

University of Idaho

College of Agricultural *and* Life Sciences



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2013 District 1 Bluegrass Production: Thermal and Non-thermal Residue Treatments

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Budget spreadsheets are available at the following link:

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

2011 Enterprise Budgets: District 1 Bluegrass Production Thermal and Non-thermal Residue Treatments

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Instructions and Assumptions for Using Enterprise Budgets and Cost Calculators

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.

Machinery cost data appears in blue type. Please see below for more information on machinery cost calculations.

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, as reported in the annual Idaho Crop Input Price Summary, available online at

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

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:

The machinery complement and associated hourly machinery cost data are in the last two tabs in the spreadsheet version. The per acre machinery cost data are used to create the individualized machinery cost data for each budget. In the crop budget sheets, entries in blue type are calculated by the machinery cost program and come from the associated Machinery Cost table for that crop. Machinery fixed costs include depreciation, interest, 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. Your per-acre fixed costs will change if the farm size differs significantly from the size used in these budgets.

Land Costs:

Land costs, included either as real or as opportunity costs, are based on typical arrangements 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 25% of crop revenue to the land owner but this crop-share percentage can be adjusted in the crop worksheets as there is considerable variation. If the percentage is adjusted on the Summary tab, it is changed for all crops.

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 is a 10-year average. The costs and returns estimates shown here are typical for northern Idaho.

Production practices most closely represent those in Kootenai and Benewah counties. 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 2000-acre farm with 1275 total acres in bluegrass. Of these 1275 total acres, about 180 acres are devoted to bluegrass seed establishment each year with the remaining 1095 acres in bluegrass production. Bluegrass is typically kept in production for six years, although this varies by residue treatment and other management issues. You may specify the length of stand in the Summary and this information will be updated throughout the spreadsheet. Following bluegrass, two grain crops and two legume crops are typically grown.

Resources: Machinery, Land, Labor, and Capital

Tractors, trucks, and other equipment used for bluegrass production are listed in the last table of this report (Table 27). Assumptions with respect to replacement and salvage values as well as years of life are based on recommendations from a panel of farmers, Extension and industry personnel as well as typical advertised values for used equipment. This information was used to construct per acre machinery costs and determine fuel usage based on output from the University of Idaho's machinery cost program as reported in the machinery costs tables. Table 22 contains per acre costs for each operation, which are then used to construct the specific machinery cost tables for bluegrass establishment (Table 23) and bluegrass production with various residue treatments (Tables 24-26). These tables provide total per acre machinery ownership and operating costs. In the spreadsheet version of this bulletin, per acre machinery costs can be changed in the first machinery cost table and the rest of the machinery cost tables will be updated as well.

Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor.

Interest on operating capital is charged on total operating costs for six months and calculated at a nominal rate. The operating interest rate can be changed on the Input Prices sheet in the spreadsheet version of this bulletin. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated costs such as office expenses, phone service, legal and accounting fees, and utilities. In addition, a management fee based on 5% of gross revenue is charged. Both the overhead and management fee rates can be changed in the Input Prices tab.

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. The machinery cost program and data sets specific to this budget are available upon request.

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. 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:

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2013 Results for District 1 Bluegrass Production: Thermal and Non-thermal Residue Treatments

This worksheet is designed to determine net returns and net present value for various residue treatments when producing Kentucky bluegrass in northern Idaho. The original values in this report are based on results from on-farm trials comparing thermal and non-thermal residue treatments conducted over six years near Worley, Idaho, in northern Idaho. A committee of growers and Extension faculty met to determine typical practices for this area, providing the underlying data used in this analysis. Operating (variable) as well as fixed (ownership) costs associated with bluegrass production are calculated for four different treatments:

1. Traditional full-burn (FB)
2. Bale then burn, reducing fuel loads (BB)
3. Bale, then mow and harrow (no burning) (NB)
4. Combination: NB, BB, FB; NB, BB, FB (C)

Net returns over both operating and total (operating plus fixed) costs are calculated based on an initial set of yield, crop price, input price, and machinery cost assumptions. Since these values can be subject to a great deal of volatility, this spreadsheet model allows users to change any of these assumptions. Table 1 lists bluegrass yield and price assumptions; total costs and net returns over total costs; operating costs and net returns over operating costs; net present value of the investment at the end of each year; and annualized net present value, which gives a valid annual comparison across rotations of different lengths. Prices for bluegrass seed and straw and associated yield assumptions (denoted by orange type) can be changed in this table, and these changes will be made throughout the file.

Net returns over total costs are negative for the majority of the bluegrass treatments under consideration, given the initial yield, crop price, input price, and machinery cost assumptions used in this study. This seemingly unrealistic result can be explained by the fact that these are economic budgets, not cash budgets. Economic budgets account for the costs of all factors of production, including opportunity costs for the following: operator labor, all capital invested in the operation, and land cost. For example, if land is owned, the operator is not typically paying rent, which is thus a foregone or opportunity cost. Another underlying reason for negative returns in these budgets is due to a conservative approach to estimating both revenue and costs, with a tendency to undervalue potential revenue and overstate costs.

Net present value (NPV), representing the present value of future cash flows less investment costs, all adjusted for the discount rate, is calculated at the end of each year in the column M of Table 1. NPV for the establishment year is set

equal to zero for this analysis because establishment costs are amortized over each year of production. If establishment costs were also discounted it would result in double counting. In order to maximize profits, producers should remove their bluegrass stand in the year in which NPV is maximized (or least negative). Under full burn (FB), net returns are maximized with a 4-year stand, which has a NPV of -\$16 per acre. Continuing to produce after year 4 causes NPV to decline by an increasing amount each year: -\$28 after year 5 and -\$63 after year 6. Under bale-then-burn (BB), net returns are maximized after year 3, with a NPV of -\$29. Continuing to produce after year 3 results in a NPV of -\$44 per acre after year 4 and -\$94 per acre after year 5. For the mechanical residue removal treatment (NB), NPV becomes increasingly negative over time, with a value of -\$82 after year 1, -\$114 after year 2, and -\$171 after year 3. If the combination treatment is continued through year 3, NPV has a value of -\$12/acre. If the combination treatment is continued through year 6 year, the NPV is estimated at -\$10 per acre. However, given the fact that our simplifying assumptions just repeated the 3-year treatment without any further yield penalties as the bluegrass stand aged, choosing to take out the stand after year 3, which has a NPV of -\$13 per acre, might be a risk-reducing strategy.

The last column in the summary in Table 1 calculates the annualized net present value (ANPV) of the bluegrass stand for that year. ANPV is corrected for time using an annuity factor, thus allowing equivalent annual comparisons across rotations of different lengths. While NPV tells you the total value of the rotation, for the whole time period, adjusted for the time value of money, ANPV gives you an annual comparison. All systems have negative returns when corrected for the time value of money, but the FB system nearly covers all costs of production, with ANPV of -\$4 per acre after year 4 and -\$6 per acre after year 5. ANPV for the BB system are close in value after years 3 and 4, with returns of -\$9 and -\$11 per acre, respectively. Since the BB system also has returns from residue production, it is nearly as profitable as the FB system, despite the higher costs of production from harvesting the bluegrass. The NB option has the least negative ANPV with a 2-year rotation at -\$44 per acre. The C system is most profitable (least unprofitable) with a 3-year stand, with a ANPV value of -\$12 per acre. A 6-year stand is close in value for the C system, with ANPV of -\$10 per acre.

Table 1. Summary of Returns for Bluegrass Production, District 1 (\$/acre)

	Bluegrass Seed Yield	Bluegrass Seed Price	Bluegrass Straw Yield	Bluegrass Straw Price	Total Revenue	Total Costs (TC)	Returns over TC	Total Variable Costs (VC)	Returns over VC	Net Present Value	Annualized Net Present Value
	per acre (lb)	(\$/lb)	per acre (ton)	(\$/ton)	per acre (\$/acre)	per acre (\$/acre)	per acre (\$/acre)	per acre (\$/acre)	per acre (\$/acre)	per acre (\$/acre)	per acre (\$/acre/yr)
Full Burn (FB):											
Establishment					\$0	\$288	-\$288	\$215	-\$215	\$0	\$0
Year 1	450	\$0.70	0	\$90.00	\$315	\$461	-\$146	\$236	\$79	-\$128	-\$71
Year 2	625	\$0.70	0	\$90.00	\$438	\$498	-\$60	\$236	\$201	-\$178	-\$68
Year 3	625	\$0.70	0	\$90.00	\$438	\$498	-\$60	\$236	\$201	-\$225	-\$66
Year 4	625	\$0.70	0	\$90.00	\$438	\$498	-\$60	\$236	\$201	-\$268	-\$65
Year 5	550	\$0.70	0	\$90.00	\$385	\$482	-\$97	\$236	\$149	-\$334	-\$69
Year 6	475	\$0.70	0	\$90.00	\$333	\$466	-\$134	\$236	\$96	-\$419	-\$77
Amortization of establishment costs based on a stand life of:							*Net returns maximized with a 4-year stand.				
4 years											
Bale then Burn (BB):											
Establishment					\$0	\$288	-\$288	\$215	-\$215	\$0	\$0
Year 1	450	\$0.70	1.25	\$90.00	\$428	\$514	-\$86	\$270	\$158	-\$76	-\$42
Year 2	625	\$0.70	1.25	\$90.00	\$550	\$514	\$36	\$270	\$280	-\$46	-\$17
Year 3	625	\$0.70	1.25	\$90.00	\$550	\$514	\$36	\$270	\$280	-\$18	-\$5
Year 4	550	\$0.70	1.25	\$90.00	\$498	\$514	-\$16	\$270	\$228	-\$29	-\$7
Year 5	475	\$0.70	1.25	\$90.00	\$445	\$514	-\$69	\$270	\$175	-\$76	-\$16
Amortization of establishment costs based on a stand life of:							*Net returns maximized with a 3-year stand.				
4 years											
Machanical Residue Removal (NB):											
Establishment					\$0	\$288	-\$288	\$0	\$0	\$0	\$0
Year 1	450	\$0.70	1.5	\$90.00	\$450	\$556	-\$106	\$269	\$181	-\$93	-\$51
Year 2	525	\$0.70	1.5	\$90.00	\$503	\$556	-\$53	\$269	\$233	-\$136	-\$52
Year 3	475	\$0.70	1.5	\$90.00	\$468	\$556	-\$88	\$269	\$198	-\$204	-\$60
Amortization of establishment costs based on a stand life of:											
3 years											
Combination (NB, BB, FB):											
Establishment					\$0	\$288	-\$288	\$0	\$0	\$0	\$0
NB 1	450	\$0.70	1.5	\$90.00	\$450	\$556	-\$106	\$269	\$181	-\$93	-\$51
BB 2	625	\$0.70	1.5	\$90.00	\$550	\$514	\$36	\$270	\$280	-\$63	-\$24
FB 3	625	\$0.70	0	\$90.00	\$550	\$498	-\$60	\$236	\$201	-\$109	-\$32
Amortization of establishment costs based on a stand life of:											
3 years											
Combination (NB, BB, FB):											
Establishment					\$0	\$288	-\$288	\$0	\$0	\$0	\$0
NB 1	450	\$0.70	1.5	\$90.00	\$450	\$556	-\$106	\$269	\$181	-\$93	-\$51
BB 2	525	\$0.70	1.25	\$90.00	\$550	\$514	\$36	\$270	\$280	-\$63	-\$24
FB 3	625	\$0.70	0	\$90.00	\$550	\$498	-\$60	\$270	\$280	-\$109	-\$32
NB 4	450	\$0.70	1.5	\$90.00	\$450	\$556	-\$106	\$269	\$181	-\$185	-\$45
BB 5	525	\$0.70	1.25	\$90.00	\$550	\$514	\$36	\$270	\$280	-\$161	-\$33
FB 6	625	\$0.70	0	\$90.00	\$550	\$498	-\$60	\$270	\$280	-\$199	-\$37
Amortization of establishment costs based on a stand life of:											
6 years											
Discount rate:											
6.75%											

Table 2. Input Prices from the 2013 Input Price Survey¹

Item	Unit	2013 Price/unit
Fuel:		
Diesel, offroad, bulk (gal)	gal	\$3.40
Gas (gal)	gal	\$3.50
Fertilizer:		
Nitrogen-Liquid	lb	\$0.77
Phosphorous*	lb	\$0.60
Sulfur (liquid)	lb	\$0.56
Potassium (dry)	lb	\$0.36
Gypsum	lb	\$0.20
*Average of dry and liquid formulations.		
Seed:		
Bluegrass seed	lb	\$3.00
Adjuvants:		
Amm. Sulf. (20-0-0-24)	lb	\$0.25
Amm. Sulf. (liquid)	pt	\$0.05
Class Act (adjuvant, antifoam)	oz	\$0.12
Crop Oil Concentrate	pt	\$1.31
Non-ionic surfactant	oz	\$0.02
Custom Rental:		
Custom Aerial	acre	\$8.95
Fertilizer Applicator	acre	\$1.00
Rogator	acre	\$8.25
Pesticides:		
2,4-DB	oz	\$0.35
Assure II EC	oz	\$0.69
Beacon	oz	\$29.75
Buctril 2 EC	oz	\$0.47
Diuron 80 DF	oz	\$0.36
Everest	oz	\$21.20
Express XP	oz	\$9.25
Roundup RT Master III	oz	\$0.17

Table 2. Input Prices from the 2013 Input Price Survey¹

Item	Unit	2013 Price/unit
Labor²:		
Hourly machine labor	hour	\$17.80
Other labor	hour	\$10.25
Overhead:		
Overhead ³	percent	2.5%
Management fee:		
Management fee ⁴	percent	5.0%
Cash rent:		
Cash rent	acre	\$0.00
Land Tax:		
Land Tax	acre	\$5.50
Interest:		
Operating Loan	percent	5.75%
Machinery Loan/investment	percent	\$6.00

¹Input costs are based on a survey of input suppliers for each region, available online at:

<http://www.cals.uidaho.edu/aers/PDF/AEES/2009/AEES09-04.pdf>

²Covers all applicable state and federal taxes.

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

⁴Calculated as a percentage of gross revenue.

Table 3. Schedule of Operations for Establishing Bluegrass, District 1

Month	Operation	Tooling	Materials/Service
Oct	Plow	255HP-WT, 10-Bottom Plow	
Oct	Spray	Self-propelled sprayer	25 oz Roundup
April	Harrow	255HP-WT, 60' spike harrow	
April	Harrow	255HP-WT, 60' spike harrow	
April	Cultivate	255HP-WT, 36' cultivator	
April	Cultivate	255HP-WT, 36' cultivator	
May	Plant/Fertilize	350HP-WT, 36' Drill	5.5 lb bluegrass seed 100 lb N, 20 lb P, 30 lb S
Jun	Spray	Self-propelled sprayer	1 qt Buctril 2 lb ai
Jun	Spray	Self-propelled sprayer	1.2 oz Everest and 2 qt COC

Table 4. Production Costs for Establishing Bluegrass, District 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Variable Costs				
Seed:				\$16.50
Bluegrass Seed	5.5	lb	\$3.00	\$16.50
Fertilizer:				\$105.00
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen (liquid)	100	lb	\$0.77	\$77.00
Phosphorus (liquid)	20	lb	\$0.56	\$11.20
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$22.59
<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>				
Buctril Advanced (2.5 lb)	32	oz	\$0.47	\$15.04
Express	0.25	oz	\$9.25	\$2.31
Non-ionic surfactant (NIS)	3.2	oz	\$0.02	\$0.07
Roundup Ultra Max RT (6 lb)	24	oz	\$0.17	\$4.04
Ammonium Sulfate (AMS)	4.48	oz	\$0.25	\$1.12
Machinery:				\$57.53
Fuel	6.47	gal	\$3.40	\$21.99
Lubricants	1	acre	\$3.38	\$3.38
Machinery Repairs	1	acre	\$9.77	\$9.77
Machinery Labor	1.26	hours	\$17.80	\$22.39
Custom & Consultants:				\$7.75
Custom Fertilize	1	acre	\$7.75	\$7.75
Other:				\$0.00
Crop insurance				\$0.00
Storage Facility & Equip. Repairs				\$0.00
Other Labor				
Operating Interest ¹				\$6.02
Total Variable Costs				\$215.38

Table 4. Production Costs for Establishing Bluegrass, District 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<u>Ownership Costs:</u>				
Machinery depreciation	1	acre	\$32.74	\$32.74
Machinery interest	1	acre	\$23.02	\$23.02
Machinery insur., housing, licenses	1	acre	\$5.67	\$5.67
Cash rent				\$0.00
Land taxes				\$5.50
Overhead ²				\$5.23
Total Fixed Costs				\$72.16
Total Costs per Acre				\$287.55

Notes:

¹Calculated as 6.75% interest on operating capital for 6 months.

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

Table 5. Schedule of Operations for Bluegrass Production, Full Burn, District 1

Month	Operation	Tooling	Materials/Service
July	Swath	15' self-propelled swather	
July	Harvest	Newer combine, about 60% of acreage Older combine, about 40% of acreage	
July	Haul seed	2-ton truck	
July	Burn stubble		
July	Fertilize	255HP-WT, fertilizer spreader	
July	Spray weeds	Self-propelled sprayer	
Aug	Spray weeds	Self-propelled sprayer	

Table 6. Production Costs for Bluegrass Production, Full Burn, District 1, Year 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$315.00
Bluegrass seed	450	cwt	\$0.70	\$315.00
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$35.99
Fuel	3.00	gal	\$3.40	\$10.20
Lubricants	1	acre	\$1.57	\$1.57
Machinery Repairs	1	acre	\$7.10	\$7.10
Machinery Labor	0.96	acre	\$17.80	\$17.12
Custom & Consultants:				\$3.21
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Operating Interest ¹				\$6.61
Total Variable Costs				\$236.39
Net Returns Above Variable Costs				\$78.61

Table 6. Production Costs for Bluegrass Production, Full Burn, District 1, Year 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
<u>Ownership Costs:</u>				
Machinery depreciation	1	acre	\$22.14	\$22.14
Machinery interest	1	acre	\$13.77	\$13.77
Machinery insur., housing, licenses	1	acre	\$4.46	\$4.46
Land Cost*	1	acre	\$73.25	\$73.25
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.52
Management fee ³				\$15.75
Total Fixed Costs				\$224.80
Total Costs per Acre				\$461.19
Returns to Risk				-\$146.19

Notes:

¹Calculated as 6.75% 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>	405.0	450.00	495.0
Operating Cost Breakeven	\$0.58	\$0.53	\$0.48
Ownership Cost Breakeven	\$0.56	\$0.50	\$0.45
Total Cost Breakeven	\$1.14	\$1.02	\$0.93
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	375.23	337.70	307.00
Ownership Cost Breakeven	356.83	321.14	291.95
Total Cost Breakeven	732.05	658.85	598.95

Table 7. Production Costs for Bluegrass Production, Full Burn, District 1, Year 2

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$437.50
Bluegrass seed	625	cwt	\$0.70	\$437.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$35.99
Fuel	3.00	gal	\$3.40	\$10.20
Lubricants	1	acre	\$1.57	\$1.57
Machinery Repairs	1	acre	\$7.10	\$7.10
Machinery Labor	0.96	acre	\$17.80	\$17.12
Custom & Consultants:				\$3.21
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Operating Interest ¹				\$6.61
Total Variable Costs				\$236.39
Net Returns Above Variable Costs				\$201.11

Table 7. Production Costs for Bluegrass Production, Full Burn, District 1, Year 2

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$22.14	\$22.14
Machinery interest	1	acre	\$13.77	\$13.77
Machinery insur., housing, licenses	1	acre	\$4.46	\$4.46
Land Cost*	1	acre	\$103.88	\$103.88
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.52
Management fee ³				\$21.88
Total Fixed Costs				\$261.55
Total Costs per Acre				\$497.94
Returns to Risk				-\$60.44

Notes:

¹Calculated as 6.75% 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.

	-		+	
	10%	Base Yield	10%	
Price	562.5	625.00	687.5	
Operating Cost Breakeven	\$0.42	\$0.38	\$0.34	
Ownership Cost Breakeven	\$0.46	\$0.42	\$0.38	
Total Cost Breakeven	\$0.89	\$0.80	\$0.72	
	-		+	
	10%	Base Price	10%	
Yield	\$0.63	\$0.70	\$0.77	
Operating Cost Breakeven	375.23	337.70	307.00	
Ownership Cost Breakeven	415.16	373.64	339.68	
Total Cost Breakeven	790.39	711.35	646.68	

Table 8. Production Costs for Bluegrass Production, Full Burn, District 1, Year 3

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$437.50
Bluegrass seed	625	cwt	\$0.70	\$437.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$35.99
Fuel	3.00	gal	\$3.40	\$10.20
Lubricants	1	acre	\$1.57	\$1.57
Machinery Repairs	1	acre	\$7.10	\$7.10
Machinery Labor	0.96	acre	\$17.80	\$17.12
Custom & Consultants:				\$3.21
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Operating Interest ¹				\$6.61
Total Variable Costs				\$236.39
Net Returns Above Variable Costs				\$201.11

Table 8. Production Costs for Bluegrass Production, Full Burn, District 1, Year 3

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$22.14	\$22.14
Machinery interest	1	acre	\$13.77	\$13.77
Machinery insur., housing, licenses	1	acre	\$4.46	\$4.46
Land Cost*	1	acre	\$103.88	\$103.88
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.52
Management fee ³				\$21.88
Total Fixed Costs				\$261.55
Total Costs per Acre				\$497.94
Returns to Risk				-\$60.44

Notes:

¹Calculated as 6.75% 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:

(Bluegrass seed only)

	- 10%	Base Yield	+ 10%
<u>Price</u>	562.5	625.00	687.5
Operating Cost Breakeven	\$0.42	\$0.38	\$0.34
Ownership Cost Breakeven	\$0.46	\$0.42	\$0.38
Total Cost Breakeven	\$0.89	\$0.80	\$0.72
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	375.23	337.70	307.00
Ownership Cost Breakeven	415.16	373.64	339.68
Total Cost Breakeven	790.39	711.35	646.68

Table 9. Production Costs for Bluegrass Production, Full Burn, District 1, Year 4

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$437.50
Bluegrass seed	625	cwt	\$0.70	\$437.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$35.99
Fuel	3.00	gal	\$3.40	\$10.20
Lubricants	1	acre	\$1.57	\$1.57
Machinery Repairs	1	acre	\$7.10	\$7.10
Machinery Labor	0.96	acre	\$17.80	\$17.12
Custom & Consultants:				\$3.21
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Operating Interest ¹				\$6.61
Total Variable Costs				\$236.39
Net Returns Above Variable Costs				\$201.11

Table 9. Production Costs for Bluegrass Production, Full Burn, District 1, Year 4

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$22.14	\$22.14
Machinery interest	1	acre	\$13.77	\$13.77
Mach. insur., housing, licenses	1	acre	\$4.46	\$4.46
Land Cost*	1	acre	\$103.88	\$103.88
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.52
Management fee ³				\$21.88
Total Fixed Costs				\$261.55
Total Costs per Acre				\$497.94
Returns to Risk				-\$60.44

Notes:

¹Calculated as 6.75% 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:

(Bluegrass seed only)

	- 10%	Base Yield	+ 10%
<u>Price</u>	562.5	625.00	687.5
Operating Cost Breakeven	\$0.42	\$0.38	\$0.34
Ownership Cost Breakeven	\$0.46	\$0.42	\$0.38
Total Cost Breakeven	\$0.89	\$0.80	\$0.72
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	375.23	337.70	307.00
Ownership Cost Breakeven	415.16	373.64	339.68
Total Cost Breakeven	790.39	711.35	646.68

Table 10. Production Costs for Bluegrass Production, Full Burn, District 1, Year 5

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$385.00
Bluegrass seed	550	cwt	\$0.70	\$385.00
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$35.99
Fuel	3.00	gal	\$3.40	\$10.20
Lubricants	1	acre	\$1.57	\$1.57
Machinery Repairs	1	acre	\$7.10	\$7.10
Machinery Labor	0.96	acre	\$17.80	\$17.12
Custom & Consultants:				\$3.21
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Operating Interest ¹				\$6.61
Total Variable Costs				\$236.39
Net Returns Above Variable Costs				\$148.61

Table 10. Production Costs for Bluegrass Production, Full Burn, District 1, Year 5

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$22.14	\$22.14
Machinery interest	1	acre	\$13.77	\$13.77
Machinery insur., housing, licenses	1	acre	\$4.46	\$4.46
Land Cost*	1	acre	\$90.75	\$90.75
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.52
Management fee ³				\$19.25
Total Fixed Costs				\$245.80
Total Costs per Acre				\$482.19
Returns to Risk				-\$97.19

Notes:

¹Calculated as 6.75% 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:

(Bluegrass seed only)

	- 10%	Base Yield	+ 10%
<u>Price</u>	495.0	550.00	605.0
Operating Cost Breakeven	\$0.48	\$0.43	\$0.39
Ownership Cost Breakeven	\$0.50	\$0.45	\$0.41
Total Cost Breakeven	\$0.97	\$0.88	\$0.80
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	375.23	337.70	307.00
Ownership Cost Breakeven	390.16	351.14	319.22
Total Cost Breakeven	765.39	688.85	626.23

Table 11. Production Costs for Bluegrass Production, Full Burn, District 1, Year 6

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$332.50
Bluegrass seed	475	cwt	\$0.70	\$332.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$35.99
Fuel	3.00	gal	\$3.40	\$10.20
Lubricants	1	acre	\$1.57	\$1.57
Machinery Repairs	1	acre	\$7.10	\$7.10
Machinery Labor	0.96	acre	\$17.80	\$17.12
Custom & Consultants:				\$3.21
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Operating Interest ¹				\$6.61
Total Variable Costs				\$236.39
Net Returns Above Variable Costs				\$96.11

Table 11. Production Costs for Bluegrass Production, Full Burn, District 1, Year 6

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$22.14	\$22.14
Machinery interest	1	acre	\$13.77	\$13.77
Machinery insur., housing, licenses	1	acre	\$4.46	\$4.46
Land Cost*	1	acre	\$77.63	\$77.63
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.52
Management fee ³				\$16.63
Total Fixed Costs				\$230.05
Total Costs per Acre				\$466.44
Returns to Risk				-\$133.94

Notes:

¹Calculated as 6.75% 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: (Bluegrass seed only)	-	Base	+
	10%	Yield	10%
<u>Price</u>	427.5	475.00	522.5
Operating Cost Breakeven	\$0.55	\$0.50	\$0.45
Ownership Cost Breakeven	\$0.54	\$0.48	\$0.44
Total Cost Breakeven	\$1.09	\$0.98	\$0.89
	-		+
	10%	Base	10%
<u>Yield</u>	\$0.63	Price	\$0.77
Operating Cost Breakeven	375.23	337.70	307.00
Ownership Cost Breakeven	365.16	328.64	298.77
Total Cost Breakeven	740.39	666.35	605.77

Table 12. Schedule of Operations for Bluegrass Production, Bale & Burn, District 1

Month	Operation	Tooling	Materials/Service
July	Swath	15' self-propelled swather	
July	Harvest	Newer combine, about 60% of acreage Older combine, about 40% of acreage	
July	Haul seed	2-ton truck	
July	Rake	255HP-WT + 30' Rake	
July	Bale	255HP-WT + 16 x 18 Baler	
July	Haul & Stack	Custom	
July	Fertilize	255HP-WT, fertilizer spreader	
Aug	Spray weeds	Self-propelled sprayer	
Sept	Spray weeds	Self-propelled sprayer	

Table 13. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$427.50
Bluegrass seed	450	cwt	\$0.70	\$315.00
Bluegrass hay	1.25	ton	\$90.00	\$112.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$52.46
Fuel	5.35	gal	\$3.40	\$18.19
Lubricants	1	acre	\$2.80	\$2.80
Machinery Repairs	1	acre	\$10.26	\$10.26
Machinery Labor	1.19	acre	\$17.80	\$21.21
Custom & Consultants:				\$14.46
Custom Fungicide Application	43%	acre	\$7.50	\$3.21
Custom Haul & Stack	1.25	acre	\$9.00	\$11.25
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.25	ton	\$3.85	\$4.81
Operating Interest ¹				\$7.40
Total Variable Costs				\$269.73
Net Returns Above Variable Costs				\$157.77

Table 13. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$32.27	\$32.27
Machinery interest	1	acre	\$20.59	\$20.59
Mach. insur., housing, licenses	1	acre	\$5.88	\$5.88
Land Cost*	1	acre	\$73.25	\$73.25
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$6.21
Management fee ³				\$15.75
Total Fixed Costs				\$243.86
Total Costs per Acre				\$513.59
Returns to Risk				-\$86.09

Notes:

¹Calculated as 6.75% 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>	405.0	450.00	495.0
Operating Cost Breakeven	\$0.67	\$0.60	\$0.54
Ownership Cost Breakeven	\$0.60	\$0.54	\$0.49
Total Cost Breakeven	\$1.27	\$1.14	\$1.04
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	428.14	385.32	350.29
Ownership Cost Breakeven	387.09	348.38	316.71
Total Cost Breakeven	815.22	733.70	667.00

Table 14. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 2

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$550.00
Bluegrass seed	625	cwt	\$0.70	\$437.50
Bluegrass hay	1.25	ton	\$90.00	\$112.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$52.46
Fuel	5.35	gal	\$3.40	\$18.19
Lubricants	1	acre	\$2.80	\$2.80
Machinery Repairs	1	acre	\$10.26	\$10.26
Machinery Labor	1.19	acre	\$17.80	\$21.21
Custom & Consultants:				\$14.48
Custom Fungicide Application	43%	acre	\$7.50	\$3.23
Custom Haul & Stack	1.25	acre	\$9.00	\$11.25
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.25	ton	\$3.85	\$4.81
Operating Interest ¹				\$7.40
Total Variable Costs				\$269.74
Net Returns Above Variable Costs				\$280.26

Table 14. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 2

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$32.27	\$32.27
Machinery interest	1	acre	\$20.59	\$20.59
Machinery insur., housing, licenses	1	acre	\$5.88	\$5.88
Land Cost*	1	acre	\$103.88	\$103.88
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$6.21
Management fee ³				\$21.88
Total Fixed Costs				\$280.61
Total Costs per Acre				\$550.35
Returns to Risk				-\$0.35

Notes:

¹Calculated as 6.75% 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	+
	10%	Yield	10%
<u>Price</u>	562.5	625.00	687.5
Operating Cost Breakeven	\$0.48	\$0.43	\$0.39
Ownership Cost Breakeven	\$0.50	\$0.45	\$0.41
Total Cost Breakeven	\$0.98	\$0.88	\$0.80
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	428.15	385.34	350.31
Ownership Cost Breakeven	445.42	400.88	364.43
Total Cost Breakeven	873.57	786.22	714.74

Table 15. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 3

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$550.00
Bluegrass seed	625	cwt	\$0.70	\$437.50
Bluegrass hay	1.25	ton	\$90.00	\$112.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$52.46
Fuel	5.35	gal	\$3.40	\$18.19
Lubricants	1	acre	\$2.80	\$2.80
Machinery Repairs	1	acre	\$10.26	\$10.26
Machinery Labor	1.19	acre	\$17.80	\$21.21
Custom & Consultants:				\$14.48
Custom Fungicide Application	43%	acre	\$7.50	\$3.23
Custom Haul & Stack	1.25	acre	\$9.00	\$11.25
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.25	ton	\$3.85	\$4.81
Operating Interest ¹				\$7.40
Total Variable Costs				\$269.74
Net Returns Above Variable Costs				\$280.26

Table 15. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 3

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$32.27	\$32.27
Machinery interest	1	acre	\$20.59	\$20.59
Mach. insur., housing, licenses	1	acre	\$5.88	\$5.88
Land Cost*	1	acre	\$103.88	\$103.88
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$6.21
Management fee ³				\$21.88
Total Fixed Costs				\$280.61
Total Costs per Acre				\$550.35
Returns to Risk				-\$0.35

Notes:

¹Calculated as 6.75% 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>	562.5	625.00	687.5
Operating Cost Breakeven	\$0.48	\$0.43	\$0.39
Ownership Cost Breakeven	\$0.50	\$0.45	\$0.41
Total Cost Breakeven	\$0.98	\$0.88	\$0.80
	-		+
	10%	Base Price	10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	428.15	385.34	350.31
Ownership Cost Breakeven	445.42	400.88	364.43
Total Cost Breakeven	873.57	786.22	714.74

Table 16. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 4

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$550.00
Bluegrass seed	625	cwt	\$0.70	\$437.50
Bluegrass hay	1.25	ton	\$90.00	\$112.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$52.46
Fuel	5.35	gal	\$3.40	\$18.19
Lubricants	1	acre	\$2.80	\$2.80
Machinery Repairs	1	acre	\$10.26	\$10.26
Machinery Labor	1.19	acre	\$17.80	\$21.21
Custom & Consultants:				\$14.48
Custom Fungicide Application	43%	acre	\$7.50	\$3.23
Custom Haul & Stack	1.25	acre	\$9.00	\$11.25
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.25	ton	\$3.85	\$4.81
Operating Interest ¹				\$7.40
Total Variable Costs				\$269.74
Net Returns Above Variable Costs				\$280.26

Table 16. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 4

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$32.27	\$32.27
Machinery interest	1	acre	\$20.59	\$20.59
Mach. insur., housing, licenses	1	acre	\$5.88	\$5.88
Land Cost*	1	acre	\$103.88	\$103.88
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$6.21
Management fee ³				\$21.88
Total Fixed Costs				\$280.61
Total Costs per Acre				\$550.35
Returns to Risk				-\$0.35

Notes:

¹Calculated as 6.75% 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:			
(Bluegrass seed only)	- 10%	Base Yield	+ 10%
<u>Price</u>	562.5	625.00	687.5
Operating Cost Breakeven	\$0.48	\$0.43	\$0.39
Ownership Cost Breakeven	\$0.50	\$0.45	\$0.41
Total Cost Breakeven	\$0.98	\$0.88	\$0.80
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	428.15	385.34	350.31
Ownership Cost Breakeven	445.42	400.88	364.43
Total Cost Breakeven	873.57	786.22	714.74

Table 17. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 5

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$497.50
Bluegrass seed	550	cwt	\$0.70	\$385.00
Bluegrass hay	1.25	ton	\$90.00	\$112.50
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen (liquid)	150	lb	\$0.77	\$115.50
Phosphorus (liquid)	20	lb	\$0.60	\$12.00
Sulfur (liquid)	30	lb	\$0.56	\$16.80
Pesticides:				\$19.28
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$52.46
Fuel	5.35	gal	\$3.40	\$18.19
Lubricants	1	acre	\$2.80	\$2.80
Machinery Repairs	1	acre	\$10.26	\$10.26
Machinery Labor	1.19	acre	\$17.80	\$21.21
Custom & Consultants:				\$3.23
Custom Fungicide Application	43%	acre	\$7.50	\$3.23
Custom Haul & Stack				
Burn Costs:				\$9.00
Burn permit	1	acre	\$3.00	\$3.00
Burning variable costs	1	acre	\$6.00	\$6.00
Other:				\$18.00
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.25	ton	\$3.85	\$4.81
Operating Interest ¹				\$7.08
Total Variable Costs				\$258.16
Net Returns Above Variable Costs				\$239.34

Table 17. Production Costs for Bluegrass Production, Bale & Burn, District 1, Year 5

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$32.27	\$32.27
Machinery interest	1	acre	\$20.59	\$20.59
Mach. insur., housing, licenses	1	acre	\$5.88	\$5.88
Land Cost*	1	acre	\$90.75	\$90.75
*Based on crop share percentage:				
Landlord	25%			
Tenant	75%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$84.41	\$84.41
**Based on years of production:				
	4			
Overhead ²				\$5.93
Management fee ³				\$19.25
Total Fixed Costs				\$264.58
Total Costs per Acre				\$522.75
Returns to Risk				-\$25.25

Notes:

¹Calculated as 6.75% 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: (Bluegrass seed only)	-	Base	+
	10%	Yield	10%
<u>Price</u>	495.0	550.00	605.0
Operating Cost Breakeven	\$0.52	\$0.47	\$0.43
Ownership Cost Breakeven	\$0.53	\$0.48	\$0.44
Total Cost Breakeven	\$1.06	\$0.95	\$0.86
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	409.78	368.81	335.28
Ownership Cost Breakeven	419.97	377.98	343.61
Total Cost Breakeven	829.76	746.78	678.89

Table 18. Schedule of Operations for Bluegrass Production, No Burn, District 1

Month	Operation	Tooling	Materials/Service
Apr	Fertilize	350HP-WT, fertilizer spreader	25 lb N, 70lb P, 10 lb S, rented fertilizer spreader
July	Swath	18' Self-propelled swather	
July	Rake	105HP-CT, Side delivery rake	
July	Bale	105HP-CT, Baler (16 x 18)	
July	Haul & Stack	Custom	\$9 per ton

Table 19. Production Costs for Bluegrass Production, No Burn, District 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$450.00
Bluegrass seed	450	cwt	\$0.70	\$315.00
Bluegrass hay	1.5	ton	\$90.00	\$135.00
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen	150	lb	\$0.77	\$115.50
Phosphorus	20	lb	\$0.60	\$12.00
Sulfur	30	lb	\$0.56	\$16.80
Pesticides:				\$0.00
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$60.96
Fuel	6.13	gal	\$3.40	\$20.84
Lubricants	1	acre	\$3.20	\$3.20
Machinery Repairs	1	acre	\$12.05	\$12.05
Machinery Labor	1.40	acre	\$17.80	\$24.87
Custom & Consultants:				\$14.50
Custom Haul & Stack	1.50	ton	\$9.00	\$13.50
Fertilizer Rental	1	acre	\$1.00	\$1.00
Other:				\$5.78
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.50	ton	\$3.85	\$5.78
Operating Interest ¹				\$6.48
Total Variable Costs				\$269.31
Net Returns Above Variable Costs				\$180.69

Table 19. Production Costs for Bluegrass Production, No Burn, District 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$38.58	\$38.58
Machinery interest	1	acre	\$25.05	\$25.05
Mach. insur., housing, licenses	1	acre	\$6.69	\$6.69
Land Cost*	1	acre	\$73.25	\$73.25
*Based on crop share percentage:				
Landlord	25%			
Tenant	67%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$109.07	\$109.07
**Based on years of production:				
	3			
Overhead ²				\$5.64
Management fee ³				\$22.50
Total Fixed Costs				\$286.29
Total Costs per Acre				\$555.59
Returns to Risk				-\$105.59

Notes:

¹Calculated as 6.75% 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:

(Bluegrass seed only)

	- 10%	Base Yield	+ 10%
<u>Price</u>	405.0	450.00	495.0
Operating Cost Breakeven	\$0.66	\$0.60	\$0.54
Ownership Cost Breakeven	\$0.71	\$0.64	\$0.58
Total Cost Breakeven	\$1.37	\$1.23	\$1.12
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	427.47	384.72	349.75
Ownership Cost Breakeven	454.42	408.98	371.80
Total Cost Breakeven	881.89	793.70	721.55

Table 20. Production Costs for Bluegrass Production, No Burn, District 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$502.50
Bluegrass seed	525	cwt	\$0.70	\$367.50
Bluegrass hay	1.5	ton	\$90.00	\$135.00
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen	150	lb	\$0.77	\$115.50
Phosphorus	20	lb	\$0.60	\$12.00
Sulfur	30	lb	\$0.56	\$16.80
Pesticides:				\$0.00
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$60.96
Fuel	6.13	gal	\$3.40	\$20.84
Lubricants	1	acre	\$3.20	\$3.20
Machinery Repairs	1	acre	\$12.05	\$12.05
Machinery Labor	1.40	acre	\$17.80	\$24.87
Custom & Consultants:				\$14.50
Custom Haul & Stack	1.50	ton	\$9.00	\$13.50
Fertilizer Rental	1	acre	\$1.00	\$1.00
Other:				\$5.78
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.50	ton	\$3.85	\$5.78
Operating Interest ¹				\$6.48
Total Variable Costs				\$269.31
Net Returns Above Variable Costs				\$233.19
Ownership Costs:				
Machinery depreciation	1	acre	\$38.58	\$38.58
Machinery interest	1	acre	\$25.05	\$25.05
Mach. insur., housing, licenses	1	acre	\$6.69	\$6.69
Land Cost*	1	acre	\$86.38	\$86.38
*Based on crop share percentage:				
Landlord	25%			
Tenant	67%			

Table 20. Production Costs for Bluegrass Production, No Burn, District 1

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$109.07	\$109.07
**Based on years of production:	3			
Overhead ²				\$5.64
Management fee ³				\$25.13
Total Fixed Costs				\$302.04
Total Costs per Acre				\$571.34
Returns to Risk				-\$68.84

Notes:

¹Calculated as 6.75% 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: (Bluegrass seed only)	- 10%	Base Yield	+ 10%
<u>Price</u>	472.5	525.00	577.5
Operating Cost Breakeven	\$0.57	\$0.51	\$0.47
Ownership Cost Breakeven	\$0.64	\$0.58	\$0.52
Total Cost Breakeven	\$1.21	\$1.09	\$0.99
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	427.47	384.72	349.75
Ownership Cost Breakeven	479.42	431.48	392.26
Total Cost Breakeven	906.89	816.20	742.00

Table 21. Production Costs for Bluegrass Production, No Burn, District 1, Year 3

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				\$467.50
Bluegrass seed	475	cwt	\$0.70	\$332.50
Bluegrass hay	1.5	ton	\$90.00	\$135.00
Variable Costs				
Fertilizer:				\$144.30
<i>Base your rate on your soil test results.</i>				
<i>The following fertilizer estimates are typical:</i>				
Nitrogen	150	lb	\$0.77	\$115.50
Phosphorus	20	lb	\$0.60	\$12.00
Sulfur	30	lb	\$0.56	\$16.80
Pesticides:				\$0.00
<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>				
Beacon	0.5	oz	\$0.26	\$0.13
Banvel	12	oz	\$0.44	\$5.28
Diuron	2	lb	\$5.15	\$10.30
Adjuvants, as needed	1	acre	\$1.00	\$1.00
Fungicide (3 out of 7 years)	43%	acre	\$6.00	\$2.57
Machinery:				\$60.96
Fuel	6.13	gal	\$3.40	\$20.84
Lubricants	1	acre	\$3.20	\$3.20
Machinery Repairs	1	acre	\$12.05	\$12.05
Machinery Labor	1.40	acre	\$17.80	\$24.87
Custom & Consultants:				\$14.50
Custom Haul & Stack	1.50	ton	\$9.00	\$13.50
Fertilizer Rental	1	acre	\$1.00	\$1.00
Other:				\$5.78
Bags, tags, cleaning, etc.	1	acre	\$16.50	\$16.50
Field Green Fire Insurance	1	acre	\$1.50	\$1.50
Baling twine	1.50	ton	\$3.85	\$5.78
Operating Interest ¹				\$6.48
Total Variable Costs				\$269.31
Net Returns Above Variable Costs				\$198.19

Table 21. Production Costs for Bluegrass Production, No Burn, District 1, Year 3

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Ownership Costs:				
Machinery depreciation	1	acre	\$38.58	\$38.58
Machinery interest	1	acre	\$25.05	\$25.05
Mach. insur., housing, licenses	1	acre	\$6.69	\$6.69
Land Cost*	1	acre	\$77.63	\$77.63
*Based on crop share percentage:				
Landlord	25%			
Tenant	67%			
Cash Rent				\$0.00
Land taxes				\$5.50
Amortization of establishment costs**	6.8%	acre	\$109.07	\$109.07
**Based on years of production:				
	3			
Overhead ²				\$5.64
Management fee ³				\$23.38
Total Fixed Costs				\$291.54
Total Costs per Acre				\$560.84
Returns to Risk				-\$93.34

Notes:

¹Calculated as 6.75% 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:	-		+
(Bluegrass seed only)	10%	Base Yield	10%
<u>Price</u>	427.5	475.00	522.5
Operating Cost Breakeven	\$0.63	\$0.57	\$0.52
Ownership Cost Breakeven	\$0.68	\$0.61	\$0.56
Total Cost Breakeven	\$1.31	\$1.18	\$1.07
	-		+
	10%	Base Price	10%
<u>Yield</u>	\$0.63	\$0.70	\$0.77
Operating Cost Breakeven	427.47	384.72	349.75
Ownership Cost Breakeven	462.76	416.48	378.62
Total Cost Breakeven	890.23	801.20	728.37

Table 22. Machinery Costs (\$/acre) for Bluegrass Production in District 1 by Implement¹

	Fixed Costs (\$/acre):			Total Fixed Costs	Variable Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing,		Repairs	Fuel	Lubricant	Total	(\$/acre)	(hr/acre)	(gal/acre)	
<i>Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:</i>												
Pickup 3/4 ton 4WD, newer	\$1.24	\$0.93	\$0.67	\$2.84	\$0.32	\$2.92	\$0.44	\$3.68	\$5.20	0.32	0.83	\$11.72
Pickup 3/4 ton 4WD, older	\$5.15	\$1.81	\$1.27	\$8.23	\$0.63	\$1.46	\$0.22	\$2.31	\$2.60	0.16	0.42	\$13.14
2-Ton Truck, used	\$1.32	\$0.80	\$0.30	\$2.42	\$1.05	\$1.46	\$0.22	\$2.73	\$2.44	0.15	0.42	\$7.59
Subtotal:	\$6.39	\$2.74	\$1.94	\$11.07	\$0.95	\$4.38	\$0.66	\$5.99	\$7.80	\$0.48	\$1.25	\$24.86
<i>Machinery costs for these implements are specific to the operations for each crop:</i>												
255HP-WT + 24' Drill	\$4.39	\$3.11	\$0.94	\$8.44	\$1.52	\$3.76	\$0.56	\$5.84	\$1.76	\$0.11	\$1.07	\$16.04
255HP-WT + 16 x 18 Baler	\$8.43	\$5.62	\$1.34	\$15.39	\$2.70	\$6.02	\$0.90	\$9.62	\$2.81	\$0.17	\$1.72	\$27.82
255HP-WT + 30' Rake	\$1.70	\$1.20	\$0.08	\$2.98	\$0.46	\$2.20	\$0.33	\$2.99	\$1.02	\$0.06	\$0.63	\$6.99
255HP-WT + 26' Mower	\$2.44	\$2.13	\$0.45	\$5.02	\$1.21	\$3.04	\$0.46	\$4.71	\$1.42	\$0.09	\$0.87	\$11.15
255HP-WT + 10-B Plow	\$8.28	\$7.63	\$0.67	\$16.58	\$2.46	\$6.89	\$1.03	\$10.38	\$3.21	\$0.20	\$1.97	\$30.17
255HP-WT + 36' Cultivator	\$1.83	\$1.34	\$0.12	\$3.29	\$0.52	\$1.48	\$0.22	\$2.22	\$0.69	\$0.04	\$0.42	\$6.20
255HP-WT + 40' Harrow	\$0.58	\$0.53	\$0.04	\$1.15	\$0.22	\$1.33	\$0.20	\$1.75	\$0.62	\$0.04	\$0.38	\$3.52
255HP-WT + 60' Spike-tooth harrow	\$0.51	\$0.43	\$0.03	\$0.97	\$0.17	\$0.89	\$0.13	\$1.19	\$0.41	\$0.03	\$0.25	\$2.57
18' Swather, self-propelled	\$4.78	\$3.28	\$0.64	\$8.70	\$1.31	\$1.13	\$0.17	\$2.61	\$2.15	\$0.14	\$0.33	\$13.46
Combine, newer	\$8.44	\$6.27	\$0.88	\$15.59	\$1.77	\$2.75	\$0.41	\$4.93	\$2.19	\$0.13	\$0.79	\$22.71
Combine, older	\$4.21	\$3.16	\$0.44	\$7.81	\$4.07	\$3.85	\$0.58	\$8.50	\$3.06	\$0.19	\$1.10	\$19.37
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84

¹Per hour machinery costs can be changed in this master table and they will update throughout. Costs are estimated by the University of Idaho Machinery Cost Calculator, available online at http://www.cals.uidaho.edu/aers/r_crops.htm. Data files are available upon request. Per acre costs are calculated based on the values listed in the Machinery Complement tab. Farm size is assumed to be 2000 acres for the purposes of machinery cost calculations.

Table 23. Machinery Costs for District 1 Bluegrass Establishment (\$/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)	
<i>Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:</i>												
Pickup 3/4 ton 4WD, newer	\$1.24	\$0.93	\$0.67	\$2.84	\$0.32	\$2.92	\$0.44	\$3.68	\$5.20	0.32	0.83	\$11.72
Pickup 3/4 ton 4WD, older	\$5.15	\$1.81	\$1.27	\$8.23	\$0.63	\$1.46	\$0.22	\$2.31	\$2.60	0.16	0.42	\$13.14
2-Ton Truck, used	\$1.32	\$0.80	\$0.30	\$2.42	\$1.05	\$1.46	\$0.22	\$2.73	\$2.44	0.15	0.42	\$7.59
<i>Machinery costs for these implements are specific to the operations for each crop:</i>												
255HP-WT + 10-B Plow	\$8.28	\$7.63	\$0.67	\$16.58	\$2.46	\$6.89	\$1.03	\$10.38	\$3.21	\$0.20	\$1.97	\$30.17
255HP-WT + 36' Cultivator	\$1.83	\$1.34	\$0.12	\$3.29	\$0.52	\$1.48	\$0.22	\$2.22	\$0.69	\$0.04	\$0.42	\$6.20
255HP-WT + 36' Cultivator	\$1.83	\$1.34	\$0.12	\$3.29	\$0.52	\$1.48	\$0.22	\$2.22	\$0.69	\$0.04	\$0.42	\$6.20
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
255HP-WT + 60' Spike-tooth harrow	\$0.51	\$0.43	\$0.03	\$0.97	\$0.17	\$0.89	\$0.13	\$1.19	\$0.41	\$0.03	\$0.25	\$2.57
255HP-WT + 60' Spike-tooth harrow	\$0.51	\$0.43	\$0.03	\$0.97	\$0.17	\$0.89	\$0.13	\$1.19	\$0.41	\$0.03	\$0.25	\$2.57
255HP-WT + 24' Drill & Fertilize	\$4.39	\$3.11	\$0.94	\$8.44	\$1.52	\$3.76	\$0.56	\$5.84	\$1.76	\$0.11	\$1.07	\$16.04
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
18' Swather, self-propelled	\$4.78	\$3.28	\$0.64	\$8.70	\$1.31	\$1.13	\$0.17	\$2.61	\$2.15	\$0.14	\$0.33	\$13.46
Total:	\$32.74	\$23.02	\$5.67	\$61.43	\$9.77	\$22.66	\$3.38	\$35.81	\$20.10	\$1.26	\$6.47	\$117.34

Table 24. Machinery Costs for District 1 Bluegrass Production, Full Burn Residue Removal (\$/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)	
<i>Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:</i>												
Pickup 3/4 ton 4WD, newer	\$1.24	\$0.93	\$0.67	\$2.84	\$0.32	\$2.92	\$0.44	\$3.68	\$5.20	0.32	0.83	\$11.72
Pickup 3/4 ton 4WD, older	\$5.15	\$1.81	\$1.27	\$8.23	\$0.63	\$1.46	\$0.22	\$2.31	\$2.60	0.16	0.42	\$13.14
2-Ton Truck, used	\$1.32	\$0.80	\$0.30	\$2.42	\$1.05	\$1.46	\$0.22	\$2.73	\$2.44	0.15	0.42	\$7.59
<i>Machinery costs for these implements are specific to the operations for each crop:</i>												
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
18' Swather, self-propelled	\$4.78	\$3.28	\$0.64	\$8.70	\$1.31	\$1.13	\$0.17	\$2.61	\$2.15	\$0.14	\$0.33	\$13.46
Combine, newer, 60% of acreage	\$5.06	\$3.76	\$0.53	\$9.35	\$1.06	\$1.65	\$0.25	\$2.96	\$1.31	\$0.08	\$0.47	\$13.63
Combine, older, 40% of acreage	\$1.68	\$1.26	\$0.18	\$3.12	\$1.63	\$1.54	\$0.23	\$3.40	\$1.22	\$0.08	\$0.44	\$7.75
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
Total:	\$22.14	\$13.77	\$4.46	\$40.37	\$7.10	\$10.46	\$1.57	\$19.13	\$15.47	\$0.96	\$3.00	\$74.96

Table 25. Machinery Costs for District 1 Bluegrass Production, Bale & Burn Residue Removal (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	(\$/acre)
<i>Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:</i>												
Pickup 3/4 ton 4WD, newer	\$1.24	\$0.93	\$0.67	\$2.84	\$0.32	\$2.92	\$0.44	\$3.68	\$5.20	0.32	0.83	\$11.72
Pickup 3/4 ton 4WD, older	\$5.15	\$1.81	\$1.27	\$8.23	\$0.63	\$1.46	\$0.22	\$2.31	\$2.60	0.16	0.42	\$13.14
2-Ton Truck, used	\$1.32	\$0.80	\$0.30	\$2.42	\$1.05	\$1.46	\$0.22	\$2.73	\$2.44	0.15	0.42	\$7.59
<i>Machinery costs for these implements are specific to the operations for each crop:</i>												
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
18' Swather, self-propelled	\$4.78	\$3.28	\$0.64	\$8.70	\$1.31	\$1.13	\$0.17	\$2.61	\$2.15	\$0.14	\$0.33	\$13.46
Combine, newer, 60% of acreage	\$5.06	\$3.76	\$0.53	\$9.35	\$1.06	\$1.65	\$0.25	\$2.96	\$1.31	\$0.08	\$0.47	\$13.63
Combine, older, 40% of acreage	\$1.68	\$1.26	\$0.18	\$3.12	\$1.63	\$1.54	\$0.23	\$3.40	\$1.22	\$0.08	\$0.44	\$7.75
255HP-WT + 30' Rake	\$1.70	\$1.20	\$0.08	\$2.98	\$0.46	\$2.20	\$0.33	\$2.99	\$1.02	\$0.06	\$0.63	\$6.99
255HP-WT + 16 x 18 Baler	\$8.43	\$5.62	\$1.34	\$15.39	\$2.70	\$6.02	\$0.90	\$9.62	\$2.81	\$0.17	\$1.72	\$27.82
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	0.02	0.04	\$3.84
Total:	\$32.27	\$20.59	\$5.88	\$58.74	\$10.26	\$18.68	\$2.80	\$31.74	\$19.30	\$1.19	\$5.35	\$109.77

Table 26. Machinery Costs for District 1 Bluegrass Production, Mechanical Residue Removal (\$/acre)

	Ownership Costs (\$/acre):				Operating Costs (\$/acre):				Labor		Fuel Use	Total Cost
	Depre- ciation	Interest	Taxes, Housing, Insurance, Licenses	Total Ownership Costs	Repairs	Fuel	Lubri- cants	Total	(\$/acre)	(hr/acre)	(gal/acre)	(\$/acre)
<i>Machinery costs for these implements are spread across every acre of the farm, regardless of crops produced:</i>												
Pickup 3/4 ton 4WD, newer	\$1.24	\$0.93	\$0.67	\$2.84	\$0.32	\$2.92	\$0.44	\$3.68	\$5.20	0.32	0.83	\$11.72
Pickup 3/4 ton 4WD, older	\$5.15	\$1.81	\$1.27	\$8.23	\$0.63	\$1.46	\$0.22	\$2.31	\$2.60	0.16	0.42	\$13.14
2-Ton Truck, used	\$1.32	\$0.80	\$0.30	\$2.42	\$1.05	\$1.46	\$0.22	\$2.73	\$2.44	0.15	0.42	\$7.59
<i>Machinery costs for these implements are specific to the operations for each crop:</i>												
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
Sprayer, 100', self-propelled	\$1.45	\$0.96	\$0.44	\$2.85	\$0.55	\$0.15	\$0.02	\$0.72	\$0.27	\$0.02	\$0.04	\$3.84
15' Swather, 20% slower than above	\$5.74	\$3.94	\$0.77	\$10.44	\$1.57	\$1.36	\$0.20	\$3.13	\$2.58	\$0.17	\$0.40	\$16.15
Combine, newer, 60% of acreage	\$5.06	\$3.76	\$0.53	\$9.35	\$1.06	\$1.65	\$0.25	\$2.96	\$1.31	\$0.08	\$0.47	\$13.63
Combine, older, 40% of acreage	\$1.68	\$1.26	\$0.18	\$3.12	\$1.63	\$1.54	\$0.23	\$3.40	\$1.22	\$0.08	\$0.44	\$7.75
18' Swather, self-propelled	\$4.78	\$3.28	\$0.64	\$8.70	\$1.31	\$1.13	\$0.17	\$2.61	\$2.15	\$0.14	\$0.33	\$13.46
255HP-WT + 40' Harrow	\$0.58	\$0.53	\$0.04	\$1.15	\$0.22	\$1.33	\$0.20	\$1.75	\$0.62	\$0.04	\$0.38	\$3.52
255HP-WT + 30' Rake	\$1.70	\$1.20	\$0.08	\$2.98	\$0.46	\$2.20	\$0.33	\$2.99	\$1.02	0.06	0.63	\$6.99
255HP-WT + 16 x 18 Baler	\$8.43	\$5.62	\$1.34	\$15.39	\$2.70	\$6.02	\$0.90	\$9.62	\$2.81	0.17	1.72	\$27.82
Total:	\$38.58	\$25.05	\$6.69	\$70.33	\$12.05	\$21.37	\$3.20	\$36.62	\$22.50	\$1.40	\$6.13	\$129.45

Table 27. Machinery Complement for Dryland Bluegrass Production, District 1

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
Tractors:										
255HP-WT	126,000	5	20	432	25,000	2,000	11	0.57	1.2	
255HP-WT	126,000	5	20	432	25,000	2,000	11	0.57	1.2	
Equipment, used with tractors above:										
10-Bottom Plow	22,000	0	20	80	4,000	600	15	0.6	1.1	5.56
36' Cultivator	28,000	0	15	50	3,000	400	4.6	0.6	1.1	26.00
40' Spring-tooth harrow	2,800	0	15	40	350	50	15	0.27	1.1	28.85
60' Spike harrow	3,000	0	15	20	350	50		0.6	1.1	43.00
Hay baler 16 x 18	88,000	0	10	170	22,000	2,000	4.6	2.5	1.2	6.36
26' Mower	27,500	0	15	87	12,000	1,000	4.6	2.17	1.1	12.61
24' Drill	25,000	5	15	50	2,000	500	4.6	3	1.2	10.18
30' side-delivery rake	13,200	0	15	63	1,500	150	4.6	0.27	1.1	17.45
Self-propelled equipment										
18' self-propelled swather	108,000	0	10	175	35,000	3,000	4.8	1.37	1.2	8.73
Combine, newer	264,000	5	15	200	50,000	3,000	7	0.95	1.2	8.91
Combine, older	50,000	15	10	122	19,000	3,000	7	0.95	1.2	6.36
100' self-propelled sprayer	125,000	5	12	80	30,000	3,000	3	3.1	1.2	72.73
Trucks:										
				Miles/year:				MPG:		
3/4-Ton Pickup	34,000	5	10	12,000	8,000	600	12	6.8	1.1	
3/4-Ton Pickup	7,500	15	15	2,000	450	1,500	12	6.8	1.1	
2-Ton Truck	35,000	10	10	5,000	10,000	2,000	6	2.5	1.2	

Note: Farm size is assumed to be 2000 acres for the purposes of machinery cost calculations.