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Of Raising Cantaloupes?

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WHAT ARE MY COSTS

of raising cantaloupes?

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Farmers often wonder what it costs to grow and harvest a crop or what it costs to raise a particular class of livestock. Enterprise cost studies are occasionally available, yet these data are not always applicable in an individual situation.

The purpose of this publication is to report some dollar costs and returns from growers and to outline how a grower can either make future estimates or simply record his own production costs and dollar returns. This is essentially a do-it-yourself kit. A sharp pencil and a little time are all that are required.

Read through the entire publication before attempting to develop your own costs and returns. At the end, several sets of budgeting sheets are included. These are identical with the data presented first. A grower may use these blank sheets to budget his own costs and returns.

Budgeting Technique

Budgeting is a method used to determine present-day costs of production or to develop plans for future use of certain resources, using current capital outlays. The present-day prices used in the technique more nearly reflect today's situation, or those costs that can be expected. This approach becomes more meaningful than cost accounting which has been used to a large extent in the past.

Answers derived in the process depend, of course, on the data put into the budget. Answers depend on:

- Physical inputs used (labor, power, equipment, seed, fertilizer)
- Cost data or prices (land values, labor rates, other costs)
- Methods of budgeting, along with degree of accuracy desired
- Judgment of the person doing the job

Each grower can develop his own production costs along with the probable results he can obtain. In doing so he can use his own physical coefficients, his own basic assumptions or values, the costs he expects to pay and the prices he himself can command. Final results are of course determined by the amounts of resources he uses and the value he places on them.

Production Costs Per 10-Sash Bed and Per Acre

In 1957 the average cost of raising cantaloupe plants was $81.21 per 10-sash bed or $33.84 per acre of cantaloupe planted (Table 1). These figures are based on:

1. A concrete block foundation and window-glass sash with estimated service lives of 50 and 25 years, respectively.

2. Present-day capital outlays of $30.78 (foundation) and $106.52 (sash).

3. Annual ownership costs of 5.25 and 10.25 percent, respectively.

4. Typical labor and material inputs as used by 39 melon growers.

The average cost of growing and harvesting cantaloupe (including the cover crop and the plants) was $171.21 per acre (Table 2). This figure is based on:

1. A cost of $33.84 per acre for plants.

2. A land value of $302 per acre.

3. An average of 43.4 hours of labor used to grow the crop.

4. A 2-plow tractor, along with other equipment of a complementary size (except for cultivating where a 1-plow tractor and 1-row cultivator were used).

5. A mechanical transplanter, but no fumigation or spraying.

6. A fertilizer application of 67 pounds nitrogen, 58 pounds phosphate and 49 pounds potash.

7. A yield of 119 bushels of cantaloupe per acre which required an average of 23.4 hours of labor for harvesting.

Table 1. Budgeted cost of raising cantaloupe plants, 39 farms, Southwestern Indiana, 1957.

Basic data resources used	Method of cost computation	Cost per 10-sash bed Sub-total	Total
1. Annual ownership costs			
Present-day replacement cost of capital outlays			
Foundation $30.78			
	x 2.00% Depreciation		
	x 2.25% Interest		
	x 0.00% Repairs		
	x 0.76% Taxes		
	x 0.24% Insurance		
	x 5.25% Total =	$ 1.61	
Sash $106.52			
	x 4.00% Depreciation		
	x 2.75% Interest		
	x 2.50% Repairs		
	x 0.76% Taxes		
	x 0.24% Insurance		
	x10.25% Total =	$10.92	
Total			$12.53

Table 1 (continued)

2. Labor	Hours per 10-sash bed		
Cutting manure	1.7		
Cleaning beds	2.2		
Setting bands	6.5		
Tamping manure	6.0		
Planting	7.7		
Weeding, thinning	10.3		
Daily care, watering	8.2		
Total	42.6 hours x $1.00 per hour =		$42.60

3. Materials	Amount		Price per unit		
Manure	2.13 tons	x	$ 4.35 per ton	$ 9.27	
Pit sand	1.16 yards	x	1.02 per yd	1.18	
Veneer bands	3,779 bands	x	3.55 per 1,000	13.42	
Seed	0.33 pounds	x	6.68 per lb	2.21	
Total					$26.08

4. Total costs	
Per 10-sash bed	$81.21
Per acre (Divided by 2.4 acres)	$33.84

Table 2. Budgeted cost of raising cantaloupes, 31 Farms, Southwestern Indiana, 1957.

Basic data resources used	Method of cost computation	Cost per acre Sub-total	Cost per acre Total
1. Cost of plants			
From Table 1			$33.84
2. Land charge			
Present market land value $302 per acre			
Interest	x 4.5% interest	$ 13.59	
Taxes	x 33% assessed valuation x $3.66 tax rate per $100	$ 3.68	
Total			$17.27

3. Labor (growing)	Hours		
Cover crop	2.9		
Land preparation	3.0		
Fertilizing	3.2		
Transplanting	10.5		
Cultivating	7.3		
Turning vines	10.2		
Weeding or hoeing	6.3		
Total	43.4 hours x $1.00 per hour =		$43.40

Table 2 (continued)

Basic data resources used	Method of cost computation	Cost per acre Sub-total	Total
4. Tractor power	Hours		
Cover crop	2.9		
Land preparation	3.0		
Fertilizing	3.2		
Transplanting	1.9		
Total	11.0 hours x $1.20 per hour	$13.20	
Cultivating	7.3 hours x $0.95 per hour	$ 6.94	
Total			$20.14
5. Equipment use	Type / Times over / Per-acre rate		
Disc harrow	7 ft tandem / 5 / @ $ 0.26	$ 1.30	
Moldboard plow	2-14" / 1 / 0.42	0.42	
Springtooth	3 section / 1 / 0.14	0.14	
Grain drill	12 ft / 2 / 1.37	2.74	
Marker	2-row / 1 / 0.34	0.34	
Corn planter	2-row / 1 / 0.59	0.59	
Transplanter	/ 1 / 0.64	0.64	
Cultivator, mtd	1 row / 6 / 0.20	1.20	
Total			$ 7.37
6. Cover crop			
Rye seeded, 1.75 bu. x $2.30 per bu.			$ 4.02
7. Fertilizer	Lb per acre x Price per lb =		
Nitrogen	67 x $ 0.124 =	$ 8.31	
Phosphate	58 x 0.092	5.34	
Potash	49 x 0.047	2.30	
Total			$15.95
8. Harvesting and hauling (119 bushel per acre)			
Labor	23.4 hours x $1.00 per hr =	$23.40	
Farm power	4.0 hours x 1.20 per hr	4.80	
Two wagons		1.02	
Total			$29.22
Total per acre costs			$171.21

Dollar Returns Per Acre and Per Hour

Cantaloupe yields vary from year to year as well as from farm to farm. In 1957 growers who did not fumigate or spray harvested an average of 119 bushels per acre (Table 3). Those who did averaged 222 bushels per acre.

A typical yield (without fumigation or spraying) is 179 bushels. Many growers stated that their 1957 yields were the lowest they had ever harvested. This was due, they thought, to the above-normal rainfall during the early part of the growing season and heavy winds that occurred at the time melons were setting on the vine.

The average farm price received by growers in 1957 was $1.76 per bushel. The average price for the period 1955 through 1958 was $1.29/bushel. The higher price in 1957 was due to the short crop of cantaloupe, not only in Indiana but in the United States as a whole. Yields and prices tend to vary inversely; hence, there is less year-to-year variation in per-acre returns than there is in either yields or prices received.

A grower with an average yield in 1957 obtained a per-acre return of $209.44 (without fumigation or spraying). The price that year due to the short supply of melons more than offset the lower yields obtained. The per-acre returns for a typical year is $230.91.

The dollar returns per hour of labor in 1957 averaged $1.45. This figure is below that of a typical year ($1.60) mainly because of the lower yields obtained.

Table 3. Dollar returns from cantaloupes, 39 farms, Southwestern Indiana, 1957.

Physical coefficients and prices	1957		Typical year a/	
	No fumigation or spraying	Fumigation and spraying	Average yield	High yield
Yield per acre (bushels)	119	222	179	267
Price per bushel	$ 1.76	$ 1.76	$ 1.29	$ 1.29
Dollar returns per acre	209.44	390.72	230.91	344.43
Total costs per acre	$171.21	$241.18	$177.17	$185.91
Cost of labor	84.60	97.20	89.60	96.90
Cost other than labor	86.61	143.98	87.57	89.01
Returns to labor and management b/				
Per Acre	$122.83	$246.74	$143.34	$255.42
Per Hour	1.45	2.54	1.60	2.64

a/ Without fumigation or spraying.

b/ After paying all other costs.

Farm-to-farm Variations in Amounts of Resource Use and Yields

Considerable farm-to-farm variation occurs in the amounts of resource use.

1. The present market land value on the typical farm was $302 per acre; however, on a third of the farms land values averaged $374 per acre, on another third they averaged only $215 per acre (Table 4).

2. The variation in the amount of labor and tractor power used was sizeable. For example, the hotbed operation required an average of 17.8 hours of labor per acre. However, a third of the growers spent only 11.5 hours; another third averaged 26.0 hours.

3. The typical grower applied 67 pounds nitrogen, 58 pounds phosphate and 49 pounds potash. However, a third of the growers averaged 112 pounds nitrogen, 91 pounds phosphate and 77 pounds potash; another third averaged 49 pounds nitrogen, 25 pounds phosphate and 25 pounds potash. In 1957 there was little or no relationship between level of fertilizer application and cantaloupe yields.

4. In 1957 most growers transplanted melons by hand; they had an average cost of $17.74 (Table 5). In 1958, 11 growers were transplanting melons with a mechanical transplanter. Their costs averaged $13.42 per acre.

5. In 1957 eight growers fumigated for nematodes and sprayed for insects and disease. Their costs increased as follows.

	Additional cost/acre
Labor	$ 4.10
Farm power	4.92
Equipment	18.15
Fumigant	13.50
Spray materials	19.12
Harvesting	10.18
Total	$69.97

6. Yields also varied widely from farm to farm. Growers who did not fumigate or spray averaged 119 bushels of cantaloupe per acre; those who did averaged 222 bushels per acre. The average yield for all growers were 129 bushels. However, one-third of the growers averaged 247 bushels per acre, 91 percent above average; another third harvested an average of only 89 bushels per acre. The farm to farm variation in yields is considerably greater than the variation from year to year.

Table 4. Variations in resource use and cantaloupe yields, 46 farms, Southwestern Indiana, 1957.

	Level of productivity or efficiency		
	Low	Average	High
Land values (per acre)	$215	$302	$374
Labor inputs (hours per acre)			
Hotbed	26.0	17.8	11.5
Cover crop	4.4	2.9	1.6
Land preparation	4.3	3.0	1.7
Fumigation (8 growers)	---	0.1	---
Fertilization	6.6	3.2	1.8
Transplanting (by hand)	21.4	14.2	8.0
(by machine)	13.5	10.5	8.1
Spraying (8 growers)			
per application	---	0.4	---
10 applications	---	4.0	---

Table 4 (continued)---Labor inputs (continued)

Cultivating	9.8	7.3	4.7
Turning vines	16.1	10.2	5.0
Hoeing	10.5	6.3	3.2
Harvesting (comparable yields) a/	20.9	24.2	34.0
Tractor power (hours per acre)			
Cover crop	4.4	2.9	1.6
Land preparation	4.3	3.0	1.7
Fertilization	6.6	3.2	1.8
Transplanting (by hand)	2.8	2.1	1.9
(by machine)	2.2	1.9	1.5
Cultivating	9.8	7.3	4.7
Harvesting (comparable yields)	3.6	4.1	5.8
Cantaloupe yields (bushels per acre)			
1957	89	129	247
1956	110	175	268
Typical year	96	179	267

a/ 89, 129, and 247 bushels.

Table 5. Transplanting costs: hand vs. machine, 39 farms, Southwestern Indiana, 1957 and 1958.

Inputs or resources methods of budgeting		Cost per acre Sub-total	Total
Transplanting by hand: (39 farms, 1957)			
Labor	14.2 hours @ $1.00 per hour	$14.20	
Tractor power	2.1 hours @ 1.20	2.52	
Two wagons	@ 1.02 per acre	1.02	
Total			$17.74
Transplanting by machine: (11 farms, 1958)			
Present-day capital outlay	$150.00		
Annual ownership cost			
$150.00 x 16.75 percent divided by 39 acres		$ 0.64	
Labor	10.5 hours @ $ 1.00 per hour	10.50	
Tractor	1.9 hours @ 1.20	2.28	
Total (assuming plants are hauled on machine)			$13.42

Table 6. Cantaloupes: budgeted costs per acre with fumigation and spraying included, 8 farms, Southwestern Indiana, 1957.

Input or resource method of budgeting			Cost per acre
Cost of plants (Same as in Table 2)			$33.84
Land charge (Same as in Table 2)			$17.27
Labor (growing)			
Fumigating	0.1 hours		
Spraying	4.0		
All other	43.4		
Total	47.5 hours x $1.00 per hour		$47.50
Farm power			
Fumigating	0.1 hours		
Spraying	4.0		
All other	11.0		
Total	15.1 hours x $1.20 per hour	$18.12	
Cultivating	7.3 hours x 0.96 (1-plow)	6.94	$25.06
Equipment			
Fumigating	1 time over x $2.14		
Spraying	6 applications 16.01		
All other	7.37		
Total			$25.52
Materials			
Fumigant		$13.50	
Spray materials		19.12	
Total			$32.62
Cover crop (Same as in Table 2)			4.02
Fertilizer (Same as in Table 2)			15.95
Harvesting (222 bushel per acre)			
Labor	31.9 hours x $1.00	$31.90	
Power	5.4 hours x 1.20	6.48	
Two wagons		1.02	
Total			$39.40
Total per acre costs			$241.18

Some Cost Rates

1. Labor, $1.00 per hour. The farm operator and some family help is worth more, yet hired labor (for transplanting, hoeing, turning vine and harvesting) in the Knox, Gibson and Daviess areas was available for considerably less--$0.75 per hour.

2. Fertilizer prices (April 1957) Lime, $3.10 per ton; Nitrogen, $83.00 per ton (or $0.124/lb); Phosphate, $34.96 per ton (or $0.092/lb); Potash, $51.90 per ton (or $0.047/lb)

3. A 2-plow tractor, $1.20 per hour.

A 1-plow tractor, $0.95 per hour.

4. Machinery and equipment cost rates

Equipment type and size	Purchase price a/	Annual ownership cost b/	Annual use (acres)	Per acre rate
Moldboard plow				
Mounted with 2-14"	$ 311	$ 52.09	123	$ 0.42
Disc harrow				
7' tandem	425	71.19	278	0.26
Spring-tooth harrow				
3-section	133	22.28	156	0.14
Grain drill - 12'	550	92.12	67	1.37
Fumigator		36.38 c/	17	2.14
Marker, 2-row	80	13.40	39	0.34
Mechanical transplanter	150	25.12	39	0.64
Corn planter, 2-row	271	45.39	77	0.59
Sprayer, 200 gallon				
1 inch, 50 ft. boom	1,137	304.15 c/	19	16.01
Cultivator				
Mounted, 1-row	280	49.90	234	0.20
Two wagons	758	126.96	125	1.02

a/ Obtained from farmers and farm machinery dealers.

b/ Estimated at 16.75 percent of first cost.

c/ Estimated at 26.75 percent of first cost.

The authors

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Reference

Purdue Agricultural Experiment Station Research Bulletin 729. The data presented are the results of a survey of 46 melon growers in Knox, Gibson and Daviess Counties in 1957. These counties are the three leading melon-producing counties.

Of the 46 growers interviewed 18 were owner-operators, operating an average of 130 acres. Nineteen of them were part-owners; they owned an average of 139 acres and, in addition, rented 139 acres. Nine were tenant-operators and farmed an average of 212 acres.

The farms averaged 186 total farm acres, with 155 acres in crops. An average of 28 acres of watermelons and 11 acres of cantaloupes were raised; melons thus accounted for 25 percent of the total crop acres.

Very few livestock were kept on the farms studied. In fact, 10 of the farms kept no livestock. Feeder cattle was the major enterprise with 14 farms feeding out an average of 45 head.

BUDGETS FOR DEVELOPING COSTS AND RETURNS

Budget of Cost of Raising Cantaloupe Plants
(Per 10-Sash Bed)

Variety grown _____ Bed started _____ (date)
Seed dropped _____
Plants transplanted _____

Basic data resources used	Method of budgeting	Cost per 10-sash bed Sub-total	Total
1. Annual ownership costs			
Present-day replacement cost of capital outlays			
Foundation $_____			
x _____% Depreciation			
x _____% Interest			
x _____% Repairs			
x _____% Taxes			
x _____% Insurance			
x _____% Total (equals)		$_____	
Sash $_____			
x _____% Depreciation			
x _____% Interest			
x _____% Repairs			
x _____% Taxes			
x _____% Insurance			
x _____% Total (equals)		$_____	
Total			$_____
2. Labor	Hours per 10-sash bed		
Cutting manure	_____		
Cleaning beds	_____		
Setting bands	_____		
Tamping manure	_____		
Planting	_____		
Weeding, thinning	_____		
Daily care, watering	_____		
Other	_____		
Total	_____ hours x $____ per hour =		$_____
3. Materials	Amount	Price	
Manure	____ ton	x $____ per ton =	$_____
Pit sand	____ yards	x ____ per yard	_____
Veneer bands	____ bands	x ____ per thousand	_____
Seed	____ lbs	x ____ per lb	_____
Total			$_____
4. Total costs			
Per 10-sash bed			$_____
Per acre (divided by ____ acres)			$_____

Budget of Cost of Raising Cantaloupe
(Per acre)

Variety_____ Plants transplanted_____ (date)
Harvesting started_____

Basic data resources used	Method of budgeting	Cost per acre Sub-total	Total
1. Cost of plants			
From previous page			$____
2. Land charge			
Present market land value $____per acre			
Interest x ____% interest rate		$____	
Taxes x ____% assessed valuation			
x$____ tax rate per $100		$____	
Total			$____
3. Labor (growing)	Hours	Hours	
Cover crop	____	Sub-total (left column)	____
plowing	____	Marking, fumigation	____
discing	____	Transplanting	____
harrowing	____	Cultivating	____
seeding	____	Spraying, __sprays	____
Land preparation		Turning vines	____
plowing	____	Hoeing or weeding	____
discing	____	Total	____
harrowing	____	x $____per hour =	$____
Fertilization	____		
broadcasting	____		
sidedressing	____		
Sub-total	____		
4. Tractor power	Hours		
Cover crop	____		
Land preparation	____		
Fertilization	____		
Transplanting	____		
Total	____ hours x $____ per hour		$____
Cultivating	____ x ____ per hour		____
Total			$____

5. Equipment use	Type	Times over	Per acre rate	Total
Disc harrow	____	____	$____	$____
Moldboard plow	____	____	____	____
Spring tooth	____	____	____	____
Grain drill	____	____	____	____
Marker	____	____	____	____
Fumigator	____	____	____	____
Corn planter	____	____	____	____
Transplanter	____	____	____	____
Sprayer	____	____	____	____
Cultivator	____	____	____	____
Total				$____

6. Cover crop

Rye seeded ____ bu x $____ per bu $____

7. Lime and fertilizer	Lb per acre		Price per lb	
Lime	____	x	$____	= $____
Nitrogen	____	x	____	____
Phosphate	____	x	____	____
Potash	____	x	____	____
Total				$____

8. Materials	Lb. per acre		Price per lb	
Fumigant	____	x	$____	= $____
Spray materials	____	x	____	____
____	____	x	____	____
____	____	x	____	____
____	____	x	____	____
Total				$____

9. Harvesting and hauling (bushels per acre)

Labor	____ hours x $____ per hour =	$____
Tractor power	____ hours x $____ per hour	____
Wagons		$____
Total		$____

10. Total per acre cost $____

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Budget of Equipment Costs
(Annual Ownership Costs Per Acre)

Equipment type and size	Purchase price (1)	Annual ownership cost Percent a/ (2)	Annual ownership cost Dollar b/ (3)	Annual use (acres) (4)	Use cost per acre c/ (5)
Disc harrow					
_____	$_____	_____	$_____	_____	$_____
Moldboard plow					
_____	_____	_____	_____	_____	_____
Springtooth harrow					
_____	_____	_____	_____	_____	_____
Grain drill					
_____	_____	_____	_____	_____	_____
Marker					
_____	_____	_____	_____	_____	_____
Fumigator					
_____	_____	_____	_____	_____	_____
Corn planter					
_____	_____	_____	_____	_____	_____
Mechanical transplanter					
_____	_____	_____	_____	_____	_____
Sprayer					
_____	_____	_____	_____	_____	_____
Cultivator					
_____	_____	_____	_____	_____	_____
Wagon(s)					
_____	_____	_____	_____	_____	_____

a/ Typically this is 16.75 percent of first cost

10.00 percent	depreciation (10 years of useful life)
2.75	interest (or 5.5 percent of average value)
3.00	repairs
0.38	taxes (or average value x 20 percent x $3.80 per $100)
0.12	insurance (or average value x 60% x $0.40 per $100)
0.50	housing
16.75 percent	total

b/ Column (1) times Column (2) c/ Column (3) divided by Column (4)

Budget of Returns Raising Cantaloupe

Yields, prices, and dollar returns	Method of budgeting	Returns Per acre and per hour
	(per acre)	
1. Yield per acre		$_____
2. Farm price received		$_____
3. Dollar return per acre (line 1 x line 2)		$_____
	(Per hour of labor of management)	
4. Total costs per acre (From Table 1)		$_____
5. Cost of labor per acre		$_____
6. Costs other than labor per acre (line 4 minus 5)		$_____
7. Return to labor and management per acre (line 3 minus 6)		$_____
8. Number of hours of labor		_____
9. Return to labor and management per hour (line 7 divided by 8)		$_____

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