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ORCHARD ECONOMICS: THE COSTS AND RETURNS TO ESTABLISH
AND PRODUCE ANJOU AND FRESH BARTLETT PEARS ON A MEDIUM-
DENSITY AND HIGH-DENSITY ORCHARD SYSTEM IN HOOD RIVER
COUNTY

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Photo: A pear orchard at the base of Mount Hood near Parkdale, Oregon.

Orchard Economics: The Costs and Returns to Establish and Produce Anjou and Fresh Bartlett Pears on a Medium-Density and High-Density Orchard System in Hood River County

Ashley Thompson, Clark Seavert, and Steve Castagnoli*

Introduction

Many factors enter into the decision to renew an existing orchard or develop a new one. Both require the commitment of considerable effort and financial resources. Planting a higher density orchard can increase production during the early establishment years and reduce the time to reach full production compared to those of a standard-density orchard. While the higher density orchards have higher economic potential, they also have greater financial risks associated with them.

This analysis is intended for growers and investors who are considering the economic and financial consequences of planting a medium-density and a high-density pear orchard. It is impossible to cover all pear varieties, rootstocks, and training system combinations in a publication of this type so an attempt has been made to reflect the typical pear production practices performed in the mid-valley area of Hood River County.

Assumptions for Both Systems

In the preparation of this publication, assumptions were made that reflect current trends in orchard design for establishing a pear orchard. These assumptions are:

1. **Farm size.** According to the 2017 USDA Farm Census, the average size of farm in Hood River County is 49 acres, however for this analysis, we assume a typical size operation growing fruit is 70 acres.
2. **Land.** Market value of irrigated land with no fruit trees is valued at \$15,000 per acre.
3. **Fruit varieties.** Bearing acres of fruit include: 30 acres of winter pears, 12 acres of fresh market Bartlett pears, 8 acres of

Anjou and fresh Bartlett pears, 5 acres of medium-density apples, 5 acres of high-density sweet cherries or wine grapes, and 10 acres, or approximately 15 percent, of the farm under establishment at various ages. It is also assumed eight acres of orchard are removed for planting.

4. **Labor.** General labor is hired at a rate of \$16.75 per hour, machine labor at \$18.75 per hour, and \$42.50 per bin to harvest pears, which includes worker's compensation, unemployment insurance, and other labor overhead expenses. All general, tractor, and harvest labor is treated as a cash variable expense. A foreman is paid \$30,000 annually at a cost of \$428 per acre, including taxes, etc. listed above. This labor is treated as a fixed cash expense.
5. **Housing.** The owner provides housing facilities for seasonal labor at a cost of \$300,000 for a 10-person unit. The life of the facility is 30 years, depreciated using the straight-line method of depreciation with a zero-salvage value. Interest is calculated using the average value of the system multiplied by a three percent interest rate ($((\text{cost} + \text{salvage value}) \div 2) \times .03$). Repairs and maintenance are two percent of the purchase price per year and costs allocated across the 70 acres of orchard.
6. Foreman housing is provided with all utilities at no cost to the employee, valued at \$2,500 per month, or \$428 per acre, and treated as a fixed non-cash

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opportunity cost to the owner. This is the estimated market rental rate for a three bedroom, two-bathroom house in the area.

7. **Machinery and equipment.** The machinery and equipment reflect the typical machinery complement of a 70-acre farm in Hood River County. A detailed breakdown of machinery values is shown in Appendix A, Table 1, page 10. Estimated machinery costs are shown in Appendix A, Table 2, page 11. A 100-hp tractor is used to pull an air-blast sprayer, flail and shredder, and assist during harvest. A 90-hp tractor is used to auger holes for new trees, spray weeds, mow grass, spread fertilizer, pull an older air-blast sprayer, apply gopher bait, and assist during harvest.
8. **Fuel.** Gasoline, diesel, and propane costs are \$3.75, \$3.25, and \$2.25 per gallon, respectively.
9. **Interest.** The interest rate on operating funds is six percent, which is treated as a cash expense. One-half of the cash expenses are borrowed for a six-month period.
10. Machinery and land are owned and assessed a five and three percent rate of interest, respectively, and treated as a fixed non-cash opportunity cost to the owner.
11. Previous years' establishment costs are provided by the operator at a charge of five percent interest and treated as a fixed non-cash opportunity cost to the owner.
12. **Chemicals.** Herbicides used for strip maintenance are applied to 30 percent of each acre.
13. **Irrigation.** A micro-sprinkler irrigation system with polytube is used at an estimated cost of \$2,100 per acre. The life of the system is 32 years and depreciated using the straight-line method of depreciation with a zero-salvage value. Interest is calculated using the average

value of the system multiplied by a five percent interest rate $((\text{cost} + \text{salvage value}) \div 2) \times .05$. Repairs and maintenance for the system cost one percent of the purchase price per year.

14. **Frost control.** Three wind machines are used for frost control for the entire orchard along with an average of 15 propane heaters per acre. The wind machines are valued at \$35,000 each and propane heaters cost \$78 each. Depreciation periods are 30 years for the wind machines and 10 years for the propane heaters using the straight-line method of depreciation. Interest is calculated using the average value of the system multiplied by a five percent interest rate $((\text{cost} + \text{salvage value}) \div 2) \times .05$. Repairs and maintenance for the system cost one percent of the purchase price per year.
15. **Omitted from this study.** Not included in this study is a return to management, owner labor, family living withdrawals, an accounting for all regulatory costs, annual price and yield volatility, price inflation, and local, state, and federal income taxes paid by the owner.

Medium-Density Orchard Assumptions

16. **Orchard description.** This orchard is planted to a spacing of 10' x 18' (242 pear trees per acre), with 75 percent Anjou and 25 percent Bartlett trees.
17. The productive life of this orchard is 25 years, once full production of 45 bins per acre is reached.
18. Trees in this system are trained to a modified central leader with lowest tier as the only permanent branches (Mid-Columbia central leader).
19. **Grower returns.** The average pear prices are \$250 per 1,050-pound bin return to grower after packing costs have been subtracted.

20. **Pear yields.** Commercial yields begin in year 4 and full production is reached 8 years after planting with 10, 20, 30, 35, and 45 bins per acre, respectively.
21. **Machine costs per acre.** Appendix A, Table 3, page 11 lists the estimated costs per acre for each machine operation with an 18' tree row spacing.
22. **Other assumptions.** Other assumptions for variable, cash fixed, and non-cash fixed costs are listed in Appendix B, Table 5, page 13.
23. Fixed cost input assumptions are listed in Table 7, page 15.

High-Density Orchard Assumptions

24. **Orchard description.** This orchard is planted to a spacing of 6' x 14' (519 pear trees per acre), with 75 percent Bartletts and 25 percent Anjou pears as pollinizers.

25. The productive life of this orchard is 25 years, once full production of 50 bins per acre is reached.
26. Trees are trained to a spindle system on a five-wire vertical trellis system.
27. **Grower returns.** The average pear prices are \$250 per 1,050-pound bin return to grower after packing costs have been subtracted.
28. **Pear yields.** Commercial yields begin in year 3 and full production is reached 8 years after planting with 10, 20, 30, 35, 40, and 50 bins per acre, respectively.
29. **Machine costs per acre.** In Appendix A, Table 4, page 12 lists the estimated costs per acre for each machine operation with a 14' tree row spacing.
30. **Other assumptions.** Other assumptions for variable, cash fixed, and non-cash fixed costs are listed in Appendix B, Table 6, page 14.
31. Fixed cost input assumptions are listed in Table 7, page 15.

Results of establishing a medium-density pear orchard

Cash flow analysis

A cash flow analysis for establishing a medium-density Anjou and fresh Bartlett pear orchard is presented in Appendix C, Table 8, page 16. It shows the cash costs required to develop this type of orchard. Cash costs include labor, trees, irrigation system, fertilizer, chemicals, beehives, machinery repairs, fuel, lube and oil, labor housing repairs and maintenance, operating (short-term) interest, machinery and housing insurance, irrigation water assessments, and property taxes. The income, variable costs, and cash fixed costs are shown for each of the seven establishment years plus the first full production year. Production begins in year 4 with ten bins of pears per acre and increases to 45 bins at full production. Total variable costs are \$1,614 in the first year, with an additional \$1,221 of cash fixed costs for a total cash cost of \$2,835 per acre.

A positive cash flow begins in year 6 with gross income exceeding total cash costs by \$1,053 per acre. At full production or eight years after planting, the orchard does not return a sufficient gross income to pay all previous years' cash costs. There is \$14,080 per acre remaining over and above prior expenses. It is not until year 12 that all previous years' cash costs are covered, Figure 1, page 9.

The major cost components in relation to total cash costs are shown in Table 10, page 18. Hired labor represents 42 percent of the total cash costs to establish this orchard. Together, fertilizer and chemicals are the second-largest cost item, making up 14 percent of the total cash costs. Machine costs, including fuel, oil, and repairs, are 11 percent of the cash costs. Tree and irrigation costs are only five percent each of the total cash costs. The remaining three cost items

make up about 23 percent of the total economic costs.

Economic costs and returns

The economic costs and returns for establishing a medium-density pear orchard are shown in Appendix C, Table 9, page 17. Economic costs include all cash costs and ownership costs that are either an opportunity cost to the owner or money borrowed from a financial institution. These ownership costs include the principal and interest payments or a return on investment to the grower for machinery, housing, land, and funds to pay previous years' establishment costs. The gross income and variable cash costs remain the same as in Table 8, except the irrigation system is amortized over its productive life in this analysis and included in fixed machine costs.

Gross income never exceeds total costs to establish this orchard. At the end of the establishment period, \$41,813 per acre remains to repay all previous establishment costs. This cost is amortized over 25 years as an annual payment of \$2,865 per acre, including principal and interest to recover the capital investment of establishing the orchard.

The relative contributions of each cost component to the total economic cost are shown in Table 10, page 18. When all expenses are included, the top two items are labor and interest charges at about 29 and 21 percent, respectively, followed by machine costs at 16 percent of the total economic costs for the first seven years of establishment. The remaining five cost items make up about 34 percent of the total economic costs, contributing less than nine percent.

Figure 1, page 9, shows the cumulative net returns when economic costs are included. A sensitivity analysis of four

scenarios based on price and interest rates are discussed in the Conclusion section under Applying Theory to Pear Study Results.

Results of establishing a high-density pear orchard

Cash flow analysis

A cash flow analysis for establishing a high-density fresh Bartlett pear orchard is presented in Appendix C, Table 11, page 19. It shows the cash costs required to establish an orchard. Cash costs include labor, trees, irrigation system, fertilizer, chemicals, beehives, machinery repairs, fuel, lube and oil, labor housing repairs and maintenance, operating (short-term) interest, machinery and housing insurance, irrigation water assessments, and property taxes. The income, variable costs, and cash fixed costs are shown for each of the seven establishment years plus the first full production year. Production begins in year 3 with ten bins of pears per acre and increases to 50 bins at full production. Total variable costs are \$1,614 in the first year, with an additional \$1,221 of cash fixed costs for a total cash cost of \$2,835 per acre.

A positive cash flow begins in year 5 with gross income exceeding total cash costs by \$800 per acre. At full production or eight years after planting, the orchard does not return a sufficient gross income to pay all previous years' cash costs. There is \$18,321 per acre remaining over and above prior expenses. It is not until year 12 that all previous years' cash costs are covered, Figure 2, page 9.

The major cost components in relation to total cash costs are shown in Table 13, page 21. Hired labor represents 41 percent of the total cash costs to establish this orchard. Fertilizer and chemicals are 11 percent, variable machine costs 9 percent, followed

Appendix D, Tables 14-22, contain the annual cost and return budgets for establishing this medium-density orchard.

by trees and trellis system at 8 percent each. The remaining four cost items make up about 23 percent of the total cash costs.

Economic costs and returns

The economic costs and returns for establishing a high-density pear orchard are shown in Appendix C, Table 12, page 20. Economic costs include all cash costs and ownership costs that are either an opportunity cost to the owner or money borrowed from a financial institution. These ownership costs include the principal and interest payments or a return on investment to the grower for machinery, housing, land, and funds to pay previous years' establishment costs. The gross income and variable cash costs remain the same as in Table 11, except the irrigation system is amortized over its productive life in this analysis and included in fixed machine costs.

Gross income never exceeds variable costs in establishing this orchard. At the end of the establishment period, \$40,502 per acre remains to repay all previous establishment costs. This cost is amortized over 25 years as an annual payment of \$3,805 per acre, which includes principal and interest to recover the capital investment of establishing the orchard.

The relative contributions of each cost component to the total economic cost are shown in Table 13, page 21. When all expenses are included, the top two items are labor and interest charges at about 28 and 21 percent, respectively, followed by machine costs at 16 percent of the total economic costs for the first seven years of establishment. The remaining six cost items

make up about 35 percent of the total economic costs, contributing less than eight percent.

Figure 2, page 9, shows the cumulative net returns when economic costs are included. A sensitivity analysis of four scenarios based on price and interest rates

are discussed in the Conclusion section under Applying Theory to Pear Study Results.

Appendix E, Tables 23-31, contain the annual cost and return budgets for establishing this high-density pear orchard.

Conclusion

Historically, growers in the Hood River Valley renew orchards when production levels no longer cover the cash variable costs of producing pears. Today, however, poor production has increased interest in replacing old trees with modern higher-density pear orchards.

High-density orchards can offer higher net returns that are obtained earlier in the life of the investment. The trade-off, however, is a higher risk due to more considerable up-front costs and significantly greater management expertise requirements.

There are two key concepts to consider when planting an orchard: profitability and financial feasibility. Profitability determines if future revenues exceed expenses based on the time value of money. Financial feasibility establishes whether the grower has the equity or can borrow funds for the investment. The following are economic theory and financial concepts, focusing on the outcomes of this study, that growers should find valuable in determining management strategies for long-term business success.

Profit Maximization Theory and Measuring Profitability

There are three critical factors to maximizing profits when planting and establishing perennial crops. They are in order of importance:

1. Fruit prices received.
2. Yields, not only how much produced annually but, more importantly, early yields in the life of an establishment period, and

3. Establishment costs.

Too often, growers are “penny-wise, pound foolish cost minimizers,” focusing on avoiding or reducing expenses when they should be seeking profit maximizing opportunities by investing dollars in:

1. Growing high quality fruit.
2. Technologies that achieve early and higher yields.
3. Techniques that result in increased efficiencies.

Economic theory suggests that dollars be invested as long as marginal revenues are greater than marginal costs. Examples would be investing in higher quality nursery stock, support systems, additional detailed pruning, and irrigation systems, as long as the profit maximization theory is met. As the adage goes, sometimes it takes money to make money!

As with most orchard renewal investments, there are sizeable up-front investment costs. The financial metric of net present value captures the total up-front investments and stream of future net cash flows of a potential investment to measure profitability. While profit is an absolute measure of a positive gain from an investment, profitability is the profit relative to the size of the investment. For example, compare two investments when both earn \$1,000 in profits. One of these investments was for \$10,000 and the other was for \$100,000. Clearly, the \$10,000 investment had better profitability, even though both investments generated equal amounts of profits. Profitability measures the efficiency of the investment to generate profit, as in an

internal rate of return. Unlike profit, profitability is a relative measure of the rate of return expected on capital investments, or the size of the return, compared to what could have been obtained from an alternative investment (opportunity cost). Therefore, projecting the returns from a new planting can generate a profit but not necessarily provide long-term profitability.

Addition through Subtraction

It is not uncommon for growers to remove and plant trees based on available annual cash flows, which runs counter to determining replacement based on the economic life of an orchard. This renewal strategy can lead to many unproductive orchards, which creates a challenge for the farm to survive in the long run.

There is a two-prong approach when evaluating orchards and renewal: addition through subtraction and applying financial management principles to existing resources to fund more planted acres. The addition through subtraction concept suggests removing orchards when revenues do not exceed cash variable costs, which could result in several acres without fruit trees. However, this strategy allows growers to allocate resources to the more productive orchards, applying the profit maximization theory described above. Many times, this allocation of resources can increase overall net farm income.

The other strategy is to analyze the business's financial strength and set limits to key financial ratios and performance measures to determine the funds available to invest in more acres of fruit trees. Over the long run, this strategy will create opportunities to replace orchards soon, resulting in a higher orchard renewal rate by increasing net farm incomes.

Applying Theory to Pear Study Results

The results in this study reveal several significant economic and financial impacts to pear producers in the Hood River Valley.

Based on the high percentage of interest charges as it relates to total costs to establish an orchard, a sensitivity analysis will illustrate these impacts by modifying rates of return on investment (ROI) for Capital Expenditures (CapEx) and land ownership. Also included is a scenario of increasing pear prices.

The following analyses are based on Figures 1 and 2, page 9.

Results of study, net returns based on cash flow: Planting a medium- or high-density pear orchard system can cash flow within 12-years after planting to generate a profit. This scenario only includes out-of-pocket expenses, with no ROI for CapEx or land ownership.

Results of study, net returns based on economic costs: When considering all economic costs, neither orchard system creates long-term profitability. The net returns continue to decline to -\$70,000 and -\$80,000 in both systems by the end of a 32-year investment period.

Scenario 1, net returns based on economic costs, except for a 0 percent ROI on land ownership: This scenario does not create long-term profitability as one might expect. The net returns are either relatively flat or decline after reaching full production resulting in -\$32,000 and -\$22,000 per acre at the end of the investment period.

Scenario 2, net returns based on economic costs, except for a 0 percent ROI for capital to establish an orchard: The net returns become positive in years 30 and 18, but in both systems the net returns are not sufficient after turning positive to generate a positive IRR.

Scenario 3, net returns based on economic costs, except for a 0 percent ROI for both land ownership and capital to establish an orchard: Under this scenario, net returns become positive in years 19 and 13. The IRR for the high-density system is six percent at the end of the investment period but again the medium-density system does not generate a positive IRR. Other than the cash flow situation, this scenario generates the highest net returns and a positive IRR for the high-density system.

Scenario 4, net returns based on economic costs, except for a 26 percent increase in pear prices: Increasing pear prices from \$250 to \$315 per field-run bin does not change the profitability picture for either system; all other assumptions are held constant. The net returns become positive for the high-density system in year 21 but does not generate sufficient net returns after that to have a positive IRR by the end of the investment period. The net returns of the medium-density system only become positive in year 32.

Takeaways from this study

Pear growers understand the risks involved in farming tree fruits, recognizing most times, they could make more money in alternative investments of similar risk and receiving a much higher return on their investment. The negative returns on investment in this study may explain the shift to alternative crops in the valley and low removal rates of pear orchards.

One crucial fact why these systems are not profitable over the long run is they do not follow the three critical factors to successful orchard renewal discussed earlier due to:

1. The prices received by the grower are the same in both systems; there is no premium price for a new variety as found in the apple and sweet cherry industries.
2. Obtaining yields in years three and four and reaching full production in eight years, with the assumed yields, are not sufficient to pay back the expense for establishing either system.
3. Production efficiencies are not created in either system, such as incorporating mechanical harvesting to lower total harvest costs, etc.

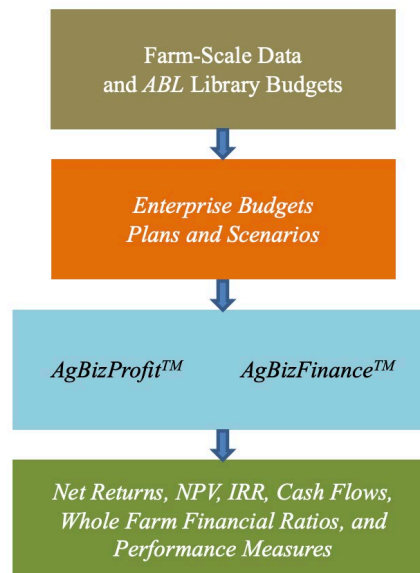
One main criticism of university cost studies is they do not reflect a specific grower's costs for their farm. In addition, they include too many economic costs and assumptions that some growers do not have. The following section will discuss how growers can use the *AgBiz Logic* decision tool to modify the information from this study as

their own.

Using AgBizLogic™ to Analyze Different Price and Yield Scenarios

Using different price and yield scenarios can provide growers with a greater appreciation of the financial risk involved in orchard establishment or renewal. Numerous factors and unforeseen events (e.g., damage from a freeze, rain, hail, birds, changes in market conditions) can impact yield and price, which are ignored in this study.

AgBiz Logic™ (ABL) is an online decision tool that considers the economic and financial factors when analyzing investments. The following schematic shows the data flow and results from the *ABL* decision tool. Grower farm-level data is collected from the tax form Schedule F (Form 1040) to generate enterprise budgets. Enterprise budgets from universities, industry, and USDA-ERS are also stored in the *ABL* Library for grower use when returns and inputs are unknown (brown). Enterprise budgets are sequenced in *ABL* plans and adjusted for inflation, discount rates, and beginning and ending investment values which provide the basis for a capital investment analysis (orange). Scenarios consist of several plans that can be compared to each other and required for the *ABL* tools (blue) to calculate the economic and financial outputs (green).



The *AgBizProfit*TM module enables users to make competent capital investment decisions by measuring an investment's profitability based on its Net Present Value, Internal Rate of Return, and cash flow breakeven.

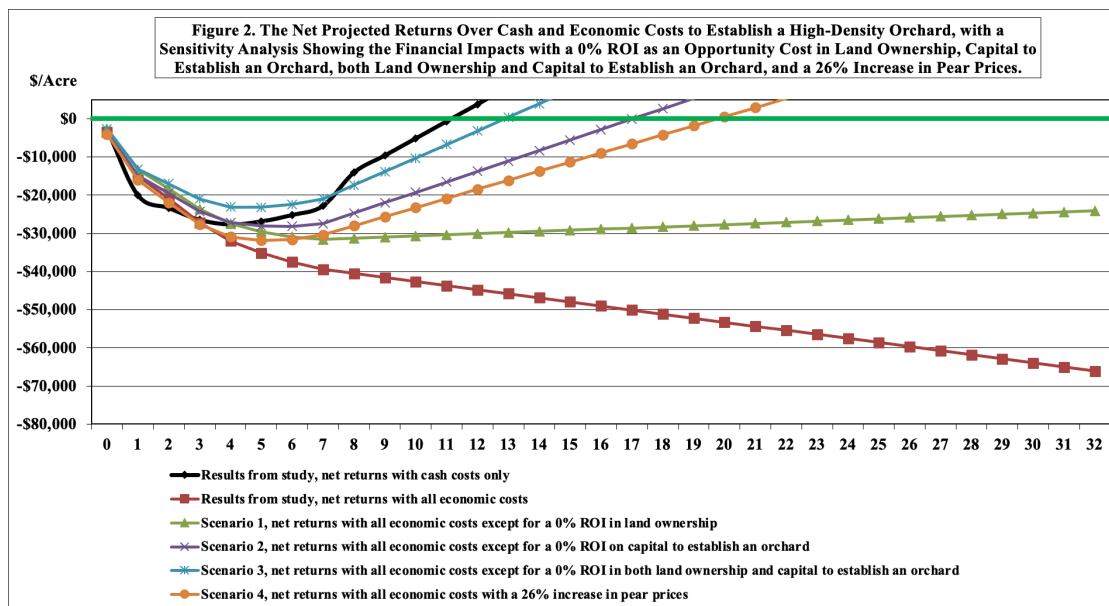
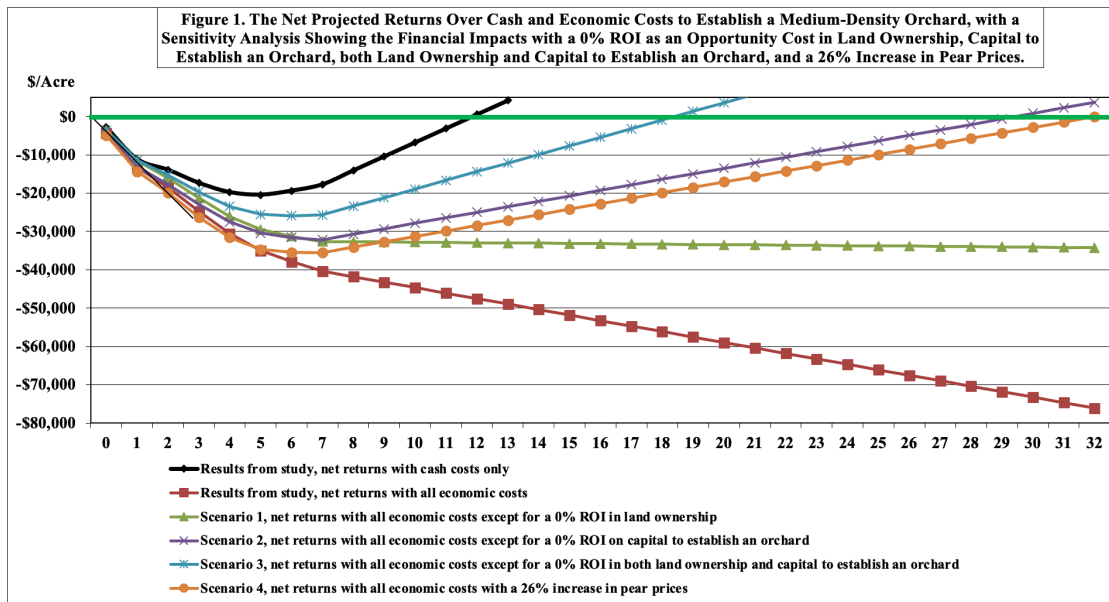
The module *AgBizFinance*TM empowers producers to make whole-farm investment decisions based on 20 financial ratios and performance measures. With this program, users input their current balance sheet information, loans, and capital leases.

AgBizFinance uses this information with plans and scenarios to generate up to 10-years of proforma cash flow statements, balance

sheets, and income statements. Growers can evaluate how orchard renewal plans can impact their short- and long-term finances and how best to fund capital investments.

These *AgBizLogic* decision tools can be accessed at <https://www.agbizlogic.com> currently at no cost. Also, budgets from this study will be available in the *ABL* Library.

It is recommended that before investing in any long-run perennial crop, that the potential investor use *AgBiz Logic* modules to thoroughly analyze the profitability and financial feasibility of potential investments under varying price and yield scenarios.



APPENDIX A

Machinery and Equipment Assumptions and Cost Calculations for a 70-acre Orchard in the Hood River Valley

Table 1. Machinery Cost Assumptions.

Machine	Size or description	Market value	Hours or <i>miles</i> of annual use	Expected life (years)	Salvage Value
Tractor	4 wheel dr 100 hp, new	\$49,000	342	20	\$6,287
Tractor	4 wheel dr 90 hp, older	25,000	205	20	3,208
Air-blast sprayer	400 gallon unit, PTO, new	22,000	101	10	3,891
Air-blast sprayer	400 gallon unit, PTO, older	14,000	68	10	2,476
Flail chopper	9' unit	10,500	48	7	2,679
Rotary Mower	9' unit	9,000	57	10	2,658
Weed sprayer, double boom	100 gallon unit	9,500	26	15	912
Fertilizer spreader		3,075	21	20	160
Brush rake		3,500	21	20	182
Gopher machine		2,400	12	20	125
Pickup	3/4 ton 4x4, new	45,000	12,000	10	17,017
Truck	2 ton, used	18,000	3,500	20	2,710
Gator	4 wheel, new	14,000	3,000	5	6,274
Auger		3,200	N/A	20	167
Front-end loader & backforks		5,800	N/A	20	580
Bin Transporter		11,000	N/A	20	2,200
Ladders	20 units, per 70 acres	4,110	N/A	10	N/A
Picking bags	20 units, per 70 acres	780	N/A	2	N/A
Chain & pruning saws	3 units each, 1-loppers	3,000	N/A	3	N/A
Irrigation system ¹	Micro-sprinklers, per acre	2,100	N/A	32	N/A
Wind machine	3 units, propane, per 70 acres	105,000	70	30	42,000
Propane heaters	15 units, per acre	81,900	70	10	8,190
Trellis system, high-density planting ¹	Five-wire vertical, per acre	5,000	N/A	20	N/A
Housing facilities, 12-person unit	1 unit, per 70 acres	300,000	N/A	30	0

¹Included in costs are all materials and labor to install system.

Table 2. Machinery Cost Calculations.

Machine	Size or description	--- Variable costs ---		-- Fixed costs --		Total cost
		Fuel & Lube	Repairs & Maint.	& Interest	Depreciation	
---- Costs per hour ----						
Tractor	4 wheel dr 100 hp, new	\$14.95	\$1.01	\$10.29		\$26.24
Tractor	4 wheel dr 90 hp, older	14.95	0.72	\$8.75		24.42
Air-blast sprayer	400 gallon unit, PTO, new	0.00	9.05	24.27		33.33
Air-blast sprayer	400 gallon unit, PTO, older	0.00	5.10	23.17		28.27
Flail chopper	9' unit	0.00	1.57	29.87		31.44
Rotary Mower	9' unit	0.00	2.79	14.21		17.00
Weed sprayer, double boom	100 gallon unit	0.00	2.95	31.58		34.52
Fertilizer spreader		0.00	1.48	11.00		12.48
Brush rake		0.00	0.42	12.09		12.51
Gopher machine		0.00	0.99	14.58		15.57
---- Costs per mile ----						
Pickup	3/4 ton 4x4, new	\$0.36	\$0.05	\$0.36		\$0.77
Truck	2 ton, used	0.72	0.57	0.37		1.66
Gator	4 wheel, new	1.04	0.02	0.68		1.74
---- Costs per acre ----						
Auger		\$0.00	\$0.59	\$3.43		\$4.02
Front-end loader & backforks		0.00	\$0.59	6.21		6.80
Bin Transporter		0.00	\$1.76	11.79		13.55
Ladders	20 units, per 70 acres	0.00	3.52	7.34		10.86
Picking bags	20 units, per 70 acres	0.00	0.67	5.85		6.52
Chain & pruning saws	3 units each, 1-loppers	6.47	2.57	15.36		24.40
Irrigation System	Micro-sprinklers, per acre	0.00	21.00	118.13		139.13
Wind machine	3 units, propane, per 70 acres	62.10	15.00	135.00		212.10
Propane heaters	15 units, per acre	18.00	11.70	169.65		199.35
Trellis system, high-density planting ¹	Five-wire vertical, per acre	0.00	50.00	375.00		425.00
Housing facilities, 12-person unit	1 unit, per 70 acres	0.00	85.71	207.14		292.86

Source: American Society of Agricultural Engineers.

Table 3. Estimated Cost of Each Operation with Power Unit for an 18' Between-Row Spacing

Operation	Tractor	Miles per hour	Acres per hour	Labor cost per acre	- Machine costs -		Total cost per acre
					Variable cost per acre	Fixed cost per acre	
Air-blast sprayer, newer	4 wheel dr 100 hp	1.75	2.55	\$7.37	\$9.82	\$13.58	\$30.77
Air-blast sprayer, older	4 wheel dr 90 hp	2.50	2.06	9.10	10.08	15.49	34.66
Flail chopper	4 wheel dr 100 hp	2.50	2.06	9.10	8.50	19.49	37.09
Rotary Mower	4wheel dr 90 hp	3.50	2.89	6.50	6.40	7.96	20.85
Weed sprayer, double boom	4 wheel dr 90 hp	2.75	4.00	4.69	4.65	10.08	19.42
Fertilizer spreader	4 wheel dr 90 hp	3.00	8.15	2.30	2.11	2.42	6.83
Brush rake ¹	N/A	N/A	N/A	0.00	0.21	5.87	6.07
Gopher machine	4 wheel dr 90 hp	2.50	3.88	4.83	4.29	6.02	15.14

¹Included with flail chopper as one operation.

Table 4. Estimated Cost of Each Operation with Power Unit for a 14' Between-Row Spacing.

Operation	Tractor	Miles per hour	Acres per hour	Labor cost per acre	Machine costs		Total cost per acre
					Variable cost per acre	Fixed cost per acre	
Air-blast sprayer, newer	4 wheel dr 100 hp	2.25	2.86	\$6.55	\$8.73	\$12.07	\$27.35
Flail chopper	4 wheel dr 100 hp	2.50	3.61	5.20	4.86	11.14	21.19
Rotary Mower	4wheel dr 90 hp	3.50	5.05	3.71	3.66	4.55	11.92
Weed sprayer, double boom	4 wheel dr 90 hp	2.75	3.50	5.36	1.64	13.08	20.08
Fertilizer spreader	4 wheel dr 90 hp	3.00	7.13	2.63	2.41	2.77	7.81
Brush rake ¹	N/A	N/A	N/A	0.00	0.12	3.35	3.47
Gopher machine	4 wheel dr 90 hp	2.50	3.39	5.52	4.91	6.87	17.31

¹Included with flail chopper as one operation.

APPENDIX B

Input Assumptions for Establishing a Medium-Density and High-Density Pear Orchard in the Hood River Valley

Table 5. Input assumptions for establishing a medium-density pear orchard, (per acre basis).

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Full Prod
Prices per bin	\$0.00	\$0.00	\$0.00	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Bins per acre	0.00	0.00	0.00	0.00	10	20	30	35	45
Cost of general orchard labor, per hour	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75
Cost of tractor driver, per hour	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75
Cost of harvest labor, per bin	\$0.00	\$0.00	\$0.00	\$0.00	\$42.50	\$42.50	\$42.50	\$42.50	\$42.50
Hauling fruit to packinghouse	\$0.00	\$0.00	\$0.00	\$0.00	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50
Hours of pruning and training labor	0.00	10.00	20.00	30.00	40.00	50.00	60.00	75.00	75.00
Hours of thinning labor	0.00	0.00	0.00	0.00	0.00	10.00	15.00	15.00	18.00
Hours of irrigating labor	0.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Hours to install pheromone dispensers	0.00	0.00	0.00	0.00	2.00	2.00	2.00	2.00	2.00
Hours to remove & replace tree labor	0.00	0.50	1.00	1.00	2.50	2.50	2.50	2.50	2.50
Hours for frost protection labor	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Hours of supervisory labor during harvest	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Cost of fertilizer - broadcast applied	\$0.00	\$212.00	\$212.00	\$212.00	\$82.00	\$70.00	\$70.00	\$82.00	\$82.00
Cost of fertilizer - lime	\$130.00	\$0.00	\$0.00	\$0.00	\$130.00	\$0.00	\$0.00	\$130.00	\$32.50
Cost of herbicide strip maintenance	\$0.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00
Cost of insecticides & fungicides	\$0.00	\$0.00	\$200.00	\$400.00	\$800.00	\$800.00	\$800.00	\$800.00	\$800.00
Cost of pheromone dispensers	\$0.00	\$0.00	\$0.00	\$0.00	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00
Cost of rodent materials & trapping	\$0.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00
Cost per beehive	\$0.00	\$0.00	\$0.00	\$0.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00
Times for fertilizer - broadcast applied	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Times for herbicide strip spray	4.00	4.00	4.00	3.00	3.00	2.00	2.00	2.00	2.00
Times for insecticides & fungicides	0.00	0.00	2.00	4.00	10.00	10.00	10.00	10.00	10.00
Number of beehives per acre	0.00	0.00	0.00	0.00	1.00	1.50	1.50	1.50	1.50
Times for rodent control	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Times for flailing orchard floor	0.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Times for mowing orchard floor	0.00	1.00	3.00	6.00	6.00	6.00	6.00	6.00	6.00

¹Includes bin checkers, supervisors, tractor and forklift drivers.

Table 6. Input assumptions for establishing a high-density pear orchard, (per acre basis).

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Full Prod
Prices per bin	\$0.00	\$0.00	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Bins per acre	0	0	0	10	20	30	35	40	50
Cost of general orchard labor, per hour	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75	\$16.75
Cost of tractor driver, per hour	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75	\$18.75
Cost of harvest labor, per bin ¹	\$0.00	\$0.00	\$0.00	\$42.50	\$42.50	\$42.50	\$42.50	\$42.50	\$42.50
Hauling fruit to packinghouse	\$0.00	\$0.00	\$0.00	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50
Hours of pruning and training labor	0.00	10.00	30.00	75.00	60.00	60.00	60.00	60.00	60.00
Hours of thinning labor	0.00	0.00	0.00	10.38	17.30	24.22	31.14	38.06	38.06
Hours of irrigating labor	0.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Hours to install pheromone dispensers	0.00	0.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
Hours to remove & replace tree labor	0.00	2.00	2.00	5.00	5.00	5.00	5.00	5.00	5.00
Hours for frost protection labor	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Hours of supervisory labor during harvest	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Cost of fertilizer - broadcast applied	\$0.00	\$212.00	\$212.00	\$212.00	\$82.00	\$70.00	\$70.00	\$82.00	\$82.00
Cost of fertilizer - lime	\$130.00	\$0.00	\$0.00	\$0.00	\$130.00	\$0.00	\$0.00	\$130.00	\$32.50
Cost of herbicide strip maintenance	\$0.00	\$60.00	\$60.00	\$60.00	\$60.00	\$60.00	\$60.00	\$60.00	\$60.00
Cost of insecticides & fungicides	\$0.00	\$200.00	\$400.00	\$740.00	\$740.00	\$740.00	\$740.00	\$740.00	\$740.00
Cost of pheromone dispensers	\$0.00	\$0.00	\$0.00	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00
Cost of rodent materials & trapping	\$0.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00	\$40.00
Cost per beehive	\$0.00	\$0.00	\$0.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00
Times for fertilizer - broadcast applied	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Times for herbicide strip spray	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Times for insecticides & fungicides	0.00	3.00	5.00	11.00	11.00	11.00	11.00	11.00	11.00
Number of beehives per acre	0.00	0.00	0.00	1.50	1.50	1.50	1.50	1.50	1.50
Times for rodent control	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Times for flailing orchard floor	0.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Times for mowing orchard floor	0.00	1.00	3.00	6.00	6.00	6.00	6.00	6.00	6.00

¹Includes bin checkers, supervisors, tractor and forklift drivers.

Table 7. Fixed cost input assumptions for establishing both a medium- and high-density pear orchard.

Property taxes	\$244.00
Property insurance	\$25.00
Land values	\$25,000
Foreman salary (annual)	\$30,000
Foreman housing (per month)	\$2,500
Irrigation assessment	\$95.00
Miscellaneous & overhead	\$125.00
Tree cost	\$10.00
Gasoline price	\$3.75
Diesel fuel price	\$3.25
Propane Price	\$2.25
Operating interest rate	6.0%
Machinery interest rate	5.0%
Labor housing interest rate	3.0%
Land interest rate	3.0%
Establishment interest rate	5.0%
% of operating capital borrowed	50.0%
Months to borrow operating capital	6.0

APPENDIX C

Cash Costs and Economic Returns and Costs to Establish a Medium-Density and High-Density Pear Orchard.

Table 8. Cash costs and returns of establishing a medium-density pear orchard, \$/acre.										
Income:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Full Prod	
Yield (bins/acre)	0.00	0.00	0.00	0.00	10.00	20.00	30.00	35.00	45.00	
Price (dollars/bin)	\$0.00	\$0.00	\$0.00	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Gross income (dollars/acre)	\$0.00	\$0.00	\$0.00	\$0.00	\$2,500.00	\$5,000.00	\$7,500.00	\$8,750.00	\$11,250.00	
Variable costs (per acre):										
Field preparation	\$1,000.00	\$30.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Trees	0.00	2,420.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Irrigation system	0.00	2,121.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Paint trees	0.00	30.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer	130.00	0.00	212.00	212.00	212.00	70.00	70.00	212.00	114.50	114.50
Chemicals	0.00	50.00	250.00	450.00	850.00	850.00	850.00	850.00	850.00	850.00
Codling moth pheromone disruption	0.00	0.00	0.00	0.00	110.00	110.00	110.00	110.00	110.00	110.00
Bee rental	0.00	0.00	0.00	0.00	55.00	82.50	82.50	82.50	82.50	82.50
Rodent control w/ trapping	0.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Harvest labor	0.00	0.00	0.00	0.00	461.27	905.80	1,350.32	1,572.59	2,017.11	2,017.11
General labor	37.50	1,345.18	525.76	874.99	1,056.19	1,386.50	1,637.75	1,889.00	1,939.25	1,939.25
Machine costs	211.95	744.75	270.75	322.15	604.91	678.18	756.11	795.08	873.00	873.00
Seasonal housing facilities, 12-person ur	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71
Miscellaneous & overhead	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00
Interest: operating capital	23.85	73.37	23.25	32.71	54.62	65.62	77.23	87.04	94.17	94.17
Total variable costs	\$1,614.01	\$7,065.01	\$1,573.48	\$2,213.57	\$3,695.70	\$4,440.31	\$5,225.62	\$5,889.92	\$6,372.25	
Gross income - variable cost	-\$1,614.01	-\$7,065.01	-\$1,573.48	-\$2,213.57	-\$1,195.70	\$559.69	\$2,274.38	\$2,860.08	\$4,877.75	
Cash fixed costs (per acre):										
Foreman salary	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57
Foreman housing	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57
Water assessment	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Property insurance	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Property taxes	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00
Total cash fixed cost	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14
Total cost	\$2,835.15	\$8,286.16	\$2,794.62	\$3,434.72	\$4,916.84	\$5,661.46	\$6,446.77	\$7,111.06	\$7,593.39	
Net projected returns	-\$2,835.15	-\$8,286.16	-\$2,794.62	-\$3,434.72	-\$2,416.84	-\$661.46	\$1,053.23	\$1,638.94	\$3,656.61	
Cumulative returns	-\$2,835.15	-\$11,121.31	-\$13,915.93	-\$17,350.65	-\$19,767.49	-\$20,428.95	-\$19,375.71	-\$17,736.77	-\$14,080.16	

Table 9. Economic costs and returns of establishing a medium-density pear orchard, \$/acre.

Income	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Full Prod
Yield (bins/acre)	0.00	0.00	0.00	0.00	10.00	20.00	30.00	35.00	45.00
Price (dollars/bin)	\$0.00	\$0.00	\$0.00	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Gross income (dollars/acre)	\$0.00	\$0.00	\$0.00	\$0.00	\$2,500.00	\$5,000.00	\$7,500.00	\$8,750.00	\$11,250.00
Variable costs (per acre):									
Field preparation	\$1,000.00	\$30.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Trees	0.00	2,420.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Irrigation system	0.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Paint trees	0.00	30.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00
Fertilizer	130.00	0.00	212.00	212.00	212.00	70.00	70.00	212.00	114.50
Chemicals	0.00	50.00	250.00	450.00	850.00	850.00	850.00	850.00	850.00
Codling moth pheromone disruption	0.00	0.00	0.00	0.00	110.00	110.00	110.00	110.00	110.00
Bee rental	0.00	0.00	0.00	0.00	55.00	82.50	82.50	82.50	82.50
Rodent control w/ trapping	0.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Harvest labor	0.00	0.00	0.00	0.00	461.27	905.80	1,350.32	1,572.59	2,017.11
General labor	37.50	1,345.18	525.76	874.99	1,056.19	1,386.50	1,637.75	1,889.00	1,939.25
Machine costs	211.95	744.75	270.75	322.15	604.91	678.18	756.11	795.08	873.00
Housing facilities	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71
Miscellaneous & overhead	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00
Interest: operating capital	23.85	73.37	23.25	32.71	54.62	65.62	77.23	87.04	94.17
Total variable costs	\$1,614.01	\$4,965.01	\$1,573.48	\$2,213.57	\$3,695.70	\$4,440.31	\$5,225.62	\$5,889.92	\$6,372.25
Gross income - variable cost	-\$1,614.01	-\$4,965.01	-\$1,573.48	-\$2,213.57	-\$1,195.70	\$559.69	\$2,274.38	\$2,860.08	\$4,877.75
Fixed costs (per acre):									
Foreman salary	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57
Foreman housing	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57
Water assessment	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Property insurance	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Property taxes	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00
Machine costs	130.33	1,167.31	361.99	450.15	832.45	829.48	835.50	835.50	835.50
Foreman housing	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57
Seasonal housing facilities, 12-person unit	207.14	207.14	207.14	207.14	207.14	207.14	207.14	207.14	207.14
Land interest costs	750.00	750.00	750.00	750.00	750.00	750.00	750.00	750.00	750.00
Interest on establishment costs	0.00	217.56	665.40	925.78	1,235.60	1,529.13	1,749.42	1,895.29	1,865.30
Total fixed cost	\$2,737.19	\$3,991.73	\$3,634.24	\$3,982.79	\$4,674.91	\$4,965.47	\$5,191.78	\$5,337.65	\$6,307.66
Total cost	\$4,351.20	\$8,956.74	\$5,207.72	\$6,196.37	\$8,370.61	\$9,405.79	\$10,417.40	\$11,227.56	\$12,679.91
Net projected returns	-\$4,351.20	-\$8,956.74	-\$5,207.72	-\$6,196.37	-\$5,870.61	-\$4,405.79	-\$2,917.40	-\$2,477.56	-\$1,429.91
Cumulative returns	-\$4,351.20	-\$13,307.94	-\$18,515.67	-\$24,712.03	-\$30,582.64	-\$34,988.43	-\$37,905.83	-\$40,383.40	-\$41,813.30

¹This cost is an annual payment for 25-years, which includes principal and interest. To recover the investment of establishing this orchard in years 0 to 7.

Table 10. Cash and Economic Costs to Establish a Medium-Density Anjou and fresh Bartlett Pear Orchard for the First Seven Years

Cost Item	Cash Costs	% of Total	Economic Costs	% of Total
Trees	\$2,560	5.22%	\$2,560	3.55%
Irrigation System	2,268	4.62%	2,268	3.14%
Fertilizer and Chemicals	6,783	13.82%	6,783	9.40%
All Labor	20,856	42.49%	20,856	28.89%
All Machine Costs	5,257	10.71%	11,535	15.98%
All Housing	4,629	9.43%	6,493	8.99%
Interest: Loans, Establishment & Land Costs	532	1.08%	15,500	21.47%
Other	6,196	12.62%	6,196	8.58%
Totals	\$49,080		\$72,191	

Table 11. Cash costs and returns of establishing a high-density pear orchard, \$/acre.

Income:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Full Prod
Yield (bins/acre)	0.00	0.00	0.00	10.00	20.00	30.00	35.00	40.00	50.00
Price (dollars/bin)	\$0.00	\$0.00	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Gross income (dollars/acre)	\$0.00	\$0.00	\$0.00	\$2,500.00	\$5,000.00	\$7,500.00	\$8,750.00	\$10,000.00	\$12,500.00
Variable costs (per acre):									
Field preparation	\$1,000.00	\$30.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Trees	0.00	5,190.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Irrigation system	0.00	2,100.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Trellis system	0.00	5,000.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Paint trees	0.00	30.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00
Fertilizer	130.00	0.00	212.00	212.00	212.00	70.00	70.00	212.00	114.50
Chemicals	0.00	60.00	460.00	800.00	800.00	800.00	800.00	800.00	800.00
Modding moth pheromone disruption	0.00	0.00	0.00	0.00	110.00	110.00	110.00	110.00	110.00
Bee rental	0.00	0.00	0.00	0.00	82.50	82.50	82.50	82.50	82.50
Rodent control w/ trapping	0.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Harvest labor	0.00	0.00	0.00	0.00	905.80	1,350.32	1,572.59	1,794.85	2,239.37
General labor	37.50	2,107.99	732.12	2,333.09	1,736.48	1,852.39	1,968.30	2,084.21	2,084.21
Machine costs	211.95	970.57	297.47	569.69	692.62	770.55	809.52	848.48	926.41
Seasonal housing facilities	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71
Miscellaneous & overhead	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00
Interest: operating capital	23.85	236.09	30.95	68.16	73.52	80.96	86.62	94.41	100.78
Total variable cost	\$1,614.01	\$15,975.37	\$2,094.26	\$4,374.66	\$4,974.63	\$5,478.44	\$5,861.24	\$6,388.16	\$6,819.49
Gross income - variable cost	-\$1,614.01	-\$15,975.37	-\$2,094.26	-\$1,874.66	\$25.37	\$2,021.56	\$2,888.76	\$3,611.84	\$5,680.51
Cash fixed costs (per acre):									
Foreman salary	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57
Foreman housing	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57
Water assessment	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Property insurance	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Property taxes	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00
Total cash fixed cost	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14	\$1,221.14
Total cost	\$2,835.15	\$17,196.51	\$3,315.40	\$5,595.81	\$6,195.78	\$6,699.58	\$7,082.38	\$7,609.30	\$8,040.63
Net projected returns	-\$2,835.15	-\$17,196.51	-\$3,315.40	-\$3,095.81	-\$1,195.78	\$800.42	\$1,667.62	\$2,390.70	\$4,459.37
Cumulative returns	-\$2,835.15	-\$20,031.66	-\$23,347.06	-\$26,442.87	-\$27,638.64	-\$26,838.23	-\$25,170.61	-\$22,779.91	-\$18,320.54

Table 12. Economic costs and returns of establishing a high-density pear orchard, \$/acre.

Income:	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Full Prod
Yield (bins/acre)	0.00	0.00	0.00	10.00	20.00	30.00	35.00	40.00	50.00
Price (dollars/bin)	\$0.00	\$0.00	\$0.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00	\$250.00
Gross income (dollars/acre)	\$0.00	\$0.00	\$0.00	\$2,500.00	\$5,000.00	\$7,500.00	\$8,750.00	\$10,000.00	\$12,500.00
Variable costs (per acre):									
Field preparation	\$1,000.00	\$30.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Trees	0.00	5,190.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Irrigation system	0.00	0.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00
Trellis system	0.00	0.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Plant trees	0.00	30.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00
Fertilizer	130.00	0.00	212.00	212.00	212.00	70.00	70.00	212.00	114.50
Chemicals	0.00	60.00	460.00	800.00	800.00	800.00	800.00	800.00	800.00
Codling moth pheromone disruption	0.00	0.00	0.00	0.00	110.00	110.00	110.00	110.00	110.00
Bee rental	0.00	0.00	0.00	0.00	82.50	82.50	82.50	82.50	82.50
Rodent control w/ trapping	0.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Harvest labor	0.00	0.00	0.00	0.00	905.80	1,350.32	1,572.59	1,794.85	2,239.37
General labor	37.50	2,107.99	732.12	2,333.09	1,736.48	1,852.39	1,968.30	2,084.21	2,084.21
Machine costs	211.95	970.57	297.47	569.69	692.62	770.55	809.52	848.48	926.41
Housing facilities	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71
Miscellaneous & overhead	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00	125.00
Interest: operating capital	23.85	236.09	30.95	68.16	73.52	80.96	86.62	94.41	100.78
Total variable costs	\$1,614.01	\$8,875.37	\$2,094.26	\$4,374.66	\$4,974.65	\$5,478.44	\$5,861.24	\$6,388.16	\$6,819.49
Gross income - variable cost	-\$1,614.01	-\$8,875.37	-\$2,094.26	-\$1,874.66	\$25.37	\$2,021.56	\$2,888.76	\$3,611.84	\$5,680.51
Fixed costs (per acre):									
Foreman salary	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57	\$428.57
Foreman housing	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57
Water assessment	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00	95.00
Property insurance	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Property taxes	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00	244.00
Machine costs	130.33	733.69	757.58	1,192.07	1,192.07	1,192.07	1,192.07	1,192.07	1,192.07
Foreman housing	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57	428.57
Seasonal housing facilities	207.14	207.14	207.14	207.14	207.14	207.14	207.14	207.14	207.14
Land interest costs	750.00	750.00	750.00	750.00	750.00	750.00	750.00	750.00	750.00
Interest on establishment costs	0.00	217.56	1,194.23	1,526.88	1,898.78	2,182.40	2,380.38	2,544.91	3,805.20
Total fixed cost	\$1,880.05	\$2,700.96	\$3,701.53	\$4,468.67	\$4,840.57	\$5,124.18	\$5,322.17	\$5,486.70	\$6,746.98
Total cost	\$3,494.06	\$11,576.33	\$5,795.78	\$8,843.33	\$9,815.20	\$10,602.63	\$11,183.41	\$11,874.86	\$13,566.47
Net projected returns	-\$3,494.06	-\$11,576.33	-\$5,795.78	-\$6,343.33	-\$4,815.20	-\$3,102.63	-\$2,433.41	-\$1,874.86	-\$1,066.47
Cumulative returns	-\$3,494.06	-\$15,070.39	-\$20,866.17	-\$27,209.50	-\$32,024.70	-\$35,127.33	-\$37,560.73	-\$39,435.59	-\$40,502.07

¹ This cost is an annual payment for 25-years, which includes principal and interest to recover the investment of establishing this orchard in years 0 to 7.

Table 13. Cash and Economic Costs to Establish a High-Density fresh Bartlett Pear Orchard for the First Seven Years

Cost Item	Cash Costs	% of Total	Economic Costs	% of Total
Trees	\$5,470	8.47%	\$5,470	5.83%
Irrigation System	2,247	3.48%	2,247	2.39%
Trellis System	5,350	8.29%	5,350	5.70%
Fertilizer and Chemicals	7,103	11.00%	7,103	7.56%
All Labor	26,656	41.28%	26,656	28.39%
All Machine Costs	6,097	9.44%	14,871	15.84%
All Housing	4,629	7.17%	6,493	6.91%
Interest: Loans, Establishment & Land Costs	795	1.23%	19,490	20.76%
Other	6,224	9.64%	6,224	6.63%
Totals	\$64,571		\$93,904	

APPENDIX D

Annual Enterprise Budgets to Establish a Medium-Density Anjou and fresh Bartlett Pear Orchard.

Table 14. Year 0, Costs to prepare land for planting a medium-density pear orchard, \$/acre.					
VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total
Tree and root removal, ripping (2x)	2.0 custom	\$0.00	\$0.00	\$1,000.00	\$1,000.00
Disking	2.0 hours	37.50	31.91	0.00	69.41
Fumigation	1.0 custom	0.00	0.00	0.00	0.00
Liming	1.0 custom	0.00	0.00	130.00	130.00
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03
Housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>23.85</u>	<u>23.85</u>
Total variable costs		\$37.50	\$211.95	\$1,364.57	\$1,614.01
FIXED CASH COSTS				Unit	Total
Foreman salary				acre	\$428.57
Foreman housing				acre	428.57
Water assessment				acre	95.00
Property insurance				acre	25.00
Property taxes				acre	<u>244.00</u>
Total fixed cash costs					\$1,221.14
FIXED NON-CASH COSTS				Unit	Total
Machinery and equipment - depreciation & interest				acre	\$20.58
Pickup, truck & Gator - depreciation & interest				acre	109.76
Foreman housing				acre	428.57
Seasonal housing facilities, 12-person unit				acre	207.14
Land interest charge				acre	<u>750.00</u>
Total fixed non-cash costs					\$1,516.05
Total fixed costs					\$2,737.19
Total of all costs per acre					\$4,351.20

Table 15. Year 1 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total	
Augering holes	14.0 hours	\$234.50	\$132.54	\$0.00	\$367.04	
Planting trees	40.0 hours	670.00	\$378.68	2,420.00	3,468.68	
Painting trees	8.0 hours	134.00	0.00	30.00	164.00	
Training trees	10.0 hours	167.50	0.00	0.00	167.50	
Herbicide strip maintenance (.30x)	4.0 applications	18.75	18.61	50.00	87.36	
Seed cover crop	20.0 lbs	16.25	15.68	30.00	61.93	
Flailing orchard floor	1.0 time	9.10	8.50	0.00	17.60	
Mowing orchard floor	1.0 time	6.50	6.40	0.00	12.90	
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13	
Irrigation	5.0 hours	83.75	0.00	21.00	104.75	
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03	
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71	
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00	
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>73.37</u>	<u>73.37</u>	
Total variable costs		\$1,345.18	\$744.75	\$2,875.09	\$4,965.01	
FIXED CASH COSTS					Unit	Total
Foreman salary				acre	\$428.57	
Foreman housing				acre	428.57	
Water assessment				acre	95.00	
Property insurance				acre	25.00	
Property taxes				acre	<u>244.00</u>	
Total fixed cash costs					\$1,221.14	
FIXED NON-CASH COSTS					Unit	Total
Machinery and equipment - depreciation & interest				acre	\$1,057.55	
Pickup, truck & Gator - depreciation & interest				acre	109.76	
Foreman housing				acre	428.57	
Seasonal housing facilities, 12-person unit				acre	207.14	
Land interest charge				acre	750.00	
Prior year's establishment costs - Interest				acre	<u>217.56</u>	
Total fixed non-cash costs					\$2,770.59	
Total fixed costs					\$3,991.73	
Total of all costs per acre					\$8,956.74	

Table 16. Year 2 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total
Pruning and training	20.0 hours	\$335.00	\$0.00	\$0.00	\$335.00
Tree removal & tree replacement	1.0 hour	35.50	16.26	20.00	71.76
Fertilizer & custom lime	2.0 applications	4.60	4.21	212.00	220.81
Herbicide strip maintenance (.30x)	4.0 applications	18.75	18.61	50.00	87.36
Insecticides & fungicides	2.0 applications	14.73	19.65	200.00	234.38
Flailing orchard floor	1.0 time	9.10	8.50	0.00	17.60
Mowing orchard floor	3.0 times	19.50	19.19	0.00	38.69
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13
Irrigation	5.0 hours	83.75	0.00	21.00	104.75
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>23.25</u>	<u>23.25</u>
Total variable costs		\$525.76	\$270.75	\$776.97	\$1,573.48
FIXED CASH COSTS				Unit	Total
Foreman salary				acre	\$428.57
Foreman housing				acre	428.57
Water assessment				acre	95.00
Property insurance				acre	25.00
Property taxes				acre	<u>244.00</u>
Total fixed cash costs					\$1,221.14
FIXED NON-CASH COSTS				Unit	Total
Machinery and equipment - depreciation & interest				acre	\$252.23
Pickup, truck & Gator - depreciation & interest				acre	109.76
Foreman housing				acre	428.57
Seasonal housing facilities, 12-person unit				acre	207.14
Land interest charge				acre	750.00
Prior year's establishment costs - Interest				acre	<u>665.40</u>
Total fixed non-cash costs					\$2,413.10
Total fixed costs					\$3,634.24
Total of all costs per acre					\$5,207.72

Table 17. Year 3 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total
Pruning and training	30.0 hours	\$502.50	\$0.00	\$0.00	\$502.50
Painting trees	8.0 hours	134.00	0.00	30.00	164.00
Tree removal & tree replacement	1.0 hour	35.50	16.26	20.00	71.76
Raking and shredding brush	1.0 x/acre	9.10	8.71	0.00	17.81
Fertilizer & custom lime	2.0 applications	4.60	4.21	212.00	220.81
Herbicide strip maintenance (.30x)	3.0 applications	14.06	13.96	50.00	78.02
Insecticides & fungicides	4.0 applications	29.46	39.30	400.00	468.76
Flailing orchard floor	2.0 times	18.20	17.00	0.00	35.20
Mowing orchard floor	6.0 times	38.99	38.39	0.00	77.38
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13
Irrigation	5.0 hours	83.75	0.00	21.00	104.75
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>32.71</u>	<u>32.71</u>
Total variable costs		\$874.99	\$322.15	\$1,016.43	\$2,213.57
FIXED CASH COSTS				Unit	Total
Foreman salary				acre	\$428.57
Foreman housing				acre	428.57
Water assessment				acre	95.00
Property insurance				acre	25.00
Property taxes				acre	<u>244.00</u>
Total fixed cash costs					\$1,221.14
FIXED NON-CASH COSTS				Unit	Total
Machinery and equipment - depreciation & interest				acre	\$340.40
Pickup, truck & Gator - depreciation & interest				acre	109.76
Foreman housing				acre	428.57
Seasonal housing facilities, 12-person unit				acre	207.14
Land interest charge				acre	750.00
Prior year's establishment costs - Interest				acre	<u>925.78</u>
Total fixed non-cash costs					\$2,761.65
Total fixed costs					\$3,982.79
Total of all costs per acre					\$6,196.37

Table 18. Year 4 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME						
	Quantity	Unit	\$/unit	Total	Price/bin	
Pears	10.00	bins	250.00	<u>2,500.00</u>	<u>250.00</u>	
Total gross income				2,500.00	250.00	
VARIABLE CASH COSTS						
	Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	40.0 hours	\$670.00	\$0.00	\$0.00	\$670.00	\$67.00
Tree removal & tree replacement	2.5 hours	88.75	39.76	20.00	148.51	14.85
Raking and shredding brush	1.0 x/acre	9.10	8.71	0.00	17.81	1.78
Fertilizer & custom lime	2.0 applications	4.60	4.21	212.00	220.81	22.08
Herbicide strip maintenance (.30x)	3.0 applications	14.06	13.96	50.00	78.02	7.80
Insecticides & fungicides	10.0 applications	73.65	98.24	800.00	971.89	97.19
Codling moth pheromone disruption	1.0 application	33.50	0.00	110.00	143.50	14.35
Bee rental	1.0 hive	0.00	0.00	55.00	55.00	5.50
Flailing orchard floor	2.0 times	18.20	17.00	0.00	35.20	3.52
Mowing orchard floor	6.0 times	38.99	38.39	0.00	77.38	7.74
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13	4.91
Frost protection	1.0 hour	16.75	106.80	0.00	123.55	12.36
Irrigation	5.0 hours	83.75	0.00	21.00	104.75	10.48
Ladders, pruning, & picking equip.	1.0 x/acre	0.00	13.23	0.00	13.23	1.32
Harvesting costs	10.0 bins	461.27	35.28	45.00	541.55	54.16
Checkers & supervisors	1.0 hour					
Tractor drivers	1.0 hours					
Hauling fruit to packinghouse	4.50 \$/bin					
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03	18.00
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71	8.57
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00	12.50
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>54.62</u>	<u>54.62</u>	<u>5.46</u>
Total variable costs		\$1,517.46	\$559.91	\$1,618.33	\$3,695.70	\$369.57
FIXED CASH COSTS						
				Unit	Total	Cost/bin
Foreman salary				acre	\$428.57	\$42.86
Foreman housing				acre	428.57	42.86
Water assessment				acre	95.00	9.50
Property insurance				acre	25.00	2.50
Property taxes				acre	<u>244.00</u>	<u>24.40</u>
Total fixed cash costs					\$1,221.14	\$122.11
FIXED NON-CASH COSTS						
				Unit	Total	Cost/bin
Machinery and equipment - depreciation & interest				acre	\$722.70	\$72.27
Pickup, truck & Gator - depreciation & interest				acre	109.76	10.98
Foreman housing				acre	428.57	42.86
Seasonal housing facilities, 12-person unit				acre	207.14	20.71
Land interest charge				acre	750.00	75.00
Prior year's establishment costs - Interest				acre	<u>1,235.60</u>	<u>123.56</u>
Total fixed non-cash costs					\$3,453.77	\$345.38
Total fixed costs					\$4,674.91	\$467.49
Total of all costs per acre					\$8,370.61	\$837.06
Net projected returns					-\$5,870.61	-\$587.06

Table 19. Year 5 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		20.00	bins	250.00	<u>5,000.00</u>	<u>250.00</u>	
Total gross income					5,000.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	50.0 hours		\$837.50	\$0.00	\$0.00	\$837.50	\$41.88
Thinning	10.0 hours		167.50	0.00	0.00	167.50	8.38
Tree removal & tree replacement	2.5 hours		88.75	39.76	20.00	148.51	7.43
Raking and shredding brush	1.0 x/acre		9.10	8.71	0.00	17.81	0.89
Fertilizer & custom lime	2.0 applications		4.60	4.21	70.00	78.81	3.94
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	50.00	68.68	3.43
Insecticides & fungicides	10.0 applications		73.65	98.24	800.00	971.89	48.59
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	7.18
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	4.13
Flailing orchard floor	2.0 times		18.20	17.00	0.00	35.20	1.76
Mowing orchard floor	6.0 times		38.99	38.39	0.00	77.38	3.87
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	2.46
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	6.18
Irigation	5.0 hours		83.75	0.00	21.00	104.75	5.24
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.66
Harvesting costs	20.0 bins		905.80	68.21	90.00	1,064.01	53.20
Checkers & supervisors	1.0 hour						
Tractor drivers	2.1 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	9.00
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	4.29
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	6.25
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>65.62</u>	<u>65.62</u>	<u>3.28</u>
Total variable costs			\$2,292.30	\$588.18	\$1,559.83	\$4,440.31	\$222.02
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$21.43	
Foreman housing				acre	428.57	21.43	
Water assessment				acre	95.00	4.75	
Property insurance				acre	25.00	1.25	
Property taxes				acre	<u>244.00</u>	<u>12.20</u>	
Total fixed cash costs					\$1,221.14	\$61.06	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$719.73	\$35.99	
Pickup, truck & Gator - depreciation & interest				acre	109.76	5.49	
Foreman housing				acre	428.57	21.43	
Seasonal housing facilities, 12-person unit				acre	207.14	10.36	
Land interest charge				acre	750.00	37.50	
Prior year's establishment costs - Interest				acre	<u>1,529.13</u>	<u>76.46</u>	
Total fixed non-cash costs					\$3,744.33	\$187.22	
Total fixed costs					\$4,965.47	\$248.27	
Total of all costs per acre					\$9,405.79	\$470.29	
Net projected returns					-\$4,405.79	-\$220.29	

Table 20. Year 6 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME						
	Quantity	Unit	\$/unit	Total	Price/bin	
Pears	30.00	bins	250.00	<u>7,500.00</u>	<u>250.00</u>	
Total gross income				7,500.00	250.00	
VARIABLE CASH COSTS						
	Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	60.0 hours	\$1,005.00	\$0.00	\$0.00	\$1,005.00	\$33.50
Thinning	15.0 hours	251.25	0.00	0.00	251.25	8.38
Tree removal & tree replacement	2.5 hours	88.75	39.76	20.00	148.51	4.95
Raking and shredding brush	1.0 x/acre	9.10	8.71	0.00	17.81	0.59
Fertilizer & custom cime	2.0 applications	4.60	4.21	70.00	78.81	2.63
Herbicide strip maintenance (.30x)	2.0 applications	9.37	9.31	50.00	68.68	2.29
Insecticides & fungicides	10.0 applications	73.65	98.24	800.00	971.89	32.40
Codling moth pheromone disruption	1.0 application	33.50	0.00	110.00	143.50	4.78
Bee rental	1.5 hives	0.00	0.00	82.50	82.50	2.75
Flailing orchard floor	2.0 times	18.20	17.00	0.00	35.20	1.17
Mowing orchard floor	6.0 times	38.99	38.39	0.00	77.38	2.58
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13	1.64
Frost protection	1.0 hour	16.75	106.80	0.00	123.55	4.12
Irrigation	5.0 hours	83.75	0.00	21.00	104.75	3.49
Ladders, pruning, & picking equip.	1.0 x/acre	0.00	13.23	0.00	13.23	0.44
Harvesting costs	30.0 bins	1,350.32	101.14	135.00	1,586.46	52.88
Checkers & supervisors	1.0 hour					
Tractor drivers	3.1 hours					
Hauling fruit to packinghouse	4.50 \$/bin					
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03	6.00
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71	2.86
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00	4.17
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>77.23</u>	<u>77.23</u>	<u>2.57</u>
Total variable costs		\$2,988.07	\$621.11	\$1,616.44	\$5,225.62	\$174.19
FIXED CASH COSTS						
			Unit	Total	Cost/bin	
Foreman salary			acre	\$428.57	\$14.29	
Foreman housing			acre	428.57	14.29	
Water assessment			acre	95.00	3.17	
Property insurance			acre	25.00	0.83	
Property taxes			acre	<u>244.00</u>	<u>8.13</u>	
Total fixed cash costs				\$1,221.14	\$40.70	
FIXED NON-CASH COSTS						
			Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest			acre	\$725.74	\$24.19	
Pickup, truck & Gator - depreciation & interest			acre	109.76	3.66	
Foreman housing			acre	428.57	14.29	
Seasonal housing facilities, 12-person unit			acre	207.14	6.90	
Land interest charge			acre	750.00	25.00	
Prior year's establishment costs - Interest			acre	<u>1,749.42</u>	<u>58.31</u>	
Total fixed non-cash costs				\$3,970.63	\$132.35	
Total fixed costs				\$5,191.78	\$173.06	
Total of all costs per acre				\$10,417.40	\$347.25	
Net projected returns				-\$2,917.40	-\$97.25	

Table 21. Year 7 establishment, Medium-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		35.00	bins	250.00	<u>8,750.00</u>	<u>250.00</u>	
Total gross income					8,750.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	75.0 hours		\$1,256.25	\$0.00	\$0.00	\$1,256.25	\$35.89
Thinning	15.0 hours		251.25	0.00	0.00	251.25	7.18
Tree removal & tree replacement	2.5 hours		88.75	39.76	20.00	148.51	4.24
Raking and shredding brush	1.0 x/acre		9.10	8.71	0.00	17.81	0.51
Fertilizer	2.0 applications		4.60	4.21	212.00	220.81	6.31
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	50.00	68.68	1.96
Insecticides & fungicides	10.0 applications		73.65	98.24	800.00	971.89	27.77
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	4.10
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	2.36
Flailing orchard floor	2.0 times		18.20	17.00	0.00	35.20	1.01
Mowing orchard floor	6.0 times		38.99	38.39	0.00	77.38	2.21
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	1.40
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	3.53
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	2.99
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.38
Harvesting costs	35.0 bins		1,572.59	117.60	157.50	1,847.69	52.79
Checkers & supervisors	1.0 hour						
Tractor drivers	3.6 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	5.14
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	2.45
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	3.57
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>87.04</u>	<u>87.04</u>	<u>2.49</u>
Total variable costs			\$3,461.58	\$637.58	\$1,790.76	\$5,889.92	\$168.28
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$12.24	
Foreman housing				acre	428.57	12.24	
Water assessment				acre	95.00	2.71	
Property insurance				acre	25.00	0.71	
Property taxes				acre	<u>244.00</u>	<u>6.97</u>	
Total fixed cash costs					\$1,221.14	\$34.89	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$725.74	\$20.74	
Pickup, truck & Gator - depreciation & interest				acre	109.76	3.14	
Foreman housing				acre	428.57	12.24	
Seasonal housing facilities, 12-person unit				acre	207.14	5.92	
Land interest charge				acre	750.00	21.43	
Prior year's establishment costs - Interest				acre	<u>1,895.29</u>	<u>54.15</u>	
Total fixed non-cash costs					\$4,116.50	\$117.61	
Total fixed costs					\$5,337.65	\$152.50	
Total of all costs per acre					\$11,227.56	\$320.79	
Net projected returns					-\$2,477.56	-\$70.79	

Table 22. Full production, Medium-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		45.00	bins	250.00	<u>11,250.00</u>	<u>250.00</u>	
Total gross income					11,250.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	75.0 hours		\$1,256.25	\$0.00	\$0.00	\$1,256.25	\$27.92
Thinning	18.0 hours		301.50	0.00	0.00	301.50	6.70
Tree removal & tree replacement	2.5 hours		88.75	39.76	20.00	148.51	3.30
Raking and shredding brush	1.0 x/acre		9.10	8.71	0.00	17.81	0.40
Fertilizer & Custom Lime	2.0 applications		4.60	4.21	114.50	123.31	2.74
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	50.00	68.68	1.53
Insecticides & fungicides	10.0 applications		73.65	98.24	800.00	971.89	21.60
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	3.19
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	1.83
Flailing orchard floor	2.0 times		18.20	17.00	0.00	35.20	0.78
Mowing orchard floor	6.0 times		38.99	38.39	0.00	77.38	1.72
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	1.09
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	2.75
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	2.33
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.29
Harvesting costs	45.0 bins		2,017.11	150.53	202.50	2,370.14	52.67
Checkers & supervisors	1.0 hour						
Tractor drivers	4.7 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	4.00
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	1.90
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	2.78
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>94.17</u>	<u>94.17</u>	<u>2.09</u>
Total variable costs			\$3,956.36	\$670.50	\$1,745.39	\$6,372.25	\$141.61
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$9.52	
Foreman housing				acre	428.57	9.52	
Water assessment				acre	95.00	2.11	
Property insurance				acre	25.00	0.56	
Property taxes				acre	<u>244.00</u>	<u>5.42</u>	
Total fixed cash costs					\$1,221.14	\$27.14	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$725.74	\$16.13	
Pickup, truck & Gator - depreciation & interest				acre	109.76	2.44	
Foreman housing				acre	428.57	9.52	
Seasonal housing facilities, 12-person unit				acre	207.14	4.60	
Land interest charge				acre	750.00	16.67	
Amortized establishment costs				acre	<u>2,865.30</u>	<u>63.67</u>	
Total fixed non-cash costs					\$5,086.51	\$113.03	
Total fixed costs					\$6,307.66	\$140.17	
Total of all costs per acre					\$12,679.91	\$281.78	
Net projected returns					-\$1,429.91	-\$31.78	

APPENDIX E

Annual Enterprise Budgets to Establish a High-Density fresh Bartlett Pear Orchard

Table 23. Table 8. Year 0, Costs to prepare land for planting a high-density pear orchard, \$/acre.					
VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total
Tree and root removal, ripping (2x)	2.0 custom	\$0.00	\$0.00	\$1,000.00	\$1,000.00
Disking	2.0 hours	37.50	31.91	0.00	69.41
Fumigation	1.0 custom	0.00	0.00	0.00	0.00
Liming	1.0 custom	0.00	0.00	130.00	130.00
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03
Housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>23.85</u>	<u>23.85</u>
Total variable costs		\$37.50	\$211.95	\$1,364.57	\$1,614.01
FIXED CASH COSTS				Unit	Total
Foreman salary				acre	\$428.57
Foreman housing				acre	428.57
Water assessment				acre	95.00
Property insurance				acre	25.00
Property taxes				acre	<u>244.00</u>
Total fixed cash costs					\$1,221.14
FIXED NON-CASH COSTS				Unit	Total
Machinery and equipment - depreciation & interest				acre	\$20.58
Pickup, truck & Gator - depreciation & interest				acre	109.76
Foreman housing				acre	428.57
Seasonal housing facilities, 12-person unit				acre	207.14
Land interest charge				acre	<u>750.00</u>
Total fixed non-cash costs					\$1,516.05
Total fixed costs					\$2,737.19
Total of all costs per acre					\$4,351.20

Table 24. Year 1 establishment, High-density pear orchard, \$/acre economic costs and returns.

VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total	
Augering holes	24.5 hours	\$410.38	\$231.94	\$0.00	\$642.32	
Planting trees	70.0 hours	1,172.50	\$662.70	5,190.00	7,025.20	
Painting trees	14.0 hours	234.50	0.00	30.00	264.50	
Herbicide strip maintenance (.30x)	2.0 applications	9.37	9.31	60.00	78.68	
Seed cover crop	20.0 lbs	16.25	15.68	30.00	61.93	
Flailing orchard floor	1.0 time	5.20	4.86	0.00	10.06	
Mowing orchard floor	1.0 time	3.71	3.66	0.00	7.37	
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13	
Irrigation	5.0 hours	83.75	0.00	2,100.00	2,183.75	
Trellis System		0.00	0.00	5,000.00	5,000.00	
Pickup, truck & Gator	1.0 x/acre	0.00	38.13	0.00	38.13	
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71	
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00	
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>236.09</u>	<u>236.09</u>	
Total variable costs		\$2,107.99	\$970.57	\$12,896.80	\$15,975.37	
FIXED CASH COSTS					Unit	Total
Foreman salary				acre	\$428.57	
Foreman housing				acre	428.57	
Water assessment				acre	95.00	
Property insurance				acre	25.00	
Property taxes				acre	<u>244.00</u>	
Total fixed cash costs					\$1,221.14	
FIXED NON-CASH COSTS					Unit	Total
Machinery and equipment - depreciation & interest				acre	\$623.93	
Pickup, truck & Gator - depreciation & interest				acre	109.76	
Foreman housing				acre	428.57	
Seasonal housing facilities, 12-person unit				acre	207.14	
Land interest charge				acre	750.00	
Prior year's establishment costs - Interest				acre	<u>217.56</u>	
Total fixed non-cash costs					\$2,336.96	
Total fixed costs					\$3,558.10	
Total of all costs per acre					\$19,533.47	

Table 25. Year 2 establishment, High-density pear orchard, \$/acre economic costs and returns.

VARIABLE CASH COSTS	Description	Labor	Machinery	Materials	Total	
Pruning and training	30.0 hours	\$502.50	\$0.00	\$0.00	\$502.50	
Tree removal & tree replacement	2.0 hours	71.00	31.92	40.00	142.92	
Fertilizer & custom lime	1.0 application	2.30	2.11	212.00	216.41	
Herbicide strip maintenance (.30x)	2.0 applications	9.37	9.31	60.00	78.68	
Insecticides & fungicides	5.0 applications	36.83	49.12	400.00	485.95	
Flailing orchard floor	2.0 times	10.40	9.72	0.00	20.11	
Mowing orchard floor	3.0 times	11.14	10.97	0.00	22.11	
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13	
Irrigation	5.0 hours	83.75	0.00	21.00	104.75	
Trellis System		0.00	0.00	50.00	50.00	
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03	
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71	
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00	
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>30.95</u>	<u>30.95</u>	
Total variable costs		\$732.12	\$297.47	\$1,064.66	\$2,094.26	
FIXED CASH COSTS					Unit	Total
Foreman salary				acre	\$428.57	
Foreman housing				acre	428.57	
Water assessment				acre	95.00	
Property insurance				acre	25.00	
Property taxes				acre	<u>244.00</u>	
Total fixed cash costs					\$1,221.14	
FIXED NON-CASH COSTS					Unit	Total
Machinery and equipment - depreciation & interest				acre	\$647.82	
Pickup, truck & Gator - depreciation & interest				acre	109.76	
Foreman housing				acre	428.57	
Seasonal housing facilities, 12-person unit				acre	207.14	
Land interest charge				acre	750.00	
Prior year's establishment costs - Interest				acre	<u>1,194.23</u>	
Total fixed non-cash costs					\$3,337.53	
Total fixed costs					\$4,558.67	
Total of all costs per acre					\$6,652.93	

Table 26. Year 3 establishment, High-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME					
	Quantity	Unit	\$/unit	Total	
Pears	10.00	bins	250.00	<u>2,500.00</u>	
Total gross income				2,500.00	
VARIABLE CASH COSTS					
	Description	Labor	Machinery	Materials	Total
Pruning and training	75.0 hours	\$1,256.25	\$0.00	\$0.00	\$1,256.25
Thinning	10.4 hours	173.87	0.00	30.00	203.87
Tree removal & tree replacement	5.0 hours	177.50	78.93	40.00	296.43
Fertilizer & custom lime	1.0 application	2.30	2.11	212.00	216.41
Herbicide strip maintenance (.30x)	2.0 applications	9.37	9.31	60.00	78.68
Insecticides & fungicides	11.0 applications	81.02	108.06	740.00	929.08
Codling moth pheromone disruption	1.0 application	33.50	0.00	110.00	143.50
Bee rental	1.5 hives	0.00	0.00	82.50	82.50
Flailing orchard floor	2.0 times	10.40	9.72	0.00	20.11
Mowing orchard floor	6.0 times	22.28	21.94	0.00	44.22
Rodent control w/ trapping	1.0 application	4.83	4.29	40.00	49.13
Frost protection	1.0 hour	16.75	106.80	0.00	123.55
Irrigation	5.0 hours	83.75	0.00	21.00	104.75
Trellis System		0.00	0.00	50.00	50.00
Ladders, pruning, & picking equip.	1.0 x/acre	0.00	13.23	0.00	13.23
Harvesting costs	10.0 bins	461.27	35.28	45.00	541.55
Checkers & supervisors	1.0 hour				
Tractor drivers	1.0 hours				
Hauling fruit to packinghouse	4.50 \$/bin				
Pickup, truck & Gator	1.0 x/acre	0.00	180.03	0.00	180.03
Seasonal housing facilities	1.0 x/acre	0.00	0.00	85.71	85.71
Miscellaneous and overhead	1.0 x/acre	0.00	0.00	125.00	125.00
Interest: operating capital	6.0 months	<u>0.00</u>	<u>0.00</u>	<u>68.16</u>	<u>68.16</u>
Total variable costs		\$2,333.09	\$569.69	\$1,709.37	\$4,612.16
FIXED CASH COSTS					
			Unit	Total	
Foreman salary			acre	\$428.57	
Foreman housing			acre	428.57	
Water assessment			acre	95.00	
Property insurance			acre	25.00	
Property taxes			acre	<u>244.00</u>	
Total fixed cash costs				\$1,221.14	
FIXED NON-CASH COSTS					
			Unit	Total	
Machinery and equipment - depreciation & interest			acre	\$1,082.32	
Pickup, truck & Gator - depreciation & interest			acre	109.76	
Foreman housing			acre	428.57	
Seasonal housing facilities, 12-person unit			acre	207.14	
Land interest charge			acre	750.00	
Prior year's establishment costs - Interest			acre	<u>1,526.88</u>	
Total fixed non-cash costs				\$4,104.67	
Total fixed costs				\$5,325.81	
Total of all costs per acre				\$9,937.97	
Net projected returns				-\$7,437.97	

Table 27. Year 4 establishment, High-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		20.00	bins	250.00	<u>5,000.00</u>	<u>250.00</u>	
Total gross income					5,000.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	60.0 hours		\$1,005.00	\$0.00	\$0.00	\$1,005.00	\$50.25
Thinning	17.3 hours		289.78	0.00	0.00	289.78	14.49
Tree removal & tree replacement	5.0 hours		177.50	78.93	40.00	296.43	14.82
Fertilizer & custom lime	1.0 application		2.30	2.11	212.00	216.41	10.82
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	60.00	78.68	3.93
Insecticides & fungicides	11.0 applications		81.02	108.06	740.00	929.08	46.45
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	7.18
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	4.13
Flailing orchard floor	2.0 times		10.40	9.72	0.00	20.11	1.01
Mowing orchard floor	6.0 times		22.28	21.94	0.00	44.22	2.21
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	2.46
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	6.18
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	5.24
Trellis System			0.00	0.00	50.00	50.00	2.50
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.66
Harvesting costs	20.0 bins		905.80	68.21	90.00	1,064.01	53.20
Checkers & supervisors	1.0 hour						
Tractor drivers	2.1 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	9.00
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	4.29
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	6.25
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>73.52</u>	<u>73.52</u>	<u>3.68</u>
Total variable costs			\$2,642.28	\$602.62	\$1,729.73	\$4,974.63	\$248.73
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$21.43	
Foreman housing				acre	428.57	21.43	
Water assessment				acre	95.00	4.75	
Property insurance				acre	25.00	1.25	
Property taxes				acre	<u>244.00</u>	<u>12.20</u>	
Total fixed cash costs					\$1,221.14	\$61.06	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$1,082.32	\$54.12	
Pickup, truck & Gator - depreciation & interest				acre	109.76	5.49	
Foreman housing				acre	428.57	21.43	
Seasonal housing facilities, 12-person unit				acre	207.14	10.36	
Land interest charge				acre	750.00	37.50	
Prior year's establishment costs - Interest				acre	<u>1,898.78</u>	<u>94.94</u>	
Total fixed non-cash costs					\$4,476.57	\$223.83	
Total fixed costs					\$5,697.71	\$284.89	
Total of all costs per acre					\$10,672.34	\$533.62	
Net projected returns					-\$5,672.34	-\$283.62	

Table 28. Year 5 establishment, High-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		30.00	bins	250.00	<u>7,500.00</u>	<u>250.00</u>	
Total gross income					7,500.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	60.0 hours		\$1,005.00	\$0.00	\$0.00	\$1,005.00	\$33.50
Thinning	24.2 hours		405.69	0.00	0.00	405.69	13.52
Tree removal & tree replacement	5.0 hours		177.50	78.93	40.00	296.43	9.88
Fertilizer & custom lime	1.0 application		2.30	2.11	70.00	74.41	2.48
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	60.00	78.68	2.62
Insecticides & fungicides	11.0 applications		81.02	108.06	740.00	929.08	30.97
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	4.78
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	2.75
Flailing orchard floor	2.0 times		10.40	9.72	0.00	20.11	0.67
Mowing orchard floor	6.0 times		22.28	21.94	0.00	44.22	1.47
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	1.64
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	4.12
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	3.49
Trellis System			0.00	0.00	50.00	50.00	1.67
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.44
Harvesting costs	30.0 bins		1,350.32	101.14	135.00	1,586.46	52.88
Checkers & supervisors	1.0 hour						
Tractor drivers	3.1 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	6.00
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	2.86
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	4.17
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>80.96</u>	<u>80.96</u>	<u>2.70</u>
Total variable costs			\$3,202.71	\$635.55	\$1,640.18	\$5,478.44	\$182.61
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$14.29	
Foreman housing				acre	428.57	14.29	
Water assessment				acre	95.00	3.17	
Property insurance				acre	25.00	0.83	
Property taxes				acre	<u>244.00</u>	<u>8.13</u>	
Total fixed cash costs					\$1,221.14	\$40.70	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$1,082.32	\$36.08	
Pickup, truck & Gator - depreciation & interest				acre	109.76	3.66	
Foreman housing				acre	428.57	14.29	
Seasonal housing facilities, 12-person unit				acre	207.14	6.90	
Land interest charge				acre	750.00	25.00	
Prior year's establishment costs - Interest				acre	<u>2,182.40</u>	<u>72.75</u>	
Total fixed non-cash costs					\$4,760.18	\$158.67	
Total fixed costs					\$5,981.33	\$199.38	
Total of all costs per acre					\$11,459.77	\$381.99	
Net projected returns					-\$3,959.77	-\$131.99	

Table 29. Year 6 establishment, High-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		35.00	bins	250.00	<u>8,750.00</u>	<u>250.00</u>	
Total gross income					8,750.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	60.0 hours		\$1,005.00	\$0.00	\$0.00	\$1,005.00	\$28.71
Thinning	31.1 hours		521.60	0.00	0.00	521.60	14.90
Tree removal & tree replacement	5.0 hours		177.50	78.93	40.00	296.43	8.47
Fertilizer & custom lime	1.0 application		2.30	2.11	70.00	74.41	2.13
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	60.00	78.68	2.25
Insecticides & fungicides	11.0 applications		81.02	108.06	740.00	929.08	26.55
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	4.10
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	2.36
Flailing orchard floor	2.0 times		10.40	9.72	0.00	20.11	0.57
Mowing orchard floor	6.0 times		22.28	21.94	0.00	44.22	1.26
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	1.40
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	3.53
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	2.99
Trellis System			0.00	0.00	50.00	50.00	1.43
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.38
Harvesting costs	35.0 bins		1,572.59	117.60	157.50	1,847.69	52.79
Checkers & supervisors	1.0 hour						
Tractor drivers	3.6 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	5.14
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	2.45
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	3.57
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>86.62</u>	<u>86.62</u>	<u>2.47</u>
Total variable costs			\$3,540.89	\$652.02	\$1,668.33	\$5,861.24	\$167.46
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$12.24	
Foreman housing				acre	428.57	12.24	
Water assessment				acre	95.00	2.71	
Property insurance				acre	25.00	0.71	
Property taxes				acre	<u>244.00</u>	<u>6.97</u>	
Total fixed cash costs					\$1,221.14	\$34.89	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$1,082.32	\$30.92	
Pickup, truck & Gator - depreciation & interest				acre	109.76	3.14	
Foreman housing				acre	428.57	12.24	
Seasonal housing facilities, 12-person unit				acre	207.14	5.92	
Land interest charge				acre	750.00	21.43	
Prior year's establishment costs - Interest				acre	<u>2,380.38</u>	<u>68.01</u>	
Total fixed non-cash costs					\$4,958.17	\$141.66	
Total fixed costs					\$6,179.31	\$176.55	
Total of all costs per acre					\$12,040.55	\$344.02	
Net projected returns					-\$3,290.55	-\$94.02	

Table 30. Year 7 establishment, High-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		40.00	bins	250.00	<u>10,000.00</u>	<u>250.00</u>	
Total gross income					10,000.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	60.0 hours		\$1,005.00	\$0.00	\$0.00	\$1,005.00	\$25.13
Thinning	38.1 hours		637.51	0.00	0.00	637.51	15.94
Tree removal & tree replacement	5.0 hours		177.50	78.93	40.00	296.43	7.41
Fertilizer & custom lime	1.0 application		2.30	2.11	212.00	216.41	5.41
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	60.00	78.68	1.97
Insecticides & fungicides	11.0 applications		81.02	108.06	740.00	929.08	23.23
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	3.59
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	2.06
Flailing orchard floor	2.0 times		10.40	9.72	0.00	20.11	0.50
Mowing orchard floor	6.0 times		22.28	21.94	0.00	44.22	1.11
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	1.23
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	3.09
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	2.62
Trellis System			0.00	0.00	50.00	50.00	1.25
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.33
Harvesting costs	40.0 bins		1,794.85	134.07	180.00	2,108.91	52.72
Checkers & supervisors	1.0 hour						
Tractor drivers	4.2 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	4.50
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	2.14
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	3.13
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>94.41</u>	<u>94.41</u>	<u>2.36</u>
Total variable costs			\$3,879.06	\$668.48	\$1,840.62	\$6,388.16	\$159.70
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$10.71	
Foreman housing				acre	428.57	10.71	
Water assessment				acre	95.00	2.38	
Property insurance				acre	25.00	0.63	
Property taxes				acre	<u>244.00</u>	<u>6.10</u>	
Total fixed cash costs					\$1,221.14	\$30.53	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$1,082.32	\$27.06	
Pickup, truck & Gator - depreciation & interest				acre	109.76	2.74	
Foreman housing				acre	428.57	10.71	
Seasonal housing facilities, 12-person unit				acre	207.14	5.18	
Land interest charge				acre	750.00	18.75	
Prior year's establishment costs - Interest				acre	<u>2,544.91</u>	<u>63.62</u>	
Total fixed non-cash costs					\$5,122.70	\$128.07	
Total fixed costs					\$6,343.84	\$158.60	
Total of all costs per acre					\$12,732.00	\$318.30	
Net projected returns					-\$2,732.00	-\$68.30	

Table 31. Full production, High-density pear orchard, \$/acre economic costs and returns.

GROSS INCOME		Quantity	Unit	\$/unit	Total	Price/bin	
Pears		50.00	bins	250.00	<u>12,500.00</u>	<u>250.00</u>	
Total gross income					12,500.00	250.00	
VARIABLE CASH COSTS		Description	Labor	Machinery	Materials	Total	Cost/bin
Pruning and training	60.0 hours		\$1,005.00	\$0.00	\$0.00	\$1,005.00	\$20.10
Thinning	38.1 hours		637.51	0.00	0.00	637.51	12.75
Tree removal & tree replacement	5.0 hours		177.50	78.93	40.00	296.43	5.93
Fertilizer & custom lime	1.0 application		2.30	2.11	114.50	118.91	2.38
Herbicide strip maintenance (.30x)	2.0 applications		9.37	9.31	60.00	78.68	1.57
Insecticides & fungicides	11.0 applications		81.02	108.06	740.00	929.08	18.58
Codling moth pheromone disruption	1.0 application		33.50	0.00	110.00	143.50	2.87
Bee rental	1.5 hives		0.00	0.00	82.50	82.50	1.65
Flailing orchard floor	2.0 times		10.40	9.72	0.00	20.11	0.40
Mowing orchard floor	6.0 times		22.28	21.94	0.00	44.22	0.88
Rodent control w/ trapping	1.0 application		4.83	4.29	40.00	49.13	0.98
Frost protection	1.0 hour		16.75	106.80	0.00	123.55	2.47
Irrigation	5.0 hours		83.75	0.00	21.00	104.75	2.10
Trellis System			0.00	0.00	50.00	50.00	1.00
Ladders, pruning, & picking equip.	1.0 x/acre		0.00	13.23	0.00	13.23	0.26
Harvesting costs	50.0 bins		2,239.37	166.99	225.00	2,631.37	52.63
Checkers & supervisors	1.0 hour						
Tractor drivers	5.2 hours						
Hauling fruit to packinghouse	4.50 \$/bin						
Pickup, truck & Gator	1.0 x/acre		0.00	180.03	0.00	180.03	3.60
Seasonal housing facilities	1.0 x/acre		0.00	0.00	85.71	85.71	1.71
Miscellaneous and overhead	1.0 x/acre		0.00	0.00	125.00	125.00	2.50
Interest: operating capital	6.0 months		<u>0.00</u>	<u>0.00</u>	<u>100.78</u>	<u>100.78</u>	<u>2.02</u>
Total variable costs			\$4,323.58	\$701.41	\$1,794.49	\$6,819.49	\$136.39
FIXED CASH COSTS				Unit	Total	Cost/bin	
Foreman salary				acre	\$428.57	\$8.57	
Foreman housing				acre	428.57	8.57	
Water assessment				acre	95.00	1.90	
Property insurance				acre	25.00	0.50	
Property taxes				acre	<u>244.00</u>	<u>4.88</u>	
Total fixed cash costs					\$1,221.14	\$24.42	
FIXED NON-CASH COSTS				Unit	Total	Cost/bin	
Machinery and equipment - depreciation & interest				acre	\$1,082.32	\$21.65	
Pickup, truck & Gator - depreciation & interest				acre	109.76	2.20	
Foreman housing				acre	428.57	8.57	
Seasonal housing facilities, 12-person unit				acre	207.14	4.14	
Land interest charge				acre	750.00	15.00	
Amortized establishment costs				acre	<u>3,805.20</u>	<u>76.10</u>	
Total fixed non-cash costs					\$6,382.98	\$127.66	
Total fixed costs					\$7,604.13	\$152.08	
Total of all costs per acre					\$14,423.62	\$288.47	
Net projected returns					-\$1,923.62	-\$38.47	