Nutritional, Cultural, and Environmental Disorders of Pecan

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UGA Horticulture-Pecans

Leaf Tissue Results---2008

	Desired Range	Mean	% Low	% High	Sample Range
Leaf N	2.5-3.3%	2.65%	12	0	2.37-2.95
Leaf P	0.12-0.3%	0.13%	12	0	0.10-0.16
Leaf K[1]	1.25-2.5%	1.39%	35	0	1.03-1.98
Leaf Ca	1.0-1.5%	1.79%	6	88	1.19-2.17
Leaf Mg	0.35-0.6%	0.49%	6	12	0.30-0.69
Leaf S	0.25-0.5%	0.21%	88	0	0.18-0.28
Leaf Fe	50-300ppm	57.8 ppm	18	0	38-75
Leaf Zn	50-100ppm	98.2 ppm	2	41	34-256
Leaf B	50-100ppm	65 ppm	12	6	45-119
Leaf Cu	6-30ppm	7.4 ppm	35	0	5-17
Leaf Mn	100-800ppm	579 ppm	0	24	261-1482
Leaf Ni	?	2.5ppm	?	?	

[1]Leaf K recommendations of 0.7-2.5 are adequate for “off” crops, but often inadequate for “on” crops. This is relative to the amount of Leaf N.

Basal Leaf Scorch

- Maintain adequate K levels
- When K level is marginal or deficient, N level should be reduced until K is corrected
- Foliar K can help, but does not replace soil applied

  (Potassium Nitrate: 3 lbs/100 gallons)

Managing the N:K Ratio

- Applying K based on leaf K level alone can be misleading

- K levels should be based on leaf N levels and expected yield; N:K ratios should be kept at or below 2.0-2.5:1

- Given a recommended leaf N level of 2.5%-3.0%, leaf K levels should be realistically maintained between 1.25%-1.5%, accordingly. The upper recommended range of 2.5% for leaf K is rarely observed in southeastern orchard situations.

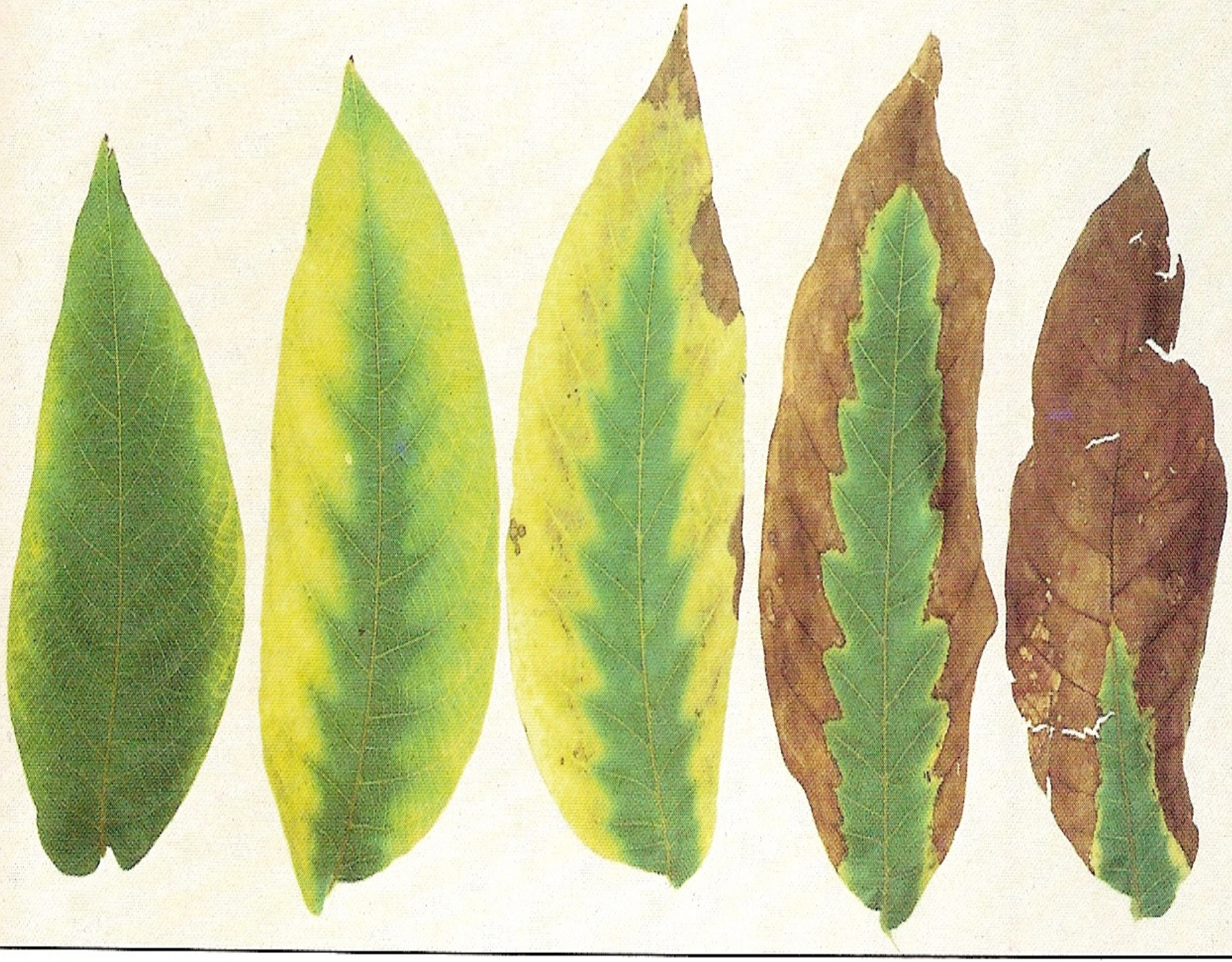
- If sample results indicate a leaf N:K ratio above 2.5:1, additional K may be needed in the “on” year, especially if late summer N is applied

- The most efficient method of improving the N:K ratio may be to reduce N application rate

- Ensure adequate K levels with additional N applications

N:P Imbalance

- Similar to N:K imbalance
- Scorching & defoliation occurs 7-10 days before shuck split



Magnesium Deficiency

- 0.35-0.6% leaf
- Deficiency occurs on acid soils (pH <5.5)
- High K or Ca
- Use Dolomitic lime
- If pH adequate, apply foliar Magnesium Sulfate at 5 lbs/100 gallons (4” shoot growth to July)

Iron Deficiency

- Usually induced by:
  Cool, wet spring
  Over-Liming
  High soil Zn, P, Mn
- Occurs early in season
- Chlorosis w/green veins
- Young leaves 1st to be affected

Zinc

- Necessary for shoot elongation, leaf expansion, and yield
- 2 lbs Zinc sulfate + 3 lbs Potassium Nitrate/100 gallons
- Begin 2 wks after bud-break until shoot elongation complete


5 lbs Zn sulfate per tree

Nickel

- Zinc Management
- Apply 1 pt/A in spring (April) while canopy is developing (parachute stage);
- 2nd application: 1 pt/A 30-60 days after 1st appl.
- Third application of 1.5-2 pts/A in late Sept.-early October before leaf fall to prevent mouse ear in the spring flush.

Nitrogen

- N absorption by roots is driven by demand
- Demand is regulated by growth of leaves or fruit, and production of proteins.
- Flowers may be aborted if leaf N is deficient the previous summer

Nitrogen

- Leaf Concentration: 2.5-3.0%
- 10 lbs N/100 lbs expected crop
- Shoot growth should be 8-12”

Boron

- Foliar B application occasionally improves fruit retention and percent kernel in the absence of noticeable B deficiency

- 3 sprays beginning with 2nd spray Timing of applications should be during the prepollination stage

Boron and pH

- Most Liquid Sources of Boron (even Boric acid) will raise pH in the tank mix
- Dry formulations of Boric acid tend to lower pH
- Depends on the solvent used

pH and Pesticides

Trade name	Common name	pH	Half-life
Dimethoate		9.0 6.0	48 minutes 12 hours
Lorsban	Chlorpyrifos	8.0 7.0	1.5 days 35 days
Kelthane		9.0 7.0	1 hour 5 days
Imidan	Phosmet	8.0 6.0	33 minutes 36 hours
Tri-Maxx	Buffer water pH 7.0 or below due to field observations.		

Why is my leaf S always deficient?

- Coastal Plain soil are naturally low in S
- S leaches readily
- C:S ratio
- Foliar S applications are beneficial
  - Micronized S = 2.5-5.0 lbs/A
  - Be careful at high temps and when mixing with miticides or Elast

	C:S ratio (1-6” depth)
Mean	504:1
Sample Range	95:1-1600:1

Water Stage Split of Pecan

- Occurs in August/September on Certain Varieties (late water stage/early shell hardening)
- Occurs w/in 24 hrs of heavy influx of water to soil
- Most split occurs in upper 1/3 of canopy
- Split occurs in pre-dawn hours
- Fruit falls from tree within 7 days of splitting

Managing Water Split

- Maintain soil moisture 2-3 wks before shell hardening (limited)
- Fruit thinning
- Micronutrients?
  - B, Ni

Shuck Decline

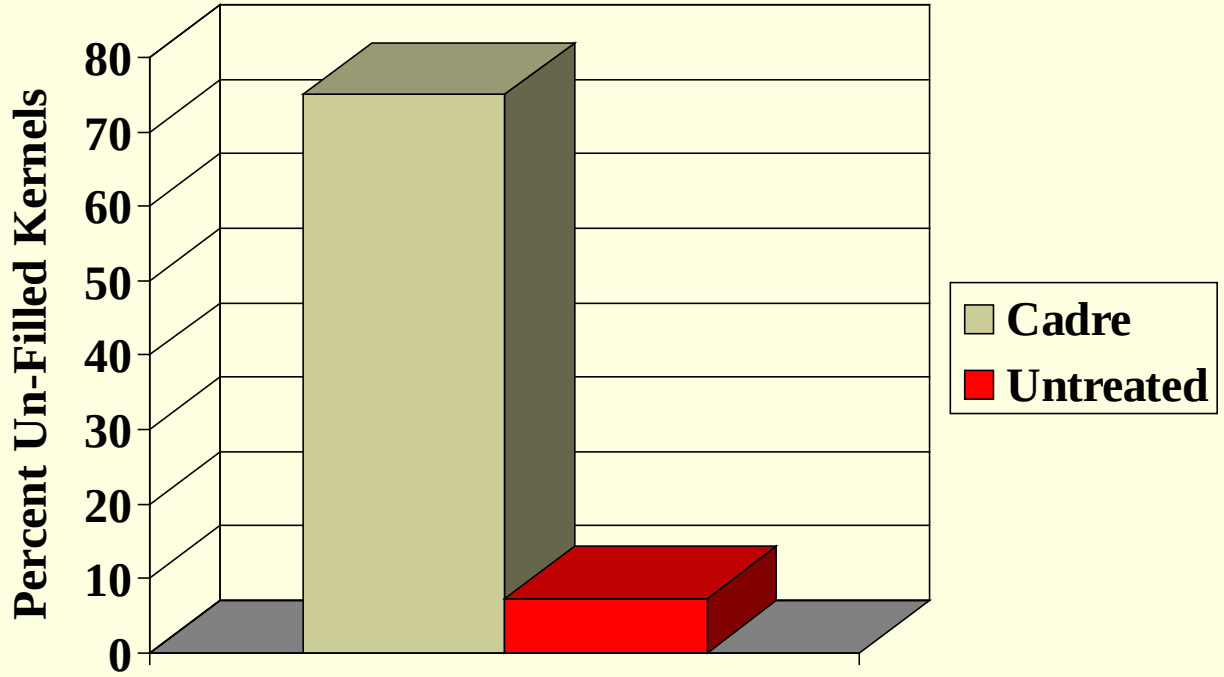
- Not a disease
- Brought on by tree stress

  Mainly fruiting stress + drought

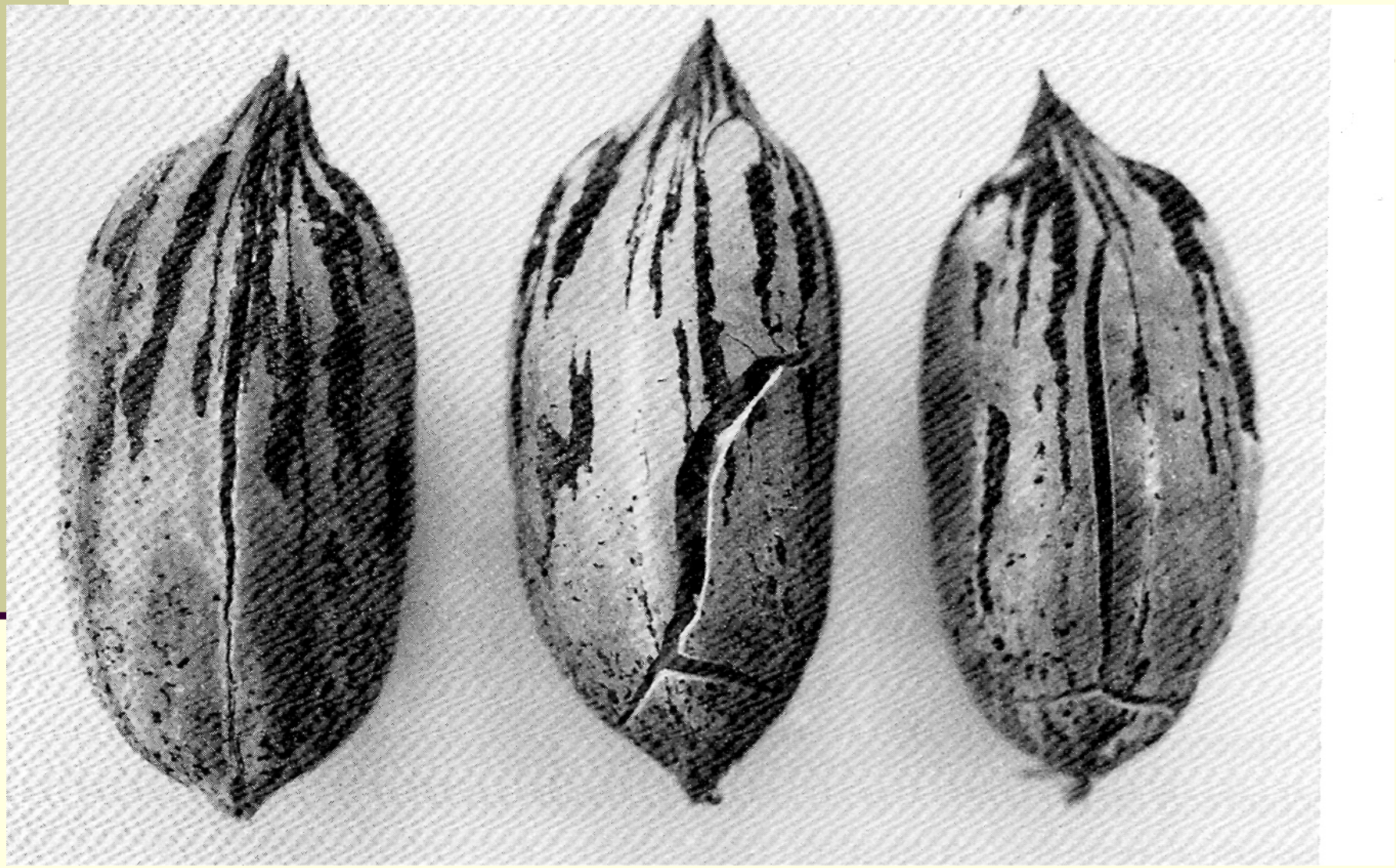
Shuck Sticking

- Inadequate soil moisture at harvest
- Failure of kernel to develop
  - Ethylene
- Cadre

Cadre


Percent Un-Filled Kernels
80
70
60
50
40
30
20
10
0
Cadre
Untreated


Reduced by Fruit Thinning



Water-Logging/Die-back

- Wet feet
- Usually most severe problems on young trees

Herbicide Damage

Command

Round Up

Paraquat

- **Typical Symptoms of Cold Injury:**
  - **Longitudinal splitting of bark**
  - **Separation of bark from wood**
  - **Sunken areas on limbs/shoots**
  - **Death/browning of cambium, inner bark, pholem**
  - **Sporadic death of small shoots in canopy**
  - **Delayed budbreak**
  - **Sparse canopy**


‘Desirable’
May 8, 2007

Effect of 2007 Easter Freeze on ‘Desirable’ Pecan

	Damage	Shoot Length (cm)	% Pistillate Shoots	#pist./ terminal	Chl
32 DAF	0	12.98	95	3.3	----
	80-100	5.62	65	2.0	----
47 DAF	0	12.98	95	2.75	39.95
	80-100	5.62	37.5	0.8	30.23
91 DAF	0	12.98	52.5	0.95	44.93
	80-100	7.525	15.0	0.30	42.08

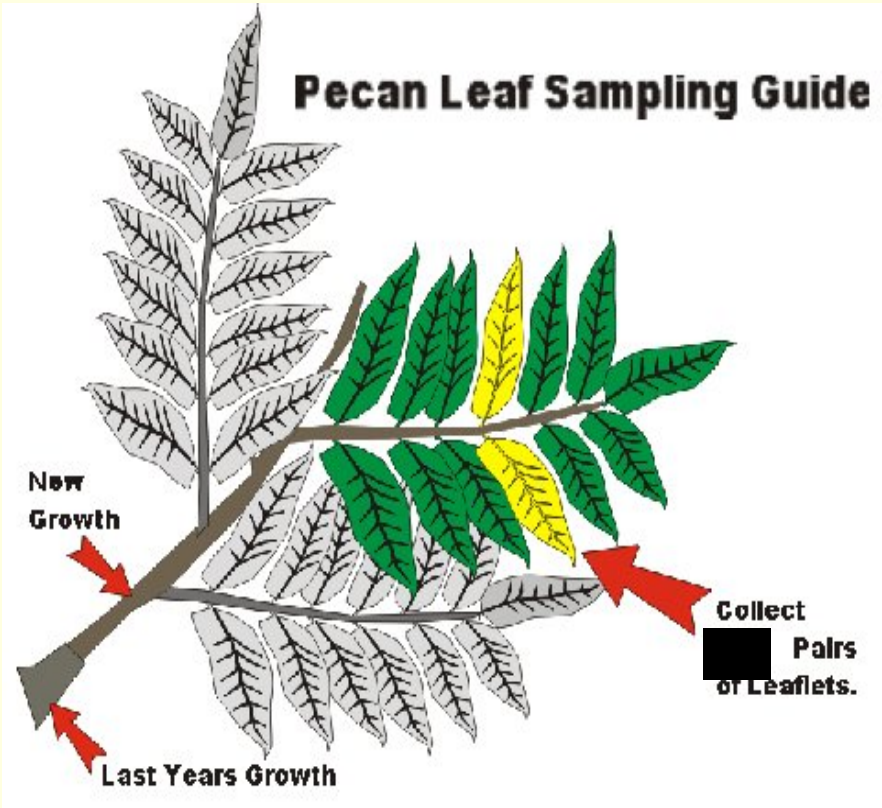
Effect of 2007 Easter Freeze on ‘Kiowa’ Pecan

	Damage	*Shoot Length (cm)*	*% Pistillate Shoots*	*#pist./ terminal*	*Chl*
32 DAF	0	---	---	---	---
	80-100	---	---	---	---
47 DAF	0	17.73	95	3.05	38.81
	80-100	20.74	5.0	0.15	26.14
91 DAF	0	22.49	85	2.38	43.33
	80-100	36.85	5.0	0.15	39.88

***30% of damaged shoots showed mouse ear symptoms**

Leaf Sampling

- Sample trees between July 7th and August 7th.
- Use terminal shoots exposed to the sun.
- Collect leaflets from all sides of the tree.
- Avoid leaflets damaged by insects and diseases.



Soil Sampling

- Useful for pH and toxicities
- Late Fall/Winter
- Sample uniform area
- 1 pint/sample (15-20 cores) over large area
- Sample to 6-8” depth

GEORGIA PECAN INFORMATION

Georgia Extension Pecan Team

The University of Georgia College of Agricultural and Environmental Sciences

Shuck Decline Info!!!

Pecan Spray Guide

Georgia Pecan News

Pecan Hotline
1-800-851-2847

Pecan Budget Info

Latest USDA Crop Estimate

Information for Growers

Georgia Pecan Production Calender

UGA Pecan Team

Pecan Links

During the late 1800's landowners began to recognize the potential profit of pecans in the southeastern United States . By the late 1800's several individuals near Savannah , Georgia had produced and marketed pecans on a small scale. By 1889 there were only 97 acres of pecans planted in Georgia .

Thousands of acres of pecan trees were planted in Southwest Georgia between 1910 and 1925. Most of these trees were initially planted as real estate investments rather than for nut production. Thousands of acres were sold in five and ten acre units, primarily in Dougherty and Mitchell Counties , which are still today the hub of Georgia'a pecan producing counties. By 1920, Georgia was producing 2.5 million pounds of pecans.

By the 1950's Georgia was ranked as the top state in the nation for pecan production.

Today, Georgia pecan orchards may range in size from just a few trees to several thousand acres. The state continues to be regarded as the top pecan producing state in the U.S. , with over 142,500 acres planted to pecans. An early harvest date compared to other areas of the nation which produce pecans, often results in good prices for Georgia pecan growers, who produced $70,000,000 in farm gate value during 2003.

Useful Info

- www.ugapecan.org
- Southeastern Pecan Growers' Handbook
- Pecan Pest Hotline: 1-800-851-2847
- GPGA Annual Meeting---May 3---Albany