

Texas Vineyard Budgets

Texas Hill Country Region



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Texas Hill Country Region Synopsis

The Texas Hill Country Region is comprised of 34 counties. With approximately 600 acres in wine grape production, this region ranks second in acreage of the four regions. This region's weather climate provides ideal conditions for growing wide variety of grapes such as Cabernet Sauvignon, Tempranillo, Sangiovese, and Syrah. Many of the producers in this region operate on a medium scale and in many cases have an on-site winery as well. This region is close has access to two large metropolitan areas, Austin and San Antonio. The close proximity to large populations and picturesque landscape make this region a well traveled tourist area. Vineyards and wineries in the Texas Hill Country have benefited enormously from the high tourist traffic. Producers in this region do face high land prices, which can be prohibitive to larger scale operations.



Figure 13: Hill Country Viticulture Region Map

Texas Hill Country Region Assumptions

The representative vineyard in the Texas Hill Country Region was a 25-acre site, of which 20 acres of vineyard were planted. The remaining 5 acres were designated for roads, buildings, access areas, and other infrastructure. The land value was estimated at \$7,500 per acre of irrigated cropland with good water, for a total of \$187,500 (American Society of Farm Managers and Rural Appraisers, 2008, p. 43). The land was assumed to have been owned and considered to be in annual cropland production prior to Establishment Year 0, thus it required minimal preparation. The preparation practices were all custom rates to postpone the purchase of the full equipment complement until Establishment Year 1. If moderate to high levels of preparation are required in Year 0, it may be necessary to purchase the equipment complement during this year as well. This study also included a non-cash capital expense of \$25.00 for land opportunity cost. Opportunity cost is, “The income that could be received by employing a resource in its most profitable alternative use” (Kay, Edwards, & Duffy, 2004, p. 435). In this region the opportunity cost (or the value of the next best alternative use for the land) was considered to be the median value the land owner could lease (\$25 per acre) the irrigated cropland with good water for per acre (American Society of Farm Managers and Rural Appraisers, 2008, p. 43). The water well and pump were assumed to be included in the land value. This assumption should be evaluated for each individual case, as it may not hold true for other scenarios. Soil type was assumed to be fine sandy loam and activities listed were typical for this soil type.

This study assumed the vineyard produced Viognier as the variety of grapes. Market price was estimated at \$1,650 per ton and a yield of 5 tons per acre based on current grower information. Price received varies with supply, demand, the buyer, and is particularly sensitive to fruit characteristics. Fruit quality is a function of site characteristics, vineyard management, and weather. The yield assumptions used in this analysis were based on expected yields for Viognier in the Texas Hill Country Region. These data were used for establishment and production budgets. In Table 15, expected returns for Viognier were compared with the Sangiovese, Syrah, and Tempranillo varieties holding all costs constant except harvest. Harvest was not held constant because harvest cost is directly correlated with yield and yield was varied in the analyses.

This region does participate in mechanized harvest but this study assumes hand harvesting. The Hill Country experiences moderate humidity and precipitation and thus typically encounters more vigorous canopy growth than the Texas High Plains but less than the Texas Gulf Coast. Many activities, such as mowing of the cover crop, are performed at a high frequency in this region to manage the higher vigor in the vineyard system.

Multiple Chemical Combination Applications

There are many options for tank mixing multiple chemicals. To account for this, the labor and equipment operation time was reduced by 50% for 12 fungicide applications and 2 insecticide applications. This method reflects the possibility of combining multiple chemicals into a single spray. In the Texas Hill Country Region, approximately 7 “sprays” are performed annually and fungicides and insecticides are considered tank mixable. Thus, 14 chemical applications were selected to reduce labor and equipment cost. If the individual situation warrants, further combining of chemical applications may be another way to reduce operating expenses in the enterprise. It is recommended that individuals consult with AgriLife Extension in their respective region concerning combination of chemicals.

Due to rounding, some table values presented in this study may be slightly different than the sum of the components.

Establishment Year 0: Land Preparation (Table 1, Pg. 161)

Operating Expenses

Land Preparation

Year 0 was when site acquisition and preparation took place. Land in the Texas Hill Country Region was assumed to be in annual cropland production, typically Coastal Bermuda hay, prior to the year of wine grape establishment and therefore required some preparation. This study also assumed that road, utility, and well/pump infrastructures were already developed and included in land value. It is possible that an irrigation well/pump is not established on the property. Due to the varying nature of prices for a well and/or pump, this study avoids its' inclusion in expenses. No vines were planted during this period. Custom ripping was necessary at a cost of \$25.00 per acre. If the land was used for grazing prior to Establishment Year 0, the land may need to be custom cleared at a cost of \$150.00 per acre and should be included in the individual budget. This region also required one custom application of an herbicide at a cost of \$35.00. Total land preparation expenses totaled \$60.00 per acre.

Individual sites may require less or additional preparation. It is also recommended that soil analysis be performed to determine specific needs. Beginning with land that has previously been in annual cultivated agricultural production, one can reduce site preparation expenses substantially.

Total variable costs for Establishment Year 0 summed to \$60.00 per acre.

Ownership Expenses

Capital Expense

Vineyard Management and/or Consultation were not given a value in this study because none was required during Year 0 in this scenario but should be included if warranted.

Non-Cash Land Expense

Land opportunity cost was \$25.00 per acre. Opportunity cost is, “The income that could be received by employing a resource in its most profitable alternative use” (Kay, Edwards, & Duffy, 2004, p. 435). In this region the opportunity cost (or the value of the next best alternative use for the land) was considered to be the median value (\$25 per acre) the land owner could lease the irrigated cropland with good water per acre (American Society of Farm Managers and Rural Appraisers, 2008, p. 7). This value may differ if an individual is converting the land from production of another cultivated agricultural enterprise. In this event, the opportunity cost would be the value of the preceding enterprise. Total non-cash land expense was \$25.00.

Total fixed costs for Establishment Year 0 were \$25.00 per acre.

Total projected cost for establishment in Year 0 was \$85.00 per acre.

The Total Cash Cost for Pre-Production Net Cost of \$60.00, was included in Total Pre-Production Net Cost Years 0 – 3 (Table 5.A) and Total Amortized Establishment Cost per Acre Beginning in Year 4 and Beyond (Table 5.A) calculation.

Investment Cost per Acre to Establish (Table 2, Pg. 162)

Deer Fence

In the Texas Hill Country Region, vineyards which do not have an 8 foot tall fence around the perimeter are at high risk of substantial crop loss due to white-tailed deer predating the grapes during the fruiting period. To mitigate this problem, a custom deer fence is considered necessary at an expense of \$1,750 per-acre for a custom fence or \$35,000 for the entire 20 acre vineyard.

Bird Netting

In the Texas Hill Country Region, vineyards which do not have bird netting placed around the fruiting zone may be at high risk of substantial crop loss due to birds feeding on grapes during the ripening period. To mitigate this problem, bird netting is considered necessary at an expense of \$2,442.50 per-acre for a custom fence or \$48,850.00 for the entire 20 acre vineyard.

Drip Irrigation

Above ground drip irrigation was the assumed method of vineyard irrigation. Total cost for purchase and installation of the drip irrigation system was \$2,486.06 per acre and a total of \$49,721.25 for the entire 20 acre vineyard. Irrigation water was applied from May through July at a frequency of once per week.

Total Establishment Activity Costs amounted to \$6,678.56 per acre.

These values were included in (Table 12.A) to calculate annual capital recovery expenses and then converted to per acre values (Table 12.B).

Establishment Year 1 (Table 3, Pg. 163)

This study assumed that the equipment complement required for the enterprise was purchased in Establishment Year 1. The cost associated with the equipment was included under capital expenses beginning in this year and persisted throughout the life of the enterprise.

Operating Expenses

Vine Planting

Vineyard spacing was as follows: 6 ft. vine spacing, 10 ft. row spacing and 435 ft. row length. One square acre (43,560 sq. ft.) with this vineyard spacing (6ft. x 10ft. = 60 sq. ft. per vine) would accommodate approximately 726 vines (43,560 sq. ft. ÷ 60 sq. ft. = 726 vines). There were 10 vine rows per acre (435 ft row length x 10 ft. row spacing = 4,350 sq. ft. per row, = 43,560 sq. ft. per acre ÷ 4,350 sq. ft. per vine row = 10 rows). Vines have an expected useful life of 25 years; 3 of which are establishment and 22 are full production. Year 1 was considered first leaf.

Vine survey and layout were performed manually at a rate of 8 skilled labor hours per acre and a cost of \$120.00. Planting was an in-house operation costing a total of \$125 per acre. The in-house operation required 2 skilled and 2 unskilled laborers at a rate of 2.5 labor hours each and cost of \$15 and \$10 per labor hour, respectively. The vinifera variety planted was Viognier at a cost of \$4.00 per vine. Planting of the vines was suggested to take place between February and March of Year 1. Total costs for planting is \$3,149.00 per acre and a total of \$62,980.00 for the entire 20 acre vineyard.

Trellis System

The assumed trellis system was a modified vertical shoot positioning (VSP) consisting of one cordon wire and three pairs of moveable catch wires. This totaled to seven wires and does not include the drip irrigation support wire. Some consider the drip irrigation support wire as

part of the trellis system, but for the purposes of this study it was included in the cost of the drip irrigation system because it performs no other uses besides structural support of the drip system. VSP posts were placed every fourth vine for trellis system support totaling 170 per acre. Support stakes were placed at every vine other than those already having a VSP post for support totaling 556 per acre. Two wooden end posts were used per vine row totaling 20 per acre. The total cost of the modified VSP trellis system was \$4,333.57 per acre and a total of \$86,671.46 for the entire 20 acre vineyard.

Vine Training

Vine Training/Tying took approximately 50 hours of unskilled labor for a total cost of \$500. Tie tape was projected at approximately \$15.00 per acre for use with vine training/tying.

Fertilizer/Pest Control

Soluble nitrogen was applied through the drip system one time at a rate of 10 lbs. per application per acre. This study assumed that actual nitrogen applied, regardless of mix, totaled 10 lbs. This was one-half of the full production rate given in Full Production Years 5 – 25 and the total cost of nitrogen application was \$16.85. A mancozeb fungicide was applied once to mitigate black rot, downy mildew, and phomopsis. The cost was \$22.79. A myclobutanil fungicide was applied once to further combat black rot and powdery mildew at an expense of \$45.25 for a total expense. An imidacloprid insecticide was applied once to combat glassy wing sharpshooters, which can be a vector for Pierce's Disease. The cost of this application was \$33.50.

Strip Spray

A glyphosate herbicide was applied once to control cover crop movement under the canopy for a cost of \$40.28.

Total Pre-Growth costs for Establishment Year 1 amounted to \$673.94 per acre.

Miscellaneous

In the Texas Hill Country Region, this study assumed that the cover crop was mowed every six weeks, or eight times annually, at a cost of \$17.93 per application for a total expense of \$143.47. Building maintenance and repair, vineyard system maintenance and repair, and irrigation utilities were 20% of Year 5 full production costs. The adjusted costs were \$4.40, \$61.70, and \$25.00 per acre, respectively. The total post-growth miscellaneous costs were \$234.57.

Total variable costs for Establishment Year 1 summed to \$8,391.08 per acre.

Ownership Expenses

Cash Capital Expense

Operating interest was calculated by multiplying one-half of the total variable costs for Establishment Year 1 by the annual interest rate of 7.56% (Federal Reserve Bank of Dallas, 2008). Total operating interest in Year 1 was \$317.18. Liability insurance, property insurance, and property taxes are shown in Table 12.B. Their per-acre costs were \$20.00, \$207.97, and \$51.99, respectively. Vineyard Management and/or Consultation were not given a value in this study because none was required during Year 1 in this scenario but should be included if warranted. Total cash capital expense in Year 1 was \$597.14.

Non-Cash Capital Expense

Annual capital recovery for farm equipment was \$630.60 and for farm buildings was \$121.15. For the deer fence, bird netting, and drip irrigation system, capital recovery cost \$148.41, \$345.67, and \$210.84, respectively. All five expenses are shown in Table 12.B. The total non-cash capital expense was \$1,456.67.

Non-Cash Land Expense

Land opportunity cost was \$25.00 per acre. This expense is explained in detail in the section *Texas Hill Country Region Assumptions* on page 129 and *Non-Cash Land Expense* on page 130. Total non-cash land expense was \$25.00.

Total fixed costs were \$2,078.81 per acre in Establishment Year 1.

Total projected cost in Establishment Year 1 was \$10,469.89 per acre.

The Total Cash Cost for Pre-Production Net Cost of \$8,988.22, was included in Total Pre-Production Net Cost Years 0 – 3 (Table 5.A) and Total Amortized Establishment Cost per Acre Beginning in Year 4 and Beyond (Table 5.A) calculation.

Establishment Year 2 (Table 4, Pg. 164)

Operating Expenses

Replant Vines

The assumed replant rate was 2.5% of total vines planted in Year 1. This means that approximately 18 new vines were required per acre. The cost per vine remained at \$4.00 which brought the total cost to \$72.00. Labor was estimated to cost \$3.13. This value may vary due to individual weather risks, plant materials used, or any other number of variables. Any expected

deviation from these calculations should be included in individual costs. This region does not typically participate in the use of grow tubes during vine infancy.

Vine Training

Pruning began in Establishment Year 2 and persisted through the life of the enterprise. Pruning required 10 hours of skilled labor for a total cost of \$100.00. Vine Training/Tying took approximately 150 hours of unskilled labor for a total cost of \$1,500. Tie tape was projected at approximately \$15.00 per acre for use with vine training/tying. The vines began to produce fruit in Establishment Year 2 and movement of the three catch wire sets up and down was required to accommodate for this. This study assumed shoot positioning was completed along with catch wire movement. Fruit load was still minimal compared with full production so it only required approximately 2 hours of unskilled labor per acre to move them up as well as down. Each activity had a total cost of \$20.00.

Fertilizer/Pest Control

Establishment Year 2 began the buildup to the full chemical application schedule by adding three new fertilizers, two fungicides, one new insecticide, and one new herbicide. Soluble nitrogen was applied through the drip system twice as opposed to once, which brings the total amount of nitrogen applied to 20 lbs. per acre at 10 lbs. per application. This study assumed that actual nitrogen applied, regardless of mix, totaled 20 lbs. The nitrogen application took place twice at a total cost of \$33.70 or \$16.85 per application. Beginning in Establishment Year 2 and continuing through the life of the enterprise, magnesium, potassium, and zinc fertilizers were applied to remedy soil deficiencies. Total costs for each activity were \$28.41, \$41.97, and \$105.57, respectively. Again, as with Establishment Year 1, a mancozeb fungicide was applied twice for a total cost of \$45.59. A myclobutanil fungicide was applied to mitigate black rot, downy mildew, and phomopsis twice at a per application cost of \$45.52 for a total cost of \$91.04. In Establishment Year 2 fruit clusters developed well and a boscalid and pyraclostrobin application was necessary to mitigate black rot, downy mildew, and powdery mildew. This chemical was applied twice at a per application cost of \$32.54 for a total expense of \$65.09. Wettable sulfur was then applied once to further combat powdery mildew at a cost of \$14.69. A carbaryl insecticide was applied twice to control leafhoppers at a cost of \$19.39 per application or a total cost of \$38.79. Continuing in Establishment Year 2 and persisting through the life of the vineyard, it was necessary to apply an imidacloprid insecticide to mitigate glassy wing sharp shooters, which can be a vector for Pierce's Disease. This application cost \$33.50.

Strip Spray

Pre-growth strip spray activities remained the same as in Establishment Year 1 except for the added option to hoe/hand pull weeds, as well as two additional glyphosate spot sprays and a glyphosate additive to increase herbicide effectiveness. A glyphosate was applied to combat

invasive grasses in the drip zone with the option of hoeing/hand pulling. The chemical application cost \$40.28 while the manual labor would have required one man hour of unskilled labor per acre for a cost of \$10.00. This study assumed that a glyphosate was applied as opposed to manual weed removal. A glyphosate spot spray was applied twice at a total cost of \$61.05 to further assist in under-canopy vigor control. Ammonium sulfate was added to all three of the glyphosate applications to increase the effectiveness of the glyphosate. Cost per application was \$4.11 and total cost was \$12.33.

Sucker Control

In Establishment Year 2, the Texas Hill Country Region producers typically perform either chemical or manual removal of suckers. The chemical option cost \$21.62 while the manual activity required two man hours of unskilled labor for a total cost of \$20.00. This study assumed that the chemical method of sucker control was performed and thus the cost of manual was removed from Table 4.

Total Pre-Growth costs for Establishment Year 2 amounted to \$2,363.74 per acre.

Miscellaneous

In the Texas Hill Country Region, this study assumed that the cover crop was mowed once every six weeks, or eight times annually, at a cost of \$17.93 per application for a total expense of \$143.47. Building maintenance and repair, vineyard system maintenance and repair, and irrigation utilities were 33% of Year 5 full production costs and were \$7.26, \$101.81, and \$41.25 per acre, respectively. The total post-growth miscellaneous costs were \$293.79.

Total variable costs for Establishment Year 2 summed to \$2,657.53 per acre.

Ownership Expenses

Cash Capital Expense

Cash capital expenses remained the same as in Establishment Year 1 except for operating interest. Operating interest was calculated by multiplying one-half of the total variable costs for Establishment Year 2 by the annual operating interest rate of 7.56% (Federal Reserve Bank of Dallas, 2008). Total operating interest in Year 2 was \$100.45. Liability insurance, property insurance, and property taxes (Table 12.B), were \$20.00, \$207.97, and \$51.99, respectively. Vineyard Management and/or Consultation were not given a value in this study because none was required during Year 2 in this scenario but should be included if warranted. The total cash capital expense in Year 1 was \$380.41.

Non-Cash Capital Expense

Non-cash capital expenses remain the same as in Establishment Year 1. Annual capital recovery for farm equipment was \$630.60 and for farm buildings, land, and tools was \$121.15. For the deer fence, bird netting, and drip irrigation system, capital recovery cost \$148.41, \$345.67, and \$210.84, respectively. All five expenses are shown in Table 12.B. The total non-cash capital expense was \$1,456.67.

Non-Cash Land Expense

Land opportunity cost remained \$25.00 per acre as it did in Establishment Year 1. This expense is explained in detail in the section *Texas Hill Country Region Assumptions* on page 129 and *Non-Cash Land Expense* on page 130. Total non-cash land expense was \$25.00.

Total fixed costs were \$1,862.08 per acre in Establishment Year 2.

Total projected cost for establishment in Establishment Year 2 was \$4,519.61 per acre.

The Total Cash Cost for Pre-Production Net Cost of \$3,037.94, was included in Total Pre-Production Net Cost Years 0 – 3 (Table 5.A) and Total Amortized Establishment Cost per Acre Beginning in Year 4 and Beyond (Table 5.A) calculation.

Establishment Year 3 (Table 5, Pg. 165)

During Establishment Year 3, which was the last year of the establishment phase, several new issues arose. First, there was a marketable harvest of approximately 50% of full production. Therefore, references to the timeline categories were classified as either pre-harvest, harvest, or post-harvest rather than the pre-growth or post-growth groups previously used. Second, again as with Establishment Year 2, there was an increase of chemical application to meet the needs of the maturing vines. Third, hand harvest took place in July. Lastly, Establishment Year 3 was the final year total projected costs are included in the total pre-production net costs and annual amortized establishment cost. This is because beyond Establishment Year 3 harvest was projected to be greater than 70% of full production (Agricultural & Applied Economics Association Task Force on Commodity Costs and Returns, 1998).

Primary Revenue

Establishment Year 3 was the first year a marketable wine grape harvest was produced and was projected to be 50% of full production, which comes to approximately 2.5 tons of the Viognier variety per acre. The estimated market value for Viognier was \$1,650 per ton. This was determined by surveying current growers and industry experts.

Total revenue for Establishment Year 3 was \$4,125.00 per acre.

Operating Expenses

Pruning

Beginning in Establishment Year 3, pre-pruning took place which required 2.50 man hours of unskilled labor for a cost of \$25.00. This was done to improve pruning efficiency. Finish pruning took place and was considered equivalent to general pruning practices in previous years. A total of 22.50 hours of skilled labor was required for finish pruning, which totaled to \$337.50. Prunings were then placed in alternate rows to be pulled/raked past the end of the vine row. This study assumed that the prunings were pulled/raked requiring 2.5 hours of skilled labor costing \$15.00 per hour for a total of \$37.50 per acre. Vineyards in the Texas Hill Country Region also typically perform summer hedging and cluster thinning due to the level of vigor. However, in Establishment Year 3, it was not necessary in this study's example vineyard until Development Year 4. Individual situations may warrant these activities in Year 3 and therefore should be included in the expenses.

Vine Training

Vine Training/Tying took approximately 75 hours of unskilled labor for a total cost of \$750.00. Tie tape was projected at approximately \$15.00 per acre for use with vine training/tying. Fruit load was still reduced in Establishment Year 3 compared with full production so it only required approximately 4 hours of unskilled labor per acre to move catch wires up as well as down. Each activity had a total cost of \$40.00. This study assumed shoot positioning was completed along with catch wire movement.

Fertilizer/ Pest Control

Establishment Year 3 finished the buildup of full production chemical practices by including one new fungicide activity and four additional fungicide activities increases. It also became necessary to enclose the canopy with bird netting to minimize bird predation upon the fruit. This practice will remain standard throughout the life of the enterprise. Soluble nitrogen was applied through the drip system twice at a per application cost of \$16.85 or a total cost of \$33.70. This study assumed that actual nitrogen applied, regardless of mix, totaled 20 lbs. As with Establishment Year 2 and throughout the life of the vineyard, magnesium, potassium, and zinc fertilizers were applied to recover soil deficiencies. The cost for magnesium was \$28.41, the cost for potassium was \$41.97, and the cost for zinc was \$105.57 or \$52.79 per application. In Establishment Year 3, it was necessary to apply a tryfloxystrobin once to mitigate black rot and downy mildew at a cost of \$42.53. Again, as with Establishment Year 2, a mancozeb fungicide spray was applied. However, it was applied three times, as opposed to twice in Year 2. The mancozeb cost \$22.79 per application for a total expense of \$68.38. A myclobutanil fungicide spray to mitigate black rot, downy mildew, and phomopsis was applied four times at a per application cost of \$45.52 for a total cost of \$182.07. Since the fruit clusters were increasing

in density in Establishment Year 3 bunch rot became a concern and it was necessary to apply a boscalid & pyraclostrobin fungicide twice at a cost of \$32.54 per application for a total cost of \$65.09. In Establishment Year 3, wettable sulfur was applied twice for a total cost of \$29.39 or a per application cost of \$14.69. A carbaryl insecticide was applied twice to control leafhoppers at a cost of \$19.39 per application or a total cost of \$38.79. In the Texas Hill Country Region, many producers face the added risk of the vines being infected by Pierce's Disease. To mitigate this risk, one application of an imidacloprid insecticide was applied to help prevent glassy wing sharpshooters, vectors for Pierce's Disease, from entering the vineyard for a cost of \$33.50. During the period of fruit development, it was necessary to apply bird netting to the canopy and then remove it directly before harvest. Both practices required one application of a skilled laborer and two labor hours each for two unskilled laborers as well as equipment necessary to perform the task. Equipment cost was included in the application of the skilled worker. Applying the bird netting cost a total of \$79.78 and removal cost a total of \$49.89.

Strip Spray

Pre-growth strip spray activities remained the same as in Establishment Year 2 except for one extra labor hour added to the option to hoe/hand pull weeds. A glyphosate was applied to further combat invasive grasses in the drip zone with the option of hoeing/hand pulling. The chemical application cost \$40.28 while the manual labor would have required two man hours of unskilled labor per acre for a cost of \$20.00. This study assumed that the chemical application was used and thus this cost was included in "Total Pre-Harvest Costs". A glyphosate spot spray was applied twice for a total cost of \$61.05, to further assist in under-canopy vigor control. Ammonium sulfate was added to all three of the glyphosate applications to increase the effectiveness of the glyphosate and the cost per application was \$4.11 for a total cost of \$12.33.

Sucker Control

In Establishment Year 3, the Texas Hill Country Region producers typically perform either chemical or manual removal of suckers. A glufosinate spot spray cost \$21.62 to chemically remove the suckers. The manual removal activity required 8 man hours of unskilled labor for a total cost of \$80.00 and was the assumed practice by this study.

Total Pre-Harvest costs for Establishment Year 3 amounted to \$2,237.72 per acre.

Harvest

In the Texas Hill Country Region, both hand harvesting and custom mechanical harvesting are performed. The logistics of custom machine harvesting can be prohibitive and the example vineyard this study used was not large enough to cover the investment cost of purchasing a machine harvester. All activities which this study lists pertain to hand harvest only. It was necessary to rent a second tractor and loader/forklift for harvest. The expenses were

\$60.00 and \$50.00, respectively. Harvest machinery cost, which included the use of the owned tractor, utility-terrain vehicle (UTV), bin trailer, picking bins, truck, lugs, and equipment set up cost \$65.50. The skilled labor harvest cost was \$52.50, which included 3.5 hours of skilled labor dispersed evenly between 2 skilled laborers or 1.75 hours each. It was also necessary to employ 10 unskilled laborers for 1.75 hours each at a cost of \$17.50 per laborer or a total of \$175.00. All harvest expenses except tractor rent, loader/forklift rent, and transportation were 50% of the full production cost because of the reduced yield in Establishment Year 3. This study calculated transportation to the winery as the cost of a ton of grapes per mile. The typical rate is approximately \$3.00 per mile for a round-trip 20 ton capacity refrigerated truck. Dividing cost per mile by capacity estimates a cost of \$0.15 per mile for one ton. This study then multiplied the \$0.15 by the anticipated yield per acre, which for Establishment Year 3 was 2.5 tons, giving the enterprise a per mile cost of \$0.375 per acre. Many of the Texas Hill Country Region producers transport their grapes to a winery within the region. This distance was estimated to be a 150 mile round-trip, translating to a transportation to winery expense of \$56.25 per acre.

The total harvest cost for Establishment Year 3 was \$459.25 per acre.

Individuals should also take into account the number of drop points and ability to fill truck capacity when transporting harvest. Both factors can dramatically alter the transportation cost per mile.

Miscellaneous

In the Texas Hill Country Region, this study assumed that the cover crop was mowed once every six weeks, or eight times annually, at a cost of \$17.93 per application for a total expense of \$143.47. Building maintenance and repair, vineyard system maintenance and repair, and irrigation utilities were 50% of Year 5 full production costs and were \$11.00, \$154.26, and \$62.50 per acre, respectively. The total post-growth miscellaneous costs were \$371.22.

Total variable costs for Establishment Year 3 summed to \$3,068.20 per acre.

Ownership Expenses

Cash Capital Expense

Cash capital expenses remained the same as in Establishment Year 2 except for an increase in operating interest. Operating interest was calculated by multiplying one-half of the total variable costs for Establishment Year 3 by the annual interest rate of 7.56% (Federal Reserve Bank of Dallas, 2008). Total operating interest in Year 3 was \$115.98. Liability insurance, property insurance, and property taxes are shown in Table 12.B. Their per-acre costs were \$20.00, \$207.97, and \$51.99 respectively. Vineyard Management and/or Consultation were not given a value in this study because none was required during Year 3 in this scenario but

should be included if warranted. This brought the total cash capital expense in Establishment Year 3 to \$395.94.

Non-Cash Capital Expense

Non-cash capital expenses remained the same as in Establishment Year 2. Annual capital recovery for farm equipment was \$630.60 and for farm buildings was \$121.15. For the deer fence, bird netting, and drip irrigation system, capital recovery cost \$148.41, \$345.67, and \$210.84, respectively. All five expenses are shown in Table 12.B. The total non-cash capital expense was \$1,456.67.

Non-Cash Land Expense

Land opportunity cost remained \$25.00 per acre as it did in Establishment Year 2. This expense is explained in detail in the section *Texas Hill Country Region Assumptions* on page 129 and *Non-Cash Land Expense* on page 130. Total non-cash land expense was \$25.00.

Total fixed costs were \$1,877.61 per acre in Establishment Year 3.

Total projected cost of production in Establishment Year 3 was \$4,945.81 per acre.

Residual returns to management, unpaid labor, and risk per acre for Establishment Year 3 totaled – (\$820.81).

The Total Cash Cost for Pre-Production Net Cost of \$3,464.14, was included in Total Pre-Production Net Cost Years 0 – 3 (Table 5.A) and Total Amortized Establishment Cost per Acre Beginning in Year 4 and Beyond (Table 5.A) calculation.

Pre-Productive Cost Summary (Table 5.A, Pg. 166)

Total Pre-Production Net Return Establishment Years 0 - 3

Total pre-production net cost for Establishment Years 0, 1, 2, and 3 was \$11,425.29. This value comprised investment cost to establish and pre-production costs less any positive net returns realized in Establishment Year 3.

Total Amortized Establishment Cost per-acre Beginning in Year 4 and Beyond

Total amortized establishment cost was \$1,002.36. This value is the annualized real pre-productive cost and was calculated as the periodic payment for an annuity (Agricultural & Applied Economics Association Task Force on Commodity Costs and Returns, 1998). This takes the interest rate for the loan (6.87% annually), total number of payments for the loan (22 years), present value of principal (\$11,425.29), and cash future value after the last payment (\$0), and then determines the annual payment required to pay off the principal and interest of the loan.

The annual amortized establishment cost was then included in Development Year 4 and beyond as a non-cash capital expense.

Establishment Summary (Table 6, Pg. 167)

This table was compiled to visually see how the costs during establishment fluctuate from year to year. This table is also an excellent way to make sure expenses were entered correctly, as the values in this table should correspond exactly with their respective year of occurrence. Any discrepancies will alert where the error has been made with relative ease. One can also evaluate the costs in this table to see where cost reducing decisions might have the most effective impact.

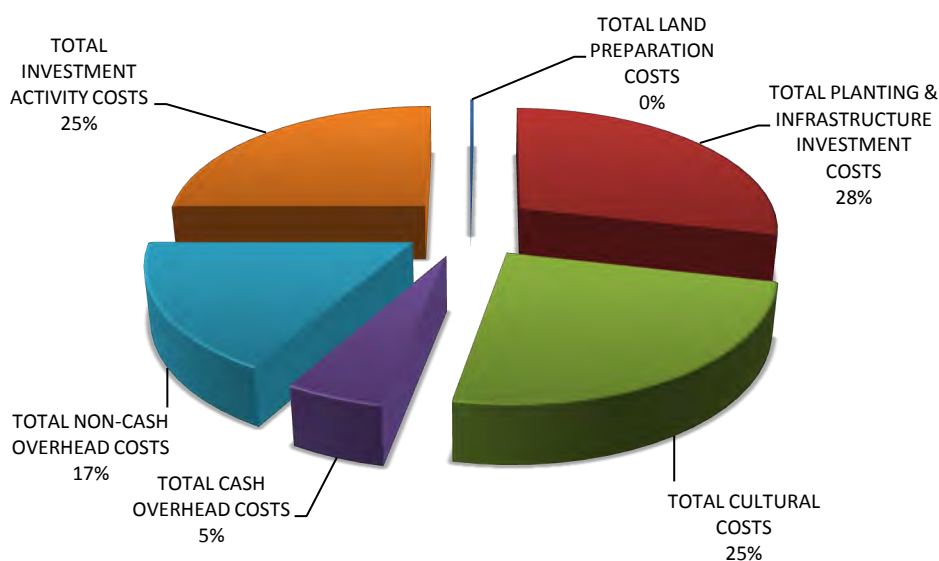


Figure 14: Total Cost Proportions for Establishment Years 0-3

This table provides insight into the nature of commercial wine grape production as opposed to a single year enterprise. Total cost per acre from Years 0 to 3 is \$20,020.31. Expanded to account for the entire 20-acre vineyard, this value swells to \$400,406.20. This value reiterates that individuals considering establishing a new vineyard must have access to a substantial amount of capital.

Development Year 4 (Table 7, Pg. 169)

Development Year 4 was the first year of the production phase. During Development Year 4, only a few new issues emerged. First, there was a marketable harvest of approximately 75% of full production and an increase of harvest cost, which is associated with the rise in harvest tonnage. Again, timeline categories were referred to as either pre-harvest, harvest, or post-harvest. Second, this study assumed that crop insurance as a cash capital expense was now purchased due to the increased risk for major revenue loss in the occurrence of natural events. Lastly, Development Year 4 included the annual amortized establishment cost found in Table

5.A as a non-cash capital expense, because Development Year 4 harvest and beyond was projected to be greater than 70% of full production (Agricultural & Applied Economics Association Task Force on Commodity Costs and Returns, 1998).

Primary Revenue

Marketable wine grape harvest for Development Year 4 in the month of July was projected to be 75% of full production, which was approximately 3.75 tons of the Viognier variety per acre. The estimated market value for Viognier was \$1,650 per ton. This was determined by surveying current growers and industry experts.

Total revenue for Development Year 4 was \$6,187.50 per acre.

Operating Expenses

Pruning

Continuing in Development Year 4, pre-pruning took place and required 5 man hours of unskilled labor for a cost of \$50.00. This was done to improve pruning efficiency. Finish pruning took place and was considered equivalent to general pruning practices in previous years. A total of 20 hours of skilled labor was required for finish pruning, which totaled to \$300.00. Prunings were then placed in alternate rows to be pulled/raked past the end of the vine row. This study assumed that the prunings were pulled/raked requiring 2.5 hours of skilled labor costing \$15.00 per hour for a total of \$37.50 per acre. Vineyards in the Texas Hill Country Region also typically perform summer hedging and cluster thinning due to the level of vigor. In Development Year 4, summer hedging required 10 hours of unskilled labor for a total cost of \$100.00 and cluster thinning required 7.5 hours of skilled labor for a total cost of \$112.50.

Vine Training

Vine Training/Tying required approximately 40 hours of unskilled labor for a total cost of \$400.00. Tie tape was projected at approximately \$15.00 per acre for use with vine training/tying. Fruit load was larger in Development Year 4 but still reduced compared with full production, so it only required approximately 4 hours of unskilled labor per acre to move catch wires up as well as down. Each activity had a total cost of \$40.00.

Fertilizer/ Pest Control

Development Year 4 remained the same as Establishment Year 3 regarding fertilizer and pest control. Soluble nitrogen was applied through the drip system twice at a per application cost of \$16.85 or a total cost of \$33.70. This study assumed that actual nitrogen applied, regardless of mix, totaled 20 lbs. As with Establishment Year 3 and throughout the life of the vineyard, magnesium, potassium, and zinc fertilizers were applied to recover soil deficiencies. The cost

for magnesium was \$28.41, the cost for potassium was \$41.97, and the cost for zinc was \$105.57 or \$52.79 per application. In Development Year 4, it was necessary to apply a tryfloxystrobin once to mitigate black rot and downy mildew at a cost of \$42.53. Again, as with Establishment Year 3, a mancozeb fungicide spray was applied three times at a cost of \$22.79 per application for a total expense of \$68.38. A myclobutanil fungicide spray to mitigate black rot, downy mildew, and phomopsis was applied four times at a per application cost of \$45.52 for a total cost of \$182.07. Since the fruit clusters were increasing in density in Development Year 4 bunch rot was again a concern and it was necessary to apply a boscalid & pyraclostrobin fungicide twice at a cost of \$32.54 per application for a total cost of \$65.09. In Development Year 4, wettable sulfur was applied twice for a total cost of \$29.39 or an expense of \$14.69 each. A carbaryl insecticide was applied twice to control leafhoppers at a cost of \$19.39 per application or a total cost of \$38.79. In the Texas Hill Country Region, many producers face the added risk of the vines being infected by Pierce's Disease. To mitigate this risk, one application of an imidacloprid insecticide was applied to help prevent glassy wing sharpshooters, vectors for Pierce's Disease, for a cost of \$33.50. During the period of fruit development, it was necessary to apply bird netting to the canopy and then remove it directly before harvest. Both practices required one application of a skilled laborer and two labor hours each for two unskilled laborers as well as equipment necessary to perform the task. Equipment cost was included in the application of the skilled worker. Applying the bird netting cost a total of \$79.78 and removal cost a total of \$49.89.

Strip Spray

Strip spray activities remained the same as in Establishment Year 3. A glyphosate was applied to further combat invasive grasses in the drip zone with the option of hoeing/hand pulling. The chemical application cost \$40.28 while the manual labor would have required two man hours of unskilled labor per acre for a cost of \$20.00. This study assumed that the chemical application was used and thus this cost was included in "Total Pre-Harvest Costs". A glyphosate spot spray was applied twice for a total cost of \$61.05, to further assist in under-canopy vigor control. Ammonium sulfate was added to all three of the glyphosate applications to increase the effectiveness of the glyphosate. Cost per application was \$4.11 and total cost was \$12.33.

Sucker Control

In Development Year 4, the Texas Hill Country Region producers typically perform either chemical or manual removal of suckers. A glufosinate spot spray cost \$21.62 to chemically remove the suckers. The manual removal activity required 8 man hours of unskilled labor for a total cost of \$80.00 and was the assumed practice by this study.

Total Pre-Harvest costs for Development Year 4 amounted to \$2,087.72 per acre.

Harvest

In the Texas Hill Country Region, both hand harvesting and custom mechanical harvesting are performed. The logistics of custom machine harvesting can be prohibitive and the example vineyard this study used was not large enough to cover the investment cost of purchasing a machine harvester. All activities which this study lists pertain to hand harvest only. It was necessary to rent a second tractor and loader/forklift for harvest. The expenses were \$60.00 and \$50.00, respectively. Harvest machinery cost, which included the use of the owned tractor, utility-terrain vehicle (UTV), bin trailer, picking bins, truck, lugs, and equipment set up cost \$98.25. The skilled labor harvest cost was \$78.75, which included 5.25 hours of skilled labor dispersed evenly between 2 skilled laborers or 2.625 hours each. It was also necessary to employ 10 unskilled laborers for 2.625 hours each at a cost of \$26.25 per laborer or a total of \$262.50. All harvest expenses except tractor rent, loader/forklift rent, and transportation were 75% of the full production cost because of the reduced yield in Development Year 4. This study calculated transportation to the winery as the cost of a ton of grapes per mile. The typical rate is approximately \$3.00 per mile for a round-trip 20 ton capacity refrigerated truck. Dividing cost per mile by capacity estimates a cost of \$0.15 per mile for one ton. This study then multiplied the \$0.15 by the anticipated yield per acre, which for Establishment Year 4 was 3.75 tons, giving the enterprise a per mile cost of \$0.5625 per acre. Many of the Texas Hill Country Region producers transport their grapes to a winery within the region. This distance was estimated to be a 150 mile round-trip, translating to a transportation to winery expense of \$84.38 per acre.

The total harvest cost for Development Year 4 was \$633.88 per acre.

Individuals should also take into account the number of drop points and ability to fill truck capacity when transporting harvest. Both factors can dramatically alter the transportation cost per mile.

Miscellaneous

In the Texas Hill Country Region, this study assumed that the cover crop was mowed once every six weeks at a cost of \$17.93 per application for a total expense of \$143.47. Building maintenance and repair, vineyard system maintenance and repair, and irrigation utilities were 75% of Year 5 full production costs. The costs were \$16.50, \$231.38, and \$93.75 per acre, respectively. Total post-harvest miscellaneous costs were \$485.10.

Total variable costs for Development Year 4 summed to \$3,206.70 per acre.

Ownership Expenses

Cash Capital Expense

Cash capital expenses remained the same as in Establishment Year 3 except for an increase in operating interest. Operating interest was calculated by multiplying one-half of the total variable costs for Establishment Year 4 by the annual interest rate of 7.56% (Federal Reserve Bank of Dallas, 2008). Total operating interest in Year 4 was \$121.21. Beginning in Establishment Year 4 and continuing throughout the life of the enterprise was the purchase of crop insurance. The charge per acre for crop insurance was \$60.00 and can be found in Table 12.B. Liability insurance, property insurance, and property taxes (Table 12.B), were \$20.00, \$207.97, and \$51.99, respectively. Vineyard Management and/or Consultation were not given a value in this study because none was required during Year 4 in this scenario but should be included if warranted. This brought the total cash capital expense in Establishment Year 4 to \$461.17.

Non-Cash Capital Expense

Non-cash capital expenses remain the same as in Establishment Year 3 except for the inclusion of the amortized establishment cost. The amortized establishment cost can be found in Table 5.A and amounted to \$1,002.36. This value is explained in detail in the section *Total Amortized Establishment Cost per-acre Beginning in Year 4 and Beyond* on page 141. Annual capital recovery for farm equipment was \$630.60 and for farm buildings was \$121.15. For the deer fence, bird netting, and drip irrigation system, capital recovery cost \$148.41, \$345.67, and \$210.84, respectively. All five expenses are shown in Table 12.B and the total non-cash capital expense was \$2,459.03.

Non-Cash Land Expense

Land opportunity cost remained \$25.00 per acre as it did in Establishment Year 3. This expense is explained in detail in the section *Texas Hill Country Region Assumptions* on page 129 and *Non-Cash Land Expense* on page 130. Total non-cash land expense was \$25.00.

Total fixed costs were \$2,945.20 per acre in Development Year 4.

Total projected cost of production in Development Year 4 was \$6,151.90 per acre.

Residual returns to management, unpaid labor, and risk for Development Year 4 were \$35.60.

Full Production Years 5 - 25 (Table 8, Pg. 171)

Table 8 shows the final enterprise budget for this study. The production year budget characterizes the typical annual costs and returns one would expect to see from a mature 5-acre vineyard in the Texas Hill Country Region. During Production Year 5, there were a few key modifications. First, Viognier yield was anticipated to be at 100% of full production. This yield was projected to be approximately 5 tons per acre. Second, maintenance, repair, and utilities were also at their full values. Third, there was an increase in harvest cost accounting for the increase in yield. This budget may be used to forecast for enterprise years 5 through 25.

Primary Revenue

Marketable wine grape harvest for Production Year 5 in the month of July was projected to be 100% of full production, which comes to approximately 5.0 tons of the Viognier variety per acre. The estimated market value for Viognier was \$1,650 per ton. This was determined by surveying current growers and industry experts.

Total revenue for Full Production Years 5 - 25 was \$8,250 per acre.

Operating Expenses

Pruning

Continuing in Production Year 5, pre-pruning took place and required 5 man hours of unskilled labor for a cost of \$50.00. This was done to improve pruning efficiency. Finish pruning took place and was considered equivalent to general pruning practices in previous years. A total of 20 hours of skilled labor was required for finish pruning, which totaled to \$300.00. Prunings were then placed in alternate rows to be pulled/raked past the end of the vine row. This study assumed that the prunings were pulled/raked requiring 2.5 hours of skilled labor costing \$15.00 per hour for a total of \$37.50 per acre. Vineyards in the Texas Hill Country Region also typically perform summer hedging and cluster thinning due to the level of vigor. In Production Year 5, summer hedging required 10 hours of unskilled labor for a total cost of \$100.00 and cluster thinning required 7.5 hours of skilled labor for a total cost of \$112.50.

Vine Training

Vine Training/Tying required approximately 40 hours of unskilled labor for a total cost of \$400.00. Tie tape was projected at approximately \$15.00 per acre for use with vine training/tying. Fruit load was at 100% of full production and thus required approximately 6 hours of unskilled labor per acre to move catch wires up as well as down. Each activity had a total cost of \$60.00.

Fertilizer/ Pest Control

Production Year 5 fertilizer and pest control practices remained the same as Development Year 4. Soluble nitrogen was applied through the drip system twice at a per application cost of \$16.85 or a total cost of \$33.70. This study assumed that actual nitrogen applied, regardless of mix, totaled 20 lbs. As with Development Year 4 and throughout the life of the vineyard, magnesium, potassium, and zinc fertilizers were applied to recover soil deficiencies. The cost for magnesium was \$28.41, the cost for potassium was \$41.97, and the cost for zinc was \$105.57 or \$52.79 per application. In Full Production Years 5-25, it continued to be necessary to apply a tryfloxystrobin once to mitigate black rot and downy mildew at a cost of \$42.53. Again, as with Development Year 4, a mancozeb fungicide spray was applied three times at a cost of \$22.79 per application for a total expense of \$68.38. A myclobutanil fungicide spray to mitigate black rot, downy mildew, and phomopsis was applied four times at a per application cost of \$45.52 for a total cost of \$182.07. Since the fruit clusters were at full density in Production Years 5-25 bunch rot remained a concern and it was necessary to apply a boscalid & pyraclostrobin fungicide twice at a cost of \$32.54 per application for a total cost of \$65.09. Wettable sulfur was applied twice for a total cost of \$29.39 or an expense of \$14.69 each. A carbaryl insecticide was applied twice to control leafhoppers at a cost of \$19.39 per application or a total cost of \$38.79. In the Texas Hill Country Region, many producers face the added risk of the vines being infected by Pierce's Disease. To mitigate this risk, one application of an imidacloprid insecticide was applied to help prevent glassy wing sharpshooters, vectors for Pierce's Disease, from entering the vineyard at a cost of \$33.50. During the period of fruit development, it was necessary to apply bird netting to the canopy and then remove it directly before harvest. Both practices required one application of a skilled laborer and two labor hours each for two unskilled laborers as well as equipment necessary to perform the task. Equipment cost was included in the application of the skilled worker. Applying the bird netting cost a total of \$79.58 and removal cost a total of \$49.79.

Strip Spray

Strip spray activities remained the same as in Development Year 4. A glyphosate was applied to further combat invasive grasses in the drip zone with the option of hoeing/hand pulling. The chemical application cost \$40.28 while the manual labor would have required two man hours of unskilled labor per acre for a cost of \$20.00. This study assumed that the chemical application was used and thus this cost was included in "Total Pre-Harvest Costs". A glyphosate spot spray was applied twice for a total cost of \$61.05, to further assist in under-canopy vigor control. Ammonium sulfate was added to all three of the glyphosate applications to increase the effectiveness of the glyphosate. Cost per application was \$4.11 and total cost was \$12.33.

Sucker Control

In Production Years 5-25, the Texas Hill Country Region producers typically perform either chemical or manual removal of suckers. A glufosinate spot spray cost \$21.62 to chemically remove the suckers. The manual removal activity required 8 man hours of unskilled labor for a total cost of \$80.00 and was the assumed practice by this study.

Total Pre-Harvest costs for Full Production Years 5-25 amounted to \$2,147.42 per acre.

Harvest

In the Texas Hill Country Region, both hand harvesting and custom mechanical harvesting are performed. The logistics of custom machine harvesting can be prohibitive and the example vineyard this study used was not large enough to cover the investment cost of purchasing a machine harvester. All activities which this study lists pertain to hand harvest only. It was necessary to rent a second tractor and loader/forklift for harvest. The expenses were \$60.00 and \$50.00, respectively. Harvest machinery cost, which included the use of the owned tractor, utility-terrain vehicle (UTV), bin trailer, picking bins, truck, lugs, and equipment set up cost \$131.00. The skilled labor harvest cost was \$105.00, which included 7 hours of skilled labor dispersed evenly between 2 skilled laborers or 3.5 hours each. It was also necessary to employ 10 unskilled laborers for 3.5 hours each at a cost of \$35.00 per laborer or a total of \$350.00. All harvest expenses were at 100% of the full production cost. This study calculated transportation to the processor as the cost of a ton of grapes per mile. The typical rate is approximately \$3.00 per mile for a round-trip 20 ton capacity refrigerated truck. Dividing cost per mile by capacity estimates a cost of \$0.15 per mile for one ton. This study then multiplied the \$0.15 by the anticipated yield per acre, which for Full Production Years 5-25 was 5.0 tons, giving the enterprise a per mile cost of \$0.75 per acre. Many of the Texas Hill Country Region producers transport their grapes to a winery within the region. This distance was estimated to be a 150 mile round-trip, translating to a transportation to winery expense of \$112.50 per acre.

The total harvest cost for Full Production Years 5-25 was \$808.50 per acre.

Individuals should also take into account the number of drop points and ability to fill truck capacity when transporting harvest. Both factors can dramatically alter the transportation cost per mile.

Miscellaneous

In the Texas Hill Country Region, this study assumed that the cover crop was mowed once every six weeks at a cost of \$17.93 per application for a total expense of \$143.47. Building maintenance and repair, vineyard system maintenance and repair, and irrigation utilities were

100% of full production costs. The costs were \$22.00, \$308.51, and \$125.00 per acre, respectively.

Total post-harvest miscellaneous costs were \$598.98 per acre.

Total variable costs for Full Production Years 5-25 summed to \$3,555.21 per acre.

Ownership Expenses

Cash Capital Expense

Cash capital expenses remained the same as in Development Year 4 except for an increase in operating interest. Operating interest was calculated by multiplying one-half of the total variable costs for Full Production Years 5 - 25 by the annual interest rate of 7.56% (Federal Reserve Bank of Dallas, 2008). Total operating interest in Year 5 was \$134.39. The charge per acre for crop insurance was \$60.00 and can be found in Table 12.B. Liability insurance, property insurance, and property taxes (Table 12.B), were \$20.00, \$207.97, and \$51.99, respectively. Vineyard Management and/or Consultation were not given a value in this study because none was required during Year 5 in this scenario but should be included if warranted. This brought the total cash capital expense in Production Year 5 to \$474.34.

Non-Cash Capital Expense

Non-cash capital expenses remain the same as in Development Year 4. The amortized establishment cost can be found in Table 5.A and amounted to \$1,002.36. This value is explained in detail in the section *Total Amortized Establishment Cost per-acre Beginning in Year 4 and Beyond* on page 141. Annual capital recovery for farm equipment was \$630.60 and for farm buildings was \$121.15. For the deer fence, bird netting, and drip irrigation system, capital recovery cost \$148.41, \$345.67, and \$210.84, respectively. All five expenses are shown in Table 12.B and the total non-cash capital expense was \$2,459.03.

Non-Cash Land Expense

Land opportunity cost remained \$25.00 per acre as it did in Development Year 4. This expense is explained in detail in the section *Texas Hill Country Region Assumptions* on page 129 and *Non-Cash Land Expense* on page 130. Total non-cash land expense was \$25.00.

Total fixed costs were \$2,958.37 per acre in Full Production Years 5-25.

Total projected cost of production in Full Production Years 5-25 was \$6,513.58 per acre.

Residual returns to management, unpaid labor, and risk per acre for Full Production Years 5-25 were \$1,736.42.

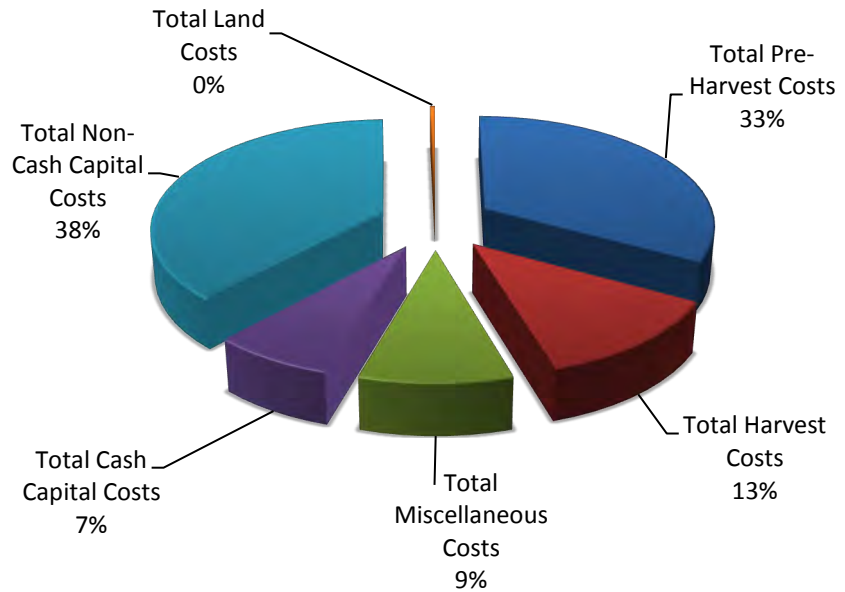


Figure 15: Total Cost Proportions for Full Production Years 5-25

Cash & Labor Activity Breakdown (Table 9, Pg. 173)

Table 9 details the cost incurred for each activity based purely on variable expenses. These include operation time, number of applications, labor cost, equipment cost, and material cost. When combined these provide a “Cost per Application” value, which can be interpreted as the cost required to apply one more unit of a given operation. “Cost per Application” should be used to derive costs and must have the same number of applications as those listed in Production Year 5 (Table 8). The “Total Annual Cost” is the product of the cost per application and number of applications. These values should be used to compare with the costs provided in Table 8 and should match. Any inconsistencies can be easily located and remedied.

The operation time required for each activity was the equipment hours plus an additional 20% of that time to account for equipment set up. There are several applications in the event that equipment or chemicals are used to act as a multiplier for their per use values. The labor rate was included based on whether the activity requires a skilled or unskilled laborer, which was then multiplied by the operation time to estimate labor cost. The equipment hours required for each activity was derived from the grower interviews. This value was the estimated time it requires to perform each activity after set up. This value was then multiplied by the hourly machinery costs found in Hourly Machinery & Equipment Costs (Table 11) of the corresponding equipment. Material costs are drawn from the Chemical Costs & Application Schedule (Table 10). Any custom activity had that expense placed under the “Custom/Rent” column. Activity costs were then tabulated to reflect a per application costs. This value played an important role in Establishment Years 0 through 4 where the number of applications was a reduction of Production Year 5 practices. The “Total Annual” column was simply the “Cost per Application”

multiplied by the “Number of Applications”. Total Annual values should match perfectly with Production Year 5 values for each specific operating and capital activity.

Chemical Costs & Application Schedule (Table 10, Pg. 175)

This table details the types of chemicals used, rate per application, cost per application, and number of applications in a given year. Individuals can personalize this table to include specific chemicals they use and the information which corresponds with them. In turn, the changes will be echoed to the pertinent tables. This table was designed to simplify the enterprise budgets as they are partially functions of the chemical applications.

Hourly Machinery & Equipment Costs (Table 11, Pg. 176)

This vineyard scenario required a wide variety of equipment, each of which has varying levels of fuel consumption, expected life, price, and repairs. Table 11 details the assumptions made and calculations to derive the hourly variable cost for each piece of machinery. The hourly variable costs were included into the Cash & Labor Activity Breakdown (Table 9) as “Equipment Costs” which were multiplied by the stated equipment use hours for a given activity to achieve an anticipated variable equipment cost for that activity. On the bottom left-hand corner of the table, also included was the assumed price for gasoline and diesel fuels. Hours of Life, Expected Life, Total Repairs, and Lube for each piece of equipment were found using ASAE guidelines (American Society of Agricultural Engineers, 2000).

Annual Equipment Costs (Table 12, Pg. 177)

Detailed ownership costs for equipment and other investments are found in Table 12. This study assumed that the equipment complement was 100% new. However, we included an adjusted total to 60% of the new purchase price to illustrate a mix of new and used equipment. Over a \$40,000 reduction in purchase price and approximately a \$5,000 decrease in annual cost resulted from the 60% of new purchase price value. This is one of the many cost saving measures that individuals may consider in their own enterprise. Costs listed were divided into two separate categories: non-cash and cash capital expenses. Purchase price, expected life, and annual capital recovery costs are detailed as discussed in previous sections. Insurance and taxes were calculated as 1% and 0.25% of purchase price (Agricultural & Applied Economics Association Task Force on Commodity Costs and Returns, 1998). The totaled values for annual capital recovery, insurance, and taxes were transmitted to Table 12.B for a per acre calculation.

Annual Investment Costs (Table 12.A, Pg. 177)

Table 12.A details the annual investment costs for buildings, drip irrigations system, trellis system, vineyard establishment, land, and tools. As with Table 12, costs listed were divided into two separate categories: non-cash and cash capital expenses. Rates of insurance and

taxes remain at 1% and 0.25% respectively as noted in the table (Agricultural & Applied Economics Association Task Force on Commodity Costs and Returns, 1998). Values given in this table comprise a significant amount of annual capital recovery for the enterprise. The total values for annual capital recovery, insurance, and taxes were transmitted to Table 12.B for a per acre calculation. Repairs were transferred to the enterprise budget tables and converted to a per acre value.

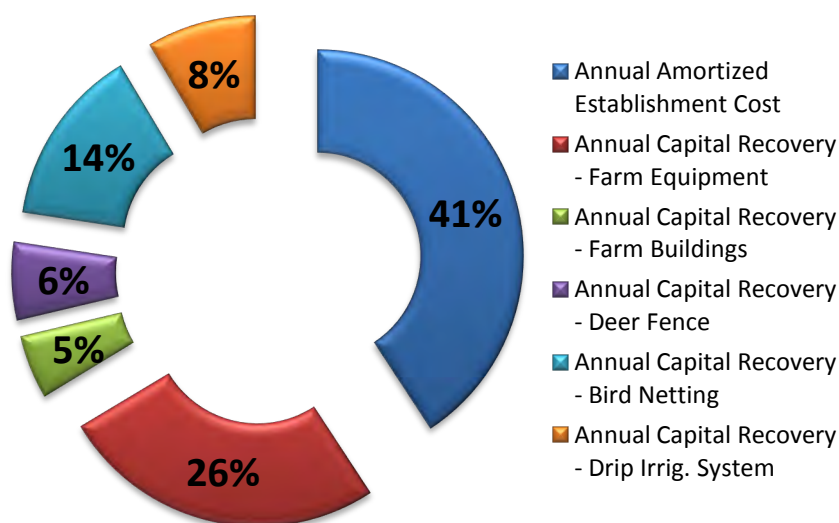


Figure 16: Proportions of Major Annual Business Overhead Costs (Table 12.B)

Annual Business Overhead Costs (Table 12.B, Pg. 177)

Table 12.B converts both total enterprise cash and non-cash capital expenses to a per acre value. It should be noted that when analyzing economies of scale, this table is effective when assessing economic efficiency. All

“price/unit” values recorded were transmitted from Table 12.B to the enterprise budgets. From examining this table, it is evident that annual capital recovery accounts for over 80% of the total overhead costs.

Financial Interest Rates (Table 12.C, Pg. 177)

Table 12.C details interest rates used for both operating loans and capital leases. For this study the rates were 7.56% and 6.87%, respectively (Federal Reserve Bank of Dallas, 2008). An operating loan was considered to be made for any term equal to or less than one calendar year. A capital lease was considered to be made for any term equal to or greater than one calendar year. Neither interest rate used accounted for inflation in this study thus, they were presented and calculated in nominal terms.

Machinery & Equipment Price Derivation (Table 13, Pg. 178)

This table is the details of the machinery and equipment complement required for our vineyard scenario. This study based all prices on Manufacturer Suggested Retail Price (MSRP) of the particular piece of equipment listed (Kayne, 2003). Total cost for each type of machinery

and equipment is detailed on the right-hand side of the table and was the MSRP multiplied by the quantity required. Values in this table tied directly into Tables 11 and 12. Individuals may require less or more than the equipment and machinery proposed by this study.

Cost per Acre at Varying Yields (Table 14, Pg. 179)

Table 14 summarizes the costs per ton as well as the return possibilities for given yields and market prices during Full Production Years 5 through 25. With the exception of harvest, all other costs were held constant. Harvest costs are directly related to the harvested yield and so the harvest expense increased as harvested yield increased. The harvest cost increased \$161.70 for every one ton increase in yield. The prices and yields were based on recent averages with input from current growers and industry experts. Range for Viognier yield was between 3 and 9 tons per acre, with 5 being the assumed level for this study. Price per ton varied between \$1,350 and \$1,950, with the median of \$1,650 being the assumed market price for this study. It should be noted that fruit quality typically declines as yield increases and thus expected price received will also fall. The converse is also true. This is not always the case, but is a good rule of thumb.

Net returns were categorized at the three key points where management decisions are made. First, net returns per acre were shown above total operating costs, or gross margin. This is critical information because producers who do not receive a positive return above operating costs at the expected price and yield should typically not produce. Second, net returns per acre above total cash costs were detailed. This information is critical because this establishes the yield and price needed to meet all cash costs. Third, net returns per acre above total costs were given. This gives insight to the long run profitability of the enterprise.

Table 14 also provides the ability for an approximation of the break-even price at given yields. Net returns per acre above total operating costs, were positive in all yield and price variations. Net returns above total cash costs were also positive for all variations.

Net returns above total costs were positive for all variations above a yield of 4 tons per acre and above a price per ton of \$1,600 as well as above a yield of 5 tons per acre and above a value of \$1,400 per ton. All of the variations were assumed to be based on the Viognier variety. This can be a useful tool in management decision making for many things. For example, the scenario of adverse weather could be analyzed with this table. Texas Hill Country wine grape producers face the added risks of adverse weather conditions such as late spring frosts, which may reduce expected yield. If one of these weather events results in a 40% loss in yield, then an individual would examine return possibilities for 3 tons per acre as opposed to 5 tons per acre.

Returns per Acre at Varying Yields, Price, and Varietals (Table 15, Pg. 180)

In Table 15, this study provides a look at returns per acre above total costs with regard to four different varieties. Tables 15.A, 15.B, 15.C, and 15.D examine returns above total costs

when yield and price were not held constant with regards to varieties a producer could plant. Information provided in this table may allow prospective and current producers to approximate what returns could be expected depending on the variety selected and the inherent characteristics each variety possesses. The four common varieties in the Texas Hill Country Region are Viognier (the assumed variety in this study), Sangiovese, Syrah, and Tempranillo.

Both sub tables were calculated with a static Total Cost of Production for a full production year found in Tables 7, 8, and 11. This approach was taken because even though there are different cultivation processes for each respective variety, the difference in total cost of the practices are negligible compared to the price and yield variation an individual might encounter. As stated previously, the total cost, except harvest, remained the same for all possibilities shown in the Tables 15.A, 15.B, 15.C, and 15.D while the total revenue varied.

Returns per Acre above Total Costs with Viognier (Table 15.A, Pg. 180)

In Table 15.A, Viognier produced a positive return above a yield of 4 tons per acre and above a value of \$1,600 per ton as well as above a yield of 5 tons per acre and above a value of \$1,400 per ton. However, Viognier has been known to produce low yields compared with the other three varieties. If the yield and market price are low, Viognier has the largest loss of the four varieties. Viognier possesses the possibility of the highest return benefit and the smallest loss risk. This variety of wine grape is probably the most popular of the reds and the most versatile. Current growers in the Texas Hill Country Region have stated the historical expected yield for Viognier is between 3 to 9 tons.

Returns per Acre above Total Costs with Sangiovese (Table 15.B, Pg. 180)

In Table 15.B, Sangiovese would be expected to produce a positive return above a yield of 4 tons per acre and above a value of \$1,600 per ton, above a yield of 5 tons per acre and above a value of \$1,400 per ton, above a yield of 6 tons per acre and above a value of \$1,200 per ton, and a yield above 7 tons per acre and above a value of \$1,000 per ton. Sangiovese is the lowest regarding yield consistency and price compared with the other two varieties. Weighed against Viognier, Sangiovese has a more consistent yield but is still lower than Tempranillo and Syrah. This variety is also one of the most popular reds and thus has a higher demand from wineries. Current growers in the Texas Hill Country Region have stated the historical expected yield for Sangiovese is between 2 to 8 tons.

Returns per Acre above Total Costs with Syrah (Table 15.C, Pg. 180)

In Table 15.C, Syrah produced a positive return above a yield of 4 tons per acre and above a value of \$1,600 per ton as well as a yield above 5 tons and above a value of \$1,400 per ton. The benefit of Syrah is its' versatility as a blending component. The downside to Syrah is that many winemakers may not currently produce a large variety or volume of wines containing

this variety of fruit. However, as wineries may produce more Rhône style blends and use it as a blending component, the demand for Syrah may rival the more popular grape varieties. Current growers in the Texas Hill Country Region have stated the historical expected yield for Syrah is between 2 to 8 tons.

Returns per Acre above Total Costs with Tempranillo (Table 15.D, Pg. 180)

In Table 15.D, Tempranillo produced a positive return above a yield of 4 tons per acre and above value of \$1,600 per ton as well as above a yield of 5 tons per acre and above value of \$1,400 per ton. Again, Tempranillo has a lower loss possibility just as Viognier. The benefit is seen in the yield amount and consistency, which is the second highest of the four varieties. Current growers in the Texas Hill Country Region have stated the historical expected yield for Tempranillo is between 3 to 9 tons.

The dilemma producer's face is that lower yields tend to produce higher quality fruit which may be sold at a higher market price, but the agricultural factors they encounter may not result in either a desirable yield or fruit quality. However, the soil type, disease pressure, insect pressure, and weed pressure may very well dictate the variety possibilities individual producers have at their disposal, thus invalidating some, if not most of the decision criteria regarding returns. If this is the case, the producer can still find ways to reduce input costs or obtain higher prices for their fruit to increase the likelihood of profitability. Regardless, all producers should consult at length with their Texas AgriLife Extension Service Viticulture Advisor prior to planting any variety of wine grapes.

Though higher return possibilities may be expressed in varieties other than the assumed Viognier, other factors should be considered. For instance, the Texas wine industry is still in infancy and many of the wineries are relatively small. This raises the issue of being able to sell large quantities of a particular variety. Many current producers in the Texas Hill Country Region sell their wine grapes to a single or few wineries. Thus, wine grape producers may have to sell to multiple wineries if a single winery cannot purchase the entire harvest, which would increase transaction costs. Each individual situation warrants a myriad of questions which must be evaluated before venturing into any variety.

**Monthly Cash
Flow Budget for
Production Years
(Table 16, Pg. 181)**

“It should be obvious that a reliable cash flow projection will enable an operator to determine the timing and magnitude of borrowing, as well as the timing and magnitude of loan repayment” (Boehlje & Eidman, 1984, p. 248). The cash flow budget also “... provides information on liquidity and loan repayability that is very important for both the lender and the farm operator” (Boehlje & Eidman, 1984, p. 249). The enterprise budgets provided in this study show the economic

costs and returns of establishing and producing commercial wine grapes in the West Texas Region. Costs included are both cash and non-cash. One specific purpose of this study was to analyze the economic feasibility of establishing a new commercial vineyard. As part of this purpose, a monthly cash flow budget was included to estimate cash flow requirements to be used for planning cash needs, borrowing, and management decision making. Most lenders require a projected cash flow statement in connection with loan applications regardless of the enterprise.

The Monthly Cash Flow Budget for Production Years (Table 16) illustrates a summary of the annual cash inflows and cash outflows as well as new operating borrowings for a full

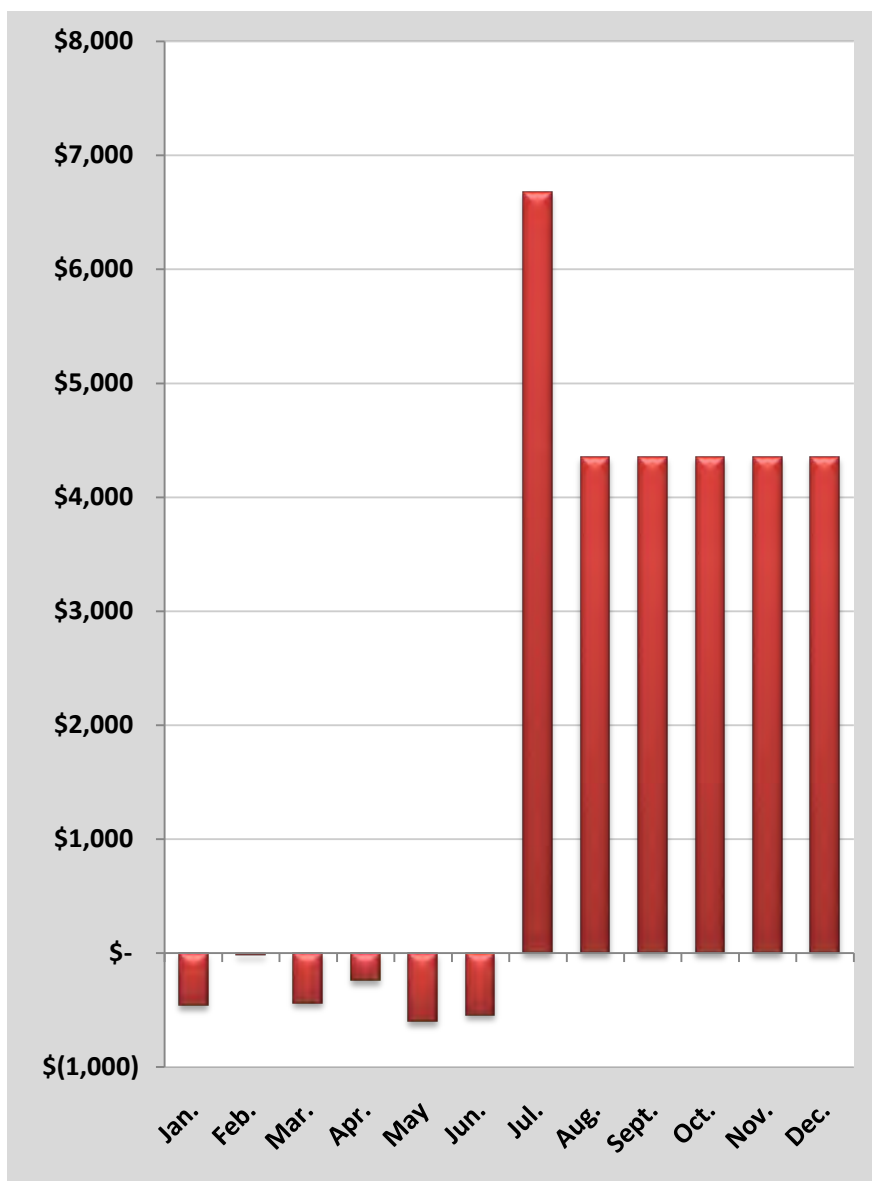


Figure 17: Bar Graph showing Monthly Cash Available for Production Years 5-25 from Table 16

production year. All of the information included was derived from Production Years 5 – 25 (Table 9) based on estimated timeline suggestions from growers. Table 16 details the cash available and does not consider non-cash related expenses. The month for which this study assumed the costs were incurred is provided in Table 8 in the right most column. The months of expense incurrence are only for the representative vineyard used in this study. Individuals may incur costs at times different from the information provided in this study and should be adjusted accordingly.

A closer look at this table reveals that all new current debt was repaid during the month of August. This was when harvest takes place and this study assumed no revenue was anticipated prior to this month. Some growers do perform forward contracting with the processor. There are many variations of these types of contracts, which may cause their individual cash flow to appear very different from the table provided in this study.

Texas Hill Country Region Summary and Outlook

The cost and returns estimates provided in this study specify results for vinifera grapes in the Texas AgriLife Research Hill Country Region. These results were established under the assumption of an excellent site, quality operation management, the use of recommended practices, and 2008 prices regarding inputs, both operating and ownership. There are several key topics which potential investors should be aware of.

First, this study projects that in the Texas Hill Country Region the per-acre economic net cost of establishing a commercial wine grape enterprise were approximately \$15,895.31 through Establishment Year 3. This study assumed 20 bearing acres. Therefore, the entire representative vineyard provided in this study was estimated to cost \$317,906.20 through Establishment Year 3. This expense can be found in Table 6 and reiterates that capital and labor intensity are prominent characteristics that underlie commercial wine grape production. Potential investors should note that the current economic climate for wine grape production in the Hill Country Region can change.

Second, substantial crop loss due to adverse weather condition risk can occur in the Hill Country Region. Spring frosts are the primary adverse weather concern. This unfavorable event can radically reduce yield and in turn slash enterprise returns. Table 14 allows producers to estimate the effects adverse weather may have on their net returns above costs. The full economic impacts of these weather occurrences considering likelihood and severity have not been evaluated for wine grape production in Texas.

Third, potential for inflation of input prices such as fuel and chemicals should also be taken into consideration. 2008 was a prime example of the speed and brevity at which input prices can increase.

Fourth, this region has shifted more to mechanized practices as more producers increase acreage. Mechanized activities, specifically machine harvest, could reduce producer's costs and in turn boost profitability.

All things considered, proficient current producers have established that conditions for growing commercial wine grapes in the Texas Hill Country Region can be profitable. This region produces approximately one-fifth of the wine grapes grown in Texas. This region participates and benefits heavily from tourist trade and is expected to continue to do so in the near future. Current growers have confirmed that this region can produce high quality fruit across a number of varieties. Consumption of wine has increased nearly 20% in Texas and over 25% in the United States since 2000 (Adams Wine Handbook, 2008). Given the increased consumption of table wine in the United States and Texas as well as the burgeoning tourist industry in this region, there is ample long run potential to seize for producers and investors who can weather the inevitable ebbs and flows associated with commercial wine grape production in the Texas Hill Country Region.

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Table 1

**Texas AgriLife Vineyard Budget - Texas Hill Country Region
Drip Irrigated
PROJECTED COSTS PER ACRE, ESTABLISHMENT YEAR 0**

Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
<u>Operating Input or Custom Operation Expenses</u>					
<u>Land Preparation</u>					
Custom Ripping	1.00	acre	25.00	25.00	-
Custom Land Clearing*	-	acre	150.00	-	-
Custom Herbicide Application	1.00	acre	35.00	35.00	-
Total Land Preparation Costs				\$ 60.00	\$ -
Total Variable Costs				\$ 60.00	\$ -
<u>Ownership Expenses</u>					
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
<u>Capital Expense</u>					
Vineyard Management and/or Consultation*	1.00	acre	-	-	-
Total Capital Cost				\$ -	\$ -
<u>Non-Cash Land Expense</u>					
Land Cost - Annual (Opportunity Cost)	1.00	acre	25.00	25.00	-
Total Land Cost				\$ 25.00	\$ -
Total Fixed Cost				\$ 25.00	\$ -
Total Projected Cost Of Establishment				\$ 85.00	\$ -
Year 0				\$ 85.00	\$ -
Total Cash Cost for Pre-Production Net Cost				\$ 60.00	\$ -
(Table 5.A)				\$ 60.00	\$ -

* Activities which may be required but are not for this study

Table 2

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Vines, Planting, Trellis and Irrigation Systems Investment Breakdown
Investment Cost Per Acre to Establish

Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
<u><i>Deer Fence</i></u>					
Custom Deer Fence	1.00	acre	1,750.00	1,750.00	-
Total Deer Fence Costs				\$ 1,750.00	\$ -
<u><i>Bird Netting</i></u>					
Bird Netting	4,350.00	feet	0.55	2,392.50	-
Ties	1,000.00	tie	0.05	50.00	-
Total Bird Netting Costs				\$ 2,442.50	\$ -
<u><i>Drip Irrigation System</i></u>					
Main Line (per ft.)	97.00	feet	1.50	145.50	-
Main Line Installation	1.00	acre	300.00	300.00	-
Injector	1.00	acre	15.00	15.00	-
Soil Moisture Sensor	1.00	acre	50.00	50.00	-
Filter System	1.00	acre	200.00	200.00	-
Valves	9.00	valve	25.00	225.00	-
Drip Line Support Wire	4,350.00	feet	0.02	98.96	-
Drip Line (per ft.)	4,350.00	feet	0.15	652.50	-
Emitters (per vine)	726.00	emitter	0.35	254.10	-
Drip Line Intallation	1.00	acre	500.00	500.00	-
Drip Line Connectors	18.00	connector	2.50	45.00	-
Well/Pump*	1.00	acre	-	-	-
Total Irrigation System Costs				\$ 2,486.06	\$ -
Total Establishment Activity Costs Per Acre				\$ 6,678.56	\$ -

* Activities which may be required but are not for this study

Table 3

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Drip Irrigated
PROJECTED COSTS PER ACRE, ESTABLISHMENT YEAR 1

Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
Operating Input or Custom Operation Expenses					
<u>Pre-Growth</u>					
<i>Plant Vines</i>					
Vine Marking (survey & layout)	8.00	acre	15.00	120.00	-
Vines (grafted)	726.00	vine	4.00	2,904.00	-
Vine Planting (2 Skilled Laborer)	5.00	hour	15.00	75.00	-
Vine Planting (2 Unskilled Laborer)	5.00	hour	10.00	50.00	-
(or) Custom Planting	1.00	acre	-	-	-
Total Planting Costs				\$ 3,149.00	\$ -
<i>Trellis System</i>					
VSP Posts	170.00	post	8.50	1,445.00	-
End Posts	20.00	post	50.00	1,000.00	-
Vine Stake	556.00	stake	0.98	544.88	-
Wire (per ft.)	30,492.00	feet	0.02	693.69	-
Installation Labor	40.00	hour	10.00	400.00	-
Installation Equipment	1.00	acre	250.00	250.00	-
Total Trellis System Costs				\$ 4,333.57	\$ -
<i>Vine Training</i>					
Vine Training/Tieing	50.00	hour	10.00	500.00	-
Tie Tape	1.00	acre	15.00	15.00	-
<i>Fertilizer/Animal Control</i>					
Fertilizer - Nitrogen (soluble through drip)	1.00	appl.	16.85	16.85	-
Fungicide - Mancozeb***	1.00	appl.	22.79	22.79	-
Fungicide - Myclobutanil***	1.00	appl.	45.52	45.52	-
Insecticide - Imidacloprid	1.00	appl.	33.50	33.50	-
<i>Strip Spray</i>					
Herbicide - Glyphosate	1.00	appl.	40.28	40.28	-
Total Pre-Growth Costs				\$ 673.94	\$ -
<i>Miscellaneous</i>					
Cover Crop - Mowing	8.00	appl.	17.93	143.47	-
Buildings, Tools - Maintenance & Repair	1.00	acre	4.40	4.40	-
Vineyard System - Maintenance & Repair	1.00	acre	61.70	61.70	-
Irrigation - Utilities	1.00	acre	25.00	25.00	-
Total Miscellaneous Costs				\$ 234.57	\$ -
Total Variable Costs				\$ 8,391.08	\$ -
<u>Ownership Expenses</u>					
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
<u>Cash Capital Expense</u>					
Operating Interest (7.56%)	1.00	acre	317.18	317.18	-
Liability Insurance	1.00	acre	20.00	20.00	-
Property Insurance	1.00	acre	207.97	207.97	-
Property Taxes	1.00	acre	51.99	51.99	-
Vineyard Management and/or Consultation*	1.00	acre	-	-	-
Total Cash Capital Cost				\$ 597.14	\$ -
<u>Non-Cash Capital Expense</u>					
Annual Capital Recovery - Farm Equipment	1.00	acre	630.60	630.60	-
Annual Capital Recovery - Farm Buildings	1.00	acre	121.15	121.15	-
Annual Capital Recovery - Deer Fence	1.00	acre	148.41	148.41	-
Annual Capital Recovery - Bird Netting	1.00	acre	345.67	345.67	-
Annual Capital Recovery - Drip Irrig. System	1.00	acre	210.84	210.84	-
Total Non-Capital Cost				\$ 1,456.67	\$ -
<u>Non-Cash Land Expense</u>					
Land Cost - Annual (Opportunity Cost)	1.00	acre	25.00	25.00	-
Total Land Cost				\$ 25.00	\$ -
Total Fixed Cost				\$ 2,078.81	\$ -
Total Projected Cost Of Establishment					
Year 1				\$ 10,469.89	\$ -
Total Cash Cost for Pre-Production Net Cost					
(Table 5.A)				\$ 8,988.22	\$ -

* Activities which may be required but are not for this study

*** Chemicals considered by this study to be Tank Mixed

Table 4

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Drip Irrigated
PROJECTED COSTS PER ACRE, ESTABLISHMENT YEAR 2

Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
Operating Input or Custom Operation Expenses					
Pre-Growth					
<u>Replant Vines</u>					
Replant Vines (2.5%)	18.00	vine	4.00	72.00	-
Replant Labor (2.5% of Labor)	1.00	acre	3.13	3.13	-
<u>Vine Training</u>					
Pruning	10.00	hour	10.00	100.00	-
Vine Training/Tieing	150.00	hour	10.00	1,500.00	-
Tie Tape	1.00	acre	15.00	15.00	-
Move Catch Wires (Up)	2.00	hour	10.00	20.00	-
Move Catch Wires (Down)	2.00	hour	10.00	20.00	-
<u>Fertilizer/Animal Control</u>					
Fertilizer - Nitrogen (soluble through drip)	2.00	appl.	16.85	33.70	-
Fertilizer - Magnesium (soluble through drip)	1.00	appl.	28.41	28.41	-
Fertilizer - Potassium (soluble through drip)	1.00	appl.	41.97	41.97	-
Fertilizer - Zinc Spray	2.00	appl.	52.79	105.57	-
Fungicide - Mancozeb***	2.00	appl.	22.79	45.59	-
Fungicide - Myclobutanil***	2.00	appl.	45.52	91.04	-
Fungicide - Boscalid & Pyraclostrobin***	2.00	appl.	32.54	65.09	-
Fungicide - Wettable Sulfur***	1.00	appl.	14.69	14.69	-
Insecticide - Carbaryl (leafhoppers)***	2.00	appl.	19.39	38.79	-
Insecticide - Imidacloprid	1.00	appl.	33.50	33.50	-
<u>Strip Spray</u>					
Herbicide - Glyphosate	1.00	appl.	40.28	40.28	-
(or) Hoeing/Hand Pulling	1.00	hour	10.00	10.00	-
Herbicide - Glyphosate (Spot Spray)**	2.00	appl.	30.53	61.05	-
Glyphosate Additive - Ammonium Sulfate	3.00	appl.	4.11	12.33	-
<u>Sucker Control</u>					
Herbicide - Glufosinate (Spot Spray)**	1.00	appl.	21.62	21.62	-
(or) Manual Removal	2.00	hour	10.00	20.00	-
Total Pre-Growth Costs				\$ 2,363.74	\$ -
<u>Miscellaneous</u>					
Cover Crop - Mowing	8.00	appl.	17.93	143.47	-
Buildings, Tools - Maintenance & Repair	1.00	acre	7.26	7.26	-
Vineyard System - Maintenance & Repair	1.00	acre	101.81	101.81	-
Irrigation - Utilities	1.00	acre	41.25	41.25	-
Total Miscellaneous Costs				\$ 293.79	\$ -
Total Variable Costs				\$ 2,657.53	\$ -
Ownership Expenses					
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
Cash Capital Expense					
Operating Interest (7.56%)	1.00	acre	100.45	100.45	-
Liability Insurance	1.00	acre	20.00	20.00	-
Property Insurance	1.00	acre	207.97	207.97	-
Property Taxes	1.00	acre	51.99	51.99	-
Vineyard Management and/or Consultation*	1.00	acre	-	-	-
Total Cash Capital Cost				\$ 380.41	\$ -
Non-Cash Capital Expense					
Annual Capital Recovery - Farm Equipment	1.00	acre	630.60	630.60	-
Annual Capital Recovery - Farm Buildings	1.00	acre	121.15	121.15	-
Annual Capital Recovery - Deer Fence	1.00	acre	148.41	148.41	-
Annual Capital Recovery - Bird Netting	1.00	acre	345.67	345.67	-
Annual Capital Recovery - Drip Irrig. System	1.00	acre	210.84	210.84	-
Total Non-Cash Capital Cost				\$ 1,456.67	\$ -
Non-Cash Land Expense					
Land Cost - Annual (Opportunity Cost)	1.00	acre	25.00	25.00	-
Total Land Cost				\$ 25.00	\$ -
Total Fixed Cost				\$ 1,862.08	\$ -
Total Projected Cost Of Establishment				\$ 4,519.61	\$ -
Year 2					
Total Cash Cost for Pre-Production Net Cost				\$ 3,037.94	\$ -
(Table 5.A)					

* Activities which may be required but are not for this study

** The more costly of the two activities is included in Total Variable Costs

*** Chemicals considered by this study to be Tank Mixed

Table 5

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Drip Irrigated
PROJECTED COSTS AND RETURNS PER ACRE, ESTABLISHMENT YEAR 3

Description		Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Revenue
Primary Revenue						
Grape Variety 1 (50% of full production)		2.50	ton	1,650.00	4,125.00	-
Total Gross Revenue					\$ 4,125.00	\$ -
Operating Input or Custom Operation Expenses						
Description		Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
Pre-Harvest						
<u>Pruning</u>						
Pre-Pruning		2.50	hour	10.00	25.00	-
Finish Pruning		22.50	hour	15.00	337.50	-
Pull/Rake Brush**		2.50	hour	15.00	37.50	-
Summer Hedging***		-	hour	10.00	-	-
Cluster Thinning***		-	hour	15.00	-	-
<u>Vine Training</u>						
Vine Training/Tieing		75.00	hour	10.00	750.00	-
Tie Tape		1.00	acre	15.00	15.00	-
Move Catch Wires (Up)		4.00	hour	10.00	40.00	-
Move Catch Wires (Down)		4.00	hour	10.00	40.00	-
<u>Fertilizer/Animal Control</u>						
Fertilizer - Nitrogen (soluble through drip)		2.00	appl.	16.85	33.70	-
Fertilizer - Magnesium (soluble through drip)		1.00	appl.	28.41	28.41	-
Fertilizer - Potassium (soluble through drip)		1.00	appl.	41.97	41.97	-
Fertilizer - Zinc Spray		2.00	appl.	52.79	105.57	-
Fungicide - Tryfloxystrobin***		1.00	appl.	42.53	42.53	-
Fungicide - Mancozeb***		3.00	appl.	22.79	68.38	-
Fungicide - Myclobutanil***		4.00	appl.	45.52	182.07	-
Fungicide - Boscalid & Pyraclostrobin***		2.00	appl.	32.54	65.09	-
Fungicide - Wettable Sulfur***		2.00	appl.	14.69	29.39	-
Insecticide - Carbaryl (leafhoppers)***		2.00	appl.	19.39	38.79	-
Insecticide - Imidacloprid		1.00	appl.	33.50	33.50	-
Bird Netting - Application (1 Skilled)		1.00	appl.	59.78	59.78	-
Bird Netting - Application (2 Unskilled)		2.00	hour	10.00	20.00	-
Bird Netting - Removal (1 Skilled)		1.00	appl.	29.89	29.89	-
Bird Netting - Removal (2 Unskilled)		2.00	hour	10.00	20.00	-
<u>Strip Spray</u>						
Herbicide - Glyphosate		1.00	appl.	40.28	40.28	-
(or) Hoeing/Hand Pulling		2.00	hour	10.00	20.00	-
Herbicide - Glyphosate (Spot Spray)**		2.00	appl.	30.53	61.05	-
Glyphosate Additive - Ammonium Sulfate		3.00	appl.	4.11	12.33	-
<u>Sucker Control</u>						
Herbicide - Glufosinate (Spot Spray)**		1.00	appl.	21.62	21.62	-
(or) Manual Removal		8.00	hour	10.00	80.00	-
Total Pre-Harvest Costs					\$ 2,237.72	\$ -
Harvest						
Tractor Rent		1.00	acre	60.00	60.00	-
Loader/Forklift Rent		1.00	acre	50.00	50.00	-
Harvest Machinery Cost		1.00	appl.	65.50	65.50	-
Harvest Labor (2 Skilled)		3.50	hour	15.00	52.50	-
Harvest Labor (10 Unskilled)		17.50	hour	10.00	175.00	-
Transportation to Winery		150.00	mile	0.38	56.25	-
Total Harvests Costs					\$ 459.25	\$ -
<u>Miscellaneous</u>						
Cover Crop - Mowing		8.00	appl.	17.93	143.47	-
Buildings, Tools - Maintenance & Repair		1.00	acre	11.00	11.00	-
Vineyard System - Maintenance & Repair		1.00	acre	154.26	154.26	-
Irrigation - Utilities		1.00	acre	62.50	62.50	-
Total Miscellaneous Costs					\$ 371.22	\$ -
Total Variable Costs					\$ 3,068.20	\$ -
Gross Margin					\$ 1,056.80	\$ -

<u>Ownership Expenses</u>					
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
<u>Cash Capital Expense</u>					
Operating Interest (7.56%)	1.00	acre	115.98	115.98	-
Liability Insurance	1.00	acre	20.00	20.00	-
Property Insurance	1.00	acre	207.97	207.97	-
Property Taxes	1.00	acre	51.99	51.99	-
Vineyard Management and/or Consultation*	1.00	acre	-	-	-
Total Cash Capital Cost				\$ 395.94	\$ -
<u>Non-Cash Capital Expense</u>					
Annual Capital Recovery - Farm Equipment	1.00	acre	630.60	630.60	-
Annual Capital Recovery - Farm Buildings	1.00	acre	121.15	121.15	-
Annual Capital Recovery - Deer Fence	1.00	acre	148.41	148.41	-
Annual Capital Recovery - Bird Netting	1.00	acre	345.67	345.67	-
Annual Capital Recovery - Drip Irrig. System	1.00	acre	210.84	210.84	-
Total Non-Cash Capital Cost				\$ 1,456.67	\$ -
<u>Non-Cash Land Expense</u>					
Land Cost - Annual (Opportunity Cost)	1.00	acre	25.00	25.00	-
Total Land Cost				\$ 25.00	\$ -
Total Fixed Cost				\$ 1,877.61	\$ -
Total Projected Cost Of Production				\$ 4,945.81	\$ -
Residual Returns To Management, Unpaid Labor, & Risk				\$ (820.81)	\$ -
Total Cash Cost for Pre-Production Net Cost (Table 5.A)				\$ 3,464.14	\$ -

* Activities which may be required but are not for this study

** The more costly of the two activities is included in Total Variable Costs

*** Chemicals considered by this study to be Tank Mixed

Table 5.A

Pre-Productive Cost Summary

Total Pre-Production Net Cost Years 0 - 3	\$ 11,425.29	\$ -
Total Amortized Establishment Cost Per Acre	\$ 1,002.36	\$ -

Table 7

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Drip Irrigated
COST PER ACRE TO ESTABLISH SUMMARY - YEARS 0 THRU 3

CCM = Cover Crop Maintenance

VT = Vine Training

FPC = Fertilizer/Pest Control

SS= Strip Spray

SC = Sucker Control

	Cost Per Acre				
	Year:	Prep	1st	2nd	3rd
	Tons Per Acre:	-	-	-	2.50
<u>Land Preparation Costs:</u>					
Land Prep: Custom Ripping		25.00	-	-	-
Land Prep: Custom Land Clearing		-	-	-	-
Land Prep: Custom Herbicide Application		35.00	-	-	-
TOTAL LAND PREPARATION COSTS		60.00	-	-	-
<u>Planting & Infrastructure Investment Costs:</u>					
Planting: Survey & Layout		-	120.00	-	-
Planting: Cultivate		-	125.00	3.13	-
Planting: Vines @ 622/acre (2.5% replant in 2nd Year)		-	2,904.00	72.00	-
Trellis System Installation		-	4,333.57	-	-
TOTAL PLANTING & INFRASTRUCTURE INVESTMENT COSTS		-	7,482.57	75.13	-
<u>Pre-Harvest Costs:</u>					
Pruning: Pruning		-	-	100.00	-
Pruning: Pre-Pruning		-	-	-	25.00
Pruning: Finish Pruning		-	-	-	337.50
Pruning: Pull/Rake Brush		-	-	-	37.50
Pruning: Summer Hedging		-	-	-	-
Pruning: Cluster Thinning		-	-	-	-
VT: Vine Training/Tieing		-	500.00	1,500.00	750.00
VT: Tie Tape		-	15.00	15.00	15.00
VT: Move Catch Wires/Shoot Positioning (Up)		-	-	20.00	40.00
VT: Move Catch Wires/Shoot Positioning (Down)		-	-	20.00	40.00
FPC: Fertilizer - Nitrogen (soluble through drip)		-	16.85	33.70	33.70
FPC: Fertilizer - Magnesium (soluble through drip)		-	-	28.41	28.41
FPC: Fertilizer - Potassium (soluble through drip)		-	-	41.97	41.97
FPC: Fertilizer - Zinc Spray		-	-	105.57	105.57
FPC: Fungicide - Tryfloxystrobin***		-	-	-	42.53
FPC: Fungicide - Mancozeb***		-	22.79	45.59	68.38
FPC: Fungicide - Myclobutanil***		-	45.52	91.04	182.07
FPC: Fungicide - Boscalid & Pyraclostrobin***		-	-	65.09	65.09
FPC: Fungicide - Wetttable Sulfur***		-	-	14.69	29.39
FPC: Insecticide - Carbaryl***		-	-	38.79	38.79
FPC: Insecticide - Imidacloprid		-	33.50	33.50	33.50
FPC: Bird Netting - Application		-	-	-	79.78
FPC: Bird Netting - Removal		-	-	-	49.89
SS: Herbicide - Glyphosate		-	40.28	40.28	40.28
(or) Hoeing/Hand Pulling		-	-	10.00	20.00
SS: Herbicide - Glyphosate (Spot Spray)		-	-	61.05	61.05
SS: Glyphosate Additive - Ammonium Sulfate		-	-	12.33	12.33
SC: Herbicide - Rely (Glufosinate)**		-	-	21.62	21.62
(or) Manual Removal		-	-	20.00	80.00
<u>Harvest Costs:</u>					
Tractor Rent		-	-	-	60.00
Loader/Forklift Rent		-	-	-	50.00
Harvest Machinery Cost		-	-	-	65.50
Harvest Labor (2 Skilled)		-	-	-	52.50
Harvest Labor (10 Unskilled)		-	-	-	175.00
Transportion to Winery		-	-	-	56.25

Miscellaneous Costs:

Cover Crop - Mowing	-	143.47	143.47	143.47	430.41
Buildings, Tools - Maintenance & Repair	-	4.40	7.26	11.00	22.66
Vineyard System - Maintenance & Repair	-	61.70	101.81	154.26	317.77
Irrigation - Utilities	-	25.00	41.25	62.50	128.75
TOTAL CULTURAL COSTS	-	908.51	2,582.40	3,068.20	6,559.11

TOTAL OPERATING COSTS/ACRE	60.00	8,391.08	2,657.53	3,068.20	14,176.81
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Cash Overhead Costs:

Operating Interest (7.56%)	-	317.18	100.45	115.98	533.62
Liability Insurance	-	20.00	20.00	20.00	60.00
Property Insurance	-	207.97	207.97	207.97	623.90
Property Taxes	-	51.99	51.99	51.99	155.97
Vineyard Management and/or Consultation*	-	-	-	-	-

TOTAL CASH OVERHEAD COSTS	-	597.14	380.41	395.94	1,373.49
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TOTAL CASH COSTS/ACRE	60.00	8,988.22	3,037.94	3,464.14	15,550.29
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INCOME/ACRE FROM PRODUCTION	-	-	-	4,125.00	4,125.00
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NET CASH COSTS/ACRE FOR THE YEAR	60.00	8,988.22	3,037.94	-	-
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PROFIT/ACRE ABOVE CASH COSTS	-	-	-	660.86	-
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ACCUMULATED NET CASH COSTS/ACRE	60.00	9,048.22	12,086.16	11,425.29	-
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Non-Cash Overhead Costs (Capital Recovery):

Amortized Establishment Cost	-	-	-	-	-
Annual Capital Recovery - Farm Equipment	-	630.60	630.60	630.60	1,891.79
Annual Capital Recovery - Farm Buildings	-	121.15	121.15	121.15	363.45
Annual Capital Recovery - Deer Fence	-	148.41	148.41	148.41	445.24
Annual Capital Recovery - Bird Netting	-	345.67	345.67	345.67	1,037.01
Annual Capital Recovery - Drip Irrig. System	-	210.84	210.84	210.84	632.51
Land Cost - Annual (Opportunity Cost)	25.00	25.00	25.00	25.00	100.00

TOTAL NON-CASH OVERHEAD COSTS	25.00	1,481.67	1,481.67	1,481.67	4,470.01
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TOTAL COST/ACRE FOR THE YEAR	85.00	10,469.89	4,519.61	4,945.81	20,020.31
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INCOME/ACRE FROM PRODUCTION	-	-	-	4,125.00	4,125.00
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TOTAL NET COSTS/ACRE FOR THE YEAR	85.00	10,469.89	4,519.61	820.81	-
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NET PROFIT/ACRE ABOVE TOTAL COST	-	-	-	-	-
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TOTAL ACCUMULATED NET COSTS/ACRE	85.00	10,554.89	15,074.50	15,895.31	-
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Table 6

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Drip Irrigated
PROJECTED COSTS AND RETURNS PER ACRE, DEVELOPMENT YEAR 4

Description		Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Revenue
Primary Revenue						
Grape Variety 1 (75% of full production)		3.75	ton	1,650.00	6,187.50	-
Total Gross Revenue					\$ 6,187.50	\$ -
Operating Input or Custom Operation Expenses						
Description		Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost
Pre-Harvest						
<u>Pruning</u>						
Pre-Pruning		5.00	hour	10.00	50.00	-
Finish Pruning		20.00	hour	15.00	300.00	-
Pull/Rake Brush**		2.50	hour	15.00	37.50	-
Summer Hedging		10.00	hour	10.00	100.00	-
Cluster Thinning***		7.50	hour	15.00	112.50	-
<u>Vine Training</u>						
Vine Training/Tieing		40.00	hour	10.00	400.00	-
Tie Tape		1.00	acre	15.00	15.00	-
Move Catch Wires (Up)		4.00	hour	10.00	40.00	-
Move Catch Wires (Down)		4.00	hour	10.00	40.00	-
<u>Fertilizer/Animal Control</u>						
Fertilizer - Nitrogen (soluble through drip)		2.00	appl.	16.85	33.70	-
Fertilizer - Magnesium (soluble through drip)		1.00	appl.	28.41	28.41	-
Fertilizer - Potassium (soluble through drip)		1.00	appl.	41.97	41.97	-
Fertilizer - Zinc Spray		2.00	appl.	52.79	105.57	-
Fungicide - Tryfloxystrobin***		1.00	appl.	42.53	42.53	-
Fungicide - Mancozeb***		3.00	appl.	22.79	68.38	-
Fungicide - Myclobutanil***		4.00	appl.	45.52	182.07	-
Fungicide - Boscalid & Pyraclostrobin***		2.00	appl.	32.54	65.09	-
Fungicide - Wettable Sulfur***		2.00	appl.	14.69	29.39	-
Insecticide - Carbaryl (leafhoppers)***		2.00	appl.	19.39	38.79	-
Insecticide - Imidacloprid		1.00	appl.	33.50	33.50	-
Bird Netting - Application (1 Skilled)		1.00	appl.	59.78	59.78	-
Bird Netting - Application (2 Unskilled)		2.00	hour	10.00	20.00	-
Bird Netting - Removal (1 Skilled)		1.00	appl.	29.89	29.89	-
Bird Netting - Removal (2 Unskilled)		2.00	hour	10.00	20.00	-
<u>Strip Spray</u>						
Herbicide - Glyphosate**		1.00	appl.	40.28	40.28	-
(or) Hoeing/Hand Pulling		2.00	hour	10.00	20.00	-
Herbicide - Glyphosate (Spot Spray)		2.00	appl.	30.53	61.05	-
Glyphosate Additive - Ammonium Sulfate		3.00	appl.	4.11	12.33	-
<u>Sucker Control</u>						
Herbicide - Glufosinate (Spot Spray)**		1.00	appl.	21.62	21.62	-
(or) Manual Removal		8.00	hour	10.00	80.00	-
Total Pre-Harvest Costs					\$ 2,087.72	\$ -
Harvest						
Tractor Rent		1.00	acre	60.00	60.00	-
Loader/Forklift Rent		1.00	acre	50.00	50.00	-
Harvest Machinery Cost		1.00	appl.	98.25	98.25	-
Harvest Labor (2 Skilled)		5.25	hour	15.00	78.75	-
Harvest Labor (10 Unskilled)		26.25	hour	10.00	262.50	-
Transportion to Winery		150.00	mile	0.56	84.38	-
Total Harvest Costs					\$ 633.88	\$ -
<u>Miscellaneous</u>						
Cover Crop - Mowing		8.00	appl.	17.93	143.47	-
Buildings, Tools - Maintenance & Repair		1.00	acre	16.50	16.50	-
Vineyard System - Maintenance & Repair		1.00	acre	231.38	231.38	-
Irrigation - Utilities		1.00	acre	93.75	93.75	-
Total Miscellaneous Costs					\$ 485.10	\$ -
Total Variable Costs					\$ 3,206.70	\$ -
Gross Margin					\$ 2,980.80	\$ -

Ownership Expenses

Description	Quantity/		\$ / Unit	Value or Cost/Unit	Your Cost
	Acre	Unit			
<u>Cash Capital Expense</u>					
Operating Interest (7.56%)	1.00	acre	121.21	121.21	-
Crop Insurance	1.00	acre	60.00	60.00	-
Liability Insurance	1.00	acre	20.00	20.00	-
Property Insurance	1.00	acre	207.97	207.97	-
Property Taxes	1.00	acre	51.99	51.99	-
Vineyard Management and/or Consultation*	1.00	acre	-	-	-
Total Cash Capital Cost				\$ 461.17	\$ -
<u>Non-Cash Capital Expense</u>					
Amortized Establishment Cost	1.00	acre	1,002.36	1,002.36	-
Annual Capital Recovery - Farm Equipment	1.00	acre	630.60	630.60	-
Annual Capital Recovery - Farm Buildings	1.00	acre	121.15	121.15	-
Annual Capital Recovery - Deer Fence	1.00	acre	148.41	148.41	-
Annual Capital Recovery - Bird Netting	1.00	acre	345.67	345.67	-
Annual Capital Recovery - Drip Irrig. System	1.00	acre	210.84	210.84	-
Total Non-Cash Capital Cost				\$ 2,459.03	\$ -
<u>Non-Cash Land Expense</u>					
Land Cost - Annual (Opportunity Cost)	1.00	acre	25.00	25.00	-
Total Land Cost				\$ 25.00	\$ -
<u>Total Fixed Cost</u>				\$ 2,945.20	\$ -
<u>Total Projected Cost Of Production</u>				\$ 6,151.90	\$ -
<u>Residual Returns To Management, Unpaid</u>					
<u>Labor, & Risk</u>				\$ 35.60	\$ -

* Activities which may be required but are not for this study

** The more costly of the two activities is included in Total Variable Costs

*** Chemicals considered by this study to be Tank Mixed

Table 8

Texas AgriLife Vineyard Budget - Texas Hill Country Region

Drip Irrigated

PROJECTED COSTS AND RETURNS PER ACRE, FULL PRODUCTION YEARS 5 - 25

PROJECTED COSTS AND RETURNS PER ACRE, FULL PRODUCTION YEARS 5 - 25						Month of Item Incurrence for Cash Flow (Table 16)
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Revenue	
Primary Revenue						
Grape Variety 1 (100% of Full Production)	5.00	ton	1,650.00	8,250.00	-	Jul
Total Gross Revenue				\$ 8,250.00	\$ -	
Operating Input or Custom Operation Expenses						
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost	Frequency
Pre-Harvest						
<u>Pruning</u>						
Pre-Pruning	5.00	hour	10.00	50.00	-	Jan
Finish Pruning	20.00	hour	15.00	300.00	-	Mar
Pull/Rake Brush**	2.50	hour	15.00	37.50	-	Mar
Summer Hedging	10.00	hour	10.00	100.00	-	Jul
Cluster Thinning***	7.50	hour	15.00	112.50	-	Jul
<u>Vine Training</u>						
Vine Training/Tieing	40.00	hour	10.00	400.00	-	Apr/May/June/Jul
Tie Tape	1.00	acre	15.00	15.00	-	Mar
Move Catch Wires (Up)	6.00	hour	10.00	60.00	-	Jun
Move Catch Wires (Down)	6.00	hour	10.00	60.00	-	Jan
<u>Fertilizer/Pest Control</u>						
Fertilizer - Nitrogen (soluble through drip)	2.00	appl.	16.85	33.70	-	May, Jun
Fertilizer - Magnesium (soluble through drip)	1.00	appl.	28.41	28.41	-	May
Fertilizer - Potassium (soluble through drip)	1.00	appl.	41.97	41.97	-	May
Fertilizer - Zinc Spray	2.00	appl.	52.79	105.57	-	May
Fungicide - Tryfloxystrobin***	1.00	appl.	42.53	42.53	-	May
Fungicide - Mancozeb***	3.00	appl.	22.79	68.38	-	Mar, May, Jun
Fungicide - Myclobutanil***	4.00	appl.	45.52	182.07	-	Apr, May, Jun, Jul
Fungicide - Boscalid & Pyraclostrobin***	2.00	appl.	32.54	65.09	-	May, Jun
Fungicide - Wettable Sulfur***	2.00	appl.	14.69	29.39	-	Apr, Jun
Insecticide - Carbaryl (leafhoppers)***	2.00	appl.	19.39	38.79	-	Jun, Jul
Insecticide - Imidacloprid	1.00	appl.	33.50	33.50	-	Apr
Bird Netting - Application (1 Skilled)	1.00	appl.	59.78	59.78	-	Jun
Bird Netting - Application (2 Unskilled)	4.00	hour	10.00	40.00	-	Jun
Bird Netting - Removal (1 Skilled)	1.00	appl.	29.89	29.89	-	Jun
Bird Netting - Removal (2 Unskilled)	2.00	hour	10.00	20.00	-	Jun
<u>Strip Spray</u>						
Herbicide - Glyphosate**	1.00	appl.	40.28	40.28	-	Mar
(or) Hoeing/Hand Pulling	2.00	hour	10.00	20.00	-	Mar
Herbicide - Glyphosate (Spot Spray)	2.00	appl.	30.53	61.05	-	May, Jun
Glyphosate Additive - Ammonium Sulfate	3.00	appl.	4.11	12.33	-	Mar, May, Jun
<u>Sucker Control</u>						
Herbicide - Glufosinate (Spot Spray)**	1.00	appl.	21.62	21.62	-	May
(or) Manual Removal	8.00	hour	10.00	80.00	-	May
Total Pre-Harvest Costs				\$ 2,147.72	\$ -	
Harvest						
Tractor Rent	1.00	acre	60.00	60.00	-	Jul
Loader/Forklift Rent	1.00	acre	50.00	50.00	-	Jul
Harvest Machinery Cost	1.00	appl.	131.00	131.00	-	Jul
Harvest Labor (2 Skilled)	7.00	hour	15.00	105.00	-	Jul
Harvest Labor (10 Unskilled)	35.00	hour	10.00	350.00	-	Jul
Transportation to Winery	150.00	mile	0.75	112.50	-	Jul
Total Harvest Costs				\$ 808.50	\$ -	
<u>Miscellaneous</u>						
Cover Crop - Mowing	8.00	appl.	17.93	143.47	-	X .667 Eight times Annually
Buildings, Tools - Maintenance & Repair	1.00	acre	22.00	22.00	-	Jan
Vineyard System - Maintenance & Repair	1.00	acre	308.51	308.51	-	Jan
Irrigation - Utilities	1.00	acre	125.00	125.00	-	Apr, May, Jun, Jul
Total Miscellaneous Costs				\$ 598.98	\$ -	
Total Variable Costs				\$ 3,555.21	\$ -	
Gross Margin				\$ 4,694.79	\$ -	

<u>Ownership Expenses</u>						<i>Month of Item Incurrence for Cash Flow (Table 16)</i>
Description	Quantity/ Acre	Unit	\$ / Unit	Value or Cost/Unit	Your Cost	
<u>Cash Capital Expense</u>						
Operating Interest (7.56%)	1.00	acre	134.39	134.39	-	Jan
Crop Insurance	1.00	acre	60.00	60.00	-	Jan
Liability Insurance	1.00	acre	20.00	20.00	-	Jan
Property Insurance	1.00	acre	207.97	207.97	-	Jan
Property Taxes	1.00	acre	51.99	51.99	-	Jan
Vineyard Management and/or Consultation*	1.00	acre	-	-	-	Jan
Total Cash Capital Cost				\$ 474.34	\$ -	
<u>Non-Cash Capital Expense</u>						
Amortized Establishment Cost	1.00	acre	1,002.36	1,002.36	-	
Annual Capital Recovery - Farm Equipment	1.00	acre	630.60	630.60	-	
Annual Capital Recovery - Farm Buildings	1.00	acre	121.15	121.15	-	
Annual Capital Recovery - Deer Fence	1.00	acre	148.41	148.41	-	
Annual Capital Recovery - Bird Netting	1.00	acre	345.67	345.67	-	
Annual Capital Recovery - Drip Irrig. System	1.00	acre	210.84	210.84	-	
Total Non-Cash Capital Cost				\$ 2,459.03	\$ -	
<u>Non-Cash Land Expense</u>						
Land Cost - Annual (Opportunity Cost)	1.00	acre	25.00	25.00	-	
Total Land Cost				\$ 25.00	\$ -	
<u>Total Fixed Cost</u>				\$ 2,958.37	\$ -	
<u>Total Projected Cost Of Production</u>				\$ 6,513.58	\$ -	
<u>Residual Returns To Management, Unpaid Labor, & Risk</u>				\$ 1,736.42	\$ -	

* Activities which may be required but are not for this study

** The more costly of the two activities is included in Total Variable Costs

*** Chemicals considered by this study to be Tank Mixed

Table 9

**Texas AgriLife Vineyard Budget - Texas Hill Country Region
Cash and Labor Activity Breakdown for Production Year 5
Cost Per Acre to Produce**

Operation	Operation	Number of Apps	Cash and Labor Cost Per Acre							Total Cost	
	Time (Hrs/A)		Labor Rate	Labor Cost	Equipment Hours	Equipment Cost	Material Cost	Custom/ Rent	Cost Per App		
Pre-Harvest:											
	<u>Pruning</u>										
Pre-Pruning	5.00	-	10.00	50.00	-	-	-	-	50.00	\$	50.00
Finish Pruning	20.00	-	15.00	300.00	-	-	-	-	300.00	\$	300.00
Pull/Rake Brush	2.50	-	15.00	37.50	-	-	-	-	37.50	\$	37.50
Summer Hedging	10.00	-	10.00	100.00	-	-	-	-	100.00	\$	100.00
Cluster Thinning***	7.50	-	15.00	112.50	-	-	-	-	112.50	\$	112.50
	<u>Vine Training</u>										
Vine Training/Tieing	40.00	-	10.00	400.00	-	-	-	-	400.00	\$	400.00
Tie Tape	-	-	-	-	-	-	15.00	-	15.00	\$	15.00
Move Catch Wires (Up)	6.00	-	10.00	60.00	-	-	-	-	60.00	\$	60.00
Move Catch Wires (Down)	6.00	-	10.00	60.00	-	-	-	-	60.00	\$	60.00
	<u>Fertilizer/Animal Control</u>										
Fertilizer - Nitrogen (soluble through drip)	0.75	2.00	15.00	11.25	-	-	5.60	-	16.85	\$	33.70
Fertilizer - Magnesium (soluble through drip)	0.75	1.00	15.00	11.25	-	-	17.16	-	28.41	\$	28.41
Fertilizer - Potassium (soluble through drip)	0.75	1.00	15.00	11.25	-	-	30.72	-	41.97	\$	41.97
Fertilizer - Zinc Spray	0.60	2.00	15.00	9.00	0.50	7.79	36.00	-	52.79	\$	105.57
Fungicide - Tryfloxystrobin***	0.30	1.00	16.00	4.80	0.25	3.89	33.84	-	42.53	\$	42.53
Fungicide - Mancozeb***	0.30	3.00	15.00	4.50	0.25	3.89	14.40	-	22.79	\$	68.38
Fungicide - Myclobutanil***	0.30	4.00	15.00	4.50	0.25	3.89	37.13	-	45.52	\$	182.07
Fungicide - Boscalid & Pyraclostrobin***	0.30	2.00	15.00	4.50	0.25	3.89	24.15	-	32.54	\$	65.09
Fungicide - Wettable Sulfur***	0.30	2.00	16.00	4.80	0.25	3.89	6.00	-	14.69	\$	29.39
Insecticide - Carbaryl (Leafhoppers)***	0.30	2.00	15.00	4.50	0.25	3.89	11.00	-	19.39	\$	38.79
Insecticide - Imidacloprid	0.60	1.00	15.00	9.00	-	-	24.50	-	33.50	\$	33.50
Bird Netting - Application (1 Skilled)	2.20	1.00	15.00	33.00	2.00	26.78	-	-	59.78	\$	59.78
Bird Netting - Application (2 Unskilled)	4.00	-	10.00	40.00	-	-	-	-	40.00	\$	40.00
Bird Netting - Removal (1 Skilled)	1.10	1.00	15.00	16.50	1.00	13.39	-	-	29.89	\$	29.89
Bird Netting - Removal (2 Unskilled)	2.00	-	10.00	20.00	-	-	-	-	20.00	\$	20.00
	<u>Strip Spray</u>										
Herbicide - Glyphosate**	0.60	1.00	15.00	9.00	0.50	6.78	24.50	-	40.28	\$	40.28
(or) Hoeing/Hand Pulling	2.00	-	10.00	20.00	-	-	-	-	20.00	\$	20.00
Herbicide - Glyphosate (Spot Spray)	0.60	2.00	15.00	9.00	0.50	6.78	14.75	-	30.53	\$	61.05
Glyphosate Additive - Ammonium Sulfite	0.25	3.00	15.00	3.75	-	-	0.36	-	4.11	\$	12.33
	<u>Sucker Control</u>										
Herbicide - Glufosinate (Spot Spray)**	0.60	1.00	15.00	9.00	0.50	6.78	5.85	-	21.62	\$	21.62
(or) Manual Removal	8.00	-	10.00	80.00	-	-	-	-	80.00	\$	80.00
TOTAL PRE-HARVEST COSTS			133.80		1,562.60	9.75	135.71	355.11	-	\$	2,147.72
Harvest:											
Tractor Rent	Fee	-	-	-	-	-	-	60.00	-	\$	60.00
Loader/Forklift Rent	Fee	-	-	-	-	-	-	50.00	-	\$	50.00
Harvest Machinery Cost	1.50	1.00	15.00	22.50	3.50	108.50	-	-	131.00	\$	131.00
Harvest Labor (2 Skilled)	7.00	-	15.00	105.00	-	-	-	-	-	\$	105.00
Harvest Labor (10 Unskilled)	35.00	-	10.00	350.00	-	-	-	-	-	\$	350.00
Transportion to Winery	-	-	-	-	-	-	-	112.50	-	\$	112.50
TOTAL HARVEST COSTS			43.50		477.50	3.50	108.50	-	222.50	\$	808.50

Miscellaneous:

Cover Crop - Mowing	0.60	8.00	15.00	9.00	0.50	8.93	17.93	\$	143.47
Buildings, Tools - Maintenance & Repair								\$	22.00
Vineyard System - Maintenance & Repair								\$	308.51
Irrigation - Utilities								\$	125.00
TOTAL MISCELLANEOUS COSTS	0.60			9.00	0.50	8.93		\$	598.98

TOTAL OPERATING COSTS/ACRE		2,049.10		253.15		222.50	\$	3,555.21
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CASH OVERHEAD:

Operating Interest (7.56%)								\$	134.39
Crop Insurance								\$	60.00
Liability Insurance								\$	20.00
Property Insurance								\$	207.97
Property Taxes								\$	51.99
Vineyard Management and/or Consultation*								\$	-

TOTAL CASH OVERHEAD COSTS							\$	474.34
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TOTAL CASH COSTS/ACRE							\$	4,029.55
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NON-CASH OVERHEAD:

Amortized Establishment Cost					1,002.36			\$	1,002.36
Annual Capital Recovery - Farm Equipment					630.60			\$	630.60
Annual Capital Recovery - Farm Buildings					121.15			\$	121.15
Annual Capital Recovery - Deer Fence					148.41			\$	148.41
Annual Capital Recovery - Bird Netting					345.67			\$	345.67
Annual Capital Recovery - Drip Irrig. System					210.84			\$	210.84
Land Cost - Annual (Opportunity Cost)					25.00			\$	25.00

TOTAL NON-CASH OVERHEAD COSTS					2,484.03		\$	2,484.03
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TOTAL OVERHEAD COSTS							\$	2,958.37
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TOTAL COST/ACRE							\$	6,513.58
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* Activities which may be required but are not for this study

** The more costly of the two activities is included in Total Variable Costs

*** Chemicals considered by this study to be Tank Mixed

Table 10

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Chemical Costs & Application Schedule

Year	Chemical Common Name	Type	MSRP (\$)	Unit	Rate Per Application	Cost Per Application	# of Apps Year 0	# of Apps Year 1	# of Apps Year 2	# of Apps Year 3	# of Apps Year 4	# of Apps Year 5
2008	Nitrogen	Fertilizer	\$ 0.56	lb	10.00	\$ 5.60	-	1.00	2.00	2.00	2.00	2.00
2008	Magnesium	Fertilizer	\$ 1.56	lb	11.00	\$ 17.16	-	-	1.00	1.00	1.00	1.00
2008	Potassium	Fertilizer	\$ 2.56	lb	12.00	\$ 30.72	-	-	1.00	1.00	1.00	1.00
2008	Zinc	Fertilizer	\$ 16.00	oz	2.25	\$ 36.00	-	-	2.00	2.00	2.00	2.00
2008	Tryfloxystrobin***	Fungicide	\$ 11.28	oz	3.00	\$ 33.84	-	-	-	1.00	1.00	1.00
2008	Mancozeb***	Fungicide	\$ 1.20	lb	12.00	\$ 14.40	-	1.00	2.00	3.00	3.00	3.00
2008	Myclobutanil***	Fungicide	\$ 4.50	oz	8.25	\$ 37.13	-	1.00	2.00	4.00	4.00	4.00
2008	Boscalid & Pyraclostrobin***	Fungicide	\$ 2.30	lb	10.50	\$ 24.15	-	-	2.00	2.00	2.00	2.00
2008	Wettable Sulfur	Fungicide	\$ 2.00	lb	3.00	\$ 6.00	-	-	1.00	2.00	2.00	2.00
2008	Carbaryl***	Insecticide	\$ 44.00	gal	0.25	\$ 11.00	-	-	2.00	2.00	2.00	2.00
2008	Imidacloprid	Insecticide	\$ 3.50	oz	7.00	\$ 24.50	-	1.00	1.00	1.00	1.00	1.00
2008	Glyphosate (Strip Spray)	Post-Emmergent Herbicide	\$ 59.00	gal	0.25	\$ 14.75	-	1.00	1.00	1.00	1.00	1.00
2008	Glyphosate (Spot Spray)	Post-Emmergent Herbicide	\$ 59.00	gal	0.17	\$ 9.85	-	-	2.00	2.00	2.00	2.00
2008	Glufosinate (Spot Spray)	Post-Emmergent Herbicide	\$ 35.00	gal	0.17	\$ 5.85	-	-	1.00	1.00	1.00	1.00
2008	Ammonium Sulfate	Glyphosate Additive	\$ 0.21	lb	1.70	\$ 0.36	-	-	3.00	3.00	3.00	3.00

*** Chemicals considered by this study to be Tank Mixed

Table 11

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Hourly Machinery & Equipment Costs

Year	Description	Price	Hours of Life	Expected Life (yrs)	Total Repairs	Repairs \$/Hr	Hourly Fuel Cons. (gal.)	Fuel \$/Hr	Lube (15% of Fuel) \$/Hr	Total Hourly Variable Costs
2008	Tractor (50 HP)	42,337	16,000	15	80%	2.12	3.00	8.25	1.24	11.60
2008	UTV 4WD	9,999	2,500	5	50%	2.00	0.50	1.00	0.15	3.15
2008	Bin Trailer	1,500	3,000	20	50%	0.25	0.50	1.00	0.15	1.40
2008	Picking Bins (qty. 5)	1,250	2,000	10	0%	-	-	-	-	-
2008	Mower/Shredder	6,242	2,000	10	150%	4.68	0.50	1.38	0.21	6.26
2008	Airblast Sprayer (>=100 gal.)	7,950	2,000	20	60%	2.39	0.50	1.38	0.21	3.97
2008	Truck	32,020	2,500	7	80%	10.25	2.00	4.00	0.60	14.85
2008	Herbicide Sprayer (>=50 gal.)	1,217	2,000	10	60%	0.37	0.50	1.38	0.21	1.95
2008	Lugs (qty. 100)	700	2,000	10	0%	-	-	-	-	-
2008	Bird Net Applicator	1,995	1,500	10	75%	1.00	0.10	0.69	0.10	1.79
TOTAL		105,210								
Gas (\$/gallon)		\$2.00								
Diesel (\$/gallon)		\$2.75								

Table 12

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Annual Equipment Costs

		Non-Cash Capital Expense					Cash Capital Expense			Total
Year	Description	Price	Expected Life (yrs)	Salvage Value	Capital to be Recovered	Capital Recovery Factor	Annual Capital Recovery	Insurance (1% of Purchase Price)	Taxes (.25% of Purchase Price)	
2008	Tractor (50 HP)	42,337	15	11,213	31,124	0.1089	4,160	423	106	4,689
2008	UTV 4WD	9,999	5	4,917	5,082	0.2430	1,573	100	25	1,698
2008	Bin Trailer	1,500	10	265	1,235	0.1415	193	15	4	212
2008	Picking Bins (qty. 5)	1,250	10	515	735	0.1415	139	13	3	155
2008	Mower/Shredder	6,242	10	1,458	4,784	0.1415	777	62	16	855
2008	Airblast Sprayer (>=100 gal.)	7,950	10	1,406	6,544	0.1415	1,023	80	20	1,122
2008	Truck	32,020	7	13,912	18,108	0.1847	4,301	320	80	4,701
2008	Herbicide Sprayer (>=50 gal.)	1,217	10	359	857	0.1415	146	12	3	161
2008	Lugs (qty. 100)	700	10	289	411	0.1415	78	7	2	87
2008	Bird Net Applicator	1,995	10	822	1,173	0.1415	222	20	5	247
TOTAL		105,210		35,156	70,054		12,612	1,052	263	13,927
60% of New Cost		63,126		21,094	42,032		7,567	631	158	8,356

Table 12.A

Annual Investment Costs

							Cash Capital Expense			Total
Description	Price	Expected Life	Salvage Value	Capital to be Recovered	Capital Recovery Factor	Annual Capital Recovery	Insurance (1% of Purchase Price)	Taxes (.25% of Purchase Price)	Repairs	
Buildings	25,000	25	-	25,000	0.0848	2,120	250	63	400	2,833
Vines	62,980	22	-	(See Table 3 & Table 5.A)			630	157	63	850
Trellis System	86,671	22	-	(See Table 3 & Table 5.A)			867	217	1,970	3,053
Deer Fence	35,000	25	-	35,000	0.0848	2,968	350	88	700	4,106
Bird Netting	48,850	10	-	48,850	0.1415	6,913	489	122	2,443	9,967
Drip Irrigation System	49,721	25	-	49,721	0.0848	4,217	497	124	994	5,833
Land (Opportunity Cost)	500	25	500	-	0.0848	34	5	1	1	41
Tools	2,000	10	200	1,800	0.1415	268	20	5	40	333
TOTAL	310,723		700	160,371		16,521	3,107	777	6,610	27,016

Table 12.B

Annual Business Overhead Costs

Description	Units/ Farm	Unit	Price/ Unit	Total	Cost
Annual Amortized Establishment Cost (From Table 5.A)	20	acre	1,002.36		20,047
Annual Capital Recovery - Farm Equipment (From Table 12 & 12.A)	20	acre	630.60		12,612
Annual Capital Recovery - Farm Buildings (From Table 12 & 12.A)	20	acre	121.15		2,423
Annual Capital Recovery - Deer Fence (From Table 12 & 12.A)	20	acre	148.41		2,968
Annual Capital Recovery - Bird Netting (From Table 12 & 12.A)	20	acre	345.67		6,913
Annual Capital Recovery - Drip Irrig. System (From Table 12 & 12.A)	20	acre	210.84		4,217
Crop Insurance	20	acre	60.00		1,200
Liability Insurance	20	acre	20.00		400
Property Insurance (From Table 12 & 12.A)	20	acre	207.97		4,159
Property Taxes (From Table 11 & 11.A)	20	acre	51.99		1,040
TOTAL			2,799		35,933

Table 12.C

Financing Interest Rates

Description	Annual Percentage Rate
Operating Loans (< 1 Year)	7.56%
Long Term Loans (> 1Year)	6.87%

Table 13

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Machinery & Equipment Price Derivation

<u>Year</u>	<u>Type</u>	<u>Qty</u>	<u>AVG MSRP (\$)</u>	<u>Total Cost (\$)</u>
2008	Tractor (>=50 HP)	1	\$42,337	\$ 42,337
2008	UTV 4WD	1	\$9,999	\$ 9,999
2008	Bin Trailer	1	\$1,500	\$ 1,500
2008	Picking Bins (5x)	5	\$250	\$ 1,250
2008	Mower/Shredder	1	\$6,242	\$ 6,242
2008	Airblast Sprayer (>=200 gallons)	1	\$7,950	\$ 7,950
2008	Truck	1	\$32,020	\$ 32,020
2008	Herbicide Sprayer (>=50 gallons)	1	\$1,217	\$ 1,217
2008	Lugs (100x)	100	\$7	\$ 700
2008	Bird Net Applicator	1	\$1,995	\$ 1,995

Table 14

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Cost Per Acre at Varying Yields

	YIELD (tons/acre)						
	3.00	4.00	5.00	6.00	7.00	8.00	9.00
OPERATING COSTS:							
Cultural Cost	2,746.70	2,746.70	2,746.70	2,746.70	2,746.70	2,746.70	2,746.70
Harvest (pick)	485.10	646.80	808.50	970.20	1,131.90	1,293.60	1,455.30
TOTAL OPERATING COSTS/ACRE	\$ 3,232	\$ 3,394	\$ 3,555	\$ 3,717	\$ 3,879	\$ 4,040	\$ 4,202
Total Operating Costs/ton	1,077	848	711	619	554	505	467
CASH OVERHEAD COSTS/ACRE	474.34	474.34	474.34	474.34	474.34	474.34	474.34
TOTAL CASH COSTS/ACRE	\$ 3,706	\$ 3,868	\$ 4,030	\$ 4,191	\$ 4,353	\$ 4,515	\$ 4,676
Total Cash Costs/ton	1,235	967	806	699	622	564	520
NON-CASH OVERHEAD COSTS/ACRE	2,484.03	2,484.03	2,484.03	2,484.03	2,484.03	2,484.03	2,484.03
TOTAL COSTS/ACRE	\$ 6,190	\$ 6,352	\$ 6,514	\$ 6,675	\$ 6,837	\$ 6,999	\$ 7,160
Total Costs/ton	2,063	1,588	1,303	1,113	977	875	796

NET RETURNS PER ACRE ABOVE TOTAL OPERATING COSTS

	YIELD (tons/acre)						
PRICE	3.00	4.00	5.00	6.00	7.00	8.00	9.00
\$/ton							
1,300	668	1,806	2,945	4,083	5,221	6,360	7,498
1,400	968	2,206	3,445	4,683	5,921	7,160	8,398
1,500	1,268	2,606	3,945	5,283	6,621	7,960	9,298
1,600	1,568	3,006	4,445	5,883	7,321	8,760	10,198
1,700	1,868	3,406	4,945	6,483	8,021	9,560	11,098
1,800	2,168	3,806	5,445	7,083	8,721	10,360	11,998
1,900	2,468	4,206	5,945	7,683	9,421	11,160	12,898
2,000	2,768	4,606	6,445	8,283	10,121	11,960	13,798

NET RETURNS PER ACRE ABOVE TOTAL CASH COSTS

	YIELD (tons/acre)						
PRICE	3.00	4.00	5.00	6.00	7.00	8.00	9.00
\$/ton							
1,300	194	1,332	2,470	3,609	4,747	5,885	7,024
1,400	494	1,732	2,970	4,209	5,447	6,685	7,924
1,500	794	2,132	3,470	4,809	6,147	7,485	8,824
1,600	1,094	2,532	3,970	5,409	6,847	8,285	9,724
1,700	1,394	2,932	4,470	6,009	7,547	9,085	10,624
1,800	1,694	3,332	4,970	6,609	8,247	9,885	11,524
1,900	1,994	3,732	5,470	7,209	8,947	10,685	12,424
2,000	2,294	4,132	5,970	7,809	9,647	11,485	13,324

NET RETURNS PER ACRE ABOVE TOTAL COSTS

	YIELD (tons/acre)						
PRICE	3.00	4.00	5.00	6.00	7.00	8.00	9.00
\$/ton							
1,300	(2,290)	(1,152)	(14)	1,125	2,263	3,401	4,540
1,400	(1,990)	(752)	486	1,725	2,963	4,201	5,440
1,500	(1,690)	(352)	986	2,325	3,663	5,001	6,340
1,600	(1,390)	48	1,486	2,925	4,363	5,801	7,240
1,700	(1,090)	448	1,986	3,525	5,063	6,601	8,140
1,800	(790)	848	2,486	4,125	5,763	7,401	9,040
1,900	(490)	1,248	2,986	4,725	6,463	8,201	9,940
2,000	(190)	1,648	3,486	5,325	7,163	9,001	10,840

Table 15

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Cost Per Acre at Varying Yields

NET RETURNS PER ACRE ABOVE TOTAL COSTS
WITH VIOGNIER

Table 15.A

PRICE		YIELD (tons/acre)							
\$/ton		3.00	4.00	5.00	6.00	7.00	8.00	9.00	
1,300	\$ (2,290)	\$ (1,152)	\$ (14)	\$ 1,125	\$ 2,263	\$ 3,401	\$ 4,540		
1,400	\$ (1,990)	\$ (752)	\$ 486	\$ 1,725	\$ 2,963	\$ 4,201	\$ 5,440		
1,500	\$ (1,690)	\$ (352)	\$ 986	\$ 2,325	\$ 3,663	\$ 5,001	\$ 6,340		
1,600	\$ (1,390)	\$ 48	\$ 1,486	\$ 2,925	\$ 4,363	\$ 5,801	\$ 7,240		
1,700	\$ (1,090)	\$ 448	\$ 1,986	\$ 3,525	\$ 5,063	\$ 6,601	\$ 8,140		
1,800	\$ (790)	\$ 848	\$ 2,486	\$ 4,125	\$ 5,763	\$ 7,401	\$ 9,040		
1,900	\$ (490)	\$ 1,248	\$ 2,986	\$ 4,725	\$ 6,463	\$ 8,201	\$ 9,940		
2,000	\$ (190)	\$ 1,648	\$ 3,486	\$ 5,325	\$ 7,163	\$ 9,001	\$ 10,840		

NET RETURNS PER ACRE ABOVE TOTAL COSTS
WITH SANGIOVESE

Table 15.B

PRICE		YIELD (tons/acre)						
\$/ton		2.00	3.00	4.00	5.00	6.00	7.00	8.00
900	\$ (4,228)	\$ (3,490)	\$ (2,752)	\$ (2,014)	\$ (1,275)	\$ (537)	\$ 201	
1,000	\$ (4,028)	\$ (3,190)	\$ (2,352)	\$ (1,514)	\$ (675)	\$ 163	\$ 1,001	
1,100	\$ (3,828)	\$ (2,890)	\$ (1,952)	\$ (1,014)	\$ (75)	\$ 863	\$ 1,801	
1,200	\$ (3,628)	\$ (2,590)	\$ (1,552)	\$ (514)	\$ 525	\$ 1,563	\$ 2,601	
1,300	\$ (3,428)	\$ (2,290)	\$ (1,152)	\$ (14)	\$ 1,125	\$ 2,263	\$ 3,401	
1,400	\$ (3,228)	\$ (1,990)	\$ (752)	\$ 486	\$ 1,725	\$ 2,963	\$ 4,201	
1,500	\$ (3,028)	\$ (1,690)	\$ (352)	\$ 986	\$ 2,325	\$ 3,663	\$ 5,001	
1,600	\$ (2,828)	\$ (1,390)	\$ 48	\$ 1,486	\$ 2,925	\$ 4,363	\$ 5,801	

NET RETURNS PER ACRE ABOVE TOTAL COSTS
WITH SYRAH

Table 15.C

PRICE		YIELD (tons/acre)						
\$/ton		2.00	3.00	4.00	5.00	6.00	7.00	8.00
1,200	\$ (3,628)	\$ (2,590)	\$ (1,552)	\$ (514)	\$ 525	\$ 1,563	\$ 2,601	
1,300	\$ (3,428)	\$ (2,290)	\$ (1,152)	\$ (14)	\$ 1,125	\$ 2,263	\$ 3,401	
1,400	\$ (3,228)	\$ (1,990)	\$ (752)	\$ 486	\$ 1,725	\$ 2,963	\$ 4,201	
1,500	\$ (3,028)	\$ (1,690)	\$ (352)	\$ 986	\$ 2,325	\$ 3,663	\$ 5,001	
1,600	\$ (2,828)	\$ (1,390)	\$ 48	\$ 1,486	\$ 2,925	\$ 4,363	\$ 5,801	
1,700	\$ (2,628)	\$ (1,090)	\$ 448	\$ 1,986	\$ 3,525	\$ 5,063	\$ 6,601	
1,800	\$ (2,428)	\$ (790)	\$ 848	\$ 2,486	\$ 4,125	\$ 5,763	\$ 7,401	
1,900	\$ (2,228)	\$ (490)	\$ 1,248	\$ 2,986	\$ 4,725	\$ 6,463	\$ 8,201	

NET RETURNS PER ACRE ABOVE TOTAL COSTS
WITH TEMPRANILLO

Table 15.D

PRICE		YIELD (tons/acre)						
\$/ton		3.00	4.00	5.00	6.00	7.00	8.00	9.00
1,200	\$ (2,590)	\$ (1,552)	\$ (514)	\$ 525	\$ 1,563	\$ 2,601	\$ 3,640	
1,300	\$ (2,290)	\$ (1,152)	\$ (14)	\$ 1,125	\$ 2,263	\$ 3,401	\$ 4,540	
1,400	\$ (1,990)	\$ (752)	\$ 486	\$ 1,725	\$ 2,963	\$ 4,201	\$ 5,440	
1,500	\$ (1,690)	\$ (352)	\$ 986	\$ 2,325	\$ 3,663	\$ 5,001	\$ 6,340	
1,600	\$ (1,390)	\$ 48	\$ 1,486	\$ 2,925	\$ 4,363	\$ 5,801	\$ 7,240	
1,700	\$ (1,090)	\$ 448	\$ 1,986	\$ 3,525	\$ 5,063	\$ 6,601	\$ 8,140	
1,800	\$ (790)	\$ 848	\$ 2,486	\$ 4,125	\$ 5,763	\$ 7,401	\$ 9,040	
1,900	\$ (490)	\$ 1,248	\$ 2,986	\$ 4,725	\$ 6,463	\$ 8,201	\$ 9,940	

Table 16

Texas AgriLife Vineyard Budget - Texas Hill Country Region
Monthly Cash Flow Budget for Production Years

Item	Jan.	Feb.	Mar.	Apr.	May	Jun.
BEGINNING CASH BALANCE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Cash Inflows:						
Farm Product Sales						
Grape Variety 1	-	-	-	-	-	-
Total Cash Inflow	-	-	-	-	-	-
Cash Outflows:						
Operating Expenses						
Pre-Harvest Costs	110	-	420	194	551	496
Harvest Costs	-	-	-	-	-	-
Miscellaneous Costs	348	18	18	49	49	49
Cash Capital Costs	-	-	-	-	-	-
Total Cash Outflow	458	18	438	243	600	545
CASH AVAILABLE	\$ (458)	\$ (18)	\$ (438)	\$ (243)	\$ (600)	\$ (545)
New Borrowings:	458	18	438	243	600	545
Total Accrued New Borrowings	458	476	914	1,157	1,757	2,302
Accrued Interest on New Borrowings	2	3	6	10	16	24
Payments on New Current Debt:						
Principal	-	-	-	-	-	-
Interest	-	-	-	-	-	-
Total Debt Repayments	-	-	-	-	-	-
Ending Cash Balance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Item	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL
BEGINNING CASH BALANCE	\$ -	\$ 4,373	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355	
Cash Inflows:							
Farm Product Sales							
Grape Variety 1	8,250	-	-	-	-	-	8,250
Total Cash Inflow	8,250	-	-	-	-	-	8,250
Cash Outflows:							
Operating Expenses							
Pre-Harvest Costs	377	-	-	-	-	-	2,148
Harvest Costs	809	-	-	-	-	-	809
Miscellaneous Costs	49	18	-	-	-	-	599
Cash Capital Costs	340	-	-	-	-	-	340
Total Cash Outflow	1,575	18	-	-	-	-	3,895
CASH AVAILABLE	\$ 6,675	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355
New Borrowings:	-	-	-	-	-	-	-
Total Accrued New Borrowings	-	-	-	-	-	-	2,302
Accrued Interest on New Borrowings	-	-	-	-	-	-	24
Payments on New Current Debt:							
Principal	2,302	-	-	-	-	-	2,302
Interest	24	-	-	-	-	-	24
Total Debt Repayments	2,326	-	-	-	-	-	2,326
Ending Cash Balance	\$ 4,373	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355	\$ 4,355