Cotton Defoliation

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Crop Management for Defoliation

Plant Water Status

- **If – plant is not water-stressed enough**

  Then – defoliation may be more difficult and regrowth can occur.

- **If – plant is too dry or water stressed**

  Then – desiccation may take place where the leaves dry up quickly and stay on the plant "stuck" leaves

From "Crop Management for Defoliation". J.S. Silvertooth. Publication AZ1213

Crop Management for Defoliation

Plant Water Status

- **Method 1. Apply defoliant after twice the time has elapsed compared with late season irrigation interval.**

  Not an exact method – dry down can vary

  - boll load

  - weather

  - soil water holding capacity

  - amount of water applied in last irrigation

From “Crop Management for Defoliation”. J.S. Silvertooth. Publication AZ1213

Crop Management for Defoliation

Plant Water Status

- **Method 2. Estimate soil water depletion – target defoliation when approximately 70% of PAW is depleted.**

  Need to know:

  - soil texture

  - water holding capacity

  - depth of soil profile filled with last irrigation

  - ET rates (AZMET/Cotton Advisory)

From “Crop Management for Defoliation”. J.S. Silvertooth. Publication AZ1213

Crop Management for Defoliation

Plant Water Status

- **Method 3. Nodes above cracked boll (NACB).**

  Procedure:

  - Locate top first position boll to be harvested

  - Count nodes down the stem to the first cracked boll

  - When 4 nodes separate bolls, defoliants can be applied for upland (3 nodes for Pima)

From “Defoliating the 2000 Crop”. S. Wright et al. California Cotton Review, v 56 pp 1-3

Crop Management for Defoliation

Nitrogen Fertility Status

- **If plant is high in N fertility, then may have delay in maturity, more vigorous plant, and difficulty in defoliation with more potential for regrowth**
- **Limit N applications to no later than peak bloom**
- **Petiole nitrate-N concentrations greater than 3000 ppm can lead to defoliation problems**

From “Crop Management for Defoliation”. J.S. Silvertooth. Publication AZ1213

Crop Management for Defoliation

Honeydew Deposits

- **Large amounts of honeydew (from whiteflies or aphids) on the leaves can reduce uptake of defoliants by the plant**
- **Possible sticky cotton and “trashy” lint from poor defoliation can result**
- **Additional incentive to control insects**

From “Crop Management for Defoliation”. J.S. Silvertooth. Publication AZ1213

Crop Management for Defoliation

Weather Conditions

- **Warner conditions cause the plant to be more physiologically active – promotes defoliant activity**
- **Hot and dry conditions will accelerate crop dry-down – more desiccation from late application**
- **Defoliant rate based on temperature and HU accumulation**

From “Crop Management for Defoliation”. J.S. Silvertooth. Publication AZ1213

Crop Management for Defoliation

Weather Conditions

Defoliant rate[1]	HU accumulation (14 d following)	Daytime high temp.
Low	>300	90° F
Medium	200 – 300	80° F
High	<200	70° F

[1]Always read and follow manufacturer's label

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PPO Herbicides/Defoliants

- New products to the defoliation market
- Class of chemistry/mode of action not new
  - Soybean and corn herbicides
  - Goal
  - Chateau
  - Aim
  - ET
  - Resource

PPO Herbicides/Defoliants

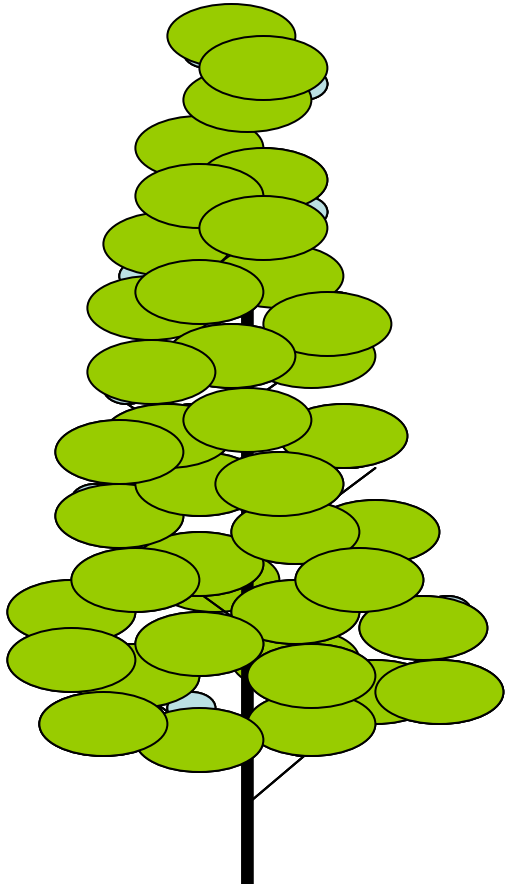
- Inhibit protoporphyrinigen oxidase enzyme
- Pigment synthesis pathway
- Inhibition starts a reaction that causes cell membrane to leak
- Leaking cell membranes rapidly dry and disintegrate

PPO Herbicides/Defoliants

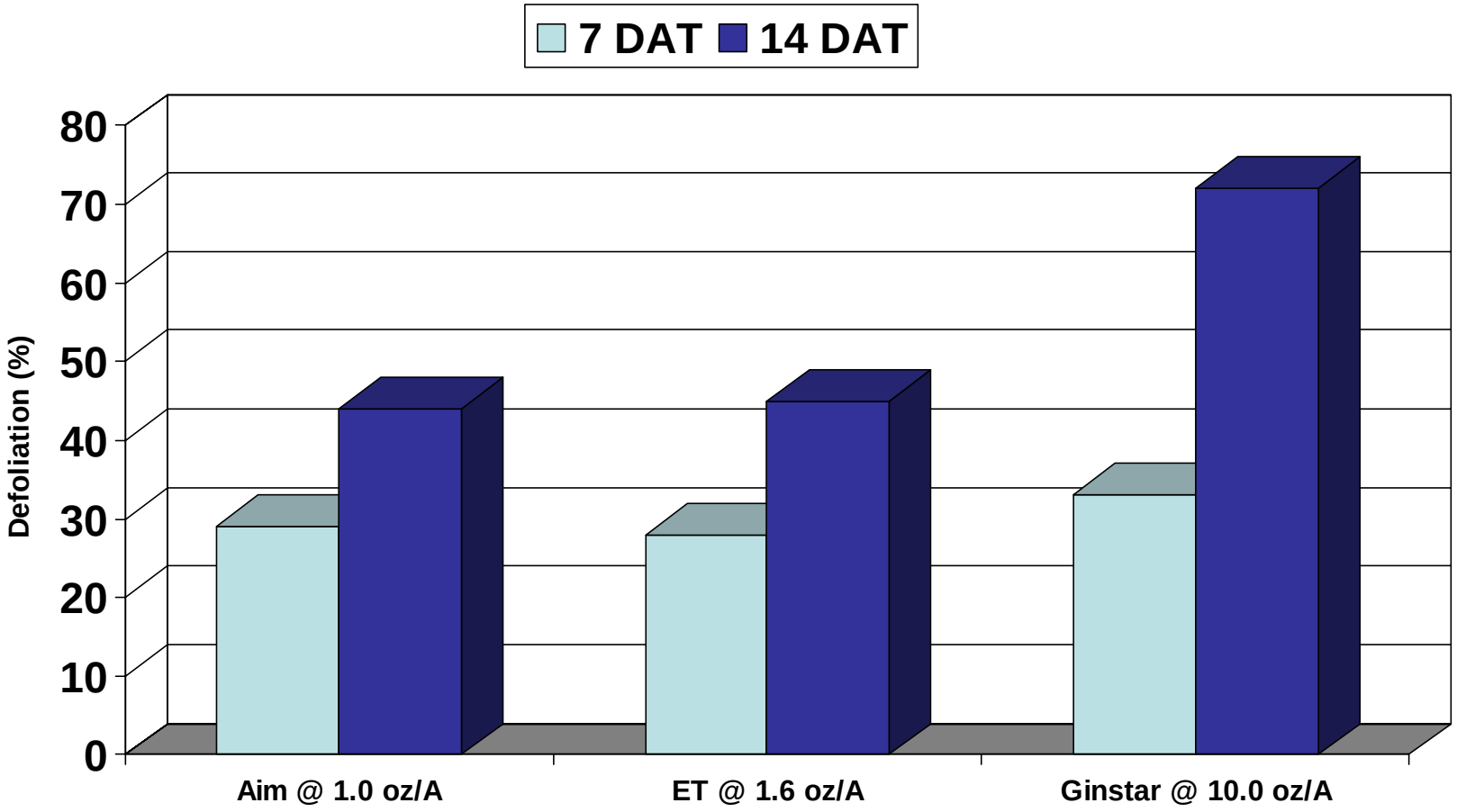
- Symptoms start with occurrence of a “water soaked” appearance within hours
- Day 1 to 3 dessication of the leaf tissue occurs (often bronze colored)
- Some products will form a abscision layer at the base of the leaf petiole

PPO Defoliants

- Used as a stand-alone product
  - Contact material
  - Expect 20 to 50% defoliation
  - Multiple applications needed for satisfactory results
  - High rates/high temperatures can result in leaf stick



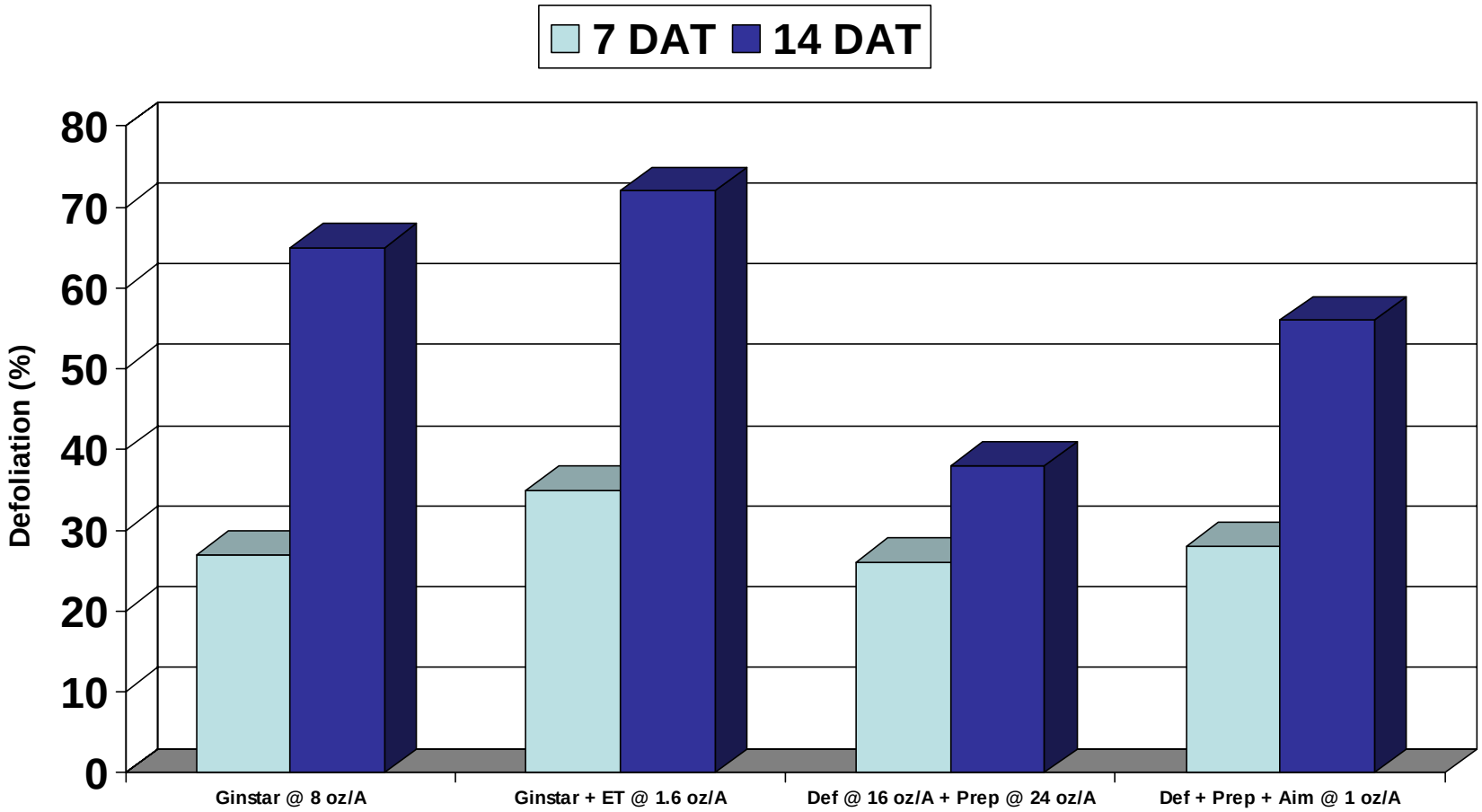
PPO Defoliants (Stand-alone)



PPO Defoliants

- Used as a tank mix
  - Visible symptoms more rapid but defoliation not greatly increased at 7 DAT.
  - Can see increase in overall performance

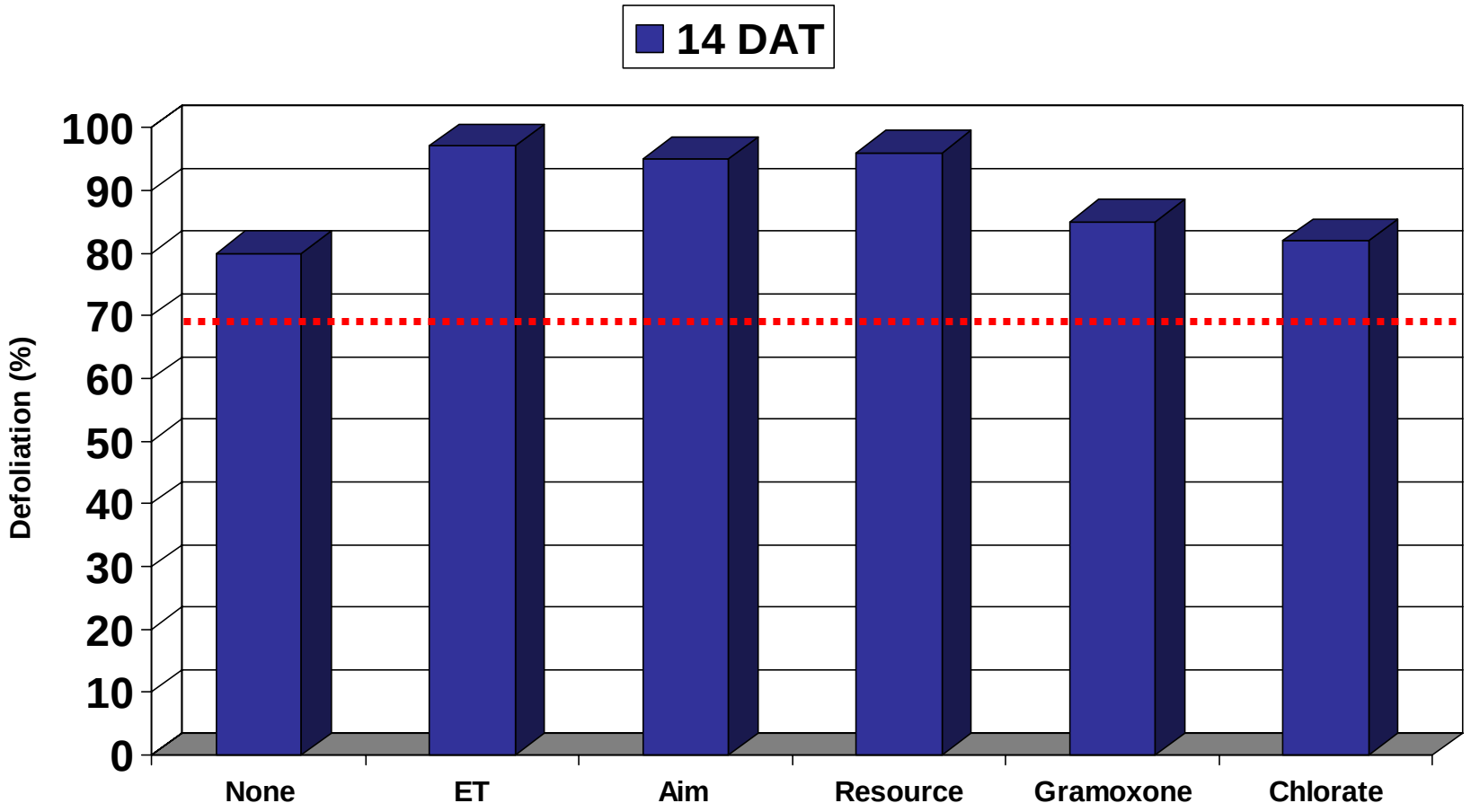
PPO Defoliants (tank mix)



PPO Defoliants

- Used as a follow-up treatment
  - Logical fit in market with other contacts (paraquat, chlorate)
  - Has provided statistically better “clean up” than paraquat or chlorate. However economics is an issue (how much defoliation is enough)

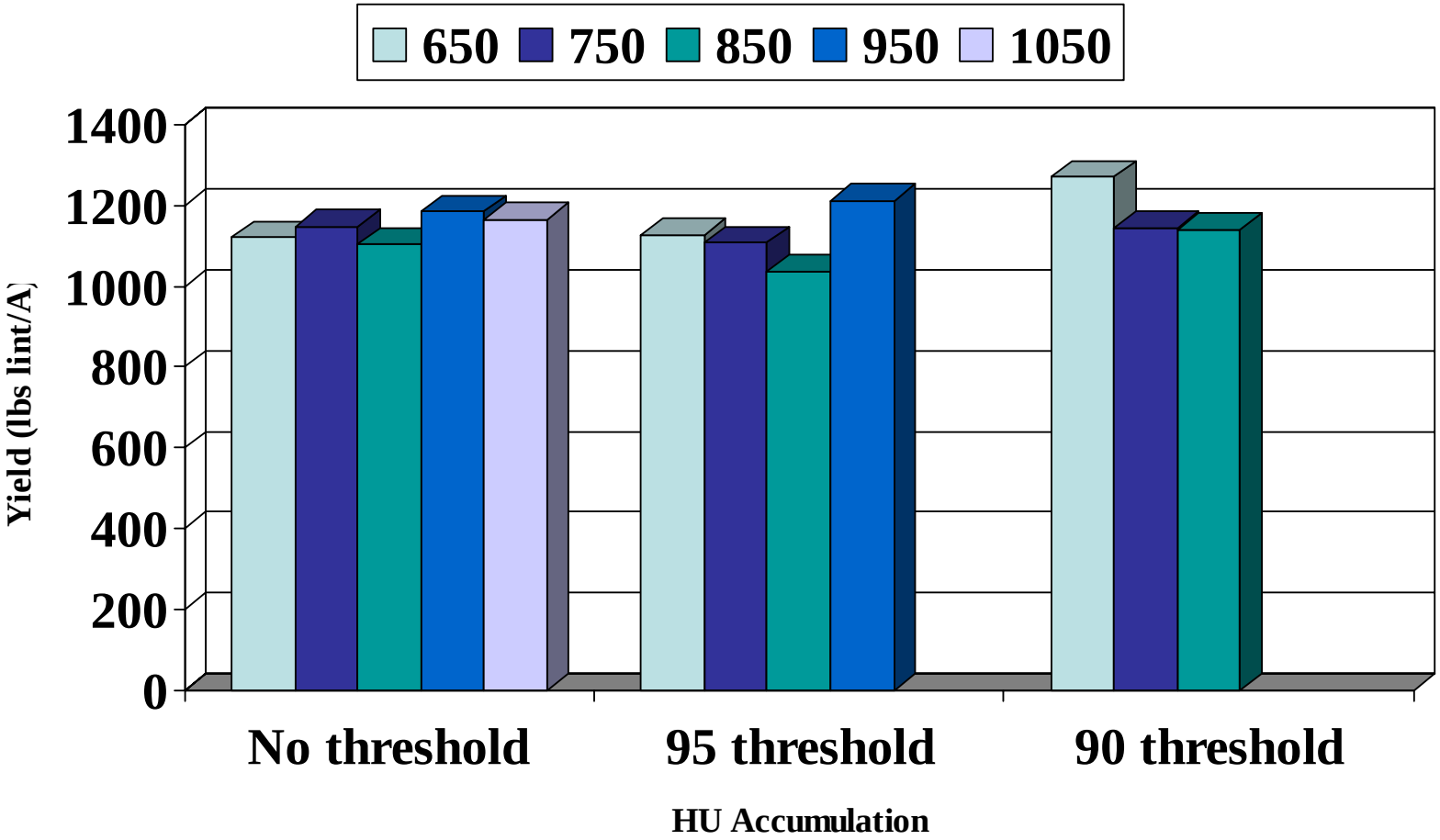
PPO Defoliants (follow-up)



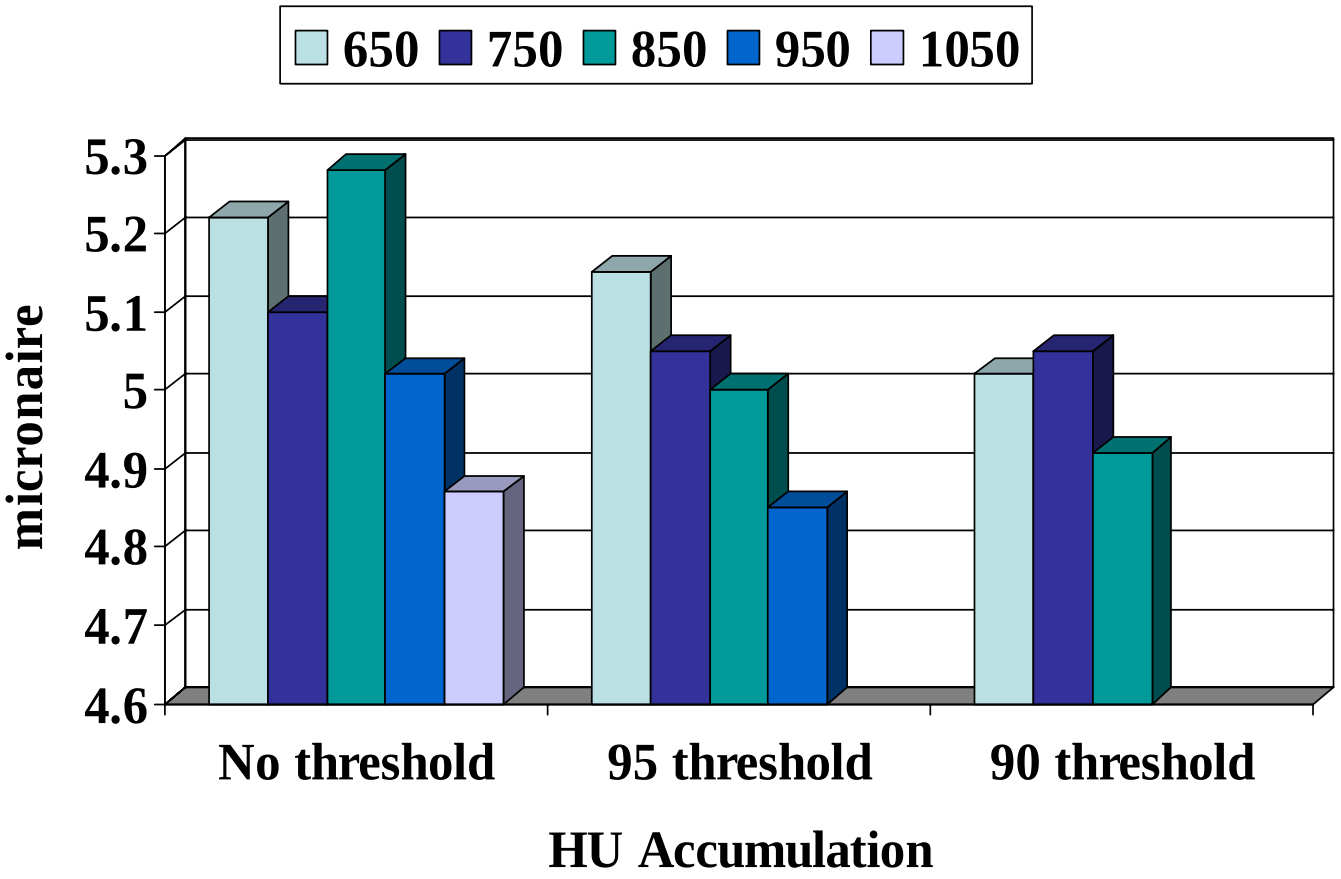
Cotton Defoliation

- Evaluating defoliation timing based on heat unit accumulation – effect on fiber quality and yield

Yield


650
750
850
950
1050
1400
1200
1000
800
600
400
200
0
Yield (lbs lint/A)
No threshold
95 threshold
90 threshold
HU Accumulation

Micronaire


650
750
850
950
1050
5.3
5.2
5.1
5
4.9
4.8
4.7
4.6
micronaire
No threshold
95 threshold
90 threshold
HU Accumulation