

Blumberg No. 5119

EXHIBIT

68

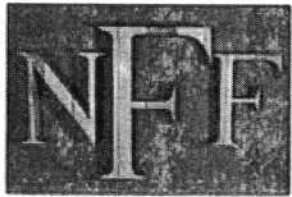
# Cost of Pecan Production

Lenny Wells

UGA Horticulture

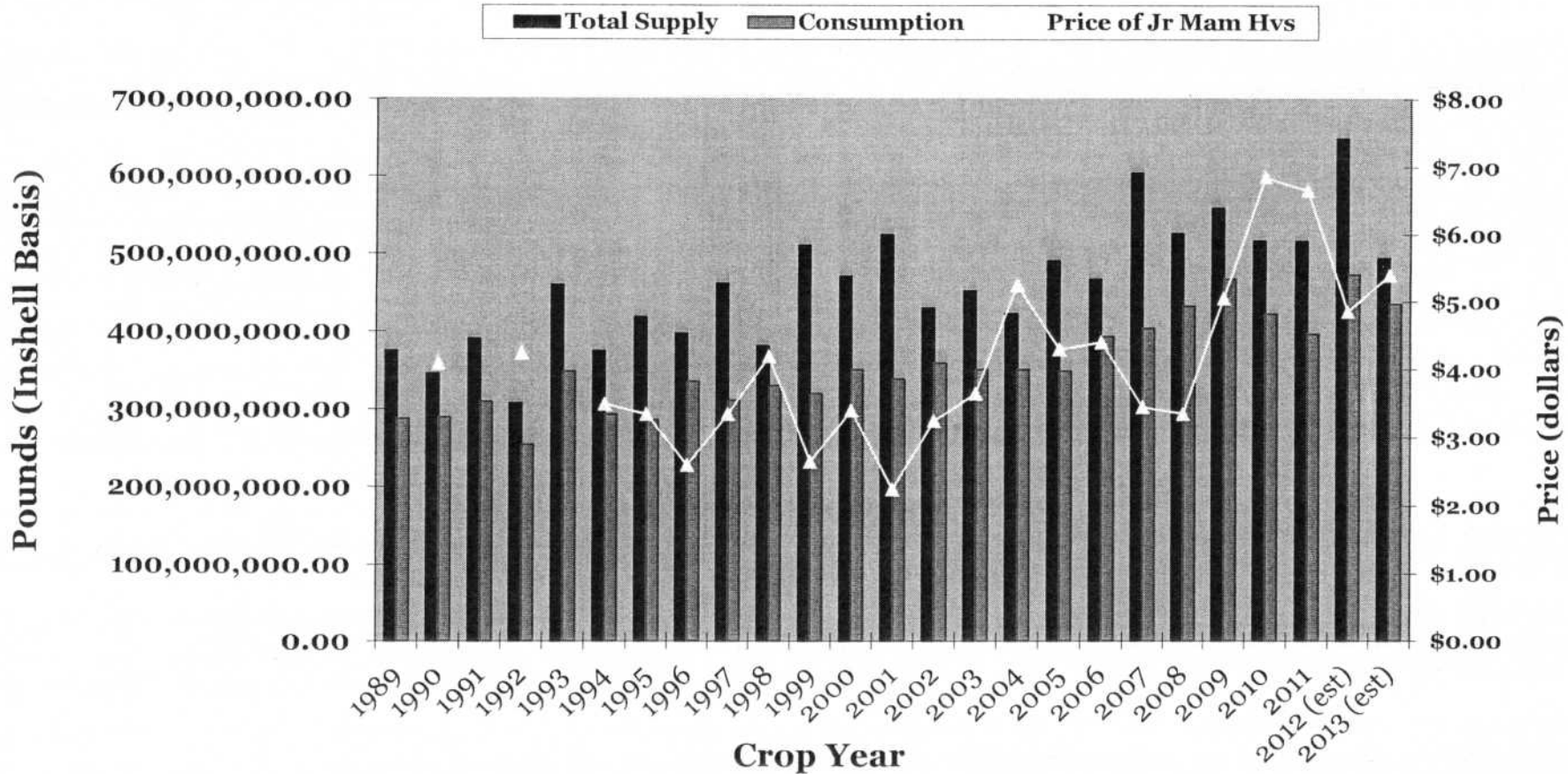
NPSA 20

Nature's Finest Foods, Ltd.



Specializing in the marketing of tree nuts!

# Consistent Supply

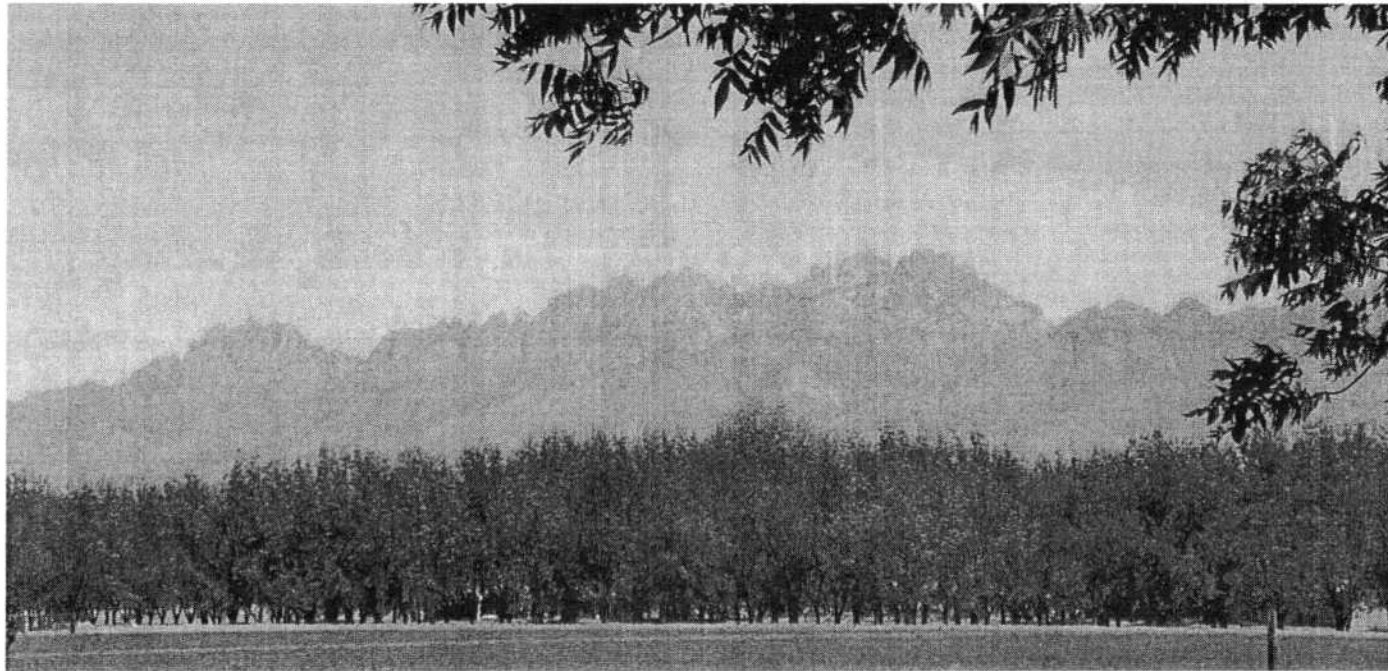


February 17, 2014

\*Note: Prices are approx. January contract prices

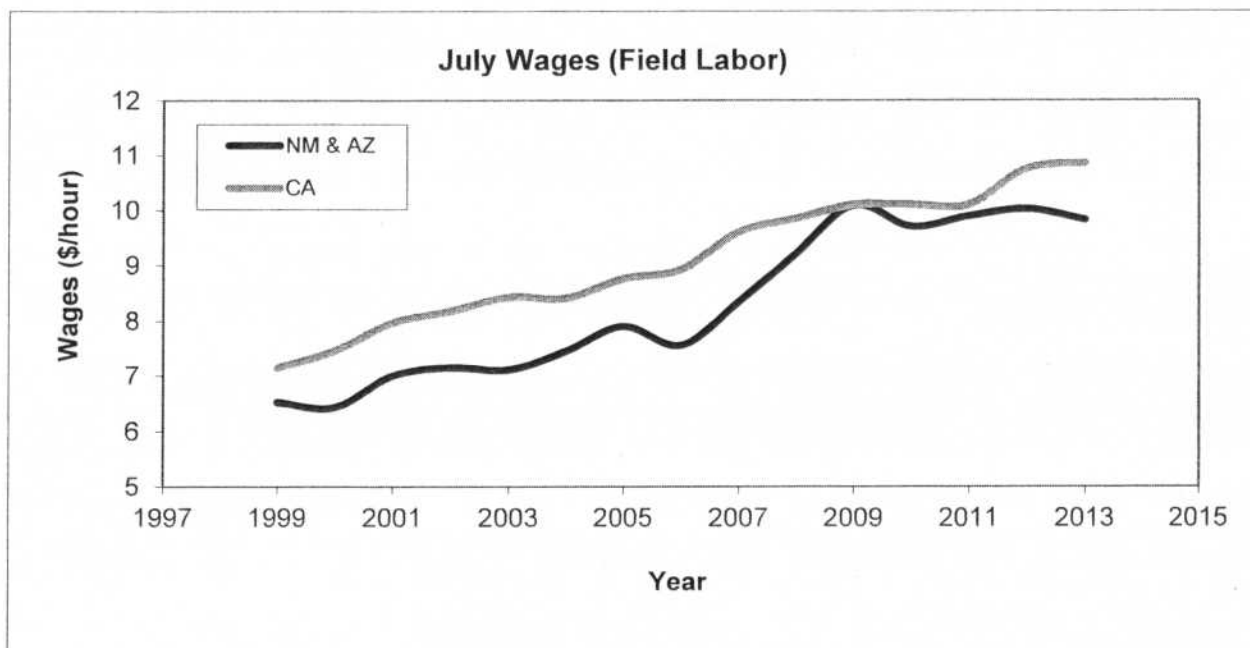
Source: National Ag Statistics Service , Foreign Ag Statistics and Nature's Finest Foods

# Western Pecan Production Costs West Texas to California



# Labor

- Farm labor is becoming scarcer in the West:
  - Tighter immigration.
  - Oil fields.
- Growers must often make due with fewer workers.
- Wages continue to increase → now \$10-11 per hr plus 25-35% overhead in many western pecan producing areas.



Source: USDA NASS (<http://usda.mannlib.cornell.edu>)

Pecan operations in the west are highly mechanized, but still require **20-30 hrs** of labor / acre annually.

Richard Heerema, NMSU

# Diesel Fuel

- Diesel fuel powers most orchard equipment.
  - 25-35 gallons per acre annually.
  - Price \$3.75/gallon in 2014 season.
  - Total cost in 2014 at least \$90/acre.
  - Diesel prices up ~30% since 2010 season.



# Irrigation

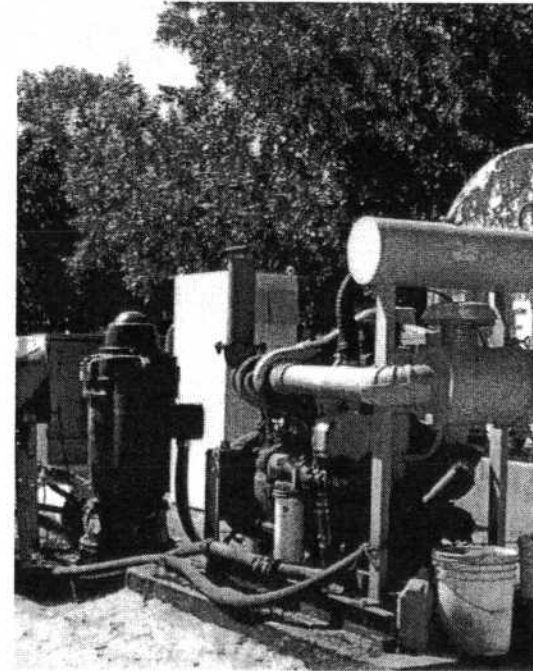
- Annual Water Needs:
  - 5-6 acre-foot/acre  
(1.6-2.0 million gal/acre)
- Water Sources:
  - Irrigation District
    - Usually limited to 2-3 acre-ft.  
Recent years limited to 6 inches or less (!).
    - Historically was the \*less\* expensive option in some places.
    - But now is ~\$150/acre-foot (!)



Richard Heerema, NMSU

# Irrigation

- Water Sources (continued)
  - Groundwater (aquifer)
    - Supplies some irrigation water on all farms throughout west and all irrigation water on many farms.
    - 100-3000 (!) feet below surface.
- Pumps → PUMPING FUEL COSTS account for more than half of irrigation expense for many growers.
  - \$4.16/Acre-inch (combined electric & natural gas pumps)



## Total Water Costs:

Pumping costs \$250-300/acre

Surface water costs \$75/acre

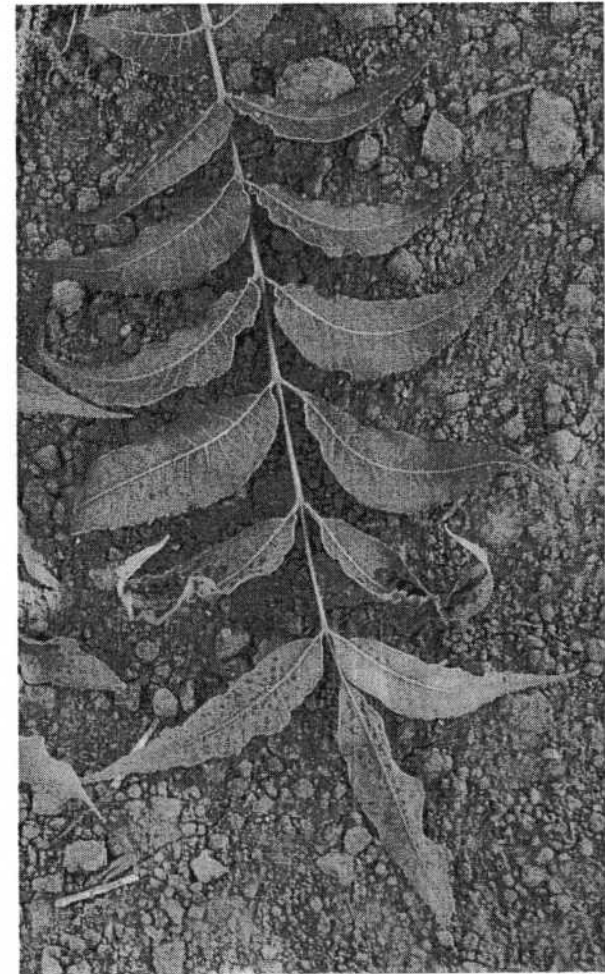
# Fertilizers: Macronutrients

- Nitrogen
  - **Critical for maintaining nut quality and yields**
  - Rates: 150-300 units/acre N annually.
  - 2014 Costs:
    - \$0.60-0.70 /unit
    - ~\$100-200 /acre
- Phosphorus
  - Many growers in the west apply P fertilizers.
  - Rates: 50-150 units/acre P annually.
  - 2014 Costs:
    - \$0.60/unit
    - ~\$30-90 /acre
- Potassium
  - Rates: 0-250 lbs/A
  - \$0-50/A
- Total Macronutrients
  - \$130-300+/acre total material cost



# Fertilizers: Micronutrients

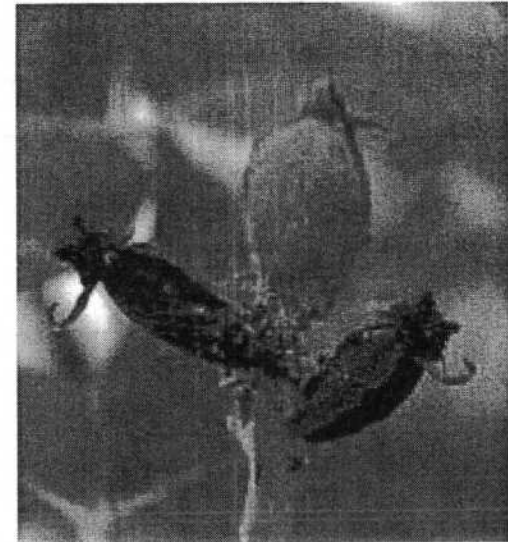
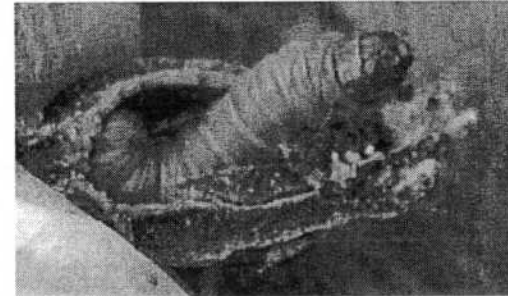
- Zinc
  - **Critical for yields.**
  - Applied foliarly with air blast sprayer.
  - 5 times every spring.
  - 10-25 lbs zinc sulfate/acre total.
- Other Micronutrients:
  - Manganese, iron, copper and nickel.
- Total Micronutrients Costs
  - Material Costs: \$25-100 per acre
  - PLUS Application Costs: \$10-15/acre



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# Insect Pest Management

- Pecan Aphids
  - Present throughout the western region
  - Insecticide controls:
    - Closer, Movento, & Lorsban → \$75-100/acre material costs
- Pecan Nut Casebearer
  - Present in NM and TX
  - Insecticide controls:
    - Lorsban & Intrepid → 1 trt each (\$50/acre material)
- Total Pest Management Costs
  - Material costs: \$150/acre
  - PLUS APPLICATION COSTS: \$10-15/acre



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# Weed Management

- Herbicides

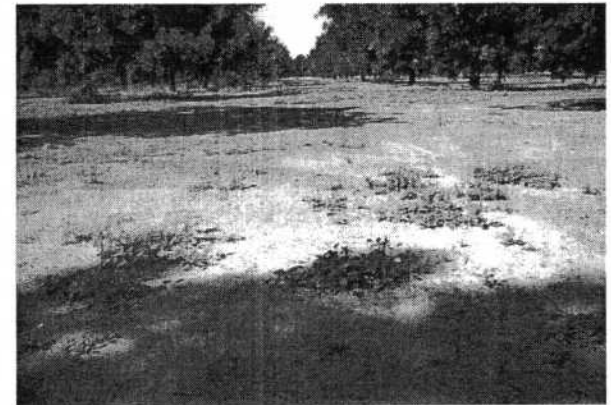
- Historically could rely on only glyphosate (e.g., Roundup)

- 5 applications is ~\$100/acre

- Now herbicide-resistance means higher glyphosate application rates or use of more expensive herbicides. Examples:

- Prowl H<sub>2</sub>O pre-emergent \$70/acre (2 apps)

- Pindar pre & post-emergent \$110/acre (2 apps)



# Harvest & Nut Cleaning

- Custom Harvest

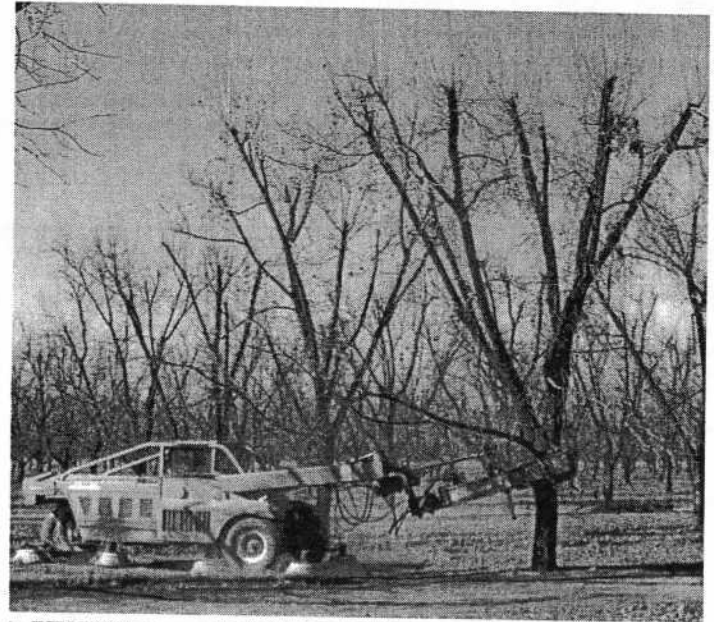
	\$0.21/lb
x	2000 lbs/acre
<hr/>	
	<b>\$420/acre</b>

- Custom Cleaning

	\$0.08/lb
x	2000 lbs
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	<b>\$160/acre</b>

- Total harvest and cleaning costs:

**\$580/acre**



# Pruning & Brush Removal

- Custom Pruning

	\$280/acre pruned
x	½ acreage
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	<b>\$140/acre</b>

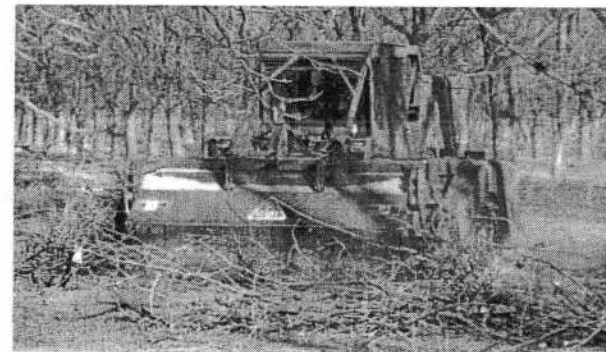
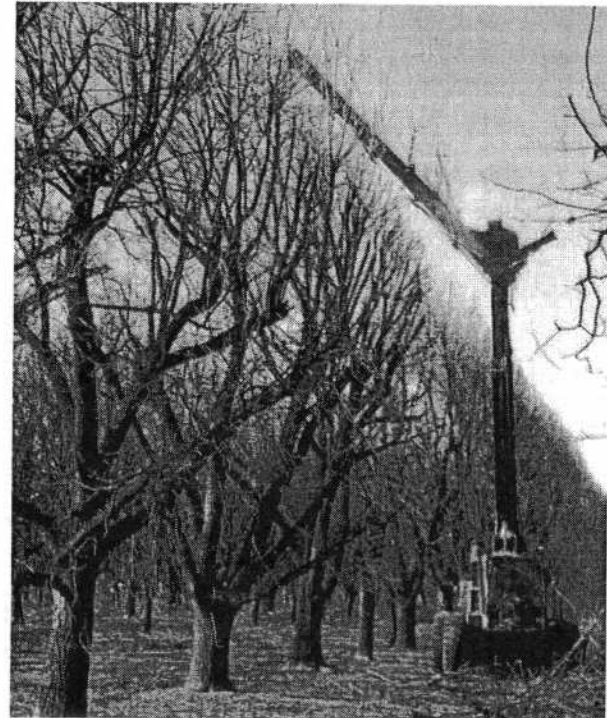
- Custom Shredding

	\$300/acre pruned
x	½ acreage
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	<b>\$150/acre</b>

- Total pruning & brush removal costs:

**\$290/acre**

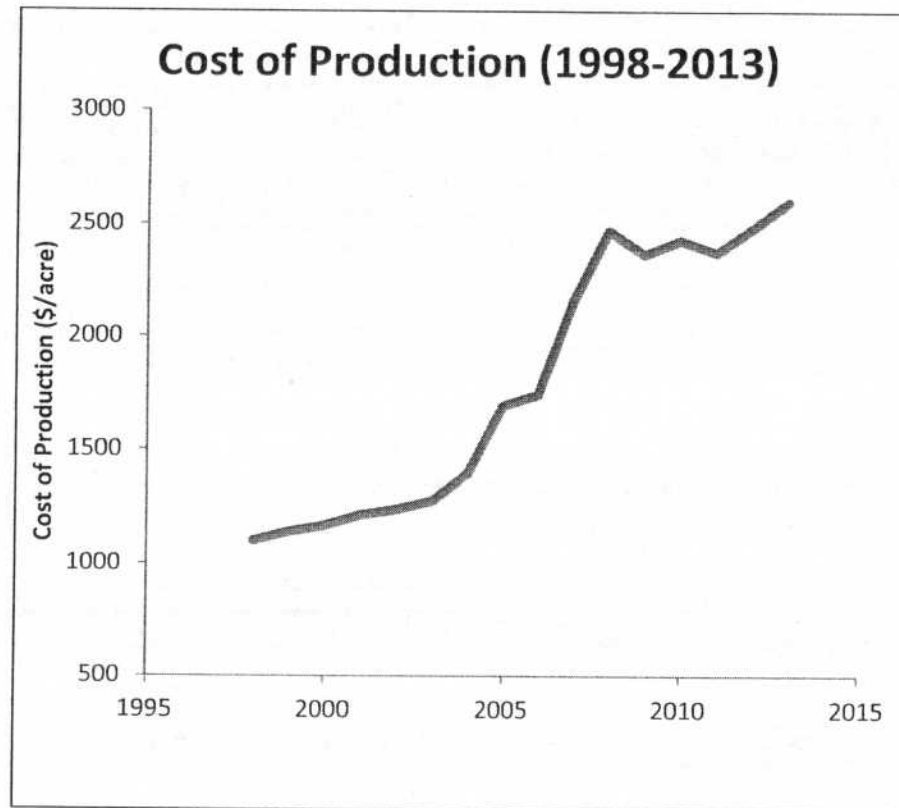
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# Total Cost to Grow Pecans in the West in 2014

VARIABLE COSTS: >\$2000

\*TOTAL (VARIABLE + FIXED) COSTS of producing pecans in 2014: >\$2,600/acre



\*Source: Dr. Jerry Hawkes, NMSU agricultural economist

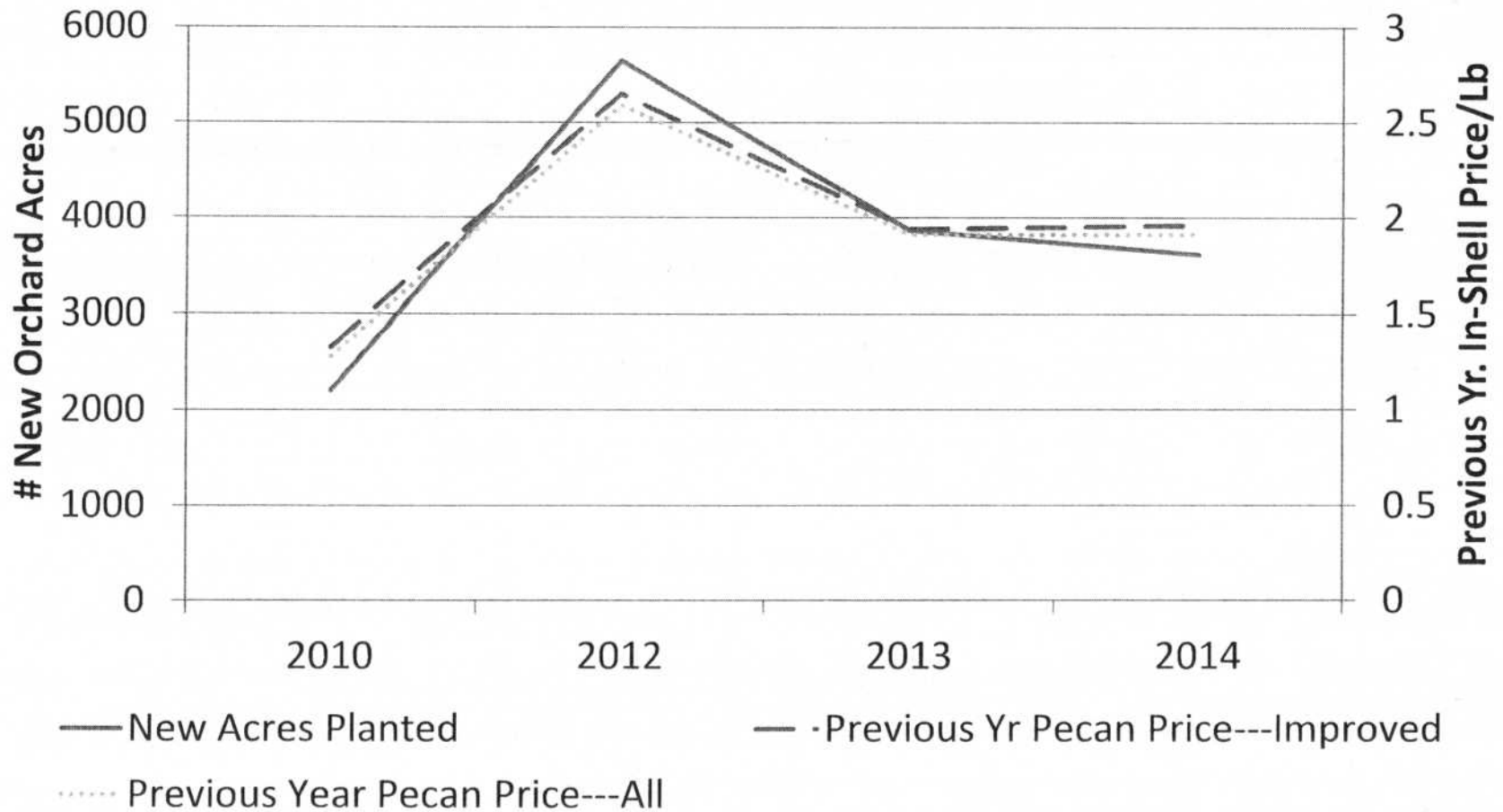
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# Cost of Pecan Production in the Southeast

Carolinas to East-Texas

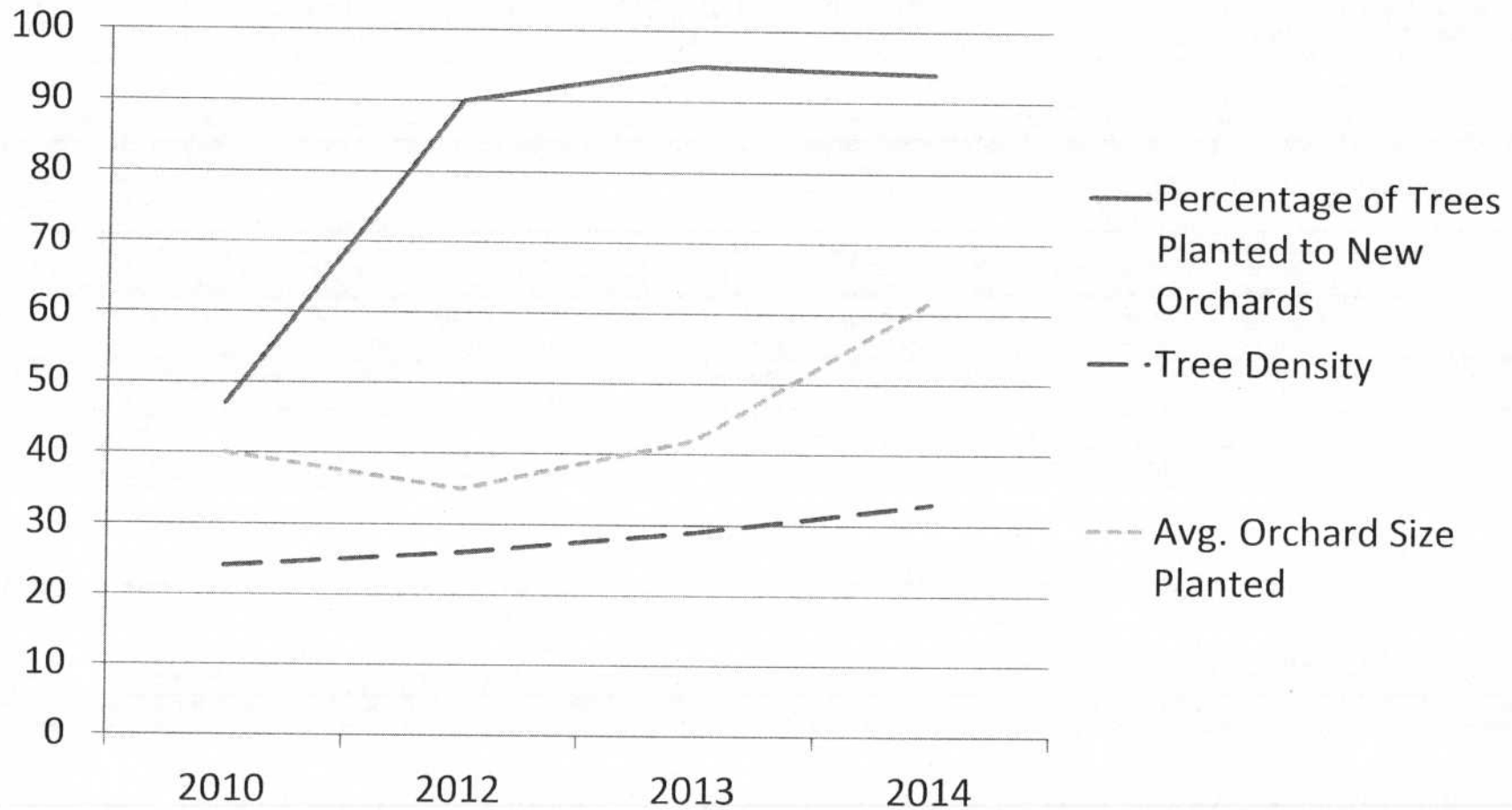


# Trends in the Georgia Pecan Industry





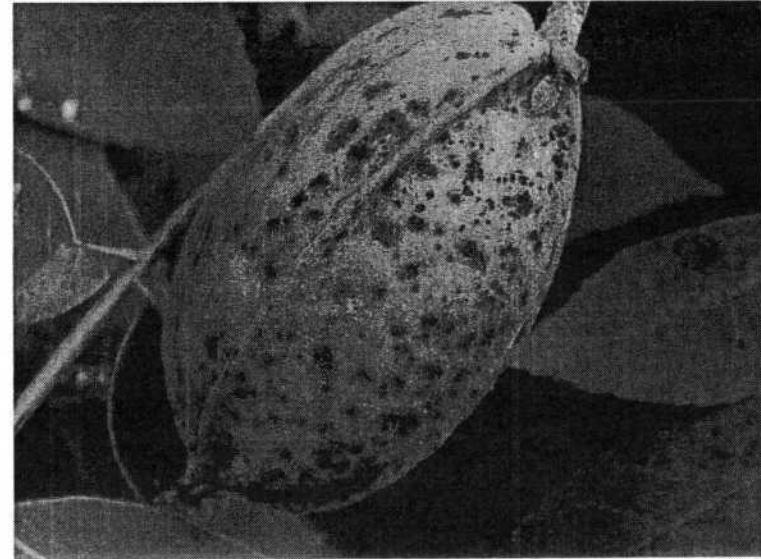
# Trends in the Georgia Pecan Industry



# Disease Management

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- Pecan Scab is the most important pest to consider in SE
- Scab thrives in warm, moist conditions
- Most commercial varieties must be sprayed preventatively with fungicides
- Fungicides must be rotated and/or tank-mixed to prevent development of resistance
- Failure to control scab leads to loss of supply and quality



# Insect Management

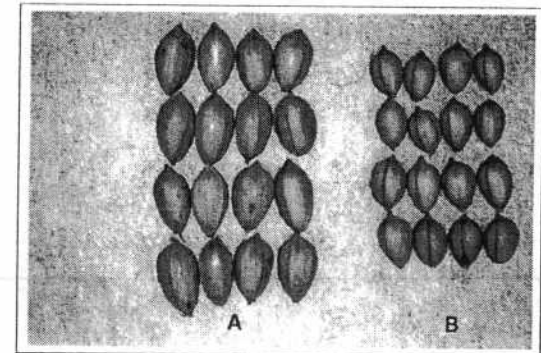
- Phylloxera, Pecan Nut Casebearer, Black Aphids, Yellow Aphids, Nut curculio, Hickory Shuckworm, Scorch Mites, and Pecan Weevil
  - Heaviest pressure occurs late season from July-September
  - Number of applications varies by year
  - Cost of insecticides rising
  - Insects can affect quality and supply of nuts



# Value of Irrigation

Water Application (Gal/Day/Acre)	Yield/Acre (lbs)	% Increase	Value of Increase (\$) (@ \$2.00/lb)
0	1034*	0	0
1200	1374	32	680
3600	1761	70	1454

\*Non-Irrigated pecan orchards rarely produce >1000 lbs/acre

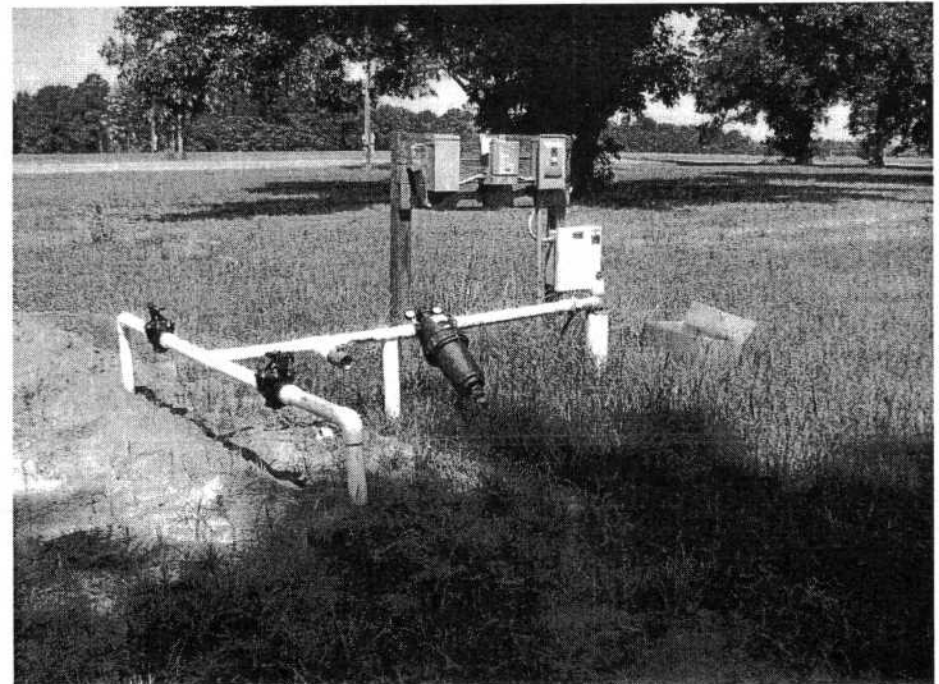


'Stuart'

Daniel, J.W. 1982

# Costs of Drip Irrigation

- Most irrigation in the SE uses well water
  - No water quality issues
- System Parts and Installation:
  - \$800 per acre
  - Subject to depreciation only after trees begin to bear crop
- Well & Pump: 4" + 5 hp = \$7800
  - 6"+30 hp = \$34,000
  - Large acreage = >\$100,000
- Operation Cost: \$35-\$60 per acre



# Equipment Costs

Item	Cost	Interest (3.5%)	Insurance	TOTAL
Herb. Sprayer	6000	210	4	
Air-blast Sprayer	101,000	3535	546	
Rotary Mower	16,000	560	47	
Dump Wagon	24,000	840	84	
Harvest Wagon	4000	140	14	
Tractor (100 hp)	95,000	3325	340	
Light Tractor (50 hp)	25,000	875	239	
Truck	30,000	1050	50	
Blower	7000	245	31	
Sweeper	15,000	525	84	
Harvester	60,000	2100	269	
Shaker	130,000	4550	798	
TOTAL	513,000	17,955	2507	533,462

# Orchard Establishment

Items	Units	Quantity	Price	Amount
Lime	Ton	1	30	30
Fertilizer	Lbs	29	.35	10.15
Zinc Sulfate	Lbs	29	.68	19.72
Foliar Zn	Acre	3	.5	1.50
Herbicide	Acre	4	29.25	117
Trees	Trees	29	20	580
Labor	Hrs	20	8	160
Fuel	Gallons	10	3.14	31.40
Repair/Maintenance	Acre	1	40.08	40.08
Irrigation System*	Acre	1	1140	1140
Irrigation Operation	Acre	1	39	39.00
Interest	---	2168.85	.05	2277.29

\*Includes 6"well+pump, materials, installation

# Variable Cost of SE Pecan Production

Items	Units	Quantity	Price	Amount
Lime	Ton	1	30	30
Nitrogen	Lbs	125	.49	61.25
Phosphorous	Lbs	40	.51	20.4
Potassium	Acre	60	.39	23.4
Zinc Sulfate	Acre	25	.5	12.5
Foliar Zn	Trees	3	2	6
Foliar Boron	Hrs	3	1.30	3.9
Fungicides	Acre	10*	16	160
Herbicides	Acre	4	29.25	117
Insecticides	Acre	8	14.97	119.76
Labor	Hours	25	8	200
Fuel	Gal	33	3.14	103.62
Repairs & Maint.	Acre	1	55	55
Irrigation Op & Maint	Acre	1	70	70
Interest		982.83	0.05	1031.97
Harvest Variable Cost	Acre	1	453.91	453.91
Total				1485.88



# Variable Cost of SE Pecan Production

Items	Units	Quantity	Price	Amount
Lime	Ton	1	30	30
Nitrogen	Lbs	125	.49	61.25
Phosphorous	Lbs	40	.51	20.4
Potassium	Acre	60	.39	23.4
Zinc Sulfate	Acre	25	.5	12.5
Foliar Zn	Trees	3	2	6
Foliar Boron	Hrs	3	1.30	3.9
Fungicides	Acre	16 (+60%)	16	256 (+60%)
Herbicides	Acre	4	29.25	117
Insecticides	Acre	8	14.97	119.76
Labor	Hours	25	8	200
Fuel	Gal	33	3.14	103.62
Repairs & Maint.	Acre	1	55	55
Irrigation	Acre	1	70	70
Interest		1118.32	0.05	1174.24
Harvest Variable Cost	Acre	1	453.91	453.91
Total				1628.15 (+9.5%)

# Hedging



Average Cost=\$200/acre

Most hedging in SE on 4-5 yr cycle, so:

$\$200 \times .25 = \$40-50/\text{acre}/\text{year}$

# Net Returns/acre

## Assumes \$1485.88/acre cost

	500	800	1000	1200	1500	2000
1	-985.88	-685.88	-485.88	-285.88	14.12	514.12
1.1	-935.88	-605.88	-385.88	-165.88	164.12	714.12
1.2	-885.88	-525.88	-285.88	-45.88	314.12	914.12
1.3	-835.88	-445.88	-185.88	74.12	464.12	1114.12
1.4	-785.88	-365.88	-85.88	194.12	614.12	1314.12
1.5	-735.88	-285.88	14.12	314.12	764.12	1514.12
1.6	-685.88	-205.88	114.12	434.12	914.12	1714.12
1.7	-635.88	-125.88	214.12	554.12	1064.12	1914.12
1.8	-585.88	-45.88	314.12	674.12	1214.12	2114.12
1.9	-535.88	34.12	414.12	794.12	1364.12	2314.12
2	-485.88	114.12	514.12	914.12	1514.12	2514.12
2.1	-435.88	194.12	614.12	1034.12	1664.12	2714.12
2.2	-385.88	274.12	714.12	1154.12	1814.12	2914.12
2.3	-335.88	354.12	814.12	1274.12	1964.12	3114.12
2.4	-285.88	434.12	914.12	1394.12	2114.12	3314.12
2.5	-235.88	514.12	1014.12	1514.12	2264.12	3514.12

# Net Returns/acre

## Assumes \$1628.15/acre cost

	500	800	1000	1200	1500	2000
1	-1128.15	-828.15	-628.15	-428.15	-128.15	371.85
1.1	-1078.15	-748.15	-528.15	-308.15	21.85	571.85
1.2	-1028.15	-668.15	-428.15	-188.15	171.85	771.85
1.3	-978.15	-588.15	-328.15	-68.15	321.85	971.85
1.4	-928.15	-508.15	-228.15	51.85	471.85	1171.85
1.5	-878.15	-428.15	-128.15	171.85	621.85	1371.85
1.6	-828.15	-348.15	-28.15	291.85	771.85	1571.85
1.7	-778.15	-268.15	71.85	411.85	921.85	1771.85
1.8	-728.15	-188.15	171.85	531.85	1071.85	1971.85
1.9	-678.15	-108.15	271.85	651.85	1221.85	2171.85
2	-628.15	-28.15	371.85	771.85	1371.85	2371.85
2.1	-578.15	51.85	471.85	891.85	1521.85	2571.85
2.2	-528.15	131.85	571.85	1011.85	1671.85	2771.85
2.3	-478.15	211.85	671.85	1131.85	1821.85	2971.85
2.4	-428.15	291.85	771.85	1251.85	1971.85	3171.85
2.5	-378.15	371.85	871.85	1371.85	2121.85	3371.85

# Cost of Pecan Production In Central Region ---Natives

Year	Operating Cost (\$/a)	Fixed Cost (\$/a)	Total Cost (\$/a)	Production (lbs/a)
All	\$ 592	\$ 19	\$ 611	700

# In-shell Production

- Average estimate of in-shell commercial pecan harvest per acre over 15 state production area = 1666.67
- Better data would be needed to express a more exact number