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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2008

SAMPLE COSTS TO ESTABLISH A VINEYARD AND PRODUCE WINE GRAPES

RED VARIETIES - CABERNET SAUVIGNON

NORTH COAST – Lake County

Crush District 2

Glenn T. McGourty	UC Cooperative Extension Farm Advisor, Lake and Mendocino Counties
Karen M. Klonsky	UC Cooperative Extension Specialist, Department of Agricultural and Resource Economics, UC Davis
Richard L. De Moura	Research Associate, Department of Agricultural and Resource Economics, UC Davis

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

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Red Varieties – Cabernet Sauvignon

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INTRODUCTION

Sample costs to establish a vineyard and produce winegrapes in the North Coast – Lake County are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on production practices considered typical for the crop and area, but will not apply to every situation. Sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, "Your Costs", in Tables 1 and 2 is provided to enter your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or your local UC Cooperative Extension office.

Current and some archived Sample Cost of Production Studies are available for many commodities and can be downloaded at http://coststudies.ucdavis.edu or can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1715 Current studies can be obtained from selected county UC Cooperative Extension offices.

ASSUMPTIONS

The assumptions refer to Tables 1 to 7 and pertain to sample costs to establish a vineyard and produce winegrapes – Cabernet Sauvignon (a red variety) - in the North Coast, Lake County. The cultural practices described represent production operations and materials considered typical of a well-managed vineyard in the region. The costs, materials, and practices shown in this study will not apply to all farms. Timing of and types of establishment and production cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, and insect and disease pressure. The practices and inputs used in this study are intended as a guide only. **The use of trade names and cultural practices in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or cultural practices.**

Land. The vineyard is located on fairly level land less than 10% slope in the upland area of Lake County. The hypothetical farm is comprised of 30 contiguous acres, 25 of which are planted with red wine grapes. The other five acres are occupied by roads, irrigation systems, and farmstead. Land is valued at $20,000 per acre. This study assumes the land was purchased for planting a vineyard. The vineyard is owned and operated by the grower.

Establishment Cultural Practices and Material Inputs

Table 1

The following establishment descriptions are typical practices for many vineyards in Lake County, but may not be appropriate to individual circumstances.

Site Preparation. Gypsum is applied to the ground after which the land is subsoiled once by a custom operator, disked and rolled by the grower, followed by two rippings each in a different direction to a depth of 2-3 feet. Afterwards the ground is disked two times. The ground is then leveled and smoothed in three passes (each in different direction) with a landplane. The following spring (February), Roundup is applied for weed control prior to planting. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year.

Vines. Dormant bench grafted Cabernet Sauvignon vines are planted in the spring (April) on 6 foot x 8 foot spacing with 908 vines per acre. Vines will be trained during the first and second years and are expected to begin yielding harvestable fruit in three years. They are expected to be productive for an additional 22 years.

Planting. Planting the vineyard starts by laying out and marking vine sites in early spring. In April, holes are dug and the vines are planted. Shortly after planting, a pass is made to place grow tubes around the young vines. In the second year, 4% of the vines or 36 vines per acre are replaced after dying during the first season.

Trellis System. The vertical trellis system (VSP) is designed to support a bilateral, cordon-trained, and spur-pruned vineyard. The trellis system is installed by a commercial trellis company beginning in the first year after the field is marked for planting and installation completed in the second year. The trellis system is considered part of the vineyard since it will be removed at the time of vine removal and is included in the vineyard establishment costs.

The trellis system consists of steel pipe end posts and highway sign stakes placed at every third vine. Steel rods are placed at vines that are between the highway sign stakes. There are four 13 gauge high tensile strength movable foliage wires - two wires on each side of the canopy - and a single 12 gauge wire at 23 inches above ground to support the cordon and fruit. A single wire 18 inches aboveground supports the drip system hose.

Vine Management (VM), Pruning, Training. In the first year, two to three weeks after planting, the vines are cut to two shoots and the vine protectors put over the plant. In July, the vine protectors are removed, the vines are pruned to a single shoot and the vine protectors replaced. Beginning in January of the second year, the vines are dormant pruned. In the spring (May), training begins which includes training the cordons and spurs, tying and suckering the trunks and cordons. In the third year and subsequent years, the vines are dormant pruned in February. The cordons are tied to the fruiting wire in March, suckered in April; wires moved and shoots tucked in May, June, and July. Suckering is the removal of sprouts from the rootstock that compete with the trunk and cordons for water and nutrients. During the first mowing in early March, alternate rows are mowed to shred the prunings.

Irrigation. Pumped water plus labor constitute the irrigation cost. The drip lines are flushed in early June prior to irrigating. The field is drip irrigated weekly from mid-June to late September. The cost is based on using a 15 hp motor to pump water from 75 feet deep applied over 25 acres. Price per acre-foot of water will vary by grower in this region depending on quantity pumped, power cost, various well characteristics, and other irrigation factors. In this study water is calculated to cost $4.50 per acre-inch. No assumption is made about effective rainfall. The amount of water applied to the vines varies and are shown in Table A.

Table A. Applied Water

Year	AcIn/Year
1	1.0
2	4.0
3+	8.0

Fertilization/Soil Amendments. Gypsum is applied at 10 tons per acre prior to ripping (land preparation). After planting, gypsum is applied in the fall (October) once every three years at two tons per acre and one-third of the cost is charged to the vineyard each year. Nitrogen as calcium nitrate (15.5-0-0) is injected into the drip irrigation system in the first year at 25 pounds of total N per acre, 50 pounds of total N in the second year and 100 pounds of N during the third year. Although application procedures will vary, in this study equally split amounts are applied once per month in June, July and August. Also, beginning in the third year, potassium thiosulfate (KTS) at 120 pounds of material is applied in equal amounts during the July irrigations.

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials are listed in *UC Integrated Pest Management Guidelines, Grapes,* available at www.ipm.ucdavis.edu. Pesticides mentioned in the study are commonly used, but are not recommendations.

Vineyard Floor (Weeds)**.** Roundup is applied to the vine row prior to planting and each year thereafter in January. A spot spray in the vine row with Roundup is applied in July. During the first two years the middles are disked four times.

Vineyard Floor (Cover Crop). At the end of the second year (October), the ground is disked twice, harrowed twice and cover crop seed is drilled at 20 to 30 pounds per acre. From the third year on, the middles are mowed four times – March (alternate rows to shred prunings), May, June and July.

Insect. In May of the third year and subsequent years, predatory mites are released over the field for mite control. Provado insecticide is applied in July to control leafhoppers.

Disease. Treatment for powdery mildew begins in the second year with applications of Thiolux, Flint and Rally in mid-May and June. Beginning in the third year, Stylet oil is applied in late April, one application of Rally and an application of Thiolux both in May, an application of Flint in June followed by Rally in June, and Rubigan in July. In the second year, because of the small vines, the applications are made to alternate rows and in the third year only Stylet oil and the first Rally application are made to alternate rows.

Vertebrate. Gophers are controlled by baiting using a tractor and mechanical baiter during April of the first year and March, April and May of the second year. It is assumed that by the end of the second year, gophers are under control and only spot bait treatments in March using an ATV to move around the field are necessary. Squirrels are treated by baiting beginning in the first year from May to November and from April to November thereafter.

Harvest. The first crop is produced in the third year. Because of the low yields, the crops in the third and fourth year are harvested by hand. In future years the crop is mechanically harvested. The crop is typically picked during early morning (7AM to 12 N). The pickers pick for 5 or 6 hours and it is assumed that each can pick one ton of fruit during this period. In this study, it is assumed that the grower will adjust the crew so that the 25-acre vineyard can be picked in approximately three days. The grower rents three tractors to pull the bin trailers and a forklift for moving the gondolas.

Yields. Wine grapes begin bearing an economic crop in the third year after planting. Yield maturity is reached in the sixth year. The annual yields are measured in tons as shown in Table B. Yields for the sixth year are based on grower input, whereas yields in the earlier years are approximated.

Table B. Annual Yields for Cabernet Sauvignon in Lake County (Crush District 2)

Year:	3	4	5	6+
Tons Per Acre:	0.75	1.50	3.50	5.75

Production Cultural Practices and Material Inputs

Tables 2 - 7

Pruning/Suckering/Canopy Management (CM). The vines are hand pruned in late February/early March. The prunings are placed in alternate row middles and shredded during the first mowing in March. The cordons in a separate pass after pruning (March) are tied to the fruit wire. The trunks and cordons are suckered after budbreak in April. In late May, the foliage wires are moved up and the shoots are tucked. Wire adjustment and tucking is also done in June and July. Mechanical leaf removal is done in late June/early July by a custom operator.

Irrigation. Water is pumped to the vineyard after running through a filtration station into the drip lines in the vine rows. The cost includes the water pumping cost plus labor. Beginning in mid-June, the vines are irrigated weekly through late September. One person using an ATV spends two hours (0.08 hours/acre) checking the lines at each irrigation. Time is also required to flush the lines at the beginning of the season. It is assumed that it takes 0.40 man hours per acre (3 men at 4 hours/30 acres) to flush the lines.

Fertilization. Nitrogen (N) at 100 pounds per season is applied through the drip irrigation in equal amounts, once in June, July and August. Potassium as potassium thiosulfate (KTS) at 120 pounds per acre is applied in equal amounts during three of the four irrigations in July. Gypsum at two tons per acre is applied in October or November once every three years. One third of the cost is shown each year. The grower rents a broadcast spreader to apply the gypsum.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes.* For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county agricultural commissioner's office. **Pesticides mentioned in this study are used to calculate rates and costs. Although the pesticides mentioned are commonly used by growers, many other pesticides are available. Check with your Lake County Viticulture Farm Advisor, PCA and/or the UC IPM website for current recommendations.** Adjuvants are recommended for use with many pesticides for effective control, but the adjuvants and their costs are not included in this study. Pesticide costs

may vary by location, brand, and grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

Crop Consultant/Pest Control Adviser (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisers. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCAs (Crop Consultants) or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. A private crop consultant is hired in this study.

Weeds/Vineyard Floor. Roundup is applied beneath the vines during the dormant period in January. The middles are mowed four times: alternate middles in March which also shreds the prunings, and every middle in May, June and July. Also in June or July, the vine rows are spot sprayed with Roundup to remove weeds not controlled by previous herbicides applications. The vine row sprays are made with the growers ATV and weed sprayer. Some sites greater than 15% slope may require the use of a tractor rather than an ATV to prevent tipping.

Insect. Mites are controlled at budbreak in mid April with a Stylet oil spray applied to alternate rows. Western Predatory Mites (*Galendromus occidentalis*), at 6,000 per acre are spread by placing bean plants with mites on them in the vines in May. Provado insecticide is applied in July to control leafhoppers.

Disease Powdery mildew is treated typically at 14 to 21 day intervals depending upon fungicide applied. Applications are made at budbreak in mid April using Stylet Oil followed with Rally in late April/early May, and with Thiolux (micronized sulfur) in May. Also, three applications each with a different fungicide and with a different mode of action are made – Flint in June, Rally in June, Rubigan in late June. The insect and fungicide sprays are made by the grower using the 50 HP tractor and air blast sprayer. Eutypa occurs in vineyards that are over 10 years old and is assumed in this study. The disease is controlled in this study by late pruning in July. The prunings are hauled from the field and burned.

Vertebrate. Gophers are assumed to be under control and are spot treated with bait in March. Squirrels are treated using bait stations and are baited from April to November. The grower uses an ATV to move around the field and to monitor the bait stations. Bird problems occur in August and September when the grapes are ripening. The birds are controlled by driving around the vineyard using equipment to make various bird calls. No cost is shown in this study for bird control.

Harvest. The vines are mechanically harvested by a custom operator which includes a machine operator and guide on the ground. Custom harvest charges vary depending upon row width and for this study, the cost is assumed to be $300 per acre. The grower furnishes three tractors that are rented and three trailers and two drivers. The grower also rents two portable light stations, a forklift and hires an operator, who loads and unloads the gondolas on and off the trailers and loads the truck for hauling to the crusher. Harvesting is done at night and assumed the harvester can pick 1.3 acres per hour or 10 acres per night. Costs are based on a three day operation. Hauling to the crusher is also contracted for and paid by the grower. It is assumed that the grower is hauling to a winery outside of the county and the cost is approximately $20 per ton.

Yields. Yield maturity is reached in the sixth year. An assumed yield of 5.75 tons per acre based on grower consensus is used to calculate returns. The annual yields are measured in tons as shown in Table B.

Returns. Return prices per ton for wine grapes are determined by variety and percent sugar. Average returns based on the California Department of Agriculture (CDFA) Crush Report for Lake County from 2001 to

2006 for Cabernet Sauvignon ranges from $1,508 to $1,803. An average of $1,650 based on the above report is used for calculating net returns to growers at different yields and price.

Assessment. The Lake County Wine Grape Commission (LCWGC) is a local entity performing marketing and research for growers. The current assessment rate is 1% of the gross value of the grapes and is collected at the wineries.

Pickup/ATV. The study assumes business use mileage of 2,500 miles per year for the pickup. The ATV is used for baiting the gophers and squirrels and is included in those costs. Additional ATV use for irrigating and checking the irrigation hose as well as checking the vineyard for diseases are shown as an operation or line item.

Labor, Equipment, and Interest

Labor. Hourly wages for workers are $10.00 for machine operators and $8.00 per hour non-machine labor. Adding 33% for the employer's share of federal and state payroll taxes, workers compensation insurance for vine crops (0040) and other possible benefits gives the labor rates shown of $13.30 and $10.64 per hour for machine labor and non-machine labor, respectively. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2008 (personal email from California Department of Insurance, March 11, 2008, unreferenced). Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum power takeoff (PTO) horsepower and fuel type. Prices for **on-farm delivery** of diesel and gasoline are $2.50 and $3.10 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration 2007 monthly data. The cost includes a 2.25% sales tax on diesel fuel and all taxes including an 8.00% sales tax on gasoline. Gasoline federal and state excise tax are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 7 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest on Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 8.75% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge. The rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2008.

Risk. The risks associated with crop production should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks, which affect profitability and economic viability.

Cash Overhead Costs

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged 0.728% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $550 for the entire farm.

Office Expense. Office and business expenses are estimated at $250 per producing acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

Sanitation Services. Sanitation services provide one double portable toilet on a trailer and cost the farm $875 annually. The cost includes one double toilet unit with washbasin, delivery and 3.5 months of weekly service.

Crop Insurance. Crop insurance costs are based on grower costs, but the level of coverage is not determined.

Environmental Fees. Fees will vary by locality. Lake County is included in the Region 5 watershed. For this study, the watershed fee includes an administrative fee of $65 per farm and per acre costs of $1.42 which includes some local fees.

Investment Repairs. Annual maintenance is calculated as two percent of the purchase price, except for vine replacement in the orchard. The average vine replacement cost over the life of the vineyard is assumed to be 0.10% of the establishment.

Non-Cash Overhead Costs

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is ((Purchase Price – Salvage Value) x Capital Recovery Factor) + (Salvage Value x Interest Rate).

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life

in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in the tables.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.25% is used to calculate capital recovery. The rate will vary depending upon size of loan and other lending agency conditions, but is a suggested rate by a farm lending agency in January 2008.

Buildings. Buildings for shop and storage cover 1,500 square feet.

Drip Irrigation System. It is assumed that a well existed on the property and the costs shown are for a new pump, motor, and filtration/injector station installed along with the drip irrigation system during planting. The well, 15 hp motor, pump, filtration station, fertilizer injector system, drip lines and the labor to install these components are included in the irrigation system cost. Water is pumped to the vineyard after running through a filtration station into the drip lines in the vine rows.

Reservoir. The reservoir is located on the property and holds 12 acre feet of water. Water is pumped into the reservoir for irrigation purposes.

Land. Bare agricultural land available for vineyard establishment in Lake County based on grower estimates is $15,000 to $20,000 per acre. Land in this study is valued at $20,000 per acre or $24,000 per producing acre.

Shop/FieldTools. This includes shop tools and equipment, hand tools, and miscellaneous field tools including pruning equipment. The cost is assumed and not based on any collected data.

Fuel Tanks. One 550-gallon fuel tank using gravity feed are on metal stands. The tanks are set up in a cement containment pad that meets federal, state, and county regulations.

Gondolas. The grower owns 30 two-ton painted gondolas that are used for harvest.

Establishment Cost. An establishment cost is the sum of the costs for land preparation, trellis system, vines, planting, cash overhead and production expenses for growing the vines through the first year that grapes are harvested. The vineyard establishment cost is used to determine the capital recovery cost, during the production years. The Total Accumulated Net Cash Cost on Table 1 in the third year represents the establishment cost. For this study the cost is $14,916 per acre or $372,900 for the 25-acre vineyard. The establishment cost is amortized over the remaining 22 years the vineyard is in production.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Tables 6 and 7. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

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For information concerning the above mentioned University of California publications contact UC DANR Communications Services (1-800-994-8849) or your local county Cooperative Extension office.

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Table 1. COSTS PER ACRE TO ESTABLISH A CABERNET SAUVIGNON VINEYARD

NORTH COAST - Lake County 2008

	Cost Per Acre			
Year:	1st	2nd	3rd	4th
Tons Per Acre:			0.75	1.50
Planting Costs:				
Land Prep: Fertilize/Soil Amendment (Gypsum)	354			
Land Prep: Rip 3X (custom)	270			
Land Prep: Disk 3X	7			
Land Prep: Landplane (custom)	75			
Land Prep: Weed (Roundup)	12			
Land Prep: Survey & Layout (custom)	106			
Land Prep: Plant (custom)	908	18		
Land Prep: Vines @ 908/acre (2% replant in 2nd year)	2,724	54		
Install Trellis		4,500		
TOTAL PLANTING COSTS	4,456	4,572		
Cultural Costs:				
Prune/Train: (includes Vine Management in Yr 2)	971	223		
Weed: Disk Middles	19	25		
Vertebrate: Gopher (bait)	12	36	3	3
Vertebrate: Squirrels (bait)	10	11	18	18
Irrigate: Flush Lines	2	2	2	2
Fertilize: N (CaNO3) injected through drip	31	63	126	126
Irrigate: (water & labor)	13	26	47	47
Weed: Vine Row Spot Spray (Roundup)	8	8	8	8
Prune: Dormant		54	373	373
Weed: Vine Row - Dormant (Roundup)		12	12	12
Weed: Mow/Shred Prunings		10	38	38
Disease: Powdery Mildew (Thiolux)		35	29	29
Disease: Powdery Mildew (Flint) Yr 1, Alt Row		43	52	52
Disease: Powdery Mildew (Rally) Yr 1 AR. Yr 2 1st spray Alt.Row		10	67	67
Cover Crop: Plant		90		
Prune: Sucker Cordons/Sucker Trunks			149	149
Insect: Mites (Predatory Mites)			67	67
Vine Management: Move Wire/Tuck Shoots			367	367
Vine Management: Tie cordon to fruit wire			269	269
Disease/Insect: @ budbreak. Mildew, Mites (oil)			32	32
Disease: Powdery Mildew (Rubigan)			31	31
Insect: Leafhopper (Provado)			30	30
Fertilize: Potash (KTS)			25	25
Fertilize/Soil Amendment: (gypsum) 1x/3 yr			58	58
PCA Service/Field Monitoring			30	30
Pickup	23	23	23	23
ATV	16	16	16	16
TOTAL CULTURAL COSTS	1,104	686	1,871	1,871
Harvest Costs:				
Harvest			188	300
Haul to Crusher			15	30
TOTAL HARVEST COSTS			203	330
Assessments:				
Lake County Wine Grape Commission			12	25
TOTAL ASSESSMENT COSTS			12	25
Interest On Operating Capital @ 8.75%	391	367	72	73
TOTAL OPERATING COSTS/ACRE	5,951	5,625	2,158	2,299

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Table 1. continued

	Cost Per Acre			
Year:	1st	2nd	3rd	4th
Tons Per Acre:			0.75	1.50
Cash Overhead Costs:				
Office Expense	250	250	250	250
Liability Insurance	22	22	22	22
Watershed Fee	4	4	4	4
Sanitation Expense	35	35	35	35
Property Taxes	293	297	305	305
Property Insurance	39	29	35	35
Investment Repairs	166	166	202	202
TOTAL CASH OVERHEAD COSTS	808	803	853	853
TOTAL CASH COSTS/ACRE	6,760	6,428	3,011	3,152
INCOME/ACRE FROM PRODUCTION			1,238	2,475
NET CASH COSTS/ACRE FOR THE YEAR	6,760	6,428	1,774	677
PROFIT/ACRE ABOVE CASH COSTS				
ACCUMULATED NET CASH COSTS/ACRE	6,760	13,187	**14,961**	15,638
Non-Cash Overhead Costs (Capital Recovery):				
Buildings	214	214	214	214
Land	1,500	1,500	1,500	1,500
Drip Irrigation System	176	176	176	176
Fuel Tank	10	10	10	10
Reservoir	279	279	279	279
Shop/Field Tools	10	10	10	10
Gondolas (30)			247	247
Equipment	218	290	269	269
TOTAL INTEREST ON INVESTMENT	2,407	2,478	2,705	2,705
TOTAL COST/ACRE FOR THE YEAR	9,166	8,906	5,716	5,857
INCOME/ACRE FROM PRODUCTION			1,238	2,475
TOTAL NET COST/ACRE FOR THE YEAR	9,166	8,906	4,479	3,382
NET PROFIT/ACRE ABOVE TOTAL COST				
TOTAL ACCUMULATED NET COST/ACRE	9,166	18,072	22,551	25,933

UC COOPERATIVE EXTENSION

Table 2. COSTS PER ACRE TO PRODUCE WINE GRAPES (Cabernet Sauvignon)

NORTH COAST - Lake County 2008

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Weed: Winter Strip (Roundup)	0.40	6	1	4	0	12	
Prune: Dormant	0.00	0	0	0	373	373	
Weed: Mow Centers (shred prunings with first mowing)	1.35	22	16	0	0	38	
CM: Tie cordons to fruit wire	25.00	266	0	3	0	269	
Vertebrate: Gopher (bait)	0.08	1	0	1	0	3	
Vertebrate: Squirrel (bait)	0.67	11	2	5	0	18	
Disease/Insects: @ budbreak. Mildew/Mites (oil)	0.34	5	4	23	0	32	
Prune: Sucker Trunks/Cordons	14.00	149	0	0	0	149	
Insect: Mites (Predatory Mites)	1.25	13	0	54	0	67	
CM: Move bottom wire/Tuck shoots	34.50	367	0	0	0	367	
Disease: Mildew (Rally) applied alternate rows	0.34	5	4	13	0	22	
Disease: Mildew (Thiolux)	0.69	11	8	10	0	29	
Disease: Mildew (Flint)	0.69	11	8	33	0	52	
Disease: Mildew (Rally)	0.69	11	8	26	0	45	
Weed: Spot Spray on Strip (Roundup)	0.30	5	1	2	0	8	
Irrigate: Flush drip lines	0.04	0	0	1	0	2	
Fertilize: N (CaNO3) applied through drip	0.00	0	0	126	0	126	
Irrigate: (water & labor)	1.04	11	0	36	0	47	
Disease: Mildew (Rubigan)	0.69	11	8	12	0	31	
Insect: Leafhopper (Provado).	0.69	11	8	11	0	30	
Disease: Eutypa (cut/burn)	2.00	53	6	0	0	60	
CM: Leaf Removal (mechanical)	0.00	0	0	0	75	75	
Fertilize: K (KTS)	0.00	0	0	25	0	25	
Fertilize: Soil amendment (gypsum) 1X/3 yr	0.07	1	1	23	33	58	
PCA Service	0.00	0	0	0	30	30	
Pickup: Business Use	0.85	14	9	0	0	23	
ATV Use	0.85	14	3	0	0	16	
TOTAL CULTURAL COSTS/ACRE	86.53	999	88	407	511	2,006	
Harvest							
Harvest: Pick (Mechanical)	2.31	33	1	0	366	399	
Haul to Processor (out of county)	0.00	0	0	0	115	115	
Assessment Fees	0.00	0	0	95	0	95	
TOTAL HARVEST COSTS/ACRE	2.31	33	1	95	481	609	
Interest on operating capital @ 8.75%						76	
TOTAL OPERATING COSTS/ACRE		1,032	89	502	992	2,691	
CASH OVERHEAD:							
Office Expense						250	
Liability Insurance						22	
Environmental Fees (watershed)						4	
Crop Insurance						65	
Sanitation Expense						35	
Property Taxes						380	
Property Insurance						89	
Investment Repairs						217	
TOTAL CASH OVERHEAD COSTS						1,062	
TOTAL CASH COSTS/ACRE						3,753	

UC COOPERATIVE EXTENSION

Table 2. continued

NORTH COAST - Lake County 2008

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
NON-CASH OVERHEAD:		Per producing		-- Annual Cost --			
Investment		Acre		Capital Recovery			
Buildings		2,400		214		214	
Land		24,000		1,500		1,500	
Drip Irrigation System		2,202		176		176	
Fuel Tank		120		10		10	
Reservoir		3,480		279		279	
Shop/Field Tools		80		10		10	
Vineyard Establishment Costs		14,916		1,266		1,266	
Gondolas (30)		1,800		247		247	
Equipment		2,429		273		273	
TOTAL NON-CASH OVERHEAD COSTS		51,427		3,974		3,974	
TOTAL COSTS/ACRE						7,728	

UC COOPERATIVE EXTENSION

Table 3. COSTS AND RETURNS PER ACRE to PRODUCE WINE GRAPES (Cabernet Sauvignon)

NORTH COAST - Lake County 2008

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grapes (Cabernet Sauvignon)	5.75	ton	1,650.00	9,488	
OPERATING COSTS					
Herbicide:					
Roundup Ultra Max	0.75	pint	7.80	6	
Custom/Contract:					
Hand Prune ($0.30/vine + OH)	908.00	vine	0.41	373	
Leaf Removal	1.00	acre	75.00	75	
Harvest (mechanical)	1.00	acre	300.00	300	
Haul to Processor (out of county)	5.75	ton	20.00	115	
PCA Service	1.00	acre	30.00	30	
Rodenticide:					
Wilco Gopher Getter Ag Bait	0.25	lb	5.82	1	
Wilco Ground Squirrel Bait	1.20	lb	4.00	5	
Insecticide:					
Stylet Oil	1.00	gal	22.80	23	
Provado Solupak	0.25	oz	44.21	11	
Predatory Mites (Western Predatory Mite)	6.00	thou	9.00	54	
Fungicide:					
Thiolux Jet	12.00	lb	0.80	10	
Flint	2.00	oz	16.50	33	
Rally 40WSP	7.50	oz	5.16	39	
Rubigan EC	4.00	floz	3.07	12	
Fertilizer/Soil Amendments:					
Calcium Nitrate (15.5-0-0+ 19Ca)	100.00	lb N	1.26	126	
Potassium Thiosulfate (KTS) (0-0-25+17S)	120.00	lb	0.21	25	
Gypsum (2 ton @ 1/3 cost per year)	0.66	ton	35.00	23	
Water:					
Water -Flush Lines	0.25	acin	4.50	1	
Water - Pumping cost	8.00	acin	4.50	36	
Vine Aids:					
Tying Materials	1.00	acre	3.00	3	
Rent:					
35HP Tractors (3 tractors for 3 days)	*0.06	week	300.00	18	
Portable Lights w/generator (2 light setups)	*0.24	day	100.00	24	
Forklift (3 days)	*0.12	day	200.00	24	
Gypsum/Compost Spreader (rented once every 3 years, 1/3 cost shown)	*0.33	day	100.00	33	
Assessment:					
Lake County Wine Grape Commission (based on gross income)	0.01	gross	9,488.00	95	
Labor (machine)	14.68	hrs	13.30	195	
Labor (non-machine)	78.60	hrs	10.64	836	
Fuel - Gas	5.00	gal	3.10	16	
Fuel – Diesel	14.98	gal	2.50	37	
Lube				8	
Machinery repair				28	
Interest on operating capital @ 8.75%				76	
TOTAL OPERATING COSTS/ACRE				2,691	
NET RETURNS ABOVE OPERATING COSTS				6,796	
CASH OVERHEAD COSTS:					
Office Expense				250	
Liability Insurance				22	
Environmental Fees (watershed)				4	
Crop Insurance				65	
Sanitation Expense				35	
Property Taxes				380	
Property Insurance				89	
Investment Repairs				217	
TOTAL CASH OVERHEAD COSTS/ACRE				1,062	
TOTAL CASH COSTS/ACRE				3,753	

*per acre per week or per acre per day

UC COOPERATIVE EXTENSION

Table 3. continued

NORTH COAST - Lake County 2008

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Buildings				214	
Land				1,500	
Drip Irrigation System				176	
Fuel Tank				10	
Reservoir				279	
Shop/Field Tools				10	
Vineyard Establishment Costs				1,266	
Gondolas (30)				247	
Equipment				273	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				3,974	
TOTAL COSTS/ACRE				7,728	
NET RETURNS ABOVE TOTAL COSTS				1,760	

UC COOPERATIVE EXTENSION

Table 4. MONTHLY CASH COSTS PER ACRE to PRODUCE WINE GRAPES (Cabernet Sauvignon)

NORTH COAST - Lake County 2008

Beginning JAN 08 Ending DEC 08	JAN 08	FEB 08	MAR 08	APR 08	MAY 08	JUN 08	JUL 08	AUG 08	SEP 08	OCT 08	NOV 08	DEC 08	TOTAL
Cultural:													
Weed: Winter Strip (Roundup)	12												12
Prune: Dormant		373											373
Weed: Mow Centers (shred prunings with first mowing)			7		10	10	10						38
CM: Tie cordons to fruit wire			269										269
Vertebrate: Gopher (bait)			3										3
Vertebrate: Squirrel (bait)				2	2	2	2	2	2	2	2		18
Disease/Insects: @ budbreak. Mildew/Mites (oil)				32									32
Prune: Sucker Trunks/Cordons				149									149
Insect: Mites (Predatory Mites)					67								67
CM: Move bottom wire/Tuck shoots					122	122	122						367
Disease: Mildew (Rally) applied alternate rows					22								22
Disease: Mildew (Thiolux)					29								29
Disease: Mildew (Flint)						52							52
Disease: Mildew (Rally)						45							45
Weed: Spot Spray on Strip (Roundup)						8							8
Irrigate: Flush drip lines						2							2
Fertilize: N (CaNO3) applied through drip						42	42	42					126
Irrigate: (water & labor)						7	14	14	11				47
Disease: Mildew (Rubigan)							31						31
Insect: Leafhopper (Provado).							30						30
Disease: Eutypa (cut/burn)							60						60
CM: Leaf Removal (mechanical)							75						75
Fertilize: K (KTS)							25						25
Fertilize: Soil amendment (gypsum) 1X/3 yr											58		58
PCA Service	3	3	3	3	3	3	3	3	3	3	3		30
Pickup: Business Use	2	2	2	2	2	2	2	2	2	2	2	2	23
ATV Use	1	1	1	1	1	1	1	1	1	1	1	1	16
TOTAL CULTURAL COSTS	18	379	285	190	259	296	418	65	19	8	66	3	2,006
Harvest:													
Harvest: Pick (Mechanical)									399				399
Haul to Processor (out of county)									115				115
Assessment Fees										95			95
TOTAL HARVEST COSTS									514	95			609
Interest on operating capital @ 8.75%	0	3	5	6	8	10	13	14	18	-1	-1	0	76
TOTAL OPERATING COSTS/ACRE	18	382	290	196	267	307	432	78	551	7	65	3	2,692

UC COOPERATIVE EXTENSION

Table 4. continued

NORTH COAST - Lake County 2008

Beginning JAN 08 Ending DEC 08	JAN 08	FEB 08	MAR 08	APR 08	MAY 08	JUN 08	JUL 08	AUG 08	SEP 08	OCT 08	NOV 08	DEC 08	TOTAL
CASH OVERHEAD:													
Office Expense	21	21	21	21	21	21	21	21	21	21	21	21	250
Liability Insurance		22											22
Environmental Fees (watershed)			4										4
Crop Insurance				65									65
Sanitation Expense	3	3	3	3	3	3	3	3	3	3	3		35
Property Taxes	380												380
Property Insurance	45						45						89
Investment Repairs	18	18	18	18	18	18	18	18	18	18	18	18	216
TOTAL CASH OVERHEAD COSTS	467	64	46	107	42	42	87	42	42	42	42	39	1,062
TOTAL CASH COSTS/ACRE	484	446	336	303	310	349	518	121	593	49	108	42	3,753

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
NORTH COAST - Lake County 2008

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE CABERNET SAUVIGNON WINE GRAPES

	YIELD (tons/acre)						
	2.75	3.75	4.75	5.75	6.75	7.75	8.75
OPERATING COSTS:							
Cultural Cost	2,006	2,006	2,006	2,006	2,006	2,006	2,006
Harvest (pick)	386	391	395	399	404	408	412
Haul to Processor	55	75	95	115	135	155	175
Assessment	45	62	78	95	111	128	144
Interest on operating capital @ 10.00%	75	75	75	75	76	76	76
TOTAL OPERATING COSTS/ACRE	2,567	2,609	2,649	2,690	2,732	2,773	2,813
Total Operating Costs/ton	934	696	558	468	405	358	322
CASH OVERHEAD COSTS/ACRE	1,062	1,062	1,062	1,062	1,062	1,062	1,062
TOTAL CASH COSTS/ACRE	3,629	3,671	3,711	3,752	3,794	3,835	3,875
Total Cash Costs/ton	1,320	979	781	652	562	495	443
NON-CASH OVERHEAD COSTS/ACRE	3,975	3,975	3,975	3,975	3,975	3,975	3,975
TOTAL COSTS/ACRE	7,604	7,646	7,686	7,727	7,769	7,810	7,850
Total Costs/ton	2,765	2,039	1,618	1,344	1,151	1,008	897

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE	YIELD (tons/acre)						
$/ton	2.75	3.75	4.75	5.75	6.75	7.75	8.75
1,350	1,145	2,454	3,763	5,073	6,380	7,690	8,999
1,450	1,420	2,829	4,238	5,648	7,055	8,465	9,874
1,550	1,695	3,204	4,713	6,223	7,730	9,240	10,749
1,650	1,970	3,579	5,188	6,798	8,405	10,015	11,624
1,750	2,245	3,954	5,663	7,373	9,080	10,790	12,499
1,850	2,520	4,329	6,138	7,948	9,755	11,565	13,374
1,950	2,795	4,704	6,613	8,523	10,430	12,340	14,249

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE	YIELD (tons/acre)						
$/ton	2.75	3.75	4.75	5.75	6.75	7.75	8.75
1,350	83	1,392	2,701	4,011	5,318	6,628	7,937
1,450	358	1,767	3,176	4,586	5,993	7,403	8,812
1,550	633	2,142	3,651	5,161	6,668	8,178	9,687
1,650	908	2,517	4,126	5,736	7,343	8,953	10,562
1,750	1,183	2,892	4,601	6,311	8,018	9,728	11,437
1,850	1,458	3,267	5,076	6,886	8,693	10,503	12,312
1,950	1,733	3,642	5,551	7,461	9,368	11,278	13,187

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE	YIELD (tons/acre)						
$/ton	2.75	3.75	4.75	5.75	6.75	7.75	8.75
1,350	-3,892	-2,583	-1,274	36	1,343	2,653	3,962
1,450	-3,617	-2,208	-799	611	2,018	3,428	4,837
1,550	-3,342	-1,833	-324	1,186	2,693	4,203	5,712
1,650	-3,067	-1,458	151	1,761	3,368	4,978	6,587
1,750	-2,792	-1,083	626	2,336	4,043	5,753	7,462
1,850	-2,517	-708	1,101	2,911	4,718	6,528	8,337
1,950	-2,242	-333	1,576	3,486	5,393	7,303	9,212

UC COOPERATIVE EXTENSION

Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD

NORTH COAST - Lake County 2008

ANNUAL EQUIPMENT COSTS

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
08	50 HP MFWD Tractor	27,200	15	5,295	2,623	118	162	2,904
08	ATV 4WD	8,000	5	3,585	1,279	42	58	1,379
08	Bin Trailer #1	2,000	20	104	175	8	11	193
08	Bin Trailer #2	2,000	20	104	175	8	11	193
08	Bin Trailer #3	2,000	20	104	175	8	11	193
08	Mower Flail 3 pt 6ft	7,000	10	1,238	870	30	41	941
08	Vine Sprayer/Air Blast	22,000	20	1,147	1,927	84	116	2,127
08	Pickup Truck 1/2 T	28,000	7	10,621	3,805	141	193	4,138
08	Trailer for ATV	1,500	15	144	151	6	8	165
08	Weed Sprayer 30 gal (pull type)	1,500	10	265	186	6	9	202
	TOTAL	101,200		22,607	11,366	451	619	12,436
	60% of New Cost *	60,720		13,564	6,820	270	371	7,462

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
Buildings: 1500 sqft	60,000	20		5,338	218	300	1,200	7,056
Drip Irrigation System	55,050	25		4,409	200	275	1,101	5,986
Vineyard Establishment	372,900	22		31,644	1,357	1,865	372	35,238
Fuel tank: 1-550 gal	3,000	25	150	238	11	16	60	325
Gondolas - 2.5 ton (30)	45,000	10		6,187	164	225	900	7,475
Land	600,000	25	600,000	37,500	0	6,000	0	43,500
Reservoir: 12 acft	87,000	25		6,968	0	435	1,740	9,143
Tools-Shop/Field	2,000	10	200	260	8	11	40	319
TOTAL INVESTMENT	1,224,950		600,350	92,544	1,959	9,127	5,413	109,042

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Crop Insurance	25	acre	65.00	1,625
Liability Insurance	25	acre	21.99	550
Office Expense	25	acre	250.00	6,250
Sanitation Fee	25	acre	35.00	875
Watershed Fee	30	acre	3.58	107

UC COOPERATIVE EXTENSION

Table 7. HOURLY EQUIPMENT COSTS

NORTH COAST - Lake County 2008

		COSTS PER HOUR						
			Cash Overhead		Operating			
Yr Description	Actual Hours Used	Capital Recovery	Insur-ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
08 50 HP MFWD Tractor	153	10.32	0.47	0.64	0.62	7.06	7.68	19.11
08 ATV 4WD	108	7.14	0.24	0.32	0.59	2.38	2.97	10.67
08 Bin Trailer #1	19	5.47	0.24	0.33	0.26	0.00	0.26	6.30
08 Bin Trailer #2	19	5.47	0.24	0.33	0.26	0.00	0.26	6.30
08 Bin Trailer #3	19	5.47	0.24	0.33	0.26	0.00	0.26	6.30
08 Mower Flail 3 pt 6ft	34	15.41	0.53	0.73	3.33	0.00	3.33	20.00
08 Vine Sprayer/Air Blast	103	11.22	0.49	0.67	3.44	0.00	3.44	15.82
08 Pickup Truck 1/2 T	21	107.43	3.97	5.45	2.05	8.91	10.96	127.81
08 Trailer for ATV	50	1.81	0.07	0.10	0.18	0.00	0.18	2.16
08 Weed Sprayer 30 gal (pull type)	17	6.41	0.22	0.30	0.40	0.00	0.40	7.33

UC COOPERATIVE EXTENSION

Table 8. OPERATIONS WITH EQUIPMENT & MATERIAL INPUTS

NORTH COAST - Lake County 2008

MONTH	OPERATION	TRACTOR	IMPLEMENT	LABOR HRS/acre	MATERIAL	RATE/AC	UNIT
Jan	Weed: Winter Strip Spray	ATV	Weed Sprayer		Roundup	0.50	pint
Feb	Prune: Dormant	Contract					
April	Prune: Sucker Trunks & Cordons			14.00			
Mar	Weed: Mow Centers & Shred Prunings	50HP	Mower Flail				
May	Weed: Mow Centers	50HP	Mower Flail				
June		50HP	Mower Flail				
July		50HP	Mower Flail				
June	Weed: Strip Spot Spray	ATV	Weed Sprayer		Roundup	0.25	pt
Mar	Vine Mgmt: Tie cordons to fruit wire			25.00	Tying Material		
May	Vine Mgmt: Move Wire/Tuck Shoots			11.50			
June	Vine Mgmt: Move Wire/Tuck Shoots			11.50			
July	Vine Mgmt: Move Wire/Tuck Shoots			11.50			
July	Vine Mgmt: Leaf Removal	Custom					
Mar	Vertebrate: Gopher	ATV			Gopher Bait	0.25	lb
April	Vertebrate: Squirrel	ATV			Squirrel Bait	0.15	lb
May		ATV			Squirrel Bait	0.15	lb
June		ATV			Squirrel Bait	0.15	lb
July		ATV			Squirrel Bait	0.15	lb
Aug		ATV			Squirrel Bait	0.15	lb
Sept		ATV			Squirrel Bait	0.15	lb
Oct		ATV			Squirrel Bait	0.15	lb
Nov		ATV			Squirrel Bait	0.15	lb
April	Disease/Insect: @ budbreak, Mildew/Mites (Alternate Row)	50HP	Air-blast Sprayer		Stytlet Oil	1.00	gal
May	Disease: Mildew (alternate rows)	50HP	Air-blast Sprayer		Rally	2.50	oz
May	Disease: Mildew	50HP	Air-blast Sprayer		Thiolux	12.00	lb
June		50HP	Air-blast Sprayer		Flint	2.00	oz
June		50HP	Air-blast Sprayer		Rally	5.00	oz
July		50HP	Air-blast Sprayer		Rubigan	4.00	floz
July	Eutypa (cut/burn)	ATV	Trailer	2.00			
May	Insect: Mites			1.30	Beneficials	6000.00	acre
July	Insect: Leafhopper				Provado	0.25	oz
June	Irrigate: Flush Lines			0.04	Water	0.25	acin
June	Irrigate: (weekly)			0.16	Water	1.25	acin
July				0.32	Water	2.45	acin
Aug				0.32	Water	2.45	acin
Sept				0.24	Water	1.85	acin
June	Fertilize: through drip 2X				Calcium Nitrate	100.00	lb N
July	Fertilize: through drip 4X				Potassium	120.00	lb
Sept	Harvest (custom pick)	Custom					
		Rent: 35HP	Gondola Trailer		Rent: Lights		
		Rent: 35HP	Gondola Trailer		Rent: Lights		
		Rent: 35HP	Gondola Trailer		Rent: Forklift		
Sept	Haul	Custom					
Oct	Fertilize/Soil Amendment 1X/3 Yrs	50HP	Rent: Spreader		Gypsum	0.66	ton