

University of Idaho

College of Agricultural *and* Life Sciences



Enterprise Budgets for the Dryland Grain Annual Cropping Region of the Pacific Northwest Using Conservation Tillage, 2016 Crop and Input Prices

Click on link below to access the following budgets:

[Soft White Winter Wheat](#)

[Hard Red Winter Wheat](#)

[Soft White Spring Wheat](#)

[Dark Northern Spring Wheat](#)

[Feed Barley](#)

[Lentils](#)

[Spring Peas](#)

[Austrian Winter Peas](#)

[Chickpeas](#)

[Spring Canola](#)

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Instructions and Assumptions for Using Enterprise Budgets and Cost Calculators

General 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

Background and Specific Assumptions:

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price represents a forecast for 2016. The costs and returns estimates shown here are typical for growing grain and rotational crops in northern Idaho.

Production practices most closely represent those in Latah County. Production practices may be similar among individual farms, but each has a unique set of resources with varying levels of productivity and production problems, and therefore, slightly different costs. Farm size, crop rotation, age and type of equipment, soils, and quality of management are crucial factors that influence production costs.

The Model Farm

This costs and returns estimate models a 2500-acre farm in a typical 3-year rotation of winter wheat followed by a spring grain and then a legume or another alternative to grain such as canola or mustard. In a typical year equal proportions would be devoted to each crop. Crop choices will vary by year, depending on relative crop prices and other management considerations. Returns for typical rotations are listed in Table 1 Summary of Returns by Crop and Rotation (\$/acre).

Input Prices:

By entering input prices on the Input Prices sheet, all of the cost calculations will be automatically updated in the spreadsheet version of this report. Input cost changes can also be made on individual crop price sheets, over-riding the input cost formula on that particular crop budget. Input costs are based on a survey of input suppliers for each region.

Crop Prices:

Crop prices can be adjusted on the Summary tab and the effects of this change will be reflected throughout all the budgets. (Yields can be adjusted similarly.) Crop prices are typically based on five-year average prices received by Idaho growers, with adjustments by region and for some contract crops.

Machinery Costs:

Fixed and variable costs of machinery operation are calculated using a budget calculator program. Details on the machinery complement assumptions, usage, years of life, repair costs, fuel usage, etc., are available in the pdf file for each crop.

Land Costs:

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

A typical lease agreement in 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. 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 input price increases as well as cropping choices affect revenue for landlords and operators differently. Note that pea, lentil, and chickpea crop-share arrangements are typically 25/75.

Labor Costs:

Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. This rate can easily be changed on the Input Prices tab.

Interest Costs:

Interest on operating capital is charged on total operating costs for six months for spring crops and for nine months for winter crops. The operating interest rate can be changed on the Input Prices sheet in the spreadsheet version of this bulletin. A general overhead charge of 5 percent of operating expenses is included to cover unallocated costs such as office expenses, phone service, legal and accounting fees, and utilities.

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. 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 operation, etc.

Color Coding:

A color coding system is used to indicate the source of the data for each budget and to show which data can be adjusted in the spreadsheet version of this report. Data in orange type can be changed without affecting the underlying equations in this cost calculator. Data with purple type are from the Summary sheet (Table 1). In the Summary sheet, crop price and yield have orange type. Adjusting any of those numbers will automatically update all calculations throughout the spreadsheet so you can quickly compare price and yield changes on net returns. Input prices can be easily updated by making changes in the green Input Prices sheet (Table 2). All calculations will again be updated throughout the spreadsheet. You will notice that data from the Input Prices tab appears in green ink on the Budget sheets.

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. My colleagues at the University of Idaho, particularly Research Scientists Jim Davis and Traci Rauch, provided critical recommendations on herbicides, pesticides, and seeding rates. However, I take responsibility for any errors in these budgets. Please feel free to contact me with any comments or suggestions.

Budget spreadsheets are available at the following link:

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

Table 1. Summary of Returns by Crop and Rotation (\$/acre)

By Crop:	Unit	Yield per acre	2016 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** (\$/acre)	Percentage Share
<u>Soft White Winter Wheat (SWWW)</u>	bu	80	\$3.61	\$289	\$371	-\$82	\$265	\$24	\$50	67/33
<u>Hard Red Winter Wheat (HRWW)</u>	bu	75	\$4.60	\$345	\$412	-\$67	\$312	\$33	\$43	67/33
<u>Soft White Spring Wheat (SWSW)</u>	bu	58	\$3.61	\$209	\$290	-\$80	\$214	-\$5	\$24	67/33
<u>Hard Red Spring Wheat (HRSW)</u>	bu	58	\$4.72	\$274	\$337	-\$64	\$249	\$25	\$37	67/33
<u>Spring Barley (SB)</u>	ton	1.5	\$92.00	\$138	\$246	-\$108	\$193	-\$55	\$9	67/33
<u>Peas (P)</u>	lb	1700	\$0.12	\$204	\$297	-\$93	\$213	-\$9	\$34	75/25
<u>Lentils (L)</u>	lb	1100	\$0.30	\$333	\$321	\$11	\$145	\$188	\$69	75/25
<u>Chickpeas (CP)</u>	lb	1200	\$0.32	\$384	\$344	\$40	\$204	\$180	\$81	75/25
<u>Spring Canola (SC)</u>	lb	1500	\$0.16	\$240	\$325	-\$85	\$230	\$10	\$42	67/33

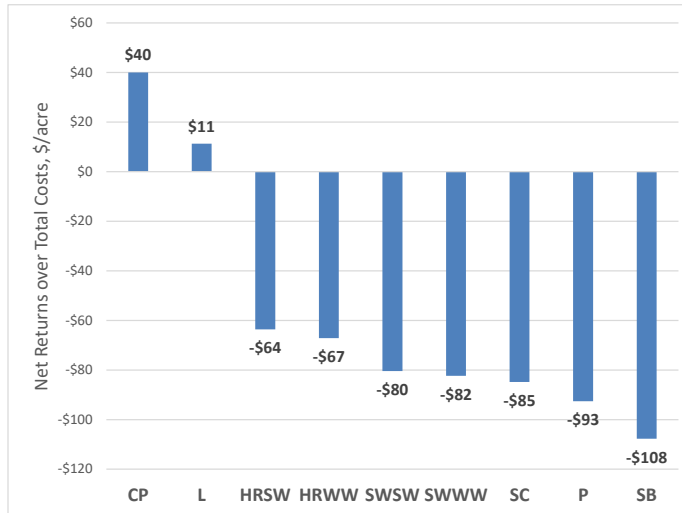
*Average farmgate prices for Washington, Oregon, and Idaho for 2011-2015. Sources: USDA-NASS and USDA-AMS.

**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.

Select the 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)
HRWW, HRSW, CP	\$334	\$365	-\$30	\$255	\$79	\$54
SWWW, SWSW, CP	\$294	\$335	-\$41	\$228	\$66	\$52

Click here for drop down menus.

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



LEGEND:
 Soft White Winter Wheat (SWWW)
 Hard Red Winter Wheat (HRWW)
 Soft White Spring Wheat (SWSW)
 Hard Red Spring Wheat (HRSW)
 Spring Barley (SB)
 Lentils (L)
 Peas (P)
 Chickpeas (CP)
 Spring Canola (SC)

Crop Prices:
 Soft White Winter Wheat (SWWW) \$3.61
 Hard Red Winter Wheat (HRWW) \$4.60
 Soft White Spring Wheat (SWSW) \$3.61
 Hard Red Spring Wheat (HRSW) \$4.72
 Spring Barley (SB) \$92.00
 Lentils (L) \$0.30
 Peas (P) \$0.12
 Chickpeas (CP) \$0.32
 Spring Canola (SC) \$0.16

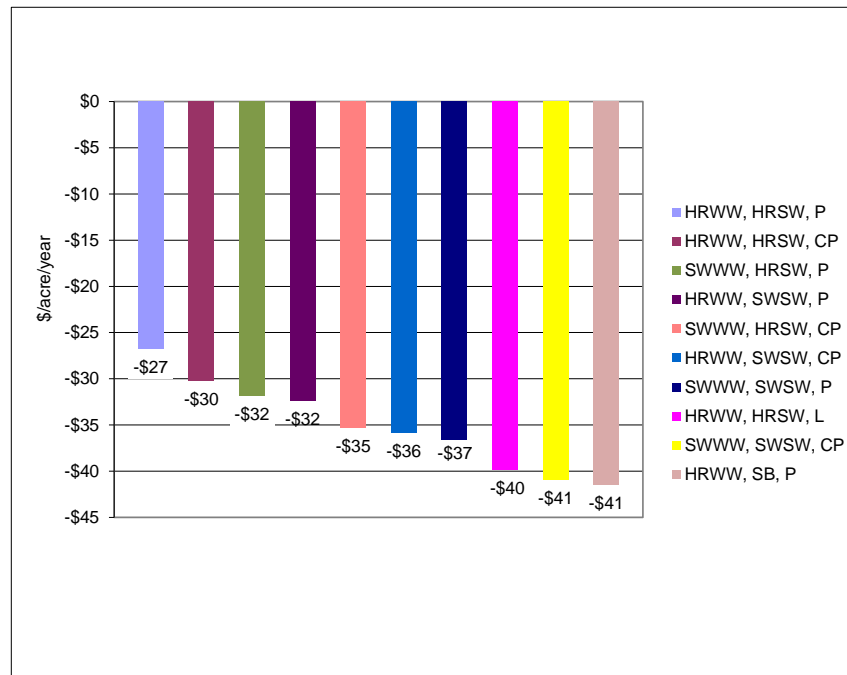


Table 2. Input Cost Assumptions

Item	Unit	2016 cost/unit
Fuel:		
Diesel, offroad, bulk (gal)	gal	\$2.00
Gas (gal)	gal	\$2.35
Seed:		
Soft White Winter Wheat (PVPs)	lb	\$0.26
Soft White Spring Wheat (PVPs)	lb	\$0.26
Dark Northern Spring Wheat (PVP)	lb	\$0.30
Barley Seed (Champion)	lb	\$0.26
Spring Pea Seed	lb	\$0.38
Lentil Seed	lb	\$0.41
Garbanzo Seed, large	lb	\$0.60
Canola Seed, Roundup Ready	lb	\$11.00
Fertilizer:		
Nitrogen, anhydrous	lb	\$0.59
Nitrogen, liquid (32-0-0)	lb	\$0.72
Phosphorous (liquid)	lb	\$0.71
Sulfur (liquid)	lb	\$0.53
Potassium (dry)	lb	\$0.31
Adjuvants:		
Amm. Sulf. (20-0-0-24)	lb	\$0.22
Amm. Sulf. (liquid)	oz	\$0.05
Crop Oil Concentrate	pt	\$1.88
Surfactant	oz	\$0.23
Syltac Sticker	pt	\$6.25
Custom Rental:		
Custom Aerial	acre	\$8.95
Custom Ground Spray	acre	\$8.50
Fertilizer Applicator	acre	\$1.00
26' Rental Shredder	acre	\$10.00
36' Ripper Shooter	acre	\$2.50
90' Rental Sprayer	acre	\$2.00

Table 2. Input Cost Assumptions

Item	Unit	2016 cost/unit	
Pesticides:			
2,4-DB	oz	\$0.29	herbicide
Achieve SC	oz	\$1.17	herbicide
Ally 60 XP	oz	\$11.98	herbicide
Asana XL	oz	\$0.88	insecticide
Assure II EC	oz	\$0.86	herbicide
Axial XL	oz	\$1.39	herbicide
Basagran	oz	\$0.57	herbicide
Bronate (Brox M)	oz	\$0.38	herbicide
Bronate Advanced (Brox M Ultra)	pt	\$6.88	herbicide
Capture LFR	oz	\$2.64	insecticide
Dimethoate 4EC	pt	\$8.40	insecticide
Discover .5 EC	oz	\$1.47	herbicide
FarGO 4EC	qt	\$16.66	herbicide
Finesse	oz	\$17.34	herbicide
Glyphosphate (R-up Power Max.)	oz	\$0.18	herbicide
Headline	oz	\$3.66	fungicide
Imidan 70	lb	\$15.41	insecticide
Lorox DF	lb	\$1.57	herbicide
Maverick	oz	\$20.77	herbicide
Montana 2F	oz	\$0.70	insecticide
Mustang Max	oz	\$2.04	insecticide
Osprey	oz	\$4.31	herbicide
Poast 1.5 EC	pt	\$16.77	herbicide
Prowl 3.3 EC	oz	\$0.46	herbicide
Pursuit WDG	oz	\$3.53	herbicide
Rhomene (MCPA Amine, 4 lb/gal)	oz	\$0.24	herbicide
Quadris Opti	oz	\$1.06	fungicide
Quilt	oz	\$1.78	fungicide
Starane Flex	oz	\$0.67	herbicide
Crop Insurance¹:			
Winter wheat	acre	\$20.00	
Soft white spring wheat	acre	\$16.00	
Hard red spring wheat	acre	\$17.00	
Feed barley	acre	\$16.00	
Oats	acre	\$7.00	
Spring peas	acre	\$22.00	
Austrian winter peas	acre	\$20.00	
Spring lentils	acre	\$22.00	
Garbanzos	acre	\$22.00	
Spring canola	acre	\$18.00	
Yellow mustard	acre	\$20.00	
Labor²:			
Hourly machine labor	hour	\$20.00	
Other labor	hour	\$17.00	
Overhead:			
Overhead ³	percent	2.50%	

Table 2. Input Cost Assumptions

Item	Unit	2016 cost/unit
Management fee:		
Management fee ⁴	percent	5%
Cash rent:		
Cash rent	acre	\$0.00
Operating Loan	percent	5.75%
Machinery Loan/investment	percent	6.00%

¹Crop insurance estimates include multi-peril crop insurance covering 85% of production for most crops (with the exception of 75% for pulses) plus fire and hail insurance.

²Includes all applicable state and federal taxes.

Table 3. Production Costs for Soft White Winter Wheat, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Wheat	80	bu	\$3.61	\$288.80
Variable Costs				
Seed:				\$23.40
Wheat Seed	90	lb	\$0.26	\$23.40
Fertilizer:				\$79.70
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	90	lb	\$0.59	\$53.10
Phosphorous	30	lb	\$0.71	\$21.30
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				\$36.56
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Osprey	4.75	oz	\$4.31	\$20.47
Starane Flex	22.00	oz	\$0.67	\$14.74
Surfactant	3.20	oz	\$0.23	\$0.74
Brox M	1.60	oz	\$0.38	\$0.61
Fungicides:				\$28.05
Quilt	14.00	oz	\$1.78	\$24.92
Syltac Sticker	0.50	pt	\$6.25	\$3.13
Machinery:				\$55.65
Fuel	10.79	gal	\$2.00	\$21.57
Lubricants	1	acre	\$3.35	\$3.35
Machinery Repairs	1	acre	\$9.31	\$9.31
Machinery Labor	1.07	hour	\$20.00	\$21.42
Custom & Consultants:				\$11.45
Custom Aerial	1	acre	\$8.95	\$8.95
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Other:				\$20.00
Crop insurance	1	acre	\$20.00	\$20.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$9.78
Total Variable Costs				\$264.58
Variable Costs per Unit				\$3.31
Net Returns Above Variable Costs				\$24.22

Table 3. Production Costs for Soft White Winter Wheat, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery payments		acre	\$18.12	\$18.12
Machinery interest on investment		acre	\$13.36	\$13.36
Machinery taxes, insurance, housing, licenses		acre	\$5.14	\$5.14
Land Cost*		acre	\$50.00	\$50.00
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Overhead ²				\$6.00
Management fee ³				\$14.00
Total Fixed Costs				\$106.61
Fixed Costs per Unit				\$1.33
Total Costs per Acre				\$371.19
Total Cost per Unit				\$4.64
Net Returns over Total Costs, or Returns to Risk				-\$82.39

Notes:

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

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:	-		+	
	10%	Base Yield	10%	
<u>Price</u>	72.00	80	88.00	
Operating Cost Breakeven	\$3.67	\$3.31	\$3.01	
Ownership Cost Breakeven	\$1.48	\$1.33	\$1.21	
Total Cost Breakeven	\$5.16	\$4.64	\$4.22	
	10%	Base Price	10%	
<u>Yield</u>	\$3.25	\$3.61	\$3.97	
Operating Cost Breakeven	81.4	73.3	66.6	
Ownership Cost Breakeven	32.8	29.5	26.8	
Total Cost Breakeven	114.2	102.8	93.5	

Table 4. Schedule of Operations for Soft White Winter Wheat, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
September	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 90 lb N, 30 lb P, 10 lb S
September	Cultiweed	350HP-WT, 36' Cultiweeder	
September	Drill	350HP-WT, 36' JD-455 Drill	90 lb Seed
April	Crop Insurance		
April	Spray Weeds	200HP-WT, 100' Sprayer	4.75 oz Osprey, 22 oz Starane+Salvo, 3.2 oz Excel 90, 1.6 oz Brox M
June	Aerial Spray	Airplane	Custom Aerial, 14 oz Quilt, .5 pt Syltac Sticker
August	Harvest	30' Combine	

Acres: 2300

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

Purple: Data are from Summary page (purple tab).

Orange Type: You may adjust data in orange type & all other data will be updated.

Green: Data are from Input costs page (green tab).

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

Table 5. Production Costs for Hard Red Winter Wheat, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Wheat	80	bu	\$3.61	\$288.80
Variable Costs				
Seed:				\$24.70
Wheat Seed	95	lb	\$0.26	\$24.70
Fertilizer:				\$102.70
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen, anhydrous, lb N	120	lb	\$0.59	\$70.80
Phosphorous	30	lb	\$0.71	\$21.30
Sulfur	20	lb	\$0.53	\$10.60
Nitrogen, topdress, aqua, lb N	30	lb	\$0.72	\$21.60
Pesticides:				\$36.56
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Osprey	4.75	oz	\$4.31	\$20.47
Starane Flex	22.00	oz	\$0.67	\$14.74
Surfactant	3.20	oz	\$0.23	\$0.74
Brox M	1.60	oz	\$0.38	\$0.61
Fungicides:				\$28.05
Quilt	14.00	oz	\$1.78	\$24.92
Syltac Sticker	0.50	pt	\$6.25	\$3.13
Machinery:				\$55.65
Fuel	10.79	gal	\$2.00	\$21.57
Lubricants	1	acre	\$3.35	\$3.35
Machinery Repairs	1	acre	\$9.31	\$9.31
Machinery Labor	1.07	hour	\$20.00	\$21.42
Custom & Consultants:				\$11.45
Custom Aerial	1	acre	\$8.95	\$8.95
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Other:				\$20.00
Crop insurance	1	acre	\$20.00	\$20.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$10.83
Total Variable Costs				\$311.53
Variable Costs per Unit				\$3.89
Net Returns Above Variable Costs				-\$22.73

Ownership Costs:

Machinery payments	acre	\$18.12	\$18.12
Machinery interest on investment	acre	\$13.36	\$13.36
Machinery taxes, insurance, housing, licenses	acre	\$5.14	\$5.14
Land Cost*	acre	\$43.00	\$43.00
*Based on Share Rent Percentage:			
Landlord		33.00%	
Tenant		67.00%	
Overhead ²			\$7.00
Management fee ³			\$14.00
Total Fixed Costs			\$100.61
Fixed Costs per Unit			\$1.26
Total Costs per Acre			\$412.14
Total Cost per Unit			\$5.15
Net Returns over Total Costs, or Returns to Risk			-\$123.34

Notes:

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

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-	Base	+
	10%	Yield	10%
<u>Price</u>	72.00	80	88.00
Operating Cost Breakeven	\$4.33	\$3.89	\$3.54
Ownership Cost Breakeven	\$1.40	\$1.26	\$1.14
Total Cost Breakeven	\$5.72	\$5.15	\$4.68
	10%	Base	10%
<u>Yield</u>	\$3.25	Price	\$3.97
Operating Cost Breakeven	95.9	86.3	78.5
Ownership Cost Breakeven	31.0	27.9	25.3
Total Cost Breakeven	126.9	114.2	103.8

Table 6. Schedule of Operations for Hard Red Winter Wheat, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
September	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 120 lb N, 30 lb P, 20 lb S
September	Cultiweed	350HP-WT, 36' Cultiweeder	
September	Drill	350HP-WT, 36' JD-455 Drill	95 lb Seed
April	Crop Insurance		
April	Topdress, Spray Weeds	200HP-WT, 100' Sprayer	4.75 oz Osprey, 22 oz Starane+Salvo, 3.2 oz Excel 90, 1.6 oz Brox M, 30 lb N (aqua)
June	Aerial Spray	Airplane	Custom Aerial, 14 oz Quilt, .5 pt Syltac Sticker
August	Harvest	30' Combine	
October	Plow	350HP-WT, 10-Bottom Plow	We assume that approximately half of the land is plowed (bottom lands).
October	Chisel	350HP-WT, 23' Chisel Plow	We assume that approximately half of the land is chiseled (hills).

Table 5. Production Costs for Soft White Spring Wheat, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Soft White Wheat	55	bu	\$3.61	\$198.55
Variable Costs				
Seed:				
Soft White Wheat Seed	80	lb	\$0.26	\$20.80
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Potassium	20	lb	\$0.31	\$6.20
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Roundup	24.0	oz	\$0.18	\$4.32
Surfactant	6.4	oz	\$0.23	\$1.47
Ammonium Sulfate	1.7	lb	\$0.22	\$0.37
Axial	8.2	oz	\$1.39	\$11.40
Brox M	12.0	oz	\$0.38	\$4.56
Starane	8.0	oz	\$0.67	\$5.36
InPlace	5.0	oz	\$0.05	\$0.25
Ammonium Sulfate	3.2	oz	\$0.05	\$0.16
Fungicides:				
Quilt ¹	7.0	oz	\$1.78	\$12.46
Syltac	0.5	pt	\$6.25	\$3.13
Machinery:				
Fuel	10.35	gal	\$2.00	\$20.69
Lubricants	1	acre	\$3.21	\$3.21
Machinery Repairs	1	acre	\$7.97	\$7.97
Machinery Labor	0.99	hour	\$20.00	\$19.79
Custom & Consultants:				
Rental Sprayer	0.0	acre	\$2.00	\$0.00
Custom Aerial	0.5	acre	\$8.95	\$4.48
Rental Ripper Shooter	1.0	acre	\$2.50	\$2.50
Other:				
Crop insurance	1	acre	\$16.00	\$16.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ²				\$5.90
Total Variable Costs				\$214.17
Variable Costs per Unit				\$3.89
Net Returns Above Variable Costs				-\$15.62

Table 6. Schedule of Operations for Soft White Spring Wheat, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
March	Spray Weeds	200HP-WT, 100' Sprayer	24 oz Roundup, 6.4 oz Surfactant, 1.7 lb Ammonium Sulfate
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 80 lb N, 15 lb P, 20 lb K, 10 lb S
April	Cultivate/Spray/Harrow	350HP-WT, 36' Cultivator with Harrow	
May	Drill	350HP-WT, 36' JD-455 Drill	80 lb seed
May	Crop Insurance		
May	Spray Weeds	200HP-WT, 100' 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, .5 pt Syltac Sticker
August	Harvest	30' Combine	

Table 7. Production Costs for Hard Red Spring Wheat, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Hard Red Wheat	58	bu	\$4.72	\$273.76
Variable Costs				
Seed:				
Hard Red Wheat Seed	100	lb	\$0.30	\$30.00
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	130	lb	\$0.59	\$76.70
Phosphorous	15	lb	\$0.71	\$10.65
Potassium	20	lb	\$0.31	\$6.20
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Roundup	24	oz	\$0.18	\$4.32
Surfactant	7.4	oz	\$0.23	\$1.70
Ammonium Sulfate	3.4	lb	\$0.22	\$0.75
Axial	8.2	oz	\$1.39	\$11.40
Brox M	12	oz	\$0.38	\$4.56
Starane	8	oz	\$0.67	\$5.36
Fungicides:				
Headline ¹	6	oz	\$2.70	\$16.20
				\$0.00
Machinery:				
Fuel	7.68	gal	\$2.00	\$15.36
Lubricants	1	acre	\$3.44	\$3.44
Machinery Repairs	1	acre	\$7.05	\$7.05
Machinery Labor	0.79	hour	\$20.00	\$15.80
Truck Driver Labor	0.36	hour	\$13.00	\$4.68
Custom & Consultants:				
Rental Sprayer	0	acre	\$2.00	\$0.00
Custom Aerial	0.5	acre	\$8.95	\$4.48
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Other:				
Crop insurance	1	acre	\$17.00	\$17.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ²				\$5.29
Total Variable Costs				\$248.73
Variable Costs per Unit				\$4.29
Net Returns Above Variable Costs				\$25.03

Table 7. Production Costs for Hard Red Spring Wheat, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation		acre	\$15.22	\$15.22
Machinery interest on investment		acre	\$11.46	\$11.46
Machinery taxes, insurance, housing, licenses		acre	\$4.95	\$4.95
Land Cost*		acre	\$37.00	\$37.00
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Overhead ³				\$6.00
Management fee ⁴				\$14.00
Total Fixed Costs				\$88.63
Fixed Costs per Unit				\$1.53
Total Costs per Acre				\$337.37
Total Cost per Unit				\$5.82
Returns to Risk				-\$63.61

Notes:

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

²Calculated as 5.75% interest on operating capital for 6 months.

³Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

⁴The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:			
	- 10%	Base Yield	+ 10%
<u>Price</u>	52.20	58	63.80
Operating Cost Breakeven	\$4.77	\$4.29	\$3.90
Ownership Cost Breakeven	\$1.70	\$1.53	\$1.39
Total Cost Breakeven	\$6.46	\$5.82	\$5.29
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$4.25	\$4.72	\$5.19
Operating Cost Breakeven	58.6	52.7	47.9
Ownership Cost Breakeven	20.9	18.8	17.1
Total Cost Breakeven	79.4	71.5	65.0

Table 8. Schedule of Operations for Hard Red Spring Wheat, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
March	Spray Weeds	200HP-WT, 100' Sprayer	24 oz Roundup, 6.4 oz Surfactant, 1.7 lb Ammonium Sulfate
April	Cultivate/Harrow	350HP- WT, 36' Cultivator with Harrow	
April	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 130 lb N, 15 lb P, 20 lb K, 10 lb S
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
May	Drill	350HP-WT, 36' JD-455 Drill	100 lb Seed
May	Crop Insurance		
May	Spray Weeds	200HP-WT, 100' Sprayer	8.2 oz Axial, 12 oz Brox M, 8 oz Starane, 5 oz InPlace, 3.2 oz Amm. Sulf
June	Aerial Spray*	Airplane	Custom Aerial, 14 oz Quilt, .5 pt Syltac Sticker
August	Harvest	30' Combine	

Table 9. Production Costs for Spring Barley, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Barley	1.5	ton	\$92.00	\$138.00
Variable Costs				
Seed:				\$22.10
Barley Seed	85	lb	\$0.26	\$22.10
Fertilizer:				\$63.15
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				\$32.30
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Roundup	24	oz	\$0.18	\$4.32
Surfactant	6.4	oz	\$0.23	\$1.47
Ammonium Sulfate	1.7	lb	\$0.22	\$0.37
Axial	8.2	oz	\$1.39	\$11.40
Starane Flex	22	oz	\$0.67	\$14.74
Machinery:				\$51.66
Fuel	10.35	gal	\$2.00	\$20.69
Lubricants	1	acre	\$3.21	\$3.21
Machinery Repairs	1	acre	\$7.97	\$7.97
Machinery Labor	0.99	hour	\$20.00	\$19.79
Custom & Consultants:				\$2.50
Rental Sprayer	0	acre	\$2.00	\$0.00
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Other:				\$16.00
Crop insurance	1	acre	\$16.00	\$16.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$5.40
Total Variable Costs				\$193.12
Variable Costs per Unit				\$128.74
Net Returns Above Variable Costs				-\$55.12

Table 10. Schedule of Operations for Spring Barley, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
March	Spray Weeds	200HP-WT, 100' Sprayer	24 oz Roundup, 6.4 oz Surfactant, 1.7 lb Ammonium Sulfate
April	Cultivate/Harrow	350HP- WT, 36' Cultivator with Harrow	
April	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 80 lb N, 15 lb P, 10 lb S
April	Cultivate/Spray/Harrow	350HP- WT, 36' Cultivator with Harrow	
May	Drill	350HP-WT, 36' JD-455 Drill	85 lb Seed
May	Crop Insurance		
May	Spray Weeds	200HP-WT, 100' Sprayer	8.2 oz Axial, 22 oz Starane+Sword
August	Harvest	30' Combine	

Table 11. Production Costs for Spring Peas, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Peas	1700	lb	\$0.120	\$204.00
Variable Costs				
Seed:				\$76.00
Pea Seed	200	lb	\$0.38	\$76.00
Fertilizer:				\$0.00
				\$0.00
				\$0.00
Pesticides:				\$46.72
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Pursuit	3	oz	\$3.53	\$10.59
Prowl	24	oz	\$0.46	\$11.04
Ammonium Sulfate	50	oz	\$0.02	\$1.00
Surfactant	1.5	oz	\$0.23	\$0.35
Imidan 70	1	lb	\$15.41	\$15.41
Dimethoate	0.3	pt	\$8.40	\$2.77
Far-GO	1	qt	\$5.56	\$5.56
Machinery:				\$53.22
Fuel	10.39	gal	\$2.00	\$20.77
Lubricants	1	acre	\$3.23	\$3.23
Machinery Repairs	1	acre	\$9.35	\$9.35
Machinery Labor	0.99	hour	\$20.00	\$19.87
				\$0.00
Custom & Consultants:				\$8.95
Rental Sprayer	0	acre	\$2.00	\$0.00
Custom Aerial	1	acre	\$8.95	\$8.95
				\$0.00
Other:				\$22.00
Crop insurance	1	acre	\$22.00	\$22.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$5.95
Total Variable Costs				\$212.84
Variable Costs per Unit				\$0.13
Net Returns Above Variable Costs				-\$8.84

Table 11. Production Costs for Spring Peas, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Depreciation		acre	17.04	\$17.04
Interest		acre	12.64	\$12.64
Taxes, insurance, housing, licenses		acre	5.06	\$5.06
Land Cost*		acre	\$34.00	\$34.00
*Based on Share Rent Percentage:				
Landlord	25.00%			
Tenant	75.00%			
Overhead ²				\$5.00
Management fee ³				\$10.00
Total Fixed Costs				\$83.74
Fixed Costs per Unit				\$0.05
Total Costs per Acre				\$296.59
Total Cost per Unit				\$0.17
Returns to Risk				-\$92.59

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:			
	- 10%	Base Yield	+ 10%
<u>Price</u>	1530	1700	1870
Operating Cost Breakeven	\$0.14	\$0.13	\$0.11
Ownership Cost Breakeven	\$0.05	\$0.05	\$0.04
Total Cost Breakeven	\$0.19	\$0.17	\$0.16
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.11	\$0.12	\$0.13
Operating Cost Breakeven	1970.8	1773.7	1612.4
Ownership Cost Breakeven	775.4	697.9	634.4
Total Cost Breakeven	2746.2	2471.6	2246.9

Table 12. Schedule of Operations for Spring Peas, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
October	Harrow	350HP-WT, 40' Heavy Harrow	
April	Harrow	200HP-WT, 60' Flex Harrow	
April	Cultivate/Harrow	350HP- WT, 36' Cultivator with Harrow	
April	Cultivate/Spray/Harrow	350HP-WT, 36' Cultivator with Harrow, 90' Sprayer	1 qt FarGO
April	Spray	200HP-WT, 100' Sprayer	3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate, 1.5 oz M90
May	Drill	350HP-WT, 36' JD-455 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	

Table 13. Production Costs for Austrian Winter Peas, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Austrian Winter Peas	2000	lb	\$0.25	\$500.00
Variable Costs				
Seed:				\$38.00
Austrian Winter Pea Seed	100	lb	\$0.38	\$38.00
Fertilizer:				\$0.00
				\$0.00
				\$0.00
Pesticides:				\$57.52
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Basagran	24.00	oz	\$0.57	\$13.68
Crop Oil Concentrate	6.40	oz	\$1.88	\$12.03
Buffer Spectrum pH	1.00	oz	\$0.23	\$0.23
Assure II	14.00	oz	\$0.86	\$12.04
Roundup	12.00	oz	\$0.18	\$2.16
Montana 2F	2.80	oz	\$0.70	\$1.96
Imidan 70	1	lb	\$15.41	\$15.41
Machinery:				\$58.02
Fuel	11.60	gal	\$2.00	\$23.19
Lubricants	1	acre	\$3.58	\$3.58
Machinery Repairs	1	acre	\$9.84	\$9.84
Machinery Labor	1.07	hour	\$20.00	\$21.41
				\$0.00
Custom & Consultants:				\$25.40
Custom Aerial	2	acre	\$8.95	\$17.90
Custom Spray	1	acre	\$7.50	\$7.50
Other:				\$20.00
Crop insurance	1	acre	\$20.00	\$20.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$8.58
Total Variable Costs				\$207.51
Variable Costs per Unit				\$0.10
Net Returns Above Variable Costs				\$292.49

Ownership Costs:

Depreciation	acre	18.00	\$18.00
Interest	acre	13.60	\$13.60
Taxes, insurance, housing, licenses	acre	5.19	\$5.19
Capital recovery	acre	\$46.36	\$46.36
Land Cost*	acre	\$106.00	\$106.00

*Based on Share Rent Percentage:

Landlord	25.00%
Tenant	75.00%

Overhead ²	\$5.00
Management fee ³	\$25.00

Total Fixed Costs	\$219.15
Fixed Costs per Unit	\$0.11

Total Costs per Acre	\$426.67
Total Cost per Unit	\$0.21

Returns to Risk	\$73.33
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Notes:

¹Calculated as 5.75% interest on operating capital for 9 months.²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.³The management fee is calculated as a 5% of gross revenue.**Breakeven Analysis:**

	-	Base	+
	10%	Yield	10%
<u>Price</u>	1800	2000	2200
Operating Cost Breakeven	\$0.12	\$0.10	\$0.09
Ownership Cost Breakeven	\$0.12	\$0.11	\$0.10
Total Cost Breakeven	\$0.24	\$0.21	\$0.19
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$0.23	\$0.25	\$0.28
Operating Cost Breakeven	922.3	830.0	754.6
Ownership Cost Breakeven	974.0	876.6	796.9
Total Cost Breakeven	1896.3	1706.7	1551.5

Table 14. Schedule of Operations for Austrian Winter Peas, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
Sept	Chisel	350HP-WT, 23' Chisel	
Sept	Cultivate/Harrow	350HP- WT, 36' Cultivator with Harrow	
Sept	Cultivate/Harrow	350HP- WT, 36' Cultivator with Harrow and sprayer	
Sept	Spray Roundup	200HP-WT, 100' Sprayer	12 oz Roundup
Sept	Drill	350HP-WT, 36' JD-455 Drill	100 lb Seed
June	Spray Weeds	Custom ground spray	24 oz Basagran 14 oz Assure II
May	Crop Insurance		
June	Aerial Spray	Pea leaf weevil spray	Custom Aerial, 1 lb Imidan 70
July	Aerial Spray	Aphid or pea weevil spray	Custom Aerial, 2.8 oz Montana 2F

Table 15. Production Costs for Spring Lentils, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Lentils	1100	lb	\$0.302	\$332.53
Variable Costs				
Seed:				\$18.45
Lentil Seed	45	lb	\$0.41	\$18.45
Fertilizer:				\$0.00
				\$0.00
Pesticides:				\$36.09
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Pursuit	3	oz	\$3.53	\$10.59
Prowl	24	oz	\$0.46	\$11.04
Ammonium Sulfate	50	oz	\$0.0031	\$0.16
Surfactant	1.5	oz	\$0.23	\$0.35
Dimethoate	1	pt	\$8.40	\$8.40
Far-GO	1	qt	\$5.56	\$5.56
Machinery:				\$53.22
Fuel	10.39	gal	\$2.00	\$20.77
Lubricants	1	acre	\$3.23	\$3.23
Machinery Repairs	1	acre	\$9.35	\$9.35
Machinery Labor	0.99	hour	\$20.00	\$19.87
				\$0.00
Custom & Consultants:				\$10.95
Rental Sprayer	1	acre	\$2.00	\$2.00
Custom Aerial Spray	1	acre	\$8.95	\$8.95
				\$0.00
Other:				\$22.00
Crop insurance	1	acre	\$22.00	\$22.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$4.05
Total Variable Costs				\$144.76
Variable Costs per Unit				\$0.13
Net Returns Above Variable Costs				\$187.77

Table 15. Production Costs for Spring Lentils, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Depreciation		acre	17.04	\$17.04
Interest		acre	12.64	\$12.64
Taxes, insurance, housing, licenses		acre	5.06	\$5.06
Capital recovery		acre	\$51.75	\$51.75
Land Cost*		acre	\$69.00	\$69.00
*Based on Share Rent Percentage:				
Landlord	25.00%			
Tenant	75.00%			
Overhead ²				\$4.00
Management fee ³				\$17.00
Total Fixed Costs				\$176.49
Fixed Costs per Unit				\$0.16
Total Costs per Acre				\$321.26
Total Cost per Unit				\$0.29
Returns to Risk				\$11.27

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	- 10%	Base Yield	+ 10%
<u>Price</u>	990	1100	1210
Operating Cost Breakeven	\$0.15	\$0.13	\$0.12
Ownership Cost Breakeven	\$0.18	\$0.16	\$0.15
Total Cost Breakeven	\$0.32	\$0.29	\$0.27
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.27	\$0.30	\$0.33
Operating Cost Breakeven	532.1	478.9	435.3
Ownership Cost Breakeven	648.7	583.8	530.8
Total Cost Breakeven	1180.8	1062.7	966.1

Table 16. Schedule of Operations for Spring Lentils, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
October	Harrow	350HP-WT, 40' Heavy Harrow	
April	Harrow	350HP-WT, 60' Flex Harrow	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Cultivate/Spray/Harrow	350HP-WT, Cultivator with Harrow	
April	Spray	200HP-WT, 100' Sprayer	3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate, 1.5 oz M90
May	Drill	350HP-WT, 36' JD-455 Drill	45 lb Seed
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, 1 pt Dimethoate
August	Harvest	30' Combine	

Table 17. Production Costs for Chickpeas, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Garbanzos	1200	lb	\$0.32	\$384.00
Variable Costs				
Seed:				\$78.00
Garbanzo Seed	130	lb	\$0.60	\$78.00
Fertilizer:				\$0.00
				\$0.00
Pesticides:				\$27.69
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Pursuit	3	oz	\$3.53	\$10.59
Prowl	24	oz	\$0.46	\$11.04
Ammonium Sulfate	50	oz	\$0.0031	\$0.16
Surfactant	1.5	oz	\$0.23	\$0.35
Far-GO	1	qt	\$5.56	\$5.56
Fungicide:				\$8.48
Quadris	8	oz	\$1.06	\$8.48
				\$0.00
Machinery:				\$53.22
Fuel	10.39	gal	\$2.00	\$20.77
Lubricants	1	acre	\$3.23	\$3.23
Machinery Repairs	1	acre	\$9.35	\$9.35
Machinery Labor	0.99	hour	\$20.00	\$19.87
				\$0.00
Custom & Consultants:				\$8.95
Rental Sprayer	0	acre	\$2.00	\$0.00
Custom Aerial Spray	1	acre	\$8.95	\$8.95
				\$0.00
Other:				\$22.00
Crop insurance	1	acre	\$22.00	\$22.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$5.70
Total Variable Costs				\$204.05
Variable Costs per Unit				\$0.17
Net Returns Above Variable Costs				\$179.95

Table 18. Schedule of Operations for Chickpeas, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
October	Harrow	350HP-WT, 40' Heavy Harrow	
April	Harrow	350HP-WT, 60' Flex Harrow	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Spray	200HP-WT, 100' Sprayer	Rental Sprayer, 3 oz Pursuit, 24 oz Prowl, 50 oz Ammonium Sulfate, 1.5 oz M90
May	Drill	350HP-WT, 36' JD-455 Drill	130 lb Seed
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, 8 oz Quadris Fungicide
August	Harvest	30' Combine	

Table 19. Production Costs for Roundup Ready Spring Canola, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Canola	1500	lb	\$0.16	\$240.00
Variable Costs				
Seed:				\$44.00
Canola Seed, Roundup Ready	4	lb	\$11.00	\$44.00
Fertilizer:				\$77.60
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	100	lb	\$0.59	\$59.00
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	15	lb	\$0.53	\$7.95
Pesticides:				\$15.86
<i>Rates & chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Roundup	12	oz	\$0.18	\$2.16
Ammonium Sulfate	50	oz	\$0.0031	\$0.16
Surfactant	1.5	oz	\$0.23	\$0.35
Capture	5	oz	\$2.64	\$13.20
Machinery:				\$56.43
Fuel	11.38	gal	\$2.00	\$22.75
Lubricants	1	acre	\$3.53	\$3.53
Machinery Repairs	1	acre	\$9.39	\$9.39
Machinery Labor	1.04	hour	\$20.00	\$20.76
Custom & Consultants:				\$11.45
Rental Sprayer	0	acre	\$2.00	\$0.00
Custom Aerial Spray	1	acre	\$8.95	\$8.95
Rental Ripper Shooter	1	acre	\$2.50	\$2.50
Other:				\$18.00
Crop insurance	1	acre	\$18.00	\$18.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00
Operating Interest ¹				\$6.42
Total Variable Costs				\$229.76
Variable Costs per Unit				\$0.15
Net Returns Above Variable Costs				\$10.24

Table 19. Production Costs for Roundup Ready Spring Canola, Annual Cropping Region

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Depreciation		acre	17.21	\$17.21
Interest		acre	12.73	\$12.73
Taxes, insurance, housing, licenses		acre	5.09	\$5.09
Land Cost*		acre	\$42.00	\$42.00
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Overhead ²				\$6.00
Management fee ³				\$12.00
Total Fixed Costs				\$95.03
Fixed Costs per Unit				\$0.06
Total Costs per Acre				\$324.80
Total Cost per Unit				\$0.22
Returns to Risk				-\$84.80

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:			
	-	Base Yield	+
	10%		10%
<u>Price</u>	1350	1500	1650
Operating Cost Breakeven	\$0.17	\$0.15	\$0.14
Ownership Cost Breakeven	\$0.07	\$0.06	\$0.06
Total Cost Breakeven	\$0.24	\$0.22	\$0.20
	10%	Base Price	10%
<u>Yield</u>	\$0.14	\$0.16	\$0.18
Operating Cost Breakeven	1595.6	1436.0	1305.5
Ownership Cost Breakeven	660.0	594.0	540.0
Total Cost Breakeven	2255.5	2030.0	1845.4

Table 20. Schedule of Operations for Spring Canola, Annual Cropping Region

Month	Operation	Tooling	Materials/Service
October	Harrow	350HP-WT, 40' Heavy Harrow	
April	Harrow	350HP-WT, 60' Flex Harrow	
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Ripper Shooter	350HP-WT, 36' Ripper Shooter	Rental Ripper Shooter, 100 lb N, 15 lb P, 15 lb S
April	Cultivate/Harrow	350HP-WT, 36' Cultivator with Harrow	
April	Spray	200HP-WT, 100' Sprayer	Rental Sprayer, 12 oz Roundup Orig Max, 50 oz Ammonium Sulfate, 1.5 oz M90
May	Drill	350HP-WT, 36' JD-455 Drill	4 lb Canola Seed, Roundup Ready
May	Crop Insurance		
June	Aerial Spray	Custom	Custom Aerial, 5 oz Capture
August	Harvest*	30' Combine	

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

Table 21. Machinery Complement for Annual Cropping Region, Dryland Grain Rotations

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	7,000	0	10	150	2,000	100	1.2	1.2	1.1	
50HP-WT w/Bucket	16,000	5	20	150	3,500	300	3	1.2	1.1	
200HP FWA Tractor	85,000	2	10	300	40,000	1000	9	1.2	1.1	
350HP-WT	110,000	5	10	550	45,000	3,000	15	1.2	1.1	
<i>Equipment:</i>										
Bankout Wagon	15,000	0	15	100	3,000	500	10	0.6	1.1	-
10-Bottom Plow	18,000	10	15	80	5,000	600	15	0.6	1.1	7
23' Chisel Plow	18,500	0	15	40	2,000	700	15	0.6	1.1	12
36' Cultivator w/Harrow	19,200	5	15	150	3,500	750	15	0.6	1.1	17
36' Cultiweeder, used	23,500	5	15	35	4,000	750	9	0.6	1.1	26
40' Heavy Harrow	21,500	0	15	40	2000	750	15	0.6	1.1	23
60' Flex Harrow	10,000	5	15	25	1000	550	9	0.6	1.1	37
100' Pull Sprayer	35,000	0	20	200	5000	1,700	8	0.6	1.2	51
40' Ripper Shooter (Rental)	-	-	-	-	-	-	14	-	1.2	19
36' JD 455 Drill	40,000	2	10	180	10,000	2,800	15	3.0	1.2	16
36' Combine	300,000	2	10	250	100,000	7,500	10	2.6	1.25	13
<i>Trucks:</i>										
				Miles/year:			MPG:			
2-Ton Truck	20,000	15	15	1,000	2,000	1,250	6	10.1	1.2	
40'Grain Trailer+Tractor	35,000	10	15	7,500	14,500	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	23,000	5	7	12,000	7,500	1,500	12	6.8	1.2	

Table 22. Machinery Costs (\$/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	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Bankout Wagon w/ 350HP	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor w/ Bucket	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
36' JD455 Drill w/ 350HP	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
60' Flex Harrow w/ 200HP	\$0.96	\$0.81	\$0.11	\$1.88	\$0.86	\$0.85	\$0.13	\$1.84	\$0.59	0.03	0.43	\$4.31
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator w/ 350HP	\$2.01	\$1.56	\$0.19	\$3.76	\$0.96	\$1.21	\$0.18	\$2.35	\$0.85	0.06	0.61	\$6.96
23' Chisel Plow w/ 350HP	\$2.95	\$2.23	\$0.27	\$5.45	\$1.91	\$4.48	\$0.67	\$7.06	\$1.83	0.13	2.24	\$14.34
10 Bottom Plow w/ 350HP	\$3.26	\$2.76	\$0.36	\$6.38	\$1.86	\$7.72	\$1.16	\$10.74	\$3.16	0.24	3.86	\$20.28
40' Heavy Harrow w/ 350HP	\$1.91	\$1.26	\$0.15	\$3.32	\$1.04	\$2.31	\$0.35	\$3.70	\$0.95	0.06	1.16	\$7.97
36' Ripper Shooter w/ 350HP	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
100' Sprayer w/ 200HP	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
Total:	\$24.98	\$18.80	\$5.84	\$49.62	\$13.73	\$34.56	\$5.18	\$53.47	\$22.08	1.42	16.89	\$125.17

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 master table and they will be updated throughout the bulletin. Per acre costs are calculated in the Machine Cost program using the values listed in the Machinery Complement tab.

Costs by Crop:

<i>Click on crop to see machinery costs by crop.</i>
Soft White Winter Wheat
Hard Red Winter Wheat
Soft White Spring Wheat
Hard Red Spring Wheat
Spring Barley
Spring Peas
Austrian Winter Peas
Spring Lentils
Chickpeas
Spring Canola

Table 23. Machinery Costs for Conventional Tillage Soft White Winter Wheat (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' Cultivator	\$2.01	\$1.56	\$0.19	\$3.76	\$0.96	\$1.21	\$0.18	\$2.35	\$0.85	0.06	0.61	\$6.96
36' Ripper Shooter (Rental)	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
23' Chisel Plow	\$1.48	\$1.12	\$0.14	\$2.73	\$0.96	\$2.24	\$0.34	\$3.53	\$0.92	0.06	1.12	\$7.17
10 Bottom Plow	\$1.63	\$1.38	\$0.18	\$3.19	\$0.93	\$3.86	\$0.58	\$5.37	\$1.58	0.12	1.93	\$10.14
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
100' Spayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$18.12	\$13.36	\$5.14	\$36.61	\$9.31	\$22.36	\$3.35	\$35.02	\$16.73	1.07	10.79	\$88.35

Table 24. Machinery Costs for Conventional Tillage Hard Red Winter Wheat (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' Cultivator	\$2.01	\$1.56	\$0.19	\$3.76	\$0.96	\$1.21	\$0.18	\$2.35	\$0.85	0.06	0.61	\$6.96
36' Ripper Shooter (Rental)	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
23' Chisel Plow	\$1.48	\$1.12	\$0.14	\$2.73	\$0.96	\$2.24	\$0.34	\$3.53	\$0.92	0.06	1.12	\$7.17
10 Bottom Plow	\$1.63	\$1.38	\$0.18	\$3.19	\$0.93	\$3.86	\$0.58	\$5.37	\$1.58	0.12	1.93	\$10.14
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
100' Spayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$18.12	\$13.36	\$5.14	\$36.61	\$9.31	\$22.36	\$3.35	\$35.02	\$16.73	1.07	10.79	\$88.35

Table 25. Machinery Costs for Conventional Tillage Soft White Spring Wheat (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Ripper Shooter (Rental)	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$15.22	\$11.46	\$4.95	\$31.63	\$7.97	\$21.48	\$3.21	\$32.66	\$16.45	0.99	10.35	\$80.74

Table 26. Machinery Costs for Conventional Tillage Hard Red Spring Wheat (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Ripper Shooter (Rental)	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$15.22	\$11.46	\$4.95	\$31.63	\$7.97	\$21.48	\$3.21	\$32.66	\$16.45	0.99	10.35	\$80.74

Table 27. Machinery Costs for Conventional Tillage Spring Barley (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Ripper Shooter (Rental)	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$15.22	\$11.46	\$4.95	\$31.63	\$7.97	\$21.48	\$3.21	\$32.66	\$16.45	0.99	10.35	\$80.74

Table 28. Machinery Costs for Conventional Tillage Spring Peas (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
40' Heavy Harrow	\$1.91	\$1.26	\$0.15	\$3.32	\$1.04	\$2.31	\$0.35	\$3.70	\$0.95	0.06	1.16	\$7.97
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
60' Flex Harrow	\$0.96	\$0.81	\$0.11	\$1.88	\$0.86	\$0.85	\$0.13	\$1.84	\$0.59	0.03	0.43	\$4.31
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$17.04	\$12.64	\$5.06	\$34.74	\$9.35	\$21.56	\$3.23	\$34.14	\$16.43	0.99	10.39	\$85.31

Table 29. Machinery Costs for Conventional Tillage Austrian Winter Peas (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
23' Chisel Plow w/ 350HP	\$2.95	\$2.23	\$0.27	\$5.45	\$1.91	\$4.48	\$0.67	\$7.06	\$1.83	\$0.13	\$2.24	\$14.34
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
Bankout Wagon w/ 350HP	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$18.00	\$13.60	\$5.19	\$36.79	\$9.84	\$23.98	\$3.58	\$37.40	\$17.58	1.07	11.60	\$91.77

Table 30. Machinery Costs for Conventional Tillage Spring Lentils (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Bankout Wagon w/ 350HP	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
40' Heavy Harrow	\$1.91	\$1.26	\$0.15	\$3.32	\$1.04	\$2.31	\$0.35	\$3.70	\$0.95	0.06	1.16	\$7.97
<i>200HP Wheel Tractor with:</i>												
60' Flex Harrow	\$0.96	\$0.81	\$0.11	\$1.88	\$0.86	\$0.85	\$0.13	\$1.84	\$0.59	0.03	0.43	\$4.31
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$17.04	\$12.64	\$5.06	\$34.74	\$9.35	\$21.56	\$3.23	\$34.14	\$16.43	0.99	10.39	\$85.31

Table 31. Machinery Costs for Conventional Tillage Chickpeas (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
40' Heavy Harrow	\$1.91	\$1.26	\$0.15	\$3.32	\$1.04	\$2.31	\$0.35	\$3.70	\$0.95	0.06	1.16	\$7.97
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>200HP Wheel Tractor with:</i>												
60' Flex Harrow	\$0.96	\$0.81	\$0.11	\$1.88	\$0.86	\$0.85	\$0.13	\$1.84	\$0.59	0.03	0.43	\$4.31
100' Sprayer	\$0.44	\$0.40	\$0.06	\$0.90	\$0.24	\$0.55	\$0.08	\$0.87	\$0.43	0.02	0.28	\$2.20
Total:	\$17.04	\$12.64	\$5.06	\$34.74	\$9.35	\$21.56	\$3.23	\$34.14	\$16.43	0.99	10.39	\$85.31

Table 32. Machinery Costs for Conventional Tillage Spring Canola (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
0.75-Ton 4WD Pickup	\$0.85	\$0.63	\$0.64	\$2.12	\$0.24	\$1.48	\$0.22	\$1.94	\$2.40	0.12	0.42	\$6.46
40' Grain Trailer & Tractor	\$0.60	\$0.69	\$1.04	\$2.33	\$0.80	\$1.75	\$0.26	\$2.81	\$2.11	0.05	0.88	\$7.25
2-Ton Truck	\$0.48	\$0.30	\$0.44	\$1.22	\$0.40	\$0.29	\$0.04	\$0.73	\$0.60	0.03	0.15	\$2.55
Trap Wagon	\$0.48	\$0.24	\$0.14	\$0.86	\$0.16	\$0.06	\$0.01	\$0.23	\$0.16	0.01	0.02	\$1.25
4WD-ATV	\$0.20	\$0.12	\$0.02	\$0.34	\$0.04	\$0.26	\$0.04	\$0.33	\$1.32	0.07	0.07	\$2.00
50HP Wheel Tractor	\$0.17	\$0.18	\$0.03	\$0.37	\$0.08	\$0.42	\$0.06	\$0.56	\$0.88	0.04	0.21	\$1.82
30' Combine	\$6.55	\$4.42	\$1.70	\$12.67	\$2.46	\$2.86	\$0.43	\$5.75	\$2.05	0.28	1.43	\$20.47
<i>350HP Wheel Tractor with:</i>												
36' JD455 Drill	\$1.83	\$1.21	\$0.38	\$3.42	\$1.35	\$3.45	\$0.52	\$5.32	\$1.42	0.10	1.73	\$10.16
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
36' Cultivator with Harrow	\$0.89	\$0.88	\$0.13	\$1.90	\$0.63	\$2.94	\$0.44	\$4.01	\$1.32	0.07	1.47	\$7.23
40' Heavy Harrow	\$1.91	\$1.26	\$0.15	\$3.32	\$1.04	\$2.31	\$0.35	\$3.70	\$0.95	0.06	1.16	\$7.97
36' Ripper Shooter (Rental)	\$0.61	\$0.49	\$0.09	\$1.19	\$0.28	\$2.53	\$0.38	\$3.19	\$1.13	0.07	1.27	\$5.51
Bankout Wagon	\$0.79	\$0.62	\$0.09	\$1.51	\$0.42	\$1.40	\$0.21	\$2.03	\$0.88	0.04	0.70	\$4.41
<i>350HP Wheel Tractor with:</i>												
60' Flex Harrow	\$0.96	\$0.81	\$0.11	\$1.88	\$0.86	\$0.85	\$0.13	\$1.84	\$0.59	0.03	0.43	\$4.31
Total:	\$17.21	\$12.73	\$5.09	\$35.03	\$9.39	\$23.54	\$3.53	\$36.46	\$17.13	1.04	11.38	\$88.62