\$3.20
Maverick ¹	0.33	oz	\$18.00	\$5.94
				\$0.00
Machinery:				\$25.43
Fuel	3.30	gal	\$1.75	\$5.78
Lubricants	1	acre	\$1.43	\$1.43
Machinery Repairs	1	acre	\$5.73	\$5.73
Machinery Labor	0.62	gal	\$20.00	\$12.49
				\$0.00
Custom & Consultants:				\$4.50
Rental Sprayer	2	acre	\$1.75	\$3.50
Rental Fertilizer Applicator	1	acre	\$1.00	\$1.00
				\$0.00
Other:				\$8.42
Crop insurance ²	1	acre	\$8.42	\$8.42
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Overhead ³				\$6.12
Operating Interest ⁴				\$7.34
Total Variable Costs				\$135.75
Variable Costs per Unit				\$1.74
Net Returns Above Variable Costs				\$265.95

Production Costs for Direct-Seeded Winter Wheat, 15-18" Precipitation

Fixed Costs:				
Machinery depreciation				\$9.24
Machinery interest				\$8.09
Machinery insurance, taxes housing, licenses				\$2.03
Chemical Fallow Cost ⁵				\$74.76
Land Cost*	1	acre	\$91.85	\$91.85
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash Rent				\$0.00
Land Taxes				\$3.90
Total Fixed Costs				\$189.88
Fixed Costs per Unit				\$2.43
Total Costs per Acre				\$325.63
Total Cost per Unit				\$4.17
Returns to Risk				\$76.07

¹Maverick is applied at the rate of 2/3 oz per acre on every other wheat crop.

²Average Whitman County CRC insurance premium based on 2008 rates at 75% coverage.

³Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

⁴Calculated as 7% interest on operating capital for 6 months.

⁵Chem fallow cost is calculated as the total cost for fallow production plus 9% interest.

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

Breakeven Analysis:

	- 10%	Base Yield	+ 10%
<u>Price</u>	70.20	78	85.80
Operating Cost Breakeven	\$1.93	\$1.74	\$1.58
Ownership Cost Breakeven	\$2.70	\$2.43	\$2.21
Total Cost Breakeven	\$4.64	\$4.17	\$3.80
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$4.64	\$5.15	\$5.67
Operating Cost Breakeven	29.3	26.4	24.0
Ownership Cost Breakeven	41.0	36.9	33.5
Total Cost Breakeven	70.3	63.2	57.5

Schedule of Operations for Direct-Seeded Winter Wheat, 15-18" Precipitation

Month	Operation	Tooling	Materials/Service
September	Drill/Fertilize	350HP-CHAL 35' Direct Seed Drill	Rental Fertilizer Applicator, 80 lb seed, 93 lb N, 8 lb P, 10 lb S
November	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 10 oz 2,4-D
April	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 10 oz 2,4-D, 1/3 oz Maverick*
April	Crop Insurance		
August	Harvest	30' Combine	

Production Costs for Direct-Seeded Spring Barley, 15-18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Barley	1.5	ton	\$107.00	\$160.50
Variable Costs				
Seed:				\$9.60
Barley Seed	80	lb	\$0.12	\$9.60
Fertilizer:				\$47.00
Nitrogen	60	lb	\$0.55	\$33.00
Phosphorous	10	lb	\$1.17	\$11.70
Sulfur	10	lb	\$0.23	\$2.30
Pesticides:				\$26.64
2,4-D	8	oz	\$0.16	\$1.28
Bronate	1	pt	\$7.68	\$7.68
Excel 90	10.4	oz	\$0.20	\$2.08
Roundup	34	oz	\$0.39	\$13.26
Ultra Pro	100	oz	\$0.02	\$2.34
Machinery:				\$29.13
Fuel	3.64	gal	\$1.75	\$6.36
Lubricants	1	acre	\$1.56	\$1.56
Machinery Repairs	1	acre	\$6.49	\$6.49
Machinery Labor	0.74	acre	\$20.00	\$14.72
Custom & Consultants:				\$6.25
Rental Sprayer	3	acre	\$1.75	\$5.25
Rental Fertilizer Applicator	1	acre	\$1.00	\$1.00
Other:				\$4.83
Crop insurance ¹	1	acre	\$4.83	\$4.83
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Overhead ²				\$6.17
Operating Interest ³				\$4.63
Total Variable Costs				\$134.25
Variable Costs per Unit				\$89.50
Net Returns Above Variable Costs				\$26.25

Production Costs for Direct-Seeded Spring Barley, 15-18" Precipitation

Fixed Costs:				
Machinery depreciation				\$10.60
Machinery interest				\$9.13
Machinery insurance, taxes housing, licenses				\$2.32
Land Cost*	1	acre	\$23.17	\$23.17
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Land Rent				\$0.00
Land Taxes				\$3.90
Total Fixed Costs				\$49.12
Fixed Costs per Unit				\$32.75
Total Costs per Acre				\$183.38
Total Cost per Unit				\$122.25
Returns to Risk				-\$22.88

Notes:

¹Average Whitman County CRC insurance premium based on 2008 rates at 75% coverage.

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 [Spring Barley Machinery Costs table](#).

Breakeven Analysis:	-	Base	+
	10%	Yield	10%
<u>Price</u>	1.35	1.5	1.65
Operating Cost Breakeven	\$99.45	\$89.50	\$81.37
Ownership Cost Breakeven	\$36.39	\$32.75	\$29.77
Total Cost Breakeven	\$135.84	\$122.25	\$111.14
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$96.30	\$107.00	\$117.70
Operating Cost Breakeven	1.4	1.3	1.1
Ownership Cost Breakeven	0.5	0.5	0.4
Total Cost Breakeven	1.9	1.7	1.6

Schedule of Operations for Direct-Seeded Spring Barley, 15-18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Shred Straw	350HP-CHAL, 26' Mower	
October	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 12 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro
March	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 22 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro
May	Seed/Fertilize	350HP-CHAL, 35' Direct Seed Drill	Rental Fertilizer Applicator, 80 lb Barley Seed, 60 lb N, 10 lb P, 10 lb S
May	Crop Insurance		
May	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 8 oz 2,4-D, 1 pt Bronate, 4 oz Excel 90
August	Harvest	30' Combine	

Production Costs for Direct-Seeded Hard Red Spring Wheat, 15-18" Precipitation

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Hard Red Wheat	42	ton	\$6.34	\$266.28
Variable Costs				
Seed:				\$19.80
Hard Red Wheat Seed	90	lb	\$0.22	\$19.80
Fertilizer:				\$55.80
Nitrogen	76	lb	\$0.55	\$41.80
Phosphorous	10	lb	\$1.17	\$11.70
Sulfur	10	lb	\$0.23	\$2.30
Pesticides:				\$25.30
2,4-D	8	oz	\$0.16	\$1.28
Ally	0.1	oz	\$10.00	\$1.00
Bronate	1	pt	\$7.68	\$7.68
Excel 90	10.4	oz	\$0.20	\$2.08
Roundup	28	oz	\$0.39	\$10.92
Ultra Pro	100	oz	\$0.02	\$2.34
Machinery:				\$29.13
Fuel	3.64	gal	\$1.75	\$6.36
Lubricants	1	acre	\$1.56	\$1.56
Machinery Repairs	1	acre	\$6.49	\$6.49
Machinery Labor	0.74	acre	\$20.00	\$14.72
Custom & Consultants:				\$6.25
Rental Sprayer	3	acre	\$1.75	\$5.25
Rental Fertilizer Applicator	1	acre	\$1.00	\$1.00
Other:				\$8.42
Crop insurance ¹	1	acre	\$8.42	\$8.42
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Overhead ²				\$7.24
Operating Interest ³				\$5.43
Total Variable Costs				\$157.36
Variable Costs per Unit				\$3.75
Net Returns Above Variable Costs				\$108.92

Production Costs for Direct-Seeded Hard Red Spring Wheat, 15-18" Precipitation

Fixed Costs:				
Machinery depreciation				\$10.60
Machinery interest				\$9.13
Machinery insurance, taxes housing, licenses				\$2.32
Land Cost*	1	acre	\$54.43	\$54.43
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Cash Rent				\$0.00
Land Taxes				\$3.90
Total Fixed Costs				\$80.38
Fixed Costs per Unit				\$1.91
Total Costs per Acre				\$237.75
Total Cost per Unit				\$5.66
Returns to Risk				\$28.53

Notes:

¹Average Whitman County CRC insurance premium based on 2008 rates at 75% coverage.

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:

	- 10%	Base Yield	+ 10%
<u>Price</u>	37.80	42	46.20
Operating Cost Breakeven	\$4.16	\$3.75	\$3.41
Ownership Cost Breakeven	\$2.13	\$1.91	\$1.74
Total Cost Breakeven	\$6.29	\$5.66	\$5.15
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$5.71	\$6.34	\$6.97
Operating Cost Breakeven	27.6	24.8	22.6
Ownership Cost Breakeven	14.1	12.7	11.5
Total Cost Breakeven	41.7	37.5	34.1

Schedule of Operations for Hard Red Spring Wheat, 15-18" Precipitation

Month	Operation	Tooling	Materials/Service
October	Shred Straw	350HP-CHAL, 26' Mower	
October	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 12 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro
March	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 16 oz Roundup, 3.2 oz Excel 90, 50 oz Ultra Pro
April	Seed/Fertilize	350HP-CHAL 35' Direct Seed Drill	Rental Fertilizer Applicator, 90 lb Seed, 76 lb N, 10 lb P, 10 lb S
May	Crop Insurance		
May	Spray Weeds	350HP-CHAL, 90' Sprayer	Rental Sprayer, 8 oz 2,4-D, 0.1 oz Ally, 1 pt. Bronate, 4 oz Excel 90
August	Harvest	30' Combine	

Machinery Costs for Reduced Tillage Dryland Grain Farm in the 15" to 18" Rainfall Zone, Eastern Washington (\$/acre)

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

		Fixed Costs (\$/acre):			Variable Costs (\$/acre):						Total Costs (\$/acre)
Trucks:	Total Annual Usage (miles):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
0.75-Ton 4WD Pickup	22000	\$1.07	\$0.69	\$0.25	\$0.82	\$4.65	0.23	\$1.55	0.62	\$0.27	\$9.30
2-Ton Truck	1000	\$0.17	\$0.13	\$0.03	\$0.29	\$0.32	0.02	\$0.13	0.05	\$0.02	\$1.09
Tandem Axle Truck	2000	\$0.75	\$1.25	\$0.09	\$2.86	\$0.63	0.03	\$0.26	0.11	\$0.05	\$5.89
Trap Wagon	1000	\$0.34	\$0.23	\$0.10	\$0.11	\$0.32	0.02	\$0.14	0.06	\$0.03	\$1.27
Tractors, other equipment:	Total Annual Usage (hours):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
4WD-ATV	200	\$0.16	\$0.10	\$0.01	\$0.03	\$1.04	0.05	\$0.20	0.08	\$0.04	\$1.57
50HP-WT	100	\$0.16	\$0.24	\$0.03	\$0.06	\$0.58	0.03	\$0.20	0.08	\$0.03	\$1.30
350HP-Challenger	250	\$0.84	\$0.68	\$0.12	\$0.51	\$0.93	0.05	\$2.21	0.88	\$0.39	\$5.66
35' Direct Seed Drill	150	\$1.91	\$1.59	\$0.42	\$0.58	\$1.22	0.06	\$2.01	0.81	\$0.36	\$8.09
30' Combine	240	\$4.42	\$3.66	\$1.06	\$0.83	\$2.99	0.15	\$2.58	1.03	\$0.46	\$15.99
72' Harrow	30	\$0.86	\$0.57	\$0.05	\$0.39	\$0.42	0.02	\$0.74	0.30	\$0.11	\$3.15
26' Rotary Mower	75	\$1.23	\$0.94	\$0.27	\$0.68	\$1.86	0.09	\$0.24	0.10	\$0.04	\$6.50
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38

Note: Farm size is assumed to be 3500 acres for the purposes of machinery cost calculations.

Costs by Crop:

Machinery costs by operation and by crop are listed below:
Chem Fallow
Winter Wheat
Spring Barley
Hard Red Spring Wheat

Machinery Costs for Reduced Tillage **Chemical Fallow in the 15" to 18" Rainfall Zone, Eastern Washington (\$/acre)**

		Fixed Costs (\$/acre):			Variable Costs (\$/acre):						Total Costs (\$/acre)
<i>Trucks:</i>	Total Annual Usage (miles):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
0.75-Ton 4WD Pickup	22000	\$1.07	\$0.69	\$0.25	\$0.82	\$4.65	0.23	\$1.55	0.62	\$0.27	\$9.30
2-Ton Truck	1000	\$0.17	\$0.13	\$0.03	\$0.29	\$0.32	0.02	\$0.13	0.05	\$0.02	\$1.09
Tandem Axle Truck	2000	\$0.75	\$1.25	\$0.09	\$2.86	\$0.63	0.03	\$0.26	0.11	\$0.05	\$5.89
Trap Wagon	1000	\$0.34	\$0.23	\$0.10	\$0.11	\$0.32	0.02	\$0.14	0.06	\$0.03	\$1.27
<i>Tractors, other equipment:</i>	Total Annual Usage (hours):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
4WD-ATV	200	\$0.16	\$0.10	\$0.01	\$0.03	\$1.04	0.05	\$0.20	0.08	\$0.04	\$1.57
50HP-WT	100	\$0.16	\$0.24	\$0.03	\$0.06	\$0.58	0.03	\$0.20	0.08	\$0.03	\$1.30
<i>350 HP-Challenger with:</i>											
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
Total		\$3.04	\$2.94	\$0.57	\$4.40	\$8.65	0.43	\$4.25	1.70	\$0.71	\$24.56

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Machinery Costs for Reduced Tillage *Winter Wheat* in the 15" to 18" Rainfall Zone, Eastern Washington (\$/acre)

		Fixed Costs (\$/acre):			Variable Costs (\$/acre):						Total Costs (\$/acre)
<i>Trucks:</i>	Total Annual Usage (miles):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
0.75-Ton 4WD Pickup	22000	\$1.07	\$0.69	\$0.25	\$0.82	\$4.65	0.23	\$1.55	0.62	\$0.27	\$9.30
2-Ton Truck	1000	\$0.17	\$0.13	\$0.03	\$0.29	\$0.32	0.02	\$0.13	0.05	\$0.02	\$1.09
Tandem Axle Truck	2000	\$0.75	\$1.25	\$0.09	\$2.86	\$0.63	0.03	\$0.26	0.11	\$0.05	\$5.89
Trap Wagon	1000	\$0.34	\$0.23	\$0.10	\$0.11	\$0.32	0.02	\$0.14	0.06	\$0.03	\$1.27
<i>Tractors, other equipment:</i>	Total Annual Usage (hours):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
4WD-ATV	200	\$0.16	\$0.10	\$0.01	\$0.03	\$1.04	0.05	\$0.20	0.08	\$0.04	\$1.57
50HP-WT	100	\$0.16	\$0.24	\$0.03	\$0.06	\$0.58	0.03	\$0.20	0.08	\$0.03	\$1.30
30' Combine	240	\$4.42	\$3.66	\$1.06	\$0.83	\$2.99	0.15	\$2.58	1.03	\$0.46	\$15.99
<i>350 HP-Challenger with:</i>											
35' Direct Seed Drill	150	\$1.91	\$1.59	\$0.42	\$0.58	\$1.22	0.06	\$2.01	0.81	\$0.36	\$8.09
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
Total		\$9.24	\$8.09	\$2.03	\$5.73	\$12.49	0.62	\$8.26	3.30	\$1.43	\$47.26

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Machinery Costs for Reduced Tillage Spring Barley in the 15" to 18" Rainfall Zone, Eastern Washington (\$/acre)

		Fixed Costs (\$/acre):			Variable Costs (\$/acre):						Total Costs (\$/acre)
	Total Annual Usage (miles):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
Trucks:											
0.75-Ton 4WD Pickup	22000	\$1.07	\$0.69	\$0.25	\$0.82	\$4.65	0.23	\$1.55	0.62	\$0.27	\$9.30
2-Ton Truck	1000	\$0.17	\$0.13	\$0.03	\$0.29	\$0.32	0.02	\$0.13	0.05	\$0.02	\$1.09
Tandem Axle Truck	2000	\$0.75	\$1.25	\$0.09	\$2.86	\$0.63	0.03	\$0.26	0.11	\$0.05	\$5.89
Trap Wagon	1000	\$0.34	\$0.23	\$0.10	\$0.11	\$0.32	0.02	\$0.14	0.06	\$0.03	\$1.27
Tractors, other equipment:											
	Total Annual Usage (hours):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
4WD-ATV	200	\$0.16	\$0.10	\$0.01	\$0.03	\$1.04	0.05	\$0.20	0.08	\$0.04	\$1.57
50HP-WT	100	\$0.16	\$0.24	\$0.03	\$0.06	\$0.58	0.03	\$0.20	0.08	\$0.03	\$1.30
30' Combine	240	\$4.42	\$3.66	\$1.06	\$0.83	\$2.99	0.15	\$2.58	1.03	\$0.46	\$15.99
<i>350 HP-Challenger with:</i>											
35' Direct Seed Drill	150	\$1.91	\$1.59	\$0.42	\$0.58	\$1.22	0.06	\$2.01	0.81	\$0.36	\$8.09
26' Rotary Mower	75	\$1.23	\$0.94	\$0.27	\$0.68	\$1.86	0.09	\$0.24	0.10	\$0.04	\$6.50
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
Total		\$10.60	\$9.13	\$2.32	\$6.49	\$14.72	0.74	\$9.09	3.64	\$1.56	\$55.14

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Machinery Costs for Reduced Tillage **Hard Red Spring Wheat in the 15" to 18" Rainfall Zone, Eastern Washington (\$/acre)**

		Fixed Costs (\$/acre):			Variable Costs (\$/acre):						Total Costs (\$/acre)
<i>Trucks:</i>	Total Annual Usage (miles):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
0.75-Ton 4WD Pickup	22000	\$1.07	\$0.69	\$0.25	\$0.82	\$4.65	0.23	\$1.55	0.62	\$0.27	\$9.30
2-Ton Truck	1000	\$0.17	\$0.13	\$0.03	\$0.29	\$0.32	0.02	\$0.13	0.05	\$0.02	\$1.09
Tandem Axle Truck	2000	\$0.75	\$1.25	\$0.09	\$2.86	\$0.63	0.03	\$0.26	0.11	\$0.05	\$5.89
Trap Wagon	1000	\$0.34	\$0.23	\$0.10	\$0.11	\$0.32	0.02	\$0.14	0.06	\$0.03	\$1.27
<i>Tractors, other equipment:</i>	Total Annual Usage (hours):	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Repairs (\$/acre)	Labor (\$/acre)	Labor (hr/acre)	Fuel (\$/acre)	Fuel (gal/acre)	Lub (\$/acre)	Total Cost
4WD-ATV	200	\$0.16	\$0.10	\$0.01	\$0.03	\$1.04	0.05	\$0.20	0.08	\$0.04	\$1.57
50HP-WT	100	\$0.16	\$0.24	\$0.03	\$0.06	\$0.58	0.03	\$0.20	0.08	\$0.03	\$1.30
30' Combine	240	\$4.42	\$3.66	\$1.06	\$0.83	\$2.99	0.15	\$2.58	1.03	\$0.46	\$15.99
<i>350 HP-Challenger with:</i>											
35' Direct Seed Drill	150	\$1.91	\$1.59	\$0.42	\$0.58	\$1.22	0.06	\$2.01	0.81	\$0.36	\$8.09
26' Rotary Mower	75	\$1.23	\$0.94	\$0.27	\$0.68	\$1.86	0.09	\$0.24	0.10	\$0.04	\$6.50
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
90' Sprayer	150	\$0.13	\$0.10	\$0.02	\$0.08	\$0.37	0.02	\$0.59	0.24	\$0.09	\$1.38
Total		\$10.60	\$9.13	\$2.32	\$6.49	\$14.72	0.74	\$9.09	3.64	\$1.56	\$55.14

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Machinery Complement for Reduced Tillage Dryland Grain Farm in the 15" to 18" Rainfall Zone, 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	200	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 Challenger	95,000	0	15	250	20,000	1,200	11	1.2	1.1	
<i>Equipment:</i>										
26' Mower	18,000	0	15	65	3000	750	12	2.5	1.2	18
72' Harrow	15,500	0	12	30	2500	550	12	0.6	1.1	52
35' Direct Seed Drill	30,000	5	10	150	10,000	1,000	13	3	1.2	15
30' Combine	225,000	5	15	240	30,000	4,000	7	2.6	1.2	11
<i>Trucks:</i>										
				Miles/year:			MPG:			
2-Ton Truck	20,000	15	15	1000	2,000	1,000	6		1.1	25
Tandem Axle Truck	35,000	15	15	2000	4,500	2,000	6	10.1	1.1	
Trap Wagon	15,000	10	10	500	3,000	400	12	3.8	1.1	20
3/4-Ton Pickup	22,000	5	7	12000	7,500	1,500	12	6.8	1.1	5