

# Learning from Testing Ag Performance Solutions

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# What is the program

- ◉ Testing Ag Performance Solutions (TAPS)
  - > Crowd sourcing ideas about management strategies
  - > We apply management in a replicated experiment
  - > Management variables:
    - Corn: hybrid, population, nitrogen, irrigation and marketing
    - Cotton: variety, population, irrigation, and growth regulator
- ◉ Fantasy farming

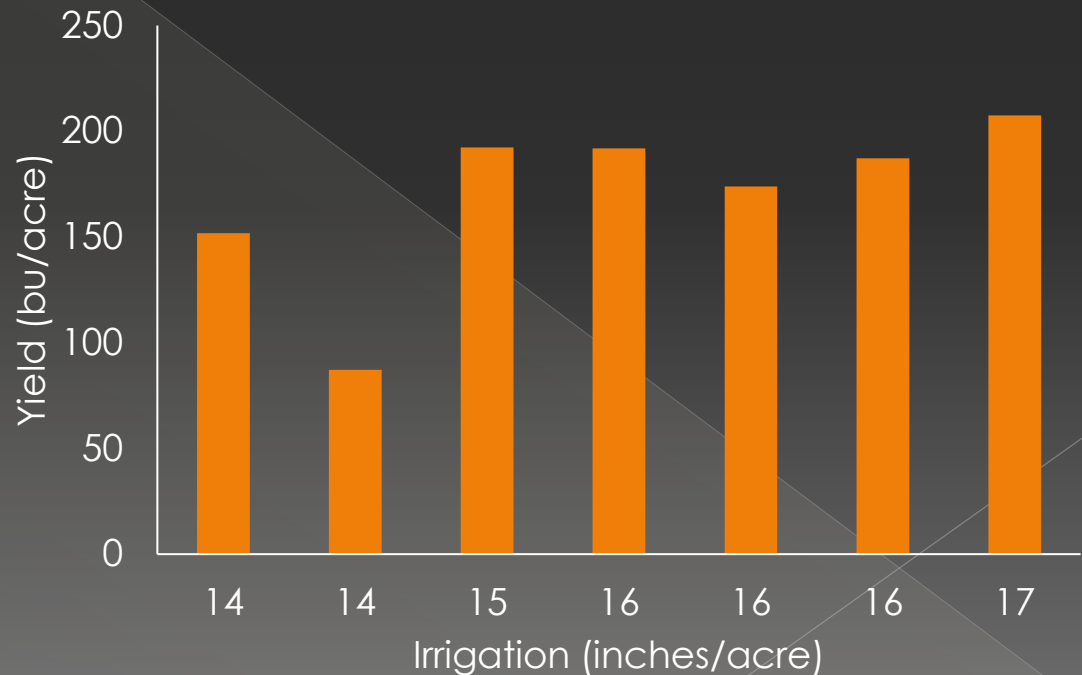
# Goals of program

- Provide an opportunity for producers to learn about technologies
- Evaluate the impact of different components of production on net return.
- Develop management strategies to optimize efficiency

# 2019 Results

- In the first year (2019) we started slow
- Only allowed participants to select N rate and irrigation

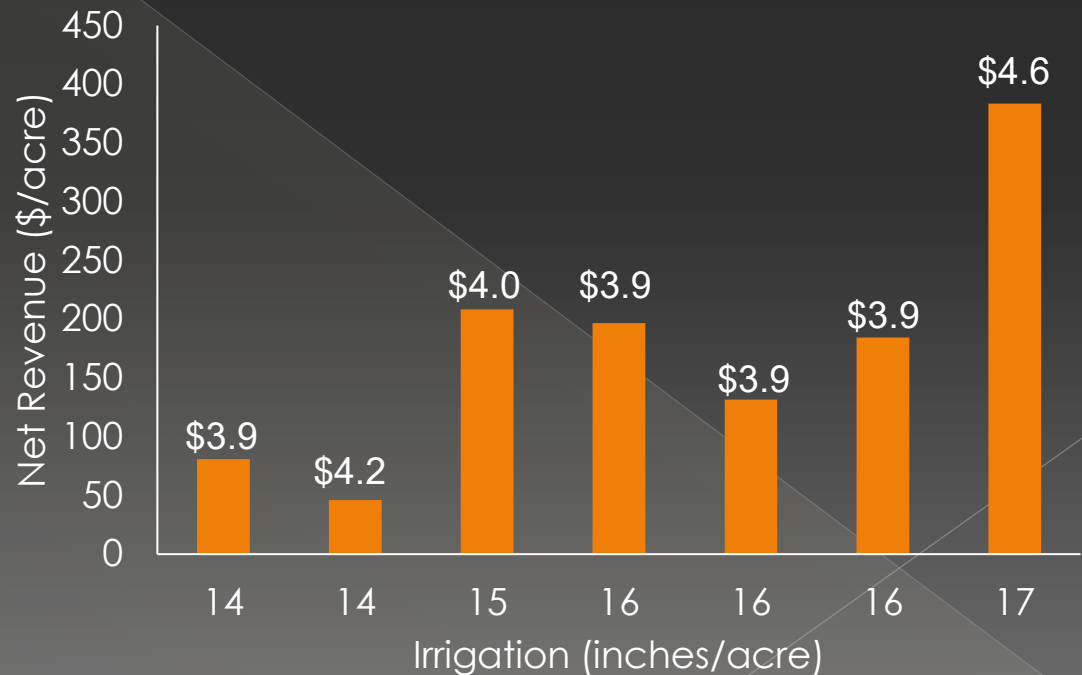
## Yield vs Irrigation



# 2019 Results

- Net return to land and labor was most impacted by yield and price

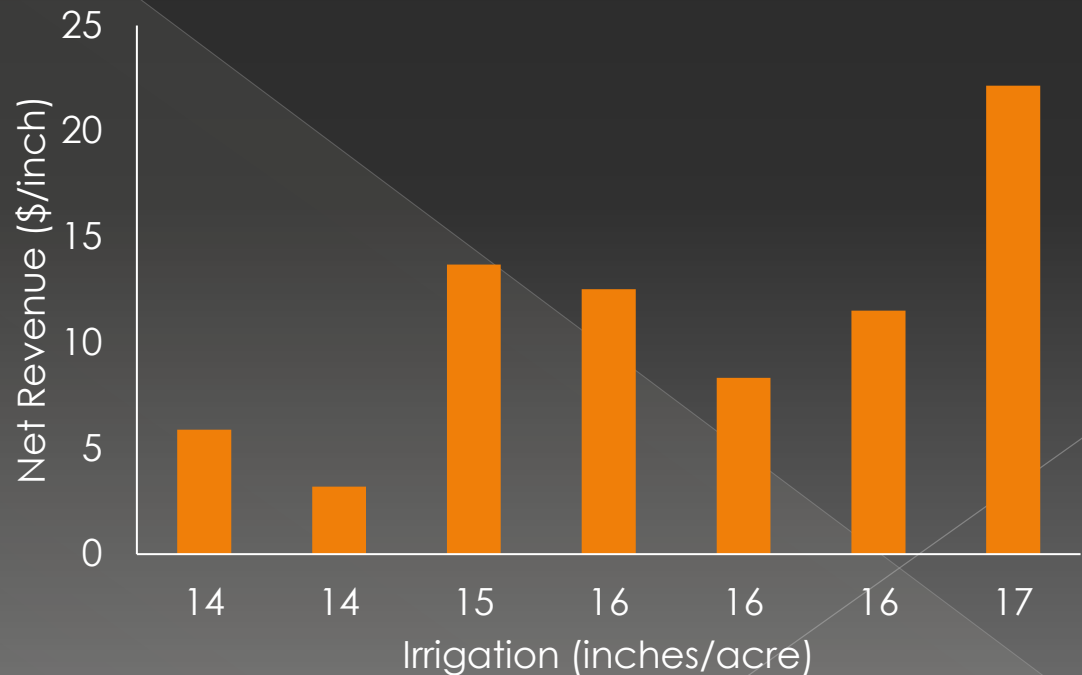
## Net Revenue vs Irrigation



# 2019 Results

- Water is most limiting factor so its important to look at net return to water per inch of irrigation applied

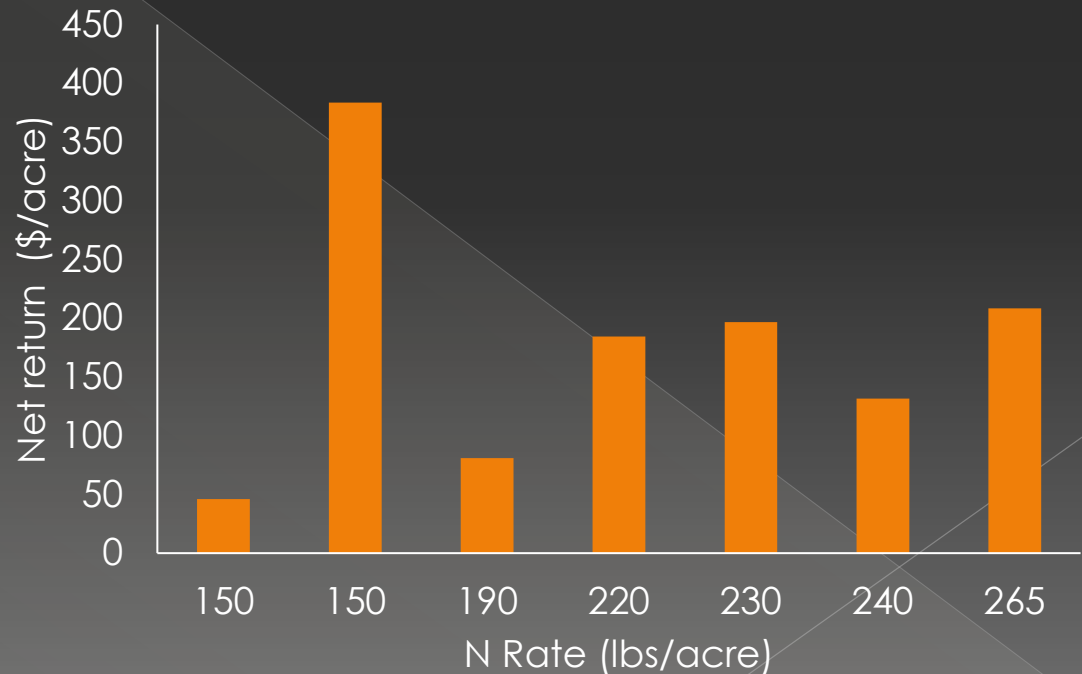
## Net return to Irrigation vs Irrigation



# 2019 Results

- Impact of N rate is overshadowed by impact of irrigation management and marketing

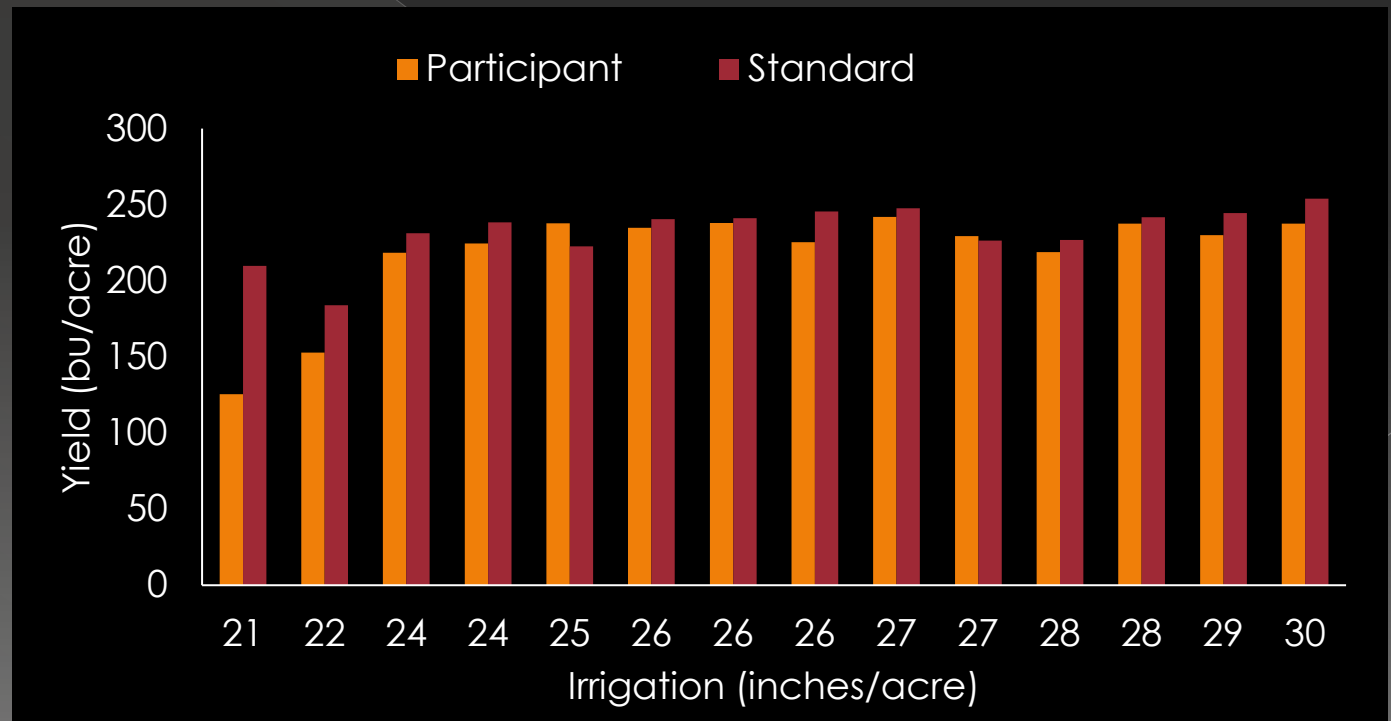
## Net return vs N Rate



# 2020 Results

- In 2020-21 we allowed participants to determine N rate, irrigation, hybrid and population.

## Yield vs Irrigation

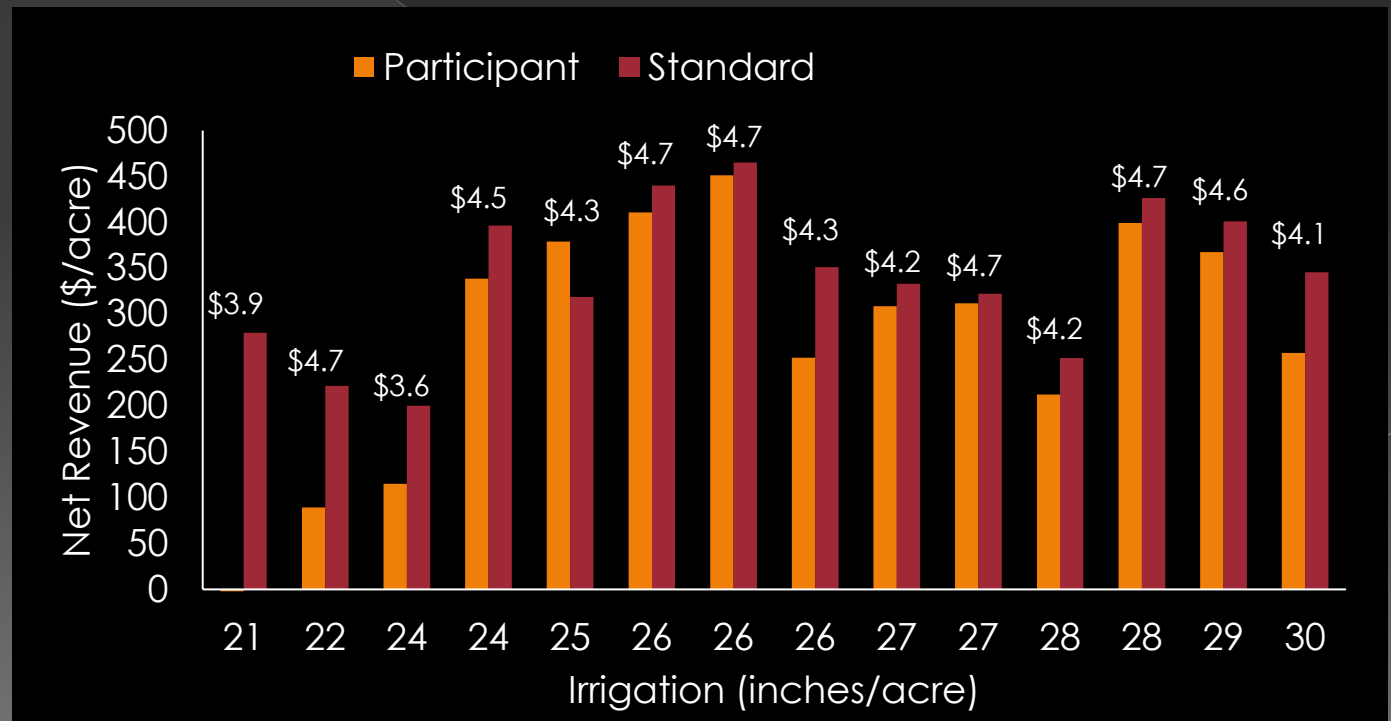




# 2020 Results

- Good yields and lower costs at moderate irrigation optimized return to land and management

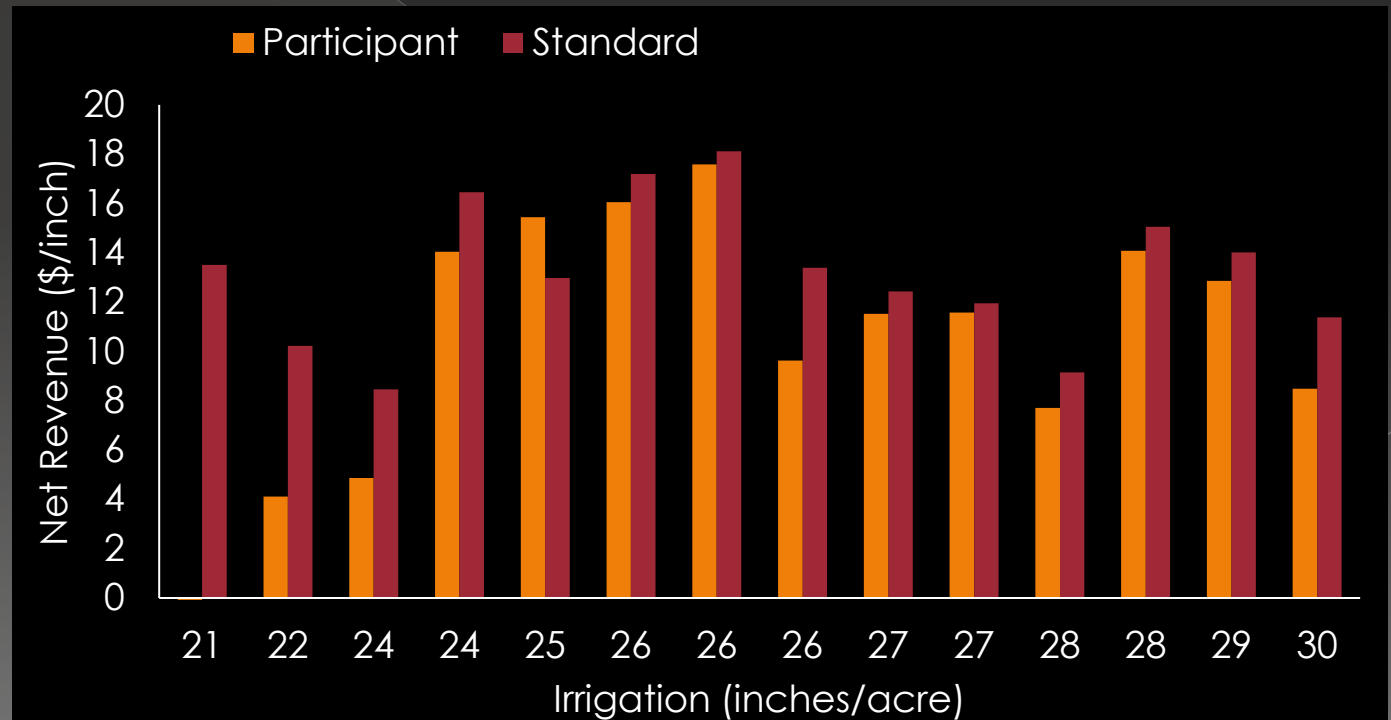
## Net Return vs Irrigation



# 2020 Results

- Good yields and lower costs at moderate irrigation optimized return to irrigation as well

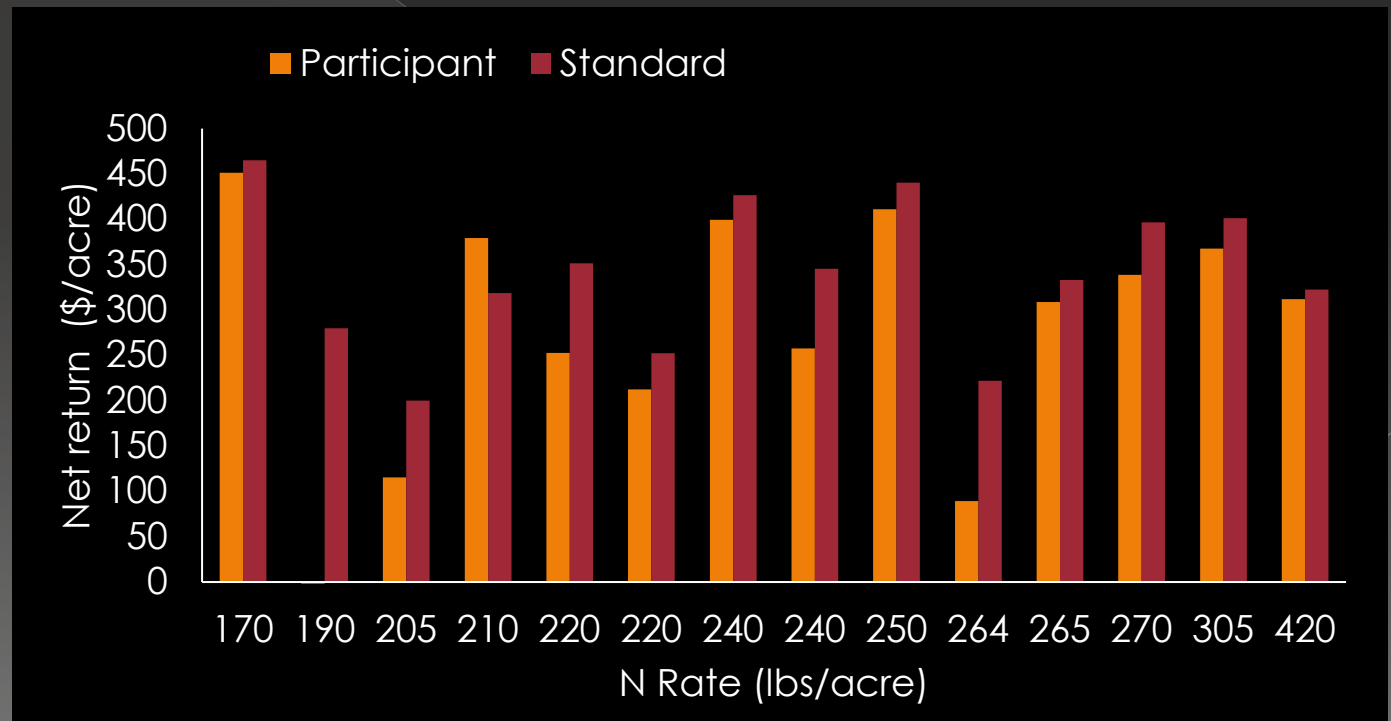
**Net Return  
to irrigation  
vs Irrigation**



# 2020 Results

- N rate has no impact on net return within the range of N rates applied

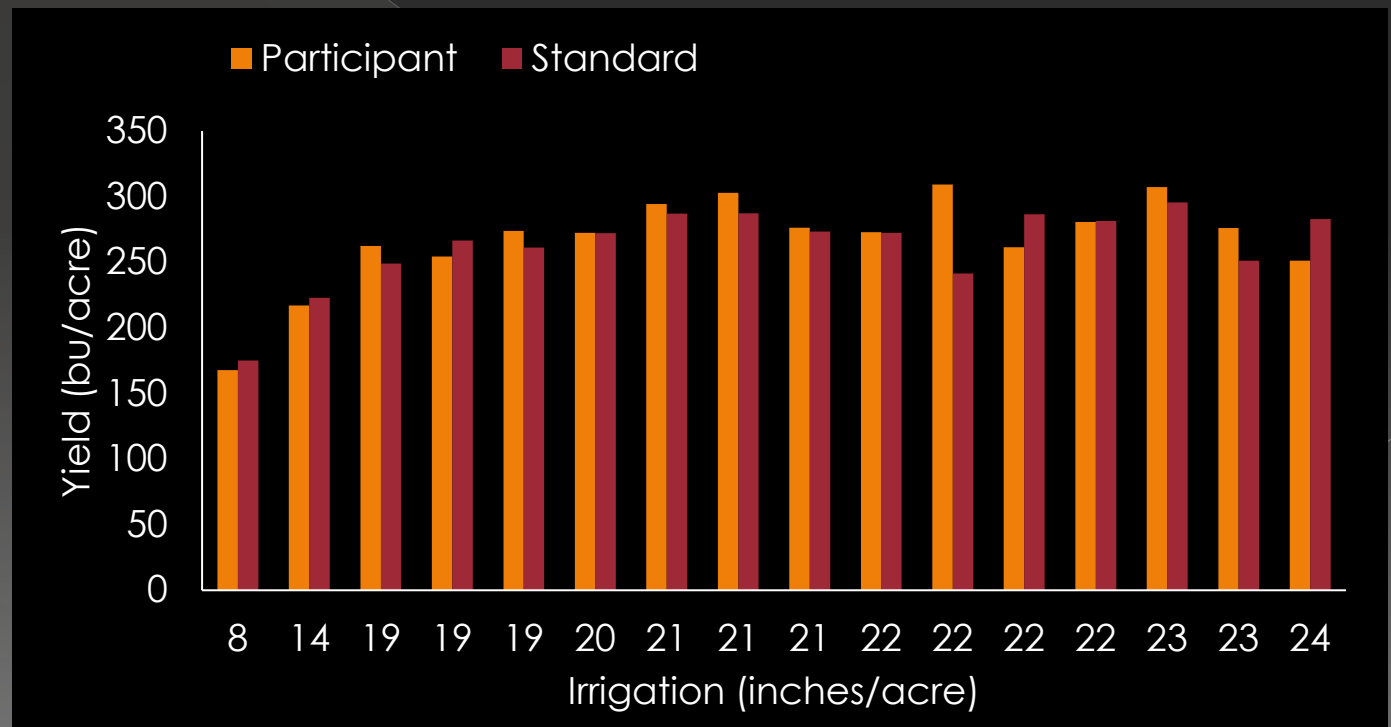
## Net Return vs N Rate



# 2021 Results

- Here again an intermediate irrigation rate optimized yields

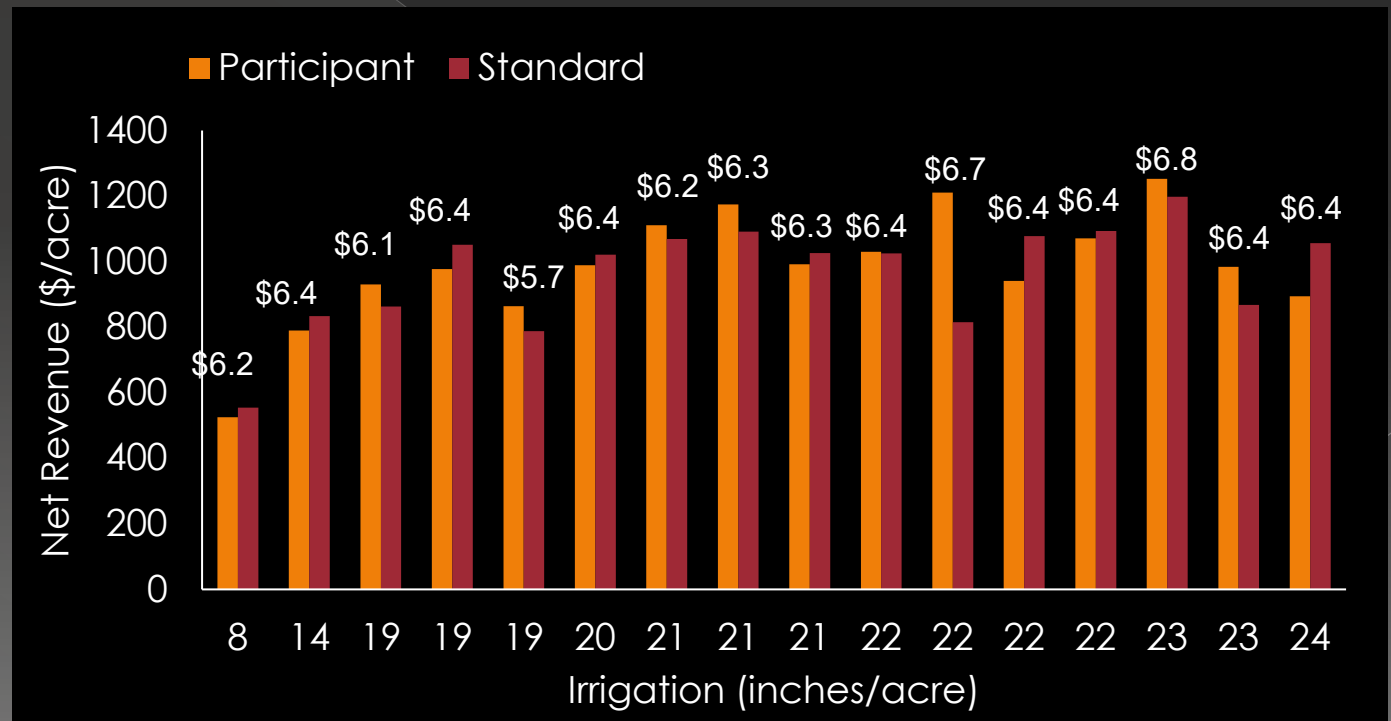
## Yield vs Irrigation



# 2021 Results

- Cleaver Marketing combined with high yields maximized net return

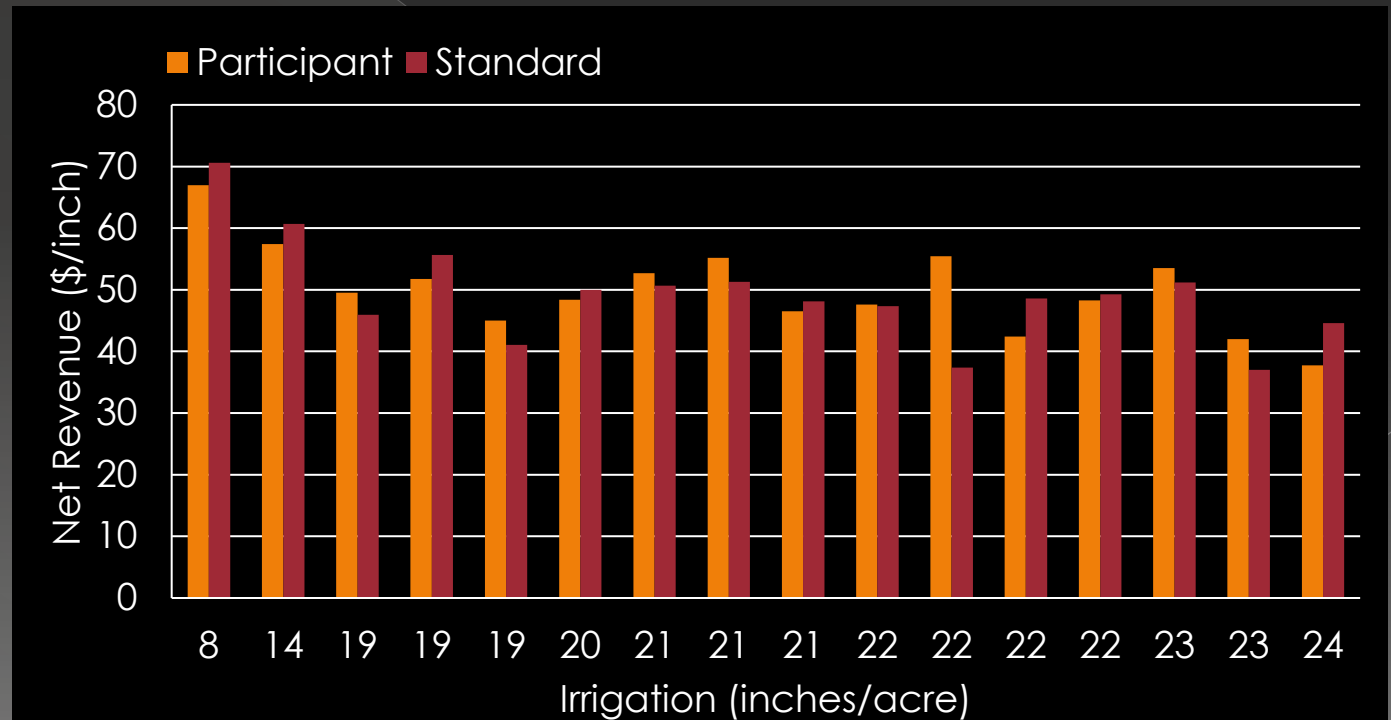
## Net Return vs Irrigation



# 2020 Results

- Low irrigation rates took more advantage rainfall during grain fill.

**Net Return  
to irrigation  
vs Irrigation**

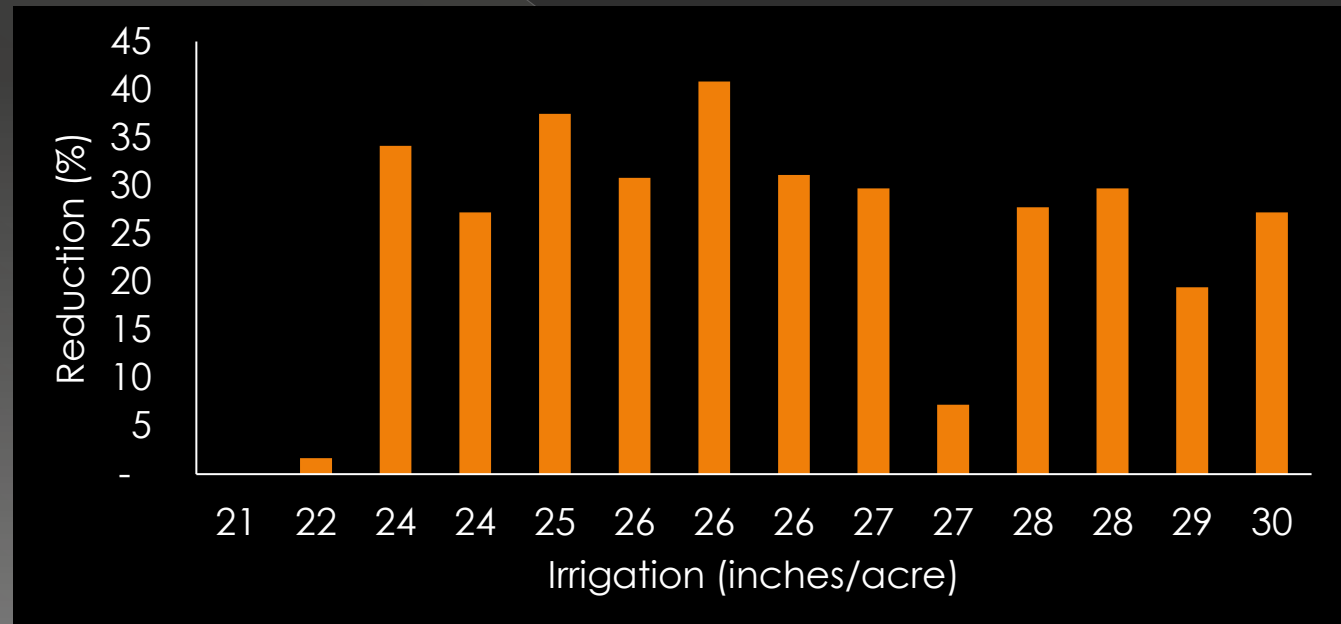


# Greenhouse Gas Lifecycle analysis

- Dr. Mary Foltz and her team compiled our data and ran lifecycle analysis on all treatments in 2020
- Goal was to understand if irrigation and N management would have meaningful impact of GHG budget of irrigated corn
- Could this generate a premium to incentivize conservation?

# Reduction in CO<sub>2</sub> for each treatment relative to highest emission

- Insufficient irrigation caused high emissions/bushel due to very low yield
- Intermediate irrigation reduced energy and provide for greatest reduction in emission





# Summary of Corn TAPS program

- Yield and marketing are critical
- Hybrid selection has a great impact on yield (Need more hybrid testing)
- Sufficient irrigation must be utilized to achieve optimum yield
- Nitrogen plays a very small role in determining profitability.
- Intermediate irrigation optimizes return to irrigation applied
  - > This is linked to net present value (AKA net worth)

# Summary of Corn TAPS program

- GHG lifecycle analysis suggest that optimizing yields is still important
  - > Intermediate irrigation minimizes emissions per bushel of corn
  - > May provide potential revenue to incentivize conservation.
- Still need direct measurements of N<sub>2</sub>O emissions
- Current analysis is based on tier 1 estimates

# A few things to consider

- ◉ We are also working on cotton in panhandle
- ◉ We can gain a lot of efficiency in improved management
  - > Leaks, nozzles management, telemetry.
- ◉ Much of this data has been collected in drought when it is very hard to dramatically reduce irrigation.
- ◉ Future production will likely be higher than today's production.

# Questions?

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