

The background of the slide is a close-up photograph of three young cotton plants (seedlings) growing in a field of cracked, dry, brown soil. The plants are arranged horizontally across the middle of the frame. Each plant has two large, rounded, green leaves and a small stem. The soil is parched and shows deep, irregular cracks, indicating a lack of water. The overall scene suggests a challenging environment for cotton cultivation, likely during a pre-season or early season period.

# *Pre-season and Early Season Cotton Management*

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# Feedback approach in crop management

## ☐ Soil analysis

- Soil nutrients
- Soil properties

## ☐ Plant tissue analysis

- Plant nutrient needs: 60 lb N/bale

# Pre-plant soil sampling

## □ Uniform field:

- 25 soil cores for a composite soil sample per field.
- 6-8 inches in depth (2 feet??)

## • Non-uniform field

# Soil testing

Lab Number: 903273-01	White (0-8")	Crop: No Crop			
<i>Soil Complete Test</i>	Method	Result	Units	Levels	
pH	1:1	8.4	SU	Very High	
Electrical Conductivity, EC	1:1	0.49	dS/m	Low	
Calcium, Ca	NH4OAc (pH 8.5)	1,800	ppm	High	
Magnesium, Mg	NH4OAc (pH 8.5)	120	ppm	Medium	
Sodium, Na	NH4OAc (pH 8.5)	120	ppm	Medium	
Potassium, K	NH4OAc (pH 8.5)	420	ppm	Very High	
Zinc, Zn	DTPA	1.6	ppm	Medium	
Iron, Fe	DTPA	12	ppm	High	
Manganese, Mn	DTPA	28	ppm	High	
Copper, Cu	DTPA	6.3	ppm	Very High	
Nickel, Ni	DTPA	0.25	ppm		
Nitrate-N, NO <sub>3</sub> -N	Cd Reduction	17	ppm	Medium	
Phosphate-P, PO <sub>4</sub> -P	Olsen	10	ppm	Medium	
Sulfate-S, SO <sub>4</sub> -S	Hot Water	14	ppm	High	
Boron, B	Hot Water	0.56	ppm	Medium	
Free Lime, FL	Acid Test	High			
ESP	Calculated	4.5	%		
CEC	Calculated	11.6	meq/100g		

# ***Soil sampling and analysis***

<http://ag.arizona.edu/pubs/crops/az1412.pdf>



College of Agriculture and Life Sciences

AZ1412

Revised 10/11

## **SOIL SAMPLING AND ANALYSIS**

*J.L. Walworth*

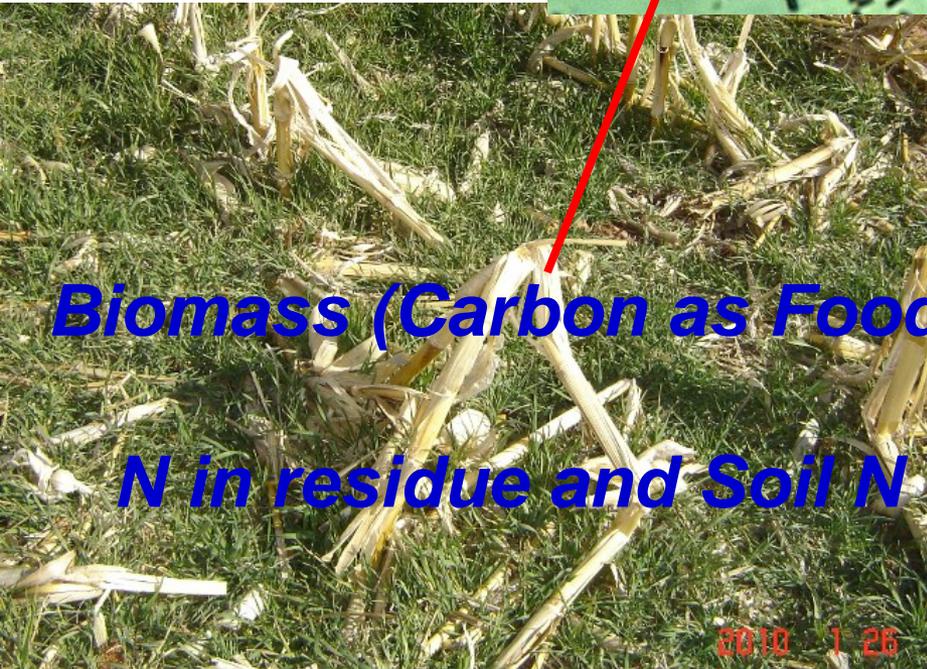
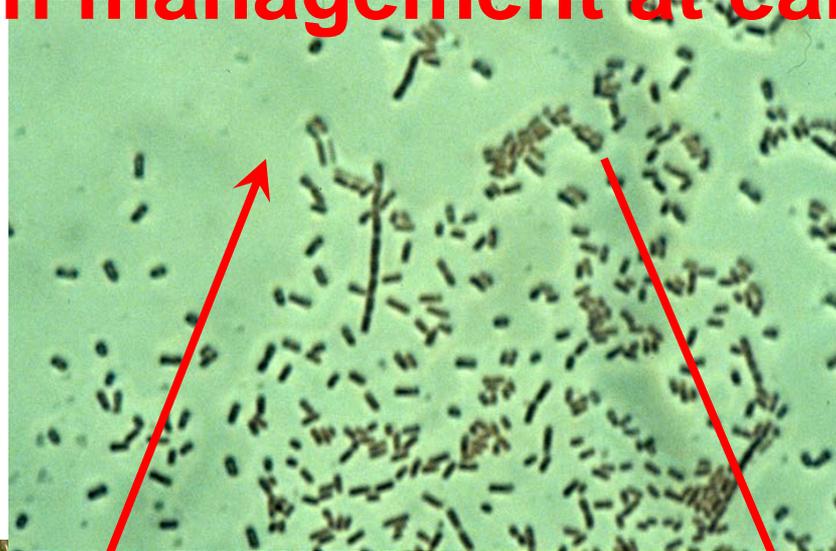
# ***Pre-plant soil N application***

<u>Pre-plant soil NO<sub>3</sub>-N (ppm)</u>	<u>Pre-plant N rate (lbs/A)</u>
0-5	30-50
5-10	20-30
10-15	0-20
>15	0

## ***Pre-plant soil P application***

<u>Pre-plant soil P<sub>2</sub>O<sub>5</sub> (ppm)</u>	<u>Pre-plant P<sub>2</sub>O<sub>5</sub> rate (lbs/A)</u>
0-5	100
5-8	60-80
>8	0

# Include rotational crop factor in your nitrogen management at early stage



*Biomass (Carbon as Food)*

*N in residue and Soil N*

2010 1 26



# *Residue Carbon:Nitrogen ratio*

<u>C:N</u>	<u>N Availability</u>	<u>Examples</u>
<10:1	High	Manure, organic fertilizer
15:1 to 30:1	Medium-Low	Legume cover crops
50:1 – 80:1	Negative	Sorghum and corn residue
>80:1	Negative	Wheat straw

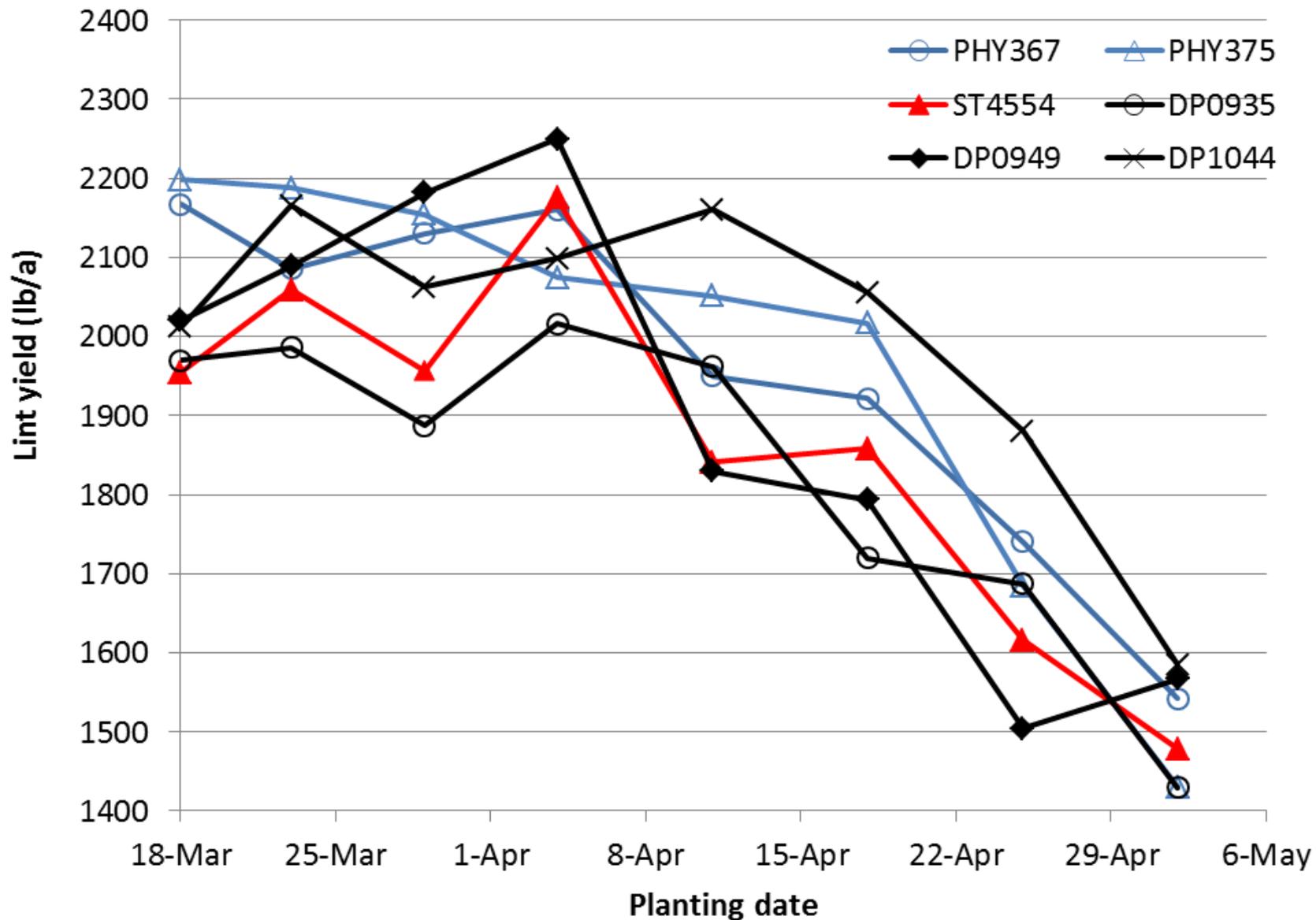
## ***Test your water for N input from irrigation***

Date	Maricopa	Marana
7/1/05	1.0	7.9
7/15/05	1.0	9.8
8/1/05	9.4	9.9
5/26/06	8.2	-
6/9/06	1.1	-
6/23/06	0.6	-
7/5/06	12.9	-
7/15/06	13.1	-
7/24/06	5.2	-

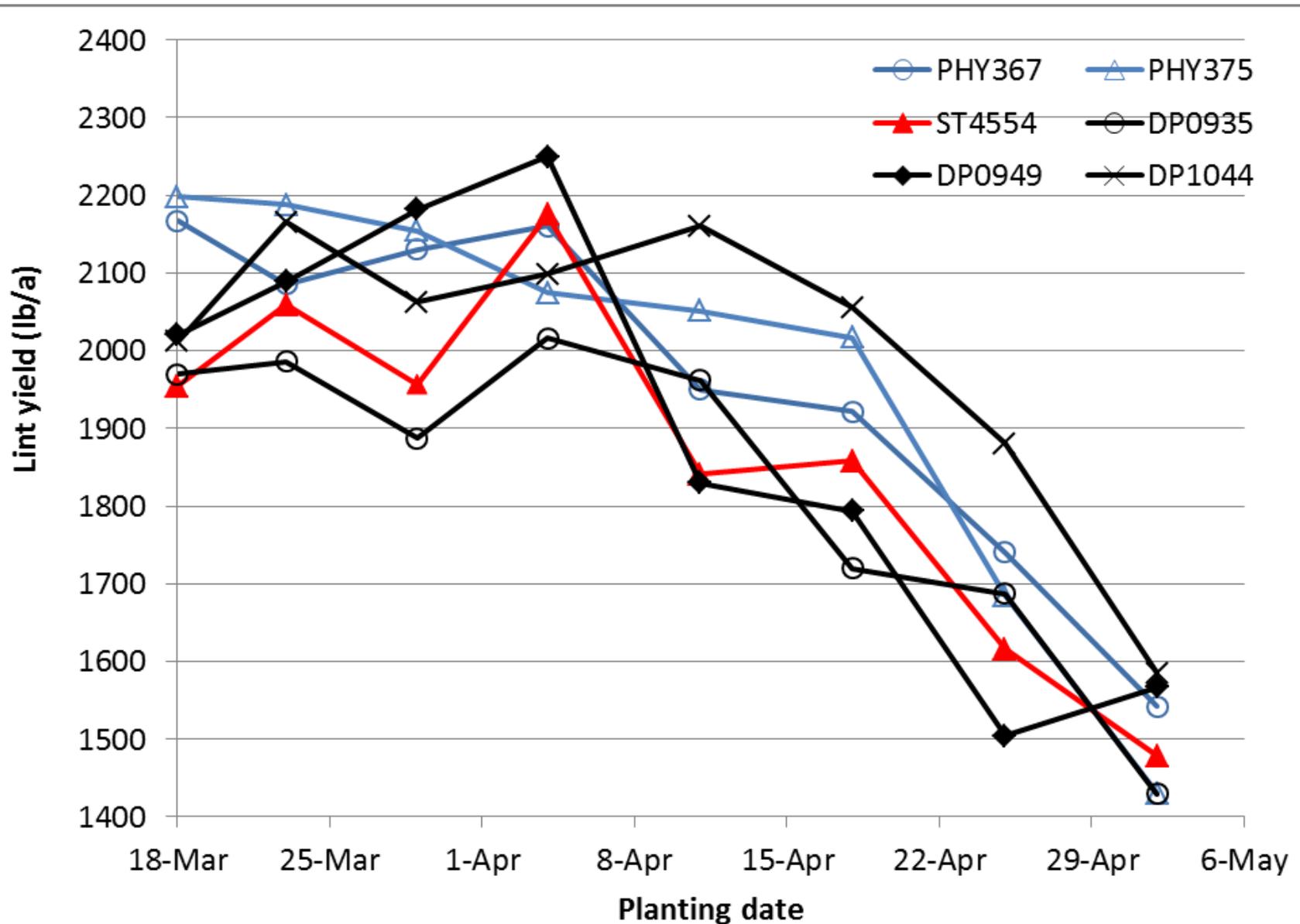
## *Test your water for N input from irrigation*

Water applied during growing season (Acre feet)	NO <sup>3</sup> -N in irrigation water			
	2ppm	5ppm	10ppm	15ppm
2	11	27	55	81
4	22	55	109	165
6	33	82	164	246

# Planting date affects cotton yield in 2011



# Planting date affects cotton yield in 2012



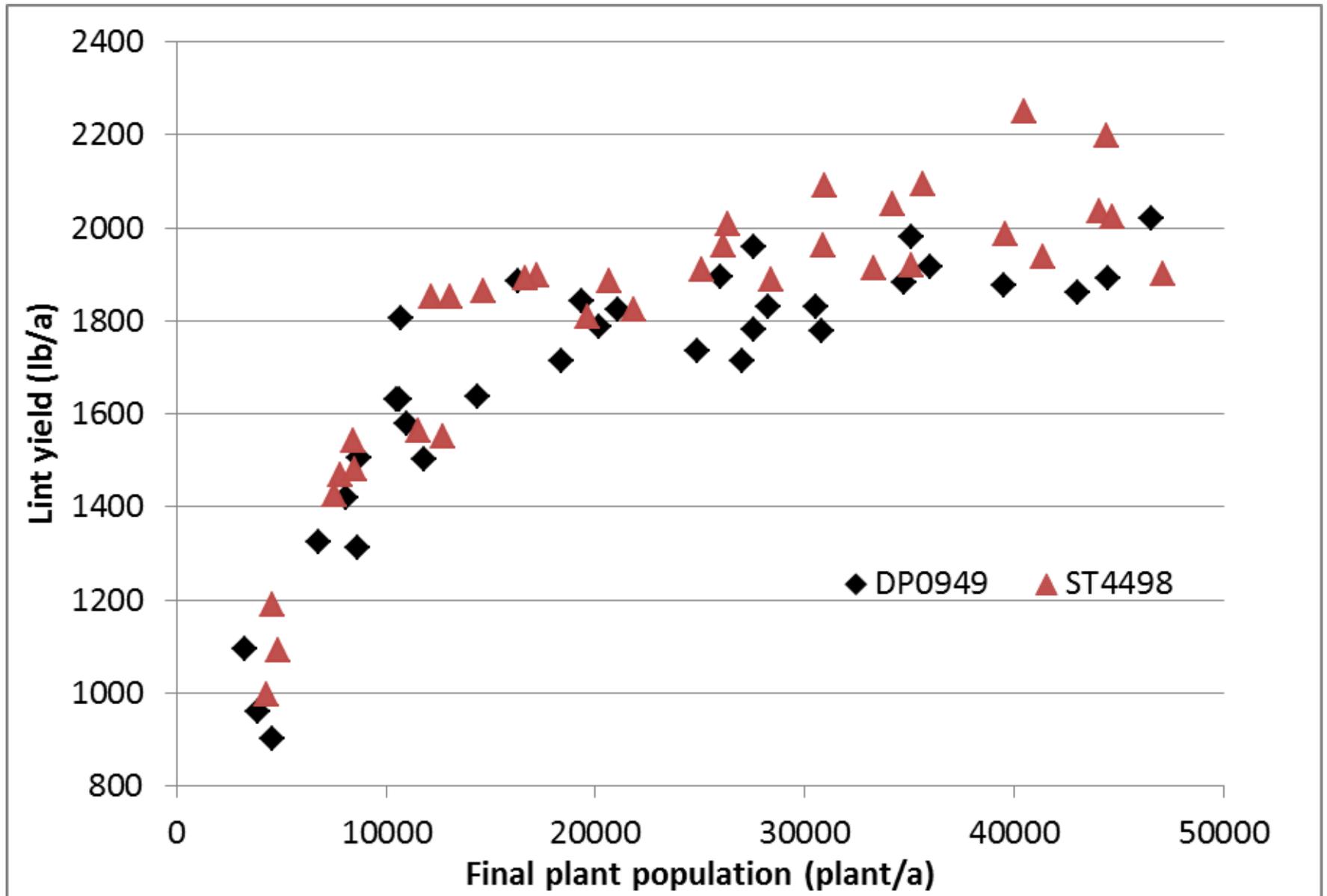
# Plant population affects cotton yield



**Columnar type**  
**DP 0949**

**Bushy type**  
**ST 4498**

# Plant population affects cotton yield in 2011

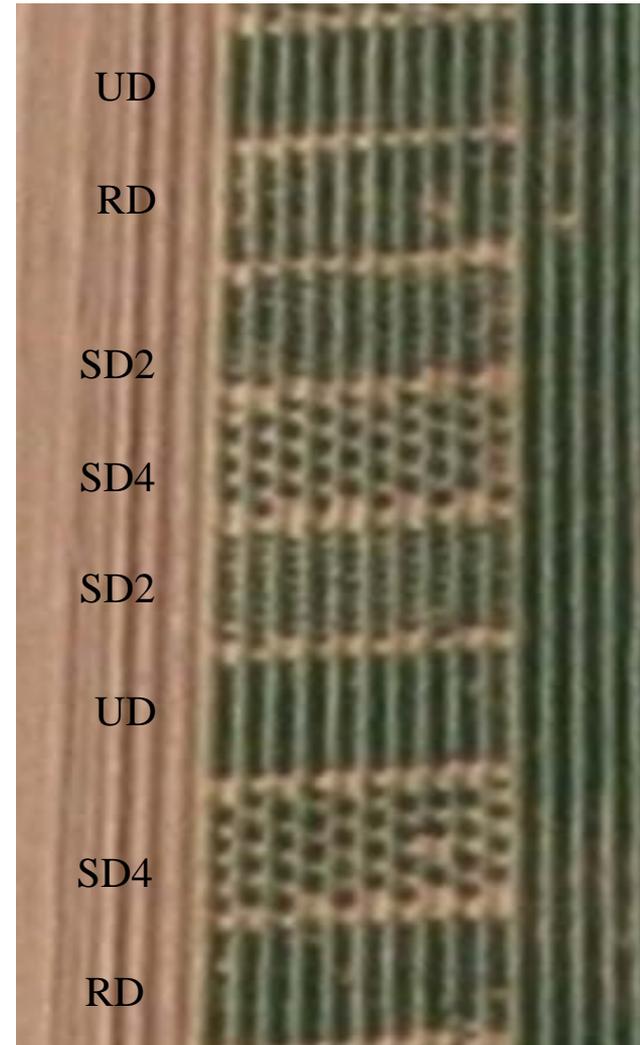


# **Plant population affects cotton yield in 2012**

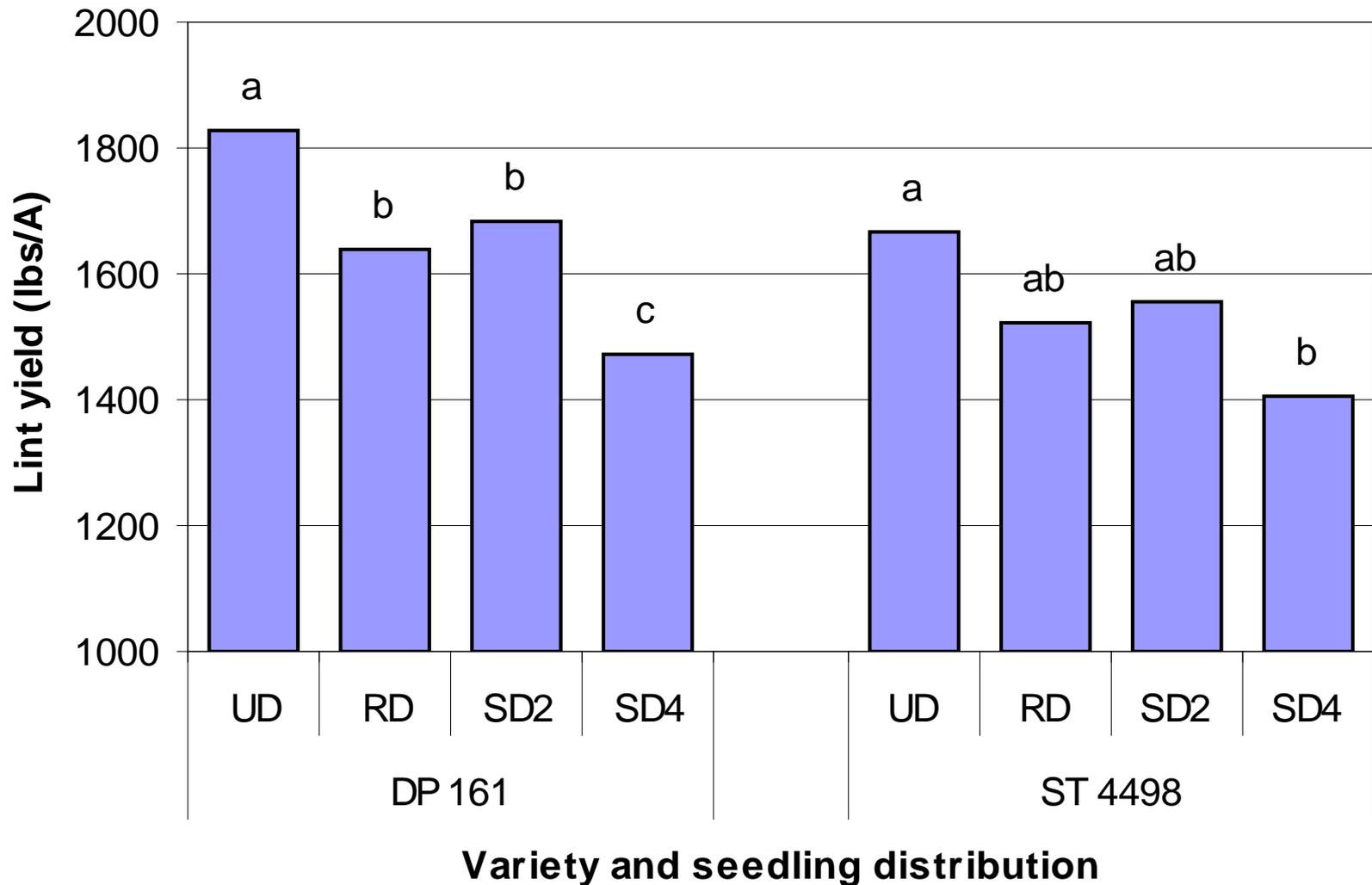
# Planting in dry and planting in moisture

# Plant distribution pattern at low population

- ❑ Population: 20,000 plants/A
- ❑ Four treatments:
  - Uniform
  - Random
  - 2-foot gap
  - 4-foot gap
- ❑ Two varieties:
  - Columnar type DP 161
  - Bushy type ST 4498



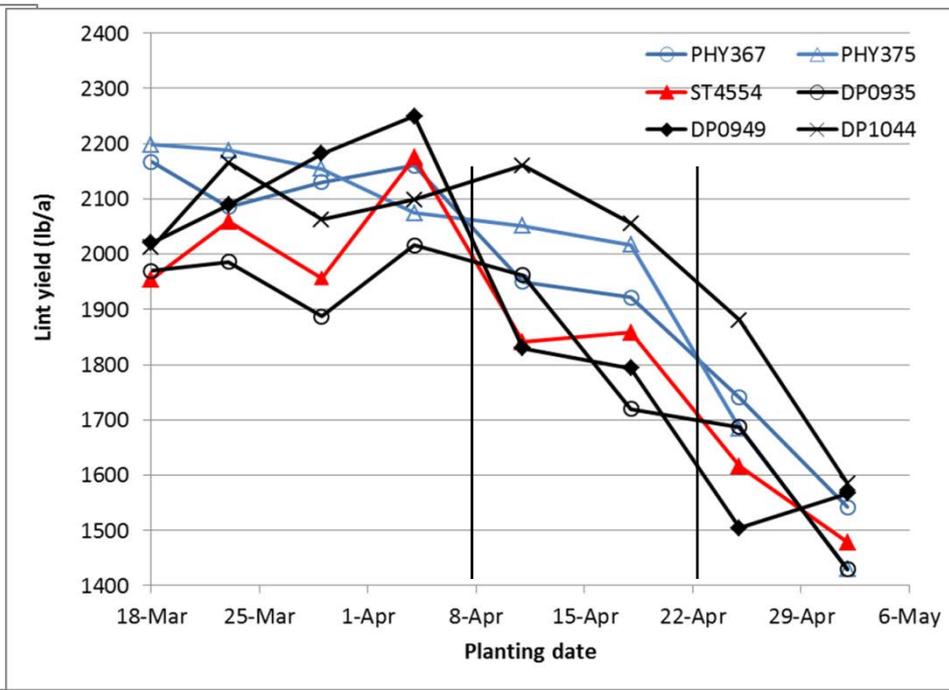
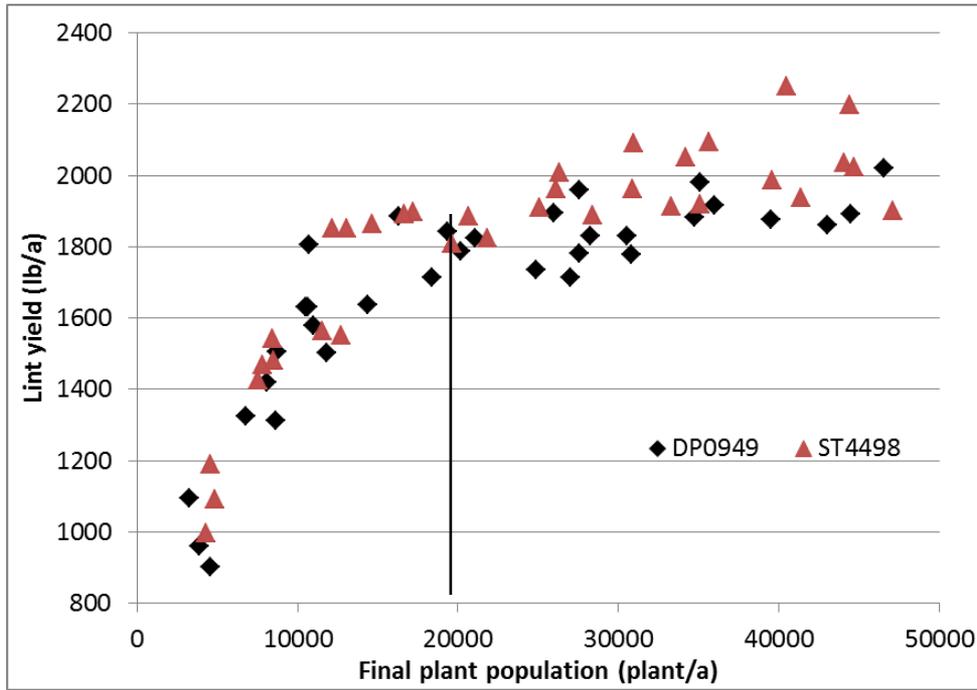
# Plant distribution pattern and growth habit



# Plant population

Optimal range: 25,000 to 35,000 plant/a final population in central Arizona (planting date??).

If you have enough plants to make decision difficult, you probably should keep it.



# Publications on PGR and Harvest aid chemicals



AZ1555

January 2012

## COMMERCIALLY AVAILABLE COTTON HEIGHT-CONTROLLING PGRs IN ARIZONA

*Guangyao (Sam) Wang and Randy Norton*

<http://ag.arizona.edu/pubs/crops/az1555.pdf>



AZ1556

January 2012

## CHOOSING HARVEST AID CHEMICALS FOR ARIZONA COTTON

*Guangyao (Sam) Wang, Randy Norton and Shawna Loper*

<http://ag.arizona.edu/pubs/crops/az1556.pdf>



*Thank you all...*

*Any questions?*

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