

**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 defoliant 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

- Warmer 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 <sup>1</sup>	HU accumulation (14 d following)	Daytime high temp.
Low	>300	90° F
Medium	200 – 300	80° F
High	<200	70° F

<sup>1</sup>Always read and follow manufacturer’s label

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

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

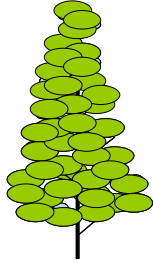
## PPO Herbicides/Defoliants

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

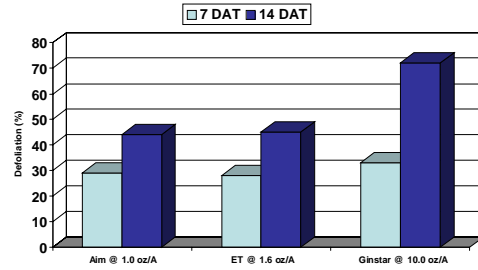


## PPO Defoliants

- 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



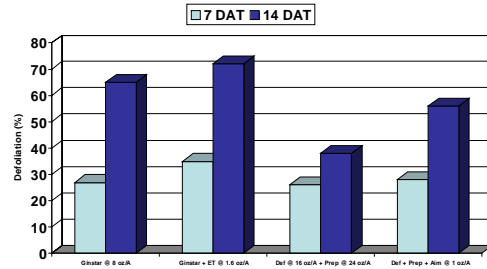
## PPO Defoliants (Stand-alone)



## 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

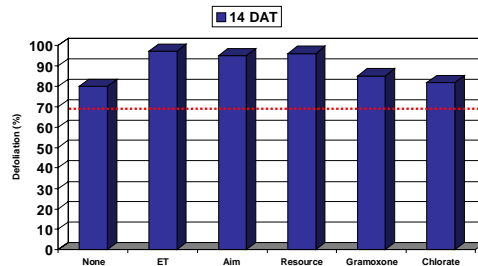
## PPO Defoliants (tank mix)



## 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)

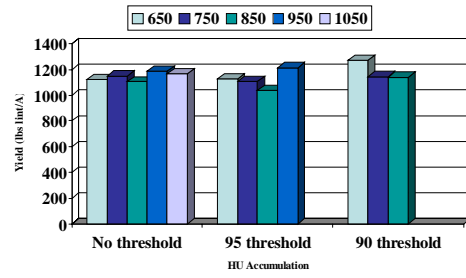
## PPO Defoliants (follow-up)



## Cotton Defoliation

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

## Yield



## Micronaire

