Northeast Texas Initiative for Cooperative Development
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Budgeting A Greenhouse or Hoop House

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What is a Budget?

- A budget provides an estimate of potential revenue, expenses, and profit
- A budget can be done for a single enterprise (also called enterprise budget)
- What is an enterprise?
  - A product, crop, or livestock
• The base unit for a greenhouse or hoop house
  – Its dimension (the space available) if only growing inside.
  – Some other convenient size if starting inside and then growing outside.
• What is the typical base unit for crops?
  – One acre
• What is the typical base unit for livestock?
  – One head or some other convenient size
    • For livestock, one head
    • For cattle, one cow
    • For swine, one litter
    • For poultry, 100 birds
Budgets

- Budgets represent typical situations
- The primary purpose is to estimate the projected costs, returns, and profit
- Budgets help planning
## Budget for Watermelon Production (One Acre)

<table>
<thead>
<tr>
<th>Item</th>
<th>Value per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
</tr>
<tr>
<td>250 cwt @ $5.50 per cwt</td>
<td>$1,375.00</td>
</tr>
<tr>
<td><strong>Variable Costs</strong></td>
<td></td>
</tr>
<tr>
<td>Seed</td>
<td>$80.00</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>95.50</td>
</tr>
<tr>
<td>Chemicals</td>
<td>97.75</td>
</tr>
<tr>
<td>Machinery expense</td>
<td>35.15</td>
</tr>
<tr>
<td>Custom Spray</td>
<td>8.00</td>
</tr>
<tr>
<td>Harvesting and Hauling</td>
<td>500.00</td>
</tr>
<tr>
<td>Labor</td>
<td>320.00</td>
</tr>
<tr>
<td>Interest @ 10% for 6 months</td>
<td>56.82</td>
</tr>
<tr>
<td>Total variable cost</td>
<td>$1,193.22</td>
</tr>
<tr>
<td>Income above variable cost</td>
<td>$181.78</td>
</tr>
<tr>
<td><strong>Fixed Costs</strong></td>
<td></td>
</tr>
<tr>
<td>Machinery depreciation, interest, taxes, and insurance</td>
<td>$62.00</td>
</tr>
<tr>
<td>Land charge</td>
<td>100.00</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$162.00</td>
</tr>
<tr>
<td>Total costs</td>
<td>$1,355.22</td>
</tr>
<tr>
<td>Estimated Profit</td>
<td>$19.78</td>
</tr>
</tbody>
</table>

**Source:** Kay, Edwards, and Duffy (p. 178, 2011)
Remarks

• Most enterprise budgets cover a year or less.
• Revenue is typically shown first.
• The cost section comes next.
  – Variable (or operating) costs
    • Pre-harvest costs
  – Fixed costs
    • Costs of the greenhouse or hoop house
    • Cost of the land used
  – Economic budgets include opportunity costs
    • Operator labor, capital used for variable costs, capital invested in the greenhouse or hoop house, and capital invested in land.
Economic Budgeting

- On an economic budget, some opportunity costs are included.
- Typically, these opportunity costs are for operator labor, and for capital invested in the greenhouse or hoop house and land.
- The profit or return that is calculated including these costs is an economic profit.
- In the watermelon budget, no opportunity cost was included for management.
- The profit in the watermelon budget is therefore the return to management.
Examples of Variable Expenses

a. Seed, Fertilizer, and Pesticides
b. Greenhouse or hoop house repairs
c. Electricity (or fuel)
d. Replacement of equipment (globes, trowel, hand cultivator, hoses, bags, labels, etc.)
e. Labor
f. Interest
g. Etc.
Local Feed Stores

- Potts Feed Store (Emory and Quitman, TX)
  - www.pottsfeedstore.com
- MFM Feed (Wolf City and Sulphur Springs, TX)
  - www.martindalefeed.com
- Atwoods (Greenville, Sulphur Springs, and Paris, TX)
  - www.atwoods.com
- Fix and Feed (Bonham, Sulphur Springs, Commerce, TX)
  - www.fixandfeed.com
- Lowes (Greenville, Sulphur Springs, Forney, and Rockwall, TX)
  - www.lowes.com
- Home Depot (Greenville, Paris, Rockwall, TX)
  - www.homedepot.com
Other Feed Stores

- BWI Companies Inc.  
  http://bwicompanies.com/
- Genetic Seed & Chemical  
  http://www.geneticseed.com/
- Willhite Seed Inc.  
  http://willhiteseed.com/
Examples of Fixed Expenses

a. Greenhouse or Hoop House Depreciation
b. Greenhouse or Hoop House Interest
c. Insurance
d. Land Charge
e. Miscellaneous Overhead
Steps for Budgeting A Greenhouse or Hoop House

- There would be a budget for the initial investment in the greenhouse or hoop house.
- There would be a budget for the season (crop year).
I. Budget the Initial Investment

• Greenhouse or hoop house
  – Build/construct it yourself
  – Buy it online and assemble it yourself
  – Buy it from a retailer

• Equipment
Building A Hoop House Yourself
Plastic

- Cost depends on the size of the structure
- Approximately $120/roll
- Helps protect against winter cold
- Traps heat and moisture
- Solid or plastic endwalls
- Solid endwalls would be constructed of plywood 2-3 sheets (usually 4’ x 8’ each) per end
- Don’t forget to construct a door
  – At least one end if not both
Landscape Fabric (Weed Screen)

• Fabric approximately $100/roll to cover entire floor
  – Concrete
  – Pebble Rocks
  – Bare Ground (if keep maintained)
Square Metal Tubing

- Special Order
- 1” 16 gauge galvanized
  24 feet
- Approximately $450-
  $600
Wooden Raised Bed 4 ft x 12 ft

Image Sources: baybranchfarm.com
Community Food and Garden Network recommends ACQ (Alkaline Copper Quat) Ground Contact treated lumber that the Food and Drug Administration (FDA) approves for food contact and growing. This lasts for at least 10 yrs.

Image Source: homedepot.com
Additional Information

• “How-to: Hoop House Construction Tips” by Steve Upson. 
  http://www.noble.org/ag/horticulture/hoopconstruct/
• “Hoop House Construction for New Mexico: 12-ft. x 40-ft. Hoop House,” New Mexico State University, Cooperative Extension Service, Circular 606 
• “Portable Field Hoophouse,” WSU Extension Manual EM015 
• “How to Build a Hoophouse for your Garden,” The Westside Gardener 
  http://westsidegardener.com/howto/hoophouse.html
• “Interested in Building Your Own Greenhouse? Here is How” 
  http://www.floridagardener.com/greenhouse/greenhousematerials.htm
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Quantity</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic PVC Pipes 2-in. x 20-ft.</td>
<td>$7.00</td>
<td>13</td>
<td>$91.00</td>
</tr>
<tr>
<td>Plastic PVC Pipe 3/4-in. x 10-ft.</td>
<td>$1.25</td>
<td>8</td>
<td>$10.00</td>
</tr>
<tr>
<td>Rebar 1/2-in. x 24-ins.</td>
<td>$1.50</td>
<td>22</td>
<td>$33.00</td>
</tr>
<tr>
<td>Glue 16-oz.</td>
<td>$5.00</td>
<td>1</td>
<td>$5.00</td>
</tr>
<tr>
<td>Screws (Drywall Screws)</td>
<td>$5.00</td>
<td>1</td>
<td>$5.00</td>
</tr>
<tr>
<td>Wood Strips 1-in. x 4-in. x 10-ft.</td>
<td>$3.00</td>
<td>8</td>
<td>$24.00</td>
</tr>
<tr>
<td>Plastic Cover (6-mil) 22-ft. x 100-ft.</td>
<td>$200.00</td>
<td>1/2</td>
<td>$200.00</td>
</tr>
<tr>
<td>Plywood 1/2-in. x 4-ft. x 8-ft.</td>
<td>$24.00</td>
<td>6</td>
<td>$144.00</td>
</tr>
<tr>
<td>Wood Studs 2-in. x 4-in. x 8-ft.</td>
<td>$3.00</td>
<td>8</td>
<td>$24.00</td>
</tr>
<tr>
<td>Hinges</td>
<td>$1.00</td>
<td>6</td>
<td>$6.00</td>
</tr>
<tr>
<td>Latch</td>
<td>$3.00</td>
<td>3</td>
<td>$9.00</td>
</tr>
<tr>
<td>Aluminum Trim 1/4-in. x 1-in. x 10-ft.</td>
<td>$1.00</td>
<td>12</td>
<td>$12.00</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td></td>
<td></td>
<td><strong>$568.00</strong></td>
</tr>
</tbody>
</table>

**Source:** “Hoop House Construction for New Mexico: 12-ft. x 40-ft. Hoop House,” New Mexico State University, Cooperative Extension Service, Circular 606, p. 5.
Buying A Hoop House Online
Websites

• Greenhouse Kits

http://www.hoophouse.com/index.html

http://growerssolution.com/page/GS/CTGY/hobby?t=green_house_kits_ppc&gclid=COjaMe4_bkCFS1p7AodggMA8g

• Self-installation
Buying a Greenhouse or Hoop House from a Retailer
For Example

• Plantation Greenhouses

  2825 South I-35W
  Burleson, TX 76028

  www.plantationgreenhouses.com
Equipment
Garden Gloves

Image Source: outblush.com
Hand Trowel

Image Source: lawn-and-garden.hardwarestore.com

Image Source: organicgardeninfo.com

Image Source: ok.gov
Hand Cultivator

*Image Source:* amazon.com
*Image Source:* gardentoolcompany.com
*Image Source:* gardentoolcompany.com
Fan Rake

Image Source: sears.com

Image Source: promo-wholesale.com

Image Source: amazon.com
Bypass Pruning Shears

Image Sources:
homedepot.com
amazon.com
lowes.com
homedepot.com
Outdoor Pushbroom

Image Source: amazon.com

Image Source: homedepot.com

Image Source: amazon.com
¾ inch 75 ft Garden Hose

Colorite Element ELCF34075 Contractor Farm Lead Free, Kink Free 3/4-Inch-by-75-Foot Garden Hose, Brick

Image Sources: amazon.com
Wheelbarrow

- 4 cubic feet
  Image Source: amazon.com

- 5 cubic feet
  Image Source: homedepot.com

- 7 cubic feet
  Image Source: homedepot.com
Scale

11 lbs or 5kg capacity

22 lbs or 10 kg capacity

44 lbs or 20 kg capacity

*Image Source:*
amazon.com

*Image Source:*
amazon.com

*Image Source:*
homedepot.com
Trash Receptacle (Trash Can)

Image Sources:
amazon.com
webstaurantstore.com
Non-Priority Items
Long Handled Shovels

Image Source: tootoo.com
Long Handled Hoe

Image Source: amazon.com
Plastic Tote Box

18 gallons

50 gallons

Image Sources: amazon.com, homedepot.com, lowes.com
Hand Towels

Image Sources:
amazon.com
homedepot.com
lowes.com
Twine

Image Sources:
amazon.com
**Wooden Stakes**

*Image Sources:*
amazon.com
homedepot.com

1 in x 2 in x 24 in

2 ft long and
2 inches in diameter

1 in x 2 in x 36 in
How are wooden stakes used?

Image Sources: amazon.com
Rain Barrel

Image Sources:
homedepot.com
lowes.com
livingdirect.com

50 gallons
55 gallons
60 gallons
10 ft x 8 ft Storage Shed

Vinyl-coated Steel

Galvanized Steel

*Image Source:* homedepot.com

*Image Source:* lowes.com
## Budget for Equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost ($)</th>
<th>Unit</th>
<th>Qty</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>lumber 2&quot; x 6&quot; x 10'</td>
<td>7.00</td>
<td>per piece</td>
<td>6</td>
<td>$42</td>
</tr>
<tr>
<td>gloves</td>
<td>7.27</td>
<td>each</td>
<td>1</td>
<td>7.27</td>
</tr>
<tr>
<td>long-handled garden hoe</td>
<td>27.54</td>
<td>each</td>
<td>1</td>
<td>27.54</td>
</tr>
<tr>
<td>long-handled shovel</td>
<td>18.66</td>
<td>each</td>
<td>1</td>
<td>18.66</td>
</tr>
<tr>
<td>trowel</td>
<td>4.49</td>
<td>each</td>
<td>1</td>
<td>4.49</td>
</tr>
<tr>
<td>fan rake</td>
<td>8.04</td>
<td>each</td>
<td>1</td>
<td>8.04</td>
</tr>
<tr>
<td>hand cultivator</td>
<td>5.00</td>
<td>each</td>
<td>1</td>
<td>5.00</td>
</tr>
<tr>
<td>Garden Hose</td>
<td>44.44</td>
<td>3/4&quot; x 75 feet</td>
<td>1</td>
<td>44.44</td>
</tr>
<tr>
<td>Pushbroom</td>
<td>18.99</td>
<td>each</td>
<td>1</td>
<td>18.99</td>
</tr>
<tr>
<td>Wooden Stakes</td>
<td>17.93</td>
<td>pack of 25</td>
<td>1</td>
<td>17.93</td>
</tr>
<tr>
<td>Twine</td>
<td>3.04</td>
<td>per 190 ft</td>
<td>1</td>
<td>3.04</td>
</tr>
<tr>
<td>Trash Can</td>
<td>9.88</td>
<td>32 gallon trash can</td>
<td>1</td>
<td>9.88</td>
</tr>
<tr>
<td>Hand Towel</td>
<td>10.65</td>
<td>set of 2</td>
<td>1</td>
<td>10.65</td>
</tr>
<tr>
<td>Bypass Pruner</td>
<td>19.98</td>
<td>each</td>
<td>1</td>
<td>19.98</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$237.91</strong></td>
</tr>
</tbody>
</table>
II. Budget the Season (Crop Year)

a. Unit of Measurement
b. Period of Time
c. Single or Multiple products
d. Assessment of Facilities
e. Equipment
a. Unit of Measurement

• Use as unit of measurement the space available if only growing inside.
• Use some other convenient size if starting inside and then growing outside.
b. Period of Time

- Use the season (crop year) for the time period considered in the budget
- All costs and revenues should be calculated for the same time period.
c. Single or Multiple Products

- May grow inside the greenhouse or hoop house
  - Tomatoes
  - Lettuce
  - Cucumbers
  - Herbs (basil, cilantro, celery, ginger, parsley, pepper, etc.)
  - Etc.
- May start in the greenhouse or hoop house and then plant outside (a new budget may be needed!)
  - Carrots
d. Assessment of Facilities

• Annual depreciation, interest, taxes, and insurance should be computed for each facility (if more than one)
e. Inventory of Equipment and Supplies

• Need to identify variable and fixed expenses
• Variable expenses
  – Seeds
  – Seed starting trays
  – Dirt, starting mix
  – Bags
  – Fertilizer
  – Plastic Labels
Seeds

Tomatoes

Peppers

Cucumbers

Lettuce

Cilantro

Parsleys

Oregano

Basil
Seed Starter Tray

Image Source: dirtworks.net

Image Source: tianhua-plastics.com

Image Source: ebay.com
Seed Starting Mix and Potting Mix

*Image Sources:* amazon.com
Garbage Bags

Image Sources: amazon.com
Organic Garden Fertilizer

Image Sources: amazon.com
Plastic Plant Labels

Image Sources:
amazon.com
homedepot.com
## Budget for The Season (Crop Year)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost ($)</th>
<th>Unit</th>
<th>Qty</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veggie seeds</td>
<td>1.30</td>
<td>per packet</td>
<td>10</td>
<td>$13.00</td>
</tr>
<tr>
<td>Seed starter tray</td>
<td>7.15</td>
<td>each</td>
<td>10</td>
<td>71.50</td>
</tr>
<tr>
<td>Seed starting mix</td>
<td>1.00</td>
<td>per 16 quart bag</td>
<td>7.5</td>
<td>7.50</td>
</tr>
<tr>
<td>Garbage Bags</td>
<td>26.99</td>
<td>70 bags of 33 gallons</td>
<td>1</td>
<td>26.99</td>
</tr>
<tr>
<td>Organic Garden Fertilizer</td>
<td>13.76</td>
<td>4 lbs</td>
<td>1</td>
<td>13.76</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$142.74</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Where to sell your excess produce?

- Farmer’s Markets
- Local supermarkets
- Local restaurants
- Start you own business (road side stand, etc.)
Prices and Yields

• The appropriate price and yield data used in an enterprise budget will depend on its use
• A budget for next month’s planning may use current price and yield
• A budget to be used for next year’s planning will require the best estimate of next year’s price and yield
• A budget used for long-run planning will require estimates of average prices and yields over the long run
Cost of Production

Cost of Production = \frac{\text{Total Cost}}{\text{Yield}}

• If the product can be sold for more than the cost of production, a profit will be made.
• If opportunity costs are included in the budget, the resulting profit is an economic profit.
Break-Even Analysis

- The budget can be used to do a break-even analysis
- Break-even yield and break-even prices can be computed
Break Even Yield = \[ \frac{\text{Total Cost}}{\text{Price of Product}} \]

The table below shows a hypothetical analysis of break-even yields for different expected prices.

<table>
<thead>
<tr>
<th>Total Cost ($)</th>
<th>Price ($/lb)</th>
<th>Break-even yield (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.75</td>
<td>133</td>
</tr>
<tr>
<td>100</td>
<td>1.00</td>
<td>100</td>
</tr>
<tr>
<td>100</td>
<td>1.25</td>
<td>80</td>
</tr>
<tr>
<td>100</td>
<td>1.50</td>
<td>67</td>
</tr>
<tr>
<td>100</td>
<td>1.75</td>
<td>57</td>
</tr>
</tbody>
</table>
Break-Even Price

**Break Even Price** = \( \frac{\text{Total Cost}}{\text{Expected Yield}} \)

The table below shows a hypothetical analysis of break-even prices for different expected yields.

<table>
<thead>
<tr>
<th>Total Cost ($)</th>
<th>Yield (lbs)</th>
<th>Break-Even Price ($/lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>250</td>
<td>0.40</td>
</tr>
<tr>
<td>100</td>
<td>300</td>
<td>0.33</td>
</tr>
<tr>
<td>100</td>
<td>350</td>
<td>0.29</td>
</tr>
<tr>
<td>100</td>
<td>400</td>
<td>0.25</td>
</tr>
<tr>
<td>100</td>
<td>450</td>
<td>0.22</td>
</tr>
</tbody>
</table>
Questions?
Thanks!