

The Bottom Line:
Getting Back to the Basics of Pecan
Production

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The Bottom Line

- About the time we can make the ends meet, somebody moves the ends.
 - Herbert Hoover
- What's going on with the price of pecans?
 - Pieces
 - Mexico
 - South Africa
 - China
 - Competing nuts
 - Weather
- How much money will it take to grow my pecans this year?
- What do my trees actually need to make good yields and quality?

Estimated Variable Cost of Production

- Pre-Harvest: \$975.79/acre
 - Harvest Cost: \$453.91/acre
 - Total Cost: \$1429.70/acre
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- A budget tells us what we can't afford, but it doesn't keep us from buying it.
 - William Feather

Break-Even Prices

Dollars/lb	500	800	1000	1200	1500	2000
1	-929.7	-629.7	-429.7	-229.7	70.3	570.3
1.1	-879.7	-549.7	-329.7	-109.7	220.3	770.3
1.2	-829.7	-469.7	-229.7	10.3	370.3	970.3
1.3	-779.7	-389.7	-129.7	130.3	520.3	1170.3
1.4	-729.7	-309.7	-29.7	250.3	670.3	1370.3
1.5	-679.7	-229.7	70.3	370.3	820.3	1570.3
1.6	-629.7	-149.7	170.3	490.3	970.3	1770.3
1.7	-579.7	-69.7	270.3	610.3	1120.3	1970.3
1.8	-529.7	10.3	370.3	730.3	1270.3	2170.3
1.9	-479.7	90.3	470.3	850.3	1420.3	2370.3
2	-429.7	170.3	570.3	970.3	1570.3	2570.3
2.1	-379.7	250.3	670.3	1090.3	1720.3	2770.3
2.2	-329.7	330.3	770.3	1210.3	1870.3	2970.3
2.3	-279.7	410.3	870.3	1330.3	2020.3	3170.3
2.4	-229.7	490.3	970.3	1450.3	2170.3	3370.3
2.5	-179.7	570.3	1070.3	1570.3	2320.3	3570.3

Assumes:

variable cost of production of \$975.79/acre+\$453.91/acre Harvesting Costs=\$1429.79 Total Variable cost



Price: Fancy Jr Mammoth Halves vs. Fancy Medium Pieces

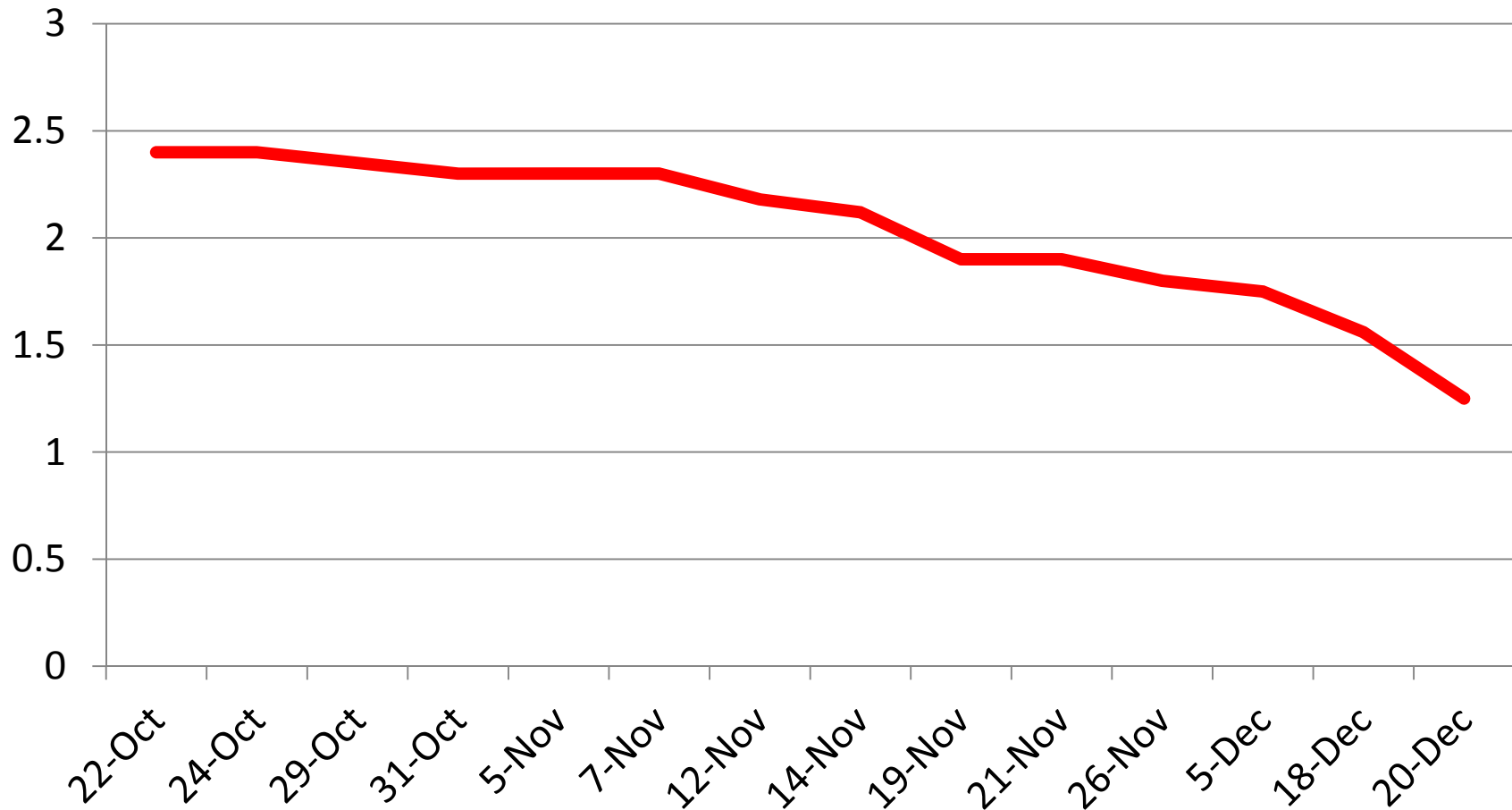


February 17, 2014

*Note: Prices are approx. January contract prices

Source: Nature's Finest Foods

2013 Pecan Prices---Stuart

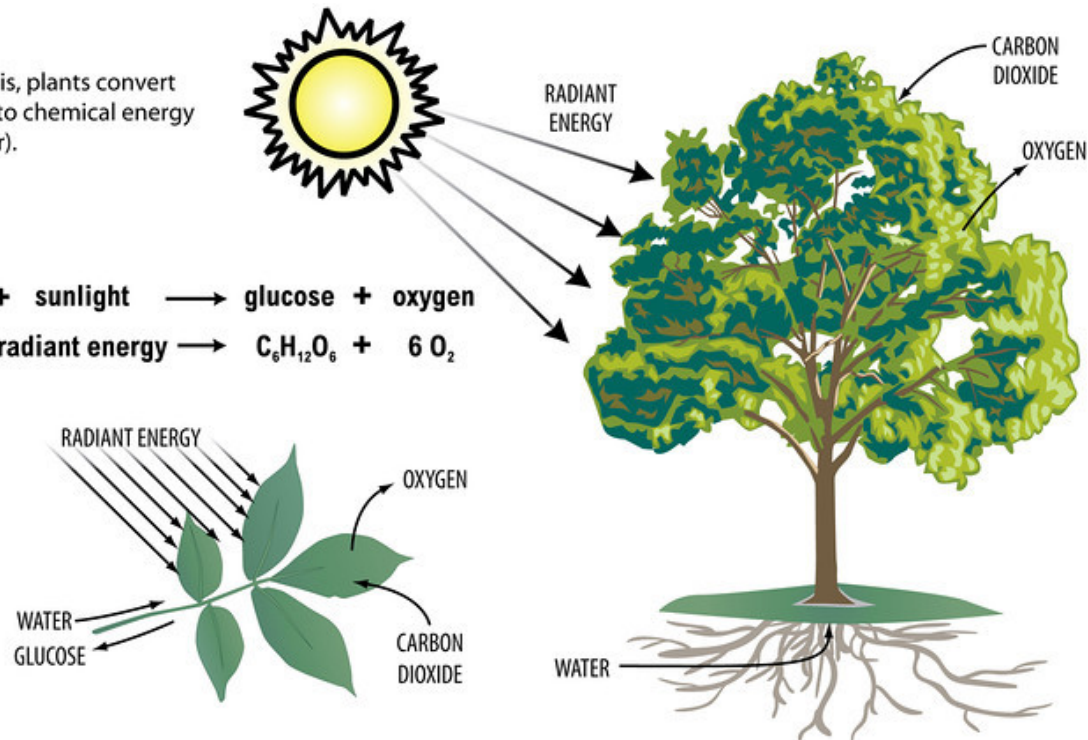
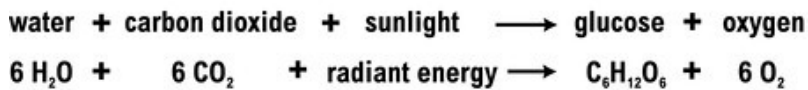


Average Price=\$2.04

What do all plants (including pecan trees) need most?

Photosynthesis

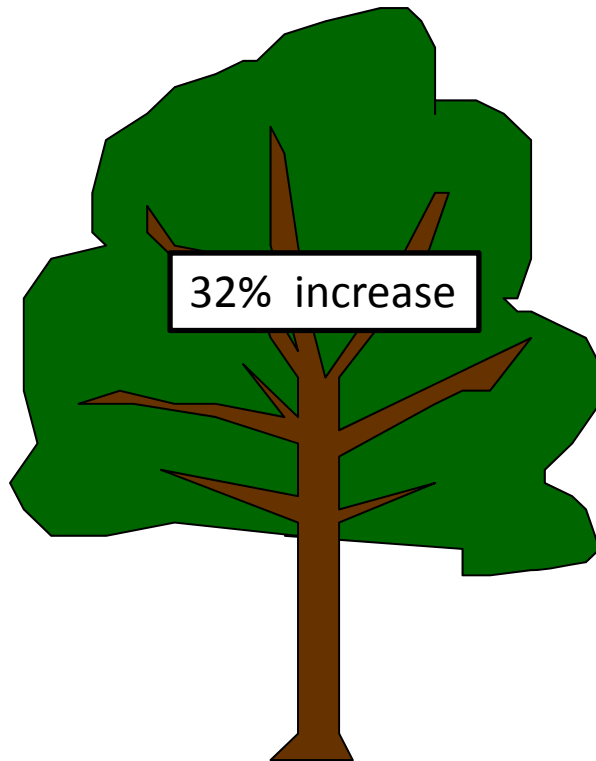
In the process of photosynthesis, plants convert radiant energy from the sun into chemical energy in the form of glucose (or sugar).



Sunlight+Water = carbs = Tree growth and Nut Production

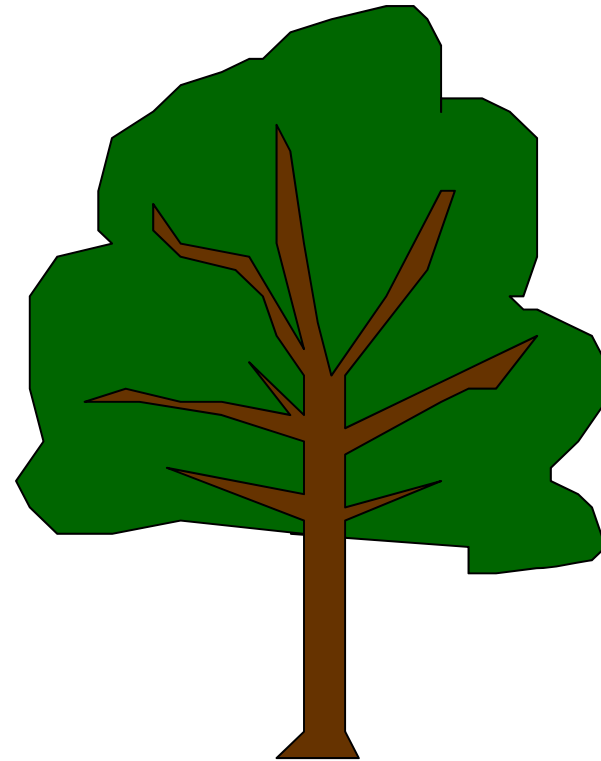
Effect of Sunlight and Air Movement on Yield---2012

OPEN



Sunlight=1843 lum/ft²
Yield=137.4 lbs/Tree

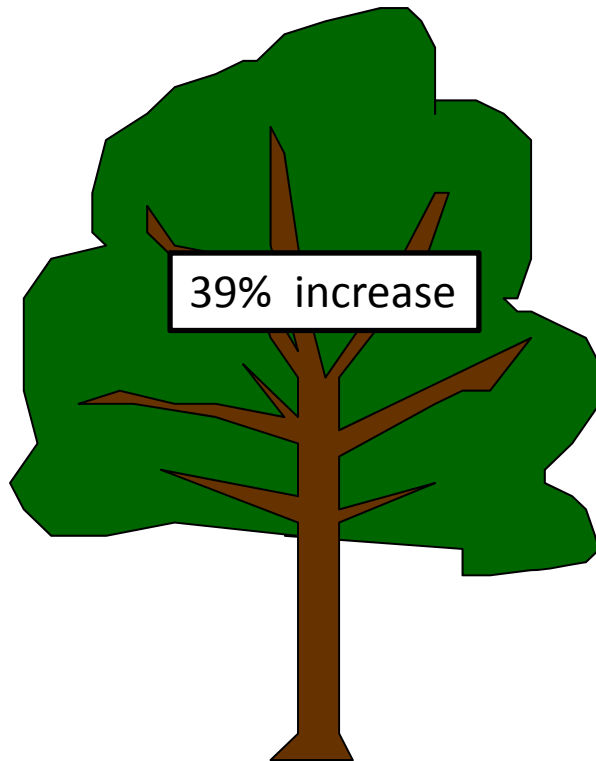
CROWDED



Sunlight=1005 lum/ft²
Yield=93.6 lbs/Tree

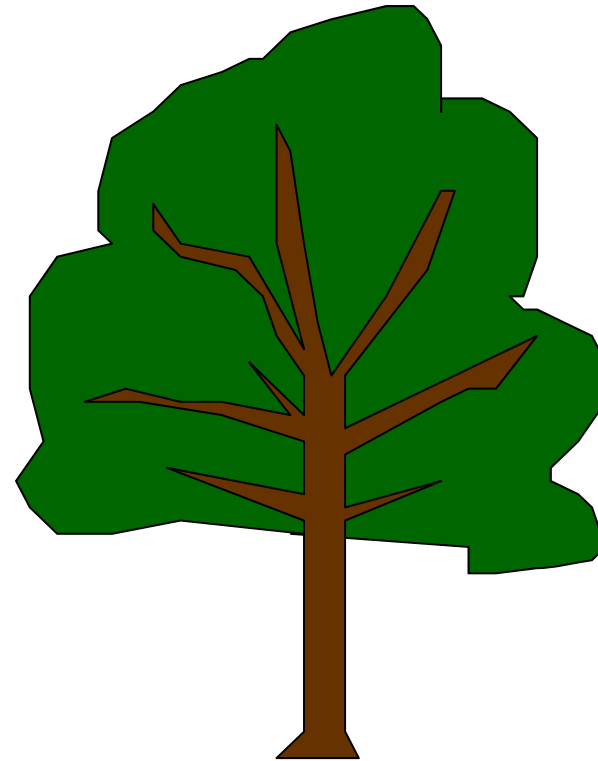
Effect of Sunlight and Air Movement on Yield---2013

OPEN



Sunlight=1176 lum/ft²
Yield=110.6/tree

CROWDED



Sunlight=996 lum/ft²
Yield=68 lbs/tree

Irrigation Schedule Recommendations (gallons per tree)

		New		Old		
April	17%	1800	(60 gal/day)	6750	(225 gal/day)	62.5%
May	26%	2880	(93 gal/day)	7905	(255 gal/day)	
June	33%	3600	(120 gal/day)	8550	(285 gal/day)	
July	40%	4500	(145 gal/day)	10,230	(330 gal/day)	
August	100%	11,160	(360 gal/day)	11,160	(360 gal/day)	
September		10,800	(360 gal/day)	10,800	(360 gal/day)	
Total		34740		55,395		
Average Per Day		189		303		

The Reduced Irrigation Schedule provides a **38% Reduction** in irrigation water use with no significant effect on tree water stress, **yield, or quality**

Pecans are a Perennial Crop

Not an Annual Crop

- Respond differently to inputs
- Orchard soils are not tilled
- Row Crops grow from seed or young plants
 - Birth, Growth, Death in 6-8 months
 - Everything you do to annual crops affects it that year
 - Effects on perennial crops are often delayed and long term

Leaf Tissue Results

	Desired Range	Mean	% Low	% High	Sample Range
Leaf N	2.5-3.3%	2.77%	3	0	2.58-3.09
Leaf P	0.12-0.3%	0.14%	0	0	0.13-0.18
Leaf K ¹	1.25-2.5%	1.26%	45	0	1.04-1.50
Leaf Ca	1.0-1.5%	1.84%	0	48	1.37-2.36
Leaf Mg ²	0.35-0.6%	0.53%	7	0	0.32-0.66
Leaf S	0.25-0.5%	0.24%	3	0	0.22-0.28
Leaf Fe	50-300ppm	71.7ppm	0	0	50-142
Leaf Zn	50-100ppm	125ppm	7	34	41-292
Leaf B	50-100ppm	84ppm	0	20	50-146
Leaf Cu	6-30ppm	9.8ppm	0	0	6-14
Leaf Mn	100-800ppm	562ppm	0	21	190-1251
Leaf Ni	?	2.5ppm	?	?	1-11

Soil Sample Results

	Desired Range (lbs/A)	Mean (lbs/A)	% Low	% High	Sample Range (lbs/A)
Soil P	30-60	98.3	0	90	48-183
Soil K	100-150	153	0	34	94-361
Soil Ca	400-900	988	3	48	192-2241
Soil Mg	90-100	184	7	90	35-436
Soil S	10-50	26.6	3	0	4-41
Soil Fe	12-25	22.6	3	24	8-76
Soil Zn	15-20	25	28	55	3.9-55.3
Soil B	0.5-1.0	0.99	41	14	0.22-6.0
Soil Cu	0.5-1.5	1.1	14	10	0.2-7.2
Soil Mn	15-40	31.9	28	7	13-45
Soil Ni ¹	?	1.26	N/A	N/A	1-7
pH	6.0-6.5	5.96	41	12	5.3-7.0

How Often Should You Lime the Orchard?

pH	6.0-6.5	5.96	41	12	5.3-7.0
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- High N rates can lower pH in upper soil layers (2-3") in the short term
- Lime applied to surface raises soil pH in upper 2-3" only
- Once soil pH reaches 6-6.5 below surface layer, it tends to remain there for a long time
- There is **NO** research-based evidence for increased yield and growth of mature pecan trees with lime application (Hunter and Hammar, 1947; Johnson and Hagler, 1955; Hagler et al. 1957; Brooks, 1964; Hunter, 1965; Worley et al. 1972)
- Excessive liming can lead to Zn deficiency, mouse ear, and problems with K uptake
- Lime when pH is <6.0 or every 3rd year at most on SE Coastal Plain soils (6.0-6.5); Keep N rates between 75-125 lbs/acre
- Savings: \$20/acre

How Often Should You Soil Apply Phosphorous

	Desired Range (lbs/A)	Mean (lbs/A)	% Low	% High	Sample Range (lbs/A)
Soil P	30-60	98.3	0	90	48-183

- P relatively immobile and accumulates on soil surface in non-tilled soils
- 1000 lb/acre pecan crop removes 1.6 lbs P per acre
- Annual turnover
- **Yield response to broadcast application of P on mature pecan is extremely rare** (Alben and Hammar, 1939; Worley and Harmon, 1964; Sullivan, 1974; Worley, 1974; **Sparks 1988**; Smith 1991;)
- Rates of >13,000 lbs P/acre only slightly increased nut size
- No benefit to annual maintenance broadcast application of P to pecans in most managed orchards
- Savings: \$20.40/acre
- If soil P<30 lbs per acre, broadcast P
- If soil P>30 lbs/acre and leaf P<0.12, band P

How Often Should You Soil Apply Potassium?

Soil K	100-150	153	23	34	94-361
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- 1000 lb/acre pecan crop removes 2.3 lbs K per acre
- Annual turnover
 - 70% of total nutrient content of fruit returned to soil in shucks (Sparks, 1975)
- **Yield response to broadcast application of K on mature orchards is extremely rare** (Hunter and Hammar, 1947; Hunter and Hammar, 1948; Sharpe et al. 1950; Sharpe et al., 1952; Hunter, 1956; Gammon and Sharpe, 1959; Hunter and Hammar, 1961; Worley, 1974; Worley, 1994)
- No real benefit to maintenance broadcast application of K in most mature managed orchards
- Savings: \$23.40/acre
- If soil K drops below 100 lbs/acre: broadcast K
- If soil K is >100 lbs/acre and leaf K is less than 1.1: band K
 - Need to keep leaf K at 2:1-2.5 ratio with leaf N, but broadcast application will not increase leaf K to 1.25

How Often Should You SOIL-apply Zinc?

Soil Zn	15-20	25	28	55	3.9-55.3
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- Most Coastal Plain soils not planted to pecan are very low in Zn
- Most mature orchards have high soil Zn levels
- Zn is immobile in soil
- Broadcast Zinc Sulfate when soil Zn is <15 lbs/acre
- If soil Zn >15 lbs/acre and leaf Zn <50 ppm or visible rosette: band Zn
- Savings: \$25/acre
- Make annual foliar Zn applications

What's the Best Way to Fertilize Pecans with Nitrogen?

- Apply 75-125 lbs N
- Inject liquid N
 - 3 applications beginning in April (10 day intervals)
 - 1 application in June
 - 1 application in late August/early September if heavy crop
 - No more than 25 lbs N/acre/injection
- Direct broadcast applications toward herbicide strip
 - Base total acreage applied on width of spread, not on total size of orchard
 - Use rate of 75-125 lbs/acre on treated area only
- Eliminate late season applications of N with:
 - Poultry Litter Application in Feb/March or
 - Establishment of good clover stand for 3 yrs

Estimated Variable Cost of Production

- Pre-Harvest: \$975.79/acre
- Harvest Cost: \$453.91/acre
- Total Cost: \$1429.70/acre

-\$176

- Pre-Harvest: \$799.79
- Total Cost: \$1253.70



Break-Even Prices

Dollars/lb	500	800	1000	1200	1500	2000
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1.1	-879.7	-549.7	-329.7	-109.7	220.3	770.3
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Assumes:

variable cost of production of \$975.79/acre+\$453.91/acre Harvesting Costs=\$1429.70 Total Variable cost

Break-Even Prices

Dollars/lb	500	800	1000
1	-753.7	-453.7	-253.7
1.1	-703.7	-373.7	-153.7
1.2	-653.7	-293.7	-53.7
1.3	-603.7	-213.7	46.7
1.4	-553.7	-133.7	146.3
1.5	-503.7	-53.7	246.3
1.6	-453.7	26.3	346.3
1.7	-403.7	106.3	446.3
1.8	-353.7	186.3	546.3
1.9	-303.7	266.3	646.3
2	-253.7	346.3	746.3
2.1	-203.7	426.3	846.3
2.2	-153.7	506.3	946.3
2.3	-103.7	586.3	1046.3
2.4	-53.7	666.3	1146.3
2.5	-3.7	746.3	1246.3

Assumes:

variable cost of production of \$799.79/acre+\$453.91/acre Harvesting Costs=\$1253.7 Total Variable cost

What Should I put in my spray tank?

- Fungicide
 - Phosphite
- Insecticide
 - As needed
- Zn
 - April/May (1st 3 sprays)
 - When you have a growth flush
- Boron
 - Pre-pollination (2-3 sprays)
- Nickel
 - Mouse Ear (2-3 sprays)
- Sulfur
 - Nut Sizing (3 sprays)



The Bottom Line

- I'm not telling you to skimp on inputs, I'm telling you what has been proven to work and what has not been proven to work according to research data
- Why spend money on it if its not improving your production or the value of your crop?
- The best measures are seldom adopted from previous wisdom, but forced by the occasion.
 - Benjamin Franklin