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## **2010 Estimated Cost of Producing Hops in the Yakima Valley, Washington State**

By

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# 2010 ESTIMATED COST OF PRODUCING HOPS IN THE YAKIMA VALLEY, WASHINGTON STATE

**-Detailed Version-**

Suzette Galinato, Ann George and Herbert Hinman<sup>1</sup>

## **Abstract**

The enterprise budget provides estimates of production costs for a well-managed hop enterprise in Yakima Valley, Washington as of 2010. Three producer scenarios are presented to demonstrate how the enterprise budget can be used to evaluate situations in which the producer may find him/herself. An interactive Excel Workbook is developed and detailed instructions are provided to allow users to input their own data or make changes to the existing spreadsheets.

Key Words: enterprise budget, hops, Washington

JEL Classification: D24, Q19

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## **Introduction**

Commercial hop acreage in Washington State is located in the Yakima Valley. In 2008, with a value of \$263.8 million, hops ranked 9th in agricultural commodity value in Washington State. In 2009, 74.95 million pounds of hops from 29,588 acres were harvested in the state, accounting for 79% of the U.S. production. Washington hop acreage is expected to decline 30% in the next few years, a consequence of a worldwide oversupply. As a result, the economic climate for Washington hop producers is currently in chaos. In previous times, growers could generally count on putting in a trellis along with a drip irrigation system and leaving it in place for its useful life of approximately 20 years. This would assume that the grower would sign a 5-year contract, and renew it for 3 additional cycles on the same piece of ground (the variety might need to be changed and replanted, but the trellis and irrigation system would remain in service). However, things are currently so volatile that growers can no longer count on being able to amortize the cost of planting along with a new trellis and drip irrigation system over more than a few years. Under the current situation, some growers who thought they had a 5-year contract to amortize establishment costs are being asked to give up those contracts in as little as 2 years. Other growers may see their plantings and trellis and irrigation system remaining longer. In light of these circumstances, it is important to provide a tool for the estimation of establishment and production costs so hop growers can evaluate the profitability of their enterprise and make informed decisions regarding future expansion. There is also value in having this information for future contract and banking negotiations. Having an official document that lays out these expenses gives credibility to a grower who is trying to negotiate loan terms or contract amounts.

## **Objectives of Study**

The primary objectives of this study are:

1. To provide a representative estimate of capital requirements and production costs of a well-managed hop enterprise grown under drip irrigation.
2. To provide producers with a procedure and a tool for analyzing the profitability of their own hop enterprise.
3. To develop an Excel workbook that has flexibility features that allows the user to easily make changes and/or additions to the existing data in the spreadsheets.

## **The Hop Production Cost Workbook (Excel)**

The tables referred to in this documentation are located at the end of this documentation.

The Hop Production Cost Workbook is divided into two spreadsheets. The first spreadsheet, shown in Table 1 as a blank spreadsheet, is for estimating establishment costs for a hop field. The yellow cells are unprotected cells into which data or

comments may be entered. The blue cells are protected cells that cannot be changed unless the spreadsheet is “unprotected.” To use the “Unprotect” and “Protect” features of the spreadsheet, simply click on these features. There are no secret passwords necessary to activate these features. To the right of the “colored” spreadsheet are “unprotected” white columns that may be used to provide “Your Costs” figures and comments that differ from that in the “colored” spreadsheet.

The second spreadsheet, shown in Table 2 as a blank spreadsheet, is for estimating the production costs for Year 1 and the Mature Years. As in Table 1, yellow cells are unprotected cells into which data or comments may be entered. The blue cells are protected cells that cannot be changed unless the spreadsheet is “unprotected.”

Table 3 shows the Amortization Calculators (blank) used with the hop spreadsheets to amortize establishment costs over their expected life.

### **Sources of Information**

In putting together the general assumptions used in this study a committee of area producers identified the inputs, yields, and assumptions under which the budgets for the representative hop situation were developed. These producers are considered to represent well-managed hop farms. The quantities and types of materials (plants, fertilizers, herbicides, insecticides, etc.) used in the budgets were based on widely used practices.

Building and machinery costs were based on what the producer committee deemed typical of an average-sized hop farm in the Yakima Valley.

### **Basic Assumptions**

The following assumptions were the general assumptions made in developing the enterprise data for hops grown in the Yakima Valley:

1. The representative farm has 660 acres devoted to hop production with 600 acres in hops currently being established or currently producing. It takes 1.1 acres of land to establish 1 acre of hops. Thus, on this representative farm approximately 60 acres of extra land are needed for roads, buildings, picking equipment, etc.
2. Bare land is valued at \$4,500 per acre.
3. A drip irrigation system costs \$1,500 per acre to install. Annual repair and maintenance costs are \$15 per acre. The water charge is \$90 per acre.
4. Management is valued at \$400 per acre.
5. The prevailing interest rate is 6% for a short term loan, and 7.5% for a long-term loan.

## Representative Situation

The representative situation is a 40-acre hop field within the 660 acre farm that needs to be completely reestablished if production is to occur on this field. The producer has been offered a 4-year contract to establish and produce hops on this field. The producer desires to determine the price that must be received if all costs (financial and opportunity) are to be covered over a four year production period. The variety of hop to be grown is to be on a standard trellis and projected to have an average mature-year production of 2,600 lbs. First-year production is projected to be 80% of mature-year production, or 2,080 lbs.

Table 4 displays the establishment costs given the above general assumptions along with the specific assumptions listed in the spreadsheet, estimated at \$5,873 per acre. Establishment costs include land preparation during the fall of the previous year, constructing the trellis system, planting the hop roots and installing the irrigation system.

Table 5 presents the estimated production costs per acre during the first year and mature years. Production costs are classified into: *variable costs*, which are associated with materials, labor, consulting services and machinery operations; and *fixed costs*, which are incurred whether or not hops are grown and include equipment and building annual replacement cost (a proxy for depreciation), interest and taxes on investment, establishment, and management and administration costs.

Interest costs represent required return on investments. They can be actual interest payments on loans to finance the investment, or an opportunity cost (a return not received if the investment had been in an alternative activity), or a combination of the two. An opportunity cost of \$400 per acre for management is listed as a fixed cost rather than a variable cost because either one uses or loses management skills during the production year. The cost per acre is representative of what the producer committee felt was a fair return to their management. Amortized establishment costs are also included in the fixed costs. In this example, the amortized establishment costs comprise the planting costs amortized over 4 years based on the life of hop plants, and trellis and irrigation costs amortized over 4 years based on the assumed life of the trellis and irrigation systems. In both cases, a short term interest of 6% is used. These costs must be recaptured during the production years in order for an enterprise to be profitable.

In Table 5, the mature years per acre yield level was estimated at 2,600 pounds with the first year of production being 80% of that of the mature years. Given these production estimates the breakeven price of alpha hops for the first 4 year planting is estimated at \$3.18 per pound. The equation to estimate the breakeven price is as follows:

$$\text{Breakeven price} = \frac{TC_{Y1} + (TC_M * (H - 1))}{Q_{Y1} + (Q_M * (H - 1))}$$

where TC refers to the total cost of production; Q is hop yield ; H is the years of hop life; and the subscripts Y1 and M represent the first year of production and mature years (i.e., years 2 - 4), respectively.

Table 6 shows the amortization calculations used to determine the amount to be amortized over the expected years of life for the hop plants, and for the trellis and irrigation systems in Table 5.

Producers reviewing these budgets most likely will state that their own costs are lower than those presented. Furthermore, others outside the industry may question the cost estimates and breakeven prices stating, "If the breakeven price is more than the market price then the producers are operating at a loss. How do they stay in business?" To adequately address these concerns and questions, one must understand the difference between "economic" and "financial" budgets and how an economic budget can be used to develop a financial budget. The budgets shown in Tables 4 and 5 are economic budgets.

While individual producers may differ relative to the type and amount of inputs and yield projections, the main sources of confusion are establishment costs and the cost of owned capital, labor, management, and land. To fully understand the representative hop budgets shown in Tables 4 and 5, one must understand the concepts of opportunity cost and amortized establishment cost.

Opportunity cost is the revenue lost by not investing in the next best similar risk alternative. For instance, if a producer invests \$50,000 of equity capital in equipment, the producer gives up the alternative of investing this money in the stock market or paying off a current loan. Thus, if the producer is to realize an "economic" profit, the equipment investment must realize a return greater than that associated with the next best alternative. If the next best alternative happens to be paying off a current loan with 9% annual interest, economic profits are not realized until a net return greater than \$4,500 is realized by the equipment investment. Thus, the hop enterprise budgets reflect an interest cost on both owned and borrowed capital.

The same is true for operator labor and management, and owned land. In calculating labor and management costs, operator labor and management are valued at their opportunity cost of being hired out to a neighboring farm, or the dollar amount it would cost to hire someone else to do the labor and management being furnished by the producer. For land owned, the opportunity cost included in the hop budgets is the return the producer would like to receive from their land investment.

Establishment costs are those costs incurred during the establishment of the enterprise. In the case of hops, establishment costs include the establishment of the trellis system (including land preparation), the irrigation system, and planting the hop roots.

### **Situation 1**

Situation 1 is the same as the Representative Situation except the "Your Costs" columns include producer costs.

Since most producers have equity in their farm business and provide labor and management associated with running their operation, in order to determine a given producer's financial costs (i.e., excluding opportunity costs), adjustments must be made

to the “economic” hop budgets presented above. Assume a producer furnishes 75% of the \$400 per acre management and administration on the farm. Being a fulltime manager, the amount of actual unpaid labor the producer contributes to the operation is minimal. This producer has an outstanding real estate loan of \$1,600,000 on which 7.5% interest is being paid over the remaining 15-year period, an outstanding machinery and building loan of \$2,500,000 on which 7.5% interest is being paid, and carries approximately \$800,000 in operating loans for an average of 6 months per year at 6.0% annual interest.

Table 7, is essentially Table 4 with the above producer’s “financial” budget information entered in the “Your Costs” columns for preparing and establishing a standard trellis hop field. Table 8, is essentially Table 5 with the above producer’s “financial” budget information entered in the “Your Costs” columns for producing standard trellis alpha hops. In the “Your Costs” columns for both Table 7 and Table 8, all opportunity costs on equity capital and unpaid operator labor and management are eliminated. Management and administrative costs were reduced from \$400 per acre to \$100 per acre since the operator furnishes all but \$100 per acre of the management and administration. All other entries, with the exception of land cost, have to do with eliminating opportunity cost on equity capital and including only interest costs actually paid. In the case of land cost, although principal payments are not expenses, both the principal and interest payment on the land loan are included since principal payments are annual cash obligations that the enterprise must cover. In the case of machinery and buildings, the principal payments on the loans are covered by “Machinery & Building Annual Replacement Cost.” In both Table 7 and Table 8, additional costs experienced by the producer that are different than the representative situation (fertilizer, chemicals, packaging, etc.) were added as an illustration of how producers can further enter their own costs. Table 9 shows the amortization calculations for Table 8.

The results for Situation 1 show that at a price of \$2.91 per pound the producer will be able to cover all financial costs and that at any price above \$2.91 opportunity costs will begin to be covered.

## **Situation 2**

Situation 2 is similar to Situation 1 in that all the basic data is the same. However, in this situation the producer wants to make his economic and financial comparisons based on a 5-year hop life and a 10-year trellis and irrigation system life. In Situation 2, after the first five years of production the current hop planting is removed with another planting replacing it.

The establishment costs for this situation are the same as those listed in Table 7. Therefore, only the production cost changes are shown in Table 10. In the Example spreadsheet the 4-year hop life is changed to a 5-year hop life and the 4-year trellis and irrigation life is changed to a 10-year life. The establishment costs calculations for the “Your Costs” figures also need to be recalculated based on the change in the years that establishment costs are to be amortized. When this is finished, both the breakeven price for the representative situation and the “Your Costs” columns will change. The results for Situation 2 show that the representative situation “economic” breakeven price

is \$2.83 while the producer's "financial" breakeven price is \$2.54. Table 11 shows the amortization calculations for Table 10.

### **Changing Spreadsheet Data**

Individual growers, and other users, can use the MS Excel workbook that is available at the WSU IMPACT Center website: <http://www.impact.wsu.edu/IMPACTProjects.html>. The user will find a copy of this documentation and the Workbook containing four different sets of data: (1) the Workbook containing blank entries; (2) the Workbook containing entries for the Representative Situation, (3) the Workbook containing entries for Situation 1; and (4) the Workbook containing entries for Situation 2. It is suggested that you download these files and store them on your hard drive in a folder created for this purpose.

Before changing any data in an existing spreadsheet, it is suggested that the MS Excel file be made "read-only" thus forcing the user to save the existing file and giving the new file a different name than that of the original file. To make a file "read-only", the user needs to go to the folder where the file is stored and right-click on the filename, left-click on "Properties" and check "Read only."

There are two methods that users can do to estimate their own production costs. The first method is to download the Workbook containing blank entries and enter your own data directly into the yellow cells. If changes are desired in the any of the blue cells, the spreadsheet must be "unprotected" before this can be done. Once finished developing a new file, save it in your current folder of files under a new filename.

The second method is to save an existing file under a different filename and modify according to your specifications by making changes directly in the spreadsheet and/or in the "Your Costs" columns. Once finished modifying this file, save it in your current folder of files under a new filename.



**Table 1: Blank Spreadsheet for Estimating Establishment Costs for a Hop Field.**

Comments and Notes			Your Costs	Comments
	\$		\$	
<b>LAND PREPARATION:</b>				
Disc				
Subsoil				
Plow/Rototill				
Cultipack/Sprtooth (2X)				
Fumigate				
Interest			0.00	
<b>Total Land Preparation</b>	0.00		0.00	
<b>ESTABLISHMENT:</b>				
<b>Materials and Labor</b>				
Field Poles				
Anchor Poles				
Anchor Holes				
Anchor Material				
Wire and Staples				
Hop Roots				
Labor				
Management				
Irrigation System				
Interest			0.00	
<b>Total Establishment Cost</b>	0.00		0.00	
<b>Total Land Preparation and Establishment Costs</b>	0.00		0.00	

NOTE: All machinery costs, other than custom hired, are included in Year 1 production costs.

**Table 2: Blank Spreadsheet for Estimating the Production Costs for Year 1 and Mature Years of a Hop Field.**

				Your Costs		Comments
	Year 1 \$	Mature Years \$	Comments and Notes	Year 1	Mature Years	
			years of hop life			
			years of trellis life			
<b>Variable Costs:</b>						
Fertilizer & Leaf Feed						
Chemicals						
Consulting and custom hire						
Licenses, fees and dues						
Parts and Repairs						
Fuel and Oil						
Supplies						
Packaging	0.00	0.00	per bale			
Kiln Fuel	0.00	0.00	per bale			
Utilities						
Hop Dryer & Baler	0.00	0.00	per bale			
Seasonal Labor						
Interest						
<b>Total Variable Costs</b>	0.00	0.00		0.00	0.00	
<b>Fixed Costs:</b>						
Equipment & Building Annual Replacement Cost						
Interest on Mach. & Buildings						
Insurance Cost (all farm insurance)						
<b>Amortized Establishment Costs:</b>						
Planting Costs	0	0.00	0.00			
Trellis & Irrig. Costs	0	0.00	0.00			
Land & Property Taxes						
Land Cost						
Irrigation Water						
Management & Administration						
<b>Total Fixed Costs</b>	0.00	0.00		0.00	0.00	
<b>TOTAL COSTS</b>	0.00	0.00		0.00	0.00	
Estimated Production Level (Lbs.)						
Breakeven Price			0 years of hop life			

**Table 3: Blank Amortization Calculators**

**AMORTIZATION CALCULATORS**

<b>A. Establishment cost attributed to Planting</b>	
Dollar amount to be amortized:	\$0.00
Number of years:	0
Interest rate:	
Amortized amount per year:	\$0.00

<b>B. Establishment cost attributed to Trellis &amp; Irrigation System</b>	
Dollar amount to be amortized:	\$0.00
Number of years:	0
Interest rate:	
Amortized amount per year:	\$0.00

**AMORTIZATION CALCULATOR  
TO BE USED FOR  
"YOUR COST" COLUMNS**

Dollar amount to be amortized:	
Number of years:	
Interest rate:	
Amortized amount per year:	

Dollar amount to be amortized:	
Number of years:	
Interest rate:	
Amortized amount per year:	

**Table 4: Estimated per Acre Costs for Preparing and Establishing a Standard Trellis Hop Field under Drip Irrigation.**

ESTIMATED COSTS PER ACRE FOR PREPARING AND ESTABLISHING A STANDARD TRELLIS HOP FIELD UNDER DRIP IRRIGATION			Your Costs	Comments
Comments and Notes			\$	
LAND PREPARATION:	\$	October-November of Previous Year		
Disc	22.00	Custom hire 1.1 acres @ \$20/acre		
Subsoil	35.00	Custom hire 1.1 acres @ \$31.80/acre		
Plow/Rototill	50.00	Custom hire 1.1 acres @ \$45.45/acre		
Cultipack/Sprtooth (2X)	34.00	Custom hire 1.1 acres @ \$15.45/acre each time		
Fumigate		Not a standard practice		
Interest	8.46	6% of land prep cost including overhead		
Total Land Preparation	149.46		0.00	
ESTABLISHMENT:				
Materials and Labor				
Field Poles	900.00	60 poles @ \$15.00/pole		
Anchor Poles	235.00	10 poles @ \$23.50/pole		
Anchor Holes	35.00	10 holes @ \$3.50/hole		
Anchor Material	200.00	10 holes @ \$20/hole		
Wire and Staples	630.00	2,100 lbs. of wire @ 30 cents/lb.		
Hop Roots	800.00	4,000 roots @ 20 cents/root		
Labor	900.00			
Management	200.00	10 hours @ \$20/hour		
Irrigation System	1500.00	Labor and materials		
Interest	324.00	6% of above establishment costs		
Total Establishment Cost	5724.00		0.00	
Total Land Preparation and Establishment Costs	5873.46		0.00	

NOTE: All machinery costs, other than custom hired, are included in Year 1 production costs.

**Table 5: Estimated per Acre Costs and Returns from Producing Standard Trellis Hops under Drip Irrigation.**

ESTIMATED PER ACRE COSTS AND RETURNS FROM PRODUCING STANDARD TRELLIS HOPS UNDER DRIP IRRIGATION					Your Costs		Comments
	Year 1 \$	Mature Years \$	Comments and Notes		Year 1	Mature Years	
			4 years of hop life				
			4 years of trellis and irrigation life				
<b>Variable Costs:</b>							
Fertilizer & Leaf Feed	275.00	250.00	Includes line cleaner				
Chemicals	325.00	450.00	Includes herbicide, insecticide & fungicides				
Consulting and custom hire	20.00	20.00	Includes scouting				
Licenses, fees and dues	40.00	40.00	Assessments, dues licenses, inspection fees				
Parts and Repairs	400.00	400.00	Includes equipment, trellis, irrigation, facilities				
Fuel and Oil	200.00	200.00					
Supplies	150.00	150.00	Includes twine & clips, general supplies				
Packaging	57.20	71.50	\$5.50 per bale	Burlap, plastic, pelletizing			
Kiln Fuel	145.60	182.00	\$14.00 per bale				
Utilities	90.00	90.00					
Hop Dryer & Baler	104.00	130.00	\$10.00 per bale				
Seasonal Labor	1600.00	1500.00	Includes benefits, employer taxes, etc.				
Interest	102.20	104.51	6% of above variable costs x 6/12 (6 months)				
<b>Total Variable Costs</b>	<b>3509.00</b>	<b>3588.01</b>			<b>0.00</b>	<b>0.00</b>	
<b>Fixed Costs:</b>							
Equipment & Building Annual Replacement Cost	500.00	500.00	\$300,000 per year for a 600-acre hop ranch with capital investments having a 5-10 year lifespan				
Interest on Mach. & Buildings	1000.00	1000.00	\$8 million @ 7.5% divided by 600 acres (picker, kiln, baler, shop, office @ \$6.5 million + equipment @ \$1.5 million)				
Insurance Cost (all farm insurance)	190.00	190.00					
<b>Amortized Establishment Costs:</b>							
Planting Costs	4 years, 6%	288.59	288.59	\$1,000	Hop roots plus \$200 labor		
Trellis & Irrig. Costs	4 years, 6%	1406.31	1406.31	\$4,873	Land prep & estab. - planting costs		
Land & Property Taxes		82.50	82.50	\$75 per acre x 1.1 acres			
Land Cost		330.00	330.00	(\$4,000 per acre x 1.1 acres) x 7.5%			
Irrigation Water		90.00	90.00				
Management & Administration		400.00	400.00				
<b>Total Fixed Costs</b>	<b>4287.40</b>	<b>4287.40</b>			<b>0.00</b>	<b>0.00</b>	
<b>TOTAL COSTS</b>	<b>7796.40</b>	<b>7875.40</b>			<b>0.00</b>	<b>0.00</b>	
Estimated Production Level (Lbs.)	2080.00	2600.00	Fill in the blank with your estimates				
Breakeven Price		3.18	4 years of hop life				

**Table 6: Amortization Calculators for Table 5**

**AMORTIZATION CALCULATORS**

<b>A. Establishment cost attributed to Planting</b>	
Dollar amount to be amortized:	\$1,000.00
Number of years:	4
Interest rate:	6.00%
Amortized amount per year:	-\$288.59

<b>B. Establishment cost attributed to Trellis &amp; Irrigation System</b>	
Dollar amount to be amortized:	\$4,873.00
Number of years:	4
Interest rate:	6.00%
Amortized amount per year:	-\$1,406.31

**Table 7: Estimated per Acre Costs for Preparing and Establishing a Standard Trellis Hop Field under Drip Irrigation for Situation 1.**

<b>ESTIMATED COSTS PER ACRE FOR PREPARING AND ESTABLISHING A STANDARD TRELLIS HOP FIELD UNDER DRIP IRRIGATION</b>				
<b>Comments and Notes</b>			<b>Your Costs</b>	<b>Comments</b>
	<b>\$</b>		<b>\$</b>	
<b>LAND PREPARATION:</b>		October-November of Previous Year		
Disc	22.00	Custom hire 1.1 acres @ \$20/acre	18.00	My cost. I do this myself with my equipment
Subsoil	35.00	Custom hire 1.1 acres @ \$31.80/acre	30.00	My cost. I do this myself with my equipment
Plow/Rototill	50.00	Custom hire 1.1 acres @ \$45.45/acre	42.00	My cost. I do this myself with my equipment
Cultipack/Sprtooth (2X)	34.00	Custom hire 1.1 acres @ \$15.45/acre each time	30.00	My cost. I do this myself with my equipment
Fumigate		Not a standard practice		
Interest	8.46	6% of land prep cost	7.20	6% of land prep cost
<b>Total Land Preparation</b>	<b>149.46</b>		<b>127.20</b>	
<b>ESTABLISHMENT:</b>				
<b>Materials and Labor</b>				
Field Poles	900.00	60 poles @ \$15.00/pole	900.00	60 poles @ \$15/pole
Anchor Poles	235.00	10 poles @ \$23.50/pole	250.00	10 poles @ \$25/pole
Anchor Holes	35.00	10 holes @ \$3.50/hole	40.00	10 holes @ \$4/hole
Anchor Material	200.00	10 holes @ \$20/hole	220.00	10 holes @ \$22/hole
Wire and Staples	630.00	2,100 lbs. of wire @ 30 cents/lb.	651.00	2,100 lbs. of wire @ 31 cents/lb.
Hop Roots	800.00	4,000 roots @ 20 cents/root	800.00	Same cost
Labor	900.00		1000.00	
Management	200.00	10 hours @ \$20/hour	250.00	10 hours @ \$25/hour
Irrigation System	1500.00	Labor and materials	1700.00	
Interest	324.00	6% of above establishment costs	348.66	6% of above establishment costs
<b>Total Establishment Cost</b>	<b>5724.00</b>		<b>6159.66</b>	
<b>Total Land Preparation and Establishment Costs</b>	<b>5873.46</b>		<b>6286.86</b>	

NOTE: All machinery costs, other than custom hired, are included in Year 1 production costs.

**Table 8: Estimated per Acre Costs and Returns from Producing Standard Trellis Hops under Drip Irrigation for Situation 1.**

ESTIMATED PER ACRE COSTS AND RETURNS FROM PRODUCING STANDARD TRELLIS HOPS UNDER DRIP IRRIGATION					Your Costs		Comments
	Year 1	Mature	Comments and Notes		Year 1	Mature	
	\$	Years				Years	
		\$					
			4 years of hop life				
			4 years of trellis and irrigation life				
<b>Variable Costs:</b>							
Fertilizer & Leaf Feed	275.00	250.00	Includes line cleaner		280.00	260.00	
Chemicals	325.00	450.00	Includes herbicide, insecticide & fungicides		335.00	470.00	
Consulting and custom hire	20.00	20.00	Includes scouting		22.00	22.00	
Licenses, fees and dues	40.00	40.00	Assessments, dues licenses, inspection fees		40.00	40.00	
Parts and Repairs	400.00	400.00	Includes equipment, trellis, irrigation, facilities		420.00	420.00	
Fuel and Oil	200.00	200.00			210.00	210.00	
Supplies	150.00	150.00	Includes twine & clips, general supplies		165.00	165.00	
Packaging	57.20	71.50	\$5.50 per bale	Burlap, plastic, pelletizing	62.40	78.00	\$6.00 per bale
Kiln Fuel	145.60	182.00	\$14.00 per bale		156.00	195.00	\$15.00 per bale
Utilities	90.00	90.00			100.00	100.00	
Hop Dryer & Baler	104.00	130.00	\$10.00 per bale		109.20	136.50	\$10.50 per bale
Seasonal Labor	1600.00	1500.00	Includes benefits, employer taxes, etc.		1750.00	1600.00	
Interest	102.20	104.51	6% of above variable costs x 6/12 (6 months)		109.49	110.90	(\$800,000 x 6% x 6/12) / 600 acres
<b>Total Variable Costs</b>	<b>3509.00</b>	<b>3588.01</b>			<b>3759.09</b>	<b>3807.40</b>	
<b>Fixed Costs:</b>							
Equipment & Building Annual Replacement Cost	500.00	500.00	\$300,000 per year for a 600-acre hop ranch with capital investments having a 5-10 year lifespan.		500.00	500.00	
Interest on Mach. & Buildings	1000.00	1000.00	\$8 million @ 7.5% divided by 600 acres (picker, kiln, baler, shop, office @ \$6.5 million + equipment @ \$1.5 million)		312.50	312.50	(\$2.5 million loan @ 7.5% interest) / 600 acres
Insurance Cost (all farm insurance)	190.00	190.00			190.00	190.00	
<b>Amortized Establishment Costs:</b>							
Planting Costs	4 years, 6%	288.59	288.59	\$1,000 Hop roots plus \$200 labor	317.45	317.45	Hop roots plus \$300 L & M : (\$1,100, 4 years, 6%)
Trellis & Irrig. Costs	4 years, 6%	1406.31	1406.31	\$4,873 Land prep & estab. - planting costs	1496.88	1496.88	Land prep. & estab. - planting costs: (\$5,186.86, 4 years, 6%)
Land & Property Taxes		82.50	82.50	\$75 per acre x 1.1 acres	82.50	82.50	
Land Cost		330.00	330.00	(\$4,000 per acre x 1.1 acres) x 7.5%	302.10	302.10	P&I for (\$1,600,000, 7.5%, 15 years) / 600 acres
Irrigation Water		90.00	90.00		90.00	90.00	
Management & Administration		400.00	400.00		100.00	100.00	3/4 of Management & Administration furnished by the producer
<b>Total Fixed Costs</b>	<b>4287.40</b>	<b>4287.40</b>			<b>3391.43</b>	<b>3391.43</b>	
<b>TOTAL COSTS</b>	<b>7796.40</b>	<b>7875.40</b>			<b>7150.52</b>	<b>7198.83</b>	
Estimated Production Level (Lbs.)	2080.00	2600.00	Fill in the blank with your estimates		2080.00	2600.00	
Breakeven Price		3.18	4 years of hop life			2.91	4 year hop life



**.Table 9: Amortization Calculators for Table 8**

**AMORTIZATION CALCULATORS**

<b>A. Establishment cost attributed to Planting</b>	
Dollar amount to be amortized:	\$1,000.00
Number of years:	4
Interest rate:	6.00%
Amortized amount per year:	-\$288.59

<b>B. Establishment cost attributed to Trellis &amp; Irrigation System</b>	
Dollar amount to be amortized:	\$4,873.00
Number of years:	4
Interest rate:	6.00%
Amortized amount per year:	-\$1,406.31

**AMORTIZATION CALCULATOR  
TO BE USED FOR  
"YOUR COST" COLUMNS**

Dollar amount to be amortized:	\$1,100.00
Number of years:	4
Interest rate:	6.00%
Amortized amount per year:	-\$317.45

Dollar amount to be amortized:	\$5,186.86
Number of years:	4
Interest rate:	6.00%
Amortized amount per year:	-\$1,496.88

**Table 10: Estimated per Acre Costs and Returns from Producing Standard Trellis Hops under Drip Irrigation for Situation 2.**

ESTIMATED PER ACRE COSTS AND RETURNS FROM PRODUCING STANDARD TRELLIS HOPS UNDER DRIP IRRIGATION				Your Costs		Comments
	Year 1	Mature Years	Comments and Notes	Year 1	Mature Years	
	\$	\$				
			5 years of hop life			
			10 years of trellis and irrigation life			
<b>Variable Costs:</b>						
Fertilizer & Leaf Feed	275.00	250.00	Includes line cleaner	280.00	260.00	
Chemicals	325.00	450.00	Includes herbicide, insecticide & fungicides	335.00	470.00	
Consulting and custom hire	20.00	20.00	Includes scouting	22.00	22.00	
Licenses, fees and dues	40.00	40.00	Assessments, dues licenses, inspection fees	40.00	40.00	
Parts and Repairs	400.00	400.00	Includes equipment, trellis, irrigation, facilities	420.00	420.00	
Fuel and Oil	200.00	200.00		210.00	210.00	
Supplies	150.00	150.00	Includes twine & clips, general supplies	165.00	165.00	
Packaging	57.20	71.50	\$5.50 per bale Burlap, plastic, pelletizing	62.40	78.00	\$6.00 per bale
Kiln Fuel	145.60	182.00	\$14.00 per bale	156.00	195.00	\$15.00 per bale
Utilities	90.00	90.00		100.00	100.00	
Hop Dryer & Baler	104.00	130.00	\$10.00 per bale	109.20	136.50	\$10.50 per bale
Seasonal Labor	1600.00	1500.00	Includes benefits, employer taxes, etc.	1750.00	1600.00	
Interest	102.20	104.51	6% of above variable costs x 6/12 (6 months)	109.49	110.90	(\$800,000 x 6% x 6/12) / 600 acres
<b>Total Variable Costs</b>	<b>3509.00</b>	<b>3588.01</b>		<b>3759.09</b>	<b>3807.40</b>	
<b>Fixed Costs:</b>						
Equipment & Building Annual Replacement Cost	500.00	500.00	\$300,000 per year for a 600-acre hop ranch with capital investments having a 5-10 year lifespan.	500.00	500.00	
Interest on Mach. & Buildings	1000.00	1000.00	\$8 million @ 7.5% divided by 600 acres (picker, kiln, baler, shop, office @ \$6.5 million + equipment @ \$1.5 million)	312.50	312.50	(\$2.5 million loan @ 7.5% interest) / 600 acres
Insurance Cost (all farm insurance)	190.00	190.00		190.00	190.00	
<b>Amortized Establishment Costs:</b>						
Planting Costs	237.40	237.40	\$1,000 Hop roots plus \$200 labor	261.14	261.14	Hop roots plus \$300 L & M : (\$1,100, 5 years, 6%)
Trellis & Irrig. Costs	662.08	662.08	\$4,873 Land prep & estab. - planting costs	704.73	704.73	Land prep. & estab. - planting costs: (\$5,186.86, 10 years, 6%)
Land & Property Taxes	82.50	82.50	\$75 per acre x 1.1 acres	82.50	82.50	
Land Cost	330.00	330.00	(\$4,000 per acre x 1.1 acres) x 7.5%	302.10	302.10	P&I for (\$1,600,000, 7.5%, 15 years) / 600 acres
Irrigation Water	90.00	90.00		90.00	90.00	
Management & Administration	400.00	400.00		100.00	100.00	3/4 of Management & Administration furnished by the producer
<b>Total Fixed Costs</b>	<b>3491.98</b>	<b>3491.98</b>		<b>2542.97</b>	<b>2542.97</b>	
<b>TOTAL COSTS</b>	<b>7000.98</b>	<b>7079.99</b>		<b>6302.06</b>	<b>6350.37</b>	
Estimated Production Level (Lbs.)	2080.00	2600.00	Fill in the blank with your estimates	2080.00	2600.00	
Breakeven Price		2.83	5 years of hop life		2.54	5 year hop life

**Table 11: Amortization Calculators for Table 10**

**AMORTIZATION CALCULATORS**

<b>A. Establishment cost attributed to Planting</b>	
Dollar amount to be amortized:	\$1,000.00
Number of years:	5
Interest rate:	6.00%
Amortized amount per year:	-\$237.40

<b>B. Establishment cost attributed to Trellis &amp; Irrigation System</b>	
Dollar amount to be amortized:	\$4,873.00
Number of years:	10
Interest rate:	6.00%
Amortized amount per year:	-\$662.08

**AMORTIZATION CALCULATOR  
TO BE USED FOR  
"YOUR COST" COLUMNS**

Dollar amount to be amortized:	\$1,100.00
Number of years:	5
Interest rate:	6.00%
Amortized amount per year:	-\$261.14

Dollar amount to be amortized:	\$5,186.86
Number of years:	10
Interest rate:	6.00%
Amortized amount per year:	-\$704.73