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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

Base Unit

- 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)

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

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 (gloves, 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

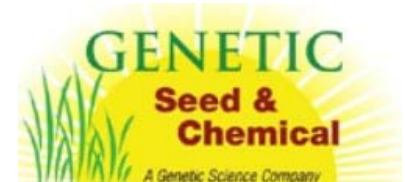
- BWI Companies Inc.

<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 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



Plywood

- 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

Lumber 2 in x 6 in x 10 ft



2 in x 6 in x 10 ft

Image Source: homedepot.com



2 in x 6 in x 10 ft

Image Source: homedepot.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.

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
http://www.bae.ncsu.edu/programs/extension/publicat/postharv/green/small_greenhouse.pdf
- “Portable Field Hoophouse,” WSU Extension Manual EM015
<http://cru.cahe.wsu.edu/CEPublications/em015/em015.pdf>
- “A Small Backyard Greenhouse for the Home Gardener,” North Carolina Cooperative Extension Service
http://www.bae.ncsu.edu/programs/extension/publicat/postharv/green/small_greenhouse.pdf
- “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 1. Hoop House Construction Material List and Estimated Cost, 12-ft. x 40-ft.

Item	Cost	Quantity	Total Cost
1. Plastic PVC Pipes 2-in. x 20-ft.	\$7.00	13	\$91.00
2. Plastic PVC Pipe 3/4-in. x 10-ft.	\$1.25	8	\$10.00
3. Rebar 1/2-in. x 24-ins.	\$1.50	22	\$33.00
4. Glue 16-oz.	\$5.00	1	\$5.00
5. Screws (Drywall Screws) 2 in box, 150 Screws	\$5.00	1	\$5.00
3 in box, 150 Screws	\$5.00	1	\$5.00
6. Wood Strips 1-in. x 4-in. x 10-ft.	\$3.00	8	\$24.00
7. Plastic Cover (6-ml.) 22-ft. x 100-ft.	\$200.00	1/2	\$200.00
8. Plywood 1/2-in. x 4-ft. x 8-ft.	\$24.00	6	\$144.00
9. Wood Studs 2-in. x 4-in. x 8-ft.	\$3.00	8	\$24.00
10. Hinges	\$1.00	6	\$6.00
11. Latch	\$3.00	3	\$9.00
12. Aluminum Trim 1/4-in. x 1-in. x 10-ft.	\$1.00	12	\$12.00
Total Cost			\$568.00

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=COja-Me4_bkCFS1p7AodggMA8g](http://growerssolution.com/page/GS/CTGY/hobby?t=green+house+kits+ppc&gclid=COja-Me4_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

3/4 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

Image Source:
amazon.com



22 lbs or 10 kg capacity

Image Source:
amazon.com



44 lbs or 20 kg capacity

Image Source:
homedepot.com

Trash Receptacle (Trash Can)



Image Sources:

amazon.com

webstaurantstore.com

Non-Priority Items

Long Handled Shovels

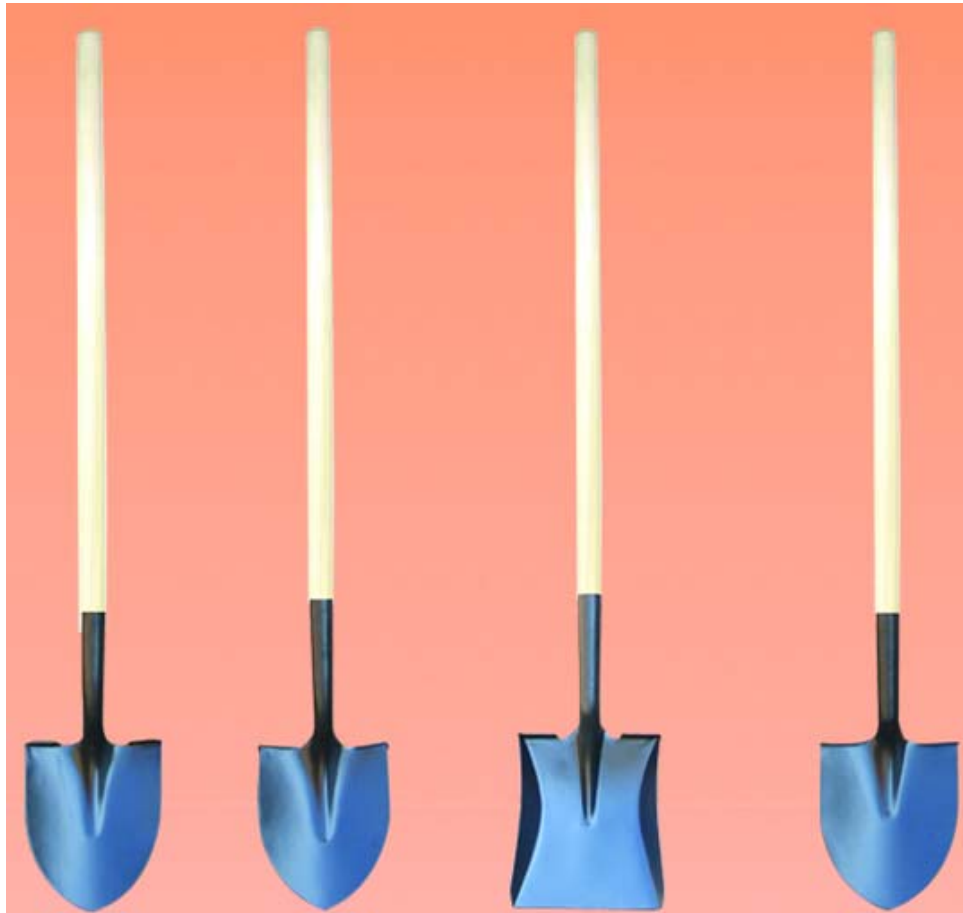


Image Source: tootoo.com

Long Handled Hoe



Image Source: [amazon.com](https://www.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

Image Source: homedepot.com



Galvanized Steel

Image Source: lowes.com

Budget for Equipment

Item	Cost (\$)	Unit	Qty	Total Cost
lumber 2" x 6" x 10'	7.00	per piece	6	\$42
gloves	7.27	each	1	7.27
long-handled garden hoe	27.54	each	1	27.54
long-handled shovel	18.66	each	1	18.66
trowel	4.49	each	1	4.49
fan rake	8.04	each	1	8.04
hand cultivator	5.00	each	1	5.00
Garden Hose	44.44	3/4" x 75 feet	1	44.44
Pushbroom	18.99	each	1	18.99
Wooden Stakes	17.93	pack of 25	1	17.93
Twine	3.04	per 190 ft	1	3.04
Trash Can	9.88	32 gallon trash can	1	9.88
Hand Towel	10.65	set of 2	1	10.65
Bypass Pruner	19.98	each	1	19.98
Total				\$237.91

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

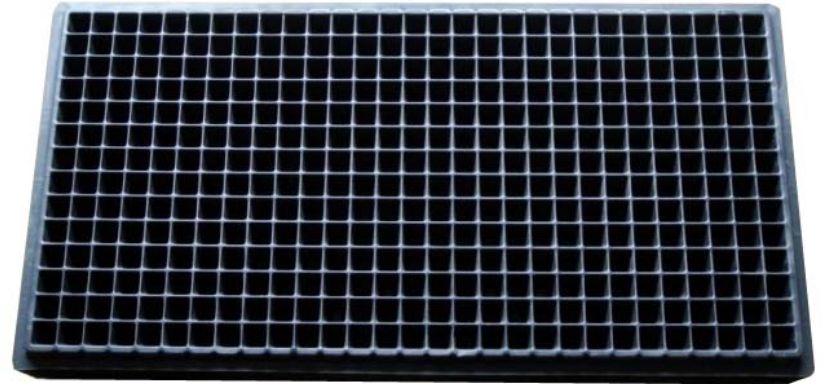


Image Source: tianhua-plastics.com

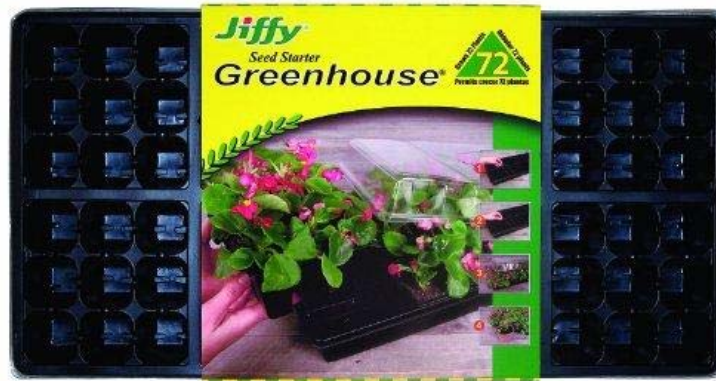


Image Source: ebay.com

Seed Starting Mix and Potting Mix



Image Sources: amazon.com

Garbage Bags



Image Sources: amazon.com

Organic Garden Fertilizer

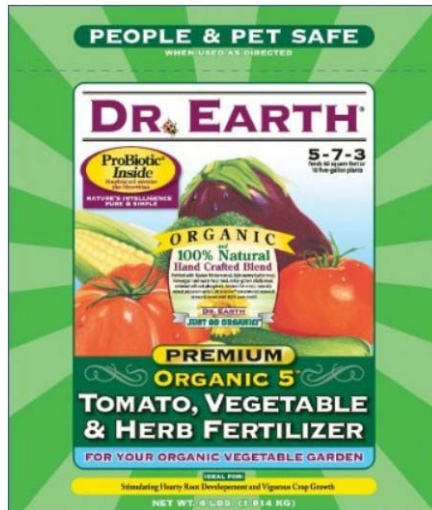


Image Sources: amazon.com

Plastic Plant Labels



Image Sources:
amazon.com
homedepot.com

Budget for The Season (Crop Year)

Item	Cost (\$)	Unit	Qty	Total Cost
Veggie seeds	1.30	per packet	10	\$13.00
Seed starter tray	7.15	each	10	71.50
Seed starting mix	1.00	per 16 quart bag	7.5	7.50
Garbage Bags	26.99	70 bags of 33 gallons	1	26.99
Organic Garden Fertilizer	13.76	4 lbs	1	13.76
Plastic Plant labels	9.99	pack of 100	1	9.99
Total				\$ 142.74

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

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

- 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

$$\text{Break Even Yield} = \frac{\text{Total Cost}}{\text{Price of Prouct}}$$

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

Total Cost (\$)	Price (\$/lb)	Break-even yield (lbs)
100	0.75	133
100	1.00	100
100	1.25	80
100	1.50	67
100	1.75	57

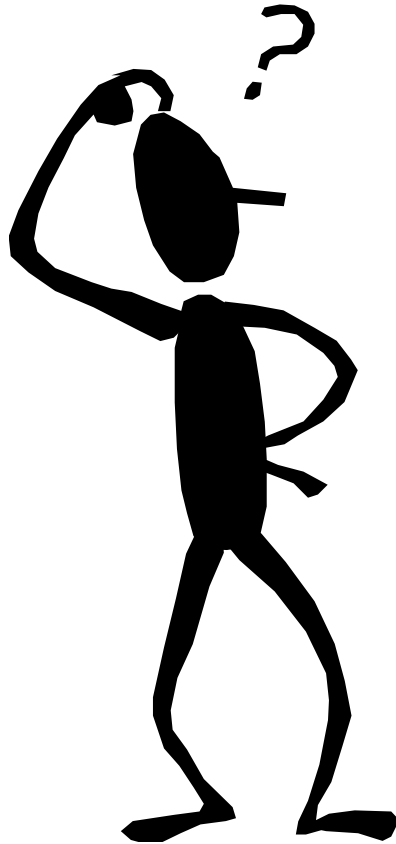
Break-Even Price

$$\text{Break Even Price} = \frac{\text{Total Cost}}{\text{Expected Yield}}$$

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

Total Cost (\$)	Yield (lbs)	Break-Even Price (\$/lb)
100	250	0.40
100	300	0.33
100	350	0.29
100	400	0.25
100	450	0.22

Questions?



Thanks!