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EASTERN BROCCOLI PRODUCTION ENTERPRISE BUDGETS

2020

Abstract

This report outlines four different baseline broccoli crop budgets meant to mirror production practices and costs up and down the eastern seaboard of the United States. These budges are meant to act as a baseline and not meant to be an example or suggested broccoli farm.

Trent J. Davis
tjd233@cornell.edu

Miguel Gómez
mig7@cornell.edu

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Charles H. Dyson School of Applied Economics and Management
College and Agriculture and Life Sciences, Cornell University
Ithaca, NY 14853-7801

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This report presents sample costs relating to broccoli production in the state of New York, Virginia, North Carolina, and South Carolina. The strategies used for broccoli production vary significantly from state to state and are briefly described in each section. Costs are broken down by stage of production and type of costs for the baseline yield and price. A sensitivity analysis considers the potential fluctuation of both price and expected yields, and their impacts on potential economic returns on a per-acre basis.

The practices described are based on production procedures reported for broccoli in each growing region. The cost studies presented follow similar formats of those developed at the University of California, Davis; Clemson University; and the University of Georgia. However, the content is more aggregated to focus on the cost items that are likely to differ among broccoli production regions in the eastern United States.

The costs represented in this report may be used as a baseline guide for preparing budgets, as well as estimating potential returns based on market input and output prices. Growing practices and economic projections in this report will vary for each grower and region due to differences in farm management, soil, weather patterns, input/output prices, labor costs, and cultural practices among other things.

The main assumptions of production prices and cost calculations are described in the following sections. Cultural practices are a sample of production practices in each studied region. They are not recommendations nor are they endorsed by Cornell University. They are solely meant to mirror market and production practices in each respected region. For additional information, or further explanation, please contact the authors Trent J. Davis and Professor Miguel I. Gómez at the Dyson School of Applied Economics and Management, Cornell University.

Chapter 1: Broccoli Production in New York - Sample Costs and Profitability Analysis

The sample production costs in the study are based on data collected in 2019/2020 and secondary data available from vegetable cost studies across the Eastern Seaboard, in which case a link to the document is provided in a footnote. The assumptions below pertain to the agricultural practices of producing, harvesting, and cooling fresh market broccoli crowns in Western New York and their assorted costs. The estimated budget below assumes broccoli is transplanted, utilization of a solid-set overhead irrigation system, and the broccoli is top-iced then put in cold storage after harvesting.

Assumptions

The hypothetical farm in this study is based on a 35 contiguous acre operation dedicated to fresh market broccoli crowns. Other crops grown are leafy lettuce, cauliflower, cucumber, and summer squash. The costs are for one broccoli crop.

1. **Land Preparation**. Conventional tillage is practiced. Machinery and labor time dedicated to land preparation are based off of the 2013/2014 Cornell University Extension report *Eastern Broccoli Crop Budgets, Chapter 1*[1]. The costs related to machinery hourly costs are those reported in the Clemson Cooperative Extension Enterprise Budge for spring cabbage[2]. Total machinery and labor costs amount to approximately $118/acre. That includes roughly 5 machine-hours (excluding transplanter) and roughly 5.5 person-labor hours.

2. **Stand Establishment**. A hybrid broccoli variety is seeded in March and grown in a greenhouse(s). Plants are transplanted in late April. Transplanting is mechanical and uses a four-row carousel transplanter for 2 hours as a cost of approximately $20/acre. Planting density is around 22,000 plants per acre (6-7 inch spacing). Approximately 24 person labor hours are needed for stand establishment at an hourly rate of $11.80 per hour. This labor time includes seeding in trays, transplanting, irrigation, fertilization, and application of insecticide at the time of transplanting. Local seed distributors estimate individual transplant material cost of $0.02/transplant. Stand establishment, machinery, and labor costs amount to approximately $766/acre.

3. **Irrigation**. Broccoli, like many other brassicas, is typically irrigated with an overhead sprinkler system in New York. The machinery portion of the cost is obtained using 2020 University of Georgia Broccoli Crop Budget[3]. The annual operating costs, measuring electricity and water costs, equal $99.40/acre[4]. The annual fixed costs, measuring

[1] http://publications.dyson.cornell.edu/outreach/extensionpdf/2013/Cornell-Dyson-eb1314.pdf
[2] https://www.clemson.edu/extension/agribusiness/files/enterprise-budgets/cabbage-springirr.pdf
[3] https://agecon.uga.edu/content/dam/caes-subsite/ag-econ/documents/extension/budgets/2020-budgets/2020-vegetables/2020%20-%20Broccoli%20Budget.xls
[4] https://www.nyserda.ny.gov/Researchers-and-Policymakers/Energy-Prices/Electricity/Monthly-Avg-Electricity-Industrial

depreciation, interest, and taxes on the machinery, is equal to $341.60/acre. The total cost of operating a solid set overhead irrigation system is estimated to be $440.96/acre.

4. **Fertility Management**. A dry fertilizer 10-10-10 at roughly 450lbs/acre (~4cwt/acre) is applied at listing and calcium-nitrate is sidedressed at a rate of 400lbs/acre (~3.5cwt/acre). The costs of fertilizers are taken from the aforementioned Clemson Extension spring cabbage crop budget. Fertility management costs, excluding labor costs, are estimated at $169/acre.

5. **Pest Management**. Given that broccoli and cabbage pest management use similar inputs, pesticide related costs included in this study are those reported in the previously Clemson Extension spring cabbage crop budget. Pest management costs, excluding labor, are estimated at $199/acre. This figure may be slightly overestimated given some of the cabbage pests in South Carolina may not be found to an extent requiring management in Western New York.

6. **Yields**. Yields are expressed in 21lb boxes per acre. Typical broccoli yields in Western New York varies between 400 and 500 boxes per acre[5]. We consider a yield of 450 21lb boxes (4.72 tons) per acre as a baseline case. Other yield values are analyzed in the sensitivity analysis section.

7. **Labor and wages**. Labor hours are derived from the Northeast[6] cabbage crop budget to approximate irrigation, fertility, pest management, and other labor inputs. Labor hours are not disaggregated by action, but instead aggregated as one input under the *Preharvest* section of Table 1. Prevailing hourly wage is $11.80/hr for nonoperating labor and 20% higher for operating labor ($14.18/hr). Total labor costs for preharvest operations is estimated at $711/acre.

8. **Harvest**. Broccoli is hand harvested at a rate of three to five cuts per growing season using a harvest aid. The harvest window is mid-June through late July, then again from late August to late October.
    a. **Labor**. Harvesting, grading, and field packing requires 75 person-hours per acre for the baseline yield of 450 boxes per acre. Harvest labor is compromised of 14 non-operating workers and one operating worker. Total labor costs are estimated at $897/acre.
    b. **Boxes**. Broccoli is packed in waxed non-recyclable boxes that cost $1.75/box. Total costs for purchasing boxes is estimated at $787.50/acre assuming the 450 boxes/acre yield.
    c. **Machinery**. Harvest costs attributable to machinery are estimated at $0.25/box for a total of $112.50/acre.

[5] A box consists of 34-38 bulk-packed crowns and weighs minimum 20lbs
[6] http://farmmgmt.rutgers.edu/ne-budgets/organic/cabbage.html

9. **Postharvest.** Broccoli crowns are weighed, top iced, and placed in cold storage.
    a. **Labor.** 14 person-hours are needed to weigh 450 boxes, top them off with ice, and transport them to the cold storage facility. Labor costs are estimated to be $165/acre for post-harvest costs.
    b. **Top-icing & cold storage**. Broccoli boxes are top iced after harvesting and then top iced a second time within 2-days at the time of shipping. Broccoli is stored at 34˚-35˚ and a relative humidity above 70%. Information for top-icing and cooling costs are taken from post-harvest studies analyzing the costs for different cooling methods specifically utilized for broccoli[7]. Material for the top ice is estimated to equal $208/acre while material costs for cold storage is estimated at $225/acre.

10. **Returns**. The typical broccoli price paid for the growers is reported to fall between $8 to $20 per-box. A mid-range price of $14/box has been used as the baseline estimate. The sensitivity analysis analyzes prices from $8/box to $20/box at $2 intervals. The baseline estimates broccoli sales receipts equaling $6,300/acre.

11. **Equipment Operating Costs**. The methodology for machinery costs can be found in the aforementioned Clemson Extension Vegetable Enterprise Budget of spring cabbage.

12. **Interest on Operating Capital**. Interest on operating capital is charged using a rate of 7% for a total of $182/acre. This is derived from an estimated total cost of $63,360 for farm start-up equipment with an average lifespan of 10 years for a farm of 35 planted acres.

13. **Land Rent**. Cropland rented for cash is priced at $50/acre for Western New York in 2020. This number is derived from speaking with multiple vegetable farmers in the Finger Lakes Region of New York.

14. **General Overhead**. A general farm overhead cost of 9% of total variable costs is included. This represents a "catch-all" cost including telephone, utilities, and contingencies. This number is consistent from the 2013/2014 broccoli crop budgets published by Cornell University Dyson Extension Services[8].

Summary of Costs

Total variable costs, including both pre- and post-harvest costs, for one acre of broccoli production, with an assumed yield of 450 21lb boxes, is estimated to equal $4,685/acre. Total fixed costs, which include depreciation of the irrigation system, machinery and other equipment, and an ice generator is estimated to equal $627/acre. Finally, total overhead costs are estimated to equal $472/acre. These combine for a total estimated cost of $5,784/acre for broccoli production in Western New York in 2020.

[7] http://www.postharvest.net.au/postharvest-fundamentals/cooling-and-storage/cost-of-cooling-a-case-study-with-broccoli
[8] http://publications.dyson.cornell.edu/outreach/extensionpdf/2013/Cornell-Dyson-eb1314.pdf

Figure 1 represents a total cost breakdown of interest on operating capital, overhead and fixed costs, pre-harvest costs, harvest costs, and post-harvest costs. Pre-harvest costs make up the largest percentage of overall costs at 36% while harvest costs make up the second largest percentage of overall costs at 31%. Table 1 presents costs by type (variable costs, fixed costs, and overhead costs), stage of production (pre-harvest, harvest, and postharvest), and type of input (material/machinery and labor). A column titled 'Your Costs' is provided in Table 1 for comparison of case-specific figures with the sample costs of this study. Please note that, due to rounding, the totals given in Table 1 differ slightly from the sums of their constituent numbers.

FIGURE 1: PROPORTION OF BROCCOLI PRODUCTION COSTS, NEW YORK 2020

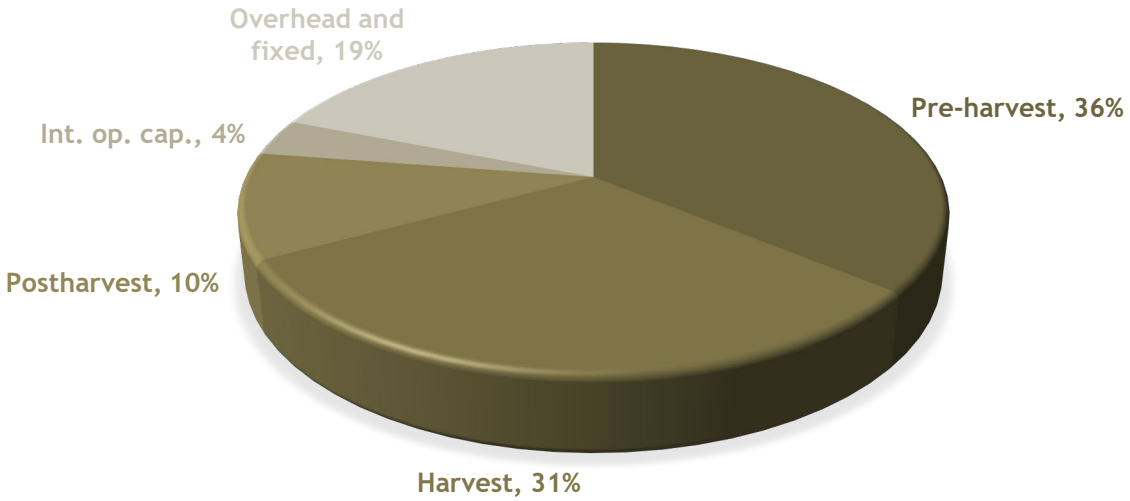

Table 1: Costs for Growing One Acre of Broccoli Crown, New York 2020

Cost	Cost Categories	Operation	Unit	Machinery & Material	$/Unit	Total Mach. $	Labor Hours	$/Unit	Total Labor $	Total Cost	Your Cost
Variable Costs	Preharvest	Land Preparation	acre	1	$40.22	$40.22	5.50	$14.16	$77.88	$118	
		Transplant	plant	24,000	$0.02	$480.00	24.25	$11.80	$285.82	$766	
		Transplanter	acre	1	$20.00	$20.00				$20	
	Fertilizers & Sprays	10-10-10	cwt	4	$17.25	$69.00				$69	
		Side dressing calcium nitrate	pound	400	$0.25	$100.00				$100	
		Herbicides	acre	1	$4.83	$4.83				$5	
		Insecticides	acre	1	$163.88	$163.88				$164	
		Fungicides	acre	1	$30.18	$30.18				$30	
	Irrigation	Irrigation	acre	1	$99.40	$99.40				$99	
	General Farm Labor		hours				60.25	$11.80	$711.28	$711	
	Harvest	Machinery	box	450	$0.25	$112.50				$113	
		Labor Hours	hours	450			75	$11.80	$896.80	$897	
	Post-Harvest	Ice (Top Ice)	box	450	$0.46	$208.80	14	$11.80	$165.20	$165	
		Cold Storage	box	450	$0.50	$225.00				$225	
	Interest on Operating Capital		USD	$2,239.14	9.25%	$207.12				$207	
	Total Variable Costs									*$4,685*	
Fixed/Overhead Costs	General Fixed Costs	Tractor/Machinery	acre	1	$182.36	$182.36				$182	
		Irrigation	acre	1	$341.56	$341.56				$342	
		Ice Generator	acre	1	$102.86	$102.86				$103	
	Total Fixed Costs									*$627*	
	Overhead Costs	Land Rent	acre	1	$50.00	$50.00				$50	
		General Overhead	USD	4,685	9%	$421.69				$422	
	Total Overhead Costs									*$472*	
Total Costs										**$5,784**	

Profitability Analysis

The breakeven price to cover variable costs is equal to $9.89/box while the breakeven price to cover total costs is equal to $12.28/box. Breakeven price is calculated by the cost per acre divided by the expected yield (boxes) per acre. Table 2 demonstrates the differences of cost per acre and cost per box of different expected yields.

Table 2: Costs Per Acre at Varying Yields to Produce Fresh Market Broccoli Crowns, New York 2020

Costs	375 boxes	400 boxes	425 boxes	450 boxes	475 boxes	500 boxes
Preharvest	$2,082.49	$2,082.49	$2,082.49	$2,082.49	$2,082.49	$2,082.49
Harvest	$1,497.33	$1,597.16	$1,696.98	$1,796.80	$1,896.62	$1,996.44
Postharvest	$311.67	$332.44	$353.22	$374.00	$394.78	$415.56
Interest on operating capital	$179.98	$185.56	$191.14	$196.71	$202.29	$207.87
TOTAL VARIABLE COSTS/ACRE	$4,071.47	$4,197.65	$4,323.83	$4,450.01	$4,576.18	$4,702.36
Total variable cost/box	*$10.86*	*$10.49*	*$10.17*	*$9.89*	*$9.63*	*$9.40*
TOTAL FIXED COSTS/ACRE	$626.77	$626.77	$626.77	$626.77	$626.77	$626.77
OVERHEAD COSTS/ACRE	$416.43	$427.79	$439.14	$450.50	$461.86	$473.21
TOTAL COSTS/ACRE	$5,114.68	$5,252.21	$5,389.75	$5,527.28	$5,664.81	$5,802.35
Total costs/box	*$13.64*	*$13.13*	*$12.68*	*$12.28*	*$11.93*	*$11.60*

The baseline model of $14/box with a yield of 450/boxes has an estimated net return of $1,850 above variable costs (Table 3) and a net return of $773 above total costs (Table 4). Both Table 3 and Table 4 represent the estimated net returns per acre at different sales prices and yields. In both tables yields change +/- by increments of 50/boxes per acre while prices change +/- by increments of $2/box. The baseline net return is bolded and boxed in both tables.

Table 3: Per Acre Net Returns Above Variable Costs, New York 2020

$/BOX	300 boxes	350 boxes	400 boxes	450 boxes	500 boxes	550 boxes
$8	$(1,671)	$(1,398)	$(1,124)	$(850)	$(576)	$(302)
$10	$(1,071)	$(698)	$(324)	$50	$424	$798
$12	$(471)	$2	$476	$950	$1,424	$1,898
$14	$129	$702	$1,276	**$1,850**	$2,424	$2,998
$16	$729	$1,402	$2,076	$2,750	$3,424	$4,098
$18	$1,329	$2,102	$2,876	$3,650	$4,424	$5,198
$20	$1,929	$2,802	$3,676	$4,550	$5,424	$6,298

Table 4: Per Acre Net Returns Above Total Costs, New York 2020						
$/BOX	**300**	**350**	**400**	**450**	**500**	**550**
$8	$(2,715)	$(2,452)	$(2,190)	$(1,927)	$(1,665)	$(1,402)
$10	$(2,115)	$(1,752)	$(1,390)	$(1,027)	$(665)	$(302)
$12	$(1,515)	$(1,052)	$(590)	$(127)	$335	$798
$14	$(915)	$(352)	$210	**$773**	$1,335	$1,898
$16	$(315)	$348	$1,010	$1,673	$2,335	$2,998
$18	$285	$1,048	$1,810	$2,573	$3,335	$4,098
$20	$885	$1,748	$2,610	$3,473	$4,335	$5,198

Chapter 2: Broccoli Production in Virginia - Sample Costs and Profitability Analysis

The sample broccoli production costs in this study are based mainly on secondary data available from brassica crop budgets published by Clemson Cooperative Extension and University of Georgia Extension, as well as information obtained through conversations with Virginia Cooperative Extension. The overall structure of the budget is based on the 2013/2014 Cornell University Extension report Eastern Broccoli Crop Budgets and updated to represent current market conditions.

Assumptions

The estimate below assumes a 17 -acre broccoli farm utilizing transplanted broccoli, hydro-cooling and top-iced methods, packed in reusable plastic containers, and cold stored after harvest

1. **Land Preparation.** Conventional tillage is practiced. Machinery and labor time dedicated to land preparation are based off of the 2013/2014 Cornell University Extension report Eastern Broccoli Crop Budgets[9]. The costs related to machinery hourly costs are those reported in the Clemson Cooperative Extension Enterprise Budge for spring cabbage[10] and updated to reflect the conditions in Virginia after consulting with Virginia Cooperative Extension. Total machinery and labor costs amount to approximately $200acre. That includes roughly 5 machine-hours (excluding transplanter) and roughly 5.5 person-labor hours.

2. **Stand Establishment.** Transplanting is mechanical and uses a four-row carousel transplanter for 2 hours as a cost of approximately $20/acre. Planting density is around 24,000 plants per acre. Approximately 24 person hours are needed for stand establishment at an hourly rate of $14.00 per hour. This labor time includes seeding in trays, transplanting, irrigation, fertilization, and application of insecticide at the time of transplanting. Local seed distributors estimate individual transplant material cost of $0.03transplant. Stand establishment, machinery, and labor costs amount to approximately $1,059/acre.

3. **Irrigation.** A drip irrigation system is modelled in this example broccoli crop budget. The per-acre costs are calculated using information pulled from the University of Georgia Extension Services 2020 broccoli crop budget[11]. Irrigation operating costs are estimated at $153/acre while fixed costs on depreciation are estimated to equal $514/acre.

4. **Fertility Management.** The fertility program is comprised of a starter of 10-20-20 fertilizer at 1,500lbs/acre for a cost of $375acre. Calcium-nitrate sidedressing is estimated to cost $100/acre at a rate of 400lbs/acre.

[9] http://publications.dyson.cornell.edu/outreach/extensionpdf/2013/Cornell-Dyson-eb1314.pdf
[10] https://www.clemson.edu/extension/agribusiness/files/enterprise-budgets/cabbage-springirr.pdf
[11] https://agecon.uga.edu/content/dam/caes-subsite/ag-econ/documents/extension/budgets/2020-budgets/2020-vegetables/2020%20-%20Broccoli%20Budget.xls

5. **Pest Management.** A combination of herbicides ($43/acre), insecticides ($300/acre), and fungicides ($125/acre) is estimated to cost $468/acre. This estimate is updated using information from Virginia Cooperative Extension.

6. **Yields.** Broccoli yields range from 533-610 twenty-one pond boxes per acre. This budget assumes a middle range yield of 600 twenty-one pound boxes are produced per acre. Different yields are estimated in the sensitivity analysis at the end of the chapter.

7. **Wages.** A base wage of $14/hr is used for non-operating labor. For operating and unpaid family labor $16.80/hr is used.

8. **Harvest.** Total harvesting variable costs are estimated to equal $2,134/acre.
    a. **Labor.** Total labor hours for harvesting one acre of broccoli, with an assumed yield of 600 twenty-one pound boxes is estimated to take 86 person-hours, for a total cost of $1,204/acre.
    b. **Boxes.** The estimated price of a reusable plastic container is $1.55/box for a total cost of $930.00.

9. **Postharvest.** Broccoli is assumed to be hydro-cooled and then top iced.
    a. **Labor.** 12-hours of labor are estimated to be needed to sort and prepare the broccoli for cooling and icing. The total labor cost is $168/acre.
    b. **Machinery & Cooling**. It is assumed the combined price of both hydro-cooling and top-icing to cost roughly $2.00/box for a total cost $1,200.

10. **Returns.** Broccoli paid to the grower is estimated at $16/box. A range of analysis depicting returns on different sales prices is discussed in tables 7 and 8.

11. **Interest on Operating Capital.** A 6.25% interest rate is estimated on an operating capital of $3,434 resulting in a yearly cost of $212/acre**.**

12. **Land Rent.** An average cash rent per acre for vegetable production in Virginia is estimated to equal $100/acre.

13. **General Overhead.** General overhead costs are estimated to equal 7.7% of total variable costs. This overhead cost is meant to be a "catch-all" including office costs, telephone, utilities, etc. The cost is estimated at $545/acre.

Summary of Costs

The estimated total variable costs of producing one acre of broccoli in Virginia equals $7,085/acre. The total fixed costs, including overhead costs, are estimated to equal $1,444/acre. The total cost of producing one acre of broccoli crowns, with an estimate yield of 600 twenty-one pound boxes, equals approximately $8,529/acre.

Figure 2 shows the percentage breakdown of pre-harvest, harvest, postharvest, interest on operating capital, and overheard + fixed costs on the total cost. Pre-harvest costs account for the largest percentage of costs at 36% of overall costs, while harvest costs account for the second largest percentage of costs at 25%, while.

Table 2 presents costs by type (variable costs, fixed costs, and overhead costs), stage of production (pre-harvest, harvest, and postharvest), and type of input (material/machinery and labor). A column titled 'Your Costs' is provided in Table 2 for comparison of case-specific figures with the sample costs of this study. Please note that, due to rounding, the totals given in Table 2 differ slightly from the sums of their constituent numbers.

FIGURE 2: PROPORTION OF BROCCOLI PRODUCTION COSTS, VIRGINIA 2020

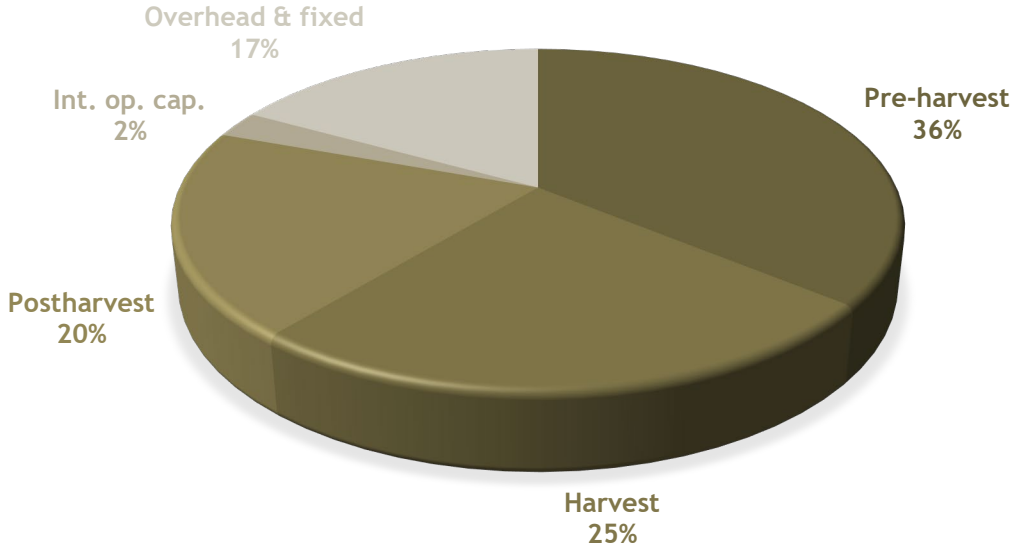

Table 5: Costs for Growing One Acre of Broccoli Crown, Virginia 2020

Cost	Cost Categories	Operation	Unit	Machinery & Material	$/Unit	Total Mach. $	Labor Hours	$/Unit	Total Labor $	Total Cost	Your Costs
Variable Costs	Preharvest	Land Preparation	acre	1	$110	$110	5.50	$16.80	$92.40	$202	
		Transplant	plant	24,000	$0.03	$720	24.222	$14.00	$339.11	$1,059	
		Transplanter	acre	1	$20.00	$20.00				$20	
	Fertilizers & Sprays	10-20-20	lbs	1,500	$0.25	$375				$375	
		Side dressing calcium nitrate	pound	400	$0.25	$100.00				$100	
		Herbicides	acre	1	$43	$43				$43	
		Insecticides	acre	1	$300	$300				$300	
		Fungicides	acre	1	$125	$125				$125	
	Irrigation	Irrigation	acre	1	$153.12	$153.12				$153	
	General Farm Labor		hours				40.278	$14.00	$689.89	$690	
	Harvest	Cost per box	box	600	$1.55	$930.00				$930	
		Labor Hours	hours				86.00	$14.00	$1,204	$1,204	
	Post-Harvest	Ice (Top Ice & hydrocooling)	box	600	$2	$1,200	12.00	$14.00	$168.00	$1,368	
		Cold Storage	box	600	$0.50	$300.00				$300	
	Interest on Operating Capital		USD	$3,434.76	6.25%	$214.67				$215	
	Total Variable Costs									*$7,084*	
Fixed/Overhead Costs	General Fixed Costs	Tractor/Machinery	acre	1	$182.36	$182.36				$182	
		Irrigation	acre	1	$514.14	$514.14				$514	
		Ice Generator	acre	1	$102.86	$102.86				$103	
	Total Fixed Costs									*$799*	
	Overhead Costs	Land Rent	acre	1	$50.00	$50.00				$100	
		General Overhead	USD	$7,084.19	7.70%	$545.48				$545	
	Total Overhead Costs									*$645*	
Total Costs										**$8,529**	

Profitability Analysis

For the baseline yield of 600 boxes/acre, the break-even price is estimate at $11.29/box to cover variable costs, and $13.66/box to cover total costs (Table 6). Net returns for the baseline yield and price (600 boxes/acre at $16/box) are estimated at $2,825/acre with respect to only variable costs, and $1,404/acre with respect to total costs.

Table 6: Costs Per Acre at Varying Yields to Produce Fresh Market Broccoli Crowns, Virginia 2020

Costs	525 boxes	550 boxes	575 boxes	600 boxes	625 boxes	650 boxes
Preharvest	$3,067.52	$3,067.52	$3,067.52	$3,067.52	$3,067.52	$3,067.52
Harvest	$1,867.25	$1,956.17	$2,045.08	$2,134.00	$2,222.92	$2,311.83
Postharvest	$1,197.00	$1,254.00	$1,311.00	$1,368.00	$1,425.00	$1,482.00
Interest on operating capital	$191.62	$196.18	$200.74	$205.30	$209.86	$214.42
TOTAL VARIABLE COSTS/ACRE	$6,323.39	$6,473.86	$6,624.34	$6,774.82	$6,925.29	$7,075.77
Total variable cost/box	$12.04	$11.77	$11.52	$11.29	$11.08	$10.89
TOTAL FIXED COSTS/ACRE	$799.35	$799.35	$799.35	$799.35	$799.35	$799.35
OVERHEAD COSTS/ACRE	$586.90	$598.49	$610.07	$621.66	$633.25	$644.83
TOTAL COSTS/ACRE	$7,709.64	$7,871.70	$8,033.77	$8,195.83	$8,357.89	$8,519.96
Total costs/box	$14.69	$14.31	$13.97	$13.66	$13.37	$13.11

Profitability varies greatly depending on expected yields and expected sales price. Yearly fluctuations in both are important to take into consideration when analyzing the potential revenues of a broccoli farm. Expected yield changes (by 25 boxes/acre) and expected sales price changes ($2/box increments) and their impacts on net returns are analyzed in tables 7 and 8. Table 7 analyzes only variable costs while Table 8 analyzes total costs.

Table 7: Per Acre Net Returns Above Variable Costs, Virginia 2020

$/BOX	525 boxes	550 boxes	575 boxes	600 boxes	625 boxes	650 boxes
$ 10	$ (1,073)	$ (974)	$ (874)	$ (775)	$ (675)	$ (576)
$ 12	$ (23)	$ 126	$ 276	$ 425	$ 575	$ 724
$ 14	$ 1,027	$ 1,226	$ 1,426	$ 1,625	$ 1,825	$ 2,024
$ 16	$ 2,077	$ 2,326	$ 2,576	$ 2,825	$ 3,075	$ 3,324
$ 18	$ 3,127	$ 3,426	$ 3,726	$ 4,025	$ 4,325	$ 4,624
$ 20	$ 4,177	$ 4,526	$ 4,876	$ 5,225	$ 5,575	$ 5,924
$ 22	$ 5,227	$ 5,626	$ 6,026	$ 6,425	$ 6,825	$ 7,224

Table 8: Per Acre Net Returns Above Total Costs, Virginia 2020							
$/BOX	**525 boxes**	**550 boxes**	**575 boxes**	**600 boxes**	**625 boxes**	**650 boxes**
$ 10	$ (2,460)	$ (2,372)	$ (2,284)	$ (2,196)	$ (2,108)	$ (2,020)
$ 12	$ (1,410)	$ (1,272)	$ (1,134)	$ (996)	$ (858)	$ (720)
$ 14	$ (360)	$ (172)	$ 16	$ 204	$ 392	$ 580
$ 16	$ 690	$ 928	$ 1,166	$ 1,404	$ 1,642	$ 1,880
$ 18	$ 1,740	$ 2,028	$ 2,316	$ 2,604	$ 2,892	$ 3,180
$ 20	$ 2,790	$ 3,128	$ 3,466	$ 3,804	$ 4,142	$ 4,480
$ 22	$ 3,840	$ 4,228	$ 4,616	$ 5,004	$ 5,392	$ 5,780

Chapter 3: Broccoli Production in North Carolina - Sample Costs and Profitability Analysis

The sample broccoli production costs in this study are based on the North Carolina broccoli cost study published by Cornell Extension in 2013/2014. The costs have been updated using secondary data fathered from published budgets from Clemson University Extension and University of Georgia Extension, as well as information from North Carolina State University Extension Services. The assumptions below pertain to the agricultural practices of producing, harvesting, and cooling fresh market broccoli crowns in North Carolina and their associated costs. In the cost estimates below, broccoli is transplanted on plastic, drip irrigated, and slurry-iced. The assumed sales price of $22/box is meant to reflect potential higher sales prices growers of high quality broccoli may be able to receive at market. This sales price may not be representative of what an average sales price would be for broccoli in North Carolina.

Assumptions

1. **Land Preparation**. It is estimated $40 of machinery and equipment time is needed to prepare one acre of land. This represents tillage, rock removal, etc. Roughly 5.5 hours of labor are estimated at $14.40/hr for a total labor cost of $79.20/acre. The total land preparation cost is estimated at $119/acre.

2. **Plastic Mulch and Drip Irrigation System**. The costs of establishing and running a plastic mulch with a drip irrigation system costs are estimated using University of Georgia study analyzing the cost of removing and replacing the same system[12]. We assume the farm has a planted area of 40 acre dedicated to brassica production. The total cost of installing the plastic mulch and drip irrigation system is estimated to cost $34,300 and is estimated to last roughly 15-20 years, with some equipment expected to need replacement earlier. It is estimated to take 21 labor hours to remove plastic and replace it resulting in a labor cost of $252/acre. The per acre cost of installing the system is expected to be roughly $1,109/acre, with a yearly irrigation operating cost of only $58/acre.

3. **Stand Establishment**. Broccoli is transplanted at a density of 30,000-40,000 transplants per acre. This sample budget uses the more conservative planting density of 30,000 plants/acre. A material cost of $0.02/plant results in a total material cost of $600/acre. It is estimated to take roughly 21 labor hours to plant resulting in a labor cost of $290/acre, for a total cost of stand establishment equaling $891/acre.

4. **Fertility Management**. Nitrogen (150 lb/acre), phosphorus (100 lb/acre), and potassium (100 lb/acre) are all used in the fertility program. Boron may also be used.

[12] https://site.extension.uga.edu/aaecext/files/2019/10/Ext-Publication-Estimated-Cost-Per-Acre.pdf

Using the North Carolina State University 2019 Southeastern Vegetable Crop Handbook[13] the price is estimated to be $140/acre for fertility management.

5. **Pest Management**. A program developed by North Carolina Extension agents incorporates both pre and post emergence pesticides, as well as herbicides and fungicides. The total cost per acre is estimated to be $459/acre.

6. **Yields**. Yields are expressed in 21-lb boxes per acre. The typical yield is 440 boxes/acre and other yields are estimated in the sensitivity analysis.

7. **Wages**. Hourly wages are estimated at $12.00/hr for non-operating labor. Operating labor is estimated to be 20% higher than non-operating equaling $14.40/hr.

8. **Harvest**. Total harvest costs are estimated to be $1,670/acre.
    a) **Labor Costs.** It is assumed 75 labor hours will be need to harvest 440 twenty-one pound boxes from one acre of broccoli production. At an hourly rate of $12.00/hr the total labor costs are estimated to equal $900/acre for harvest.
    b) **Boxes.** The estimated price of a reusable plastic container is $1.75/box, with 440 boxes being required, for a total cost of $770.

9. **Post-harvest.** Broccoli is assumed to be cooled using slurry-ice and then placed in cold storage. The total post-harvest cost is estimated at $548.
    a) **Labor.** It is estimated 9.5 labor hours are needed for sorting and slurry-icing 440 boxes of broccoli crowns. At a rate of $12/hr the labor cost equals $114.
    b) **Ice.** Slurry-ice is assumed to cost $0.49/box while cold storage is estimated at $0.50/box. The total cost for ice and cold storage equals $434.

10. **Returns.** Broccoli is estimated to be sold at $22/box. With estimated yields equaling 440 boxes/acre the baseline return is $9,680/acre.

11. **Interest on Operating Capital.** An assumed interest rate 9.25% is used against $2,798/acre of operating capital for a per-acre cost of $259/acre.

12. **Land Rent.** Land rent for vegetable land is estimated at $65/acre.

13. **General Overhead & Fixed Costs.** We include a general farm overhead cost of 9% of total variable costs; it amounts to approximately $540/acre and reflects "catch-all" costs including telephone, utilities and contingencies**.** Fixed costs 6.5% interest rate for depreciation on machinery, irrigation, and ice generator, taxes, office costs, etc., resulting in $507/acre.

[13] https://content.ces.ncsu.edu/pdf/2019-southeastern-us-vegetable-c/2019-02-06/SOUCROPHANDBOOK.pdf

Summary of Costs

The estimated total costs of one acre of broccoli production utilizing plasti-culture techniques in North Carolina is $7,188/acre. Variable costs (including irrigation installation) total $6,013/acre while total fixed costs and overhead costs equal $1,013/acre.

Figure 3 shows a percentage breakdown of different costs. Pre-harvest is the largest cost, equating to 49%, or $3,529/acre. The largest input causing pre-harvest costs to equal the largest share of total costs are the combined costs of plastic-culture and sprays totaling $2,188/acre. Harvest costs are the second largest cost component at 23% of total costs ($1,670/acre).

Table 9 presents costs by type (variable costs, fixed costs, and overhead costs), stage of production (pre-harvest, harvest, and postharvest), and type of input (material/machinery and labor). A column titled 'Your Costs' is provided in Table 9 for comparison of case-specific figures with the sample costs of this study. Please note that, due to rounding, the totals given in Table 9 differ slightly from the sums of their constituent numbers.

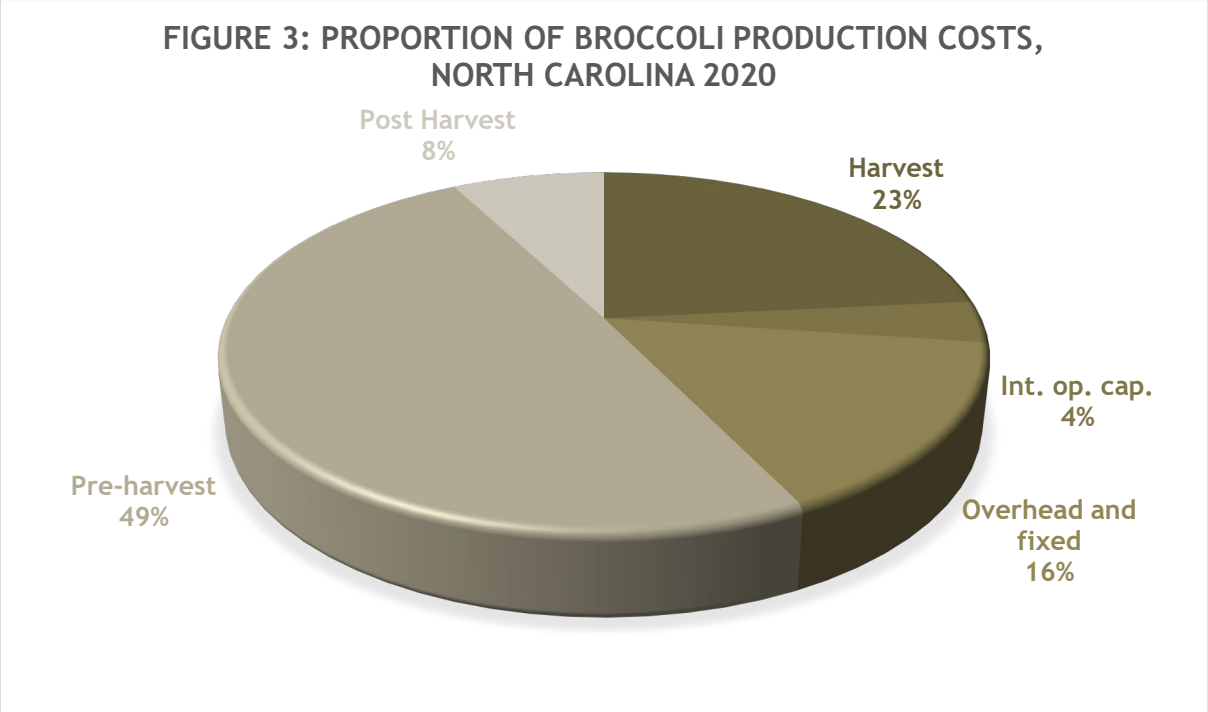

Table 9: Costs Per Acre of Producing Broccoli Crowns, North Carolina 2020											
Cost	**Cost Categories**	**Operation**	**Unit**	**Machinery & Material**	**$/Unit**	**Total $**	**Labor Hours**	**$/Unit**	**Total $**	**Total Cost**	**Your Costs**
Variable Costs	Preharvest	Land Preparation	acre	1	$40.22	$40.22	5.5	$14.40	$79.20	$119	
		Transplant	plant	30,000	$0.020	$600.00	24.2	$12.00	$290.67	$891	
		Transplanter	acre	1	$20.00	$20.00				$20	
	Plasti-Culture	Plastic Removal					21.0	$12.00	$252.00	$252	
		Fertilizer				$140.00	3.0	$12.00	$36.00	$176	
		Pesticides				$459.28	3.0	$12.00	$36.00	$495	
		Plastic	ft	8,712	$0.06	$479.16	4.0	$12.00	$48.00	$527	
		Tape	ft	8,712	$0.01	$121.97				$122	
		Stakes	stake	2,200	$0.25	$550.00	12.0	$12.00	$144.00	$694	
		Lay Plastic								$150	
		Irrigation hook-up					2.0	$12.00	$24.00	$24	
		Irrigation	acre	1	$58.08	$58.08				$58	
	Harvest	Machinery	box	440	$1.75	$770.00				$770	
		Labor Hours	hours	440			75.0	$12.00	$900.00	$900	
	Post-Harvest	Ice (Top Ice)	box	440	$0.49	$214.37	9.5	$12.00	$114.00	$328	
		Cold Storage	box	440	$0.50	$220.00				$220	
	Int. on Oper.Capital		USD	2,622	9.25%	$242.55				$243	
	Total Variable Costs									*$6,006*	
Fixed/Overhead Costs	General Fixed Costs	Tractor/Machinery	acre	1	$185.70	$185.70				$186	
		Irrigation	acre	1	$218.51	$218.51				$219	
		Ice Generator	acre	1	$102.86	$102.86				$103	
	Total Fixed Costs									*$507*	
	Overhead Costs	Land Rent	acre	1	$65.00	$65.00				$65	
		General Overhead	USD	5,487	9.00%	$493.81				$494	
	Total Overhead Costs									*$606*	
	Total Costs									**$7,118**	

Profitability Analysis

For the baseline yield assumption of 440 boxes/acre the breakeven sales price to cover only variable costs is estimated to be $13.14/box. This roughly $11 less per box than the estimated $22/box used in the baseline analysis. The breakeven sales price to cover total costs is estimated to equal $15.63/box, still significantly lower than the estimated sales price received by producers.

Table 10: Costs Per Acre at Varying Yields to Produce Fresh Market Broccoli Crowns, North Carolina 2020

Costs	365 boxes	390 boxes	415 boxes	440 boxes	465 boxes	490 boxes
Preharvest	$3,529	$3,529	$3,529	$3,529	$3,529	$3,529
Harvest	$1,385	$1,480	$1,575	$1,670	$1,765	$1,860
Postharvest	$272	$291	$310	$328	$347	$366
Interest on operating capital	$240	$245	$250	$256	$261	$266
TOTAL VARIABLE COSTS/ACRE	$5,426	$5,545	$5,664	$5,783	$5,901	$6,020
Total variable cost/box	*$14.87*	*$14.22*	*$13.65*	*$13.14*	*$12.69*	*$12.29*
TOTAL FIXED COSTS/ACRE	$507	$507	$507	$507	$507	$507
OVERHEAD COSTS/ACRE	$553	$564	$575	$585	$596	$607
TOTAL COSTS/ACRE	$6,487	$6,616	$6,746	$6,875	$7,005	$7,134
Total costs/box	*$17.77*	*$16.96*	*$16.25*	*$15.63*	*$15.06*	*$14.56*

Table 11 and Table 12 show net return sensitivity analysis at different assumed price points and yields. Table 11 analyzes net returns against variable costs and Table 12 analyzes net returns against total costs. Both tables indicate net returns from broccoli grown in North Carolina are relatively robust in terms of profitability. It would take substantial crop loss, or a significant downturn in sales prices received, for the example broccoli farm used in this budget to see net losses. The assumed yield (440 boxes/acre) and assumed price ($22/box) result in bolded and boxed in each table for quick reference.

Table 11: Per Acre Net Returns Above Variable Cost, North Carolina 2020

$/BOX	365 boxes	390 boxes	415 boxes	440 boxes	465 boxes	490 boxes
$ 16	$ 414	$ 695	$ 976	$ 1,257	$ 1,539	$ 1,820
$ 18	$ 1,144	$ 1,475	$ 1,806	$ 2,137	$ 2,469	$ 2,800
$ 20	$ 1,874	$ 2,255	$ 2,636	$ 3,017	$ 3,399	$ 3,780
$ 22	$ 2,604	$ 3,035	$ 3,466	**$ 3,897**	$ 4,329	$ 4,760
$ 24	$ 3,334	$ 3,815	$ 4,296	$ 4,777	$ 5,259	$ 5,740
$ 26	$ 4,064	$ 4,595	$ 5,126	$ 5,657	$ 6,189	$ 6,720
$ 28	$ 4,794	$ 5,375	$ 5,956	$ 6,537	$ 7,119	$ 7,700

Table 12: Per Acre Net Returns Above Total Cost, North Carolina 2020													
$/BOX		**365 boxes**		**390 boxes**		**415 boxes**		**440 boxes**		**465 boxes**		**490 boxes**	
$	**16**	$	(647)	$	(376)	$	(106)	$	165	$	435	$	706
$	**18**	$	83	$	404	$	724	$	1,045	$	1,365	$	1,686
$	**20**	$	813	$	1,184	$	1,554	$	1,925	$	2,295	$	2,666
$	**22**	$	1,543	$	1,964	$	2,384	**$**	**2,805**	$	3,225	$	3,646
$	**24**	$	2,273	$	2,744	$	3,214	$	3,685	$	4,155	$	4,626
$	**26**	$	3,003	$	3,524	$	4,044	$	4,565	$	5,085	$	5,606
$	**28**	$	3,733	$	4,304	$	4,874	$	5,445	$	6,015	$	6,586

Chapter 4: Broccoli Production in South Carolina - Sample Costs and Profitability Analysis

The sample broccoli production costs in this study are based on secondary data gathered primarily from the Clemson University Extension enterprise report for both fall[14] and spring[15] cabbage costs. The assumptions in this budget pertain to the general agricultural practices of producing harvesting and cooling fresh market broccoli in South Carolina and their associated costs. It is assumed broccoli is transplanted, overhead irrigated, hydro-cooled, and top iced.

Assumptions

The hypothetical farm in this study has a 100 continuous acre operation dedicated to fresh market broccoli crowns. Other crops grown are onions, turnips, collards, kale, sweet corn, green beans, eggplant, parsley, strawberries, green beans, and peanuts. There are two broccoli crops per year, one in the spring and one in the fall. The costs are for one fall broccoli crop.

1. **Land Preparation**. The machinery used in land preparation and their related costs are taken from the Clemson University's collard crop budget[16]. The transplanter cost is excluded from this section. Land preparation is estimated to require 5.5 hours of people labor hours. The total variable cost of land preparation is estimated to be $148/acre.

2. **Stand Establishment**. Broccoli is assumed to be planted at a rate of 18,000 transplants per acre with a spacing of 10in. The individual transplant cost is estimated to be $0.03/transplant for a total material cost of $450/acre. Transplanter variable cost is estimated at $23.49/acre. 10 labor hours are estimated to be required to plant 18,000 broccoli transplant. The wage rate is $11/hr for a total labor cost of $110/acre. The total stand establishment cost is estimated to be $583/acre.

3. **Irrigation**. Broccoli is irrigated using a solid set system. Due to the sandy soils, broccoli is irrigated daily or multiple times daily in the late summer for the fall crop during establishment. Costs are taken from the University of Georgia cabbage crop budget[17]. The initial installation costs are estimated to be roughly $100,000. Variable costs are estimated at $39/acre while fixed costs, including depreciation, are estimated at $384/acre. The total cost for irrigation Is estimated at $424/acre.

4. **Fertility Management**. Fertility management costs and materials are taken from the Clemson University spring cabbage budget. Application of 5-10-10 fertilizers ($300/acre), side dressing of calcium nitrate ($100/acre), and lime ($45/acre) for an approximate cost of $445/acre.

[14] https://www.clemson.edu/extension/agribusiness/files/enterprise-budgets/cabbage-fallirr.pdf
[15] https://www.clemson.edu/extension/agribusiness/files/enterprise-budgets/cabbage-springirr.pdf
[16] https://www.clemson.edu/extension/agribusiness/files/enterprise-budgets/collards-irr.pdf
[17] https://agecon.uga.edu/extension/budgets.html

5. **Pest Management**. Chemical costs and quantities are those reported in the irrigated spring cabbage budget from Clemson University. The combination of pesticides, fungicides, and herbicides totals an estimated $197/acre.

6. **Yields**. Yields are expressed in twenty-one to twenty-two pound boxes. Broccoli yields are estimated to be between 400-600 boxes per acre. The baseline budget uses a conservative estimate of 400 boxes/acre. Different yields are analyzed in the sensitivity analysis.

7. **Wages**. Prevailing hourly wages of non-operating labor is estimated at $11/hr, and operating labor is estimated at $13.20/hr.

8. **Harvest**. Broccoli is harvested in late April-Mid May and mid-to-late October using a harvest aid. Harvesting variable costs amount to approximately $1,800/acre.
    a. **Labor**. 100 labor hours are estimated to be required to harvest the baseline yield assumption of 400 boxes/acre. At a wage rate of $11/hr the labor costs equate to $1,100/acre.
    b. **Boxes**. Boxes are estimated to cost $1.75 a piece for a total cost for 400 boxes of $700.

9. **Postharvest**. Broccoli crowns are hydro-cooled by submersion in cold water. Broccoli boxes are then top-iced at a rate of 10lbs of ice per box, palletized and stored for up to 2-weeks, and then top-iced a second time before shipping. Postharvest variable costs are estimated at $557/acre.
    a. **Labor**. 12 labor hours are needed for the postharvest phase operating at roughly 400 boxes/hour. At a wage rate of $11/hr the total labor costs for postharvest are estimated at $132/acre.
    b. **Ice & Cooling**. Top-ice generation is estimated at $0.46/box while cold storage is estimated to equal $0.50/box. It takes approximately $0.10/box of cold water and energy to hydro-cool one box of broccoli. Each box is estimated to cost $1.06 for both icing and cooling costs. Total icing and cooling costs, excluding labor, are estimated at $425/acre.

10. **Returns**. The price producers receive for broccoli crowns can vary drastically. For the baseline budget estimate we use $18/box. Different price levels are modelled in the sensitivity analysis found at the end of this chapter.

11. **Interest on Operating Capital**. An interest rate of 9.25% is applied to pre-harvest, harvest, and postharvest variable costs for an approximate value of $200/acre.

12. **Land Rent**. Land rent is estimated to equal $50/acre[18] for suitable vegetable producing land.

[18]https://www.nass.usda.gov/Statistics_by_State/Regional_Office/Southern/includes/Publications/Economic_and_Demographic_Releases/Land_Value/LANDVAL18.pdf

13. **General Overhead**. General farm overhead of 7.7% of total variable costs, equal to $348/acre is included. This is a "catch-all" cost including telephone, utilities, office costs, etc.

Summary of Costs

The estimated total cost of producing one acre of broccoli in South Carolina is estimated at $5,463/acre. Variable costs account for $4,514/acre while fixed costs and general overhead accounts for $949/acre.

Figure 4 shows a percentage breakdown of the different costs. Pre-harvest costs account for the largest percentage of overall costs at 36% ($1,958/acre), and harvest costs are the second largest percentage at 33% ($1,800/acre).

Table 13 presents costs by type (variable costs, fixed costs, and overhead costs), stage of production (pre-harvest, harvest, and postharvest), and type of input (material/machinery and labor). A column titled 'Your Costs' is provided in Table 13 for comparison of case-specific figures with the sample costs of this study. Please note that, due to rounding, the totals given in Table 13 differ slightly from the sums of their constituent numbers

FIGURE 4: PROPORTION OF BROCCOLI PRODUCTION COSTS, SOUTH CAROLINA 2020

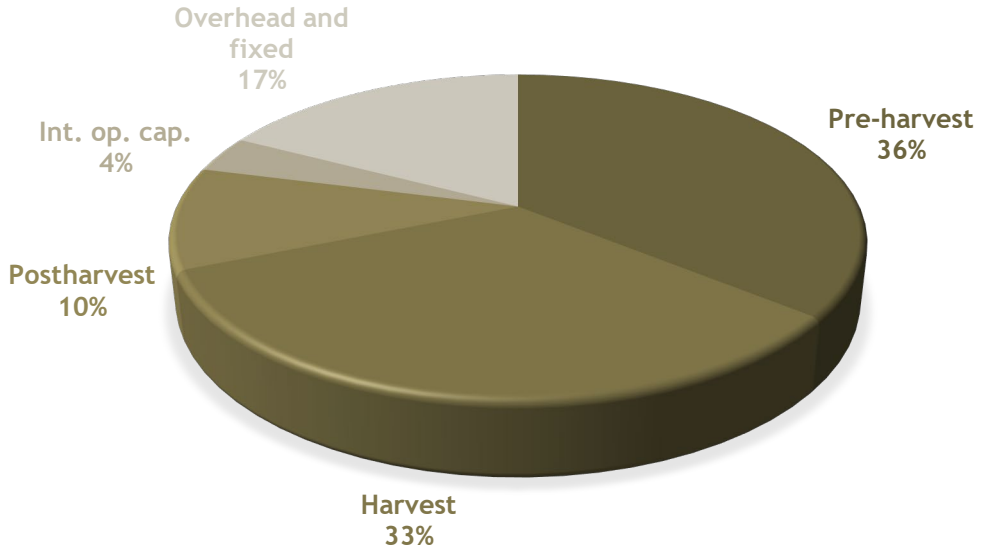

Table 13: Costs Per Acre of Producing Broccoli Crowns, South Carolina 2020

Cost	Cost Categories	Operation	Unit	Machinery & Material	$/Unit	Total $	Labor Hours	$/Unit	Total $	Total Cost	Your Costs
Variable Costs	Preharvest	Land Preparation	acre	1	$75.01	$75.01	5.5	$13.20	$72.60	$148	
		Transplant	plant	18,000	$0.03	$450.00				$450	
		Transplanter	acre	1	$23.29	$23.29	10.0	$11.00	$110.00	$133	
		5-10-10 (spread)	cwt	12	$25.00	$300.00				$300	
		side dressing-calcium nitrate	cwt	4	$25.00	$100.00				$100	
		Lime	ton	1	$45.00	$45.00				$45	
		Herbicides	acre	1	$15.75	$ 15.75				$16	
		Insecticides	acre	1	$138.05	$138.05				$138	
		Fungicides	acre	1	$43.52	$ 43.52				$44	
	Irrigation	Irrigation	acre	1	$39.95	$39.95				$39.95	
	General Farm Labor						49.5	$11.00	$544.50	$545	
	Harvest	Machinery	box	400	$1.75	$700.00				$700	
		Labor Hours	hours				100.00	$11.00	$1,100.00	$1,100	
	Post-Harvest	Hydro Cool		400	$0.10	$39.86	12.00	$11.00	$132.00	$172	
		Ice (Top Ice)	box	400	$0.46	$185.60				$186	
		Cold Storage	box	400	$0.50	$200.00				$200	
	Interest on Operating Capital		USD	$2,097	9.25%	$194.01				$194	
	Total Variable Costs									*$4,334*	
Fixed/Overhead Costs	General Fixed Costs	Tractor/Machinery		1.00	$ 63.82	$63.82				$64	
		Irrigation		1.00	$384	$384				$384	
		Ice Generator		1.00	$102.86	$102.86				$103	
	Total Fixed Costs									*$551*	
	Overhead Costs	Land Rent	acre	1.00	$50.00	$50.00				$50	
		General Overhead	USD	$4,388.88	7.70%	$337.94				$338	
	Total Overhead Costs									*$388*	
Total Costs										**$5,270**	

Profitability Analysis

For the baseline yield assumption of 440 boxes/acre the breakeven price to cover only variable costs is estimated to equal $10.31/box. The breakeven price to cover total costs is estimated to equal $12.61/box. Keep in mind, the baseline model used $18/box as the base sales price. This shows broccoli production in South Carolina is estimated to be reasonably profitable as the sales price is estimated to be significantly higher than both breakeven prices. Table 14 shows the different costs of producing broccoli at different yields, and their respective breakeven prices.

Table 15 and Table 16 show net return sensitivity analysis at different assumed price points and yields. Table 15 analyzes net returns against variable costs and Table 16 analyzes net returns against total costs. Both tables indicate net returns from broccoli grown in South Carolina are relatively robust in terms of profitability. It would take substantial crop loss, or a significant downturn in sales prices received, for the example broccoli farm used in this budget to see net losses. The assumed yield (440 boxes/acre) and assumed price ($18/box) result in bolded and boxed in each table for quick reference.

Table 14: Costs Per Acre at Varying Yields to Produce Fresh Market Broccoli Crowns, South Carolina 2020

Cost	325 boxes	350 boxes	375 boxes	400 boxes	425 boxes	450 boxes
Preharvest	$1,957.67	$1,957.67	$1,957.67	$1,957.67	$1,957.67	$1,957.67
Harvest	$1,462.50	$1,575.00	$1,687.50	$1,800.00	$1,912.50	$2,025.00
Postharvest	$150.80	$162.40	$174.00	$185.60	$197.20	$208.80
Interest on operating capital	$165.16	$170.90	$176.64	$182.38	$188.12	$193.86
TOTAL VARIABLE COSTS/ACRE	$3,736.13	$3,865.97	$3,995.81	$4,125.65	$4,255.48	$4,385.32
Total variable cost/box	$11.50	$11.05	$10.66	$10.31	$10.01	$9.75
TOTAL FIXED COSTS/ACRE	$550.68	$550.68	$550.68	$550.68	$550.68	$550.68
OVERHEAD COSTS/ACRE	$337.68	$347.68	$357.68	$367.67	$377.67	$387.67
TOTAL COSTS/ACRE	$4,624.49	$4,764.33	$4,904.17	$5,044.00	$5,183.84	$5,323.68
Total costs/box	$14.23	$13.61	$13.08	$12.61	$12.20	$11.83

Table 15: Per Acre Net Returns Above Variable Cost, South Carolina 2020

$/BOX	300 boxes	350 boxes	400 boxes	450 boxes	500 boxes	550 boxes
$ 12	$ (136)	$ 334	$ 804	$ 1,274	$ 1,745	$ 2,215
$ 14	$ 464	$ 1,034	$ 1,604	$ 2,174	$ 2,745	$ 3,315
$ 16	$ 1,064	$ 1,734	$ 2,404	$ 3,074	$ 3,745	$ 4,415
$ 18	$ 1,664	$ 2,434	$ 3,204	$ 3,974	$ 4,745	$ 5,515
$ 20	$ 2,264	$ 3,134	$ 4,004	$ 4,874	$ 5,745	$ 6,615
$ 22	$ 2,864	$ 3,834	$ 4,804	$ 5,774	$ 6,745	$ 7,715
$ 24	$ 3,464	$ 4,534	$ 5,604	$ 6,674	$ 7,745	$ 8,815

Table 16: Per Acre Net Returns Above Total Cost, South Carolina 2020							
$/BOX	**300 boxes**	**350 boxes**	**400 boxes**	**450 boxes**	**500 boxes**	**550 boxes**
$ 12	$ (1,024)	$ (564)	$ (104)	$ 356	$ 816	$ 1,276
$ 14	$ (424)	$ 136	$ 696	$ 1,256	$ 1,816	$ 2,376
$ 16	$ 176	$ 836	$ 1,496	$ 2,156	$ 2,816	$ 3,476
$ 18	$ 776	$ 1,536	$ 2,296	$ 3,056	$ 3,816	$ 4,576
$ 20	$ 1,376	$ 2,236	$ 3,096	$ 3,956	$ 4,816	$ 5,676
$ 22	$ 1,976	$ 2,936	$ 3,896	$ 4,856	$ 5,816	$ 6,776
$ 24	$ 2,576	$ 3,636	$ 4,696	$ 5,756	$ 6,816	$ 7,876