

PECAN ENTERPRISE COST ANALYSIS



Cooperative Extension Service
Agricultural and Applied Economics
The University of Georgia
College of Agricultural and Environmental Sciences

Acknowledgments

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SEPTEMBER 2002**

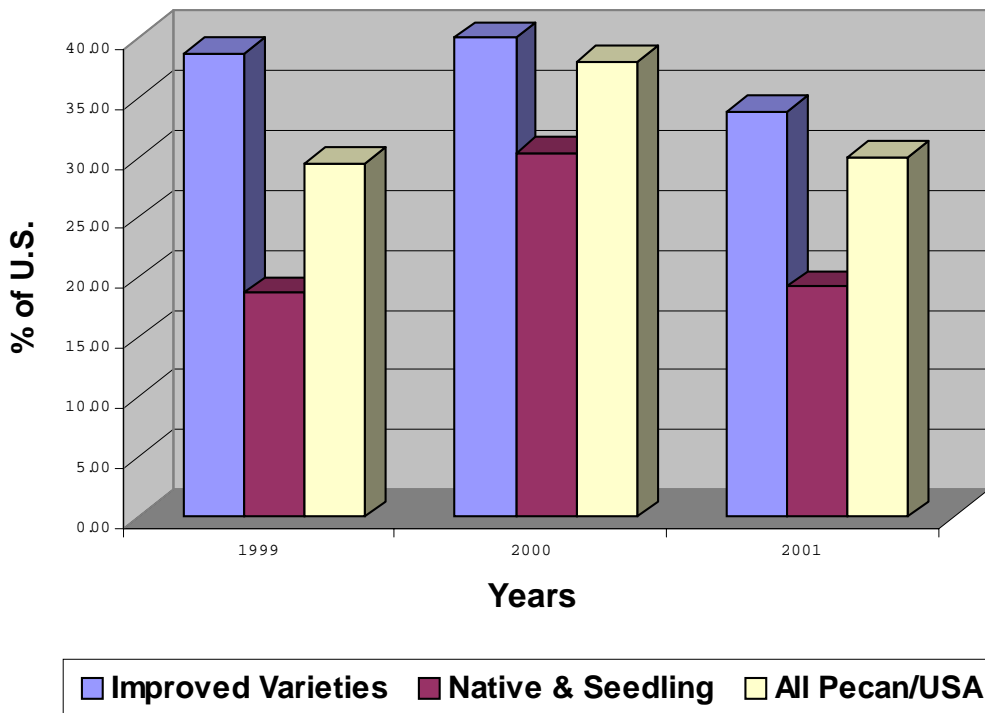
Prepared by:

**Greg E. Fonsah, Extension Economist, UGA
Kerry Harrison, Extension Engineer, UGA
Brad Mitchell, Extension Coordinator, Mitchell County**

Pecan Production in Georgia.

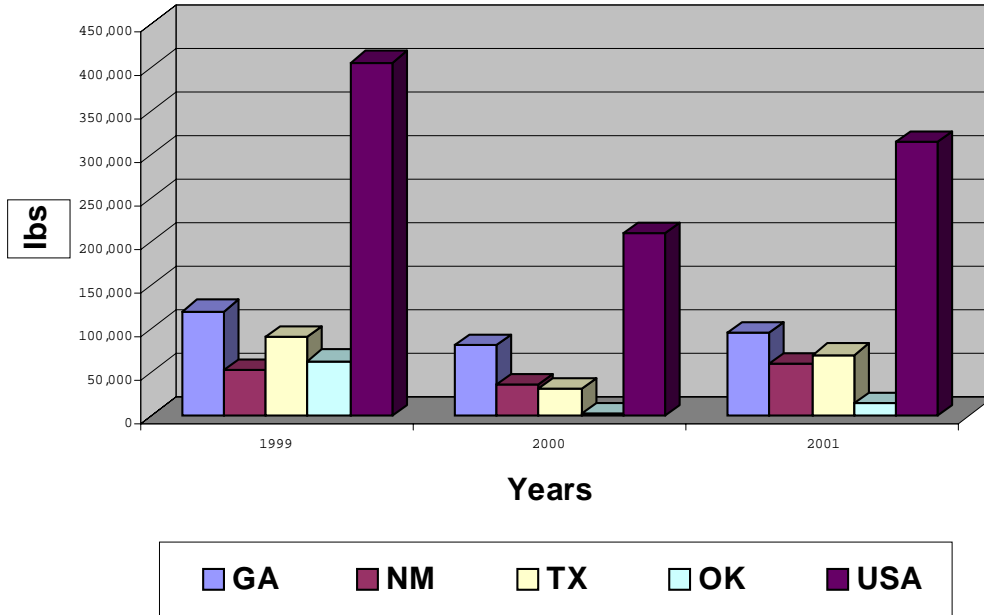
Nationwide, Georgia has position herself as number one in the production of Pecans. USDA and NASS reports (2001) indicates that in 1999, 2000 and 2001, the State of Georgia alone produced 29.5%, 38.0% and 30% of all pecans grown in the United States. For the improved varieties, GA produced 38.7%, 40.0% and 33.8% in 1999, 2000 and 2001 (Fig 1).

Fig: 1. Percentage of Georgia Utilized Pecan Production, 1999 - 2001



Source: Agricultural Statistics Board, NASS, USDA (2002) Non-citrus Fruits and Nuts
2001 Preliminary Summary, pp 74-75.

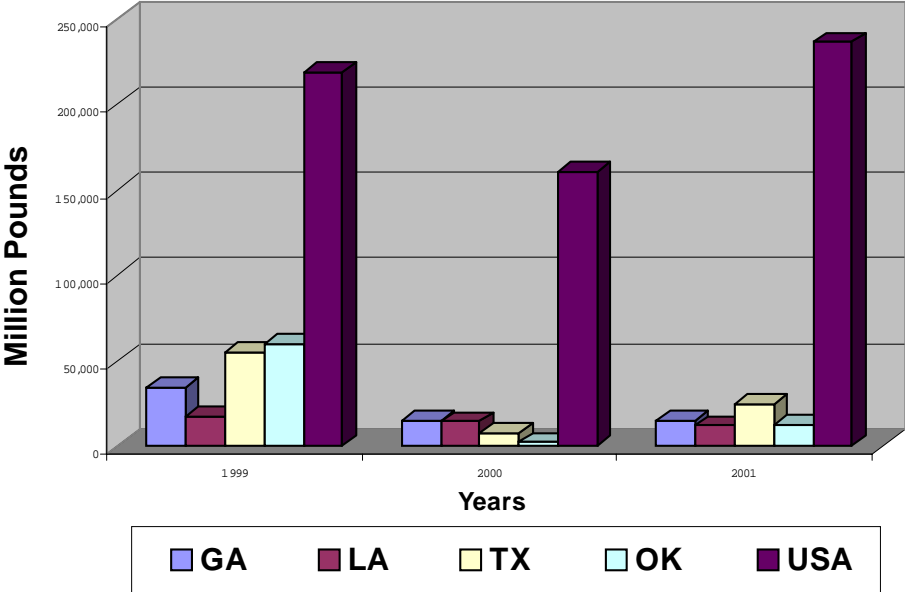
Fig. 2. All Pecan Production-Major States, 1999-2001



Source: Agricultural Statistics Board, NASS, USDA (2002) Non-citrus Fruits and Nuts 2001 Preliminary Summary, pp 74-75.

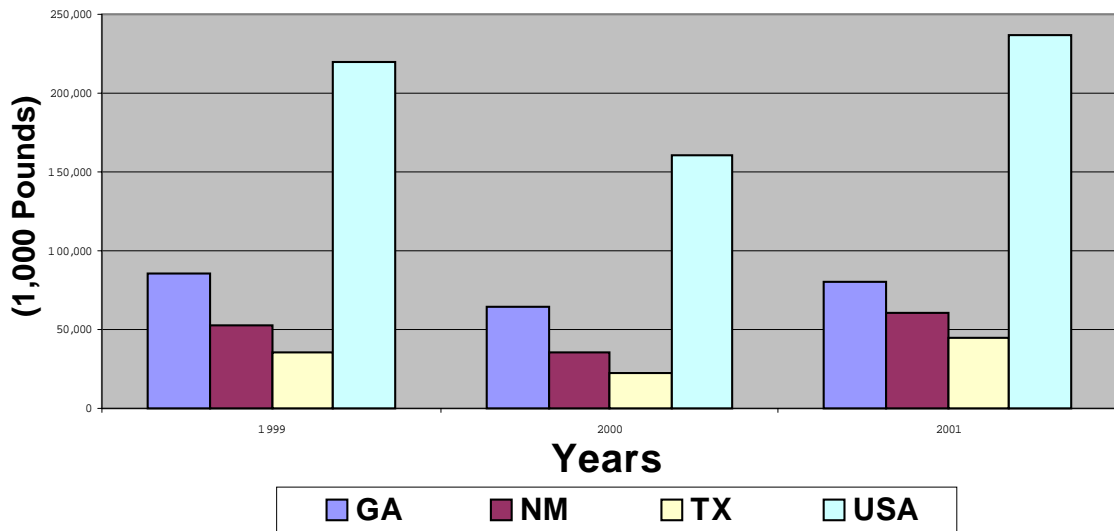
The same USDA and NASS report shows that out of the 406, 209.9 and 315 million pounds of Pecan produced in 1999, 2000 and 2001, Georgia contributed 120, 80, and 95 million pounds respectively (Fig. 2). This is equivalent to 35, 15 and 15 million pounds of Native and Seedlings (Fig 3), and 85, 65 and 80 million pounds for the Improved Varieties respectively for the same years (Fig. 4).

Fig. 3. Pecan Production: Major States: Native and Seedling, 1999-2001



Source: Agricultural Statistics Board, NASS, USDA (2002) Non-citrus Fruits and Nuts 2001 Preliminary Summary, pp 74-75.

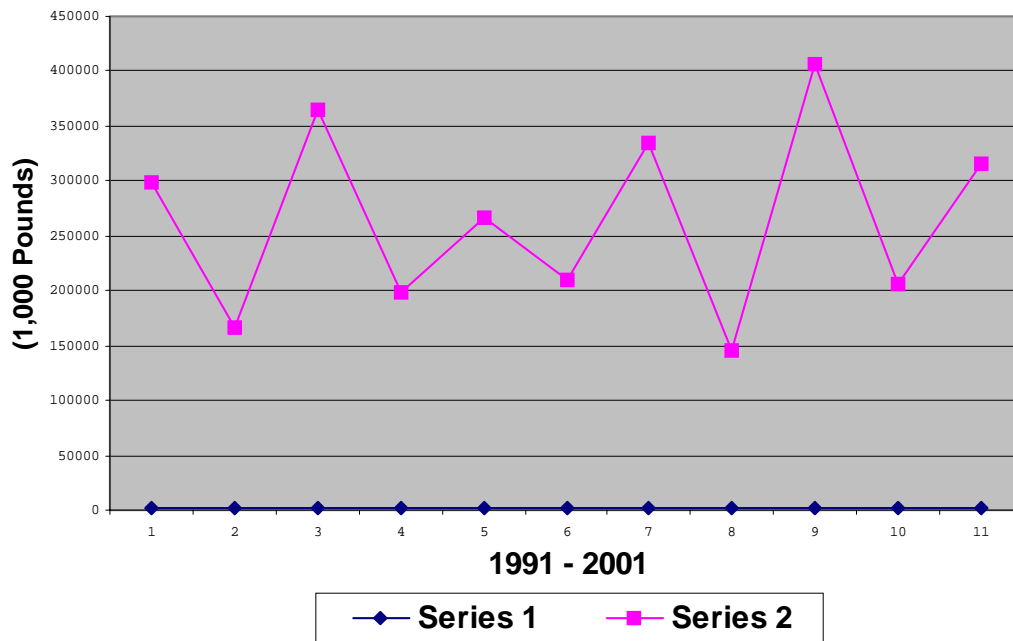
Fig: 4. Pecan Production - Major States, Improved Varieties, 1999-2001



Source: Agricultural Statistics Board, NASS, USDA (2002) Noncitrus Fruits and Nuts
2001 Preliminary Summary, pp 74-75.

From 1991 – 2001, the United States Pecan production (in-shell basis) illustrates a chain saw trend due to the alternate bearing cycles and the introduction of improved varieties (fig. 5).

Fig. 5. Pecan Production (in-shell basis): United States, 1991-2001



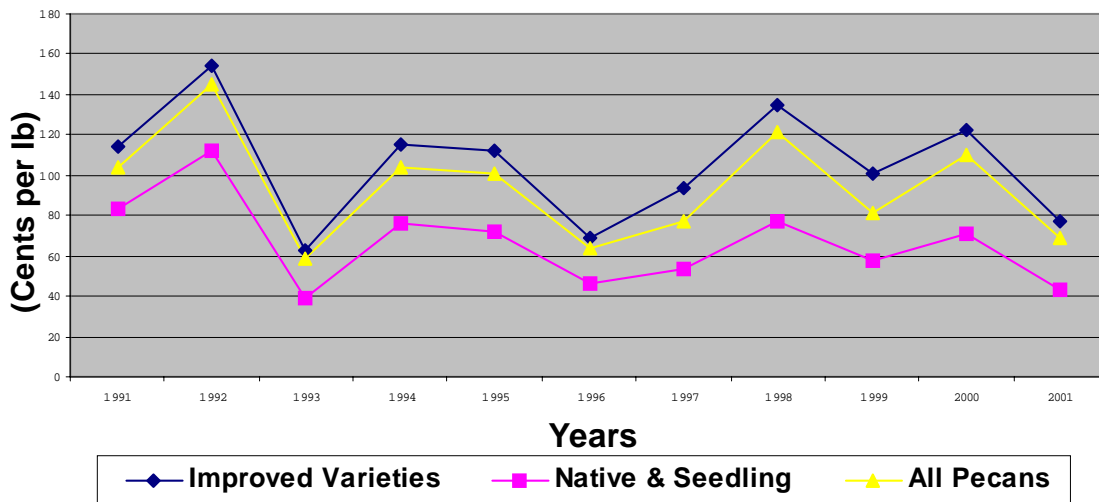
Source: Agricultural Statistics Board, NASS, USDA (2002) Noncitrus Fruits and Nuts
2001 Preliminary Summary, pp 74-75.

It is equally important to know your market as well as cost of production to determine profit margin and how much capital is needed especially during the establishment years. The pecan budget should be used simply as a guide for inputting your own costs.

Pecan Price Trend

Pecan prices are volatile, sensitive and fluctuating. This volatility depends on several factors, including the variety, locality and aggregate productivity. Price trend for the past ten years vary from 154 to 43.4 cents per pound (fig. 6).

Fig: 6. Price Trend: Improved Varieties, Native & Seedling, and All Pecans, 1991-2001



Source: Agricultural Statistics Board, NASS, USDA (2002) Non-citrus Fruits and Nuts 2001 Preliminary Summary, pp 74-75.

Farm Input Prices

There are several factors that can influence prices of inputs, total cost of production and profit margin respectively. Most farmers in Georgia may not invest in drip and overhead irrigation materials or dig a new well since they already have them available. If so, that would significantly increase profitability. Small Pecan farmers, i.e. from one to thirty acres may or may not install an irrigation system. Also motor size (HP) may differ depending on the number of acreage. Quantity discounts may affect prices of inputs. The cost estimate in this budget reflects a combination of the current agricultural practices in Georgia and recommendations from UGA specialists. The prices are actual prices from vendors around the counties involved in pecan production and they exclude quantity discounts.

Machinery costs

Estimated total annual fixed machinery costs for pecans is \$139.00 per acre. This cost varies based on the size of the farm. Again, small growers (1-30 acres) may not accrue this cost. However, if they decide to invest in machinery, overhead cost per acre may be relatively higher as the annual machinery investment costs are spread over a smaller acreage. Growers with 40 to 100 acres large farms may incur some of the cost. Also, only one equipment like sweeper will be needed by a farmer with less than 100 acres. A rational grower may simply purchase used equipments such as herbicide sprayer, air-blast sprayer, rotary mower, wagon, tractor, sweeper etc. to minimize cost and eventually maximize profit.

Types of Costs

Total costs of cultivating pecan include fixed and variable cost respectively. Variable costs are broken down into pre-harvest, harvesting and marketing costs. Fixed cost components include machinery, irrigation, recaptured establishment costs, land, overhead and management. Pre-harvest variable cost is \$424. Harvesting and Marketing cost is \$144. Total variable cost is \$568. On the other hand, total fixed cost is \$678 while the total budgeted cost per acre is \$1,246, excluding cost of land. The estimated establishment and first year maintenance cost per acre for Georgia Pecan is \$734. This cost trends down from second through fourth year to \$429 and trends up from fifth through seventh years to \$626. For more costs details, please turn to the budget section of this publication.

Irrigation Costs

Drip and solid set irrigation costs have been incorporated in this enterprise cost analysis. Annual fixed costs per acre for drip irrigation is estimated at \$66 while total annual costs per acre is \$103. The estimated annual fixed costs per acre for the solid set irrigation system is \$105 while the total annual costs per acre is \$184. The solid set system is relatively more expensive in terms of initial investment per acre. Micro-sprayer irrigation system is also used by some pecan growers in Georgia. This system is the most efficient especially on sandy soil and due to its water dispersal surface area coverage of to 3 to 20 ft diameter (1– 7 meters). However, the system is not incorporated in this enterprise cost analysis but would be very much in line with the estimated drip costs. Therefore, it is recommended that growers with micro-sprayer system should use the drip irrigation budget and those with micro-sprinkler system, should use the solid set irrigation budget respectively.

PECANS

(Total Cost Budget)

*Number of acres = 1

IRRIGATION: Enter 0 for none, 1 for drip, 2 for Solid Set 1

	Best	Opt	Median	Pess	Worst
*Yield (lbs)	1600	1400	1200	1000	800
*Price per lb.	1.25	1.05	0.85	0.65	0.45

Item	Unit	Quant.	Price	\$Amt/ac	TOTAL
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Variable Costs

Lime, applied	Ton	0.5	22.00	11.00	11
Nitrogen	Lbs.	150	0.300	45.00	45
Phosphorus	Lbs.	30	0.250	7.50	8
Potassium	Lbs.	100	0.140	14.00	14
Zinc Sulfate	Lbs.	10	0.30	3.00	3
Fungicides	Appl	9	12.22	109.98	110
Herbicides	Appl	2	6.79	13.58	14
Insecticide	Appl	8	10.83	86.64	87
Labor	Hr.	3.46	7.00	24.20	24

Machinery

Fuel	Gal.	32.25	0.95	30.64	31
Rep & maint.	Acre	1	41.30	41.30	41
Land rent	Acre	1	0.00	0.00	0
Irrigation	Acre	1	37.49	37.49	37
Other	Acre	1	0.00	0.00	0
Interest on Oper. Cap.	\$	386.84	0.10	19.34	19

Pre-Harvest Variable Costs **424.33** **424**

Harvest and Marketing Costs

Fuel	Gal.	14.21	0.95	3.27	3
Machinery	Acre	1	20.26	20.26	20
Labor	Hr.	3.44	7.00	24.08	24
Cleaning & Drying	Lbs.	1200	0.08	96.00	96

Total Harvesting and Marketing Costs **143.60** **144**

Total Variable Costs **567.93** **568**

FIXED COST

Machinery Cost	Hr.	1.00	139.07	139.07	139
Irrigation	Acre	1.00	65.92	65.92	66
Recapture estab. costs	Acre	1.00	430.76	430.76	431
Land	Acre	1.00	0.00	0.00	0
Overhead and Management	\$	424	0.10	42.43	42

Total Fixed Costs **678.17** **678**

Total budgeted cost per acre **1246.10** **1246**

Costs Per Lb.

Pre-harvest variable cost per lb.	0.35
Harvest & marketing cost per lb.	0.12
Fixed costs per lb.	0.57

Total budgeted cost per lb. **1.04**

(continued on next page)

EXPECTED RETURNS FROM TOTAL ACREAGE

ACRES	EXPECTED YIELD/AC	VOLUME MARKETED	EXPECTED PRICE	TOTAL RETURNS
1	1200	1200	0.85	1020

RISK RATED RETURNS OVER TOTAL COSTS

Net return levels (TOP ROW);
 The chances of obtaining this level or more (MIDDLE ROW); and
 The chances of obtaining this level or less (BOTTOM ROW).

		Optimistic		Expected		Pessimistic	
*Returns(\$)	195	55	(86)	(226)	(367)	(507)	(648)
Chances	7%	16%	31%	50%	31%	16%	7%
Chances				50%	31%	16%	7%

CHANCES FOR PROFIT = 21% BASE BUDGETED NET REVENUE = (226)

**ESTIMATED ESTABLISHMENT AND FIRST YEAR MAINTENANCE
COST PER ACRE FOR GEORGIA PECAN, 2002**

ITEM	UNIT	QUANT.	PRICE	AMOUNT
OPERATING COSTS				
LIME (DOL.)	TON	2	22.00	44.00
FERT (10-10-10)	lb	120	0.30	36.00
ZINC SULFATE	LBS	50	0.30	15.00
HERBICIDES	APPL	3	6.79	20.37
TREES	TREE	27	8.25	222.75
SPRAY MAT'L	ACRE	1	15.00	15.00
LABOR	HRS	20	7.00	140.00
MACHINERY				
FUEL	GAL	16.02	0.95	15.22
REP & MAINT		1	48.00	48.00
IRRIGATION	ACRE	1	37.49	37.49
OTHER				
TOTAL OPERATING COSTS				593.83
FIXED COSTS				
TRACT & EQUIP	\$	1	45.00	45.00
GEN OVERHEAD	\$	593.83	0.05	29.69
IRRIGATION	\$	1	65.92	65.92
LAND	\$		0.06	0
OTHER				
TOTAL FIXED COSTS				140.61
TOTAL ESTABLISHMENT COSTS				734.44

**ESTIMATED ANNUAL MAINTENANCE COST FOR PECANS,
SECOND THROUGH FOURTH YEARS, GEORGIA, 2002**

ITEM	UNIT	QUANT.	PRICE	AMOUNT
OPERATING COSTS				
LIME (DOL.)	TON	0.33	22.00	7.26
FERT (10-10-10)	lb	480	0.30	144.00
ZINC SULFATE	LBS	0	0.30	0.00
HERBICIDES	APPL	3	6.79	20.37
SPRAY MAT'L	ACRE	1	15.00	15.00
LABOR	HRS	6	7.00	42.00
MACHINERY				
FUEL	GAL	9.07	0.95	8.62
REP & MAINT		1	28.00	28.00
IRRIGATION	ACRE	1	37.49	37.49
OTHER				
TOTAL OPERATING COSTS				302.74
FIXED COSTS				
TRACT & EQUIP	\$	1	45.00	45.00
GEN OVERHEAD	\$	302.74	0.05	15.14
IRRIGATION	\$	1	65.92	65.92
LAND	\$		0.06	0.00
OTHER				
TOTAL FIXED COSTS				126.05
TOTAL COSTS				428.79

**ESTIMATED ANNUAL MAINTENANCE COST FOR PECANS,
FIFTH THROUGH SEVENTH YEARS, GEORGIA, 2002**

ITEM	UNIT	QUANT.	PRICE	AMOUNT
OPERATING COSTS				
LIME (DOL.)	TON	0.33	22.00	7.26
FERT (10-10-10)	IBS	960	0.30	288.00
ZINC SULFATE	LBS	15	0.30	4.50
HERBICIDES	APPL	3	6.79	20.37
TREES	TREE	0	8.00	0.00
SPRAY MAT'L	ACRE	1	15.00	15.00
LABOR	HRS	9	7.00	63.00
MACHINERY				
FUEL	GAL	15.88	0.95	15.09
REP & MAINT		1	40.00	40.00
IRRIGATION	ACRE	1	37.49	37.49
OTHER				
TOTAL OPERATING COSTS				490.70
FIXED COSTS				
TRACT & EQUIP	\$	1	45.00	45.00
GEN OVERHEAD	\$	490.70	0.05	24.54
IRRIGATION	\$	1	65.92	65.92
LAND	\$		0.06	0.00
OTHER				
TOTAL FIXED COSTS				135.45
TOTAL COSTS				626.16

COMPOUND AND RECAPTURE OF ESTABLISHMENT COSTS

	COMPOUNDING RATE	YEARS TO PRODUCTION			
	0.06	7	1.50	734	1104
		6	1.42	429	608
		5	1.34	429	574
		4	1.26	429	541
		3	1.19	626	746
		2	1.12	626	704
		1	1.06	626	664
COMPOUND ESTAB. COST					4941
RECAPTURE ESTAB. COST					
YEARS			20		
INTEREST			0.06		
ANNUAL COST		----->			431

CHEMICALS FOR PECANS

Item	Unit	Quantity	Price	Amt/Ac.
Herbicide	Appl.	1	\$6.42	\$6.42
Herbicide	Appl.	1	\$7.15	\$7.15
Herbicide	Appl.	0	\$0.00	\$0.00
Insecticide	Appl.	1	\$4.00	\$4.00
Insecticide	Appl.	3	\$11.00	\$33.00
Insecticide	Appl.	1	\$7.65	\$7.65
Insecticide	Appl.	3	\$14.00	\$42.00
Insecticide	Appl.	0	\$0.00	\$0.00
Fungicide	Appl.	4	\$10.00	\$40.00
Fungicide	Appl.	5	\$14.00	\$70.00
Fungicide	Appl.	0	\$0.00	\$0.00
Fungicide	Appl.	0	\$0.00	\$0.00
Fungicide	Appl.	0	\$0.00	\$0.00
Fungicide	Appl.	0	\$0.00	\$0.00
Other	Appl.	0	\$0.00	\$0.00
Other	Appl.	0	\$0.00	\$0.00
Other	Appl.	0	\$0.00	\$0.00
Other	Appl.	0	\$0.00	\$0.00
Total		19		\$210.22

ESTIMATING MACHINERY OPERATING COSTS FOR PECANS

Operation	Equip. Width (ft.)	Field Speed (mph)	Field Effic. %	Acres Per Hour	Number Times Over	Fuel Use (Gal.)	Mach Repairs (\$)	Labor Use (Hr.)
Pre-Harvest								
Sprayer:								
Herbicide	20.00	3.00	70	5.09	2	1.47	1.72	0.47
Air Blast	40.00	2.50	65	7.88	12	24.75	35.43	1.83
Rotary Mower	15.00	6.00	95	10.36	10	6.03	4.14	1.16
Total Pre-Harvest						32.25	41.30	3.46
Harvest								
Shake	40	1.00	90	4.36	3	3.09	5.50	0.83
Sweep	10	3.00	90	3.27	3	3.44	9.37	1.10
Harvest	10	2.00	80	7.00	3	2.68	4.89	0.51
Haul						5.00	0.50	1.00
Total Harvest						14.21	20.26	3.44

ESTIMATED TOTAL ANNUAL FIXED MACHINERY COSTS FOR PECANS

Item	Acres Interest	400 10.0%	Percent Used For Crop	Purchase Price	Salvage Value	Yrs. Life	Deprec.	Int	Tax & Ins	FC/Ac
Sprayer,herbicide			75%	600	120	5	72	27	4	0.26
Sprayer,airblast			100%	65000	13000	5	10400	3900	546	37.12
Rotary Mower(15')			75%	7500	1500	7	643	338	47	2.57
Wagon(dump)			100%	10000	2000	15	533	600	84	3.04
Wagons(4 used)			50%	3600	500	5	310	103	14	1.07
Tractor(2)*			60%	67500	13500	8	4050	2430	340	17.05
Tractor			50%	57000	11400	8	2850	1710	239	12.00
Truck			30%	20000	4000	1	4800	360	50	13.03
Blower			100%	3700	740	5	592	222	31	2.11
Sweeper(2)**			100%	10000	2000	10	800	600	84	3.71
Harvester			100%	32000	6400	10	2560	1920	269	11.87
Shaker			100%	95000	19000	10	7600	5700	798	35.25
Total Investment				371,900	74160		35210	17909	2507	139
								35210		
								17909		
								2507		
TOTAL FIXED COSTS								55626		
FIXED COSTS per ACRE								\$ 139.07		

* These prices are for new equipments. Used equipments could be purchased.

**Only one sweeper is required for 100 acres or less.

DRIP IRRIGATION FOR PECANS

BASED ON		100		ACRES
SPACING	40	by	40	
INTEREST ON INVESTMENT CAPITAL				10.00%
TAXES & INSURANCE				0.015
DEPTH OF WELL IN FEET				350

INVESTMENT AND ANNUAL FIXED COSTS

	NEW COST	YRS.LIFE	DEPREC.	INTEREST	TAX & INS.
PIPE & FITTINGS	10300	20	515	515	77
TUBING & EMITTERS	9500	10	950	475	71
WELL	8400	25	336	420	63
PUMP & MOTOR	3500	15	233	175	26
FILTER & AUTO	2600	10	260	130	20
MISC.	1029	20	51	51	8
INSTALLATION	20600	20	1030	1030	155
TOTAL INVESTMENT	55929		3376	2796	419

TOTAL ANNUAL FIXED COSTS **6592**

ANNUAL FIXED COSTS PER ACRE **65.92**

OPERATING COSTS

MOTOR SIZE (HP)		20		
REPAIRS		1337		
ANNUAL PUMPING HOURS		1820		
ELECTRICITY				
Demand (standby charge) per YEAR		240		
Rate \$ per KWH		0.08		
ANNUAL ENERGY COST		2412		
ANNUAL ENERGY COST PER ACRE				24.12
OPERATING COST PER ACRE PER YEAR				37.49

TOTAL ANNUAL COSTS PER ACRE **103.41**

SOLID SET IRRIGATION FOR PECANS

BASED ON		100	ACRES
SPACING	40	by	40
INTEREST ON INVESTMENT CAPITAL			10.00%
TAXES & INSURANCE			0.015
DEPTH OF WELL IN FEET			400

INVESTMENT AND ANNUAL FIXED COSTS

	NEW COST	YRS.LIFE	DEPREC.	INTEREST	TAX & INS.
PIPE & FITTINGS	30900	20	1545	1545	232
SPRINKLERS	10000	10	1000	500	75
WELL	9600	25	384	480	72
PUMP & MOTOR	6500	15	433	325	49
FILTER & AUTO	2600	10	260	130	20
MISC.	1550	20	77	77	12
INSTALLATION	30900	20	1545	1545	232
TOTAL INVESTMENT	92050		5245	4602	690

TOTAL ANNUAL FIXED COSTS **10538**

ANNUAL FIXED COSTS PER ACRE **105.38**

OPERATING COSTS

MOTOR SIZE (HP)		50	
REPAIRS		1823	
ANNUAL PUMPING HOURS		1820	
ELECTRICITY			
Demand (standby charge) per YEAR		600	
Rate \$ per KWH		0.08	
ANNUAL ENERGY COST		6031	
ANNUAL ENERGY COST PER ACRE			60.31
OPERATING COST PER ACRE PER YEAR			78.54

TOTAL ANNUAL COSTS PER ACRE **183.92**

PECAN RETURNS

This example assumes very good management practices.

Year	Yield	Price	Var. Cost	Return over		
				Var. Cost	Total Cost	
1	0	\$ 0.90	593.83	-593.83	734.44	-734.44
2	0	\$ 0.90	302.74	-302.74	428.79	-428.79
3	0	\$ 0.90	302.74	-302.74	428.79	-428.79
4	0	\$ 0.90	302.74	-302.74	428.79	-428.79
5	0	\$ 0.90	490.70	-490.70	626.16	-626.16
6	0	\$ 0.90	490.70	-490.70	626.16	-626.16
7	0	\$ 0.90	490.70	-490.70	626.16	-626.16
8	135	\$ 0.90	508.25	-386.75	643.71	-522.21
9	270	\$ 0.90	525.80	-282.80	661.26	-418.26
10	405	\$ 0.90	476.98	-112.48	1155.15	-790.65 ****
11	540	\$ 0.90	494.53	-8.53	1172.70	-686.70
12	675	\$ 0.90	512.08	95.42	1190.25	-582.75
13	810	\$ 0.90	529.63	199.37	1207.80	-478.80
14	945	\$ 0.90	547.18	303.32	1225.35	-374.85
15	1190	\$ 0.90	579.03	491.97	1257.20	-186.20

This year fixed costs for the mature orchard was used.
In reality , the higher fixed costs may begin earlier or later.

Prepared by: Greg E. Fonsah, Extension Economist, UGA,
Kerry Harrison, Extension Engineer, UGA and
Brad Mitchell, Extension Coordinator, Mitchell County

The University of Georgia College and Agricultural & Environmental Sciences and Ft. Valley State University, and the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability.

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