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SAMPLE COSTS TO ESTABLISH and PRODUCE
WINE GRAPES



INTERMOUNTAIN REGION
SHASTA-TRINITY COUNTIES

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INTRODUCTION

Sample costs to establish a vineyard and produce wine grapes under drip irrigation in the Intermountain Region, Shasta-Trinity counties are presented in this study. The study is for the new grower buying land, building a shop, purchasing equipment, drilling a well and planting wine grapes. Viticultural practices vary widely in this geographical region, due to topography that ranges from valley floor to mountainside. Therefore, 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 these same practices will not apply to every situation. The sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 3 and 4 is provided for entering your farming 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.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis. Current studies can be downloaded from the department website at <http://coststudies.ucdavis.edu> or obtained from selected county UC Cooperative Extension offices.

ASSUMPTIONS

The assumptions refer to Tables 1 to 9 and pertain to sample costs to establish a vineyard for wine grape production in the Intermountain Region, Shasta-Trinity Counties. The cultural practices shown represent operations and materials considered typical in a well-managed vineyard in the region. The costs, materials, and practices shown in this study will not be applicable to all situations. Establishment and cultural practices vary by grower and the differences can be significant. Each grower must consider topography, elevation, water supply, desired cultural practices (i.e. conventional versus organic), and other site specific factors in evaluating these sample costs. The study is intended as a guide only. *The trade names and cultural practices shown in this report do not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of similar products or practices.*

Farm. The 6-acre vineyard consists of 3-acres of wine grapes and land around the vineyard, all enclosed by a surrounding deer fence, plus land for equipment storage, shop, and roads. In this case study, the landowner purchases the 6-acres for \$10,000 per acre and is the manager/operator. Another 14 acres adjoining the vineyard is separately purchased for a homesite. Although the grower does the majority of the labor for the operations, a labor cost (opportunity cost) is shown for each operation.

Power supply. Pumping is electric and the power is purchased from the local utility company. In cases where utility power is not available on-site, costs for constructing an off-grid power supply or connecting to the grid must be included. Some growers may pump with diesel power.

Establishment Operating Costs (Tables 1 & 2)

Site Preparation. The vineyard is planted on previously unfarmed land with scattered trees. The site for the vineyard is level to 10% slope, southwest facing and does not require any environmental permits. Soil samples are taken for nutrient and nematode analysis prior to ripping. In September, prior to the planting year, a custom operator removes vegetation from the site and rips the dry soil to 3-feet deep in the vine rows. Some areas may have buried rock in which ripping would pull them to the surface. In this case growers may not rip. The trees and brush are pushed into a pile for disposal by burning in the winter. Vegetation is bladed off with the subsequent regrowth controlled through a Roundup herbicide application the following spring. After land preparation, the trellis is constructed, the drip irrigation system installed, and a deer fence built.

Vineyard/Vines. The vineyard consist of three one-acre blocks arranged in a linear fashion with 8 rows to each acre spaced 9-feet apart for a total vineyard width of 225 feet. Vines are spaced with rows 6-feet apart for a total of 95 vines in each row making each row 582 feet long. An 8-foot deer fence is 50 feet away from all sides of the vineyard requiring 671 feet of perimeter fence per acre with posts 12-feet apart. The three 8-foot gates are each constructed as one double gate and a single gate. The total land use surrounded by the deer fence is five acres.

Planting. Dormant benchgrafts on phylloxera resistant rootstock (Grannett, Walker and Marcum, 2002) are planted in mid-April. A planting hole is dug, roots are trimmed and the vine planted to the appropriate depth. In recent times, Pinot Noir is the highest valued variety in the area. Pinot Noir, Riesling, Chardonnay, and Gewürztraminer are the common planted varieties in the area. Realizing the potential for market changes, it may be desirable to plant more than one variety. The vines are planted on a 6 x 9-foot spacing, 806 vines per acre. Because of the field configuration, a “middle” exists on the two outside vine rows. Therefore, 800 vines per acre are purchased to plant 760 vine locations. Due to dead or unhealthy plants, 5% are replanted in the second year.

Trellis System. The vertical shoot positioning system (VSP) is a vertical divided trellis system that maximizes the capturing of sunlight for high yields. However, in lower elevation locations where heat and light are intense, making the risk of fruit sunburn higher, growers may choose to use a horizontally divided canopy to provide additional fruit shading. In the fall of the year prior to planting, holes are dug by hand with a posthole digger to put in the end posts and grapestakes. Slotted grapestakes 8 feet long (18 inches deep in soil) are placed every 25 feet apart with smaller stakes for vines not positioned at the grapestakes. End posts are vertical 8 foot x 5-inch diameter wood treated posts with diagonal braces into the vineyard. All wire is high tensile 12.5 gauge: a 12-inch drip wire, a 42-inch cordon wire and two pairs of shoot positioning wires 10-inches and 22-inches above the cordon wire. Gripples attached to each wire tightens the wires on each row. The gripple tensioning tool is included in the tools inventory. The system is considered as part of the vineyard since it will be removed when the vines are removed. Therefore it is included in the establishment cost.

Training/Pruning. Training and pruning establish the vine framework and these techniques will vary with variety and trellis system. In this study training includes pruning, tying, suckering, shoot positioning and thinning. The vines are pruned to vertical shoot positioned (VSP) trellising. Vines are trained by a vertical shoot position system to maximize leaf exposure to sunlight. Other trellising systems might be more appropriate for vigorous vines on yield sites at low elevation or to provide canopy protection to fruit to reduce sunburn.

First year vines are allowed to sprawl and grow from open-ended milk cartons placed over the vine to protect them from small rodents. At the beginning of the second year, vines are pruned back in the

Table A. Expectations for grapevine growth and yield in Shasta Trinity Counties.

| Year | Season | | Yield |
|------|---|------------------|---------|
| | Spring | Fall | |
| 1 | Plant and allow maximum growth | Site Preparation | None |
| 2 | Prune back to 2 buds in the spring, allow no yield and establish cordon | | None |
| 3 | Prune small wood, manage growth to complete cordon, thin to limit yield | | 0.5 ton |
| 4 | Prune and thin to allow a 1 ton increase in yield | | 1.5 ton |
| 5 | Prune and thin to allow a 1 ton increase in yield | | 2.5 ton |
| 6 | Prune and thin to allow a 1 ton increase in yield | | 3.5 ton |

spring to two buds and the cordon is established. Pruning is assumed to take five hours, plus an additional 10 hours for training. Wood smaller than a pencil is removed early in the third year vines and clusters are thinned to one or two per vine for a 0.5 ton per acre yield. In the third, fourth and fifth years, it takes 17, 18, and 20 hours, respectively, for pruning in February. Sixteen hours are allocated each year from April to June for tying, shoot positioning and cluster thinning. Pruning and canopy management times will vary by trellis type, variety, and vine vigor. In the first two years, the prunings are chopped and incorporated in to the soil with the disking in March. In the third and subsequent years, the prunings are placed in the middles and chopped with a flail mower prior to the March disking.

Irrigation and Frost Protection. The dripline is installed prior to planting. The vineyard uses well water for irrigation and frost protection. Water is delivered to the head of the vineyard through a single 3-inch PVC pipe. Laterals include on and off valves to divert water to either the drip line or the frost protection lines. The field is irrigated through the drip system beginning after planting in the first year. In subsequent years the vines are irrigated from March to September. The irrigation cost includes the water pumping costs, irrigation labor, and tractor time. Minimal tractor time is included each month for the irrigator to travel to and from the vineyard. One hour of irrigation labor per acre is needed for each inch of irrigation water. At the height of irrigation demand in July, irrigation sets will be 8 hours per day. Irrigation amounts in years one and two are one-half that of years three and beyond, 10.5 inches per season vs. 21 inches for the season. Most of the April

irrigation is applied for frost protection. In certain cases, landowners may have the option of using surface water such as a stream for irrigation and frost protection; thereby, saving on the cost of the well. However, when surface water is used added filtration is needed.

Drip System. Three-inch lateral lines are laid out in the fall prior to trellis installation. After planting, the drip line is attached to the drip wire on the trellis system and emitters are punched. Drip system labor is included in the total drip system costs. The drip system is considered part of the vineyard and is included in the establishment costs.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. **Pesticides mentioned in the study are not recommendations, but those commonly used in the region.** For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For additional information and pesticide use permits, contact the local county Agricultural Commissioner's office.

Insects. Leafhoppers and sharpshooter control begins in the third year coinciding with canopy development. Provado is applied in April with the second sulfur spray.

Diseases. Wettable sulfur is applied in early April of the second year to prevent powdery mildew. In the third and subsequent years, wettable sulfur is applied once in March and twice in April and in May. The grower applies the sulfur.

Weeds. Roundup is used to control weeds in the vine row in February. The middles are disked in March for weed control, and to chop and incorporate the prunings. In the third and subsequent years, the prunings are chopped with a flail mower prior to disking. The middles are mowed for weed control in September. Roundup is applied by using a backpack sprayer with a boom in the fall of the first year and thereafter every spring. Growers who chose to control weeds through non-chemical means may need to purchase an in-row cultivator (\$6000 - \$10,000).

Fertilization. The grower applies 15-15-15 fertilizer by hand in the spring. Costs include a tractor to haul the bags to the field and the application labor. Soil samples for nutrient and nematode analysis were collected prior to planting. Fertilizer application should be based on the soil analysis; in this study it is assumed that the fertilizer applied will supply the basic requirements.

Harvesting. Harvest starts in the third year. The grower hires three or more workers to harvest grapes at a \$0.06 per pound rate (\$120 per ton) for harvest. Each worker can harvest up to a ton of grapes in a day. The grower parks the pickup and trailer at the edge of the field and the pickers dump the grapes from their picking buckets into the bins. The grower uses the pick-up truck and flat bed trailer to make daily 4-hour roundtrips to the winery with up to five 1,000-pound bins or 2.5 tons of grapes. The cost per acre is allocated accordingly.

Yield. No yield is expected the first two years, with yields of 0.5 tons per acre (1.3 lbs/vine) the third year and increasing 1 ton per acre (2.6 lbs/vine) in the next three years to a maximum yield of 3.5 tons per acre (9.2 lbs/vine).

Returns. The grapes are sold to a winery and since prices per ton fluctuate significantly due to variety, fruit quality, market trends and overall production, this study assumes that the grower receives an average of \$1,500 per ton.

Production Operating Costs

Pruning/Canopy Management. Pruning is done annually in March and a second pass is made to tie the vines/canes. Prunings are placed in the row middles and disked into the soil to decompose. It is assumed that it takes 20 hours per acre to prune, 4 hours to tie and 4 hours per pass for suckering, shoot thinning and positioning. Passes are made in May for suckering, shoot thinning and positioning. Passes are made in June and July for shoot positioning, cluster thinning and some tying. Pruning time will vary with trellis type, variety and vine vigor.

Irrigation/Frost Protection. We assume pumping from a well, but in some cases water is from streams, which have lower lift and pumping energy costs. Water pumping cost is assumed to be \$2 per acre-inch. The irrigation costs include pumping costs, irrigation labor, and the use of a tractor and trailer. Minimal tractor time is included each month for the irrigator to travel to and from the vineyard. One hour of irrigation labor per acre is needed for each inch of irrigation water. At the height of irrigation demand in July, irrigation sets will be 8 hours per day. In isolated areas, diesel pumping may be used. Pulsators are used for frost protection, applying approximately 0.1 inch per hour over only the vine rows. Water use for Pulsators is assumed to be about the same as drip – about 13 gallons per minute (gpm) per acre. Some growers use spinner or impact sprinklers requiring 50 gpm per acre for frost protection.

Fertilization. Soil samples were collected in the first year for nutrient analysis. In this study, it is assumed that 80 pounds of 15-15-15 fertilizer will cover the N, P, K and S for all years.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. **Pesticides mentioned in the study are not recommendations, but those commonly used in the region.** For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. A Pesticide Identification number is required to purchase pesticides for commercial use. For information regarding pesticide ID numbers and use permits, contact the County Agricultural Commissioner's office. For additional production information, contact the UC Cooperative Extension Viticulture Farm Advisor.

Pest Control Adviser. Growers may hire private (independent) PCAs or receive the service as part of the services provided by their local retail agricultural chemical and fertilizer supplier. The pest control adviser (PCA) monitors the field for pests, diseases, and nutrition. PCAs are required to provide written recommendations for pesticides that they advise a grower to use. No PCA is included in this study.

Insects. Leafhoppers and sharpshooter may be a problem in some years. Provado is applied in April with the second sulfur spray.

Disease. Wettable sulfur is applied to control powdery mildew once in March and twice in both April and May.

Harvesting. The grower hires three or more workers to harvest grapes at a \$0.06 per pound rate (\$120 per ton) for harvest. Each worker can harvest up to a ton of grapes in a day. The grower uses the pick-up truck and flat bed trailer to make daily trips to the winery with up to five 1,000-pound bins or 2.5 tons of grapes. The grower parks the pickup and trailer at the edge of the field (row) and the pickers dump the grapes from their picking buckets into the bins. The grower hauls 2.5 tons per load and takes 4-hours round trip. The cost per acre is allocated accordingly.

Yield. The 2004 grape crush report suggests yields in grape crushing district 9 can reach 4 or 4.5 tons per acre, but this study includes production in areas up to 2,500 foot elevation so yields are projected to average only 3.5 tons per acre in years six and beyond (see Table A). A ton of wine grapes makes about 150 gallons of wine. A gallon of wine makes approximately five 750 milliliter bottles.

Returns. The Pinot Noir grapes are sold to a winery and since prices per ton fluctuate significantly due to variety, fruit quality, market trends and overall production, this study assumes that the grower receives an average of \$1,500 per ton. Prices for the 4 varieties, based on the Final Grape Crush Reports, 2001-2004, for Chardonnay, Gewürtztraminer, Pinot Noir and Riesling in Region 9 are shown in Table B. In this study, profitability above total costs occurred when yields at \$1,500 per ton exceeded 6.5 tons per acre or when prices at 3.5 tons exceeded \$2,500 per ton.

Table B. Average grower returns per delivered ton from District 9*

| | 2001 | 2002 | 2003 | 2004 | Average |
|-----------------|-------|-------|-------|-------|---------|
| Chardonnay | 496 | 328 | 330 | 454 | 402 |
| Gewürtztraminer | 950 | 922 | 879 | 818 | 892 |
| Pinot Noir | 1,776 | 1,462 | 1,587 | 1,441 | 1,566 |
| Riesling | | | | 1,200 | 1,200 |

* Grape crush reports, 2001-2004, CDFA.

Pickup. The grower uses the pickup for business and personal use. The assumed general business use for the pickup is 20 hours per acre. In addition the pickup with a trailer is used for hauling the harvested grapes to the winery and is included in that cost.

Labor. Labor rates of \$10.96 per hour for machine operators and for general labor includes payroll overhead of 37%. The basic hourly wage for machine operators and for general labor is \$8.00. Although, the machine operator labor is more skilled than general labor, the wages are the same because the machine operator is the unsalaried grower. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for vineyards (code 0040), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 and 4 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 Take Off (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.51 and \$2.05 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 6 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 7.65% 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.

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. Growers may purchase Federal crop insurance to reduce the production risk associated with specific natural hazards. Insurance policies vary and range from a basic catastrophic loss policy to one that insures losses for up to 75% of a crop. Insurance costs will depend on the type and level of coverage.

Cash Overhead

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. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, equipment repairs, and management.

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 all 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 at 0.690% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$429 annually for the entire farm.

Management/Supervisor Wages. Salary is not included. Returns above costs are considered a return to management

Office Expense. Office and business expenses are estimated at \$166 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

Investment Repairs. Annual repairs on investments or capital recovery items that require maintenance are calculated as 2% of the purchase price. Repairs are not calculated for land. Repairs at 2% are included for establishment costs to account for trellis repairs and vine replacement.

Non-Cash Overhead

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 $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

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 Table 6.

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 6.01% used to calculate capital recovery cost is the USDA-ERSs ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector.

Irrigation System. A 6-inch diameter deep-water well, 200 feet deep is drilled on the property. A 5-horsepower (hp) 4-inch diameter submersible pump delivers 39 gallons per minute (gpm) to either irrigate all three acres through 1 gallon per hour (gph) emitters or to frost protect using pulsators on the second frost protection line placed on the drip wire. Drip lines are 3/4 inch with one one-gallon per hour (gph) emitter placed at each vine location. Water is applied continuously to one acre per set resulting in three sets per irrigation. A 220-gallon tank and filter is included in the pumping station costs.

Land. This study is based upon the purchase of six acres of unfarmed land at \$10,000 per acre. Three acres are planted to vines and are enclosed by a perimeter deer fence. The deer fence is installed 50 feet from the vines and accounts for two unplanted acres around the vineyard and inside the fence. One acre is allocated to the shop, equipment storage area and roads. The landowner also purchased an additional 14-acres which includes space for the homestead. These 14 acres are not included in the enterprise.

Tools. This includes shop tools, hand tools, and miscellaneous field tools such as pruning tools, and backpack sprayer.

Establishment Cost. Costs to establish the vineyard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, trellis system, drip system, planting, vines, cash overhead and production expenses for growing the vines through the first year that grapes are harvested minus any returns from production. The Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment cost. For this study the cost is \$16,542 per acre or \$49,626 for the 3-acre vineyard. The establishment cost is spread over the remaining 22 years of the 25 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 50% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are in the Whole Farm Equipment, Investment and Business Overhead Tables. 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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Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
 INTERMOUNTAIN REGION - TRINITY & SHASTA COUNTIES

| | Cost Per Acre | | | | | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|
| | Year: | 1st | 2nd | 3rd | 4th | 5th |
| Tons Per Acre: | | | | 0.50 | 1.50 | 2.50 |
| Land Preparation and Planting Costs: | | | | | | |
| Clear Land and Rip (Custom) | | 500 | | | | |
| Fertilizer: Soil & Nematode Test | | 41 | | | | |
| Trellis: Build & Install | | 3,274 | | | | |
| Irrigation: Install filter, pipe, drip | | 1,603 | | | | |
| Fence: Build deer fence | | 1,769 | | | | |
| Plant: Vines (760), cartons, labor. Replant 5% second year | | 3,113 | 159 | | | |
| TOTAL LAND PREP and PLANTING COSTS | | 10,301 | 159 | | | |
| Cultural Costs: | | | | | | |
| Prune: Hand Prune | | | 55 | 186 | 197 | 219 |
| Prune/Train: Tie canes/Shoot Position/Thin | | | 147 | 190 | 190 | 190 |
| Weed: Hand spray vine rows (Roundup) | | 57 | 57 | 57 | 57 | 57 |
| Weed : Disk middles | | 16 | 16 | 16 | 16 | 16 |
| Prune: Chop Prunings | | | | 17 | 17 | 17 |
| Fertilize: Hand spread (15-15-15) (Yr 1 Zinc Sulfate added) | | 46 | 32 | 32 | 32 | 32 |
| Disease: Mildew (wetable sulfur). Insect: Leafhopper (Provado) | | | | 51 | 51 | 51 |
| Disease: Mildew (wetable sulfur) | | | 19 | 74 | 74 | 74 |
| Irrigate: water & labor | | 168 | 168 | 304 | 304 | 304 |
| Weed: Mow | | 16 | 16 | 16 | 16 | 16 |
| Pickup Truck Use | | 409 | 409 | 409 | 409 | 409 |
| TOTAL CULTURAL COSTS | | 712 | 918 | 1,354 | 1,365 | 1,387 |
| Harvest Costs: | | | | | | |
| Pick and Haul | | | | 88 | 236 | 383 |
| TOTAL HARVEST COSTS | | | | 88 | 236 | 383 |
| Interest On Operating Capital @ 7.65% | | 699 | 37 | 52 | 54 | 56 |
| TOTAL OPERATING COSTS/ACRE | | 11,713 | 1,114 | 1,495 | 1,654 | 1,826 |
| Cash Overhead Costs: | | | | | | |
| Office Expense | | 167 | 167 | 167 | 167 | 167 |
| Liability Insurance | | 143 | 143 | 143 | 143 | 143 |
| Property Taxes | | 329 | 324 | 332 | 332 | 332 |
| Property Insurance | | 89 | 85 | 91 | 91 | 91 |
| Investment Repairs | | 263 | 263 | 263 | 263 | 263 |
| TOTAL CASH OVERHEAD COSTS | | 991 | 982 | 997 | 997 | 997 |
| TOTAL CASH COSTS/ACRE | | 12,704 | 2,096 | 2,491 | 2,651 | 2,822 |
| INCOME/ACRE FROM PRODUCTION | | | | 750 | 2,250 | 3,750 |
| NET CASH COSTS/ACRE FOR THE YEAR | | 12,704 | 2,096 | 1,741 | 401 | |
| PROFIT/ACRE ABOVE CASH COSTS | | | | | | 928 |
| ACCUMULATED NET CASH COSTS/ACRE | | 12,704 | 14,800 | 16,542 | 16,942 | 15,614 |
| Non-Cash Overhead: Capital Recovery | | | | | | |
| Well | | 222 | 222 | 222 | 222 | 222 |
| Shop/Field Tools | | 227 | 227 | 227 | 227 | 227 |
| Pump Tank Filter | | 100 | 100 | 100 | 100 | 100 |
| Shop Building | | 522 | 522 | 522 | 522 | 522 |
| Land | | 1,202 | 1,202 | 1,202 | 1,202 | 1,202 |
| Equipment | | 1,251 | 1,187 | 1,316 | 1,316 | 1,316 |
| TOTAL INTEREST ON INVESTMENT | | 3,523 | 3,459 | 3,588 | 3,588 | 3,588 |
| TOTAL COST/ACRE FOR THE YEAR | | 16,227 | 5,556 | 6,080 | 6,239 | 6,411 |
| INCOME/ACRE FROM PRODUCTION | | | | 720 | 2,250 | 3,750 |
| TOTAL NET COST/ACRE FOR THE YEAR | | 16,227 | 5,556 | 5,330 | 3,989 | 2,661 |
| NET PROFIT/ACRE ABOVE TOTAL COST | | | | | | |
| TOTAL ACCUMULATED NET COST/ACRE | | 16,227 | 21,783 | 27,112 | 31,101 | 33,762 |

UC COOPERATIVE EXTENSION
Table 2. MATERIALS AND CUSTOM TO ESTABLISH A VINEYARD
 INTERMOUNTAIN REGION - Shasta & Trinity Counties

| | Unit | \$/Unit | Total Costs Per Acre | | | | | | | | | |
|--------------------------------|------|---------|----------------------|-------|--------|------|--------|------|--------|------|--------|-----|
| | | | Year 1 | | Year 2 | | Year 3 | | Year 4 | | Year 5 | |
| | | | units | \$ | units | \$ | units | \$ | units | \$ | units | \$ |
| OPERATING COSTS | | | | | | | | | | | | |
| Custom: | | | | | | | | | | | | |
| Site Preparation | acre | 500.00 | 1.00 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Harvest (hand) | ton | 120.00 | | | 0 | 0.50 | 60 | 1.50 | 180 | 2.50 | 300 | |
| Fertilizer: | | | | | | | | | | | | |
| Soil/Nematode Test | each | 100.00 | 0.30 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15-15-15 | lb | 0.20 | 80.00 | 16 | 80.00 | 16 | 80.00 | 16 | 80.00 | 16 | 80.00 | 16 |
| Zinc Sulfate 36% | lb | 0.46 | 30.00 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fungicide: | | | | | | | | | | | | |
| Wettable Sulfur | lb | 0.84 | | 0 | 3.00 | 3 | 15.00 | 13 | 15.00 | 13 | 15.00 | 13 |
| Insecticide: | | | | | | | | | | | | |
| Provado Solupak | oz | 43.95 | | 0 | 0 | 0.75 | 33 | 0.75 | 33 | 0.75 | 33 | |
| Herbicide: | | | | | | | | | | | | |
| Roundup | pint | 6.80 | 6.00 | 41 | 6.00 | 41 | 6.00 | 41 | 6.00 | 41 | 6.00 | 41 |
| Water: | | | | | | | | | | | | |
| Water: | acin | 2.00 | 10.50 | 21 | 10.50 | 21 | 21.00 | 42 | 21.00 | 42 | 21.00 | 42 |
| Fence: | | | | | | | | | | | | |
| 8' bunny fence | foot | 1.50 | 671.00 | 1,007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| fence clips | foot | 0.01 | 671.00 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8'x10' gate | each | 300.00 | 1.00 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10' T post | each | 6.00 | 56.00 | 336 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trellis: | | | | | | | | | | | | |
| 8' grape stakes | each | 8.00 | 184.00 | 1,472 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8'x5" end posts | each | 9.50 | 16.00 | 152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6'x4" post braces | each | 8.00 | 16.00 | 128 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pound posts (Install) - Custom | acre | 100.00 | 1.00 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60" plant stakes (rebar) | each | 1.00 | 576.00 | 576 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12.5 gauge ht wire | foot | 0.02 | 27,936.00 | 559 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gripples | each | 1.00 | 48.00 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Irrigation System: | | | | | | | | | | | | |
| Valves for rows | each | 20.00 | 8.00 | 160 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100ft 3" pvc pipe | foot | 1.50 | 100.00 | 150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rent (Trencher) | acda | 50.00 | 1.00 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3/4" drip tube | foot | 0.07 | 4,656.00 | 326 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 gph comp emitter | each | 0.30 | 800.00 | 240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3/4" frost tube | foot | 0.07 | 4,656.00 | 326 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pulsators | each | 1.00 | 200.00 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vines: | | | | | | | | | | | | |
| Benchgrafted Vines | each | 3.50 | 762.00 | 2,667 | 38.00 | 133 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vine Ties (Ty-M-Up) | roll | 5.00 | | 0 | 3.00 | 15 | 3.00 | 15 | 3.00 | 15 | 3.00 | 15 |
| Milk cartons | each | 0.40 | 762.00 | 305 | 38.00 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| Labor (machine) | | 10.96 | 44.00 | 482 | 30.80 | 338 | 38.40 | 421 | 40.00 | 438 | 41.60 | 456 |
| Labor (non-machine) | hrs | 10.96 | 55.50 | 608 | 30.50 | 334 | 56.00 | 614 | 57.00 | 625 | 59.00 | 647 |
| Fuel - Diesel | gal | 1.51 | 78.93 | 119 | 63.46 | 96 | 74.18 | 112 | 77.90 | 118 | 81.59 | 123 |
| Lube | | | | 18 | | 14 | | 17 | | 18 | | 18 |
| Machinery repair | | | | 57 | | 52 | | 59 | | 63 | | 66 |
| Interest | | | | 699 | | 37 | | 52 | | 54 | | 56 |
| TOTAL OPERATING COSTS | | | 11,713 | | 1,114 | | 1,494 | | 1,655 | | 1,825 | |

UC COOPERATIVE EXTENSION
Table 3. COSTS PER ACRE to PRODUCE WINE GRAPES
 INTERMOUNTAIN REGION - Shasta & Lassen Counties

| Operation | Operation Time (Hrs/A) | Cash and Labor Cost per acre | | | | | Total Cost | Your Cost |
|--|------------------------------|------------------------------|-------------------------|---------------------------------|-----------------|--------------|---------------|--------------|
| | | Labor Cost | Fuel, Lube & Repairs | Material Cost | Custom/ Rent | | | |
| Cultural: | | | | | | | | |
| Weed: Spray Vine Rows (Roundup) | 0.33 | 15 | 1 | 41 | 0 | 57 | | |
| Prune: (hand) | 20.00 | 219 | 0 | 0 | 0 | 219 | | |
| Prune: Tie vines/canes | 4.00 | 44 | 0 | 15 | 0 | 59 | | |
| Prune: Chop Prunings | 1.00 | 13 | 4 | 0 | 0 | 17 | | |
| Weed: Disk Middles | 1.00 | 13 | 3 | 0 | 0 | 16 | | |
| Disease: Mildew (sulfur) | 4.00 | 53 | 11 | 10 | 0 | 74 | | |
| Canopy Management: Shoot Position, Cluster Thin | 12.00 | 132 | 0 | 0 | 0 | 132 | | |
| Fertilize: Hand (15-15-15) | 0.33 | 15 | 1 | 16 | 0 | 32 | | |
| Irrigate: (water & labor) | 2.00 | 256 | 6 | 42 | 0 | 304 | | |
| Disease: Mildew (sulfur). Insect: Leafhopper (Provado) | 1.00 | 13 | 3 | 35 | 0 | 52 | | |
| Weed: Mow Middles | 1.00 | 13 | 3 | 0 | 0 | 16 | | |
| Pickup: General Business Use | 20.00 | 263 | 146 | 0 | 0 | 409 | | |
| TOTAL CULTURAL COSTS | 66.66 | 1,050 | 177 | 159 | 0 | 1,387 | | |
| Harvest: | | | | | | | | |
| Hand Pick & Haul | 5.60 | 74 | 43 | 0 | 420 | 537 | | |
| TOTAL HARVEST COSTS | 5.60 | 74 | 43 | 0 | 420 | 537 | | |
| Interest on operating capital @ 7.65% | | | | | | 58 | | |
| TOTAL OPERATING COSTS/ACRE | | 1,124 | 220 | 159 | 420 | 1,981 | | |
| CASH OVERHEAD: | | | | | | | | |
| Office Expense | | | | | | 167 | | |
| Liability Insurance | | | | | | 143 | | |
| Property Taxes | | | | | | 416 | | |
| Property Insurance | | | | | | 149 | | |
| Investment Repairs | | | | | | 594 | | |
| TOTAL CASH OVERHEAD COSTS | | | | | | 1,468 | | |
| TOTAL CASH COSTS/ACRE | | | | | | 3,449 | | |
| NON-CASH OVERHEAD: | | | | | | | | |
| | | Per producing Acre | | Annual Cost Capital Recovery | | | | |
| Well | | 3,333 | | 222 | | 222 | | |
| Tools | | 1,667 | | 227 | | 227 | | |
| Pump, Tank, Filter | | 1,500 | | 100 | | 100 | | |
| Shop Building | | 6,667 | | 522 | | 522 | | |
| Land | | 20,000 | | 1,202 | | 1,202 | | |
| Vineyard Establishment | | 16,542 | | 1,375 | | 1,375 | | |
| Equipment | | 9,830 | | 1,314 | | 1,314 | | |
| TOTAL NON-CASH OVERHEAD COSTS | | 59,539 | | 4,961 | | 4,961 | | |
| TOTAL COSTS/ACRE | | | | | | 8,410 | | |

UC COOPERATIVE EXTENSION
Table 4. COSTS AND RETURNS PER ACRE to PRODUCE WINE GRAPES
 INTERMOUNTAIN REGION - Shasta & Lassen Counties

| | Quantity/ Acre | Unit | Price or Cost/Unit | Value or Cost/Acre | Your Cost |
|---|-------------------|------|-----------------------|-----------------------|--------------|
| GROSS RETURNS | | | | | |
| Wine Grapes | 3.50 | ton | 1,500.00 | 5,250 | |
| OPERATING COSTS | | | | | |
| Trellis: | | | | | |
| Vine Ties (Ty-M-Up rolls) | 3.00 | each | 5.00 | 15 | |
| Herbicide: | | | | | |
| Roundup Ultra Max | 6.00 | pint | 6.80 | 41 | |
| Fungicide: | | | | | |
| Wettable Sulfur (micronized) | 15.00 | lbs | 0.84 | 13 | |
| Insecticide: | | | | | |
| Provado Solupak | 0.75 | oz | 43.95 | 33 | |
| Fertilizer: | | | | | |
| 15-15-15 | 80.00 | lb | 0.20 | 16 | |
| Water: | | | | | |
| Water | 21.00 | acin | 2.00 | 42 | |
| Contract: | | | | | |
| Harvest: Hand | 3.50 | tons | 120.00 | 420 | |
| Labor (machine) | 43.52 | hrs | 10.96 | 477 | |
| Labor (non-machine) | 59.00 | hrs | 10.96 | 647 | |
| Fuel - Diesel | 86.03 | gal | 1.51 | 130 | |
| Lube | | | | 19 | |
| Machinery repair | | | | 71 | |
| Interest on operating capital @ 7.65% | | | | 58 | |
| TOTAL OPERATING COSTS/ACRE | | | | 1,981 | |
| NET RETURNS ABOVE OPERATING COSTS | | | | 3,269 | |
| CASH OVERHEAD COSTS: | | | | | |
| Office Expense | | | | 167 | |
| Liability Insurance | | | | 143 | |
| Property Taxes | | | | 416 | |
| Property Insurance | | | | 149 | |
| Investment Repairs | | | | 594 | |
| TOTAL CASH OVERHEAD COSTS/ACRE | | | | 1,468 | |
| TOTAL CASH COSTS/ACRE | | | | 3,449 | |
| NON-CASH OVERHEAD COSTS (Capital Recovery) | | | | | |
| Well | | | | 222 | |
| Tools | | | | 227 | |
| Pump, Tank, Filter | | | | 100 | |
| Shop Building | | | | 522 | |
| Land | | | | 1,202 | |
| Vineyard Establishment | | | | 1,375 | |
| Equipment | | | | 1,314 | |
| TOTAL NON-CASH OVERHEAD COSTS/ACRE | | | | 4,961 | |
| TOTAL COSTS/ACRE | | | | 8,410 | |
| NET RETURNS ABOVE TOTAL COSTS | | | | -3,160 | |

UC COOPERATIVE EXTENSION

Table 5. MONTHLY COSTS PER ACRE to PRODUCE WINE GRAPES
INTERMOUNTAIN REGION - Shasta & Lassen Counties

| Beginning JAN 05 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|--------------|
| Ending DEC 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 | 05 |
| Cultural: | | | | | | | | | | | | | |
| Weed: Spray Vine Rows (Roundup) | | 57 | | | | | | | | | | | 57 |
| Prune: (hand) | | | 219 | | | | | | | | | | 219 |
| Prune: Tie vines/canes | | | 59 | | | | | | | | | | 59 |
| Prune: Chop Prunings | | | 17 | | | | | | | | | | 17 |
| Weed: Disk Middles | | | 16 | | | | | | | | | | 16 |
| Disease: Mildew (sulfur) | | | 19 | 19 | 37 | | | | | | | | 74 |
| Canopy Management: Shoot Position, Cluster Thin | | | 44 | | 44 | | 44 | | | | | | 132 |
| Fertilize: Hand (15-15-15) | | | | 32 | | | | | | | | | 32 |
| Irrigate: (water & labor) | | | | 31 | 44 | 57 | 83 | 57 | 31 | | | | 304 |
| Disease: Mildew (sulfur). Insect: Leafhopper (Provado) | | | | 51 | | | | | | | | | 51 |
| Weed: Mow Middles | | | | | | | | | 16 | | | | 16 |
| Pickup: General Business Use | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | | | 409 |
| TOTAL CULTURAL COSTS | 41 | 98 | 414 | 174 | 166 | 98 | 168 | 98 | 88 | 41 | 0 | 0 | 1,387 |
| Harvest: | | | | | | | | | | | | | |
| Hand Pick & Haul | | | | | | | | | | 537 | | | 537 |
| TOTAL HARVEST COSTS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 537 | 0 | 0 | 537 |
| Interest on operating capital | 0 | 1 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 12 | 0 | 0 | 58 |
| TOTAL OPERATING COSTS/ACRE | 41 | 99 | 418 | 179 | 172 | 104 | 175 | 106 | 97 | 590 | 0 | 0 | 1,981 |
| OVERHEAD: | | | | | | | | | | | | | |
| Office Expense | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | | | 167 |
| Liability Insurance | 143 | | | | | | | | | | | | 143 |
| Property Taxes | | | | 416 | | | | | | | | | 416 |
| Property Insurance | | | | 149 | | | | | | | | | 149 |
| Investment Repairs | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 594 |
| TOTAL CASH OVERHEAD COSTS | 209 | 66 | 66 | 630 | 66 | 66 | 66 | 66 | 66 | 66 | 50 | 50 | 1,468 |
| TOTAL CASH COSTS/ACRE | 250 | 165 | 484 | 809 | 238 | 171 | 241 | 172 | 163 | 656 | 50 | 50 | 3,449 |

UC COOPERATIVE EXTENSION
Table 6. RANGING ANALYSIS
 INTERMOUNTAIN REGION - Shasta & Lassen Counties

COSTS PER ACRE AT VARYING YIELD TO PRODUCE WINE GRAPES

| | YIELD (ton/acre) | | | | | | |
|-------------------------------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1.50 | 2.50 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 |
| OPERATING COSTS: | | | | | | | |
| Cultural Cost | 1,387 | 1,387 | 1,387 | 1,387 | 1,387 | 1,387 | 1,387 |
| Harvest Cost | 230 | 383 | 537 | 690 | 843 | 996 | 1,150 |
| Interest on operating capital | 56 | 57 | 58 | 59 | 60 | 61 | 61 |
| TOTAL OPERATING COSTS/ACRE | 1,673 | 1,827 | 1,982 | 2,136 | 2,290 | 2,444 | 2,598 |
| Total Operating Costs/ton | 1,115 | 731 | 566 | 475 | 416 | 376 | 346 |
| CASH OVERHEAD COSTS/ACRE | 1,468 | 1,468 | 1,468 | 1,468 | 1,468 | 1,468 | 1,468 |
| TOTAL CASH COSTS/ACRE | 3,141 | 3,295 | 3,450 | 3,604 | 3,758 | 3,912 | 4,066 |
| Total Cash Costs/ton | 2,094 | 1,318 | 986 | 801 | 683 | 602 | 542 |
| NON-CASH OVERHEAD COSTS/ACRE | | | | | | | |
| | 4,961 | 4,961 | 4,961 | 4,961 | 4,961 | 4,961 | 4,961 |
| TOTAL COSTS/ACRE | 8,102 | 8,256 | 8,411 | 8,565 | 8,719 | 8,873 | 9,027 |
| Total Costs/ton | 5,401 | 3,302 | 2,403 | 1,903 | 1,585 | 1,365 | 1,204 |

NET RETURNS PER ACRE ABOVE OPERATING COSTS

| PRICE \$/ton | YIELD (ton/acre) | | | | | | |
|-----------------|------------------|-------|--------|--------|--------|--------|--------|
| | 1.50 | 2.50 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 |
| 500 | -923 | -577 | -232 | 114 | 460 | 806 | 1,152 |
| 1,000 | -173 | 673 | 1,518 | 2,364 | 3,210 | 4,056 | 4,902 |
| 1,500 | 577 | 1,923 | 3,268 | 4,614 | 5,960 | 7,306 | 8,652 |
| 2,000 | 1,327 | 3,173 | 5,018 | 6,864 | 8,710 | 10,556 | 12,402 |
| 2,500 | 2,077 | 4,423 | 6,768 | 9,114 | 11,460 | 13,806 | 16,152 |
| 3,000 | 2,827 | 5,673 | 8,518 | 11,364 | 14,210 | 17,056 | 19,902 |
| 3,500 | 3,577 | 6,923 | 10,268 | 13,614 | 16,960 | 20,306 | 23,652 |

NET RETURNS PER ACRE ABOVE CASH COSTS

| PRICE \$/ton | YIELD (ton/acre) | | | | | | |
|-----------------|------------------|--------|--------|--------|--------|--------|--------|
| | 1.50 | 2.50 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 |
| 500 | -2,391 | -2,045 | -1,700 | -1,354 | -1,008 | -662 | -316 |
| 1,000 | -1,641 | -795 | 50 | 896 | 1,742 | 2,588 | 3,434 |
| 1,500 | -891 | 455 | 1,800 | 3,146 | 4,492 | 5,838 | 7,184 |
| 2,000 | -141 | 1,705 | 3,550 | 5,396 | 7,242 | 9,088 | 10,934 |
| 2,500 | 609 | 2,955 | 5,300 | 7,646 | 9,992 | 12,338 | 14,684 |
| 3,000 | 1,359 | 4,205 | 7,050 | 9,896 | 12,742 | 15,588 | 18,434 |
| 3,500 | 2,109 | 5,455 | 8,800 | 12,146 | 15,492 | 18,838 | 22,184 |

NET RETURNS PER ACRE ABOVE TOTAL COSTS

| PRICE \$/ton | YIELD (ton/acre) | | | | | | |
|-----------------|------------------|--------|--------|--------|--------|--------|--------|
| | 1.50 | 2.50 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 |
| 500 | -7,352 | -7,006 | -6,661 | -6,315 | -5,969 | -5,623 | -5,277 |
| 1,000 | -6,602 | -5,756 | -4,911 | -4,065 | -3,219 | -2,373 | -1,527 |
| 1,500 | -5,852 | -4,506 | -3,161 | -1,815 | -469 | 877 | 2,223 |
| 2,000 | -5,102 | -3,256 | -1,411 | 435 | 2,281 | 4,127 | 5,973 |
| 2,500 | -4,352 | -2,006 | 339 | 2,685 | 5,031 | 7,377 | 9,723 |
| 3,000 | -3,602 | -756 | 2,089 | 4,935 | 7,781 | 10,627 | 13,473 |
| 3,500 | -2,852 | 494 | 3,839 | 7,185 | 10,531 | 13,877 | 17,223 |

UC COOPERATIVE EXTENSION
Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 INTERMOUNTAIN REGION - Shasta & Lassen Counties

ANNUAL EQUIPMENT COSTS

| Yr Description | Price | Yrs Life | Salvage Value | Capital Recovery | Cash Overhead | | Total |
|------------------------------|---------------|----------|---------------|------------------|----------------|------------|--------------|
| | | | | | Insur- ance | Taxes | |
| 05 Flail Mower | 3,500 | 20 | 177 | 301 | 13 | 18 | 332 |
| 05 Mower (rotary) | 1,000 | 20 | 0 | 87 | 3 | 5 | 96 |
| 05 Harvest Bins | 500 | 20 | 26 | 43 | 2 | 3 | 47 |
| 05 JD 28 Tractor with loader | 18,000 | 20 | 5,000 | 1,435 | 79 | 115 | 1,629 |
| 05 Pickup | 40,000 | 5 | 17,927 | 6,319 | 200 | 290 | 6,808 |
| 05 Disk | 2,500 | 20 | 489 | 205 | 10 | 15 | 230 |
| 05 Vine Sprayer | 1,500 | 20 | 318 | 122 | 6 | 9 | 138 |
| 05 Trailer for Tractor | 1,800 | 20 | 442 | 145 | 8 | 11 | 164 |
| 05 Trailer for Pickup | 2,500 | 20 | 0 | 218 | 9 | 13 | 239 |
| TOTAL | 71,300 | | 24,379 | 8,875 | 330 | 478 | 9,683 |
| 50% of New Cost * | 35,650 | | 12,190 | 4,437 | 165 | 239 | 4,842 |

ANNUAL INVESTMENT COSTS

| Description | Price | Yrs Life | Salvage Value | Capital Recovery | Cash Overhead | | | Total |
|-------------------------|----------------|----------|---------------|------------------|----------------|--------------|--------------|---------------|
| | | | | | Insur- ance | Taxes | Repairs | |
| Establishment | 49,626 | 22 | | 4,125 | 171 | 248 | 993 | 5,537 |
| Land | 60,000 | 25 | 60,000 | 3,606 | 0 | 600 | 0 | 4,206 |
| Pump, Tank, Filter | 4,500 | 40 | | 299 | 16 | 23 | 90 | 427 |
| Shop | 20,000 | 25 | | 1,566 | 69 | 100 | 400 | 2,135 |
| Tools – Shop/Field | 5,000 | 10 | | 680 | 17 | 25 | 100 | 822 |
| Well | 10,000 | 40 | | 665 | 35 | 50 | 200 | 950 |
| TOTAL INVESTMENT | 149,126 | | 60,000 | 10,941 | 307 | 1,046 | 1,783 | 14,078 |

ANNUAL BUSINESS OVERHEAD COSTS

| Description | Units/ | | Price/ Unit | Total Cost |
|---------------------|--------|------|----------------|---------------|
| | Farm | Unit | | |
| Liability Insurance | 6 | acre | 71.50 | 429 |
| Office Expense | 3 | acre | 166.67 | 500 |

UC COOPERATIVE EXTENSION
Table 8. HOURLY EQUIPMENT COSTS
 INTERMOUNTAIN REGION - Shasta & Lassen Counties

| Yr Description | COSTS PER HOUR | | | | | | | |
|------------------------------|-------------------------|---------------------|----------------|-------|-----------|----------------|----------------|--------------------|
| | Actual Hours Used | Cash Overhead | | | Operating | | | Total Costs/Hr. |
| | | Capital Recovery | Insur- ance | Taxes | Repairs | Fuel & Lube | Total Oper. | |
| 05 Flail Mower | 3 | 50.10 | 2.12 | 3.07 | 1.25 | 0.00 | 1.25 | 56.54 |
| 05 Mower (rotary) | 18 | 2.42 | 0.10 | 0.14 | 0.32 | 0.00 | 0.32 | 2.98 |
| 05 Harvest Bins | 17 | 1.28 | 0.05 | 0.08 | 0.06 | 0.00 | 0.06 | 1.47 |
| 05 JD 28 Tractor with loader | 70 | 10.22 | 0.57 | 0.82 | 0.18 | 2.22 | 2.40 | 14.01 |
| 05 Pickup | 77 | 41.14 | 1.30 | 1.89 | 2.47 | 4.82 | 7.29 | 51.62 |
| 05 Disk | 18 | 5.69 | 0.29 | 0.42 | 0.31 | 0.00 | 0.31 | 6.71 |
| 05 Vine Sprayer | 15 | 4.08 | 0.21 | 0.30 | 0.22 | 0.00 | 0.22 | 4.81 |
| 05 Trailer for Tractor | 8 | 9.07 | 0.48 | 0.70 | 0.22 | 0.00 | 0.22 | 10.47 |
| 05 Trailer for Pickup | 17 | 6.49 | 0.26 | 0.37 | 0.30 | 0.00 | 0.30 | 7.42 |

UC COOPERATIVE EXTENSION
Table 9. OPERATIONS WITH EQUIPMENT
 INTERMOUNTAIN REGION - Shasta & Lassen Counties

| Operation | Operation | | | Non-Machine | Material | Broadcast | Unit |
|--------------------------------------|--|---------|----------------|---------------------|-----------------|-----------|--------|
| | Month | Tractor | Implement | Labor (hrs/acre) | | | |
| Cultural: | | | | | | | |
| Prune: (hand) | Mar | | | 20.00 | | | |
| Prune: Tie vines/canes | Mar | | | 4.00 | Vine Ties | 3.00 | rolls |
| Prune: Chop Prunings | Mar | JD 28 | Flail Mower | | | | |
| Weed: Spray Vine Rows (Roundup) | Feb | JD 28 | Trailer | 1.00 | Roundup | 6.00 | pt |
| Weed: Disk Middles | Mar | JD 28 | Disk | | | | |
| Disease: Mildew . Insect: Leafhopper | Apr | JD 28 | Sprayer | | Wettable Sulfur | 3.00 | lb |
| | | | | | Provado | 0.75 | oz |
| Spread fertilizer (hand) | Apr | JD 28 | Trailer | 1.00 | 15-15-15 | 80.00 | lb |
| Irrigate: (water & labor) | Apr | JD 28 | Trailer | 2.00 | Water | 2.00 | acin |
| | May | JD 28 | Trailer | 3.00 | Water | 3.00 | acin |
| | June | JD 28 | Trailer | 4.00 | Water | 4.00 | acin |
| | July | JD 28 | Trailer | 6.00 | Water | 6.00 | acin |
| | Aug | JD 28 | Trailer | 4.00 | Water | 4.00 | acin |
| | Sept | JD 28 | Trailer | 2.00 | Water | 2.00 | acin |
| | Canopy Management: Shoot Position, Tie, Cluster Thin | May | | | 4.00 | Vine Ties | 1.00 |
| Jun | | | | 4.00 | Vine Ties | 1.00 | each |
| Jul | | | | 4.00 | Vine Ties | 1.00 | each |
| Disease: Mildew (sulfur) | Mar | JD 28 | Sprayer | | Wettable Sulfur | 3.00 | lb |
| | Apr | JD 28 | Sprayer | | Wettable Sulfur | 3.00 | lb |
| | May | JD 28 | Sprayer | | Wettable Sulfur | 3.00 | lb |
| | May | JD 28 | Sprayer | | Wettable Sulfur | 3.00 | lb |
| Weed: Mow Middles | Sept | JD 28 | Mower | | | | |
| Harvest: Pick & Haul | Oct | Pickup | Trailer w/bins | Picking | Contract | 120.00 | \$/ton |