# Pecan Production

Andrew Sawyer – Area Pecan Agent, Southeast Georgia

UF-IFAS Orchard Field Day

October 23, 2024

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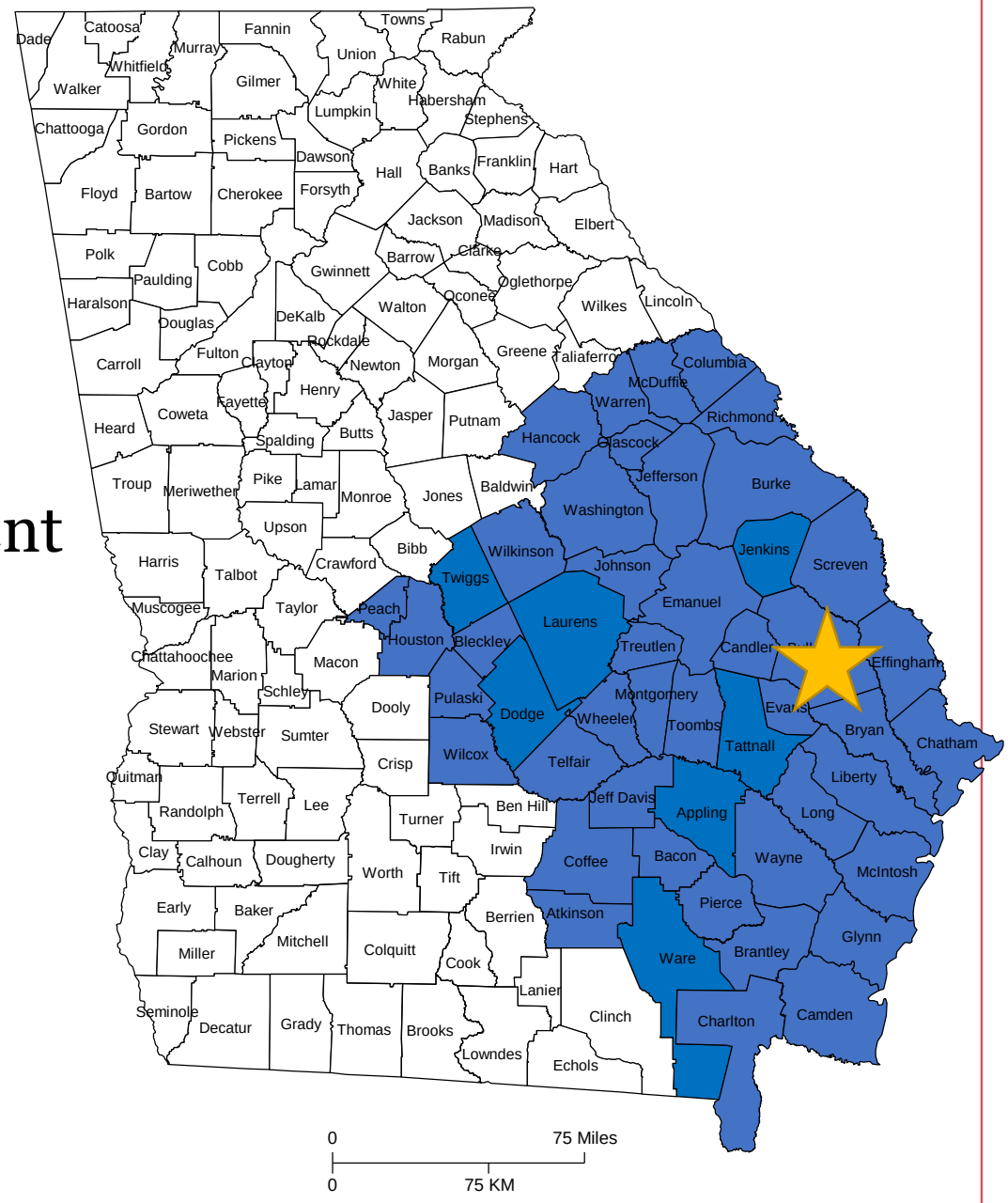
# Overview

1. History
2. Low-Input Varieties
3. Orchard Establishment

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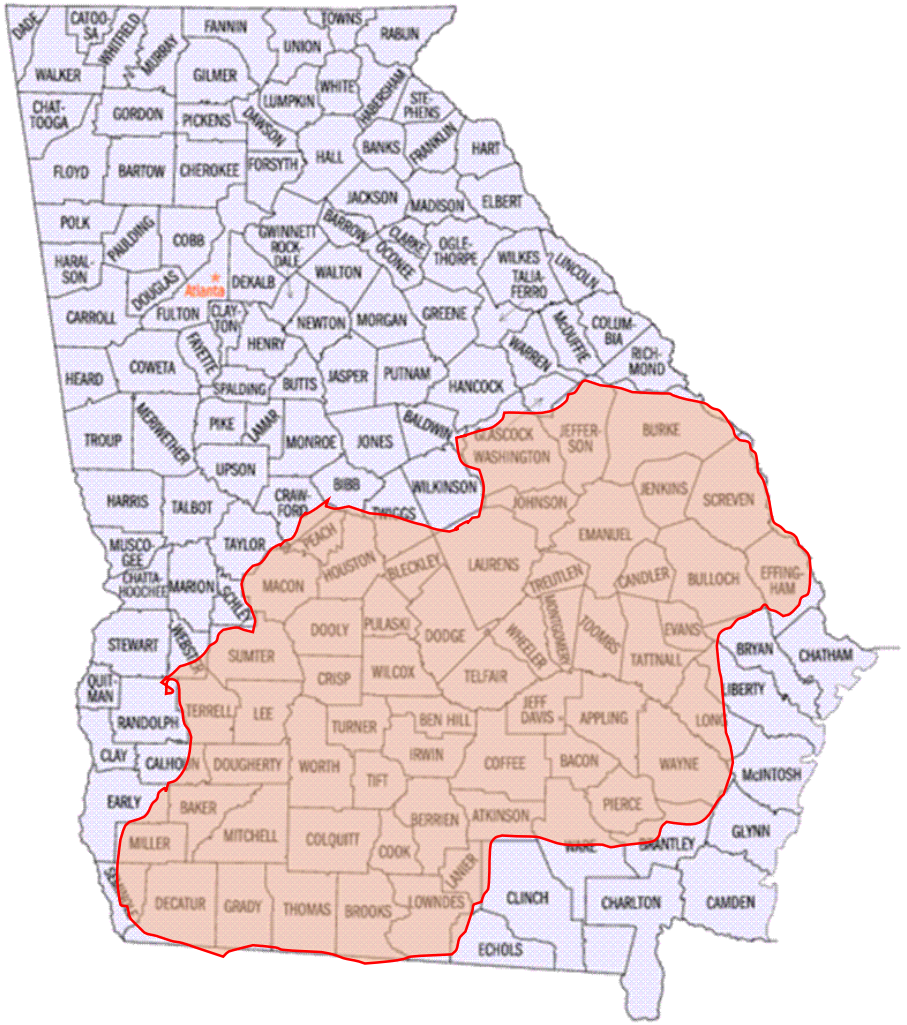
# Georgia Pecan Production

- Approx. 180,000 acres of mature orchards in production
- Approx. 5,000 acres of new orchards planted annually since 2012
- Approx. 80-90% of commercial orchards irrigated---mostly drip, micro
- Avg orchard planting increasing in size and planting density
- Large growers beginning to utilize hedging to manage sunlight/tree size

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# Hurricane Helene

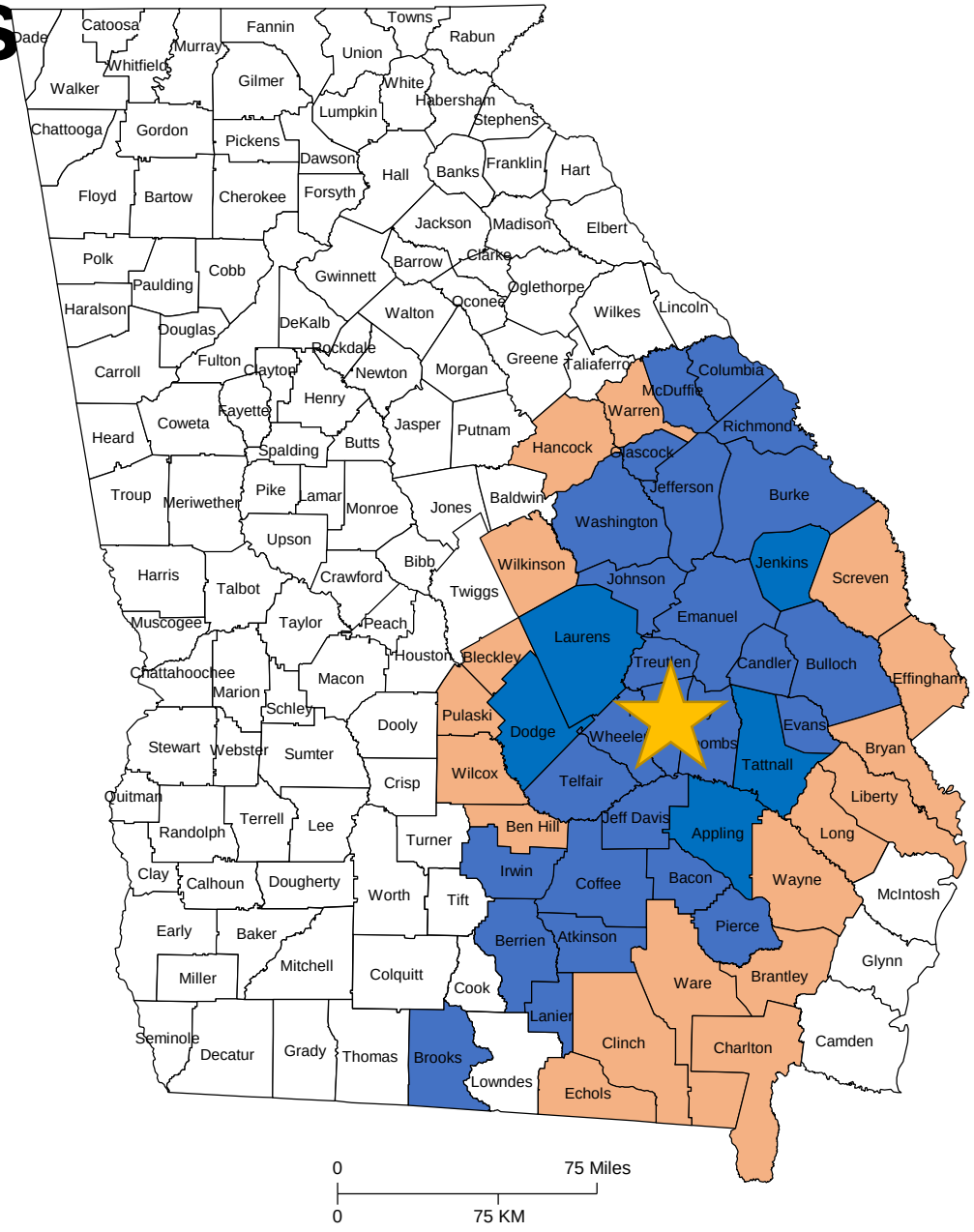
# GA Pecan Loss

48,180 acres affected

36.1 million lbs from 2024

397, 485 trees lost

109 mph wind in Montgomery County

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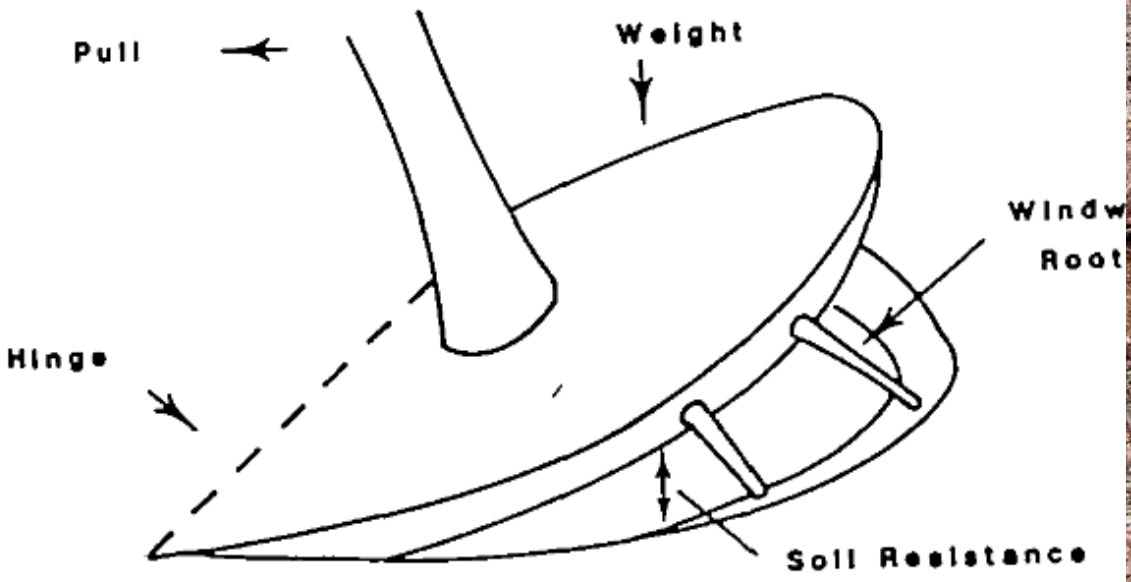
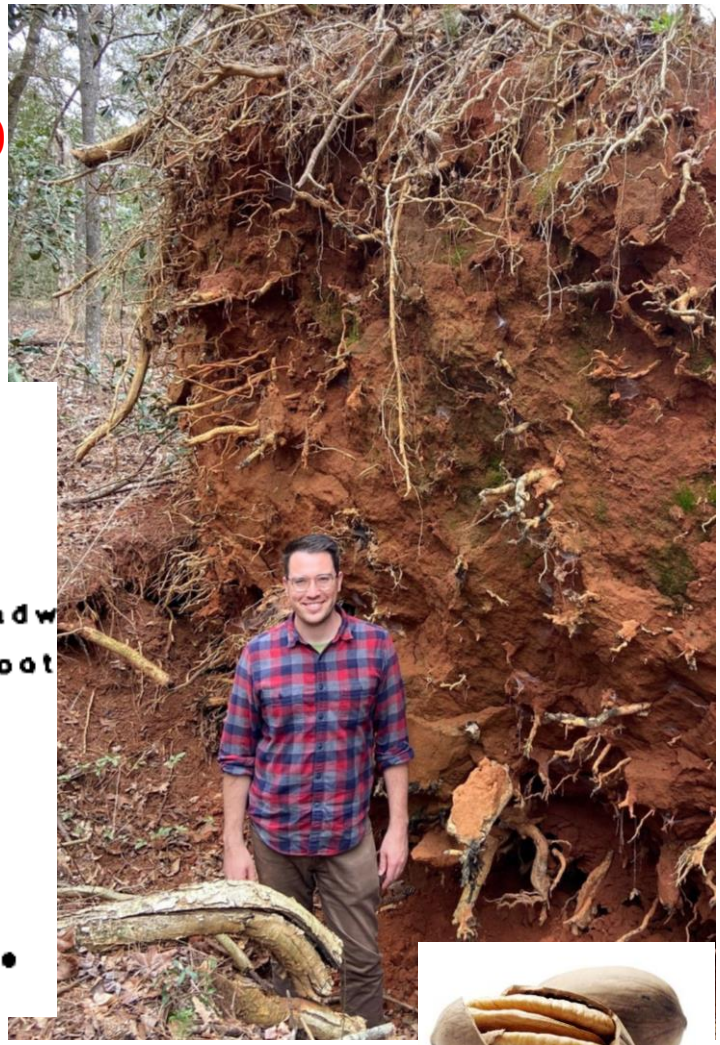
# Major Factors Driving Tree Stability

- Wind load (wind intensity, crown size, tree spacing)
- Weight of associated root plate ("counterweight")
- Strength of windward roots
- Tree mass
- Tree weight distribution (center of gravity)




Coutts 1986, *Forestry*



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# 2023 Problem for SE Pecan Industry

| | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|
| Stuart | $1.44 | $1.55 | $1.05-$1.30 | $1.85-$2.25 | $1.20-$1.55 |
| Desirable | $2.20-$2.40 | $2.40 | $1.70-$1.90 | $2.30-$2.40 | $1.50-$1.85 |

- As long as cheap Mexican pecans flow into U.S., this will not change without new markets
- Can't control price you receive, nor cost of fertilizer, chemicals, fuel, etc.

# For SE Pecans to Compete:

1) We need scab resistance
2) We need yield = 1500-2000 lbs range

3) We need to manage crop load

# Two Different Routes for Growing Pecans

**High Volume, High Input**

- Hedge/Tight Spacing
  - 35 X 35
- Varieties
  - Pawnee
  - Creek
  - Caddo

**Scab Resistance, Low Input**

- Conventional Spacings
  - 25-35X50, 30 X 60, 40 X 40
- Varieties
  - Excel
  - Lakota
  - McMillan
  - Elliot

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# UGA Recommended Pecan Varieties

| Low | Moderate | Mod/High | High |
|---|---|---|---|
| Avalon | Creek | Caddo | Byrd |
| Elliott | Kiowa | Cape Fear | Carroll |
| Excel | Oconee | Hoffman | Desirable |
| Kanza | Sumner | Schley | Morrill |
| Lakota | Zinner | Stuart | Pawnee |
| McMillan | | Tanner | Treadwell |
| | | Tom | |
| | | Whiddon | |

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# Low Input Test 3-Year Average

| | Yield | Count | % kernel | Cost/A | Price ($) | Gross ($) | Net ($) |
|---|---|---|---|---|---|---|---|
| Desirable | 1490 | 43 | 53 | 1467.98 | 2.03 | 3024.70 | 1556.72 |
| Pawnee* | 1068 | 46 | 57 | 1439.98 | 2.55 | 2723.4 | 1283.42 |
| **Lakota** | **2249** | **48** | **57** | **1154.19** | **1.86** | **4183.14** | **3028.95** |
| Excel | 2260 | 46 | 49 | 1154.19 | 1.76 | 3941.60 | 2787.41 |
| McMillan* | 1162 | 56 | 53 | 1154.19 | 1.77 | 2056.74 | 902.55 |

---Lakota has to be fruit thinned for consistent yields

*Pawnee numbers from commercial orchard
*McMillan trees approx. 1-2 yrs younger than Excel & Lakota

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1. Varieties
2. Water
3. Pollination
4. Sunlight
5. Fertilization

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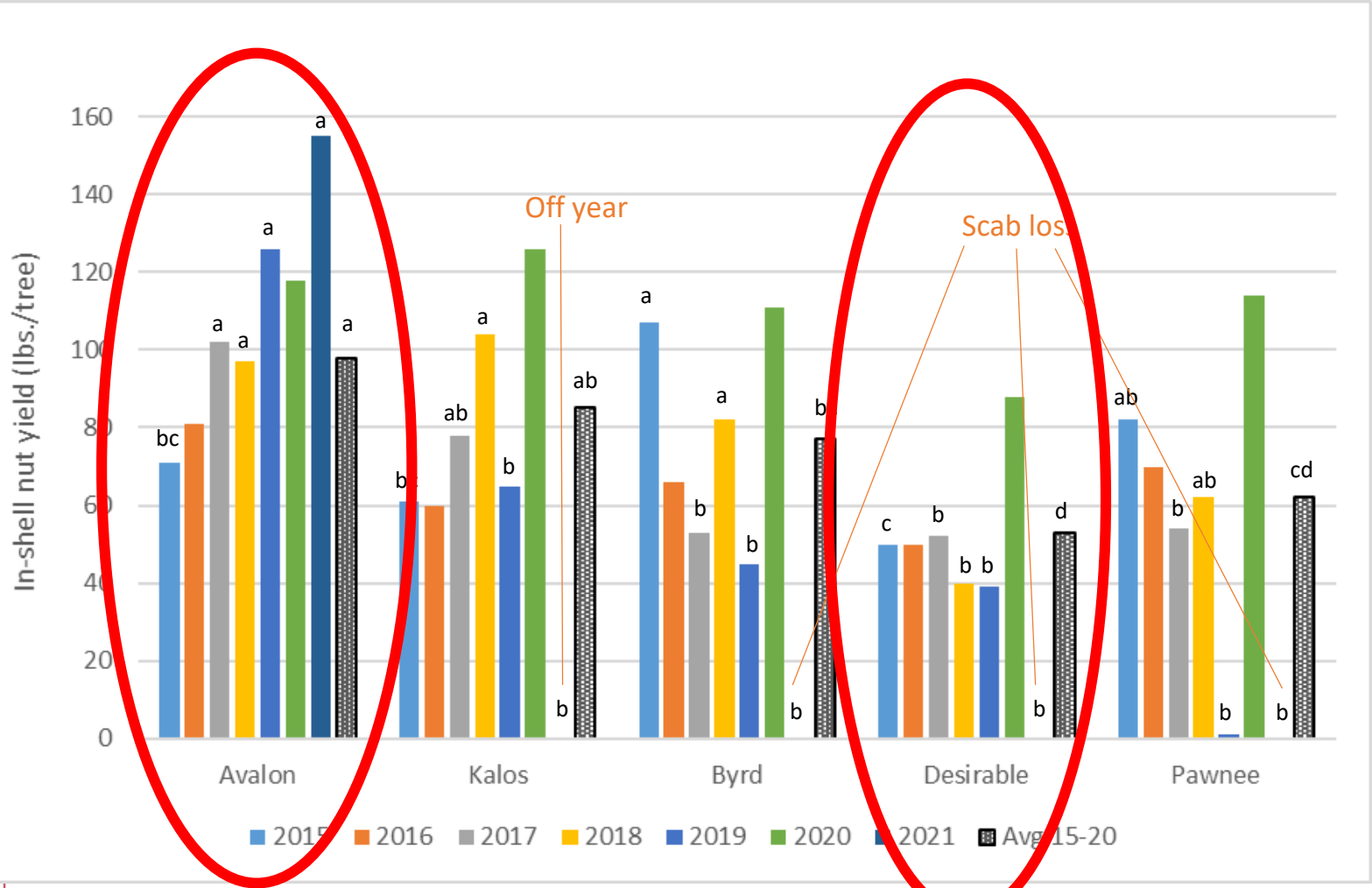
# Avalon vs. Desirable




40' x 40' Spacing

Avg. Yields 11-16

Avalon – 98 lbs.
Kalos – 85 lbs.
Byrd – 77 lbs.
Des – 53 lbs.
Pawnee – 62 lbs.

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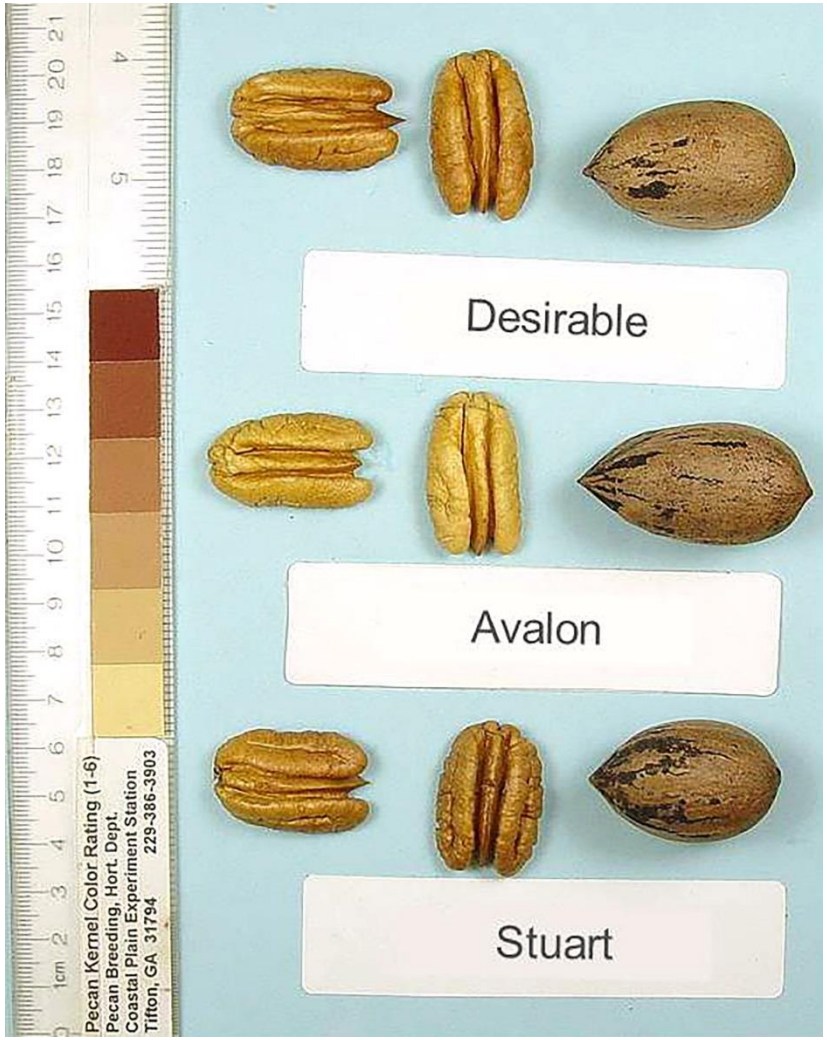
In-shell yield (lbs./tree) of pecan cultivars in Tift Co. in the eleventh through seventeenth year of growth (2015-2021).

# Avalon

- Selected by Dr. Patrick Conner from a cross between ‘Gloria Grande’ and ‘Barton’.

- Selected for large size, good quality, and lack of scab.

- Good scab resistance
  - (similar to Elliott)
- Harvest date abt 1 wk before Desirable
- 47 nuts/lb, 54% kernel
- Mod. Cluster Size/Average Precocity
- Monitor black aphids
- Type II

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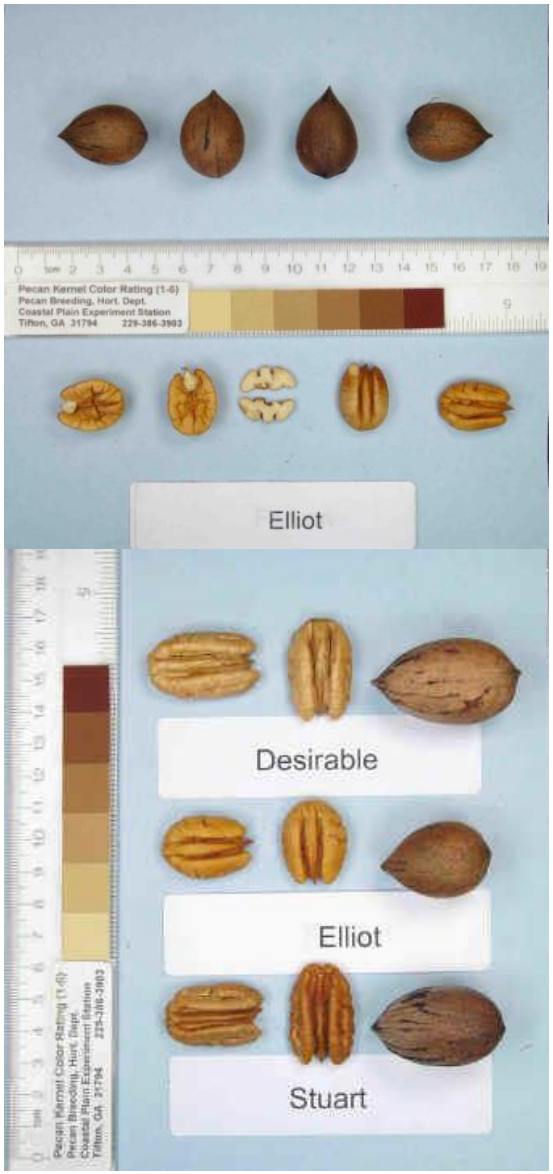
# Elliott

77 nuts/lb.

51% kernel

- Excellent resistance
- Good quality kernel
- Well-known to buyers
- Alternates
- Small nut size
- Freeze damage in north
- Yellow aphids a common pest

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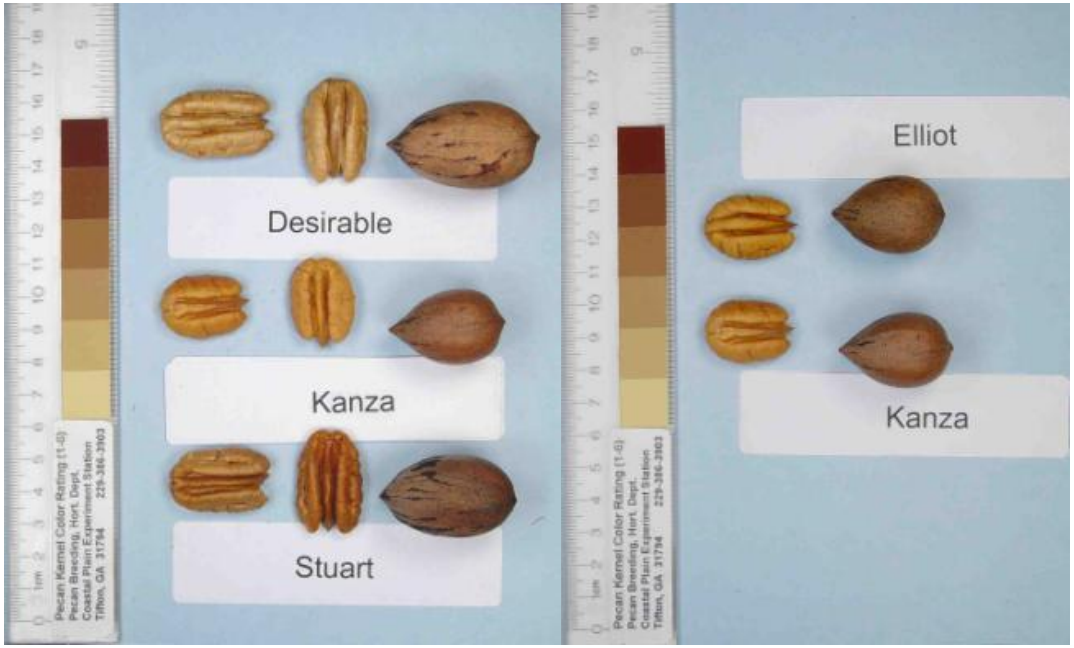
Dr. Patrick Conner

# Kanza

68 nuts/lb.

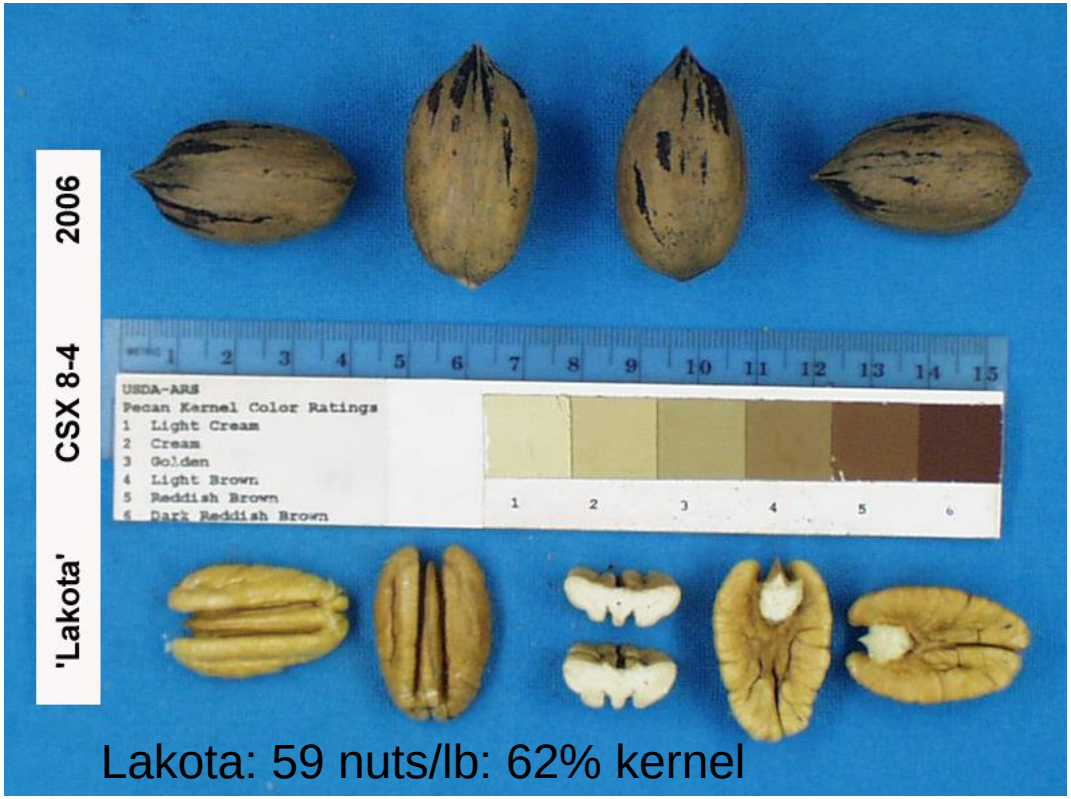
51% kernel




- Similar nut to ‘Elliott’
- Cold hardy
- Early harvest data, end of September
- Small nut size
- Tends to alternate

# Lakota*

- 59 nuts/lb*
- Nut size variable
- 62% kernel
- Good scab resistance
- Harvest late Sept.
- Heavy alternate bearing
- Good partner w/Pawnee

Lakota: 59 nuts/lb: 62% kernel

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# Lakota Issues


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# Orchard Establishment

- Well drained soil
- Sandy loam topsoil/clay subsoil
- Shallow water table limits root growth
- Plant on nearly level or gently sloping land
- Avoid low areas for scab susceptible varieties

# Pecan Water Demand

At 12 trees per acre, Drip/Microjet system capacity should be 3600-4200 gallons/acre/day

4,000 gallons

Per

Acre

Per

Day

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# Pecan Irrigation Schedule for Bearing Orchards

| Month | % Full Capacity |
|---|---|
| April | 17% |
| May | 26% |
| June | 33% |
| July | 40% |
| August | 100% |
| September | 100% |

*If you receive 1” or more of rain from bud-break to the onset of kernel-filling, turn the system off for 3 days.

*Throughout the kernel filling period, apply irrigation daily regardless of rain events up to 2”. With a 2” rain during kernel filling, turn the irrigation off for 3 days.

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Sandy Soils=Use higher end of rate
Clay Soils=Use lower end of rate

# Drips vs Microjet

Drip

Microjet

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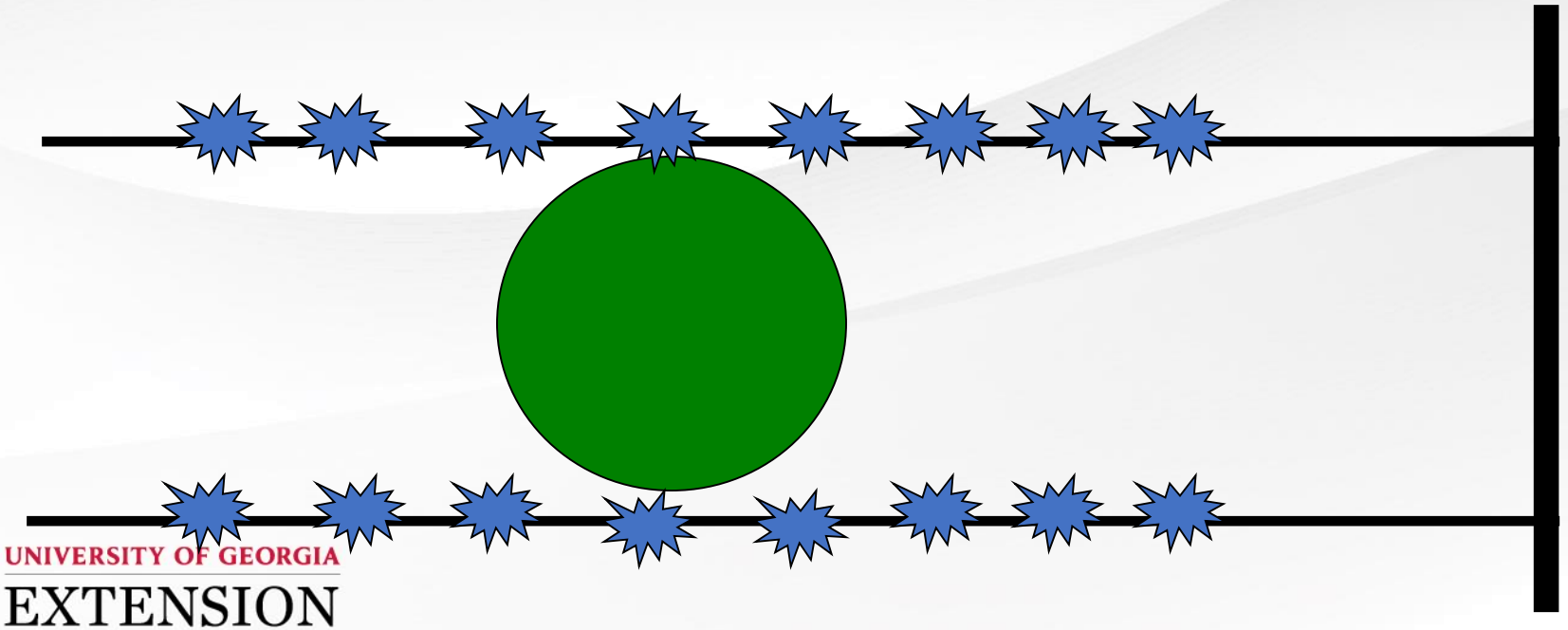
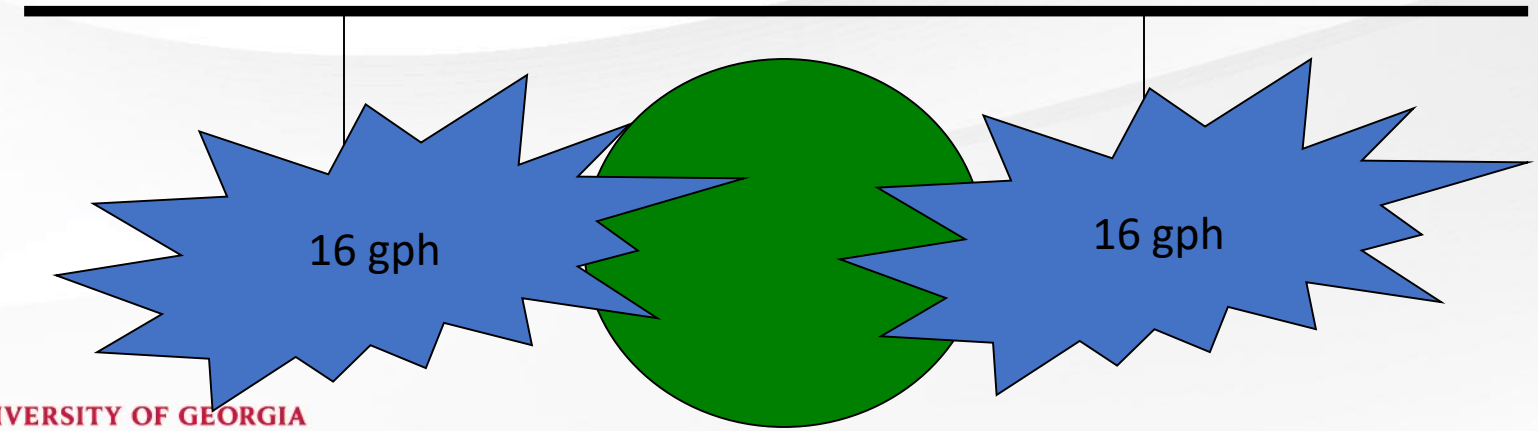
# Drip Irrigation

- Lateral lines normally 6-8 ft from tree
- Most emitters used are 2 gph
- 8-12 emitters per tree



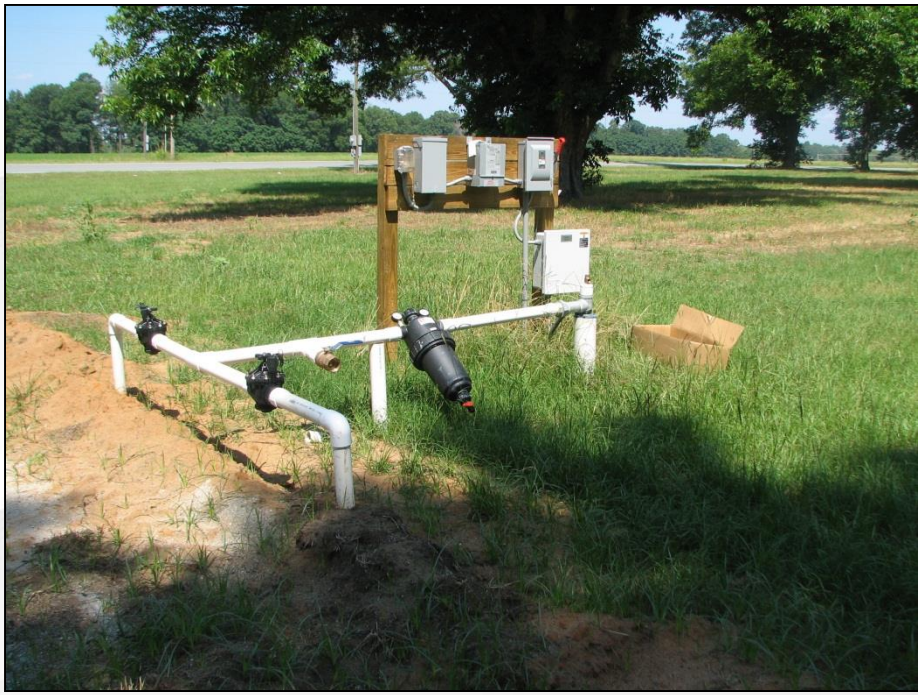
# Microjet

- Same benefits as drip
- Larger wetted area
- Best system for establishment of young trees



# Costs of Drip Irrigation

- Most irrigation in the SE uses well water
  - No water quality issues
- System Parts and Installation:
  - $900 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



# Irrigating Young Trees

1. **Drip**
   - **1 emitter within 1 ft of tree; another 3-4 ft away**
   - **Apply 48 gallon per week (2 gal / hr)**
   - Need to cover about 50% of the root zone with water

2. **Microsprinkler**
   - **1 emitter 3-4 ft away**
   - **Apply 100 gal per week (14 gal / hr)**

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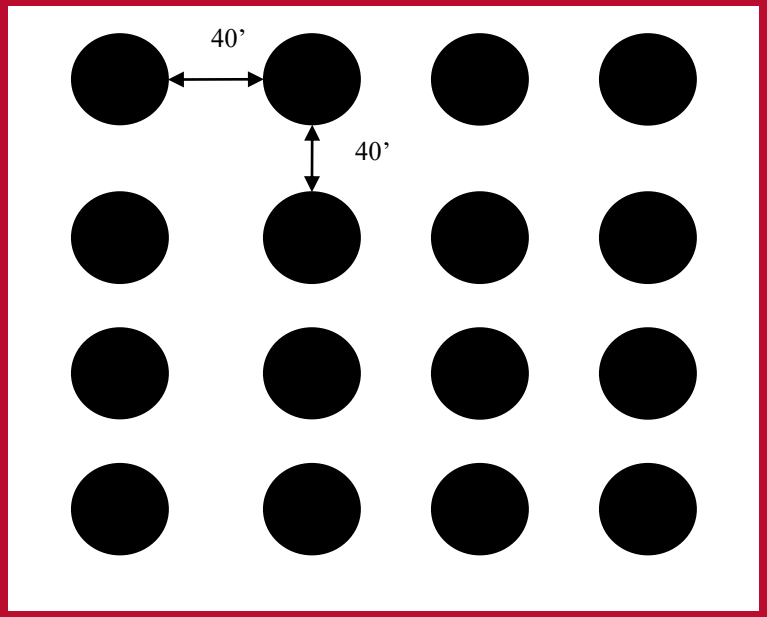
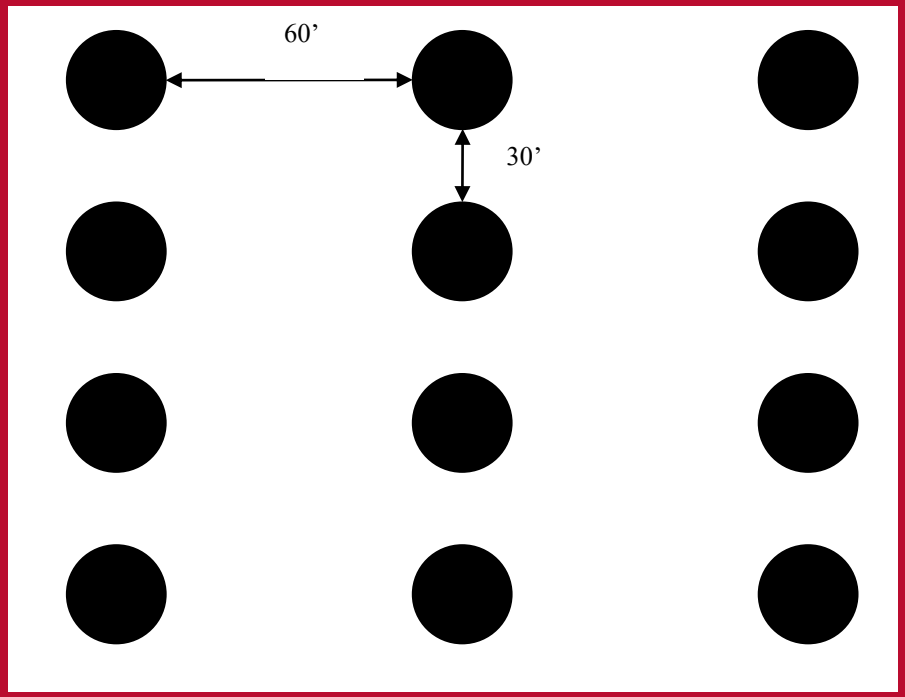
# Orchard Design

Tree spacing is based on level of management

Trees per acre = 43,560ft2 / tree width X row width

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# Providing Sufficient Pollination

- In off year, yield may be as much as 30% less on trees more than 2 rows (80’) from pollinator
- Pollinator should be placed no more than 150’ from main variety
- Need 1 pollinator for up to 8 trees

**EVERY 5TH TREE IN EVERY 5TH ROW**

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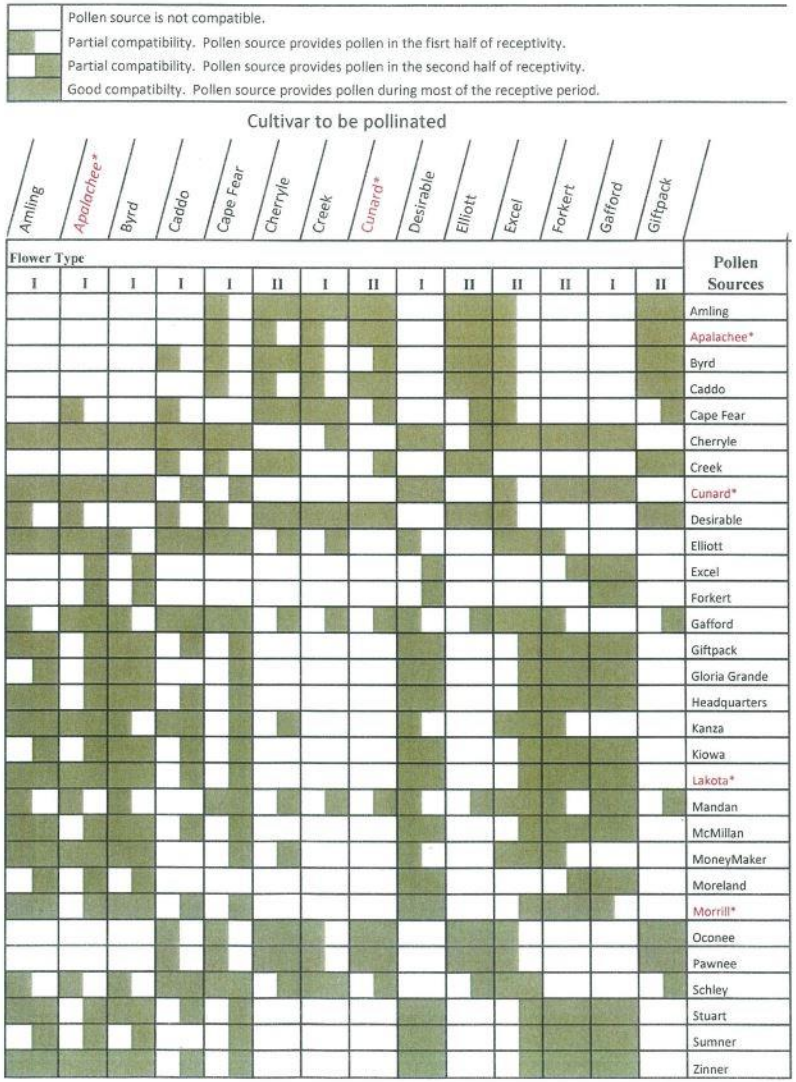
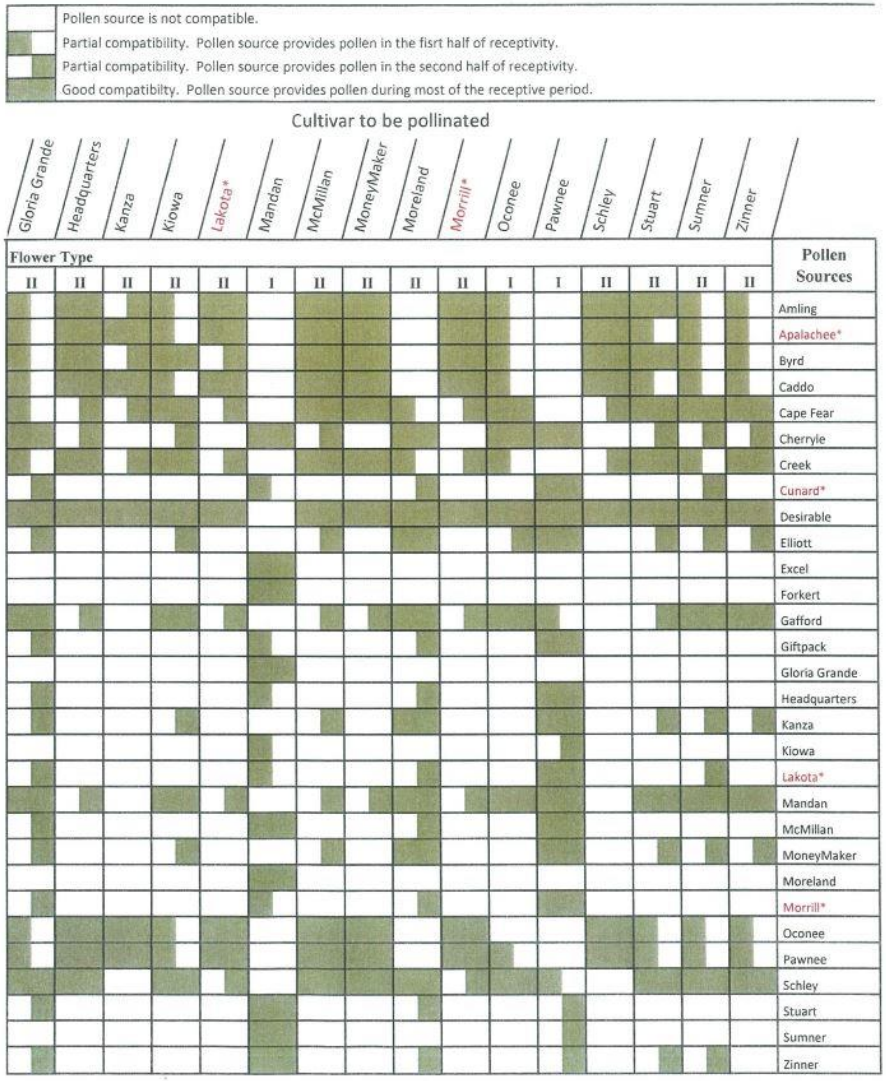
# Pecan Pollination Chart




*To determine compatibility, find the cultivar to be pollinated in the **top row and scan down** the column for potential pollinators. Shading in the left half of the box indicates the pollinator would be effective in the first half of the cultivar's receptive period. Shading in the right half of the box indicates the pollinator would be effective in the last half of the receptive period. Shading of the entire box indicates pollen would be shed by the pollinator during most of the cultivar's receptive period. Data for cultivars with red type is preliminary.

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# Planting Trees

1. Bare-root
2. Container

Plant either when dormant to ensure success.

January – February

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# Planting

- Transplanting Nursery Trees
  - 18” or larger auger
  - Backhoe

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# Pruning Tips

Fill water ¼ into hole

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# Fertilization

Newly planted trees

Broadcasting into herbicide strip

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# Fertilization Recommendation for Young Trees

- Focus on P, K, Zn---not N!

**Rate of 10-10-10 / per tree**

| Year | April | June |
|---|---|---|
| 1 | 0 lb | 0 lb |
| 2 | 0.5 lb | 0.5 lb |
| 3 | 1 lb | 1 lb |
| 4 | 2 lbs | 2 lbs |

- Apply Zinc Sulfate at 1-3lb per tree for the 1st 3 – 4 years

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# Equipment

# Planting

- Transplanting Nursery Trees
  - 18” or larger auger
  - Backhoe

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# Tractor Requirements

- Most tasks in a pecan orchard can be accomplished with 100-125 hp tractor


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# Tractor Requirements

- Lighter tractor may be used for herbicide application, tree planting, limb removal, etc.


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# Mowers


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# Herbicide Sprayers

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# Air-Blast Sprayers

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# Harvesting


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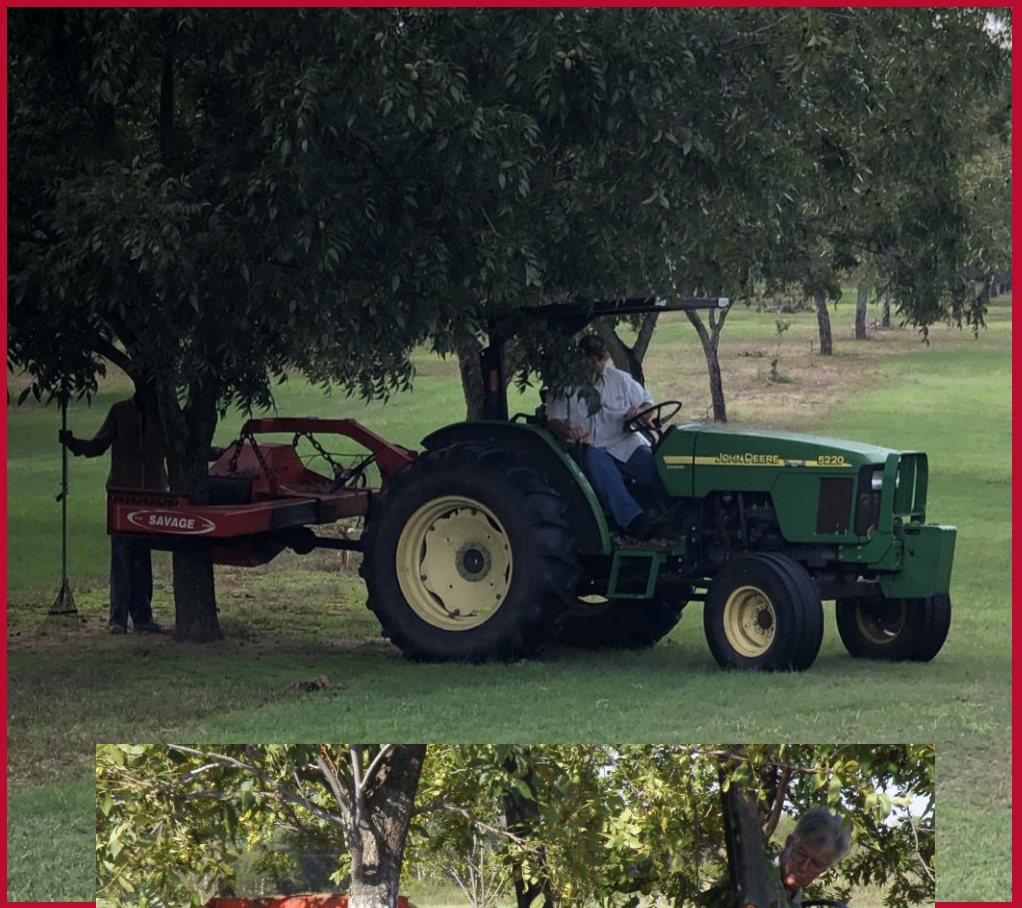
# Shakers

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# Harvesters


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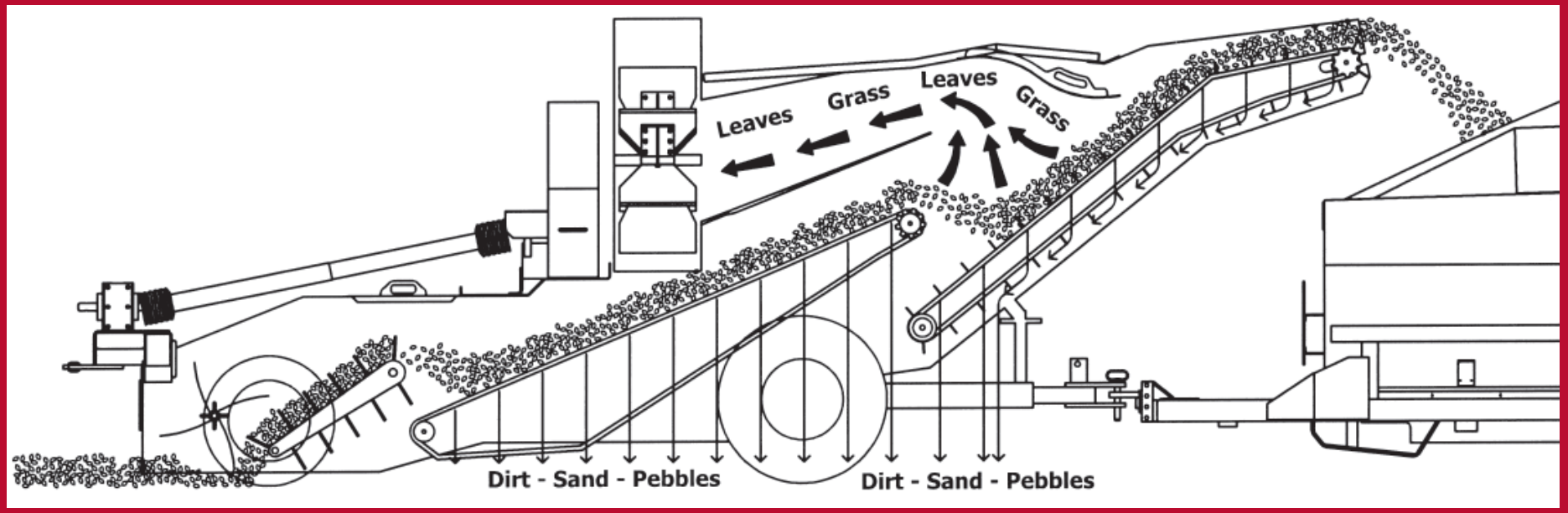


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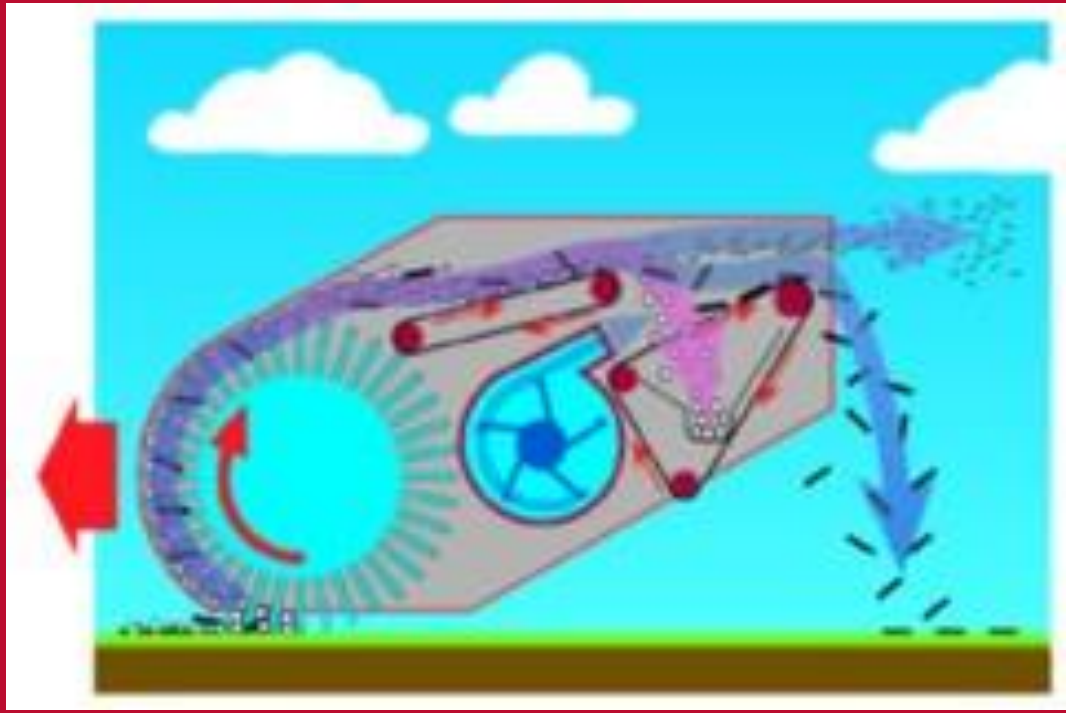

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# Cleaner

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# Pecan Organizations

- Georgia Pecan Grower's Association

  www.georgiapecan.org
- U.S. Pecan Grower's Council

  https://uspecans.org/
- American Pecan Council

  https://americanpecan.com/

# Questions?

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