

# Snap Shot of Our Irrigation Research in the Panhandle

Jason Warren, Seth Byrd, Sumit Shrama,  
Cameron Murley, and Saleh Taghvaeian  
Oklahoma State University



# Irrigation Management Resources in the Panhandle

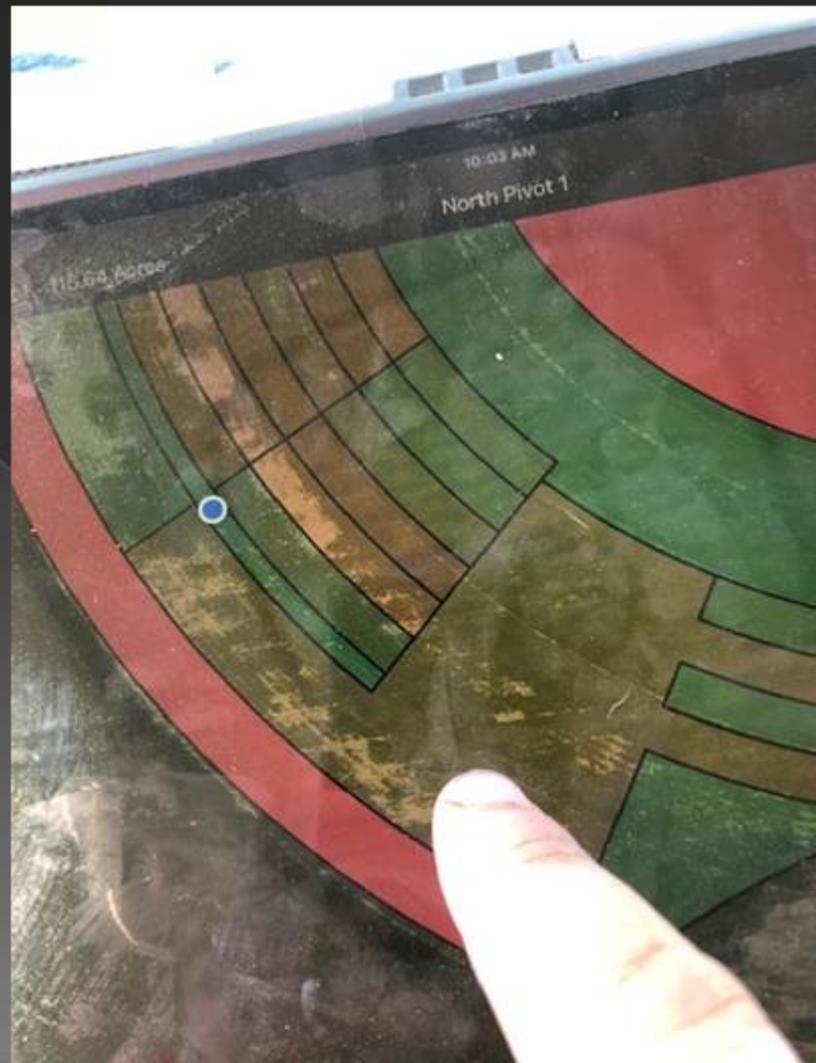


- We Utilize subsurface drip irrigation in Goodwell at OPREC and a variable rate irrigation pivot at McCaull R&D Farm Near Elkhart
- Each system is remotely managed and monitored
- Each can provide replicated water treatments

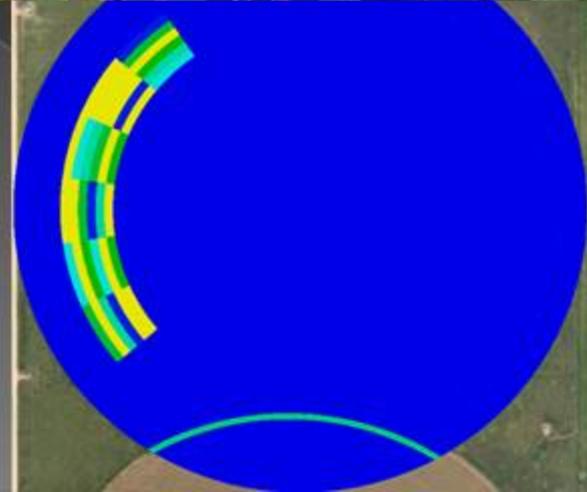
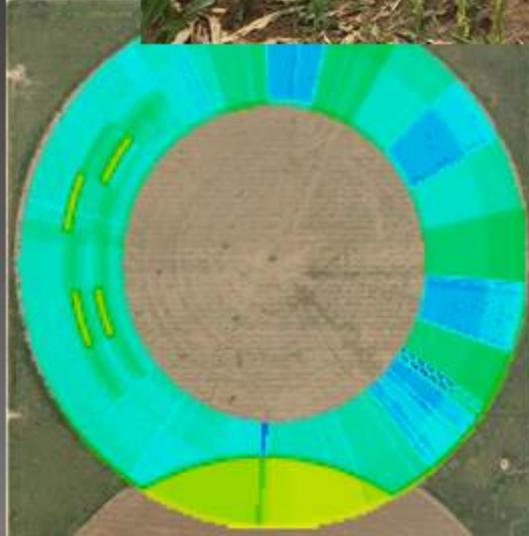
# Testing Ag Performance Solutions (TAPS)

- ◉ Located at McCaull under pivot VRI
- ◉ Participants tell us how much water and N to apply
- ◉ Pre-plant, sidedress and fertigation
- ◉ Irrigation applied at 0-1.25 inch/5 days
  - > Target but not always happens!
- ◉ Remote data was provided to participants to aid in decision making

# Pre-plant Strip Tillage



# Variable Rate Irrigation and fertigation System



# Aerial Imagery is Used to Monitor Plots

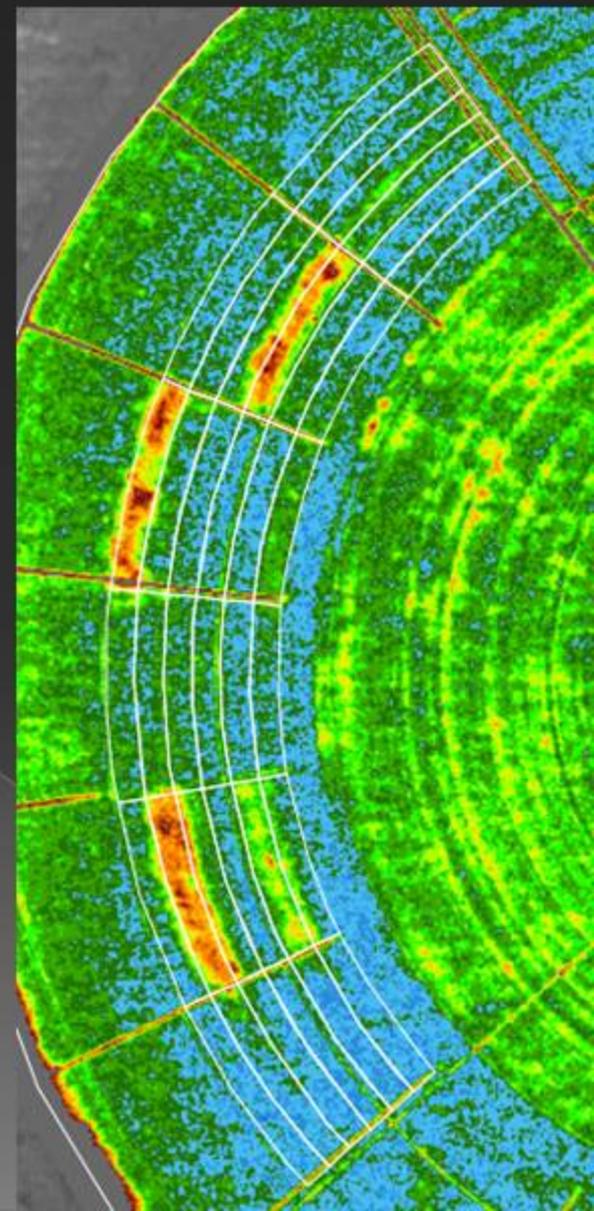


## OSU TAPS Imagery data

8/15/19 update

The values in the table below are NDVI readings that we extracted from the center 10 ft of your TAPS plots we then averaged them across the plots. We also clipped 50 ft off the end of each plot so as to not include the impact of any delay time in our fertilizer applicator during fertilization. The absolute value of the NDVI has little value because it will change as a function of atmospheric conditions, therefore expressed the values a % of the check (TAPS7).

	11-Jun	21-Jun	23-Jun	9-Jul	19-JUL	24-JUL	29-JUL	10-AUG
	NDVI_OSU							
TAPS1	0.274	0.153	0.129	0.421	0.47	0.52	0.48	0.45
TAPS2	0.272	0.154	0.134	0.424	0.47	0.52	0.49	0.44
TAPS3	0.268	0.168	0.148	0.422	0.47	0.52	0.49	0.43
TAPS4	0.271	0.153	0.130	0.392	0.46	0.52	0.48	0.43
TAPS5	0.278	0.165	0.151	0.437	0.47	0.52	0.49	0.45
TAPS6	0.271	0.166	0.153	0.444	0.47	0.52	0.48	0.44
TAPS7	0.277	0.157	0.137	0.324	0.41	0.51	0.46	0.31
TAPS8	0.278	0.165	0.149	0.424	0.47	0.52	0.49	0.45
TAPS9	0.280	0.172	0.155	0.426	0.46	0.52	0.49	0.43
	-----Expressed as a % of the Zero N check-----							
TAPS1	99	97	94	130	115	103	105	146
TAPS2	98	98	98	131	115	103	105	144
TAPS3	97	107	108	130	114	102	105	141
TAPS4	98	98	95	121	113	102	103	138
TAPS5	101	105	110	135	116	102	105	148
TAPS6	98	106	112	137	116	103	105	143
TAPS7	100	100	100	100	100	100	100	100
TAPS8	101	105	108	131	114	102	106	146
TAPS9	101	109	113	132	113	103	105	140



# Integrated Irrigation Scheduling Tools



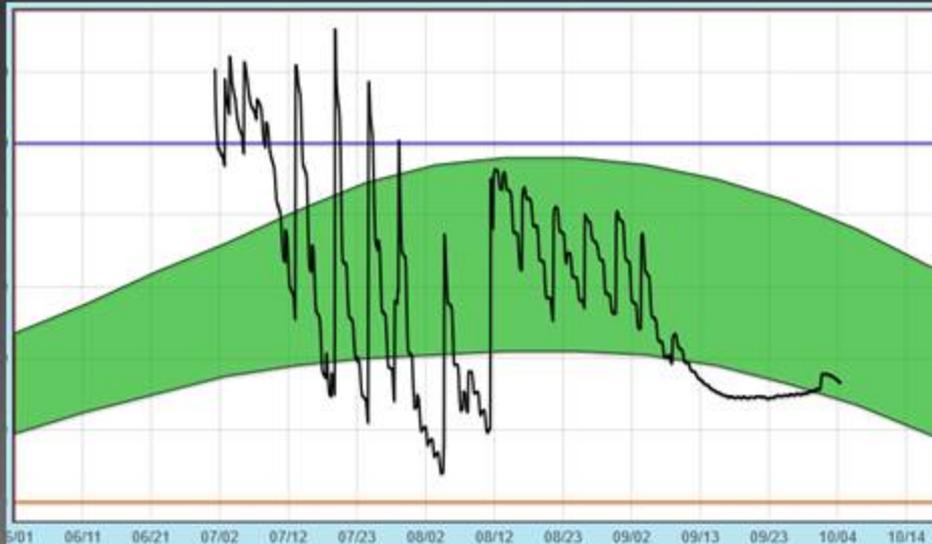
Com P1197AM - Gruver clay loam, 0 to 1 percent slopes



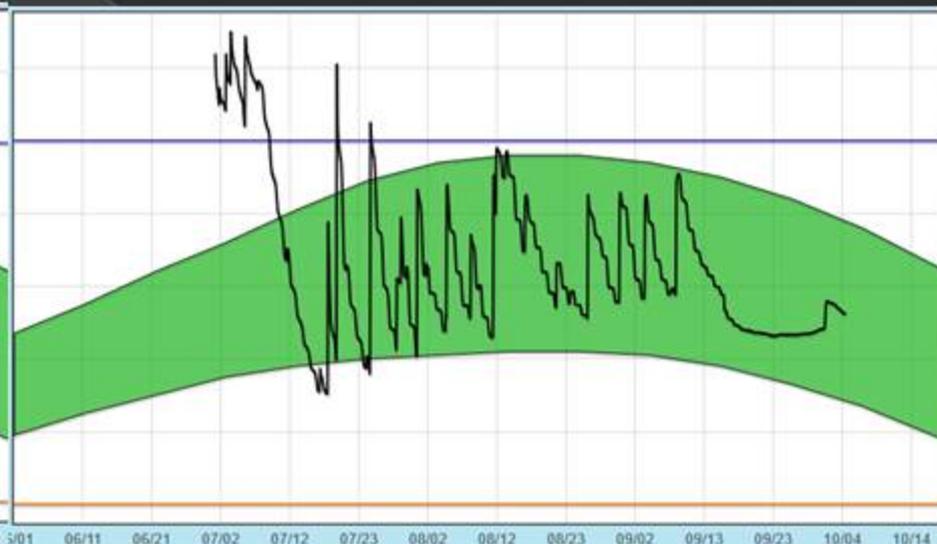
# Soil Moisture Data was Provided

- Water was not the only factor but was important

Lowest Yielding (14.5 in)

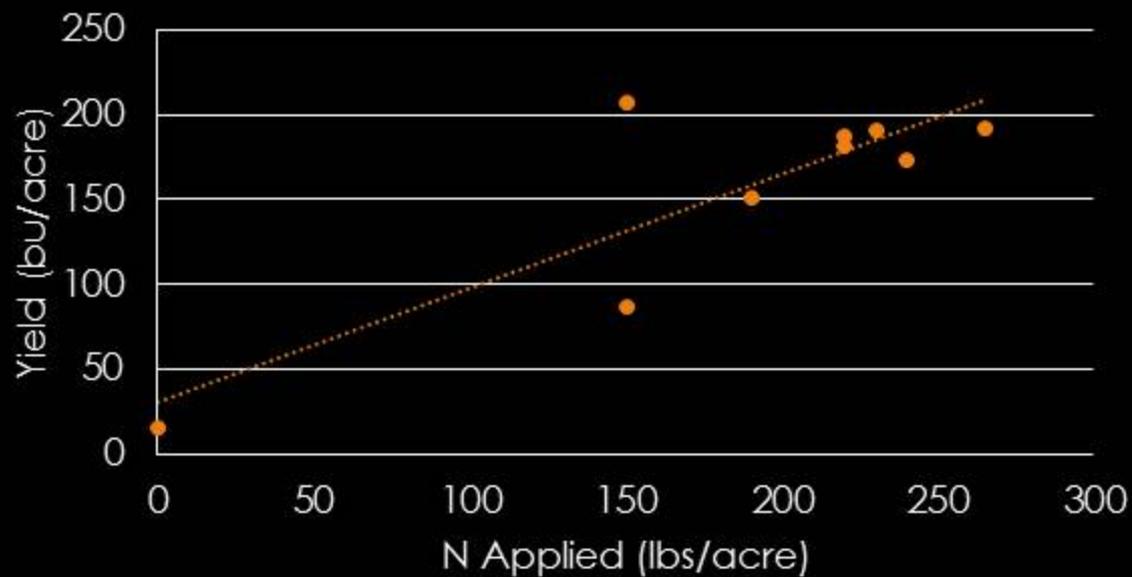


Highest Yielding (17.3 in)

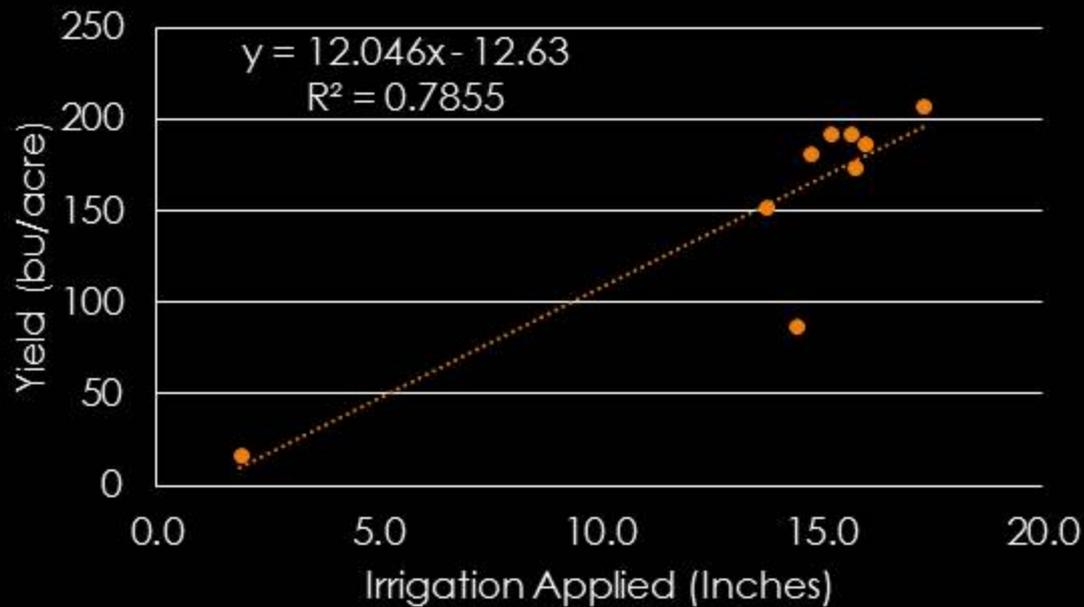


# TAPS Yield

## Yield as a Function of Nitrogen



## Yield as a Function of Water



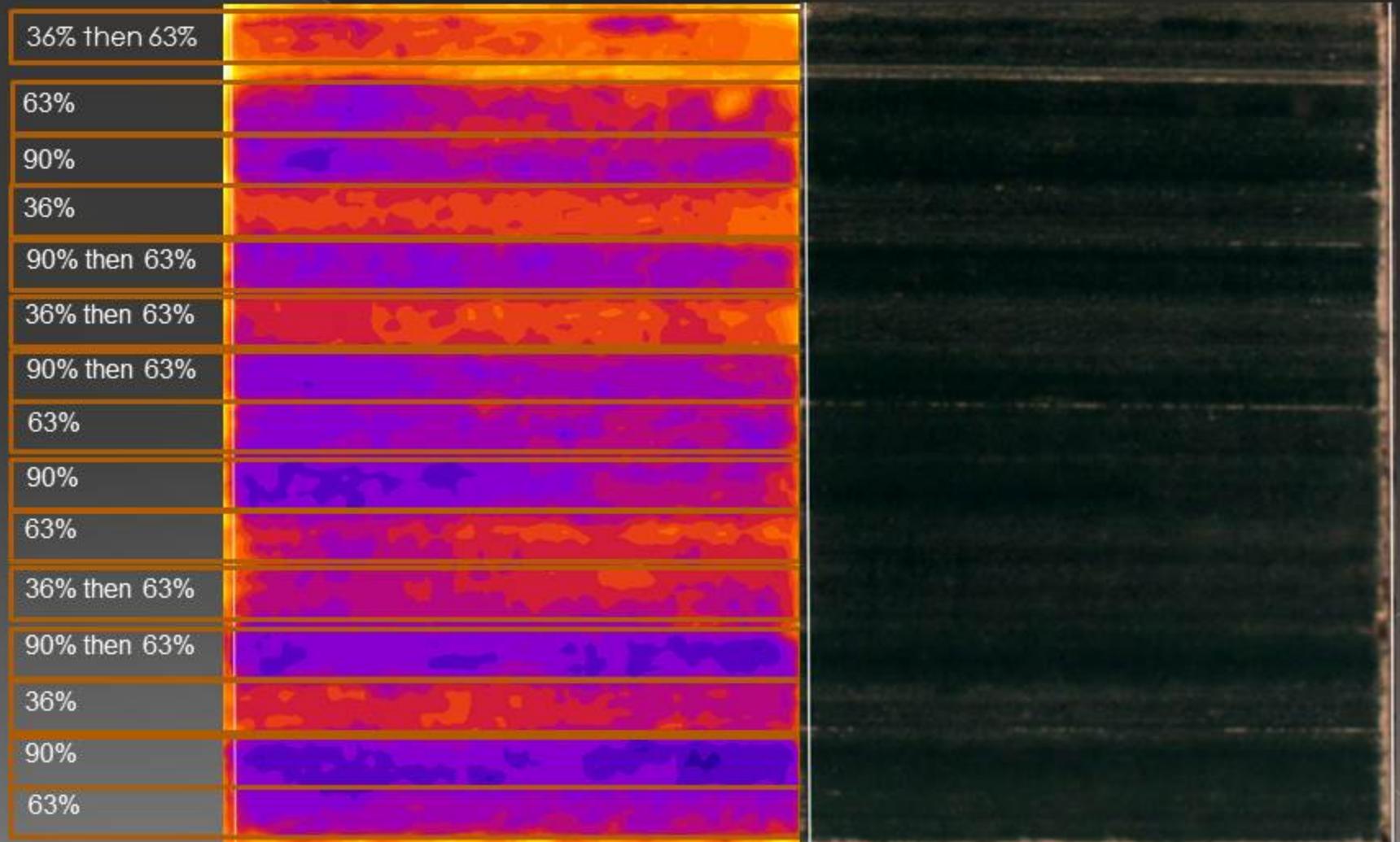
# Plans for Next Year for TAPS

- ⦿ Incorporate other soil moisture sensors and crop model products
- ⦿ Increase the number of participants.
- ⦿ Engage growers with on-farm demonstrations of technologies
  - We initiated this with 2 farmers using the integrated crop model system.
  - One of them is investing in this next year.

# Cotton Irrigation Research

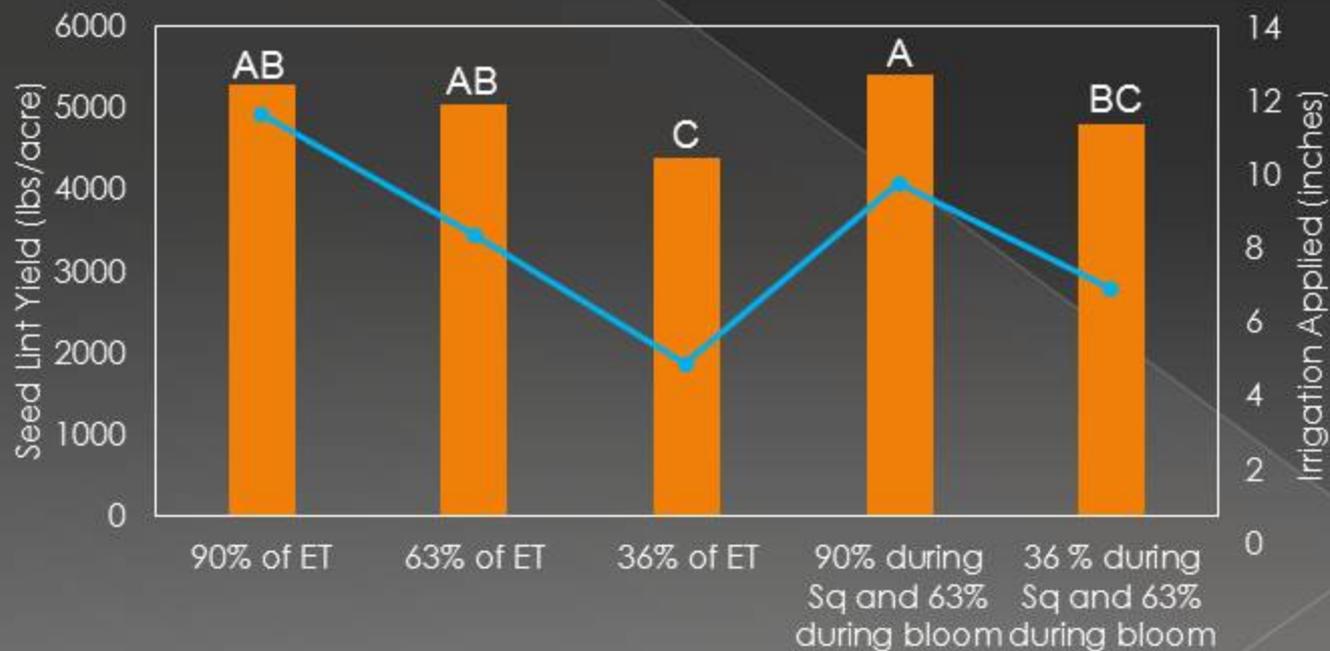
- Located on subsurface drip irrigation system at OPREC (Goodwell).
- Objective was to evaluate various irrigation strategies for cotton in Panhandle
- Short season suggests that management to stimulate maturity is key to success
- We applied treatments to replace different amount of mesonet estimated ET

# Treatment in in Thermal image (Aug. 13)



# Seed Lint Yield

- Seed lint yield was optimized at 9 inches
- Need ginned yield and quality to draw better picture



# Low Water May Have Better Quality

36% ET



90% ET



# Summary of Cotton Research

- Providing adequate irrigation during squaring is important in maximizing seed lint yield
- Irrigation rate can be reduced during bloom to 63% of ET
- Early season stress can reduce yield
- The quality component will be very important in evaluating value of cotton
- We will conduct similar research at Altus in 2020.

# Questions



- Jason.warren@okstate.edu
- @soilwater
- 405-612-9843
- www.notill.okstate.edu
- [www.Ogallala.org](http://www.Ogallala.org)



OgallalaWater.org



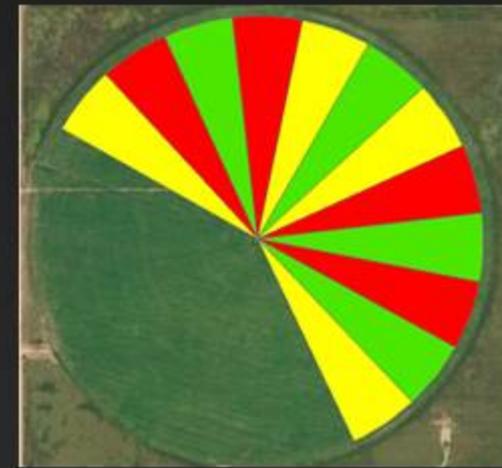
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Department of  
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# Evaluation of N Response Under Different Irrigation Rates

- Objective was to evaluate N response at a field scale under different irrigation rates
- Conducted at McCaull R&D farm in 2018 and 2019
- Altered speed of pivot to apply 1, 1.25, and 1.5 inch/revolution
- N rates applied at 0-270 lbs N/acre preplant.

# Water applications



- Water was applied at different rates in replicated slices using Fieldnet Controller

Field View Pivot View

## Stopped

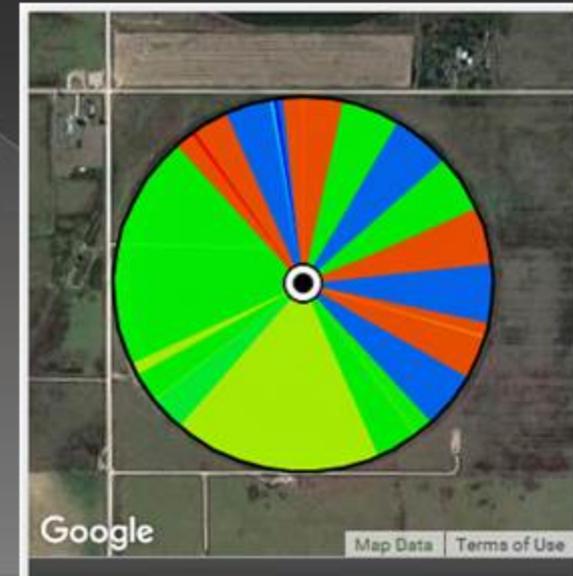
27d 0h 32m (2018-11-07 02:48:26 PM)

Manual Mode ▾

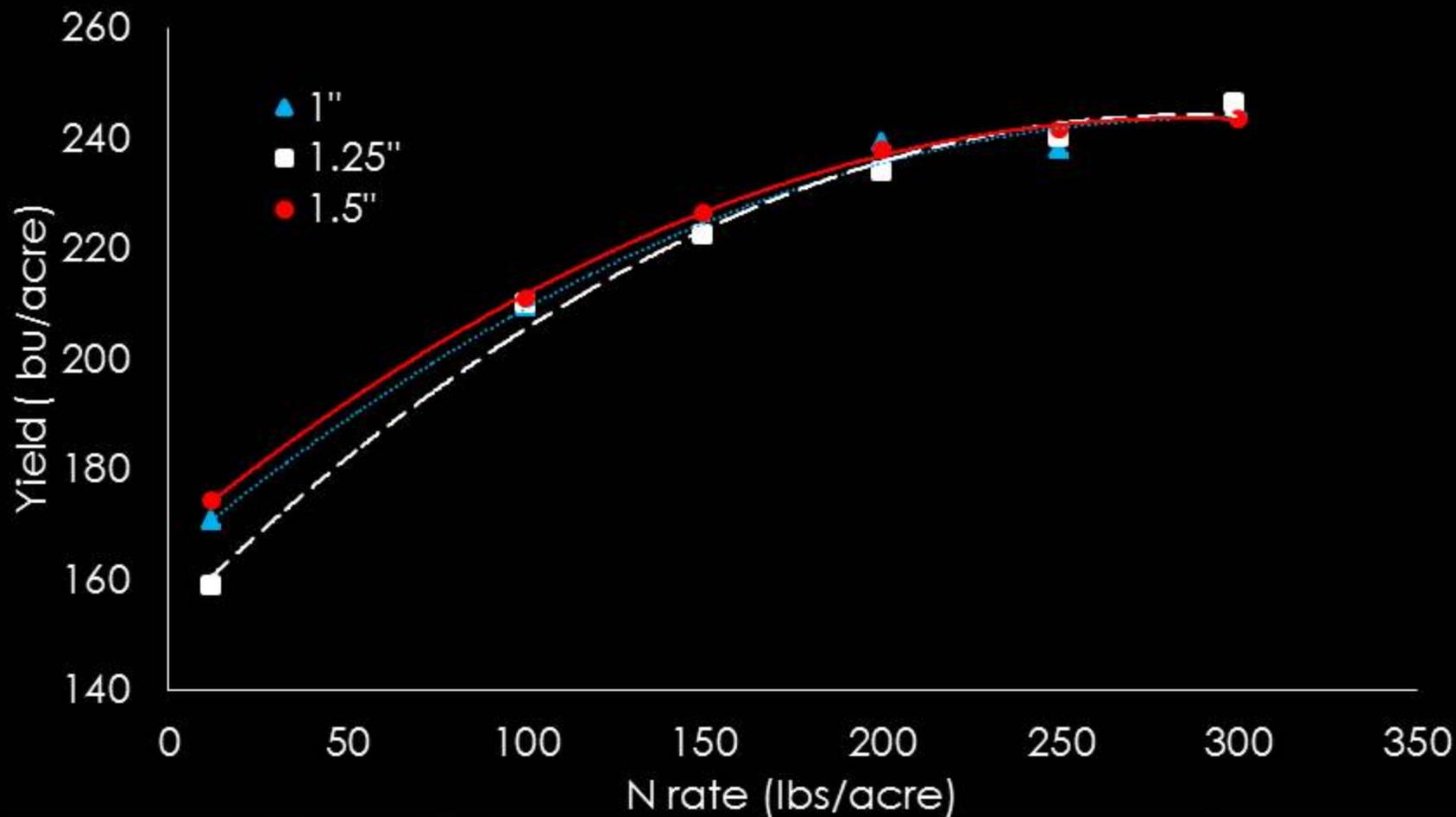
Rate	Depth	Pressure
80.0	0.09	0
%	in	psi

Temperature --- Auxiliary Pressure ---

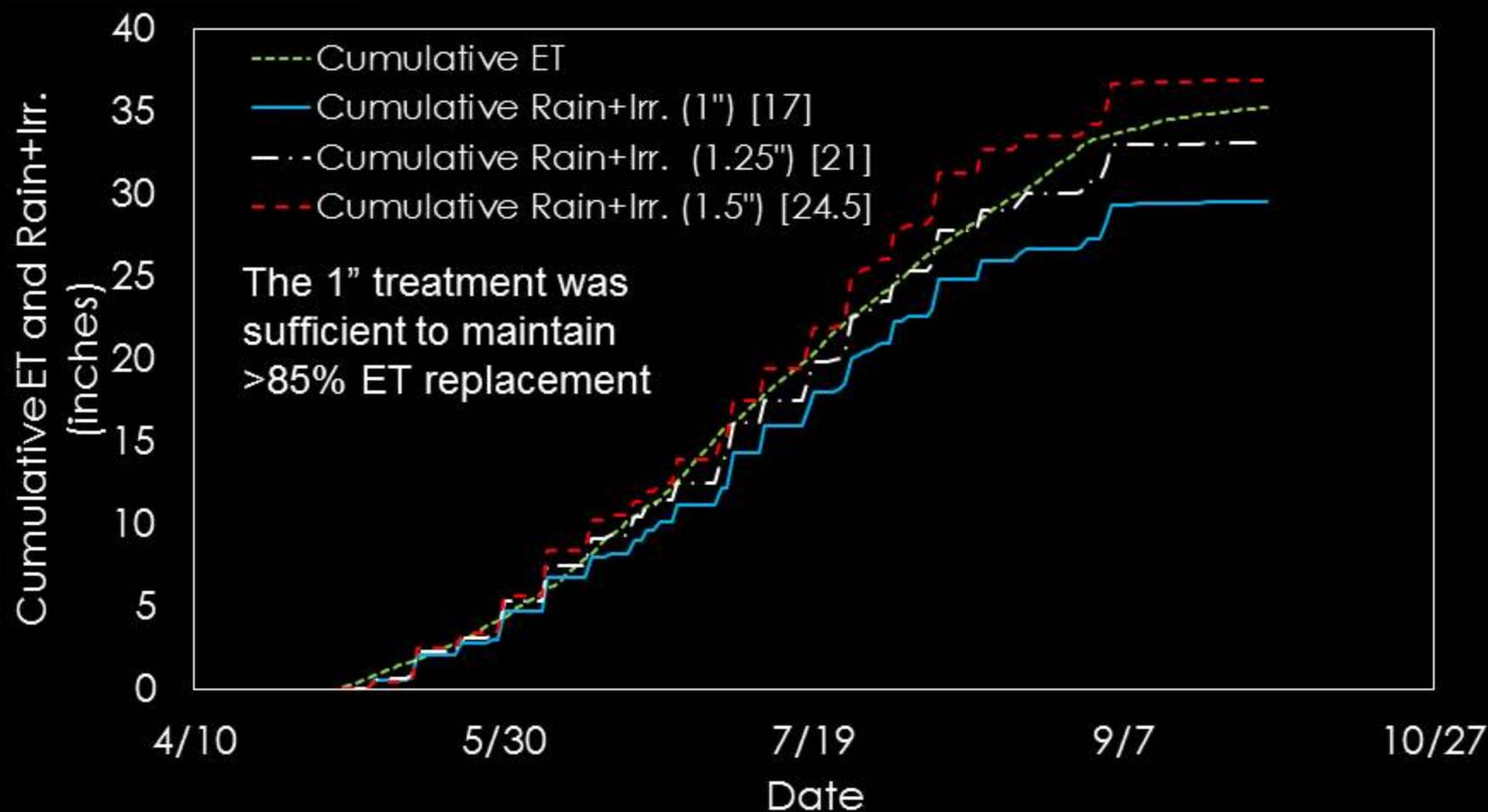
START/STOP	WATER	ACCESSORY	AUTO-REVERSE	AUTO-RESTART



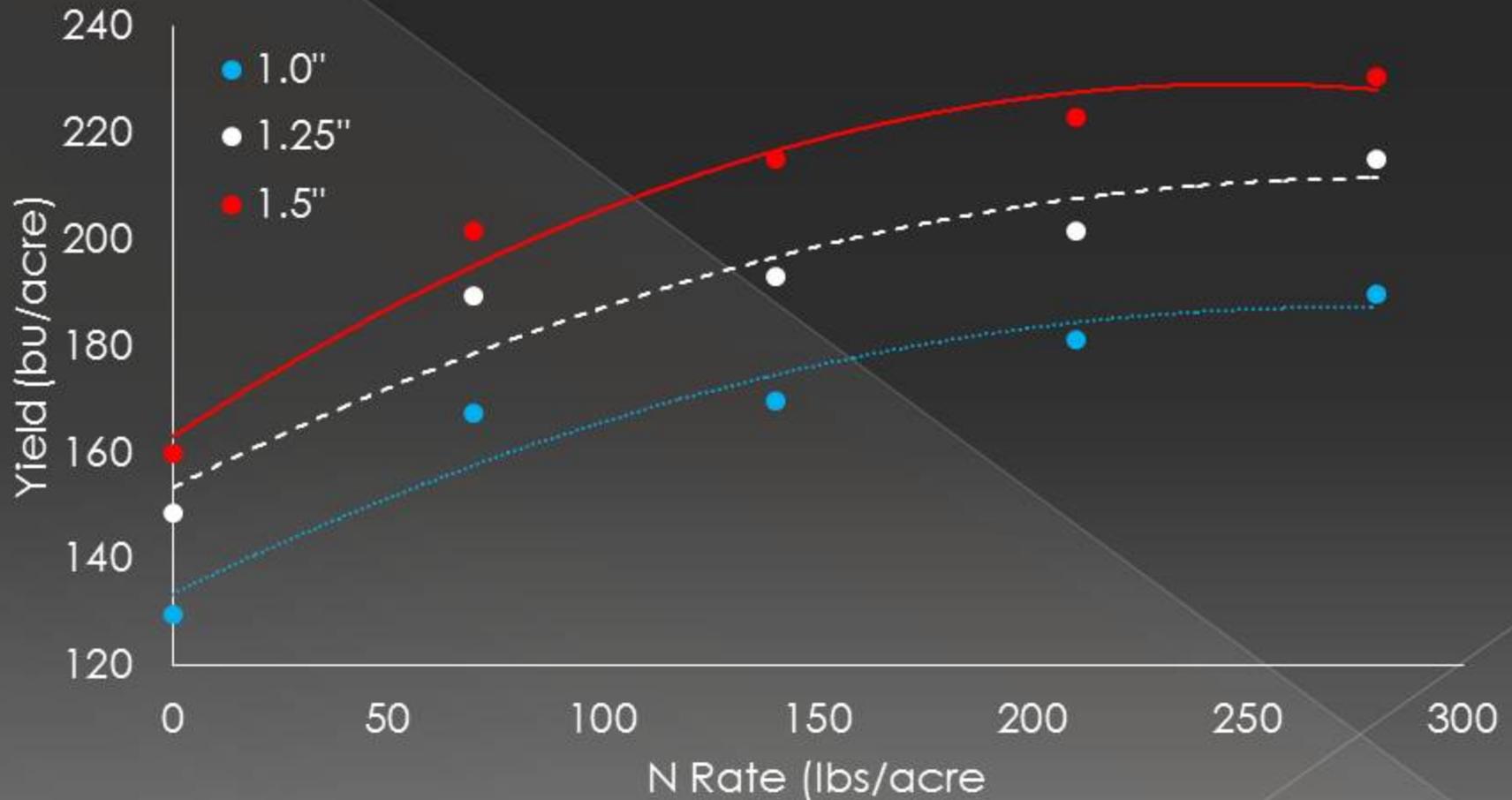
# 2018 Grain Yield



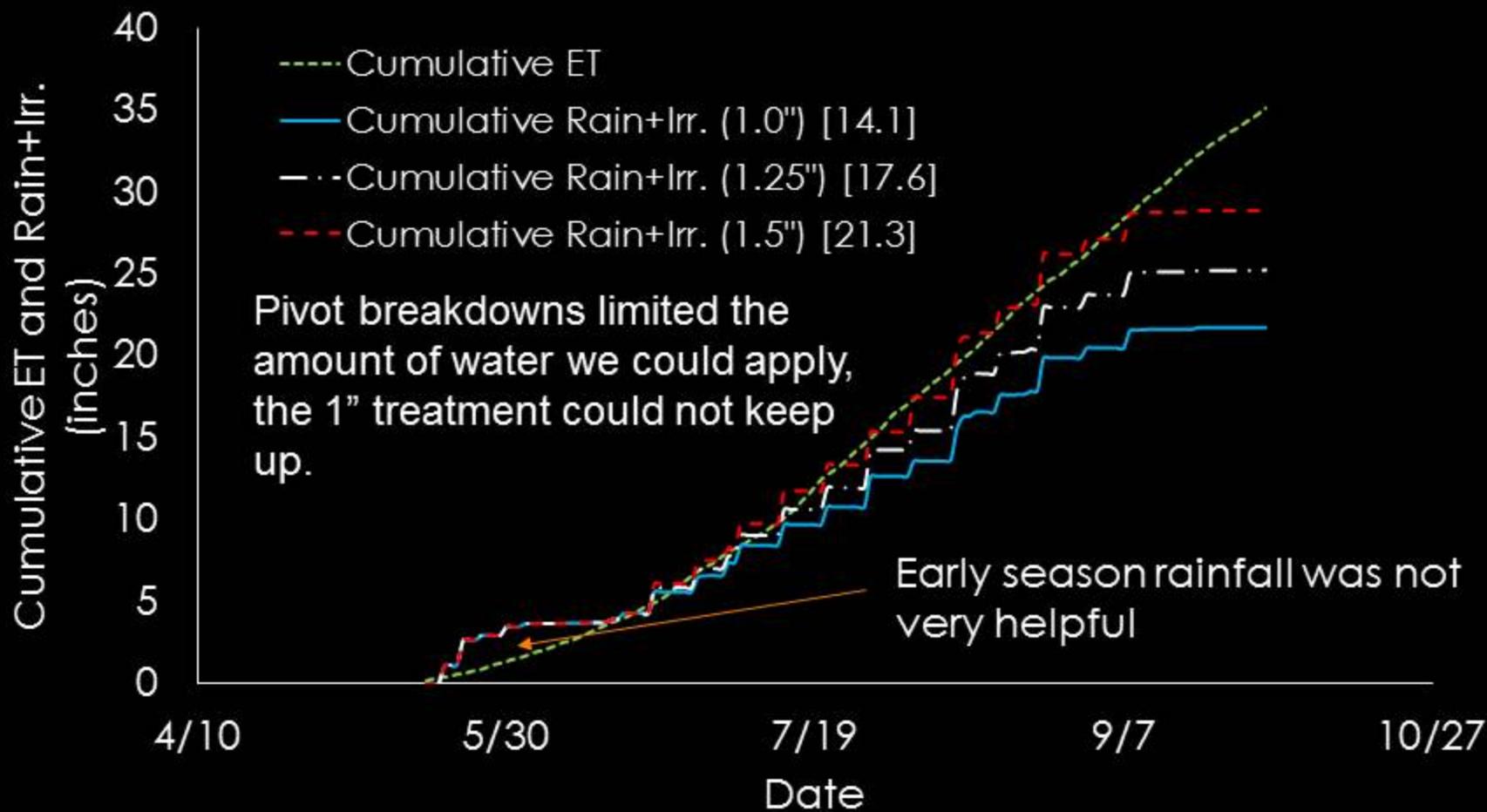
# Irrigation Applied in 2018



# 2019 Grain Yield



# Irrigation Applied in 2019



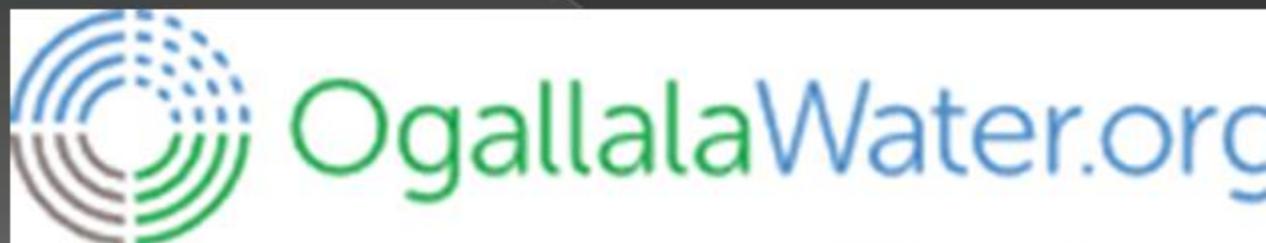
# Summary of Nitrogen Study

- Crop Yields have been optimized with 200 lbs N/acre in the 2 years
- Response to irrigation is dependent on in season rainfall
- This project was meant to simulate on-farm conditions
  - > Pivot breakdown
- We will continue this project and process aerial imagery to assess its value in managing water and N.

# Questions



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