

Circle Back: Pivot Agronomics



MISSISSIPPI STATE
UNIVERSITY™

Pivot Agronomics

Irrigation Threshold

- Corn
- Cotton

Irrigation Rate

- Silt loams
- Clays

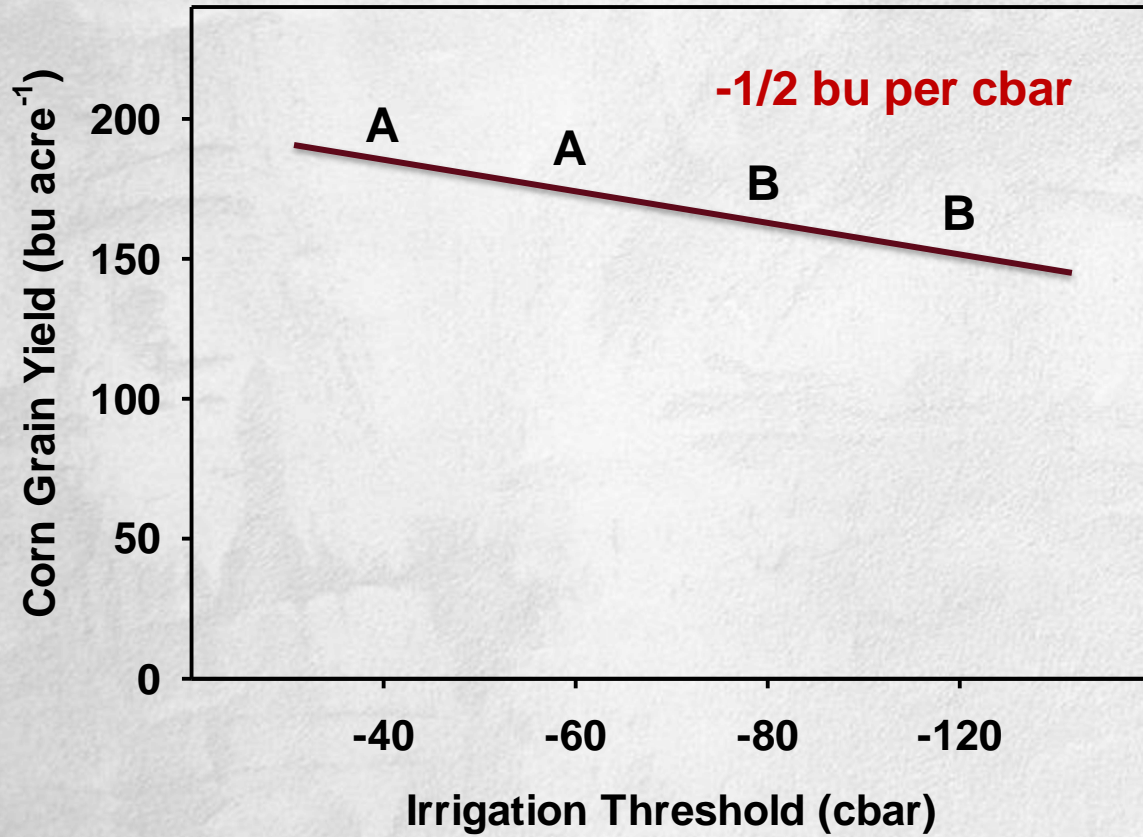
Soils and Irrigation

- Not all soils are equal
- Adapt pivot management to soils

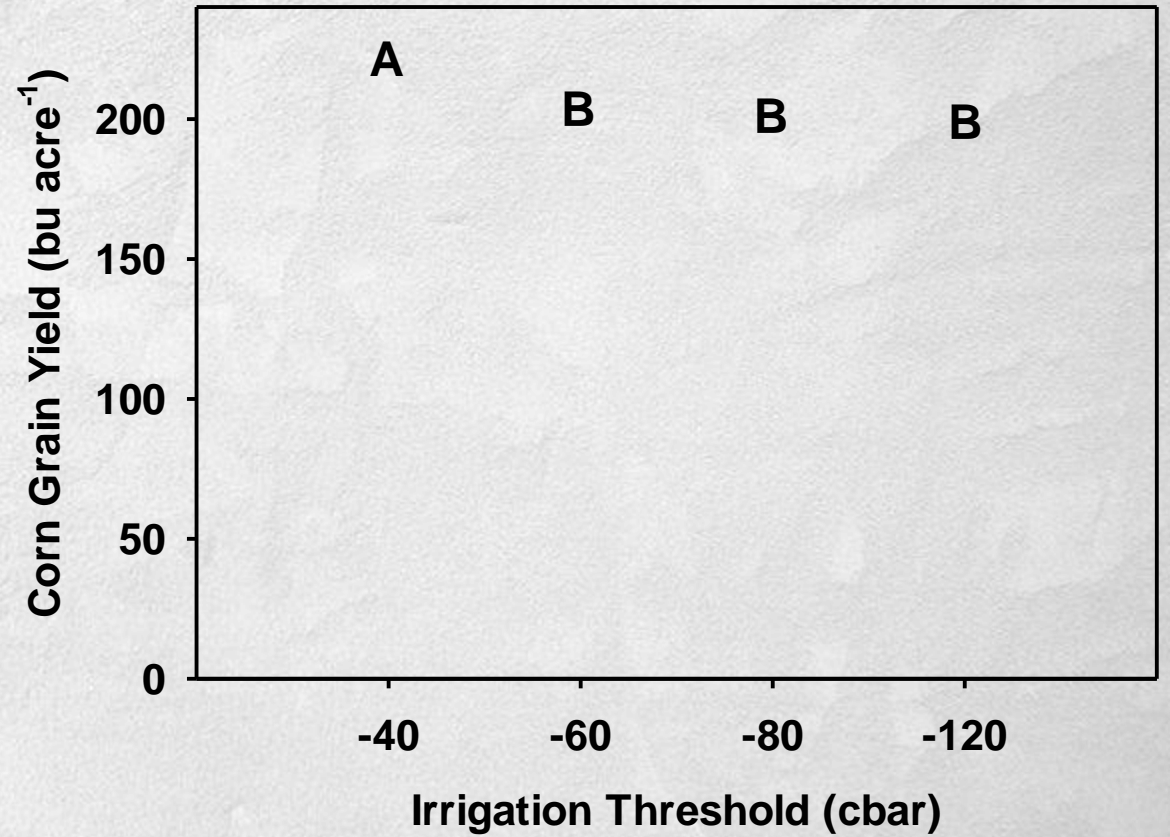


Corn Irrigation Thresholds

Brooksville

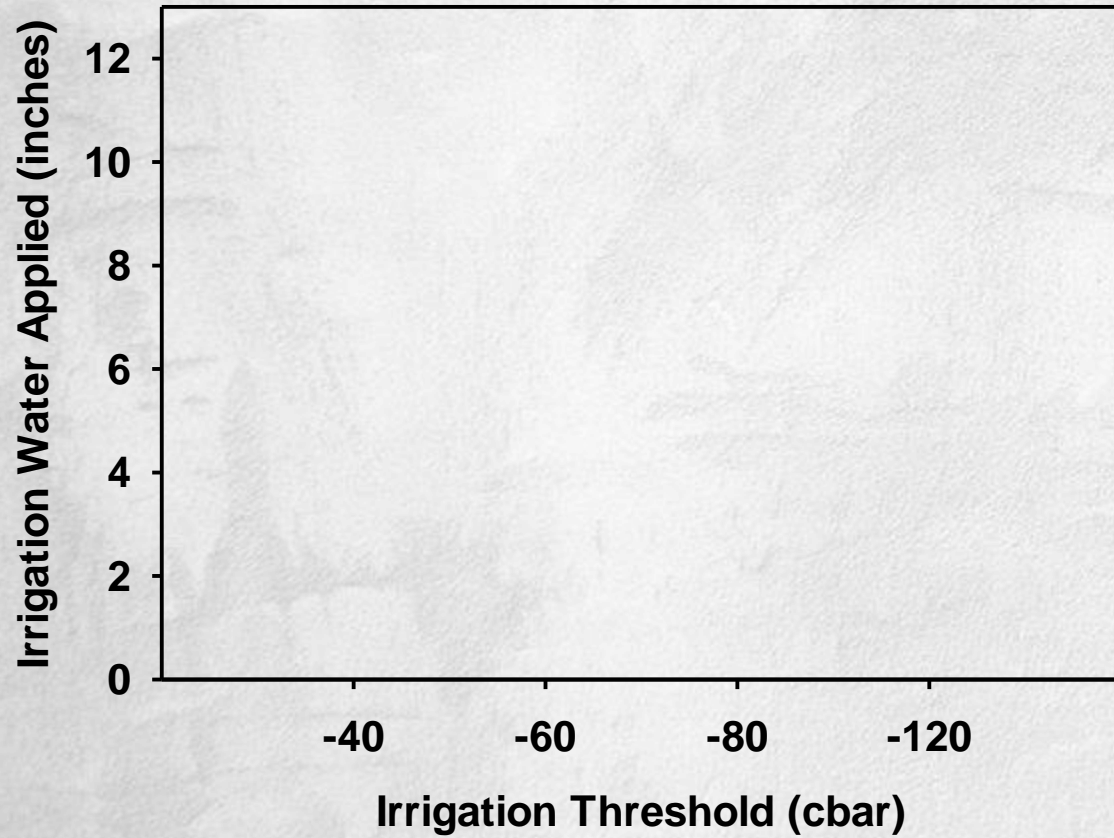


Stoneville

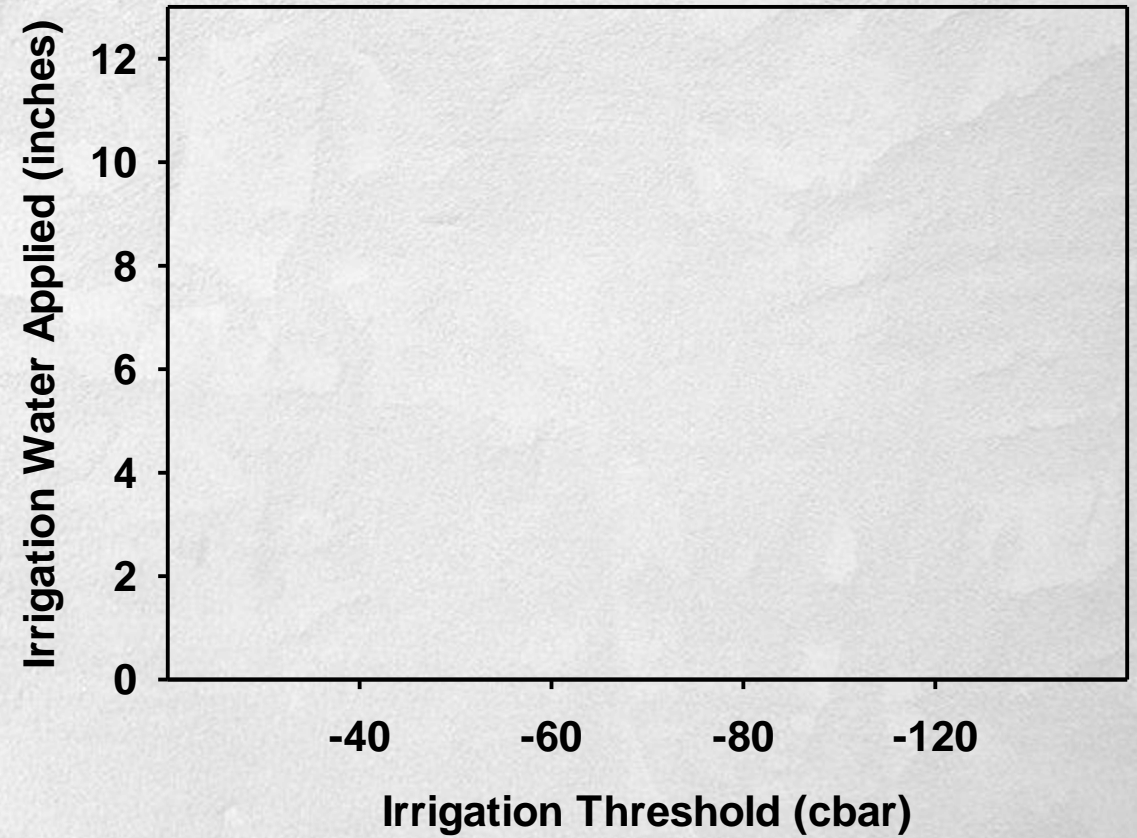


Corn Irrigation Water Use

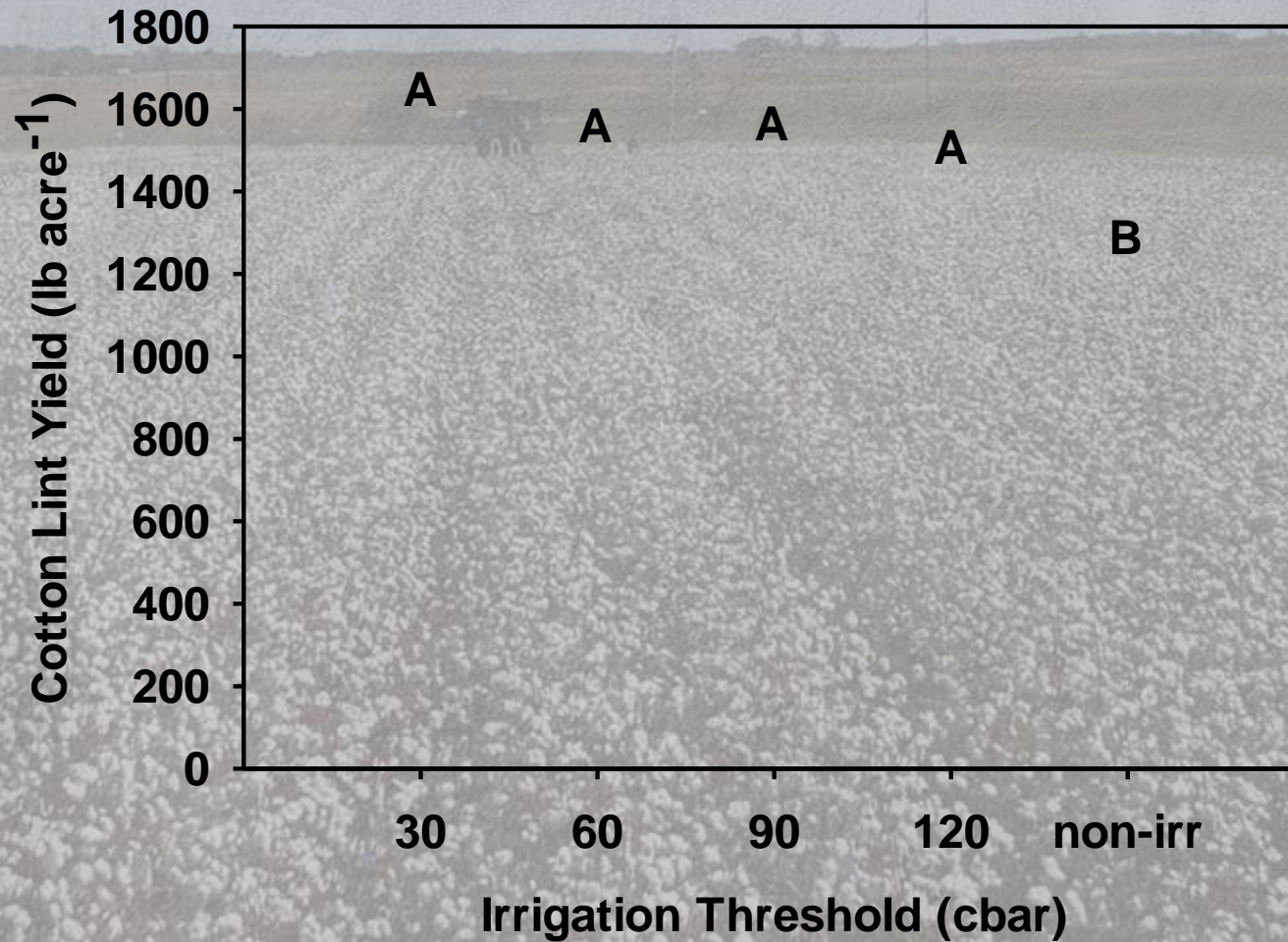
Brooksville



Stoneville



Cotton Thresholds - Preliminary



Pivot Agronomics

Irrigation Threshold

- Corn
- Cotton

Irrigation Rate

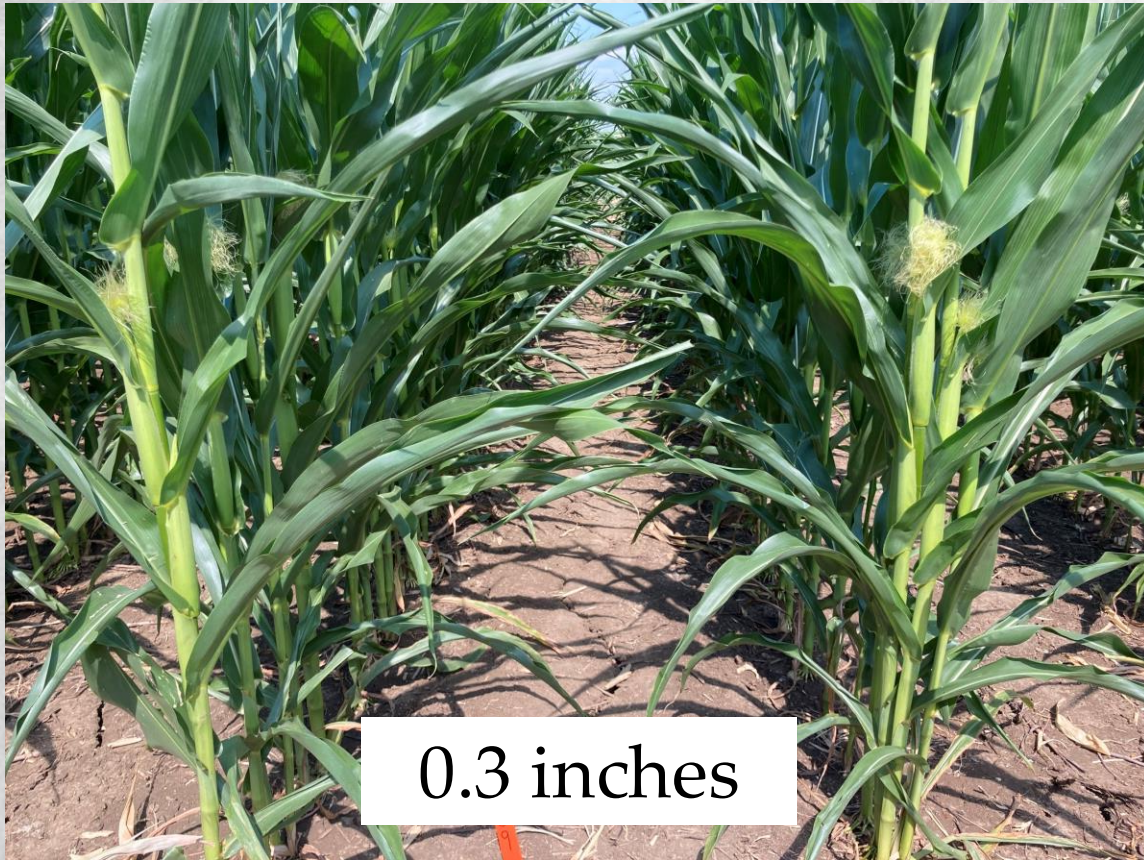
- Silt loams
- Clays

Soils and Irrigation

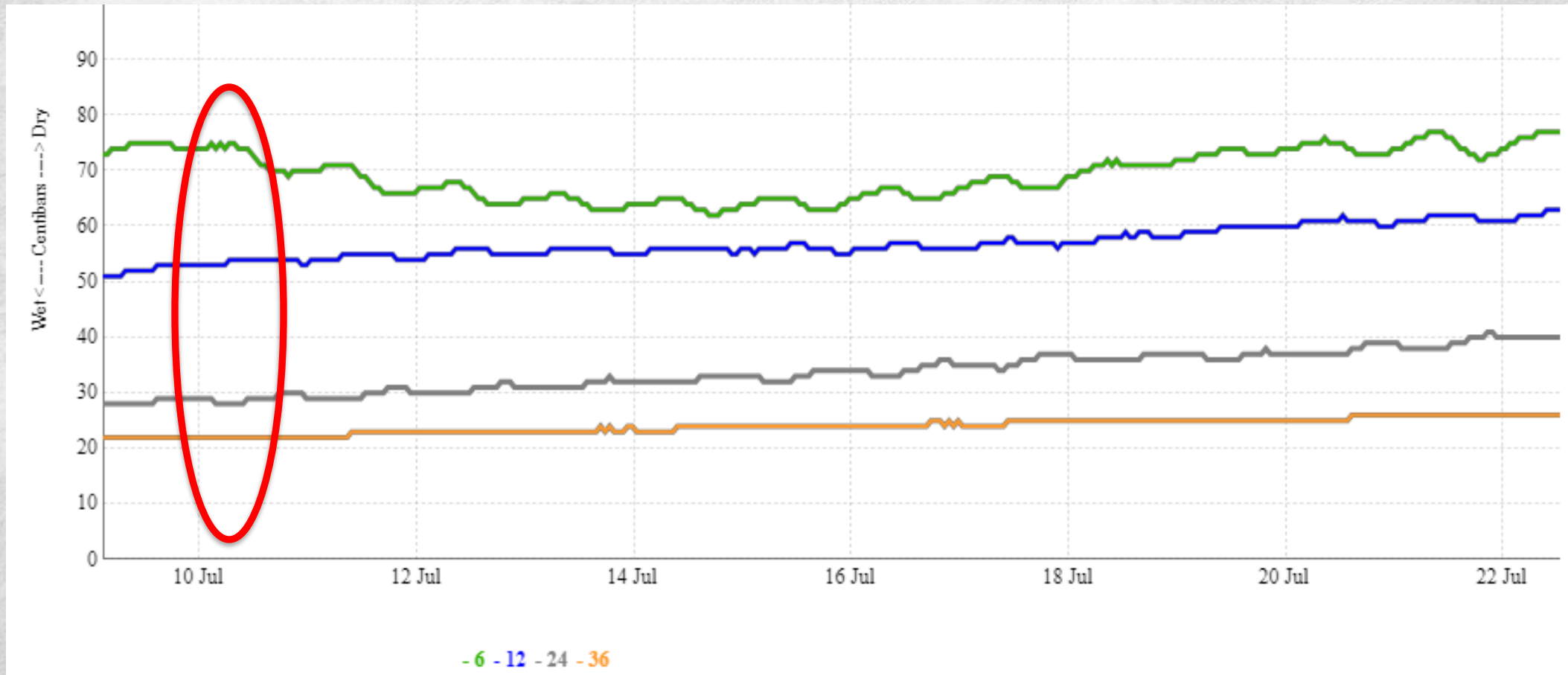
- Not all soils are equal
- Adapt pivot management to soils



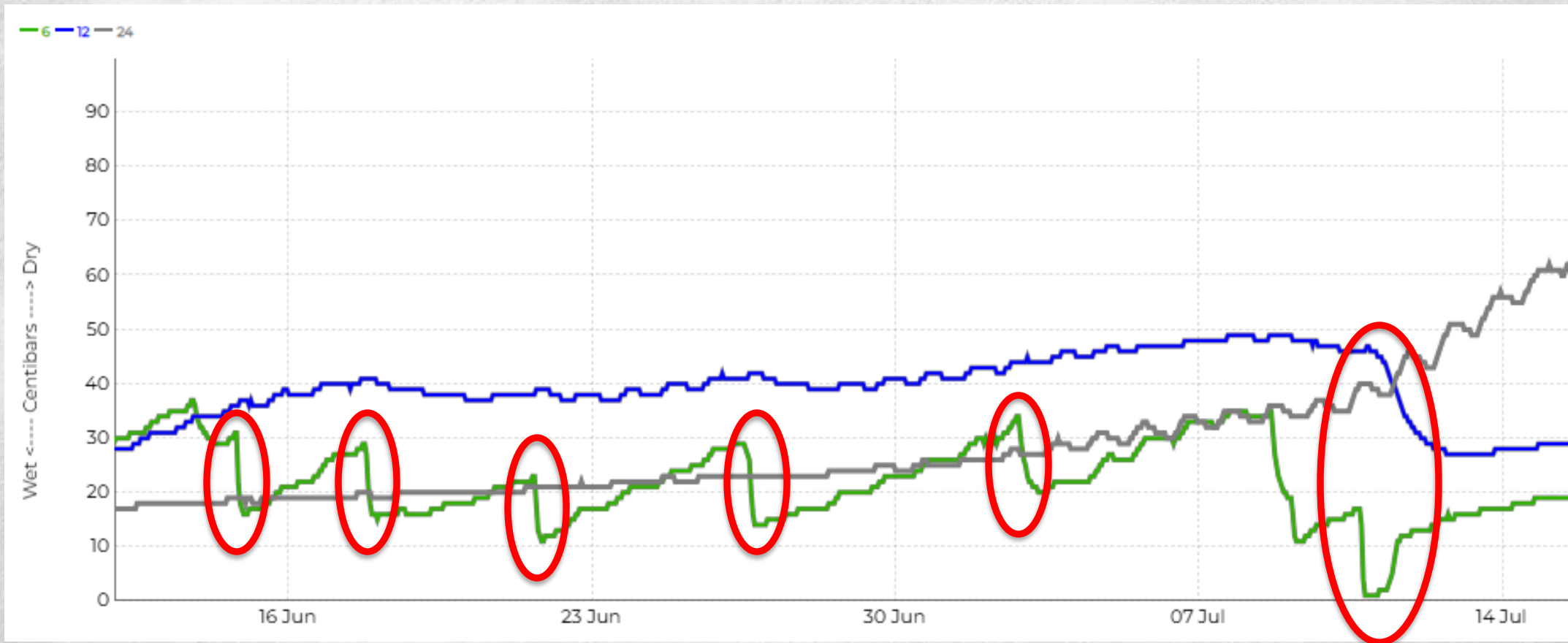
Irrigation Rate



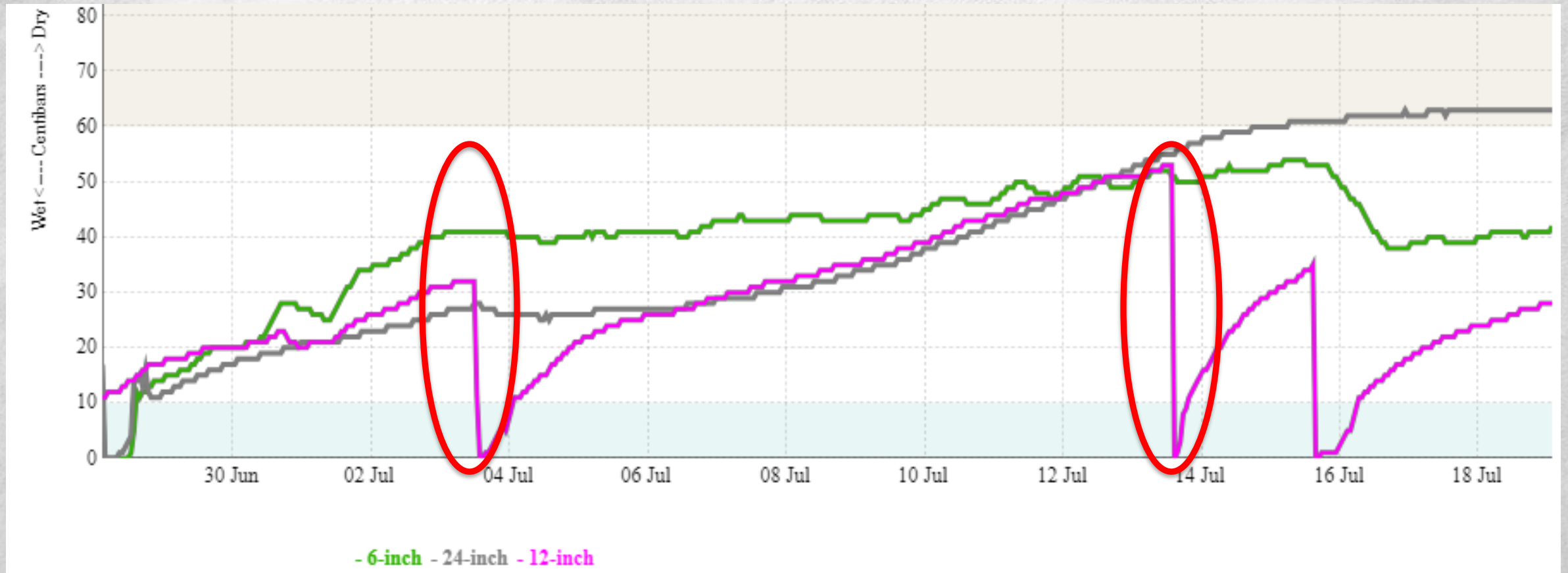
Low Application Rate – Silt Loam



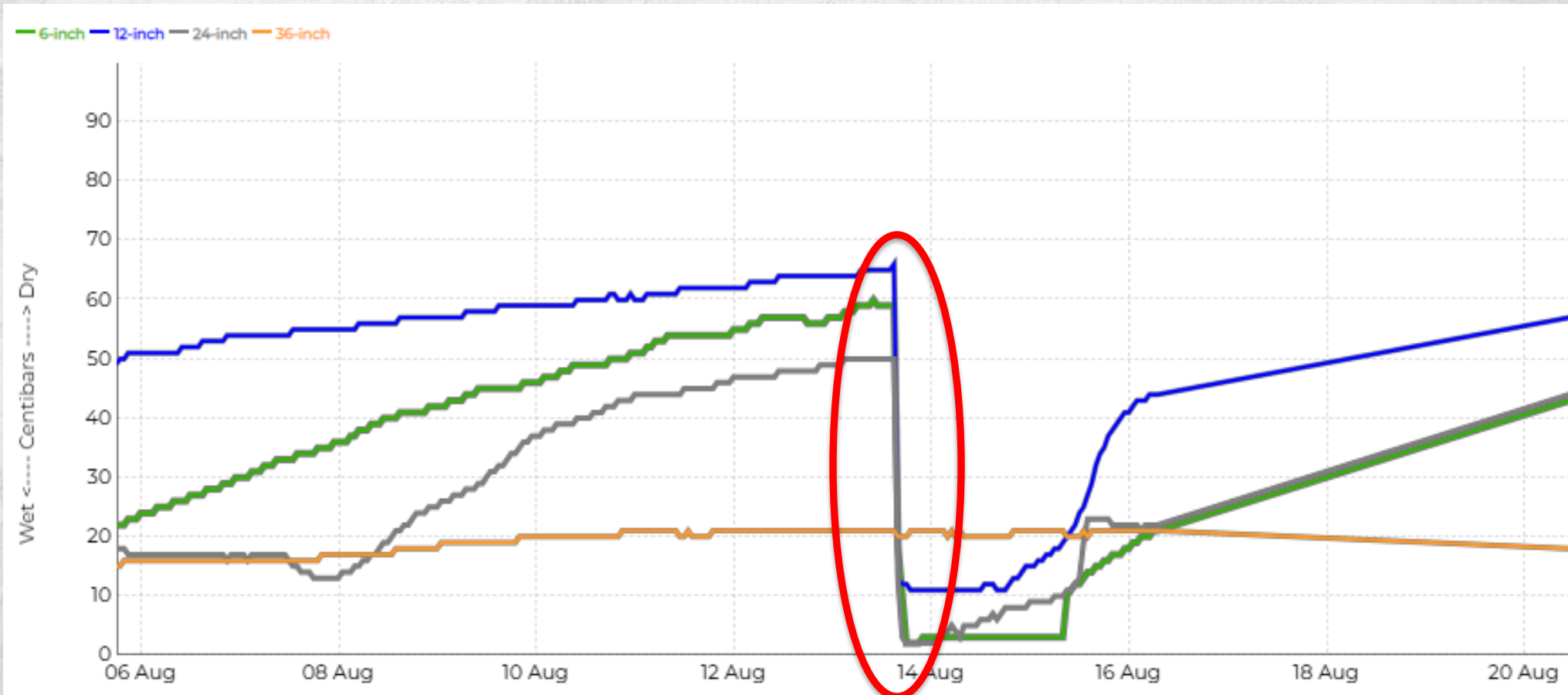
Good Rate – Silt Loam



Low Application Rate – Clay/Silty Clay



Good Rate – Clay/Silty Clay



Pivot Agronomics

Irrigation Threshold

- Corn
- Cotton

Irrigation Rate

- Silt loams
- Clays

Soils and Irrigation

- Not all soils are equal
- Adapt pivot management to soils



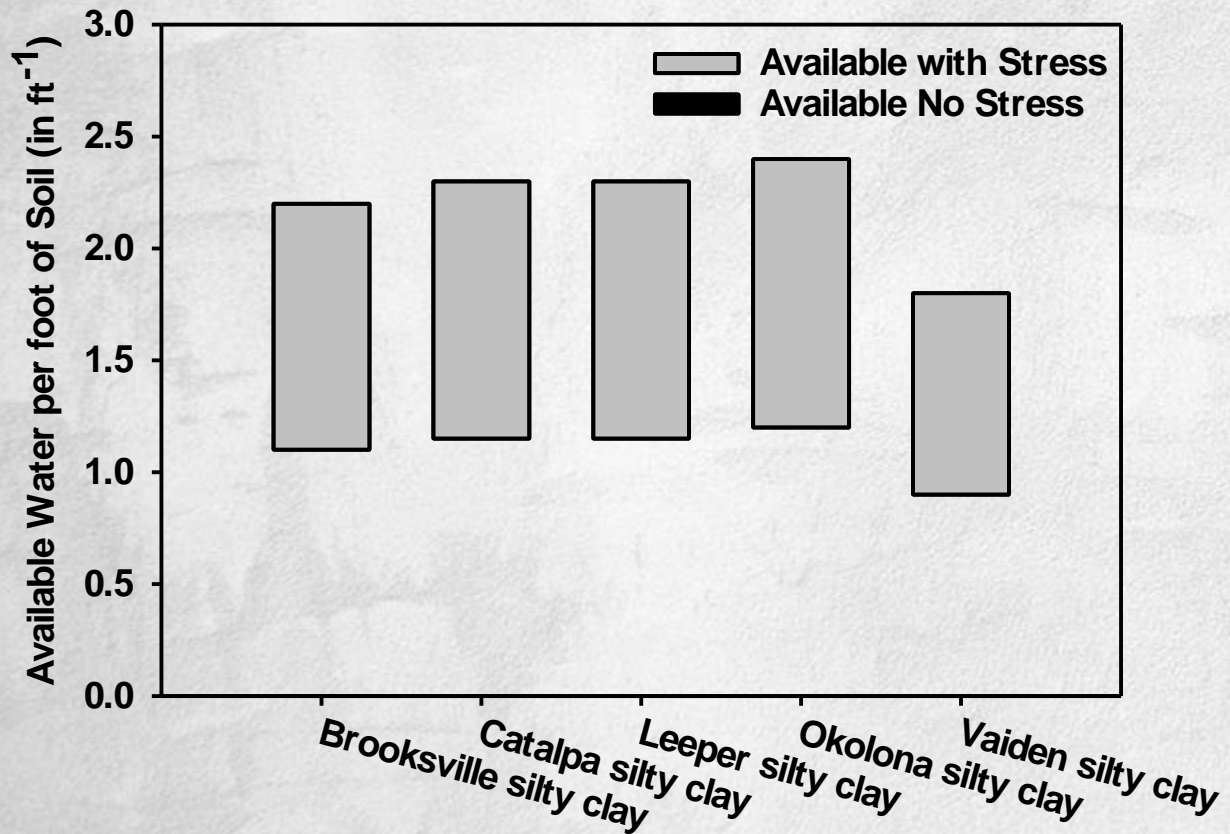
Soils and Irrigation

- How do soils affect:
 - How much water we need
 - Irrigation system design
 - Triggering an irrigation
- Soils hold different amounts of water
- How quickly an irrigation threshold is reached partially depends on the soil.

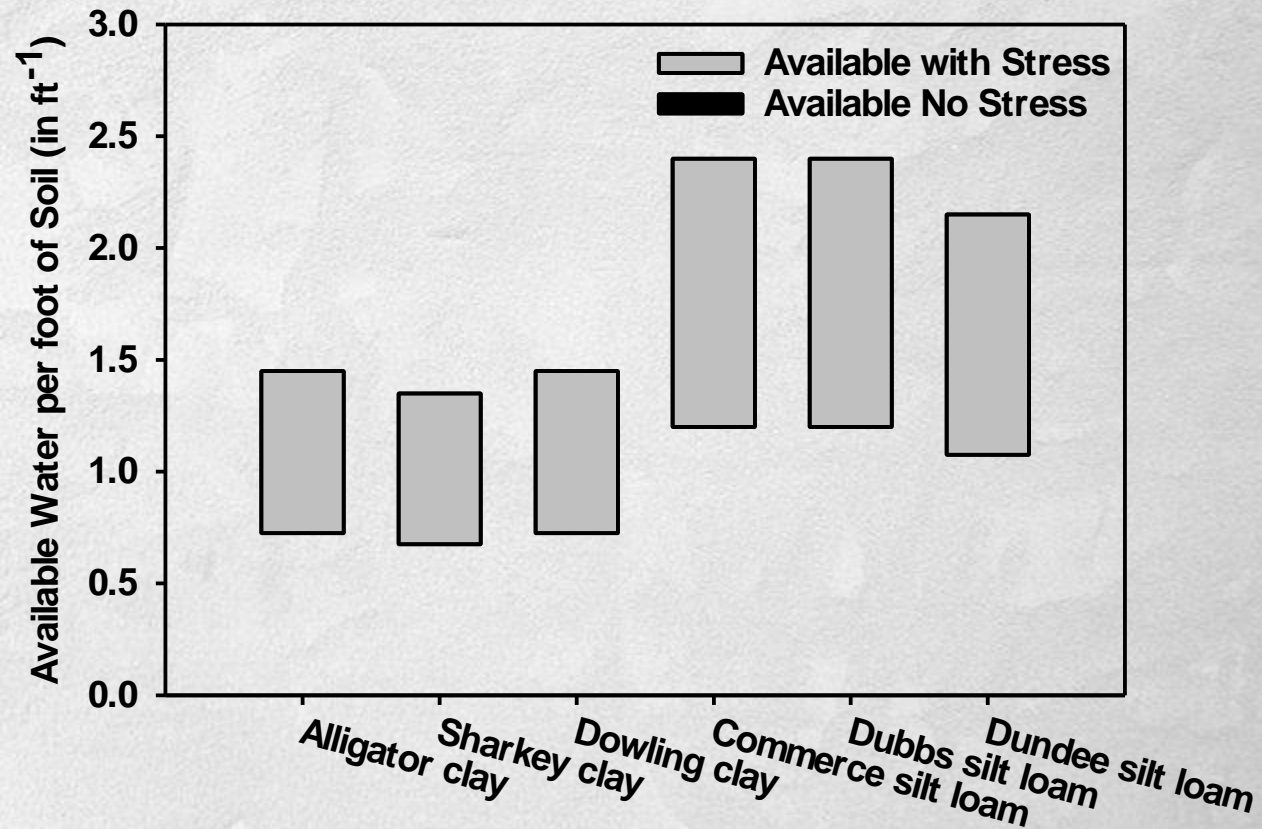


Not all Soils are Equal

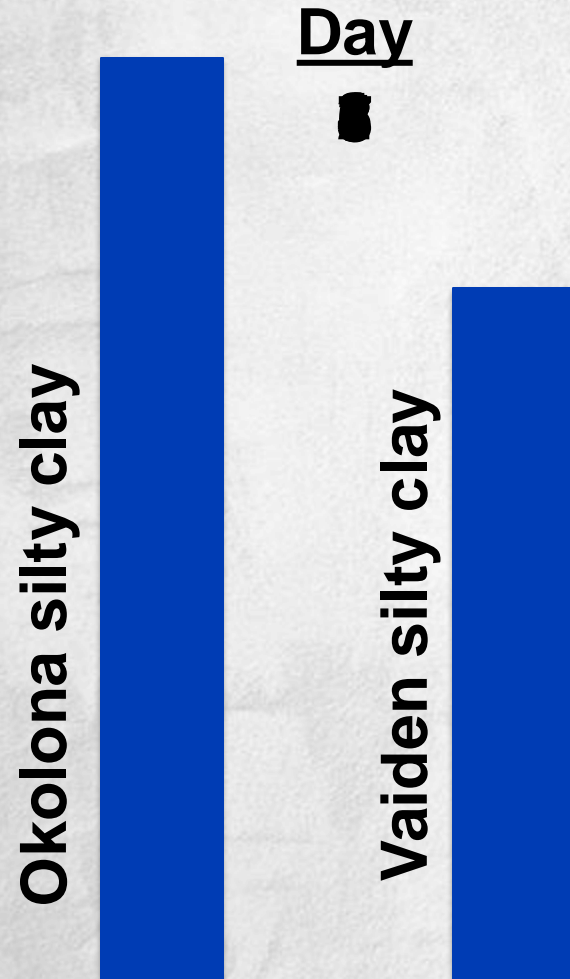
Prairie



Delta



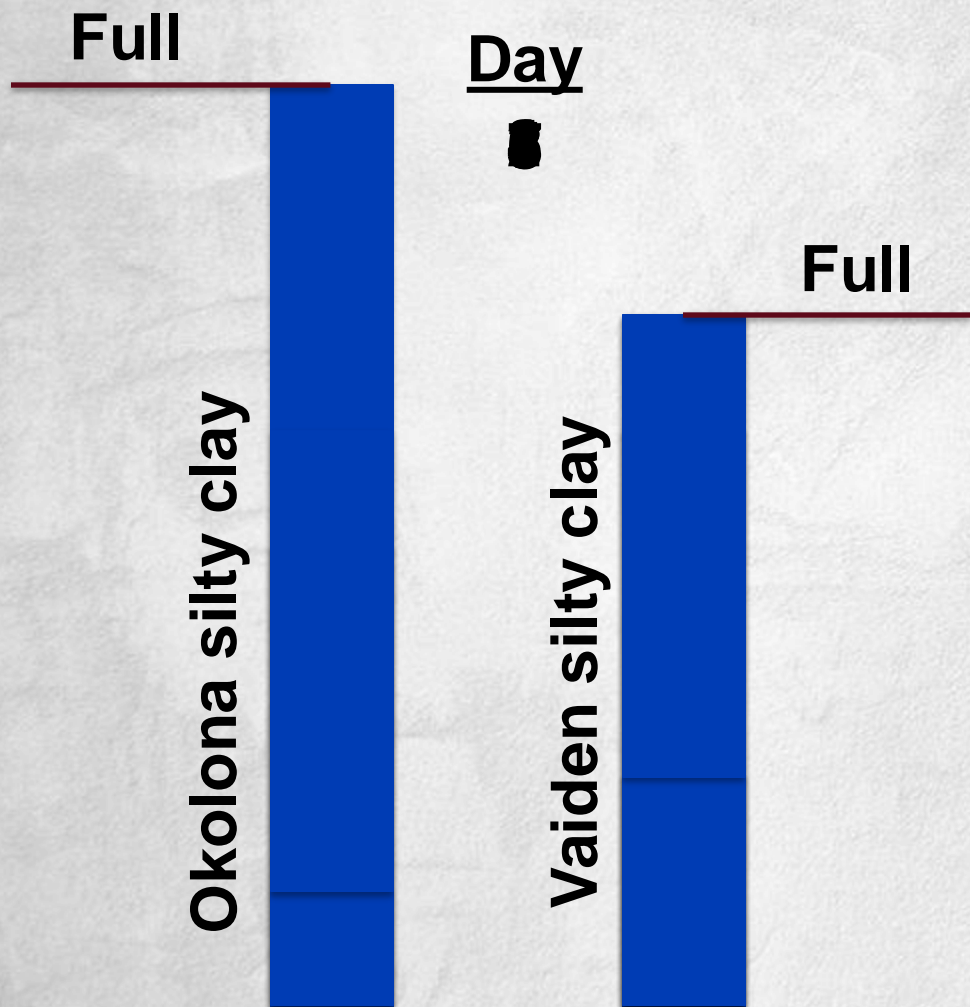
Soils and Irrigation



	Okolona silty clay	Vaiden silty clay
Available water (pre-stress)	1.2 in foot ⁻¹	0.9 in foot ⁻¹
Assume 2 feet deep	2.4 in	1.8 in
Peak water use	0.3 in day ⁻¹	0.3 in day ⁻¹
Days to stress	8 days	6 days



Soils and Irrigation



	Okolona silty clay	Vaiden silty clay
Available water (pre-stress)	1.2 in foot ⁻¹	0.9 in foot ⁻¹
Assume 2 feet deep	2.4 in	1.8 in
Peak water use	0.3 in day ⁻¹	0.3 in day ⁻¹
Days to stress	8 days	6 days



Soils and Irrigation

Harder to manage with less water holding capacity:

- Low pivot capacity
- Partial circle pivots
- Shared ponds/pumps

Considerations:

- Cheat your higher capacity soils
 - Within a pivot spin
 - Shared ponds/pumps
- Upgrade infrastructure for low water holding soils first
- Conservative irrigation thresholds



Soils and Irrigation

- How do soils affect
 - How much water we need
 - Less available water = even more critical reservoirs are big enough
 - Irrigation system design
 - Less available water = even more critical system is designed correctly
 - Triggering an irrigation
 - Less available water = more conservative (pull trigger sooner)





Summary

- -40 cbar for corn and soybean
- Pre-tassel through 50% milkline
- Flowering to R6.5
- Cotton is resilient
- Increase application rates
- Consider soils in your irrigation strategy



Dave Spencer

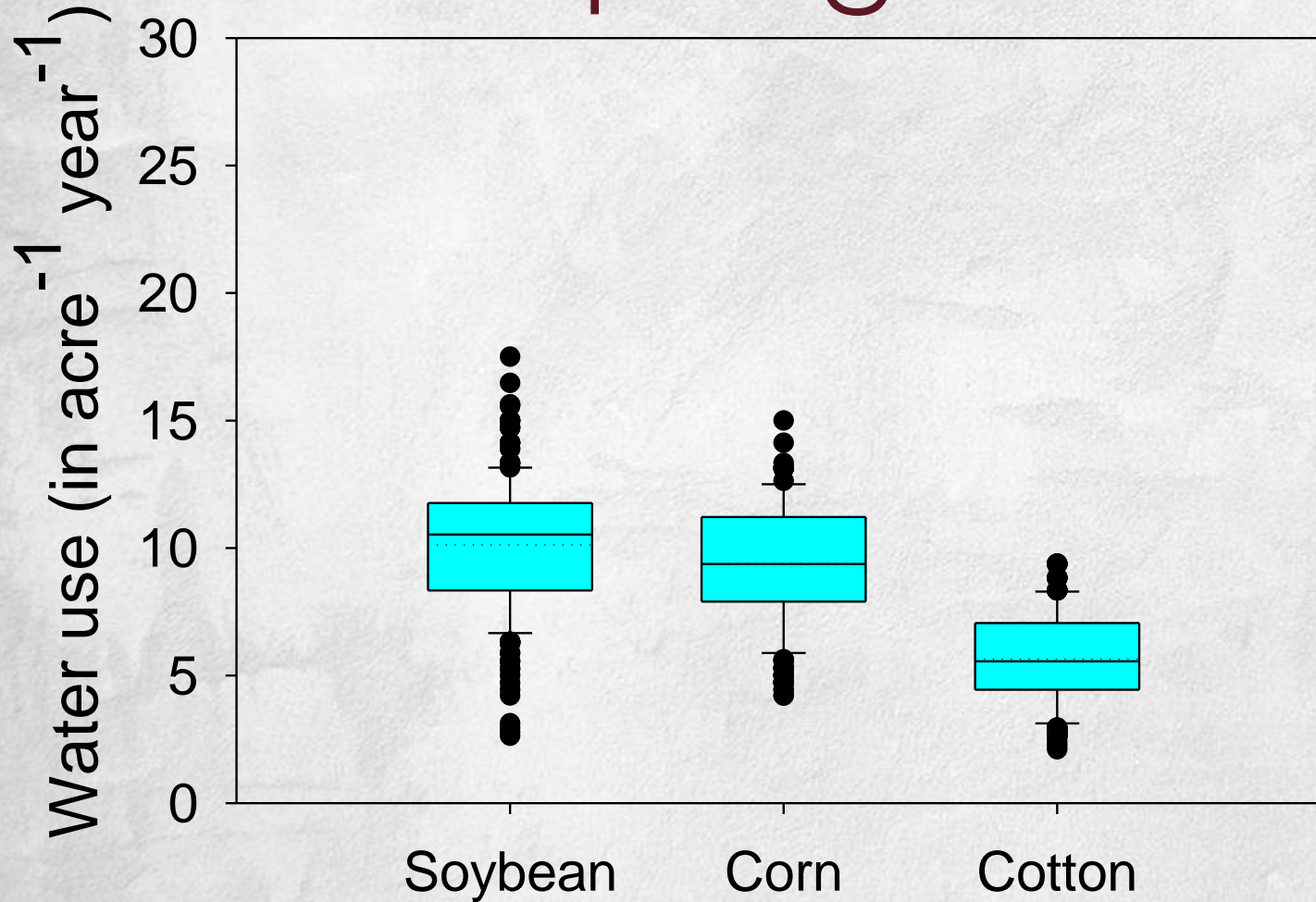
662-769-7554

dave.spencer@msstate.edu



MISSISSIPPI STATE
UNIVERSITY™

Crop Irrigation Demand



Average Irrigation Demand

- Soybean 10"
- Corn 10"
- Cotton 6"

