# Causes of Square & Boll Shed
## (2020 LATMC)


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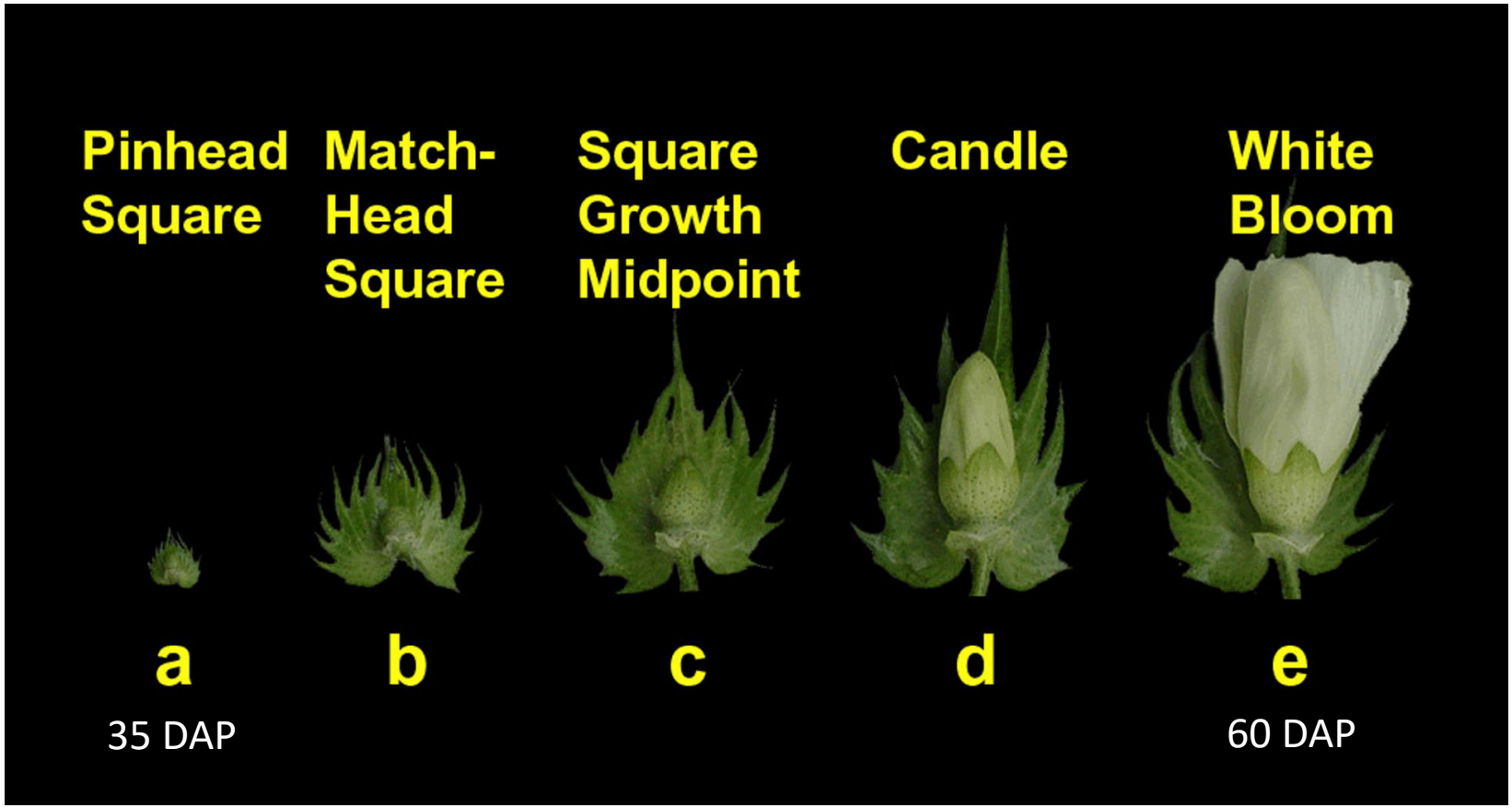
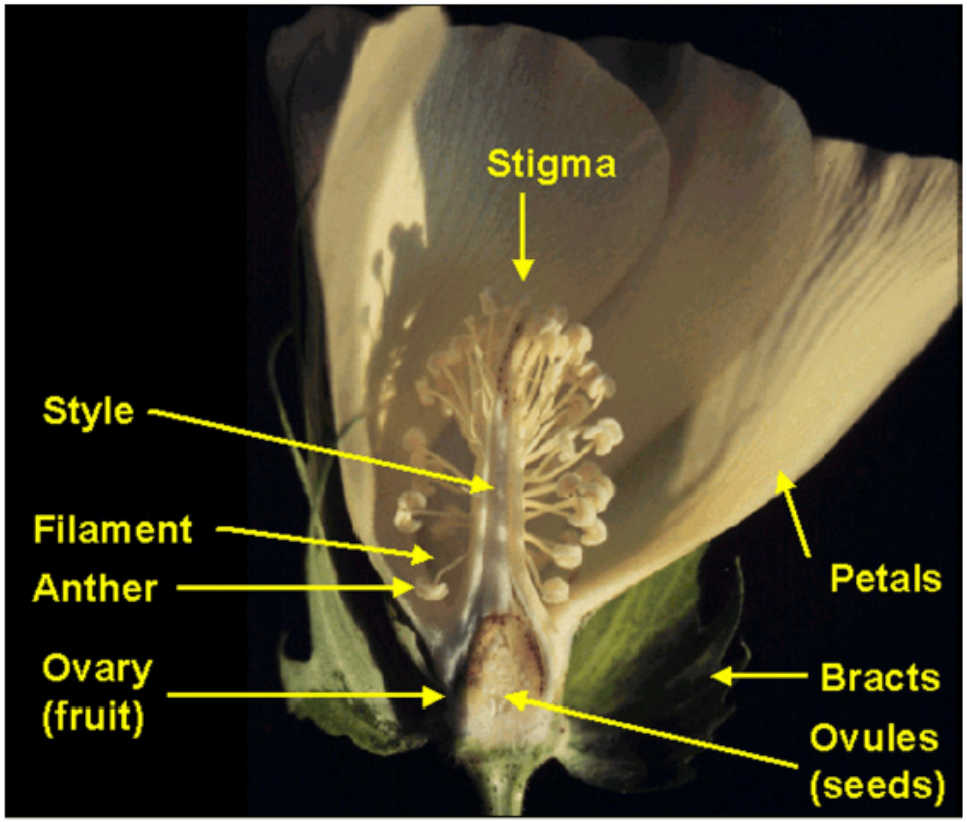
# Squaring and Flowering




Ritchie et al., 2008

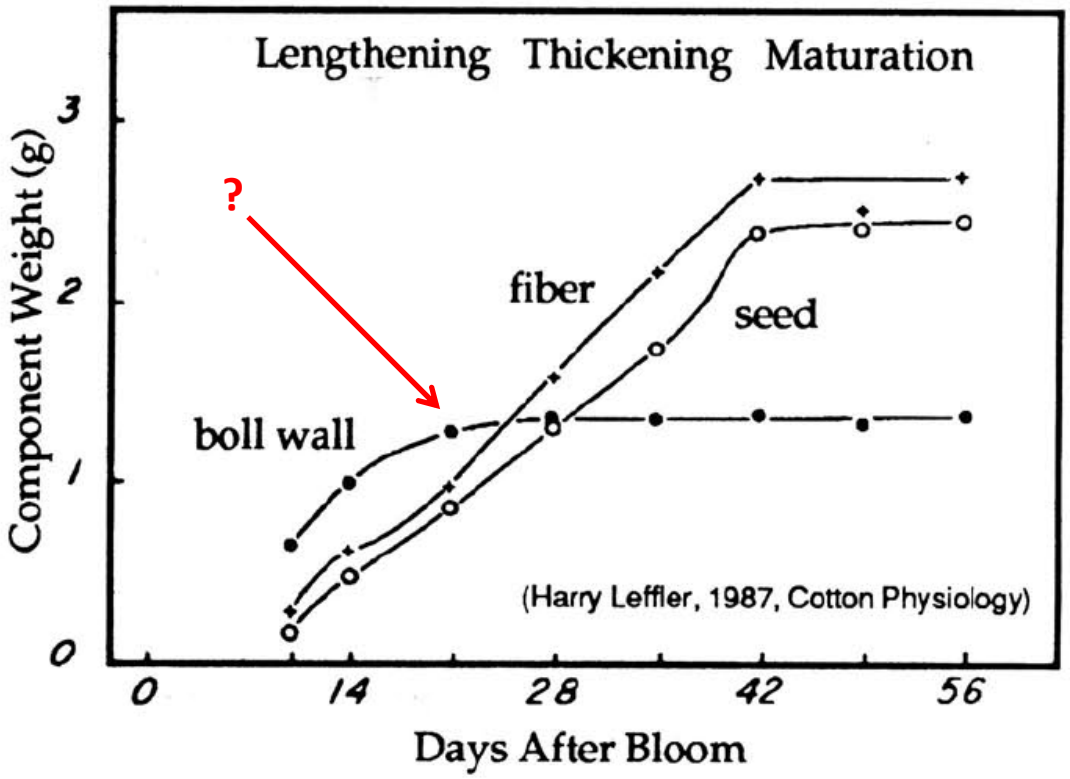
# Anthesis




Ritchie et al., 2008

# Boll Components

# Developmental Pattern




Hake et al., 1989

# Fiber Development

**Fiber Cell Initiation**

**[0 to 20 DPA]**

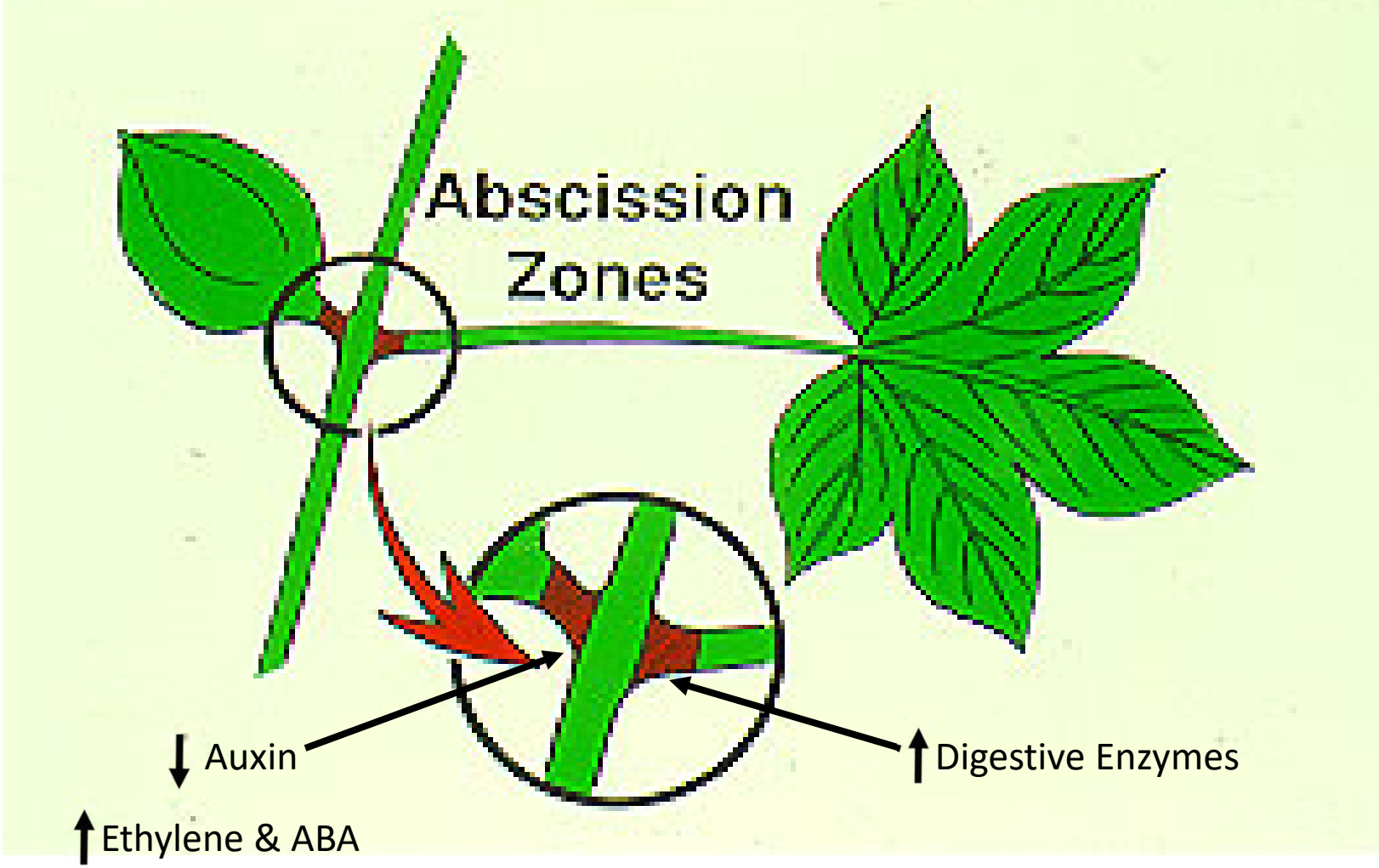
**Fiber Elongation**

**[15 to 45 DPA]**

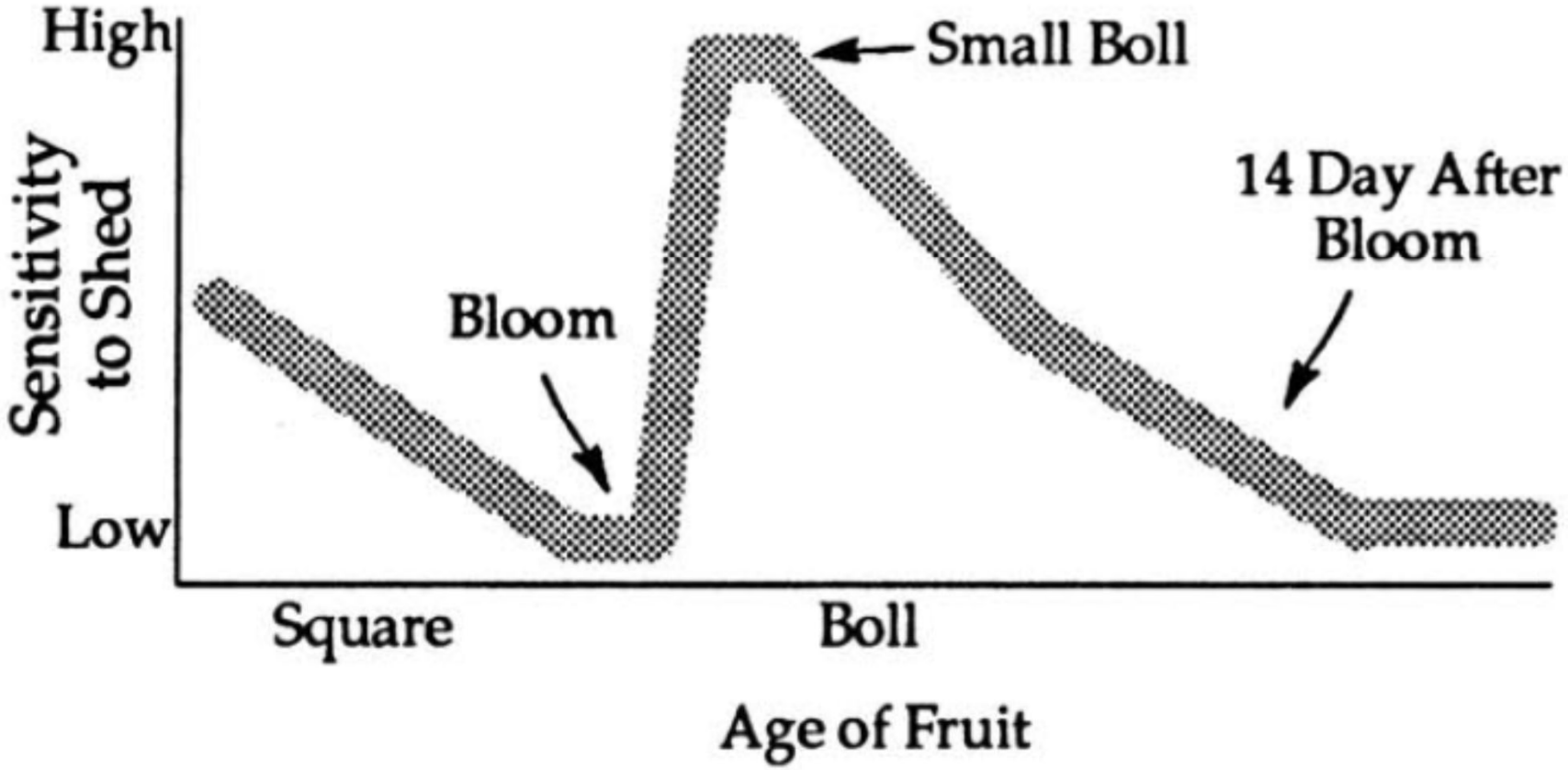
**Fiber Thickening**

**Fiber Maturation**
**[45-50 DPA]**

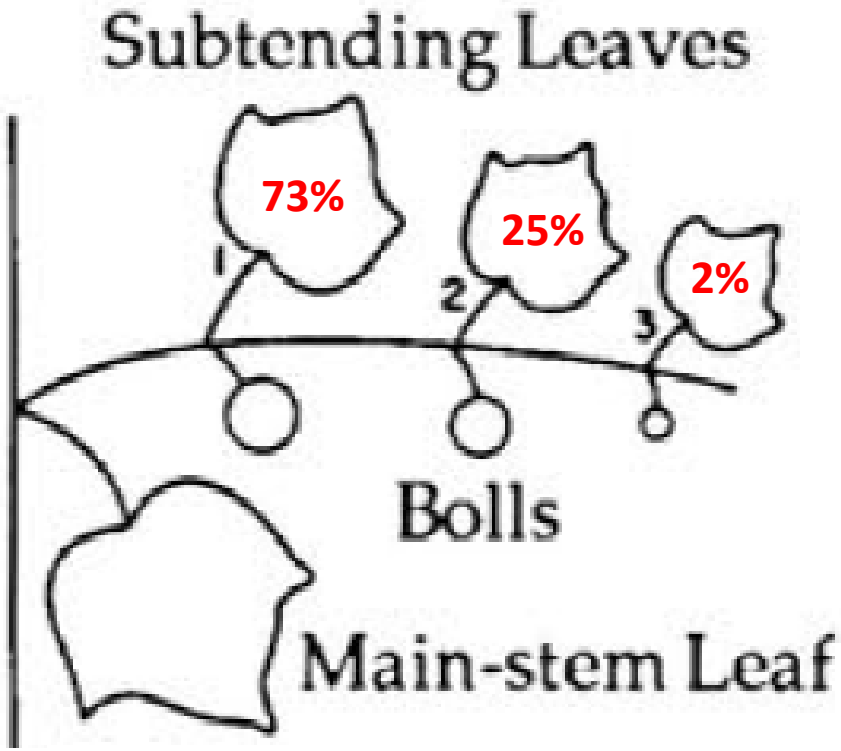
# The Abscission Process



# Square and Boll Age

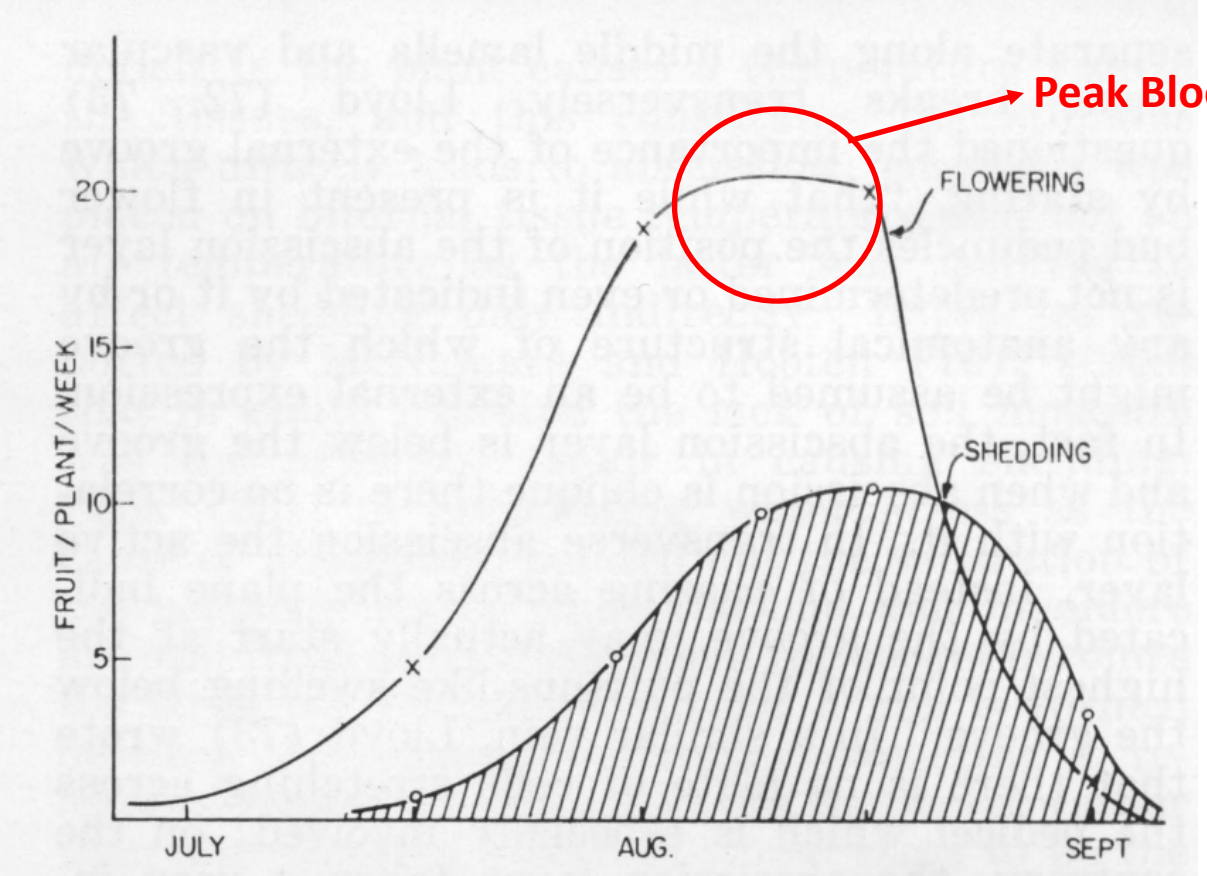


# Fruit Position



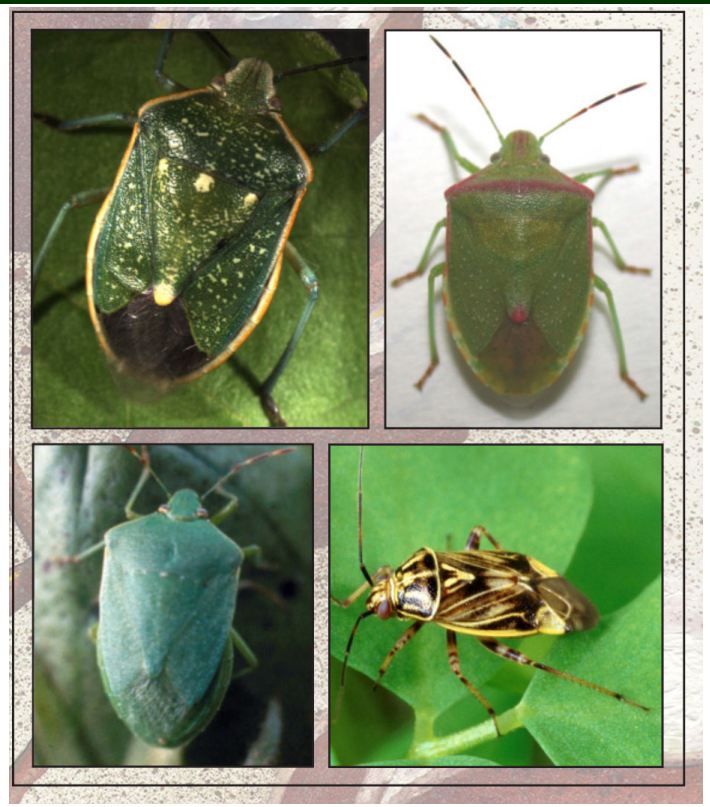

**Oosterhuis, 1990; Guinn 1982**
**Varies by Node Too.**

# Seasonal Trends




**Intra-Plant Competition**
**[60% Abscission not Uncommon]**

# Insects

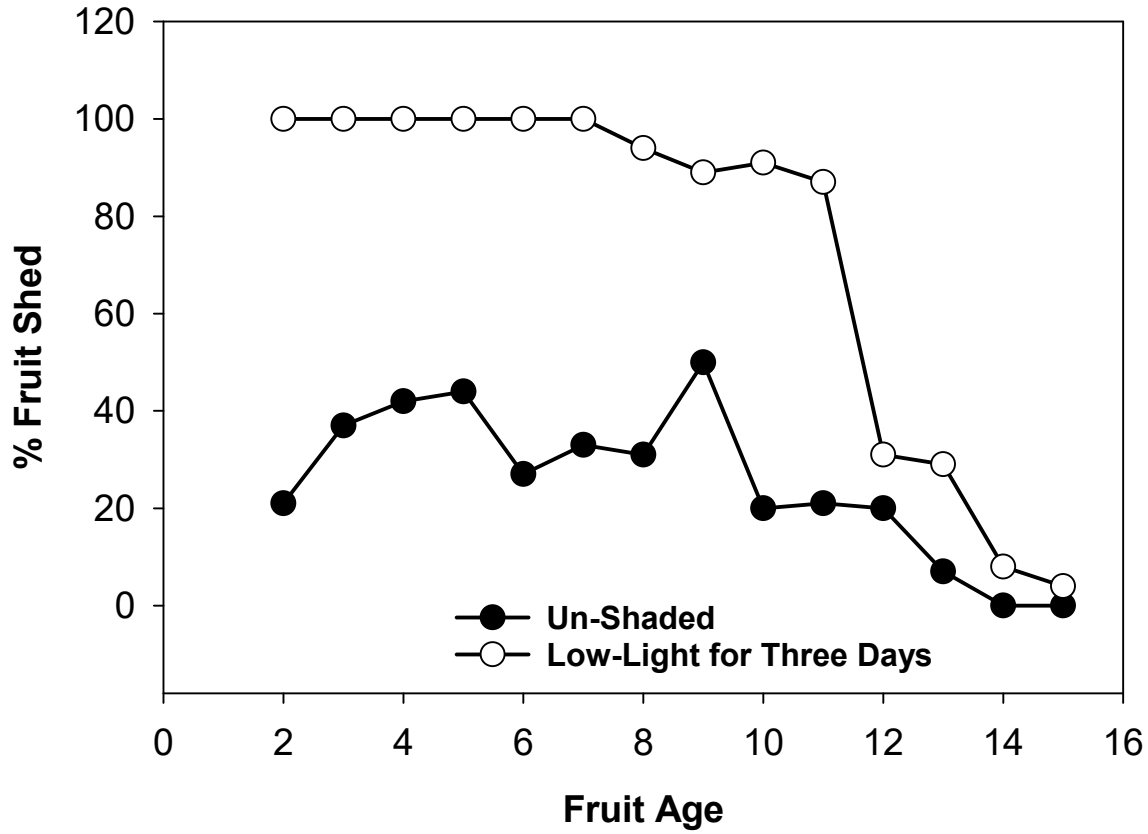


Greene et al. (2006)

https://guide.utcrops.com/cotton/cotton-insect-guide/bollworm-and-tobacco-budworm/

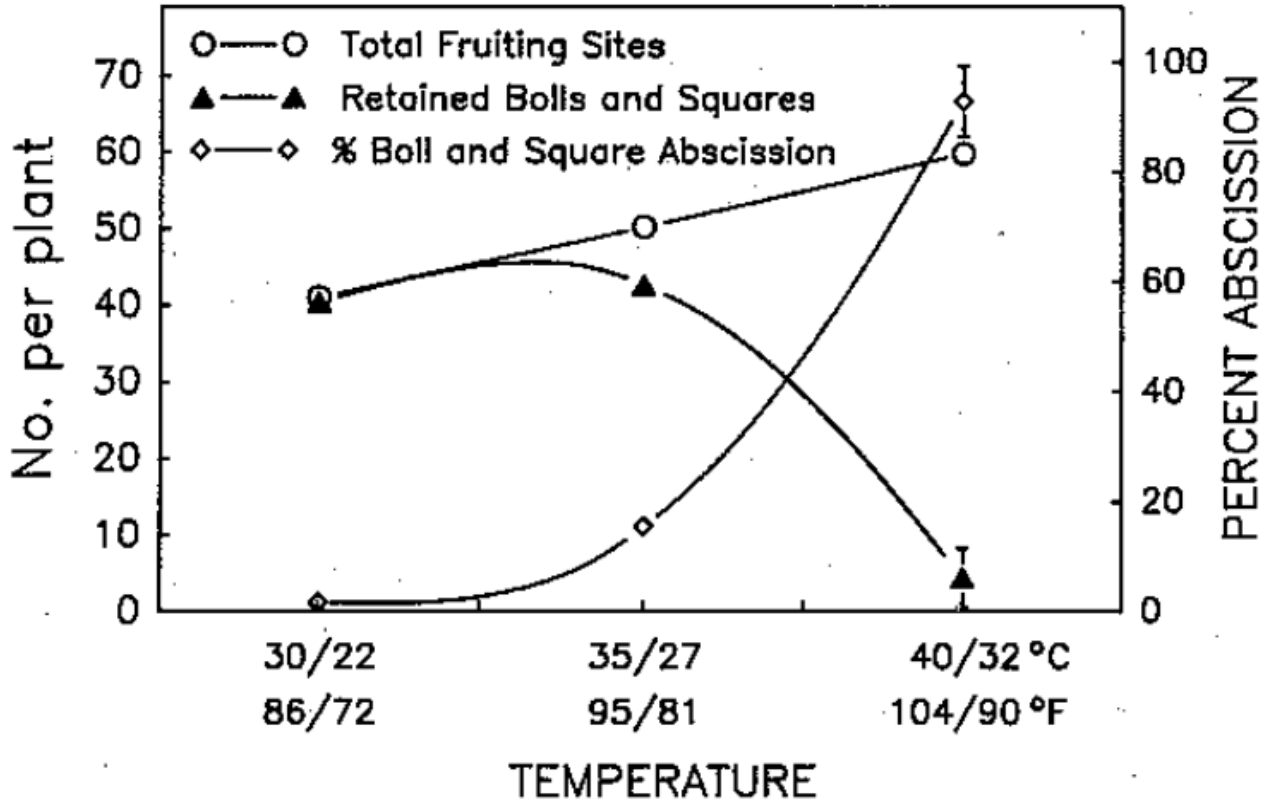
**Ethylene Production is a Response to Injury**

# Low Light



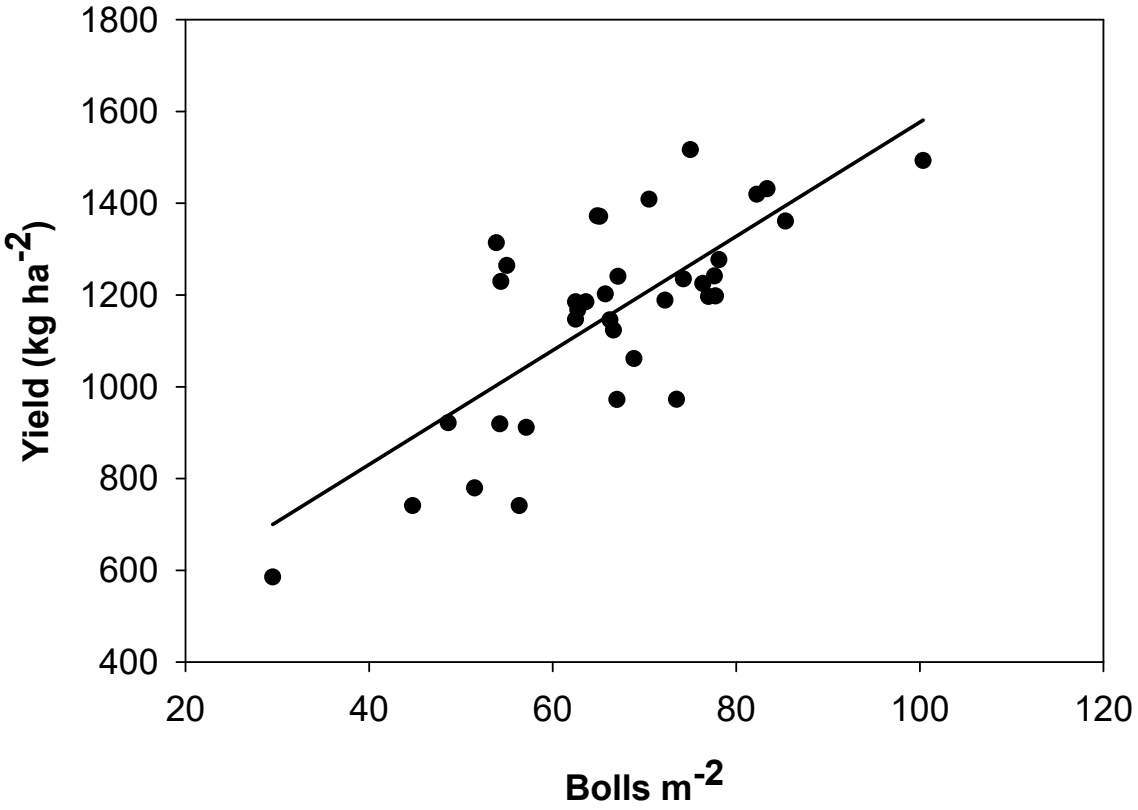

Guinn 1982

# High Temperature




Hodges et al., 1993

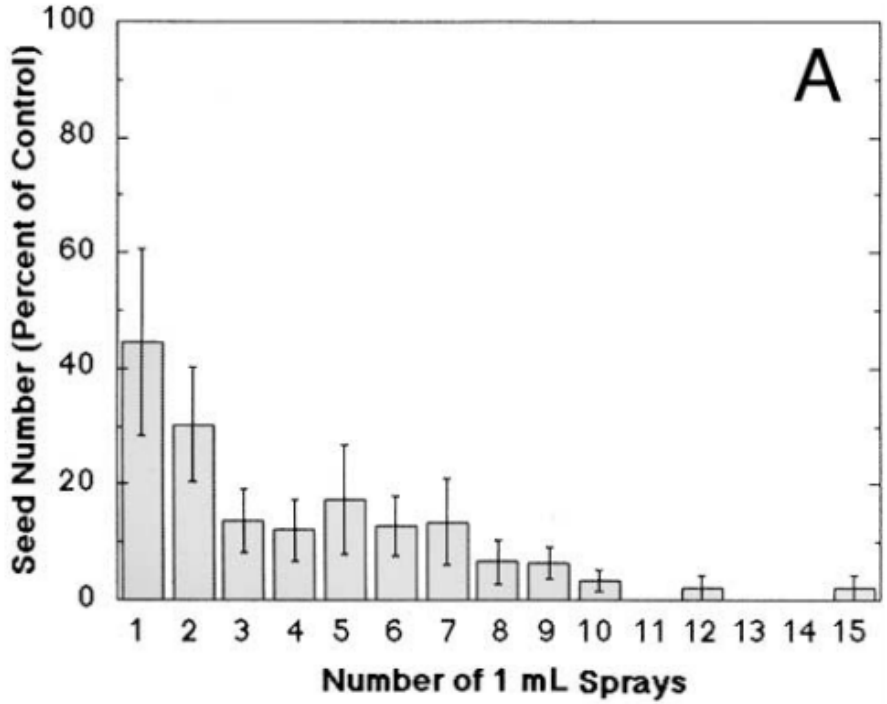
# Mineral Nutrition?

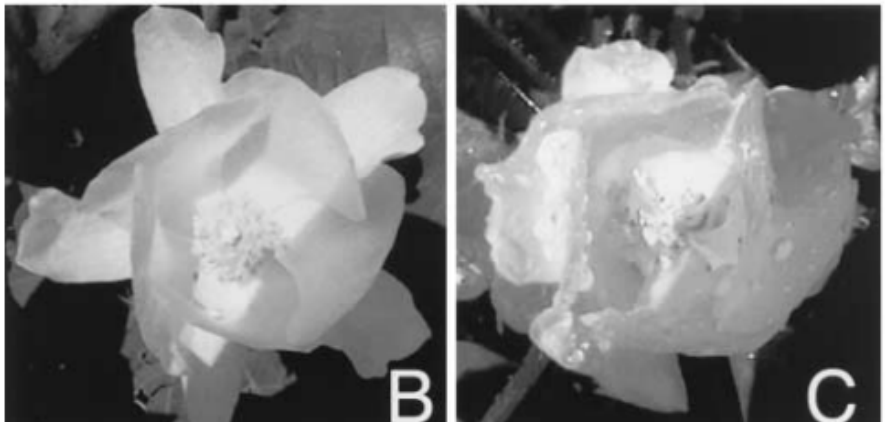


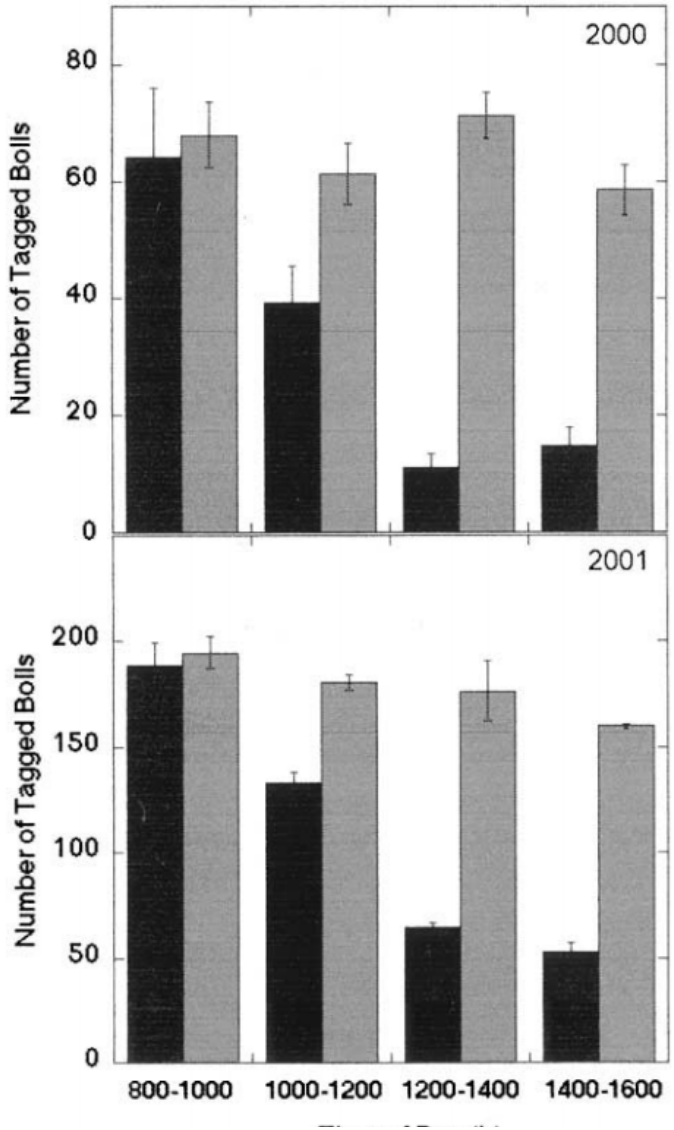

**This was an N Rate Experiment.**
**Higher Abscission in Low Yield Situation?**

# Water

# Water Timing

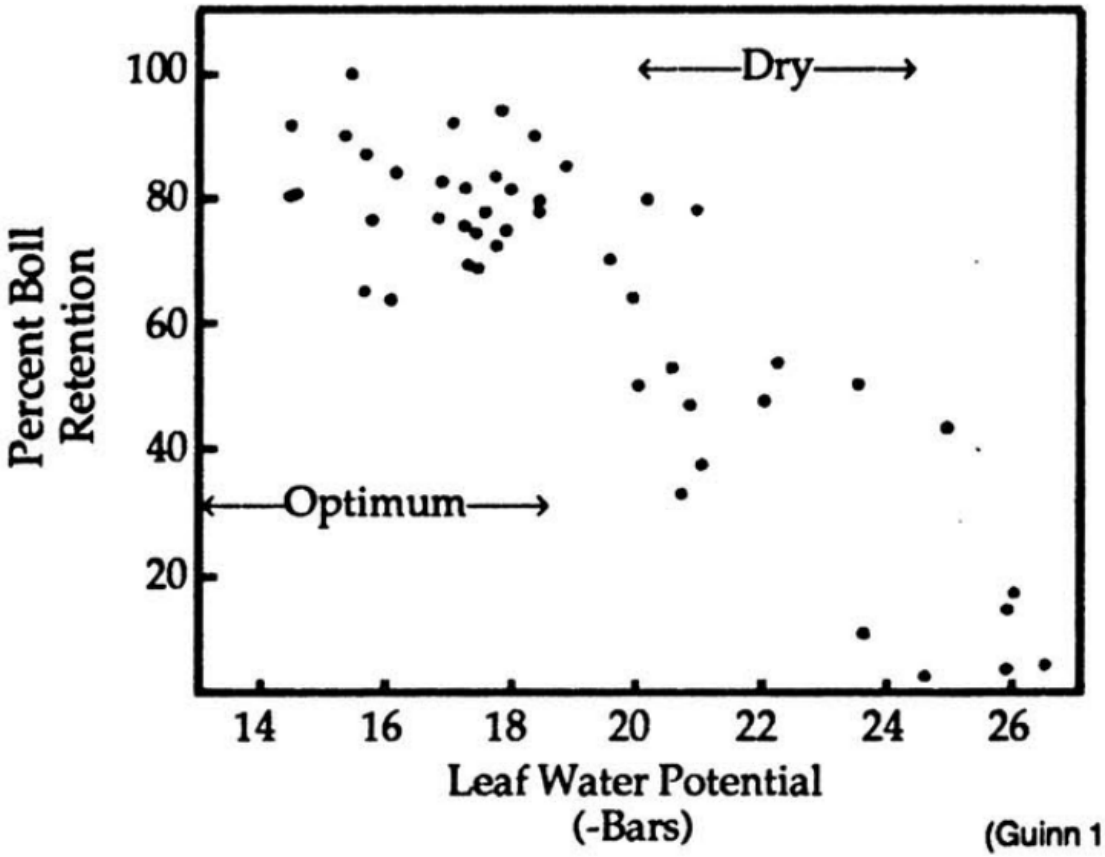


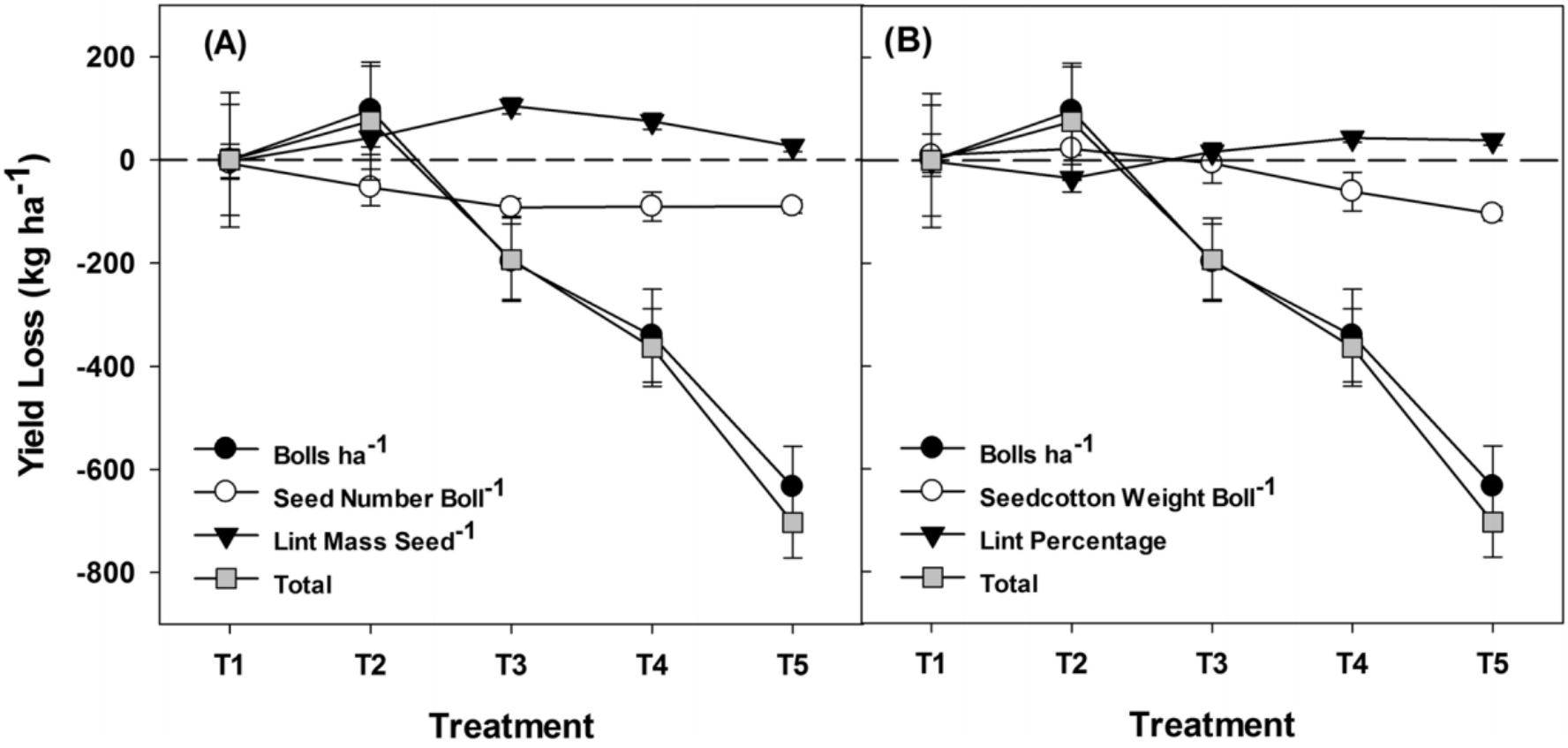

Burke, 2003

# Drought-Induced Abscission



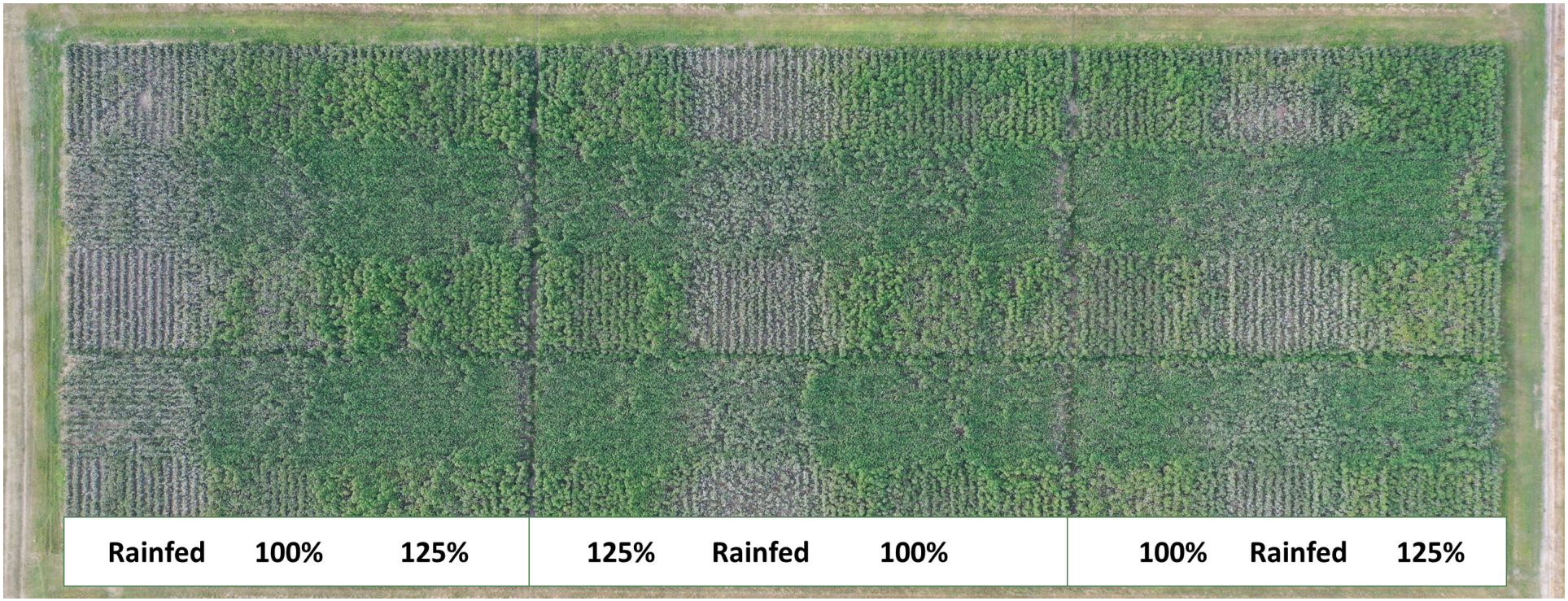

(Guinn 1984)

# Drought-Induced Yield Loss



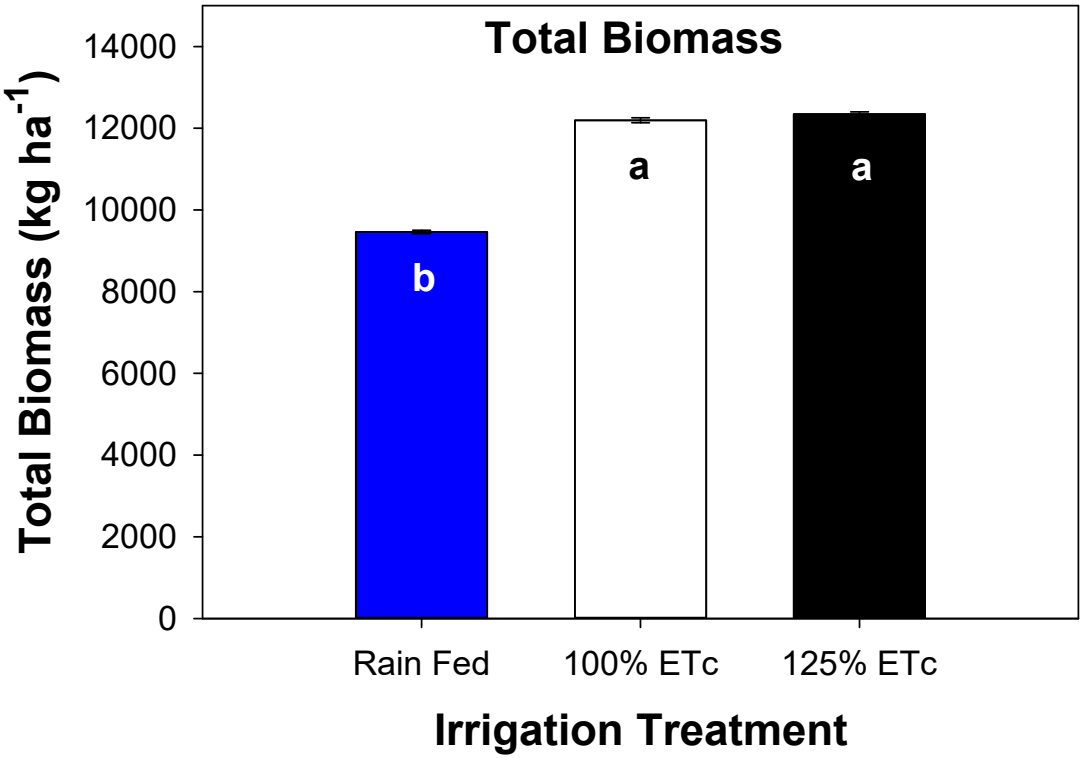

Hu et al. 2018

# Too Much of a Good Thing

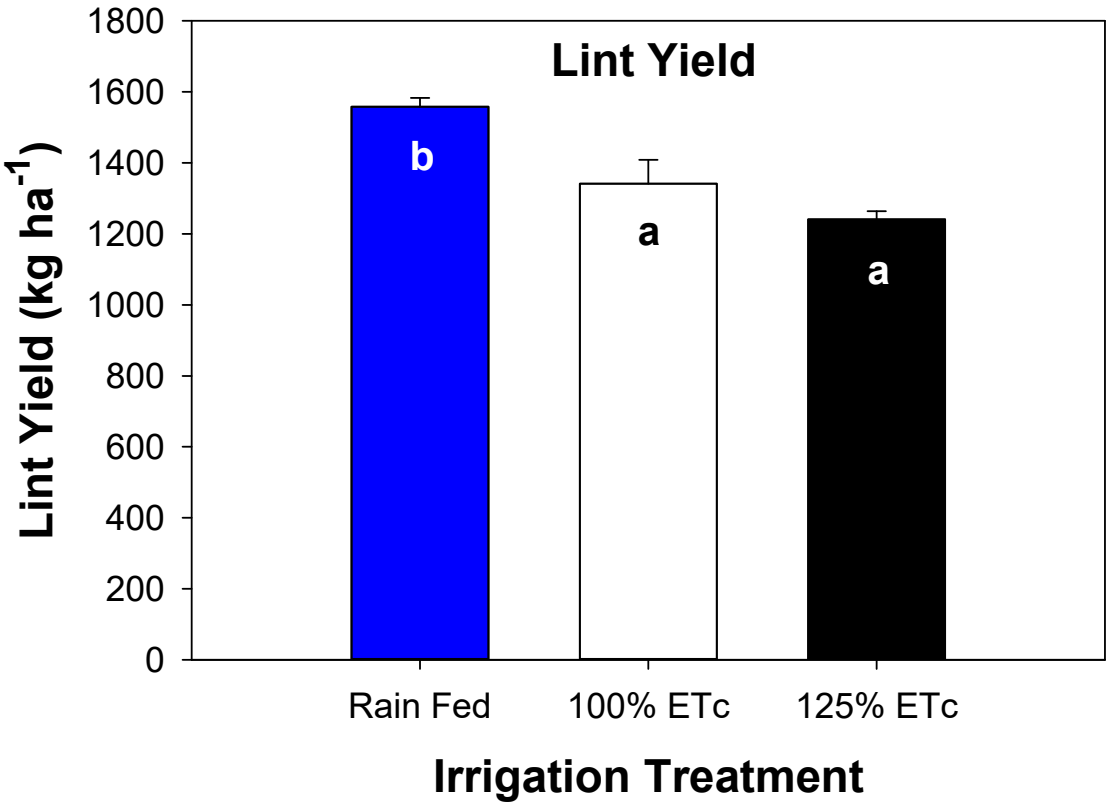



## Yield = Biomass x Harvest Index

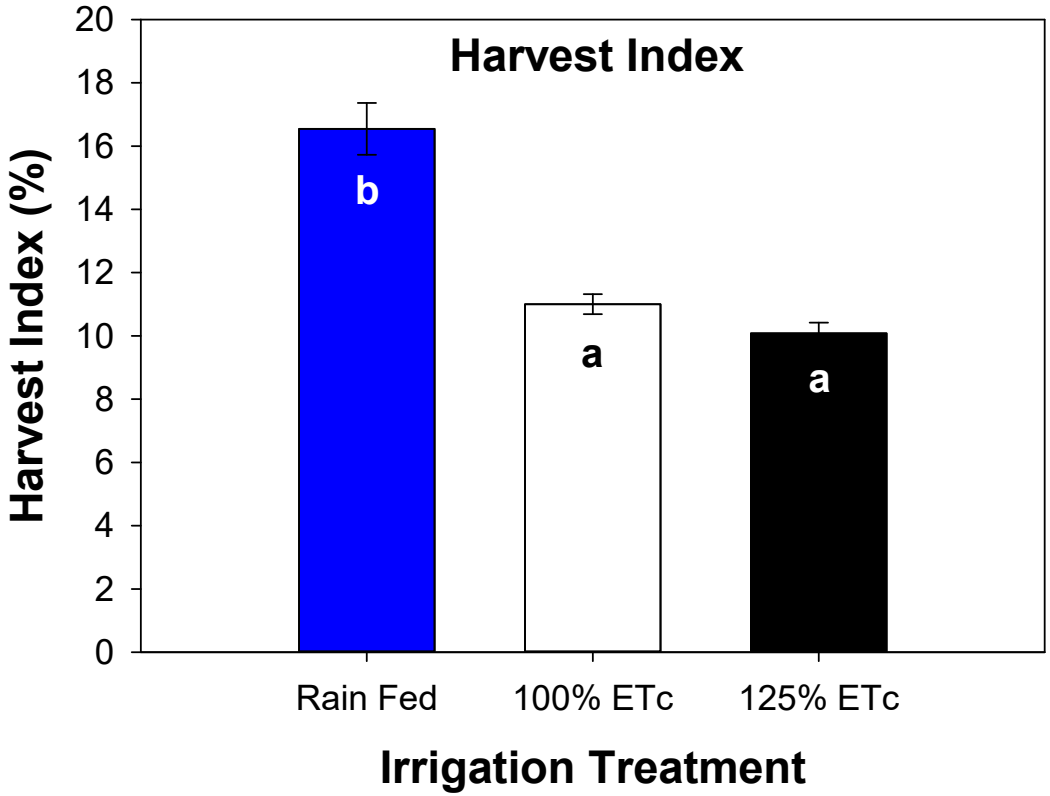
# Total Biomass



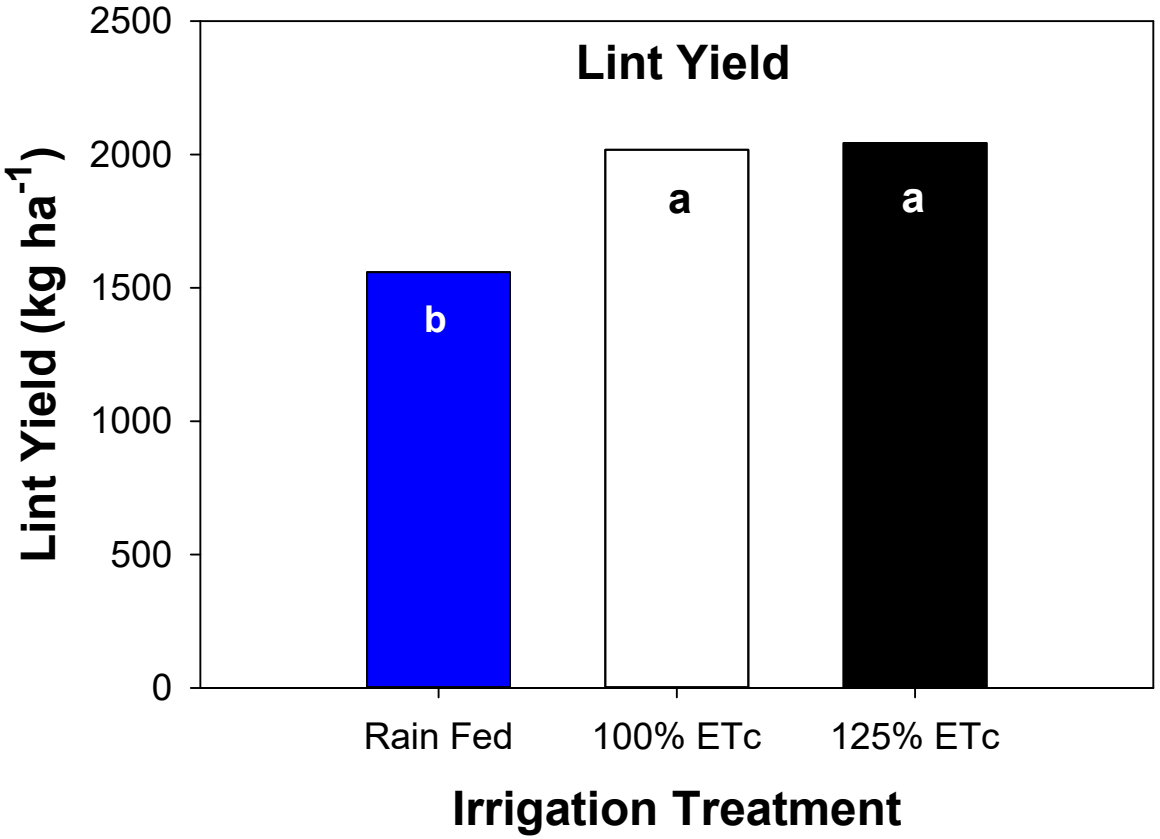
# Lint Yield


Lint Yield
Lint Yield (kg ha-1)
1800
1600
1400
1200
1000
800
600
400
200
0
b
a
a
Rain Fed
100% ETc
125% ETc
Irrigation Treatment

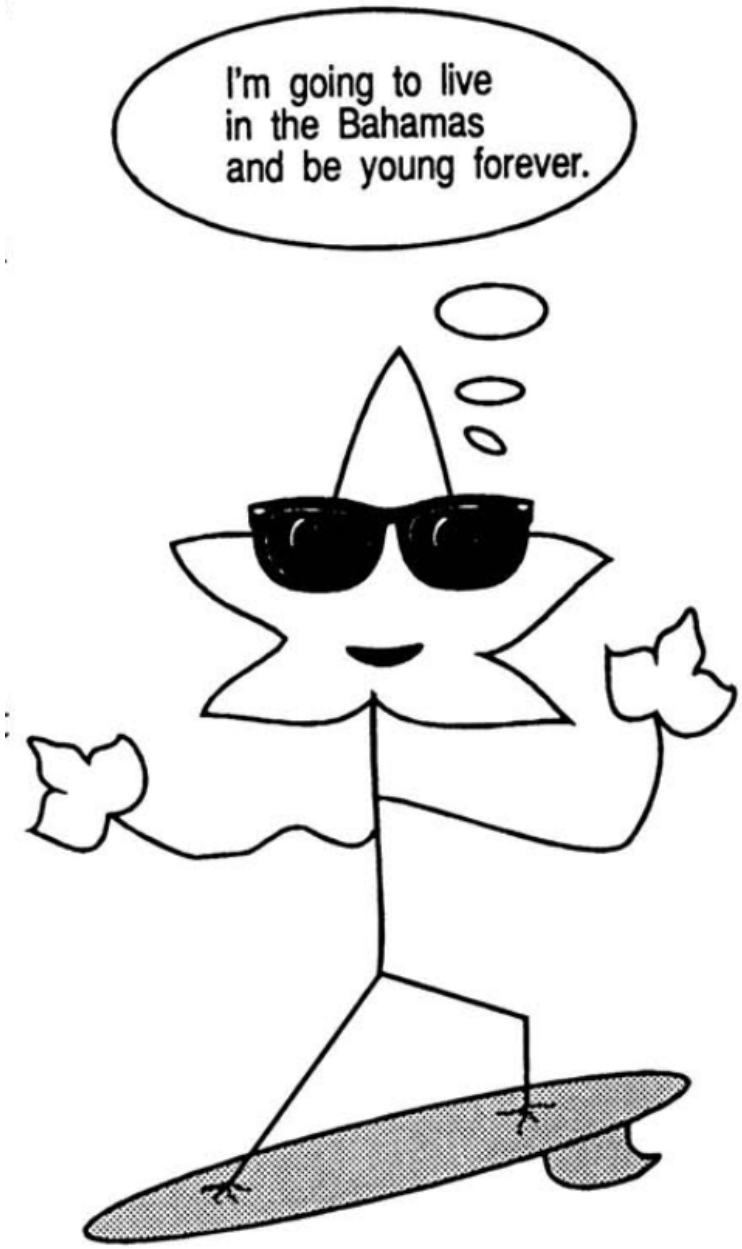
# Harvest Index



# Hypothetical Yield




**Why Didn't We Achieve this Instead?**




**Stichler and Hake, 1991**

# QUESTIONS?