

FEASIBILITY ANALYSIS OF A HOP FARM IN EDNA VALLEY, CA

Presented to the  
Faculty of the Agribusiness Department  
California Polytechnic State University

In Partial Fulfillment  
of the Requirements for the Degree  
Bachelor of Science

by  
Brandon James Spreafico

December 2013

Table of Contents

Chapter 1

INTRODUCTION.....4

    Problem Statement.....7

    Hypothesis.....7

    Objectives.....7

    Justification.....7

Chapter 2

REVIEW OF THE LITERATURE.....10

    The Feasibility Study.....10

    Hop Industry.....11

    Growing Hops.....15

    Goals and Values.....17

    Climates of Yakima Valley and Edna Valley.....18

Chapter 3

METHODOLOGY.....20

    Procedures for Data Collection.....20

    Procedures for Data Analysis.....22

    Assumptions.....23

    Limitations.....24

Chapter 4

Development of the Study.....25

Chapter 5

Summary.....27

Conclusion.....29

REFERENCES CITED.....30

Appendix

Table 1.....1

Table 2.....2

Amortization Table.....3

Temperature Data.....4

Precipitation Data.....7

National Hop Report Data.....10

Hop Acres Harvested Graph.....11

Hop Yield Per Acre Graph.....12

Hop Production Graph.....13

Hop Price Per Pound.....14

Value of Hop Production.....15

## Chapter 1

### INTRODUCTION

The United States was the second largest producer of hops in the world with a 29.7% share of the world market in 2010, and plays a vital role in the domestic and international trade of hops (Gabrielyan and Marsh 2012). Hops are one of the four main ingredients used in the brewing process to keep freshness in the production of beer. Hops are considered the age-old seasoning of beer, and are used to protect the beer from spoilage from wild bacteria and bring balance to sweet malts. They also help in the head retention of beer and act as a natural filter by helping to clear the beer. The hops help please the palate by imparting their unique characters and flavors, putting the “bitter” in beer (BeerAdvocate 2013). USDA data reports that United States hop prices have changed dramatically over the last two decades. The domestic average real price of hops from 1947-2008 was \$1.42 per pound, with an average hop production of 56.94 million pounds annually.

The United States beer industry has seen much growth over the past few years, as consumers are becoming more interested in different flavorings and styles of beer. This has opened the door for many new breweries to open, especially microbreweries. A microbrewery was originally a term used to describe the relative size of a brewery, but the term has gradually come to reflect an alternative perception and approach to brewing flexibility, adaptability, experimentation and customer service. These microbreweries focus on offering products that compete on the basis of quality and diversity, instead of

low pricing and advertising. This has left the large commercial breweries trying to adapt to the changing environment, by introducing new brands intended to compete in the microbrewery market, or buying or investing in these microbreweries. With this changing environment shifting towards quality and diversity in beer, a door has been opened for the most important ingredient in beer production: hops (Richey 2012).

The United States has over 1,100 microbreweries, and saw that number increase by over 300 breweries in just one year from 2011 to 2012. The state with the highest number of these microbreweries is California, with 428 different microbreweries and brewpubs (Richey 2012). Forty of these licensed breweries are located between Ventura and Santa Cruz, with twelve of these breweries located within San Luis Obispo County. This number continues to grow as Arroyo Grande and Paso Robles have both opened new microbreweries in the last few months. With all this growth in the industry, there certainly is potential for success in joining the industry. The major problem that all these microbreweries face is that they are forced to import their hops from other states, increasing their costs of production. The problem is that almost all of the United States commercial hop production occurs in three primary states: Washington, Oregon, and Idaho. These states make up 30,016 acres of hop producing land, with Washington being home to 78% of this land (USA Hops 2008). Therefore, California microbreweries are forced to contract out of state for their hops and as a result must pay even higher prices for shipping a product they never get to verify the quality of before receiving.

The 3/S Ranch in San Luis Obispo, CA will be analyzed in this study as a potential hops producer and supplier for microbreweries throughout California. The farm would be set up and operated on family owned property. The 3/S Ranch is located on

Orcutt Road, on the outskirts of San Luis Obispo in the Edna Valley. The ranch totals 700 acres and starts on Orcutt Road and goes back 3.5 miles into the Santa Lucia Mountains. Wine vineyard grapes surround the ranch; it is one of the last pieces of property not occupied by grapes or homes in the Valley. The 3/S Ranch is currently a working cattle ranch along with other operations. The other operations include: a red rock mining operation open year round, a barn used to host weddings and events, and 80 acres of irrigated farm land currently leased to Bejo Seeds on an annual basis. However, the ranch is capable of having 200 acres of irrigated farming land, but most of this land is currently used as grazing land for the cattle. This ranch provides a tremendous opportunity for farming, as the land and water are readily available at low costs. Establishing a hop farm on the 3/S Ranch will require a feasibility study to be completed in order to estimate if the project is physically and financially feasible.

The feasibility study will help to determine whether implementing a hop farm on the 3/S ranch is possible and an economically sound decision. Hops need the correct environment and climate to successfully grow and a study will help determine if this commodity can prosper in the Edna Valley. The feasibility study will also help determine if the hop farm is an economically sound decision. It will help determine if the investment into the resources and equipment needed to start the farm will be worth the financial risk in the long run. In the case with the 3/S Ranch, the observed growing climate, conditions, and demand for hops from local microbreweries will provide a hop farm on the 3/S ranch an opportunity for success.

## Problem Statement

Is the Edna Valley, CA area suitable for growing hops and if so, is there enough demand for hops to succeed?

## Hypothesis

Hops can successfully be grown in Edna Valley, CA and the hop farm will provide a profit greater than the cattle grazing opportunity cost

## Objectives

1. To compare and contrast the growing climates of the best and most well-known regions for growing hops to the Edna Valley region.
2. To assess the opportunity cost of a hop farm on the 3/S Ranch in Edna Valley.
3. To determine if there is a demand for hops and whether there is already an oversupply of hops in the global and domestic market.

## Justification

The United States produced over six million pounds of hops in 2012 with an average yield of just over 1,900 pounds per acre. These hops helped in the production of

beer in the United States, an industry that is worth nearly \$250 billion and is made up of over 2,400 breweries. United States craft brewers have doubled their collective beer sold since 2001, from 5.35 million barrels up to nearly 13 million barrels in the 2012 production year (Richey 2012). The beer industry in California alone injects over \$32 billion into California's economy and is home to 428 different microbreweries and brewpubs (Richey 2012). The California beer industry provides over 229,000 jobs and \$10.5 million in wages and benefits were generated by the industry. The beer industry provides jobs at all different levels of the market, from being directly employed by the beer industry to working at a licensed retailer or outlet that sells beer. A hop farm may generate many jobs ranging from the field to sales and distribution.

The majority of the world's commercial hop production occurs between latitudes 35 and 55 degrees, either north or south of the equator. The 35 to 55 degrees latitude north of the equator runs from just north of Los Angeles all the way up to Alaska along the Pacific Coast. The 3/S Ranch and Edna Valley are located at latitude of 35.216 degrees, falling just within the ideal growing region for hops. Day length during the growing season, as determined by the latitude, has a major effect on total yield (USA Hops 2008). Hops need at least six to eight hours of sun a day and this number would be exceeded in the open rolling hills of Edna Valley. The average yearly temperature is slightly higher in Edna Valley than some of the major growing regions like the Yakima Valley. The Yakima averages a temperature higher during the summer growing months slightly higher than Edna Valley. The Yakima region also averages more annual and monthly rainfall than the Edna Valley, as hops require much water in their quick growing process. This difference in water would not be a problem for the 3/S Ranch as they have



the resources to provide the extra water needed during the growing process. This will allow for extra irrigation during the hot, dry, and long summer days when the hop growing process is most crucial.

The 3/S Ranch has one of the largest and most productive wells in all of the Edna Valley, pumping out thousands of gallons of water a minute. There is a tremendous amount of water available, and all the farming fields are irrigation ready with the water being pumped from this well. There are over 80 acres of irrigated farming land currently being used on the ranch and the ranch is capable of farming up to 200 acres of irrigated land. The 3/S Ranch has options as to what they want to do with the land and water, as the ranch just came out of the agricultural preserve, or Williamson Act. This gives the 3/S Ranch freedom to do whatever they want with the land as long as the County of San Luis Obispo approves it. The 3/S Ranch certainly has the potential for large-scale production like the Yakima Valley and has the potential to become a key supplier in the beer and hops industry if the right conditions are met, and the right varietal of hops found.

## Chapter 2

### REVIEW OF THE LITERATURE

#### The Feasibility Study

Before investing large amounts of money a business should examine the feasibility of their new business idea. The feasibility study will help determine whether the business can provide revenue to pay off its debts in a timely manner. Blank (1984) provided guidelines for testing the key factors that will help in determining the feasibility of the business, which are: market determination, raw product supply, and the production process. The market analysis estimates the demand for the new product being introduced and is also used to project future sales revenue. Blank (1984) stated that in order to create demand for the product several factors should be analyzed, these include: consumption trends, distribution systems, market entry barriers, potential buyers, possible selling arrangements, and sales prices. These factors will help determine if the project is possible, given the resource constraints. The study will also identify the benefits of the project, both tangible and intangible. Lastly, the feasibility study will achieve the ultimate goal of determining the development and operational costs of the project, and whether the benefits are worth the costs (Blank 1984).

## Hop Industry

Adam Simms (2012) the owner of a hops supply company called Label Peelers, explained how the craft brewing industry and home brewing industry has put a tremendous strain on hops, as people are no longer just drinking Budweiser. He explained that much of the hops demand and trends have to do with whichever beer is most popular at the time. Each style of beer uses a different variety of hops; therefore, it's best to produce a hops variety that is used in the trending beer at the time. Last year's hop trends were fueled by bold, hoppy American Indian Pale Ales or IPAs. As a result of this, Matt Hollingbery (2013) of Hollingbery and Sons Inc. explained that Cascade, Chinook, Simcoe and Citra varieties were in high demand last year. The Brewer's Association brewing survey revealed that hop usage is growing and brewers used 1.14 pounds of hops per barrel of beer in the 2011 production year. The association anticipates that number to jump to 1.2 pounds or more for the 2013 production year (The Brewers Association). Certainly, the type of beer that is in style is going to impact the industry. The two most common varieties of hops have been Cascade and Centennial for centuries, and this has continued, but another current trend has been for hops to complement the less hop-driven Belgian styles of beer that are popular in the United States craft brewing industry today. As these beer style trends change, the impact will certainly be felt by the hops industry, particularly when darker beers such as porters and stouts become more popular.

The style of beer trending isn't the only factor influencing the hops market, but Mother Nature also plays a key role. Two years ago, there was a shortage of Amarillo

hops because the hop rhizomes were spread out too thin and the crop was pushed too far and too fast. The Amarillo hops were also faced with severe flooding last year causing major damages to the hops plant (Morgan 2013). Hops are an agricultural product, so it takes time for the hops to reach their full maturity, typically two to four years (Morgan 2013). There are many scenarios that Mother Nature can bring to the hops plant before they have reached maturity and begun yielding profitable hops.

Hollingbery (2013) pointed out that the trend over the last 50 years has to been produce hops that have higher and higher alphas. This push was caused by big breweries wanting to drive the price of hops down. As a result, these high alpha hops produced in the United States and Germany are readily available at a fairly cheap price. Also, there has been a global trend for lagers to reduce their bitterness. Budweiser went from producing a beer with 24 International Bittering Units (IBU) to a beer that only has 8 IBU's today. Ian Ward, president of Brewers Supply Group, explained how the craft brewing industry is not really interested in these high alpha hops but instead is focusing on packing flavor into their beers with a reasonable amount of bitterness (Morgan 2013). These hops are known as aroma hops and are in high demand among craft breweries. The aroma hops are actually in short supply as it is taking time for the growers to pull and grub out the high alpha varieties for the aroma hops. This process takes time because producers must ensure that the high alpha varieties are completely gone from the ground before planting the aroma hops (Morgan 2013). These shortages have many brewers trying to limit their risk in buying proprietary varieties by getting them out of their recipes. This has led to a huge jump in the usage of Centennial and Cascade.

Hollingbery (2013) stated the biggest trend over the past two years has been for people to move out of proprietary varieties into more traditional and readily available hops.

Producers have gone back to the traditional and readily available hops knowing that there will be a demand for these varieties. It is difficult for the farmers to adapt to the demand for new varieties of hops. The biggest reason for this is because the trellis and establishment costs are so high. These farmers must invest in the trellises, pitching and drying equipment, trucks, tractors, and massive pieces of machinery that sit idle for ten months of the year all of which add up for the farmer. These plants grow year after year and take time to reach maturity, and once in the ground, the grower doesn't want to pull out the plants and try something new with all the money invested (Morgan 2013).

Ian Ward (2013) stressed the importance of communicating with all parties involved in the production and selling process. Everyone needs to make money, from the supplier, to the distributors, to the banks who finance the operations. Inviting your potential consumers out to the farm to see first-hand where the hops are coming from and how they are being processed, packaged, and stored can be crucial in the selling process and will only help build a strong relationship with consumers. This communication will also help determine if what varieties should be planted and the amount of acreage that needs to be added or subtracted for the consumer to help obtain a sustainable hops price (Morgan 2013). This will help the farmer sell all of his hops at a sustainable price, rather than having to get rid of excess hops through a broker where prices will be sufficiently lower.

The hops industry is an international and unrestricted industry; therefore, the United States isn't the only country that influences hops demand. The United States faces some major hop growing competition from many countries including: Germany,

Slovenia, Ukraine, Poland, China, India, and New Zealand. Germany specifically is the United States biggest threat as they are the global leader in hop production, and have been producing some unique and interesting varieties over the past few years. These varieties could lead to a greater demand for European hops, hurting the United States hop market. Despite this, the United States hops market is expected to continue to grow strong, and breweries in Germany are specifically asking for American hops, not wanting the European equivalent (Hollingbery 2013). The United States exports 75% of domestically grown hops, primarily to Europe (Hollingbery 2013). This causes hop demand to be based on exchange rates. When the dollar is cheaper than the euro more American hops are purchased, but when the euro is cheaper than the dollar, suppliers will buy more European hops (Hollingbery 2013).

The hops price tag and internal industry relationships are the biggest factors that will continue to impact the hops market, as the craft brewing industry grows and the variety of hops demanded changes. Obviously brewers want the highest quality of hops available at the cheapest prices, but a scenario like the 2012 shortage of aroma hops can cause major price spikes (Hollingbery 2013). These potential shortages and surpluses combined with a complex growing and harvesting cycle and high distributor costs causes the hop consumers to become very weary. Many consumers are unaware that different varieties of hops ripen at different times. The aroma varieties that have been growing in popularity ripen very early, while high alpha hops ripen very late. Because of this fluctuating season, consumers like to have a variety of hops to keep their crews busy and beer supply steady throughout the year (Hollingbery 2013). Having everything ripen at

once would be a disaster and spacing out the harvest allows for more steady supply and production.

### Growing Hops

Edwardson (1952) explained the process of planting and growing the hops starting with the rhizome cuttings of the hops. Rhizome cuttings are preferred to seeds for uniformity, and more consistent times of ripening. The rhizomes are six to eight inches long and each piece bears at least two pairs of buds or “eyes,” which are used to produce new plants. Some Pacific Coast crops may be obtained from cuttings planted in the spring, but generally a full crop is not harvested until the second or third year. These cuttings are planted on hills in rows, and are typically six to seven feet apart, and planted at a depth of about seven inches below the surface of the soil. This soil should ideally be loamy and well drained with a pH between 6.5 and 8 (Brewing Techniques 1994). The soil needs to have fertilizers that are rich in potassium, phosphates, and nitrogen. The planted rows must be straight due to the methods of cultivating the hop plants (Edwardson 1952).

Edwardson (1952) stated that there are two systems of hop culture, either the pole system or the trellis system. The trellis system is mainly used and largely favored in both Europe and the United States, and is the system that would be favored at the 3S Ranch. Edwardson (1952) describes the high and the low trellis. The low trellis is generally set up on poles or stakes about eight feet long at each hill, and wires are run over the tops of the poles for the full length of the yard each way, crossing at angles. The vines are then

pulled up and lead up the pole and tied to the wires. These vines are taken off the ground to prevent disease and ensure proper growth. The high trellis is the most widely used method and ranges from 12 to 20 feet. It is a permanent structure, which allows easy access to the plants and allows the plants to gather more uniform exposure to the light and better develops the plants. The hop plants can also be more easily spread with this system and cultivating the plants is much easier. The wiring is different in the high trellis as the wires are strung at right angles to each other at the top of the posts and twine is used to support the vines until they reach the wires (Edwardson 1952).

Once planted the younger plants need to be watered frequently for short periods of time. These young plants are establishing the plants root system, and giving them too much water will do more harm than good. The plant takes the entire first year to develop its root structure, but the plant will typically become fully grown and begin producing fragrant flowers in the second year of growth. During this growing process it is very important that severe trimming is done every few weeks. If this is not done there will be a jungle of tangled vines making the harvest time much more difficult (Montell 1994).

There are also many diseases and pests that need to be watched closely for from the time of planting to harvest. Downy mildew is the main cause of unhealthy hops, and will appear in the spring when the new shoots begin to grow. Any infected roots need to be removed because they are a source of infecting for the rest of the vine. Also, it is best to water with a drip irrigation system as opposed to a sprinkler irrigation system as the moisture will cause the Downy mildew to germinate and take over the plant. However, the Downy mildew can be controlled by spraying various fungicides containing copper hydroxide onto the plant (Montell 1994). Pests that can affect the plant include spider



mites and the western spotted cucumber beetle. Spider mites come out with the warm weather and will start by infecting the top of a vine and working their way down. Using any of the sprays that are used for controlling aphids can control these pests. The western spotted cucumber beetle will damage the tips of the hop vines and the cones and are controlled by using Diazinon on the plant (Montell 1994).

### Goals and Values

Gasson (1973) studied a farmers' goals and values, to gain a better understanding of the motivation that would help lead to a more comprehensive explanation of a farmer's economic behavior and more realistic models of agricultural location. The farmer's final decision depends on a whole range of farm and farmer characteristics as well as his attitude and values (Hart 1980). In order to test for these attitudes and values, 127 hop farmers were interviewed and given a list of 20 different values in random order and were asked to indicate whether they were personally relevant in farming. They were also told to rank these values from most important to least important. The study showed that intrinsic values were regarded the highest among all farmers, greater than expressive, instrumental, or social values. These intrinsic characteristics include: independence, doing the work you like, leading a healthy, outdoor life, purposeful activity, value in hard work, and control in a variety of situations (Ibery 1983). The social value of earning the respect of the workers was considered very important and was ranked fourth overall by hop farmers. Ibery (1983) stated this is because hop growing is very capital and labor intensive which requires great skill, and with a shortage of the workers in the industry,

makes earning their respect very important.

### Climates of Yakima Valley and Edna Valley

The Yakima Valley is located within the rain shadow of the Cascade Mountain Range. The summers are dry and hot, while winters get colder with light snowfall due to the prevailing westerly winds. Yakima faces all four distinct seasons. The region gets a lot of sunshine, getting over 270 blue sky days per year, averaging only eight inches of precipitation a year. Most of this precipitation comes from the annual 20 to 25 inches of snowfall during the winter months of November, December, and January. The Yakima faces four distinct seasons with average temperatures of: 37 degrees in winter, 63 degrees in spring, 88 degrees in summer, and 64 degrees in fall. They have an average growing season of 195 days and paired with the perfect weather makes Yakima the hop capital of the world. They are also leaders in agricultural products, wine production, and tourism (Greater Yakima Chamber of Commerce 2013).

The Edna Valley is located within San Luis Obispo County and lies in between Los Angeles and San Francisco. The Valley lies within the foothills of the Santa Lucia Mountains and is known for its sunny and comfortable weather. The summers are relatively mild, with daytime highs typically in the high 70s to low 80s, with cooler evenings. The area has a very mild winter with daytime highs in the 60s and 70s, with cold and crisp nights (San Luis Obispo Chamber of Commerce 2013). Edna Valley hardly sees frost and almost never sees any snow. The area sees significantly more precipitation than the Yakima Valley receiving an average of over 23 inches of

precipitation per year. The rain season typically begins in November and continues into March (San Luis Obispo Chamber of Commerce 2013).

## Chapter 3

### METHODOLOGY

#### Procedures for Data Collection

In order to achieve the first objective of comparing and contrasting the growing climates of the Yakima Valley and Edna Valley data will be collected. Average monthly temperatures, average yearly temperatures, and average seasonal temperatures will be collected from a variety of sources. These sources will primarily consist of the National Climatic Data Center and the USDA. The average monthly temperatures and average yearly temperatures will be collected for the past 25 years, allowing any drastic changes in temperature to be easily identified. The average monthly and yearly precipitation totals from the past 25 years will also be collected from the National Climatic Data Center and USDA. The average rainfall in inches will be collected for both locations. Also, the number of blue-sky days a year and number of growing days per year will be collected for each location. This data will also be collected over the past 25 years and will come from each location's Chamber of Commerce, the National Climatic Data Center, and the USDA. Finally, various characteristics on the soil will be gathered from Soil Web. These characteristics will include: type of soil, soil pH, fertility, parent material, water holding capacity, and how well the soil drains.

To assess the costs of setting up and operating a hop farm on the 3/S Ranch in Edna Valley a spreadsheet will be used from Washington State University. The

spreadsheet contains all the resources and costs needed to set up and operate a hop farm. The costs will need to be adjusted because they are based on prices in Washington, which are generally cheaper than prices in California. Prices will be collected from Farm Supply in San Luis Obispo to better estimate the total costs in setting up and operating the hop farm. The type and quantity of resources needed will be based on planting one acre of hops. The first data collected will have to do with land preparation that will focus on the labor costs of disking and plowing the field. Then the costs of establishment will be collected from both Washington State University and Farm Supply. The material and labor costs for one acre will include: 60 field poles, 10 anchor poles, 10 anchor holes, anchor material for 10 holes, 2,100 pounds of wire, staples, 4,000 hop roots, and the labor and materials needed for the drip irrigation system (Washington State University 2010). Costs for labor and management will also need to be collected.

Variable and fixed costs will also need to be estimated for operation costs, once the trellis system has been installed and the hops planted. The variable costs will include: fertilizer and leaf feed, chemicals, parts and repairs, supplies, fuel, and seasonal labor. Fixed costs will include: equipment and buildings, hop dryer and baler, interest on these machines and buildings, insurance costs, land and property taxes, and license, fees, and dues. Irrigation water and the cost of the land will not need to be analyzed as the 3/S Ranch already possesses both of these resources and does not need to pay for them.

To determine if there is a demand for hops and analyze the total supply numbers, data will be collected from the USDA's National Agricultural Statistics Service (NASS). Data will be collected from the USDA NASS's National Hop Report, dating back 20 years from 1992 to 2011. This will help in determining any trends in hop production and

pricing. The USDA NASS National Hop Report will provide data regarding: total acres harvested, total yield in pounds per acre, total production in thousands of pounds, price per pound in dollars, and value of production in thousands of dollars. This data will be collected for both the entire United States as well as the top 3 hop producing states. Once this information is organized into a spreadsheet, graphs will be made to show the trends of each of these five categories.

### Procedures for Data Analysis

The data collected from the National Climatic Data Center, Weather.com, and the Chamber of Commerce will be input into an Excel spreadsheet. The Excel file will contain five separate sheets, these sheets will contain data regarding: temperature, precipitation, growing days, soil, and the budget. The average monthly, annual, and seasonal temperatures will all be input into the temperature sheet and will contain the temperature data over the past 25 years. Once organized and separated, this data will be placed into bar and line graphs. This will allow for the data to be compared between the two regions and will help in identifying any trends and similarities between the locations over the past 25 years. This same set up will be used in the remaining three sheets. The precipitation sheet will include average monthly and yearly precipitation. The growing sheet will include the number of blue-sky days per year and the number of growing days per year. Lastly, the soil sheet will contain all of the soil data mentioned in the previous section for each location, allowing their characteristics to be compared.

In order to analyze the total set up and operating costs, the costs collected for each resource will be input into an Excel spreadsheet. This spreadsheet will be set up similar to the excel spreadsheet from Washington State University, but will contain the adjusted prices that are collected from Farm Supply. The data for resources and costs will be separated into four main categories that will include: land preparation, establishment, variable costs, and fixed costs. Each category will provide a total cost and all four categories will be added up to provide the total cost for setting up one acre of hops.

In order to analyze the demand for hops and the total supply, the data collected from the USDA's NASS will be input into an Excel spreadsheet. This data will be organized by inputting the total acres harvested, total yield per acre, total production, price per pound, and value of production into columns containing the past 20 years of statistics from 1992 to 2011. This will allow for graphs to be made that will show trends and changes in prices and production over the past 20 years.

### Assumptions

This study assumes that the 3/S Ranch will not renew its lease with Bejo Seeds and will allow the 80 acres of irrigated fields to be planted with hops. It also assumes that the 3/S Ranch will provide needed water from the well charging only for the electricity required for pumping the water. Lastly, it assumes that the 3/S Ranch will plant the hops using a high trellis system as their method of production.

## Limitations

Estimating the demand for hops in Edna Valley will not provide an absolute accurate indicator of the potential for a hop farm in Edna Valley. The Edna Valley is primarily known for its grapes and vineyards so it will be difficult to predict what the demand will be for this new commodity. Analyzing the demand for hops in Yakima will be difficult to compare given that Yakima has already established a reputation as the hop leader. Analyzing the demand for hops from local breweries would help in determining the total demand, but that information will be difficult to obtain as many breweries already have contracts with growers in Washington.



## Chapter 4

### Development of the Study

A feasibility study must estimate costs and revenue in order to determine if a project will be financially sound. Determining all the costs of setting up a trellis system and planting the hops would be very difficult to estimate but the University of Washington State's, "2010 Estimated Cost of Producing Hops in the Yakima Valley, Washington State," provides all the needed supplies, labor, and equipment for setting up 1 acre of hops. With the information provided by Washington State University, the spreadsheet was manipulated so that costs are changed based on local prices of San Luis Obispo's Farm Supply Company and the resources that the 3/S Ranch already possesses. The primary changes that needed to be made were for the cost of supplies for establishing the hops and the variable costs for maintaining the hops. The cost of poles, anchor material, wires, and an irrigation system were all changed to local prices. The variable costs of fertilizer, chemicals, fuel, packaging, and licenses, fees, and dues were all changed to reflect local prices and costs in San Luis Obispo.

The fixed costs given by Washington State University needed to be changed, as the 3/S Ranch already possesses many of the fixed costs. The only water costs that needed to be calculated were the annual electricity costs incurred from pumping the water. Land cost did not need to be included as the land is already owned, and no rent will need to be paid. Buildings are also available on the ranch for use, so no building costs need to be included. The fixed costs that were included were insurance costs and

the amortized establishment costs of the planting, trellis system, and irrigation costs. The irrigation system still needs to be set up which will cost money for both supplies and labor. 3/S Ranch does not have the necessary equipment needed for spraying and harvesting the hops so an estimate is needed for the fixed costs of equipment.

## Chapter 5

### Summary

Creating a feasibility study for a hop farm in Edna Valley was a difficult task, as the Edna Valley region is most well-known for its grape production. California and the Edna Valley have very minimal hop production so it was difficult to gather information that could be compared to local supply and demand of hops. Because of this much of the data gathered was related to the Yakima Valley as well as the United States production as a whole. Some of this data will be skewed due to the fact that the Yakima Valley is already a world-renowned area for their hop production and attains the highest demand for their high quality hops. The area is known as a high quality growing region, as is the Edna Valley. After comparing the climates and yearly precipitation totals of each region it can be seen on the graphs and data that the regions follow a similar climate pattern. The Yakima Valley has harsher winter conditions but follows a very similar spring and summer pattern compared to the Central Coast and Edna Valley. The winter conditions should not be of much concern as this is a time period where hop production has already been completed with the most important growing periods being in spring and summer. While the Yakima Valley has much colder winter conditions the Central Coast sees much more rain during this period, rain is virtually nonexistent during the summer months. The Yakima Valley sees steady rainfall throughout the year with their greatest rainfall coming between October and January. While the Yakima Valley receives slightly more rainfall

during the summer months this should not be a problem as the 3/S Ranch has the necessary water for irrigation during these drier months.

When looking at the National Hop Report provided by the USDA NASS several different trends can be noted. One of the biggest trends that can be seen is that the total United States hop acres harvested has been on a steady decline since 1992. The only exception to this is during 2008 and 2009 when a major oversupply of hops was seen. This data can be seen in the appendix section of the hop under the graph titled “Total United States Hop Acres Harvested.” While the total acres harvested have been declining the yield per acre and value of production have been increasing. This is likely due to an increased level of technology which has helped the production of hops become much more efficient as less land is now needed to produce a larger volume of hops. These graphs are in the appendix of the report under the graphs titled, “United States Hop Yield Per Acre in Pounds” and “Total United States Value of Hop Production.” Another increasing trend, which has been positive, is the hop price per pound which has steadily been increasing since 1992, going from about \$1.25 per pound to \$2.75 per pound in 2011. This data is also in the appendix under the graph titled “United States Hop Price Per Acre.” While this average price is a positive trend it should be noted that the needed breakeven price for hops as calculated in table 2 of the appendix is \$3.40. While some hop demand surely meets this price, it is unknown if the Edna Valley will be able to reach this price level as they are a region not yet known for their hop production compared to the Yakima Valley which is able to demand extremely high prices.

In addition to this breakeven price, prices will need to be able to cover the initial startup costs. In Table 1 of the appendix, a total land preparation and establishment cost

was calculated to be \$6,663.16 for 1.1 acres of hops. This number was calculated by totaling up the costs for land preparation as well as the costs for establishing an irrigated trellis system. The materials and labor were the primary components calculated in the establishment cost. In addition to these startup costs the variable and fixed costs were calculated in Table 2 of the appendix. The variable costs for year one were projected at \$4,356.90 and total fixed costs for year one at \$4,204.90. These add up to a total cost for fixed and variable costs of \$8,561.80 for year one alone. This shows that the initial startup cost of hops will be a very expensive task for a market that is unproven and unknown in the area.

### Conclusion

After conducting all the research and data and analyzing the costs, I feel that it would be best to hold out on the production of hops. As of now the market for hops seems to be too volatile and when you include this with the high start-up costs and breakeven price it becomes a very risky business to enter. The best option would be to wait a few years to see how the supply and demand of hops changes as well as to see what kind of demand hops gather through the Edna Valley Hops Project. Another option would be to consider growing grapes on the 3/S ranch as this is already a booming industry and creates very high demand within the region.

## References Cited

- “About Yakima.” 2013. *Greater Yakima Chamber of Commerce*. Washington. pp.1-7.  
<<http://www.yakima.org/>>
- Blank, Steve C. 1984. *Practical Business Research Methods*. Westport: AVI Publishing.  
pp.73-82
- Edwardson, John R. 1952. “Hops: Their Botany, History, Production and Utilization.”  
*Economic Botany* (6: 2). April-June. pp.160-175
- Freeman, Otis W. 1936. “Hop Industry of the Pacific Coast States.” *Economic  
Geography* (12: 2). April. pp.155-163.
- Gabrielyan, Gnel and Thomas L. Marsh. 2012. “Domestic and Export Price Formation of  
U.S. Hops. *Agricultural & Applied Economics Association’s Annual Meeting*.  
Seattle. August 2012. pp.1-28
- Galinato, Suzette, Ann George, and Herbert Hinman. 2010. “Estimated Cost of  
Producing Hops in the Yakima Valley, Washington State.” *Washington Hop  
Commission and WSU IMPACT Center*. (1: 1). pp.1-7.
- Gasson, R. 1973. "Goals and Values of Farmers." *Agricultural Economics* (24). pp.521-  
42.
- Hart, P. 1980. "Problems and Potentialities of the Behavioural Approach to Agricultural  
Location." *Geogr. Annlr. Ser. B.* (62). pp.99-108.
- Hollingbery, Matt, and Adam Simms. "Brewers Association: A Passionate Voice for  
Brewers." *Brewers Association*. 2012. <<http://www.brewersassociation.org/>>.
- Ibery, Brian W. 1983. "Goals and Values of Hop Farmers." *Transactions of the Institute  
of British Geographers*. (8: 3). pp.329-341.

- Montell, Stephanie. 1994. "Hops in the Backyard: From Planting to Harvest and the Hazards in Between." *Brewing Techniques* (2: 3). May-June. pp.1-6.
- Morgan, Jason. 2013. "Growing Hops Trend: The Hottest Hops and Budding Industry Developments." *Craft Brewing Business*. February. pp.1-11.
- "National Hop Report." 2012. *National Hop Report*. USDA: National Agricultural Statistics Service. December 2012. pp.1-5.
- Richey, David. 2012. "California Craft Brewing Industry: An Economic Impact Study." *California Craft Brewers Association*. 2012. pp. 1-27
- "San Luis Obispo Weather." 2013. *San Luis Obispo Chamber of Commerce*. San Luis Obispo. pp.1-2. <[http://visitslo.com/cm/About\\_SLO/sloweather.html](http://visitslo.com/cm/About_SLO/sloweather.html)>
- Snyder, Dylan W. 2012. "Feasibility Analysis of a Microbrewery." Unpublished Senior Project. California Polytechnic State University, San Luis Obispo. pp.7-15
- "USA Hops." 2008. *Hop Growers of America*. Washington.  
<http://www.usahops.org/>
- "Welcome to BeerAdvocate (BA). Respect Beer." *BeerAdvocate*. 2013.  
<<http://beeradvocate.com/>>.