Profitability Comparison Study of an Organic Almond Orchard Versus a Conventionally Farmed Almond Orchard in Stanislaus County

(Chapters 1-3)

Presented to the Agribusiness Department

California Polytechnic State University

In Partial Fulfillment

of the Requirements for the Degree

Bachelor of Science in Agribusiness

By

Carl B Evers III

June 2011

APPROVAL PAGE

Title: Profitability Comparison study of an Organic Almond Orchard Versus a Conventionally Farmed Almond Orchard in Stanislaus County (chapters 1-3)

Author: Carl B Evers III

Date Submitted: November 30, 2010

Senior Project Advisor: Dr. Kenneth Scott

Signature : _____

Abstract

This study examined the differences in costs and profitability for established conventional and organic almond orchards in Stanislaus County, California. The study used a partial budgeting approach to compare cost and profitability for established orchards for 2010, and thus ignored transition costs. Data was obtained from UC Davis cost studies for organic almonds, and from the Green Valley Ranch in Keyes, CA for conventional almonds. Adjustments were made to the U.C. Davis costs to account for changes in input use, input costs and grape prices Stanislaus County during the 2010 growing season, and to ensure both orchards in the study reflected a similar management style.

The basic costs were found, and the organic costs were slightly higher than the conventional, however with the partial budget change it was deemed "unfeasible" without a price premium for organic. The study found that the profitability of established orchards would be equal with a price premium of 29%. There were many limitations and estimations when doing this study such as secondary information; therefore the price premium may be more or less depending on the orchard.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Organic food products are becoming more popular as a significant player in many food markets. Although they still do not make up a very large portion of the food products sold in major grocery stores, organic foods continue to gain popularity. In the 1990's organics were a rare sight in major grocery stores, and were mostly found in specialty organic stores. With the success these specialty stores such as Whole Foods and Trader Joe' s, the organic trend has caught the attention of the nation. The market for organic goods has been steadily increasing during the last decade at a rate of about 15-21% (Brodt, 2009). The USDA's Economic Research Service (ERS) reported that organic sales in the U.S. increased from $3.6 billion in 1997 to $21.2 billion in 2008 (Dimitri and Oberholtzer, 2009). Over a longer time horizon, the growth in organic sales is even more impressive: from $178 million in 1980 to $10 billion in 2003, according to *BusinessWeek* (Cropper, 2004). This large rate of growth in organic sales is likely a result of large food retailer chains such a Costco and Wal-Mart increasing the amount of organic food products they sell, and many grocery stores bringing in private labels for organic products, such as Albertson's with their *Wild Harvest Organic* label.

Along with this trend of increasing organic food sales, the demand for organic almonds has increased as well. The relationship of demand to supply is reflected in recent organic price premiums, which have typically raised the price for organic almonds 75–200% over the price for conventional almonds (i.e., from just under double to triple the conventional price), with some recent years bringing in farm gate prices as high as $8 per pound (Brodt, 2009). Ultimately, with the increasing demand for organic food products, including almonds, the acreage of organically grown almonds also is likely to increase. However, for an orchard to be certified organic, it must go

through a process to convert to organic practices. The farm can apply for organic certification only after it has completed the conversion process, which means it has complied with the organic procedures for three years.

The objective of this study is to compare costs and returns for a hypothetical organic almond orchard to an actual conventionally farmed orchard. The conventional orchard in this study was a "typical" one growing hard shell and soft shell almonds. The orchard is located in Stanislaus County, CA, where almonds are a very popular crop. In addition to possible environmental benefits from farming organically, this study examines whether or not there is a potential for increased profitability from the production of organic almonds in this area. In the case of converting a conventionally farmed orchard to an organic orchard, there are many factors to consider, and the data collected in this project can help managers consider these factors. These include the costs of the current operation, the cost of the operation with organic inputs, the determination of profitability of producing organic almonds versus conventionally produced almonds, and the tools to conclude if converting is economically feasible. Ultimately, this study will determine whether net profits from organic almonds will meet or exceed net profits from conventional almonds.

Problem Statement

Based on both the increased amount of almond orchards that are being planted in the central valley of California, and the continued rise in demand for organic almonds, there may be opportunities for planting organic almond orchards. Ranch managers may be interested in planting organic orchards instead of conventionally farmed orchards, but are uncertain about whether or not the orchard will be more profitable. This study will describe the necessary procedures for certifying an orchard as organic, as well as compare profitability between an organic and non-organic orchard.

Hypothesis

On an average year, an organic almond orchard will be more profitable than a conventional orchard per acre.

Objectives

1. To describe the annual operating costs associated with a conventional orchard and the annual operating costs to be expected with a hypothetical organically farmed orchard.
2. To determine whether there is an increase in profitability when producing organically farmed almonds versus conventionally farmed almonds using enterprise budgets and a partial budget.

Significance of the Study

In light of the growing demand for organic products, and the growing number of almond orchards being planted in the central valley of California, almond farmers should be looking into planting orchards that can be certified as organic. It is often assumed that organic agriculture is a more expensive and less profitable alternative to conventional agriculture. This study was meant to look at the concerns many farmers have about the economics of conventional versus organic agriculture as it relates to almonds. In reading this report, producers will have an improved understanding of financial and environmental advantages and disadvantages of organic farming, such as higher commodity prices versus lower crop yields.

Since the organic orchard in this study is hypothetical, no individual will benefit directly from that part of the study. However, it may be significant to the owners of the conventional orchard used in this study, as the hypothetical organic orchard was based off of the actual budgets from the conventional orchard. Almond farmers in the central valley may also find the information

from this study useful. The information provided on organic certification could be useful to any producer interested in the process.

Chapter 2

LITERATURE REVIEW

Organics and Organic Certification

Organic production is a system that is managed in accordance with the Organic Foods Production Act (OFPA) of 1990 and regulations in Title 7, Part 205 of the Code of Federal Regulations to respond to site-specific conditions by integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity (USDA 2010). Organic producers cannot use traditional pesticides, synthetic fertilizers, or procedures such as irradiation or bioengineering.

Integrated Pest Management (IPM), or biological control is often used instead of pesticides to manage crop pests. Composting, animal manures, organic fertilizers, and cover crops are used instead of synthetic fertilizers. Although there are differing methods of organically producing crops, the main idea behind organic farming is 'zero impact' on the environment. The motto of the organic farmer is to protect the earth's resources and produce safe, healthy food (Living Organic 2008).

In order to sell products labeled as organic, they must be certified by a USDA or state approved organic certifier. The California state certification firm used in this study was California Certified Organic Farmers (CCOF). The certification process, according to the CCOF website, involves four steps. Application for certification occurs only after the conversion has been made and is functioning as an organic entity. To start the application, the farm must have proof that they have been following organic standards for the previous three years. To start the certification process, the farmer contacts CCOF to obtain the application package. The application package contains the required forms and an Organic Systems Plan (OSP). The OSP is completed once (then updated as needed) and is necessary for the producer to give record of what practices and

procedures they followed to become, and remain organic. After forms are completed, a $275 non-refundable fee is due to CCOF. The next step is the inspection to ensure the entity is functioning under the NOP standards, and also any international standards they request verification for; this also has a fee that varies by size of the production. The final step is actually receiving certification, which takes six to ten weeks with CCOF (*Certification,* 2010). After certification, products may be labeled both USDA and CCOF Organic.

Although organic standards documents can also be found of the USDA website, CCOF has a list of manuals to inform producers about organic certification. The first of the first of three manuals, ¨*Manual One: CCOF Certification Process*, describes the rights and responsibilities of certified producers, costs of becoming certified, procedures of CCOF, how CCOF certifies organic productions, and how organic certification is maintained. The second manual, *Manual Two: National Organic Standards*, listed the USDA National Organic Program Standards, which can also be found on the USDA website in the NOP section of the site. This study will review the requirements to become USDA certified organic, and will focous on the costs of certification that occur annually.

Organic Cost Studies

Two cost studies done by UC Davis on converting a conventionally farmed almond orchard to organic are used in this study. The cost studies were done on orchards very near to the conventional orchard used in this study, so the soil types, pests and diseases should be similar.

Both studies, *Sample Costs to Produce Organic Almonds* 2002, and 2007, analyzed the use of cover crops, fertilization, irrigation, pest management, disease management, pruning, harvest, labor, management, cash and non cash overhead costs, and yield expectancy in an organic orchard. The detailed information in these studies and their enterprise budgets will very useful in creating an

enterprise budget for the hypothetical organic orchard used in this study. There was no conclusion made as to whether or not an organic orchard would be more profitable or not in these cost studies.

The costs in these studies are very specific and should serve as a good basis for estimating costs in any organic orchard in the central valley, and managers should be able to adjust for input usage based on their area relatively easily, since they know the soil, water, and pest conditions of their area, so that it is an accurate estimate of costs for their specific location.

Enterprise Budgets

Enterprise budgeting is a useful tool to assess the returns and costs of an enterprise per acre for an entire enterprise. In contrast, a partial budget can be used to find what the benefits and detriments of an alternative production method would be, considering only changes in production practices.

Enterprise budgets are used on farms to estimate costs and potential revenues for a single enterprise. On a farm with multiple crops and livestock, each will have an enterprise budget. In addition to creating different budgets for each commodity, they can also be made for different levels of production or technology. For crops, each item on the budget will be based on a per acre basis. An enterprise budget typically contains the estimated crop yields and estimated price, so the revenue per acre can be projected. It also contains each of the inputs for pre-harvest (variable) and post-harvest (variable). Inputs can include fertilizer, seed, labor, irrigation charges, and percent of overhead. Each input will have a line on the enterprise budget that notes the unit of measure, the quantity required, price per unit and total price, on a per acre basis. Below the variable costs, the fixed costs are calculated; fixed costs can include machinery, taxes, land and management (Kay, Edwards and Duffy, 2008)

Partial Budgeting

Partial budgeting is used on farms when changes are being made, such as converting from one enterprise to another, or analyzing several enterprises and their interchangeability. It can be used when considering increases in head of cattle, or it can aid in the decision to lease or buy a piece of machinery or to plant more grapes instead of almonds. Kay et al. note that a partial budget compares benefits and costs of changing from one enterprise to another, or changes in practices for a given enterprise. The partial budget it set up like a 'T' account; on the left side, potential profits from the new enterprise or practice and the decreased cost of inputs from the enterprise or practice being replaced are considered benefits. On the right side, the amount of profit that will be lost from the enterprise being replaced is listed, and the increased cost of inputs from the new enterprise, are detriments. After both benefits and detriments are broken down, and each side is added up, they can be compared using two equations to determine the overall impact on the business (Kay, Edwards and Duffy, 2008)

Partial budgeting can be useful in the decision process farm owners and managers use to decide on alternative uses of resources they have in their businesses. Partial budgeting is a systematic approach that can assist the manager in making informed decisions. But this budgeting process can only estimate possible financial impacts, not assure them. Management decisions and chance can change the projections. These may result in better or poorer than expected performance. Repeating the analysis using different assumptions about key variables will give some idea about the degree of risk involved in making the proposed change (Tigner, 2006).

Chapter 3

METHEDOLOGY

Procedures for Data Collection

The objective of this project is to compare costs and returns for a conventionally farmed almond orchard and an organic one. The data used in this study will come from a ranch located in Stanislaus County, CA, and from organic cost studies conducted by U.C. Davis. The Stanislaus County ranch is the Green Valley ranch, a 409-acre conventionally farmed almond orchard consisting of both hard-shell and soft-shell almonds. The cost studies, *Sample Costs to Produce Organic Almonds* 2002 and 2007, are a detailed analysis of the costs associated with organically farming almonds in San Joaquin County.

The costs for the conventionally farmed orchard came directly from the actual 2011 budget for that orchard which was developed by the orchard manager. The costs are organized on an annual enterprise budget where the costs of labor, fertilizer, weed management, pest management, pruning, pollination, irrigation, harvest, equipment and maintenance, and other miscellaneous costs are all quantified on a per-acre basis. The expected income for the ranch is also organized on the same annual enterprise budget for the ranch, where anticipated yields and commodity prices are used to compute income on a per acre basis.

The costs for the hypothetical organic orchard will be based off of the enterprise budget for the Green Valley Ranch, and then modified to account for the different inputs used to farm organically. This means that the inputs for the Green Valley Ranch will be eliminated, and the inputs for the organic orchard will be added, but operational costs such as harvest, pruning, and water will remain the same as in the Green Valley Ranch. For example, labor rates for both ranches will be the same, as if both ranches are being managed by the same manager, so the labor rates for

both machine and non-machine labor will be $11.75 as they appear in the enterprise budget for the Green Valley Ranch, and not as $16 for machine labor and $11.75 for hand labor as they appear in the U.C. Davis Cost Study. Harvest costs for machinery and labor will also be the same as the Green Valley Ranch, as well as irrigation, and pruning and shredding costs, since the difference in these costs that would arise between the U.C. Davis cost study and Green Valley Ranch budget would be due to differences in management styles, not the cost of organic versus conventional inputs. The type of inputs used (insecticides and fertilizers), and their costs will be based on the inputs used in the 2002 and 2007 UC Davis studies *Sample Costs to Producing Organic Almonds.* Although the values in these studies are for San Joaquin County, the majority of the inputs are an accurate estimate for Stanislaus County. Costs that changed in the organic orchard were the costs for fertilizer, herbicides, fungicides and labor. The conventional inputs were eliminated and the costs for organic fertilizer, fungicides and weed control increased. These included costs for compost, organic fertilizer and fungicides, and the increased cost of machine labor required for weed control.

Table 1: Inputs Eliminated and Added

Conventional Inputs Eliminated	**Organic Inputs Added**
Chemical Fertilizer	Organic Fertilizer
Chemical Pesticides	Organic Herbicides
Chemical Herbicides	Extra Machine Labor for Weed Control

It is assumed that the reason managers would plant an organic orchard is that they expected higher profit from that orchard. To determine 2010 prices of almonds per pound, the previous three years of California Almond prices, obtained from the USDA website (www.usda.gov), will be averaged. The ranch manager will have projected the crop yields for the actual conventional orchard

in the enterprise budget for the Green Valley Ranch. The expected yield for the organic orchard will be reduced by seventy five percent (as recommended by U.C. Davis) in its enterprise budget when determining the expected income for the ranch.

Procedures for Data Analysis

The UC Davis cost studies' enterprise budgets and the enterprise budget of the conventionally farmed orchard used in this study (Green Valley Ranch) will be used as the source of data for both orchards. The equipment, harvest, and miscellaneous costs in the UC Davis budget for organic almonds will be adjusted to be similar to the actual orchard's costs, in the assumption that the same manager would manage the hypothetical orchard, and therefore have similar operational methods and costs.

Data Organization

The actual enterprise budget for the Green Valley Ranch will be used in this study, and the UC Davis cost studies' enterprise budgets were used as a model to create the enterprise budgets for the organic orchard. Data specific to the management style of the Green Valley Ranch will be integrated into the budget to better reflect the costs of management incurred by that ranch, so that the wage rates, harvest, pruning, pollination, water pumping costs, other cultural costs will be the same for each ranch. Microsoft Excel will be used to organize the cost data for both orchards into enterprise budgets. The cost data for obtaining and maintaining organic certification by CCOF will included in the enterprise budget for the organic orchard. The cost data will be expressed in dollars, the yield data were in tons and the inputs in their necessary measurement (i.e. hours, gallons, tons, etc.).

Analysis

Once the data is organized and computed, and enterprise budgets are created for both ranches, break-even analysis will be done on the operating costs of both orchards. At this point, the costs per acre, and the expected income per acre of both ranches can be compared side-by-side. Once the costs and income expected from the enterprise is compared, a partial budget will be used to test if it will be more profitable to farm an orchard conventionally or organically. The benefits of the change will be listed on the left side of the budget, and the detriments will be listed on the right side.

Benefits include the increased revenue from yields obtained from organic production (even if they were less than conventional production), and the decreased costs resulting from not farming the orchard organically. The detriments included the lost revenue from conventional production, and the increased costs associated with farming organically. The two sides will be summed and could then be compared using benefit to detriment analysis and break-even analysis. The equations for Benefit-Detriment analysis used are: **B-D** and **B/D**: for the change to be beneficial, both equations should have been greater than 1 to indicate a positive change.

The hypothesis may be proven or disproved through the analysis of the data collected. To be proven, the revenues of the organic orchard, after conversion, must equal or exceed the expected revenues the orchard had it been farmed conventionally. To reject the hypothesis, the expected costs associated with the organic orchard must exceed the expected costs of the conventional orchard to the degree that the profits from the organic revenues do not outweigh the added costs incurred by farming organically.

Assumptions

It is assumed that in projecting the crop yields for the enterprise budgets there will not be extremely high yields or unexpectedly low yields for those years due to unusual pest or disease infestations, or unexpected weather such as severe frosts, or large rainstorms during pollination season, which are possible scenarios for either the organic or conventional orchard. Because the actual orchard (Green Valley Ranch) is already well into production age, the author will assume the organic orchard to already be of a similar age as the actual conventional orchard where it will also be producing a yield typical to a mature orchard, and the planting and beginning costs have already been paid. Also, no conversion costs from conventional to organic were incurred, since the organic orchard was produced organically from planting, and it is assumed no special or major environmental research or restoration of the land was required in order to plant and establish the organic orchard.

Limitations

Although the conventional orchards budget is a real budget from an actual producing farm, the organic orchard's budget is hypothetical, based on information from UC Davis's cost studies, and from information gained from interviewing an industry expert (Aldrin 2010). Any trade names, or firms mentioned in the data collection and analysis were in no way directly involved in this study, nor are they endorsed by this project. This project was limited by its use of secondary information. Also limiting this study was the short length of time available to gather, analyze and interpret data. Though it was assumed that projected yields were "typical", actual yields from year to year will vary and possibly have extremely low or high points.

Chapter 4

Analysis

The analysis shows operating costs for two orchards are slightly different, with the organic budget being higher. The partial budget favored the conventional vineyard over the organic vineyard with a negative benefit to detriment analysis, when no price premium was given to the organic crop. The price premium needed to favor the organic orchard was also found. Once a partial budget was used to compare the two orchards with a price premium being given to the organic crop, the organic orchard was favored in the partial budget. To find current estimations of price and yield, production per acre from the previous five years was averaged.

Conventional Orchard Enterprise Budget

The conventional budget shows yields of 2,200 pounds per acre at $1.30 per pound, equaling revenues of $2,860 per acre. The operating costs of fertilizer, herbicide, fungicide, water, harvest, and labor equal $1,899.00. A cost breakdown shows that the fertilizer, herbicide and fungicide account for around 17% of operating costs whereas labor is around 35% of operating costs. The water pumping costs for well water, which will remain the same for both orchards, makes up 10.5% of operating costs.

The break-even yield for this budget is about 1,461 pounds per acre, which is 739 pounds per acre less than this orchard is expected to produce. The break-even price is $1.16 per pound, again less than expected return for this orchard ($.14/pound less). Rate of return to land is 17.63%. These break-evens show that the current orchard would typically cover their operating costs, and be profitable for the owner/operator.

Table 2: Conventional

Enterprise Budget

Enterprise Budget: Almonds, Sprinkler Irrigation

Almond Price per Pound =	$1.30		Management =	$75/acre
Almond Yeilds Per Acre(lb) =	2200		Land Value =	$5,263
Revenues:	Unit	Price or Cost /Un	Quantity	Revenue per Acre
ALMOND SALES	Acre	$1.30	2200	$2,860.00
Variable Costs:				
Preharvest Costs:				
Pesticide/Herbicide				
Round Up	Quart	$6.50	4	$26.00
Surflan	Quart	$20.00	1.5	$30.00
Goal	Pint	$15.00	1.2	$18.00
Squirrel Bait	Lb	$1.00	5	$5.00
Agrimek	Gallon	$250.00	0.06	$15.00
Rovral	Lb	$20.00	1	$20.00
Zinc	Lb	$0.85	3	$2.55
Mite Wash	Pint	$1.50	2	$3.00
Sulfur/Captan	Lb	$4.00	3	$12.00
Steem (ants)	Gallon	$6.00	1.5	$9.00
Fertilizer				
Huma Blend	Lb	$4.00	2	$8.00
CF#1	Lb	$3.00	1	$3.00
UN 32	Units	$0.50	160	$80.00
Humic Acid	Lb	$2.50	3	$7.50
K-Nitrate	Lb	$0.24	45	$10.80
Gypsum	Ton	$115.00	0.1875	$21.56
Tracite 0-0-21	Gallon	$9.00	3	$27.00
Kyphyte	Lb	$8.00	3	$24.00
Irrigation				$0.00
Pumping Cost (electricity)	Ac. Ft.	$50.00	4	$200.00
Labor Costs:				
Labor (Machine)	Hour	11.75	21	$246.75
Labor (Non-Machine	Hour	11.75	36.15	$424.76
Post Harvest Costs:				
	Acre	12.00	1	$12.00
Shred Prunings	Acre	27.00	1	$27.00
Pollination	Hives	140.00	2	$280.00
Fuel	Acre	66.46	1	$66.46
				$1,579.39
Fixed Costs:				
Machinery/Equiptment	Acre	$140.97	1	$140.97
Pruning equiptment	Acre	$2.99	1	$2.99
Taxes (Land)	Acre	$34.87	1	$34.87
Land (Net Rent)	Percent	1.25%	$5,263.00	$65.79
Management flat fee	Acre	75.00	1	$75.00
Total Fixed Costs				$319.62
Total Costs				$1,899.00

Summary of Enterprise Budget

Break-Even Yeild	1460.77
Break-Even Price	$ 1.16

	Value or Cost
1. Total Receipts	$2,860
Total Variable Cost	$1,579
2. Returns Over Variable Costs	$1,281
Machinery Fixed Costs	$144
3. Returns to Land and Management	$1,137
Management Charge	$143
4. Gross Returns to Land	$994
Real Estate Taxes	$65.79
5. Net Returns to Land Investment	$928
6. Rate of Return to Land	17.63%
Value of Land = $5,263	
Land Rent	$65.79
7. Pure Profits	**$862.08**

Organic Orchard Enterprise Budget

The organic budget shows yields of 1,600 pounds per acre at $2.50 per pound, equaling revenues of $4,000.00 per acre. The operating costs of fertilizer, herbicide, fungicide, water, harvest, and labor equal $2,296.63. A cost breakdown shows that the fertilizer, herbicide and fungicide account for around 27% of operating costs whereas labor is around 29% of operating costs. The water pumping costs for well water, which will remain the same for both orchards, makes up 8.7% of operating costs. The large difference in fertilizer, herbicide, and fungicide costs between the two orchards is due mainly to the large costs incurred with buying and spreading plant based compost as a fertilizer on the organic orchard at $282 per acre.

The break-even yield for this budget is about 919 pounds per acre, which is 681 pounds per acre less than this orchard is expected to produce. The break-even price is $1.44 per pound, again less than expected return for this orchard ($1.06/pound less). Rate of return to land is 30.65%. These break-evens show that the current orchard would typically cover their operating costs, and be very profitable for the owner/operator.

Table 3: Organic Enterprise Budget

Enterprise Budget: Organic Almonds, Sprinkler Irrigation

Almond Price per Pound =	$2.50		Management =	$75/acre
Almond Yeilds Per Acre(lb) =	1600		Land Value =	$5,263

Revenues:	Unit	Price or Cost /Un	Quantity	Revenue per Acre
ALMOND SALES	Acre	$2.50	1600	$4,000.00
Variable Costs:				
Preharvest Costs:				
Pesticide/Herbicide				
Thiolux Jet	Lb	$ 0.80	60	$48.00
Lime Sulfur Solution	Gallon	$ 5.00	8	$40.00
Dipel DF	Lb	$ 14.36	1	$14.36
Stollers Natrual Oil	Gallon	$ 15.29	10	$152.90
Safer Roach/Ant Powder	Lb	$ 2.79	2	$5.58
Entrust 80 WP	Ounce	$ 31.18	2.5	$77.95
Fertilizer				
Solubor (Boron)	Lb	$ 1.08	2	$2.16
MKM Zinc Sulfate Powder 36%	Lb	$ 0.74	10	$7.40
Compost (Plant Based)	Ton	$ 27.00	10	$270.00
Irrigation				
Pumping Cost (electricity)	Ac. Ft.	$ 50.00	4	$200.00
Labor Costs:				
Labor (Machine)	Hour	$ 11.75	22	$258.50
Labor (Non-Machine	Hour	$ 11.75	35.2	$413.60
Custon				
Spread Compost	Ton	$ 12.00	1	$12.00
Post Harvest				
Prune/Train/Sucker	Acre	$ 12.00	1	$12.00
Shred Prunings	Acre	$ 27.00	1	$27.00
Pollination	Hives	$ 140.00	2	$280.00
Fuel	Acre	$ 66.46	1	$66.46
Propane for Flamer	Gallon	$ 1.80	49.5	$89.10
				$1,977.01
Fixed Costs:				
Organic Certification/ Inspection Fees	Acre	$3.30	1	$3.30
Cover Crop Establishment	Acre	$34.00	1	$34.00
Machinery/Equiptment	Acre	$ 140.97	1	$140.97
Pruning equiptment	Acre	$ 2.99	1	$2.99
Taxes (Land)	Acre	$ 34.87	1	$34.87
Land (Net Rent)	Percent	1.25%	$5,263.00	$65.79
Management flat fee	Acre	$ 75.00	1	$75.00
Total Fixed Costs				$319.62
Total Costs				$2,296.63

Summary of Enterprise Budget

Break-Even Yeild	918.65	
Break-Even Price	$1.44	
		Value or Cost
1. Total Receipts		$4,000
Total Variable Cost		$1,977
2. Returns Over Variable Costs		$2,023
Machinery Fixed Costs		$144
3. Returns to Land and Management		$1,879
Management Charge		$200
4. Gross Returns to Land		$1,679
Real Estate Taxes		$65.79
5. Net Returns to Land Investment		$1,613
6. Rate of Return to Land		30.65%
Value of Land = $5,263		
Land Rent		$65.79
7. Pure Profits		**$1,547.46**

Conventional to Organic Partial Budget Analysis

The Partial Budget analysis shows that without a price premium being received for the organic almonds, the detriments are more than the benefits of growing the almonds organically. This is shown by the Benefit minus Detriment of -$833.59, as well as the Benefit to Detriment ratio of .787, which suggests that conventional production is more profitable. However, with a 29% price premium ($1.82 per pound), the organic orchard would be equally as profitable as the conventional Orchard. Additionally, if the organic orchard were to yield 2,326 pounds per acre, it would also be equally profitable.

When the price premium of 192% that was to be expected for the organic orchard in this study is applied, the benefits are far more than the detriments of growing the almonds organically in the partial budget. This is shown by the Benefit minus Detriment of $1,086.41, as well as the Benefit to Detriment ratio of 1.28, which suggests that organic production is more profitable.

Hypothesis

According to the analysis of the partial budget, the hypothesis "on an average year, an organic almond orchard will be more profitable than a conventional orchard per acre," must be accepted because the benefits are greater than the detriments when a typical organic price premium is applied to the revenues from the organic orchard. The difference in net benefit is large enough that this result should apply in most years, and in any "typical" year where no extreme weather or pest problem is encountered.

Table 4: Partial Budget Without Organic Premium

Benefits			Detriments		
Increased Yeild:			**Decreased Yeild:**		
Organic Almonds			**Conventional Almonds**		
1,600 pounds at:	$1.30	$ 2,080.00	2,200 pounds at:	$1.30	$ 2,860.00
				1.3	
Decreased costs: Conventional Almonds			**Increased Costs:** Organic Almonds		
Fertilizer			**Fertilizer**		
Huma Blend		$ 8.00	Solubor (Boron)		$ 2.16
CF# 1		$ 3.00	MKM Zinc Sulfate		$ 7.40
UN 32		$ 80.00	Compost (Plant Based)		$ 270.00
Humic Acid		$ 7.50			
K-Nitrate		$ 10.80			
Gypsum		$ 21.50			
Tracite 0-0-21		$ 27.00			
Kyphite		$ 24.00			
Herbicides/Pesticides			**Herbicides/Pesticides**		
Round Up		$ 26.00	Thiolux Jet		$ 48.00
Surflan		$ 30.00	Lime Sulfur Solution		$ 40.00
Goal		$ 18.00	Dipel DF		$ 14.36
Squirrel Bait		$ 5.00	Stollers Nartr'l Oil		$ 153.00
Agrimek		$ 15.00	Entrust 80 WP		$ 77.95
Rovral		$ 20.00	Boric Acid (Ants)		$ 5.58
Zinc		$ 2.55			
Mite Wash		$ 3.00			
Sulfur/Captan		$ 12.00			
Steem (ants)		$ 9.00			
Labor		$ 671.51	**Labor**		$ 429.00
Total Benefit		$ 3,073.86	**Total Detriment**		$ 3,907.45
	Benefit-Detriment=	$ (833.59)			
	Benefit/Detriment=	0.78667			

Break-Even Quantity:		2,241
Break-Even Price:	$	1.82
Price Premium Needed:		29%

Table 5: Partial Budget with Organic Price Premium

Benefits			Detriments		
Increased Yeild:			**Decreased Yeild:**		
Organic Almonds			**Conventional Almonds**		
1,600 pounds at:	$2.50	$ 4,000.00	2,200 pounds at:	$1.30	$ 2,860.00
				1.3	
Decreased costs: Conventional Almonds			**Increased Costs:** Organic Almonds		
Fertilizer			**Fertilizer**		
Huma Blend		$ 8.00	Solubor (Boron)		$ 2.16
CF# 1		$ 3.00	MKM Zinc Sulfate		$ 7.40
UN 32		$ 80.00	Compost (Plant Based)		$ 270.00
Humic Acid		$ 7.50			
K-Nitrate		$ 10.80			
Gypsum		$ 21.50			
Tracite 0-0-21		$ 27.00			
Kyphite		$ 24.00			
Herbicides/Pesticides			**Herbicides/Pesticides**		
Round Up		$ 26.00	Thiolux Jet		$ 48.00
Surflan		$ 30.00	Lime Sulfur Solution		$ 40.00
Goal		$ 18.00	Dipel DF		$ 14.36
Squirrel Bait		$ 5.00	Stollers Nartr'l Oil		$ 153.00
Agrimek		$ 15.00	Entrust 80 WP		$ 77.95
Rovral		$ 20.00	Boric Acid (Ants)		$ 5.58
Zinc		$ 2.55			
Mite Wash		$ 3.00			
Sulfur/Captan		$ 12.00			
Steem (ants)		$ 9.00			
Labor		$ 671.51	**Labor**		$ 429.00
Total Benefit		$ 4,993.86	**Total Detriment**		$ 3,907.45
	Benefit-Detriment=	$ 1,086.41			
	Benefit/Detriment=	1.27804			

Break-Even Quantity:		1,165
Break-Even Price:	$	1.82
Price Premium Needed:		-37%

Chapter 5

SUMMARY, CONCLUSIONS AND RECCOMENDATIONS

Summary

This study has presented the analysis of post-conversion costs and profitability for conventional and organic almond orchards. Sample budgets were collected from different regions and growers, and modified to reflect current, Stanislaus County costs, prices, yields and needs. The two budgets were compared, analyzed and both types of production were found to be profitable. However, organic production resulted in a small negative amount cost-to-benefit analysis unless a price premium was applied, which indicates that at a zero percent price premium, organic production is not as profitable as conventional production. However, once the current industry price premium was added (U.C. Davis, 2007), organic production resulted in a large positive amount in cost-to-benefit analysis, and that organic production is more profitable than conventional production.

Conclusions

Analysis of the two enterprise budgets, conventional and organic, indicates that both type of production are profitable. Both cover their operating costs and have additional funds to cover depreciation and other fixed costs. The partial budget analysis found that the producing organic would result in more costs (detriments) than benefits to the orchard unless a price premium was available for the organic crop. Since organic almonds are a well-established product with consumers and continue to stay in high demand, the price premium as recommended by U.C. Davis was applied, and organic production resulted in more benefits than detriments to the orchard. The hypothesis that an organic almond orchard will be more profitable than a conventional almond orchard is accepted, since the price premium of 29% needed for the

benefits to at least equal the detriments of producing organically are far exceeded by the current market premium of 192%.

Recommendations

For any producer deciding whether or not to plant an orchard as organic, or even whether or not to convert their orchard to organic, they should use their own budgets, or input their own prices into the enterprise budgets categories. When planting ground with a crop that is intended to be certified organic, the costs needed to convert such as soil testing for carbons and residual non-organic chemicals; overall operating changes such as mechanized weed removal, as well as the revenues potentially lost due to lower yields during the three-year conversion must be taken into account. Also, the period required to pay off those costs would be important to a producer. In the larger scope, a market study for the Stanislaus County area should be done to be confident that a market for organic almonds would be available before a producer should plant a certified organic orchard.

References Cited

Brodt, Sonja, Karen Klonsky, and Ann Trupp. "Market Potential for Organic Crops in California: Almonds, Hay, and Winegrapes." *Gianni Foundation of Agricultural Economics.* 9.1 (2009)

Carman, Hoy, Karen Klonsky, and Armelle Beujard. "Marketing Order Impact on the Organic Sector: Almonds, Kiwifruit, and Winter Pears." University of California Agriculture and Natrual Resources, California Agriculture Experiment Station. 347 (2004).

"Certification". 2010. *California Certified Organic Farmers*. http://www.ccof.org/

Cropper, Carol Marie. 2004. "Does It Pay to Buy Organic?" *BusinessWeek.* (September 6). http://www.businessweek.com/magazine/content/04_36/b3898129_mz070.htm

Dimitri, Carolyn and Lydia Oberholtzer. 2009. *Marketing U.S. Organic Foods: Recent Trends from Farms to Consumers.* Washington: USDA Economic Information Bulletin No. 58.

Eisenhardt, Kathleen. "Building Theories From Case Study Research." Academy of management Review 14.4 (1989)

Holtz, Brent, Roger Duncan, Paul Verdegall, and Karen Klonsky. “Sample Costs to Producing Organic Almonds.” University of California Cooperative Extension. (2007).

Holtz, Brent, Roger Duncan, Paul Verdegall, and Karen Klonsky. “Sample Costs to Producing Organic Almonds.” University of California Cooperative Extension. (2002).

Kay, Ronald D., William M. Edwards, and Patricia A. Duffy. 2008. *Farm Management,* Sixth Edition. New York City : McGraw-Hill Companies.

“Organic Farming- Definition.” Living Organic. <http://www.living-organic.net/organic-farming.html>

Tigner, Robert. “Partial Budgeting: A Tool to Analyze Farm Business Changes.” Ag Decision Maker (2006).