

Estimated Costs of Producing,
Harvesting, and Marketing
Blueberries in the
Southeastern United States

Objectives

- Estimate the costs of producing, harvesting and marketing blueberries
 - Enterprise Budget
- Evaluate the profitability of establishing a blueberry planting
 - Cash Flow Analysis
 - Net Present Value
 - Internal Rate of Return

Procedures

- Cost estimates were based on a 100 Acre blueberry planting
- Production practices were based on management practices recommended by Extension Specialists and Farmers
- Equipment costs were based on 2004 purchase prices
- Input prices were collected from farmers and dealers who supply NC blueberry growers

Cultivar	Acres	Lbs per acre
O'Neal	12	8,500
Bladen	4	6,000
Reveille	15	5,500
Croatan	15	7,000
Duke	6	8,500
Sampson	5	7,500
Pender	5	7,500
Blue Ridge	8	8,500
Legacy	5	8,500
Premier	10	7,500
Columbus	5	7,000
Powderblue	10	10,000
Total	100	7,600

Good Highbush Blueberry Soil in NC

- Course sands w/ an organic base, open porous and w/ a water table of at least 14” but not more than 30”
- Most NC plantings are on Lynn Haven or Leon type soils
- Sandy soils characterized by an organic content of 2% or greater in the surface layer, underlain w/ a white sand layer above an organic hardpan

Yield Assumptions – Good Soil

Years	Irrigation	No irrigation
3	2,000	1,500
4	4,000	3,000
5	5,500	4,000
6	7,000	4,500
7 – 9	8,000	5,000
10 -12	7,000	4,000
13 - 15	6,000	3,500
16- 18	5,000	3,000
19 - 20	4,000	2,500

Yield Assumptions – Marginal Soil

Years	Irrigation
3	1,500
4	3,000
5	4,000
6	5,000
7 – 9	6,000
10 -12	5,000
13 - 15	4,000
16- 18	3,500
19 - 20	3,000

Yield Assumptions – Marginal Soil

Years	No Irrigation
3	750
4	1,000
5	2,000
6	2,500
7 – 8	3,000
9 - 10	2,500
11 - 12	2,000
13- 14	1,500
15	1,000

Yield Assumptions

- Fresh Market – 80%
 - 60% hand harvested @ \$8.29/flat
 - 20% machine harvested @ \$5.67/flat
- Process Market – 18%
 - 1.8% hand harvested (“fresh rejects”) @ \$0.83/lb
 - 16.2% machine harvested @ \$0.39/lb
- Economic loss – 2%

Harvest Assumptions

- Harvest season lasted 11 weeks – Last week in May through first week in August
- Fresh blueberries were sold for \$14.11 per flat
- Processed berries were sold for \$0.60 per pound

Note: One flat equals 9 pounds of blueberries

Estimated Annual Costs, 8th Year

Expense	Good Soil	Good Soil	Mar. Soil
Pruning	\$ 297	\$ 297	\$ 297
Weed Control	144	144	144
Disease & Insect	360	360	360
Irrigation	477	0	477
Land Rental	40	40	40
Harvest	6,053	3,784	4,541
Total	\$7,371	\$4,625	\$5,859

Estimated Annual Returns, 8th Year

	Good Soil	Good Soil	Marginal Soil
Receipts	\$10,897	\$6,810	\$8,173
Expenses	- 7,371	- 4,625	- 5,859
Returns	\$ 3,526	\$2,185	\$2,314

Equipment Investment – 1st Year

Tractor, 70 – 80 hp (2)	\$65,000
Mower, 5ft, HD	1,000
Fertilizer Spreader	1,200
Herb Sprayer, 200 gal	2,000
Shielded Herb Sprayer	4,000
Tapered Disk, 5ft	1,800
V-bladed Sweep Plow	2,000
Drain Runner (spinner)	1,900
Total	\$78,900

Establishment Costs – 1st Year

Land Clearing (\$3,000/A)	\$300,000
Ditching & Drainage (\$120/A)	12,000
Forming Beds (\$25/A)	2,500
Plants (1,210/A @ 50¢ /plant)	60,500
Irrigation Pond (4 – 30,000 cu yd)	36,000
Irrigation Well (300 gpm)	15,000
Sprinklers, pipes & valves	120,000
Pumps (4 – 1,400 gpm)	38,000
Total	\$584,000

Equipment Investment – 2nd Year

Airblast Sprayer, 220 gal	\$7,600
Farm Trailers (4)	4,000
Total	\$11,600

Equipment Investment – 3rd Year

Truck, 1-Ton	\$ 26,000
Mower, Articulated Flail	12,000
Mower, Flail, 40"	5,000
Metal Building (125'x50')	156,250
Packing Equipment	35,000
Total	\$234,250

Equipment Investment

4 th Year	Harvester, Self Propelled	\$114,000
5 th Year	Farm trailers (4)	\$4,000
6 th Year	Packing Equipment (line 2)	\$35,000
6 th Year	Color Sorter	70,000
6 th Year	Pneumatic Pruners	12,000

Flow of Funds – Good Soil

Years	Irrigation	No irrigation
1	-\$804,064	-\$567,974
2	-\$ 58,264	-\$ 31,174
3	-\$193,727	-\$190,434
4	\$ 60,832	\$ 24,867
5	\$247,561	\$180,069
6	\$199,036	\$ 68,489
7	\$379,090	\$217,016
8	\$379,090	\$217,016
9	\$379,090	\$217,016

Flow of Funds – Marginal Soil

Years	Irrigation	No irrigation
1	-\$804,064	-\$567,974
2	-\$ 58,264	-\$ 31,174
3	-\$217,524	-\$226,939
4	-\$ 2,223	-\$101,350
5	\$152,979	\$ 53,743
6	\$ 72,926	-\$ 57,890
7	\$252,981	\$ 90,583
8	\$252,981	\$ 90,583
9	\$252,981	\$ 56,110

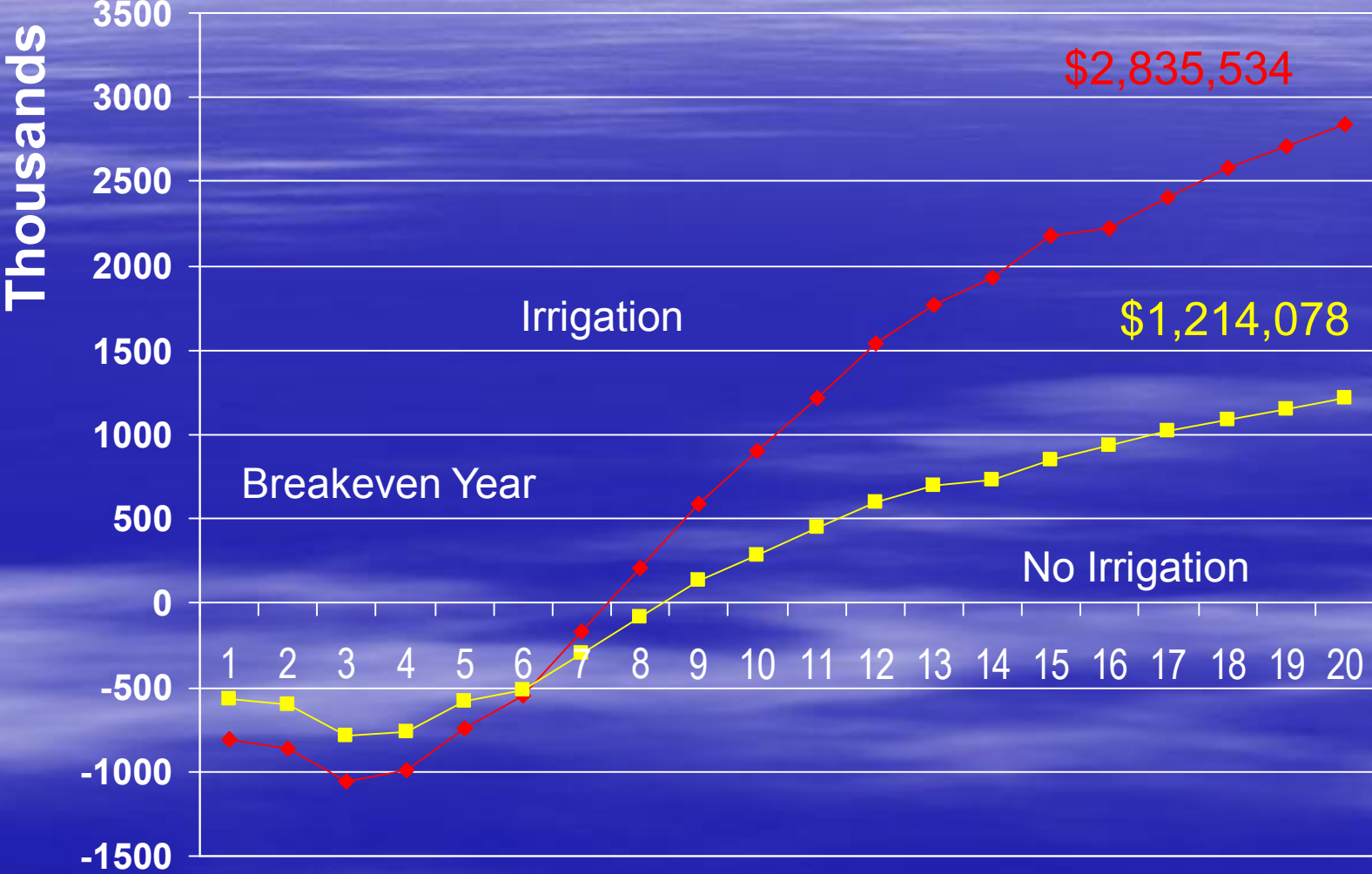
Accumulated Cash Flows – Good Soil

Years	Irrigation	No irrigation
1	-\$804,064	-\$567,974
2	-\$862,328	-\$599,148
3	-\$1,056,055	-\$789,582
4	-\$995,224	-\$764,715
5	-\$747,663	-\$584,646
6	-\$548,627	-\$516,157
7	-\$169,537	-\$299,141
8	**\$209,553	-\$82,125
9	\$588,664	**\$134,892

Breakeven Year

- The year when enough revenue has been generated to cover start-up expenses.
- To secure a loan of shorter duration could leave the farming operation insolvent.

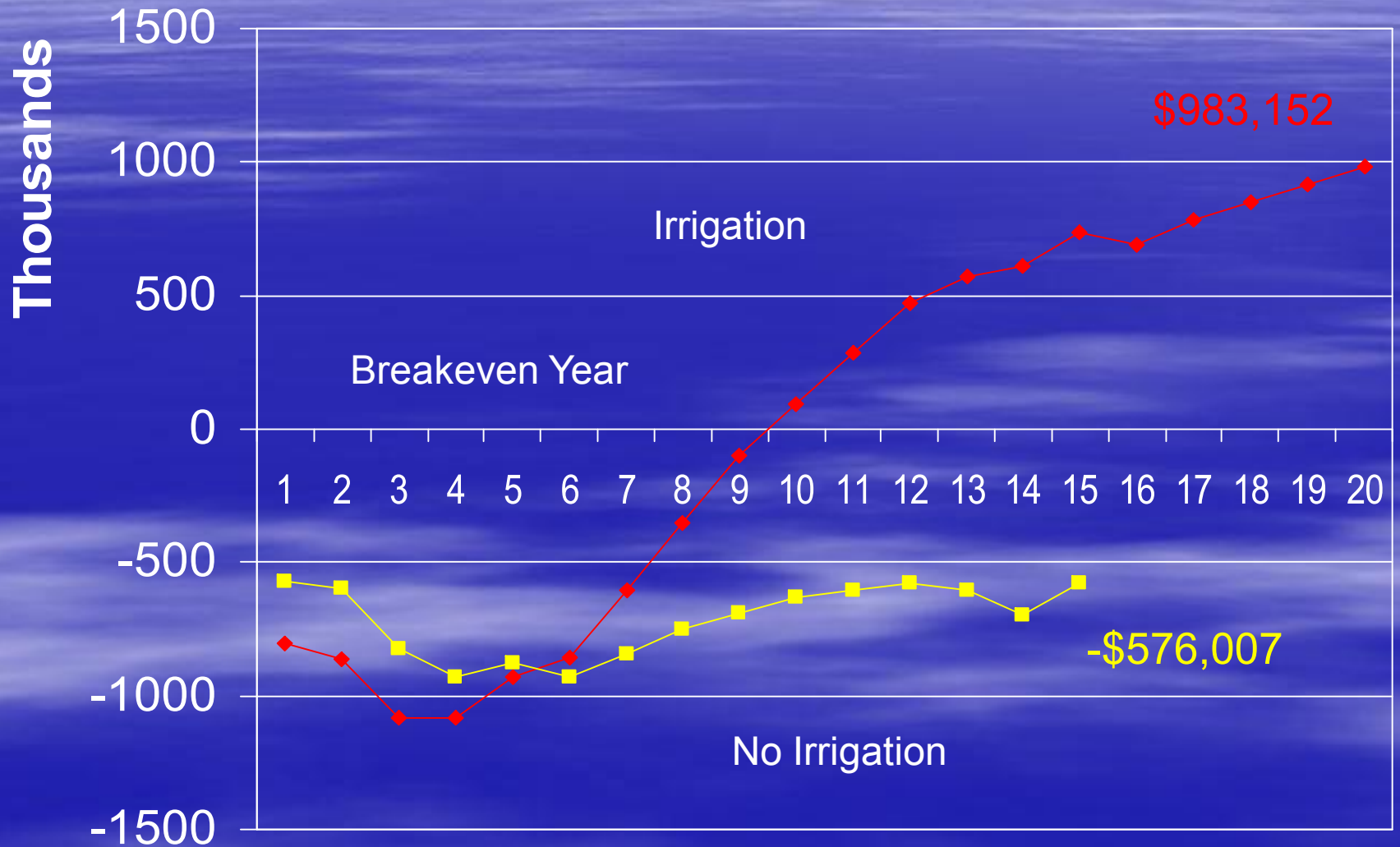
Accumulated Cash Flows – Good Soil



Accumulated Cash Flows – Marginal Soil

Years	Irrigation	No irrigation
1	-\$804,064	-\$567,974
2	-\$862,328	-\$599,148
3	-\$1,079,852	-\$826,087
4	-\$1,082,075	-\$927,437
5	-\$929,096	-\$873,694
6	-\$856,170	-\$931,584
7	-\$603,189	-\$841,001
8	-\$350,208	-\$750,418
9	-\$97,227	-\$691,309
10	**\$92,699	-\$632,199

Accumulated Cash Flows – Marginal Soil



Net Present Value

- Today's cash equivalent value of the 20 year blueberry planting.
- Assumes you can invest money at a given interest rate
- “Best” interest rate is low risk alternative, e.g. long term certificate of deposit
- Essence is the enterprise should be accepted if the $NPV > \$0$

NPV – Good Blueberry Soil

	Today's Cash Equivalent	
Interest Rate	Irrigated Planting	Non-Irrigated Planting
6%	\$1,127,073	\$ 372,654
7%	\$ 950,795	\$ 286,236
8%	\$ 795,006	\$ 210,000

Today's Cash Equivalent

- A new 100A blueberry planting on good soil with irrigation is worth \$1,127,073 today
- Someone would have to pay a farmer \$1,127,073 to bribe him to forget his plans of establishing a 100A blueberry planting
- One could pay up to \$11,271 per Acre for good blueberry soil and still do as well as in other investments

NPV – Marginal Blueberry Soil

	Today's Cash Equivalent	
Interest Rate	Irrigated Planting	Non-Irrigated Planting
6%	\$ 146,889	-\$ 625,119
7%	\$ 60,617	-\$ 627,689
8%	-\$ 15,493	-\$ 629,187

Internal Rate of Return for the Blueberry Investment

Conditions	Rate of Return
Good Soil	
- Irrigation	16.6%
- No Irrigation	11.6%
Marginal Soil	
- Irrigation	7.8%
- No Irrigation	-11.7%

Internal Rate of Return for the Blueberry Investment

- Compared to a Treasury bond that yields 4.85%:
 - Blueberry plantings on good soil with an IRR of 16.6% & 11.6% look pretty good.
 - A planting on marginal soil w/ irrigation that has an IRR of 7.8% is not as attractive when you consider the risk and amount of time associated with blueberry production
 - A planting on marginal soil w/o irrigation “yields” an negative IRR

“Limited” Sensitivity Analysis

- Decrease the yields on good blueberry soils and marginal soils w/ irrigation in 9th & 14th by 50%

	Good Soil		Mar Soil
Year	W/ Irrig.	W/O Irrig.	W/ Irrig.
9 th	4,000	2,500	3,000
14 th	3,000	1,750	2,000

NPV's with Reduced Yields

	Good Soil		Marginal Soil
Interest Rate	Irrigated Planting	Non-Irrigated Planting	Irrigated Planting
6%	\$894,117	\$230,544	\$20,855
7%	\$740,244	\$157,700	\$91,183
8%	\$604,431	\$93,574	\$153,057

Internal Rate of Return for the Blueberry Investment w/ Reduced Yields

Conditions	Rate of Return	
	"Ideal" Yields	Reduced Yields
Good Soil		
- Irrigation	16.6%	15.0%
- No Irrigation	11.6%	9.7%
Marginal Soil		
- Irrigation	7.8%	5.7%

Benefits of Irrigation

Good Soil	
- Breakeven year for irrigation equipment	7 th Year
- Internal Rate of Return	26%
Marginal Soil	
- Breakeven year for irrigation equipment	8 th Year
- Internal Rate of Return	22%

Conclusions

- A new 100A blueberry planting on good soil can be a profitable venture
- A new 100A blueberry planting on marginal soil w/o irrigation is a losing venture
- A new 100A blueberry planting on marginal soil w/ irrigation can be a risky venture
- Irrigation for frost protection and soil moisture pays handsomely

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