ALMOND ORCHARD ESTABLISHMENT COSTS
FOR THE NORTHERN SAN JOAQUIN VALLEY - 1991

BY

WESLEY K. ASAI - UNIVERSITY OF CALIFORNIA
POMOLOGY FARM ADVISOR, STANISLAUS COUNTY

LONNIE C. HENDRICKS - UNIVERSITY OF CALIFORNIA
POMOLOGY FARM ADVISOR, MERCEDES COUNTY

This cost study is designed to provide almond orchardists or prospective growers the estimated costs to establish a new almond orchard. This study is based on typical costs for a better than average orchard under good management. The costs may reflect practices that are not necessary for all growers in all years.

This study assumes that the farm has good soil, good water, very good equipment, and top management. Used equipment is often purchased for orchard use. This will reduce capital investment, depreciation and interest, but will likely increase repair costs, operating costs and down time. This study uses costs based on 60% of new costs to reflect this mix of new and used equipment.

In this study, harvest costs are based on current custom harvest charges when equipment is hired, and on operating costs where the equipment is owned. Hulling is assumed to be custom, therefore interest and depreciation for hulling is not included.

GENERAL ASSUMPTIONS

1. LAND:
   Land is valued at $5000/acre. There are 2.4 acres allocated to roads and farmstead. This increases the cost of land to $5263/producing acre. Land is not depreciated.

2. TREES:
   Trees are planted at 24' X 24' square spacings, with 75 trees per acre. The orchard is assumed to be 100 acres.

3. IRRIGATION:
   The orchard is flood irrigated with irrigation district canal water, and costs reflect the Modesto Irrigation District.

4. PEST MANAGEMENT:
   In year 1 there is only a spring Twig Borer spray. In year 2 there is a spring and a dormant spray. In year 3 a spring fungicide spray is added and in years 4 and 5 a summer worm spray is added.

5. LABOR:
   Hourly wages for workers are $5.97 and $4.25 per hour for skilled and field workers respectively. Adding 34% for FICA, insurance and other benefits gives labor rates shown of $8.00 per hour for skilled and $5.70 per hour for field labor. The labor operations involving machinery are 10% higher to reflect the extra labor involved in equipment moving, setup and maintenance.
6. OVERHEAD:
   County taxes are calculated as 1% of the land value plus 1% of the average value of the trees, equipment, buildings and improvements. Insurance is charged at 0.8% of the average value of the equipment over its useful life. Office and business costs are estimated at 4% of cash costs.

7. INTEREST:
   Interest on operating capital is based on cash costs and is calculated at a rate of 12% per year. Interest is also charged on investment at 12% per year to account for income forgoes that could be received from an alternative investment (opportunity cost) and is based on the value of the land plus the average value of the trees over the life of the orchard, buildings and equipment.

8. EQUIPMENT:
   In allocating equipment costs per acre, the following calculations were made: (a) Original Cost of equipment is the cost of new equipment plus sales tax; (b) Depreciation is straightline with no salvage value; (c) Interest on investment is calculated as one-half of the new cost per acre (the average value of equipment during its useful life) multiplied by an interest rate of 12%; (d) The total investment costs are also calculated as 60% of the depreciation and the interest costs for all new equipment to reflect a mix of new and used equipment.
SAMPLE COSTS TO ESTABLISH AN ALMOND ORCHARD  
NORTHERN SAN JOAQUIN VALLEY - 1991

Labor costs (Total to the grower) Skilled labor = $8.00 / Hr.  Field labor = $5.70 / Hr.  Interest rate = 12%

Costs are for a 100 acre orchard planted 24' X 24' Square (75 trees / acre), under flood irrigation with cultivated middles.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>COSTS PER ACRE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
</tr>
<tr>
<td>YIELD IN POUNDS OF MEATS PER ACRE</td>
<td>0</td>
</tr>
</tbody>
</table>

**PLANTING COSTS**
- Land preparation: Backhoe (8 holes per hr.) $350.00
- Fumigate: (Methyl bromide) $500.00
- Disk and float $66.00
- Tree cost $262.50
- Survey and plant $75.00
- **TOTAL PLANTING COSTS** $1,253.50

**CULTURAL COSTS**
- Prune and train $0.00
- Ridge and knock banquet $3.00
- Irrigate (6x)
  - Labor $11.40
  - Water cost $10.00
- Fertilizer and application $10.00
- Pest control program $25.00
- Pollination $12.68
- Miscellaneous labor and materials $20.00
- Interest on operating capital - 12% $84.81
- Office and business expense (4% of cash costs) $59.93
- **TOTAL PREHARVEST CASH COSTS** $1,558.23

**HARVEST COSTS**
- Shake $65.00
- Sweep $19.69
- Hand rake $4.28
- Pick up and haul $57.75
- Hull and shell ($0.05 per meat lb.) $25.00
- **TOTAL HARVEST COSTS** $0.00

**TOTAL CASH COSTS** $1,558.23

**DEPRECIATION**
- Buildings and equipment $111.00
- **TOTAL DEPRECIATION COSTS** $111.00

**INTEREST ON INVESTMENT @ 12%**
- Buildings and equipment $92.00
- Land ($5000 / Acre Bare land cost) $600.00
- Interest on accumulated costs $263.35
- **TOTAL INTEREST ON INVESTMENT COSTS** $692.00

**TOTAL COST PER ACRE FOR YEAR** $2,361.23

**CREDIT FOR NUT MEATS @ $1.00 / LB.** $500.00

**NET COST FOR YEAR** $2,361.23

**TOTAL ACCUMULATED COST** $2,361.23

UC COOPERATIVE EXTENSION
## Equipment and Building List for Almonds

*Northern San Joaquin Valley - 1990.*

**Assumes grower owns all except harvest equipment.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>New Cost</th>
<th>Annual Use (Acres)</th>
<th>Annual Cost Per Acre</th>
<th>Life (Years)</th>
<th>Trade Off</th>
<th>Depreciation</th>
<th>Interest</th>
<th>Tar*</th>
<th>Fuel</th>
<th>Repairs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60 HP Diesel Tractor</td>
<td>$25,000</td>
<td>100</td>
<td>$220.00</td>
<td>1200</td>
<td>10</td>
<td>$22.00</td>
<td>$15.00</td>
<td>120</td>
<td>8.40</td>
<td>2.50</td>
<td>99.00</td>
</tr>
<tr>
<td>2</td>
<td>30 HP Diesel Tractor</td>
<td>$15,000</td>
<td>100</td>
<td>150.00</td>
<td>1200</td>
<td>10</td>
<td>15.00</td>
<td>9.00</td>
<td>120</td>
<td>1.70</td>
<td>1.50</td>
<td>3.20</td>
</tr>
<tr>
<td>3</td>
<td>100 Gal PTO Weed Sprayer</td>
<td>$27,500</td>
<td>100</td>
<td>28.00</td>
<td>1200</td>
<td>10</td>
<td>6.75</td>
<td>1.65</td>
<td>100</td>
<td>2.29</td>
<td>2.29</td>
<td>4.58</td>
</tr>
<tr>
<td>4</td>
<td>500 Gal (Gallon) Sprayer</td>
<td>$38,000</td>
<td>100</td>
<td>380.00</td>
<td>2000</td>
<td>10</td>
<td>38.00</td>
<td>22.60</td>
<td>80</td>
<td>5.30</td>
<td>15.20</td>
<td>20.50</td>
</tr>
<tr>
<td>5</td>
<td>10 Ft Flail Mower</td>
<td>$65,000</td>
<td>100</td>
<td>65.00</td>
<td>2000</td>
<td>10</td>
<td>6.50</td>
<td>3.90</td>
<td>120</td>
<td>3.90</td>
<td>3.90</td>
<td>7.80</td>
</tr>
<tr>
<td>6</td>
<td>Buckrake/Frontend Loader</td>
<td>$56,000</td>
<td>100</td>
<td>56.00</td>
<td>2500</td>
<td>10</td>
<td>5.60</td>
<td>3.36</td>
<td>100</td>
<td>2.24</td>
<td>2.24</td>
<td>4.48</td>
</tr>
<tr>
<td>7</td>
<td>4 Wheel ATV &amp; Sprayer</td>
<td>$60,000</td>
<td>100</td>
<td>60.00</td>
<td>3000</td>
<td>5</td>
<td>12.00</td>
<td>3.65</td>
<td>60</td>
<td>1.20</td>
<td>1.20</td>
<td>1.20</td>
</tr>
<tr>
<td>8</td>
<td>Pruning Equipment</td>
<td>$12,000</td>
<td>100</td>
<td>12.00</td>
<td>10</td>
<td>1</td>
<td>1.20</td>
<td>0.72</td>
<td>100</td>
<td>0.72</td>
<td>0.72</td>
<td>1.44</td>
</tr>
<tr>
<td>9</td>
<td>1/2 Ton Pickup</td>
<td>$14,000</td>
<td>100</td>
<td>140.00</td>
<td>2000</td>
<td>5</td>
<td>28.00</td>
<td>8.40</td>
<td>60</td>
<td>4.20</td>
<td>4.20</td>
<td>8.40</td>
</tr>
<tr>
<td>10</td>
<td>Flood Irrigation System</td>
<td>$30,000</td>
<td>100</td>
<td>300.00</td>
<td>7000</td>
<td>35</td>
<td>8.57</td>
<td>36.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Two Irrigation Pumps (100Hp)</td>
<td>$35,000</td>
<td>100</td>
<td>350.00</td>
<td>3000</td>
<td>20</td>
<td>17.50</td>
<td>21.00</td>
<td>5</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>12</td>
<td>Shaker Harvester</td>
<td>$0</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>13</td>
<td>Sweeper</td>
<td>$0</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>14</td>
<td>Pick-up Machine &amp; 4 Carts</td>
<td>$0</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>15</td>
<td>12 Ft Offset Disc</td>
<td>$6,333</td>
<td>100</td>
<td>68.00</td>
<td>2500</td>
<td>10</td>
<td>6.83</td>
<td>4.10</td>
<td>120</td>
<td>3.28</td>
<td>3.28</td>
<td>6.56</td>
</tr>
<tr>
<td>16</td>
<td>14 Ft Roller Float</td>
<td>$15,000</td>
<td>100</td>
<td>15.00</td>
<td>2500</td>
<td>10</td>
<td>1.50</td>
<td>0.90</td>
<td>120</td>
<td>0.72</td>
<td>0.72</td>
<td>1.44</td>
</tr>
<tr>
<td>17</td>
<td>10 Ft Springtooth</td>
<td>$6,000</td>
<td>100</td>
<td>60.00</td>
<td>2500</td>
<td>10</td>
<td>6.00</td>
<td>3.60</td>
<td>120</td>
<td>2.88</td>
<td>2.88</td>
<td>5.76</td>
</tr>
</tbody>
</table>

**Buildings:**

- Buildings: $25,000
- Misc Tools: $6,000
- Thermometers & Frost Alarm: $500

**Total Costs**: $224,863

**60% of New Costs**: $134,140

**$186,000**

*Definitions*

- **Years to Trade**: The projected life of the machine in years adjusted for excessive annual use.
- **Overhead**: Cost per acre per year.
- **Depreciation**: "Cost per acre" divided by "years to trade".
- **Interest**: "Cost per acre x interest rate" divided by 2 - average interest cost per acre per year.
- **Tar**: Total accumulated repairs. The total cost of repairs during the machine's life expressed as a percent of "new cost". Calculated from equations based on equipment type and annual use.
- **Hourly Cost of Fuel**: Diesel fuel, oil, and lubrication costs per hour = hp x cost per gallon x 0.0667
- **Hourly Cost of Repairs**: Gasoline fuel, oil, and lubrication costs per hour = hp x cost of gasoline per gallon x 0.0889
- **60% of New Costs**: Used to reflect a mix of new and used equipment.

---

UC Cooperative Extension