



Effects of drought stress on water use efficiency and leaf temperature of two cotton genotypes

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GLOBAL WARMING
INCREASING WATER USE
INCREASING FOOD DEMAND

DROUGHT IMPACTS



The infographic features a world map with a color scale from blue (low impact) to red (high impact). A legend below the map lists 'DROUGHT IMPACTS' with a corresponding color key. To the left of the map, there is a vertical list of categories: 'Economic', 'Social', 'Environmental', and 'Health & Safety', each with a corresponding colored box.

GLOBAL WARMING
INCREASING WATER USE
INCREASING FOOD DEMAND

DROUGHT IMPACTS

Drought effects in
2003
2005
2007
2008
2010

Surface Air Temperature Increase 1960 to 2000

Temperature Increase

Cotton is widely grown in arid and semiarid regions

Reduction in yield and quality

Drought and water use efficiency

Responses of cotton to water scarcity



- Stomatal limitation
- Lower Photosynthetic activity
- Decrease in leaf area
- Slow plant development
- Early growth cycles
- Formation of small bolls
- Yield losses

Water Use Efficiency of Cotton

$$WUE = \text{Dry matter} / \text{Water Use}$$



Agronomic techniques

Genetic Improvement

Material and Methods

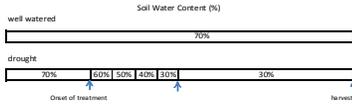



Treatments:

Genotypes
 Chirpa-433 (G. hirsutum)
 Amphidiploid (Chirpa-433 x G. Sturtii)

Watering
 Control (Well watered)
 Drought

Soil Water Content (%)



well watered: 70%

drought: 70% | 60% | 50% | 40% | 30% | 20%

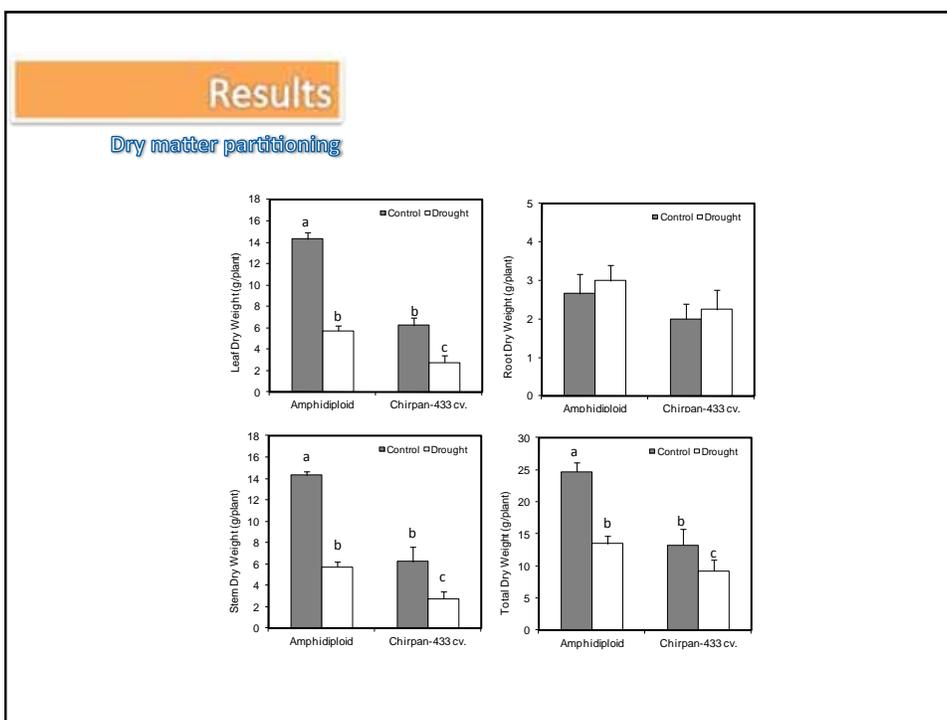
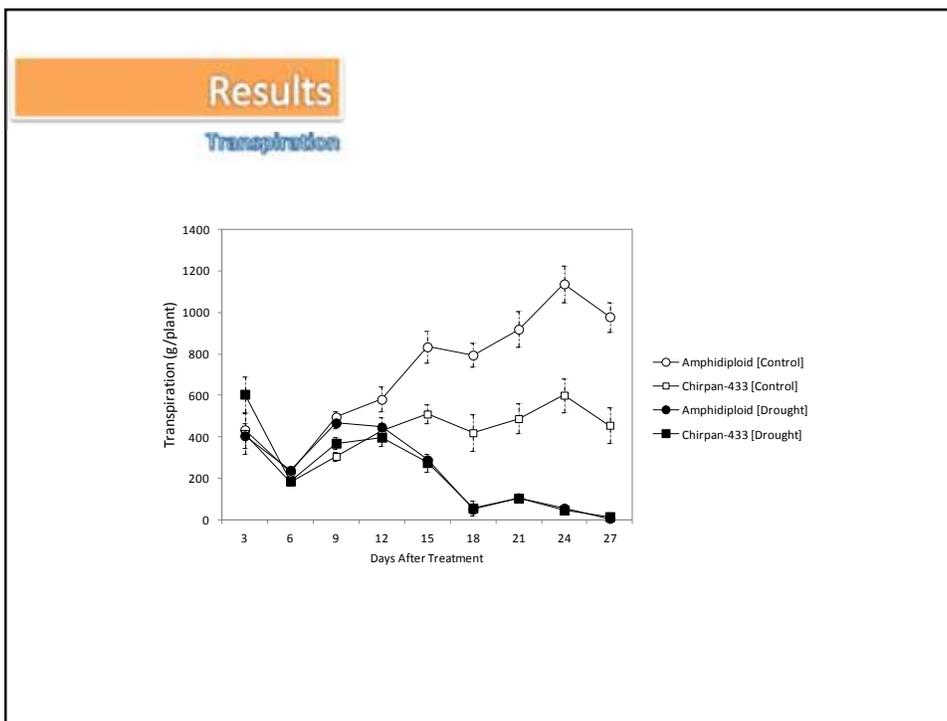
Onset of treatment | harvest

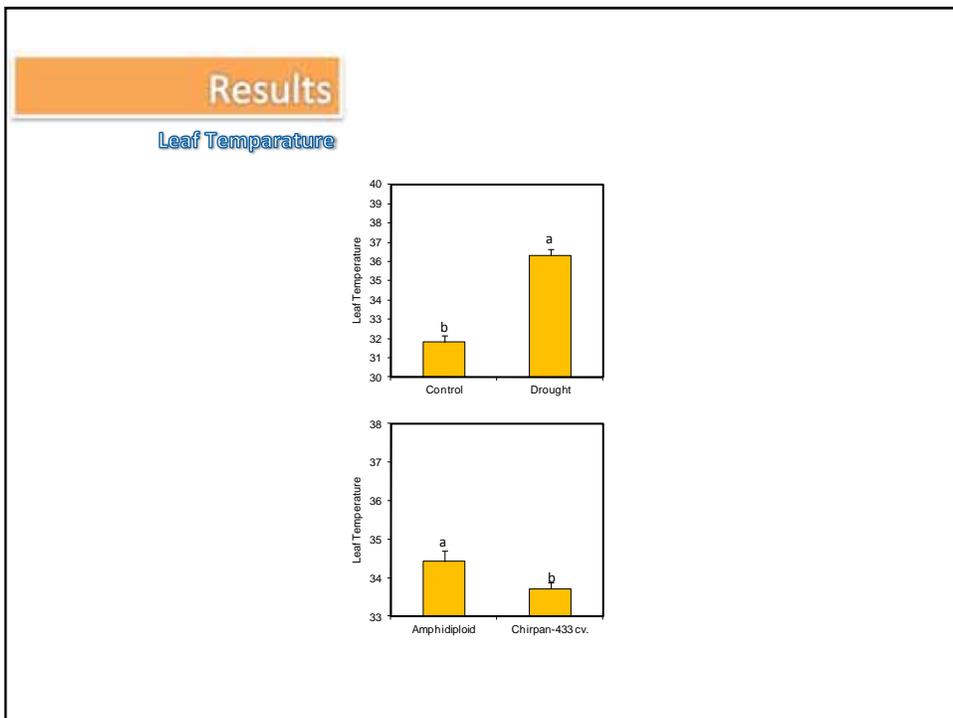
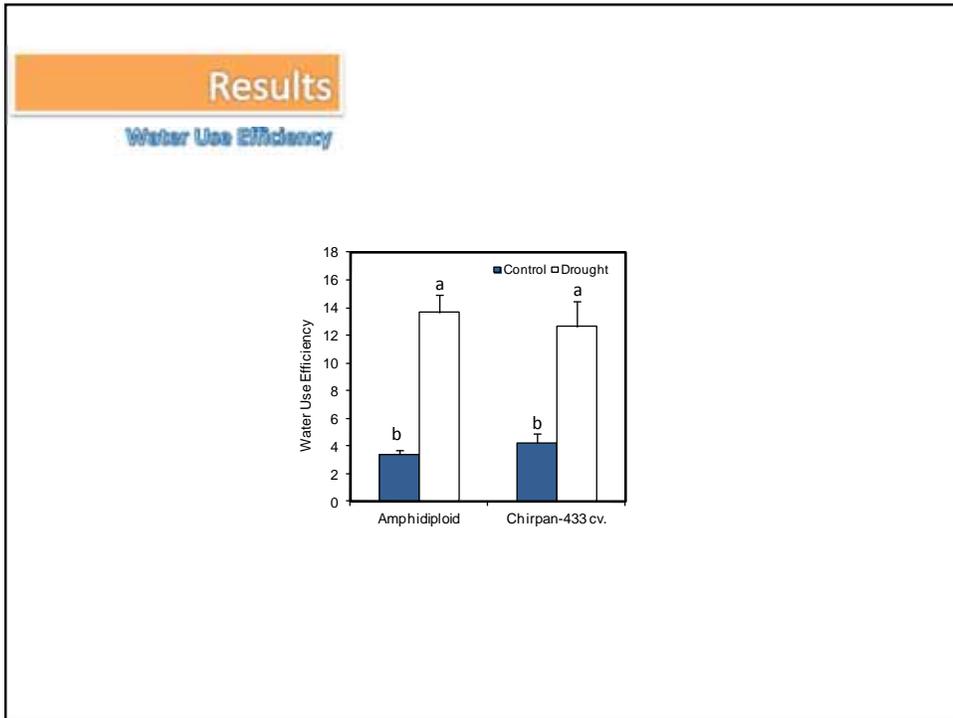
Material and Methods

- Dry matter partitioning
- Transpiration
- Water Use Efficiency
- Leaf Temperature
- Proline
- Enzyme activities (SOD, CAT, POD)
- Chlorophyll content









Thank you for your attention