Florida Stakeholder Engagement Program (STEP) – Corn Contest

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Agricultural and Biological Engineering Program

February 7th, 2025

Panhandle Corn and Soybean Update

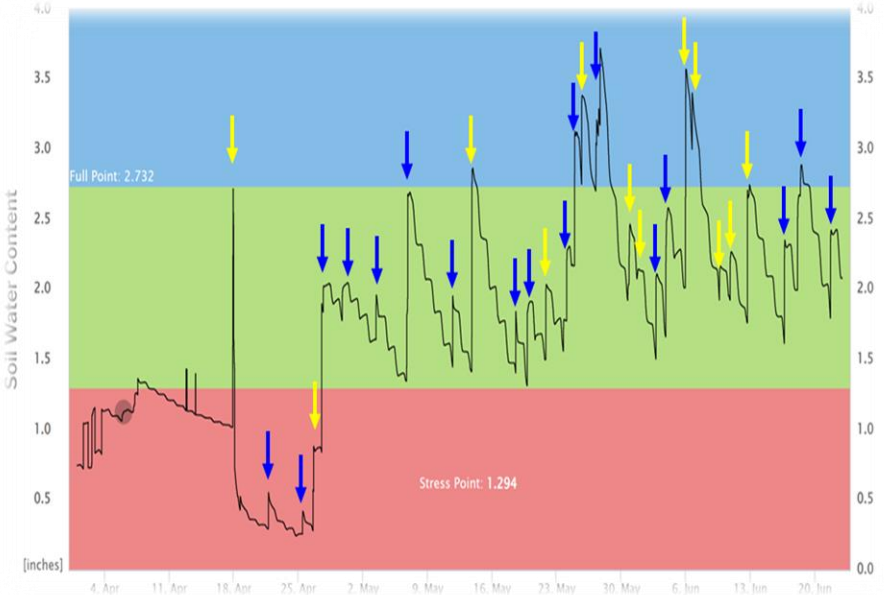
Florida STEP

- The **Florida Stakeholder Engagement Program (Florida STEP)** is an extension program to engage growers, ag industry, agricultural research, and extension in an interactive real-world system to increase productivity, sustainability, and profitability.

Competition

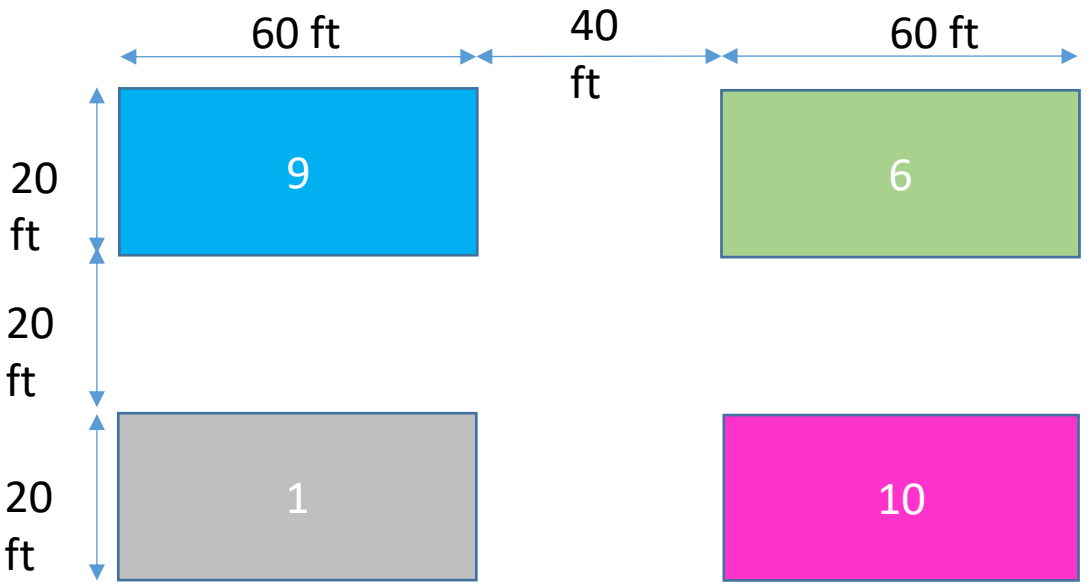
Peer-to-peer interaction

Action-oriented learning
Experimental



Corn Contest - Design

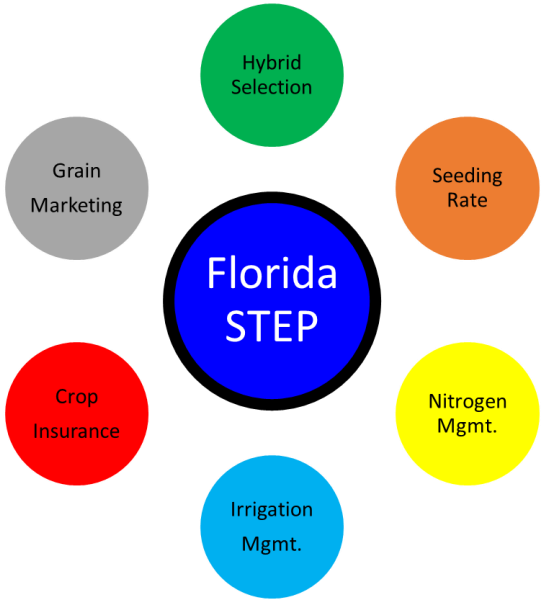
- NFREC-SV
- Variable Rate Sprinkler Irrigation Systems
- Four randomized plots for statistical evaluation



- Each farm on paper includes 1000 harvest acres.

Management Decisions

- Hybrid Selection
- Seeding Rate
- Irrigation Management
- Nitrogen Management
- Insurance Selection
- Grain Marketing



- These decisions were made using a STEP Website https://step.ifas.ufl.edu/
- All other management decisions, such as pesticide use, residue management, among others remained constant for all teams.

Hybrid Selection
- Competition default hybrids.
- Teams can bring their own hybrid.

Seeding Rate
- Any rate between 26K to 36K in the increment of 2K.

Nitrogen Mgmt.
- 4R nitrogen management.
- Source: (i) Conventional or (ii) Control release fertilizer program.
- Placement: (i) Broadcast, (ii) Banding, (iii) fertigation and (iv) Liquid Side-dressing.
- No limit on Rate and timing
- Extra 30 lbs N/ac in case of leaching rain event.

Irrigation Mgmt.
- Soil moisture-based irrigation scheduling; Evapotranspiration-based irrigation scheduling; and Pre-determined irrigation scheduling.
- One set of soil moisture sensor as per teams' choice.
- Maximum irrigation depth of 0.5 inches at an increment of 0.05 inches.
- No irrigation application if no selection was made.

Insurance Selection
- Two types of crop insurance options were provided (i) Revenue Protection and (ii) Yield Protection.
- Insurance premium quotes were provided to the teams before the start of the competition.

Grain Marketing
- Marketing selections for the simulated 1,000-acre farm
- No postharvest (storage) marketing was allowed
- Flat-price or Basis contract in 10,000-bushel increment
- Chicago future price plus a local basis provided to teams

FLORIDA STAKEHOLDER ENGAGEMENT PROGRAM (STEP)

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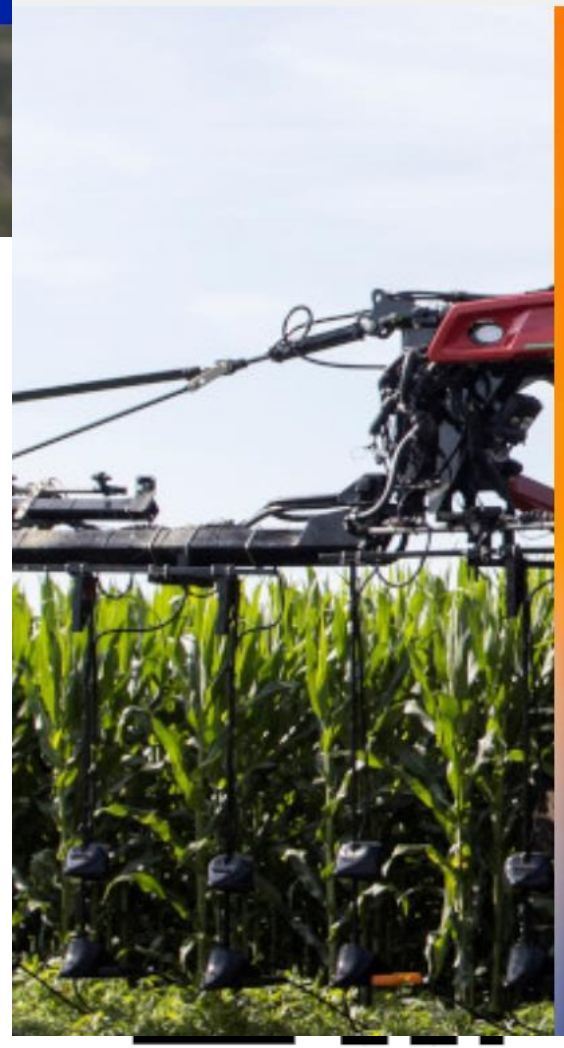

Login

Corn | Cotton

Step_admin27 *
Username

Password *

LOG IN

Not registered yet? Sign up

Admin login page : Admin login

Forgot Password?

The NFREC-SV crew managed all plots

Soil moisture sensor

Sentek probe (Holder Ag) | BMP logic | AquaSpy

Selected Sensor: Sentek probe (Holder Ag)

IRRIGATION

Date *

mm/dd/yyyy

Amount | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50

Amount (Inches) *

SUBMIT

Selected sensor:

#	Date	Amount	Sensor	Applied	
1	2024-04-19	0.2	Sentek probe (Holder Ag)	⊗	🗑
2	2025-01-22	0.2	Sentek probe (Holder Ag)	✓	✂
3	2025-01-31	0.45	Sentek probe (Holder Ag)	✓	✂
4	2025-02-05	0.4	Sentek probe (Holder Ag)	✓	✂

Management Decision – Hybrid Selection and Seeding Rate

- Competition Default Hybrids:

1. DEKALB 68-35 /MSRP $400
2. DEKALB 70-45 /MSRP $394
3. Dyna-Gro (Nutrien) 57VC51 /MSRP $300
4. Dyna-Gro (Nutrien) D58SS65 /MSRP $300
5. INTEGRA 6641SS /MSRP $346
6. NK1838-3110 /MSRP $340
7. NK1677-3110 /MSRP $350
8. Pioneer P1622VYHR /MSRP $397
9. Pioneer P1608YHR /MSRP $390
10. Pioneer P17677YHR /MSRP $400
11. Pioneer P2042VYHR /MSRP $372
12. REREVERE1839 /MSRP $360
13. Agritech 704vt2p /MSRP $315
14. Agritech 85VT2P /MSRP $285

Hybrid Selection and Seeding Rate

- Teams were allowed to choose any plant population:
  - 26,000
  - 28,000
  - 30,000
  - 32,000
  - 34,000
  - 36,000

- Teams were allowed to work with multiple local seed companies for hybrid selection.

Management Decision – Nitrogen Management

- **Nitrogen management (4R's)**
  - Fertilizer rate
  - Fertilizer timing
  - Fertilizer application methods
  - Fertilizer source
- **Fertilizer source options:**
  - Conventional Fertilizer option
  - Controlled-Release Fertilizer (CRF) option
- **Fertilizer placement options:**
  - Broadcast
  - Banding
  - Liquid side dressing

Nitrogen Management

- **Fertilizer rate and timing:**
  - Any rate (seasonal split as per the grower's choice)
  - Any time (as per grower's choice)

Ag. Technologies and Data Availability

WATERS AGRICULTURAL LABORATORIES, INC.

Soil Analysis

Waters Agricultural Laboratories, Inc

257 Newton Hwy | Camilla, GA 31730- | Phone (229) 336-7216

"Improving Growth... With Science"

Customer: 1725
UNIVERSITY OF FLORIDA

7580 CTY RD 13
LIVE OAK, FL 32
UNITED STATES

Sample ID: STEP-1-0-12
Grower: VIVEK SHARMA
Received: 3/15/2022

Test Method:

P	
Phosphorus	
116 H	9(
Al	
Aluminum	

WATERS AGRICULTURAL LABORATORIES, INC.

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257 Newton Hwy | Camilla, GA 31730- | Phone (229) 336-7216

"Improving Growth... With Science"

Customer: 1725
UNIVERSITY OF FLORIDA

7580 CTY RD 136
LIVE OAK, FL 32060
UNITED STATES

Sample ID: STEP-2-12-24
Grower: VIVEK SHARMA
Farm ID: POTATOE
Field ID:
Lab Number: 766197CC
Layer ID:
Received: 3/15/2022
Processed: 3/17/2022

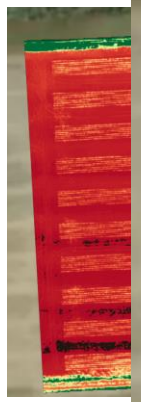
Test Method: Mehlich I — **Soil Laboratory Data (lbs/a)** — **Target pH** 6

P	K	Mg	Ca	Soil pH	Buffer pH	S	B	Zn	Mn	Fe	Cu
Phosphorus	Potassium	Magnesium	Calcium		Adams-Evans	Sulfur	Boron	Zinc	Manganese	Iron	Copper
45 M	53 L	27 L	267 L	5.9	7.80	11 L	0.3 L	0.4 L	2 L	37 VH	0.2 L

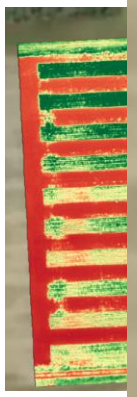
Al	Na	NO3-N	NH4	Soluble Salts	Organic Matter	ENR	Mo	Ni	BiCarbs	
Aluminum	Sodium	Nitrate-N	Ammonia				Molybdenum	Nickel		
		0.01 ppm	ppm	mmhos/cm	%		ppm	ppm	meq/L	

Drone Imagery

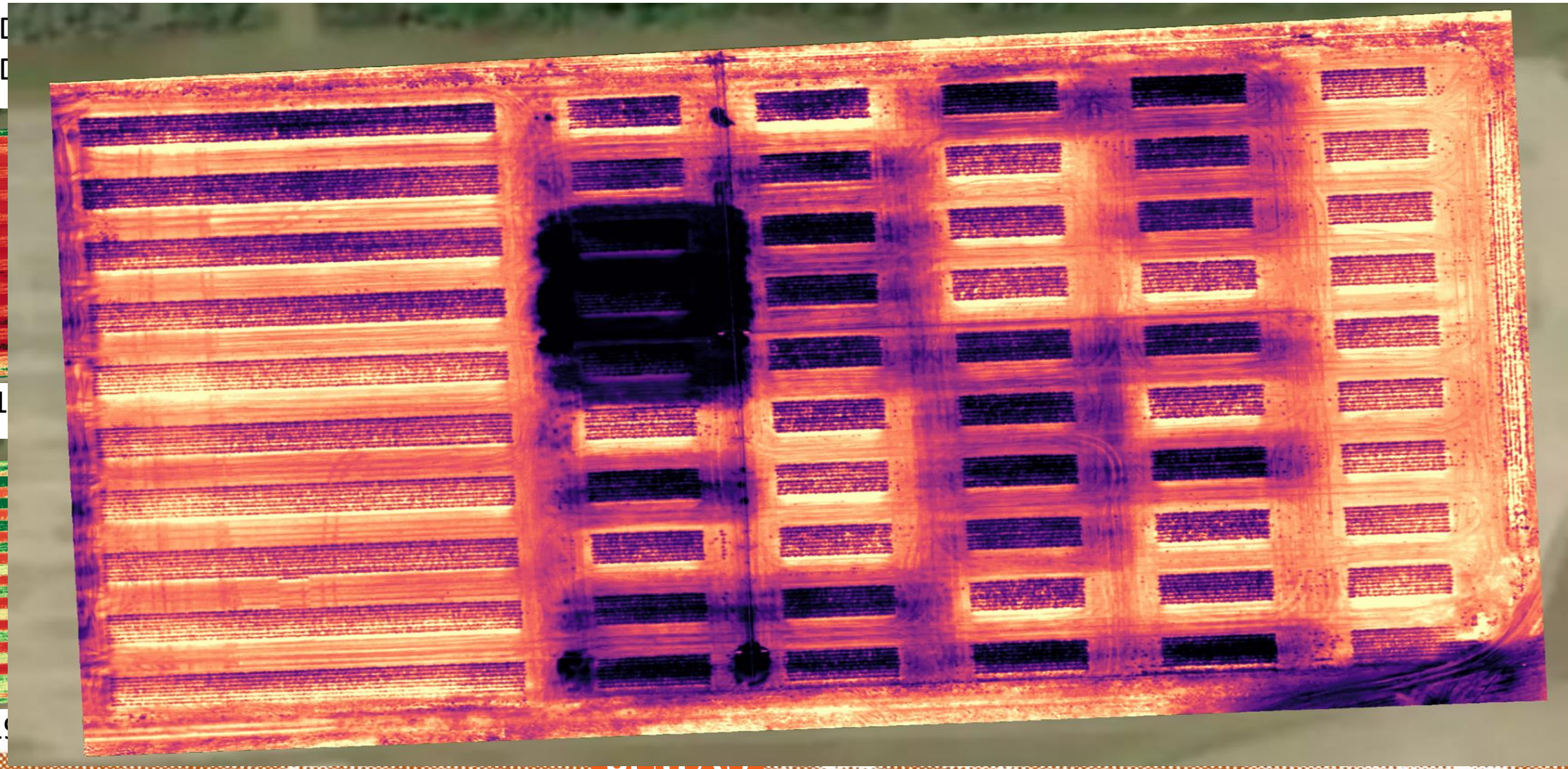
- ND
- ND



April 1



May 1

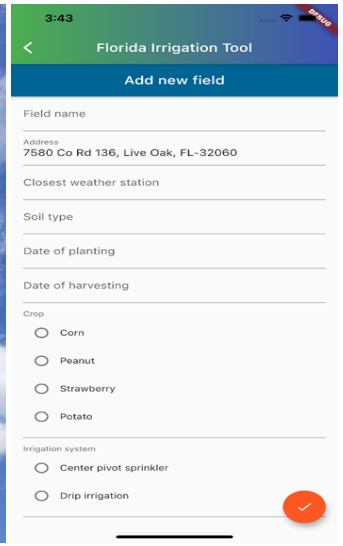


Management Decision – Irrigation Management

- **Irrigation Management:**
  - Soil moisture-based irrigation scheduling
  - Irrigation app (ET based irrigation scheduling)
  - Pre-determined calendar schedule

Lateral Move Variable Rate Irrigation System

Soil Moisture Sensing



ET Based Irrigation Scheduling

Calendar based Irrigation Scheduling

Management Decision – Irrigation Management

- Holder Ag – Sentek drill and drop sensor
- BMP Logic
- AquaSpy


Plot Harvesting using the Kincaid
Two-plot Combine
August 14, 2024

Management Decision – Crop Insurance

Premiums based on…

- Corn acreage: 1,000 acres
- Actual production history (APH): 220 bu/ac
- Projected corn price: $4.67/bu

Choose crop insurance type.

- Yield Protection: pays indemnity if actual yield is below covered percent of APH yield.
- Revenue Protection: pays indemnity if actual yield times harvest price is below covered percent of APH yield times higher of projected price or harvest price.

Choose coverage level (50% to 85%).

Premium per acre

Coverage Level	Yield Protection	Revenue Protection
50%	$2.34	$3.18
55%	$3.26	$4.66
60%	$4.24	$6.43
65%	$6.31	$10.03
70%	$8.22	$13.49
75%	$11.98	$19.60
80%	$18.53	$29.76
85%	$29.17	$45.82

Management Decision – Grain Marketing

Grain marketing based on 1,000 acres of corn delivered to local buying point on harvest date (no storage) at 15.5% moisture.

Example: 200 bu/acre x 1000 acres = 200,000 bushels

Options:

1. Forward contract 10,000-bushel increments prior to harvest week.
    - Flat price contract, or
    - Basis contract
2. Sell at cash spot price during harvest week (default for uncontracted bushels).

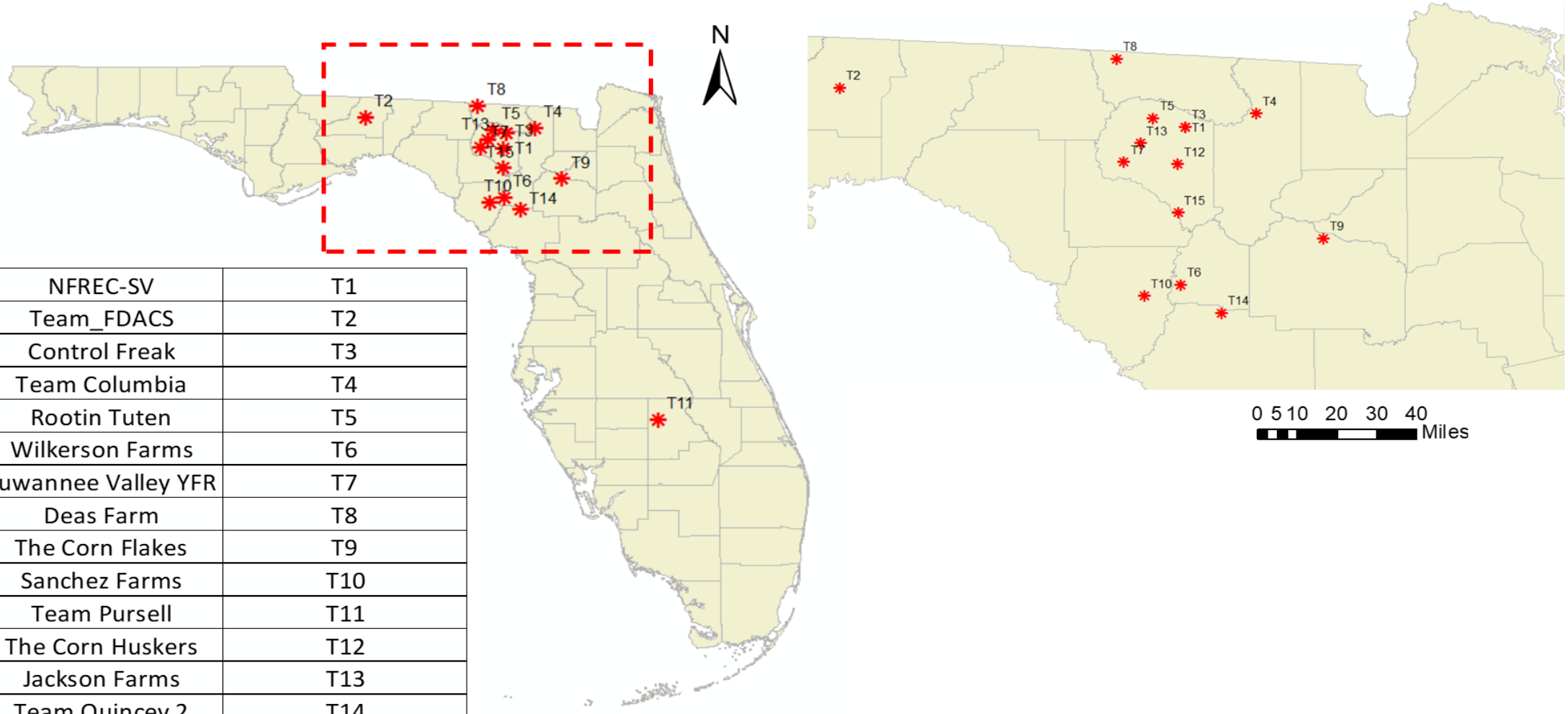
Competition Results/ Awards

- The teams are competing for two awards:
  - Most profitable
  - Highest input use efficiency

- Winners will be awarded $2000, $1000, and $500 for 1st, 2nd, and 3rd place in each category.

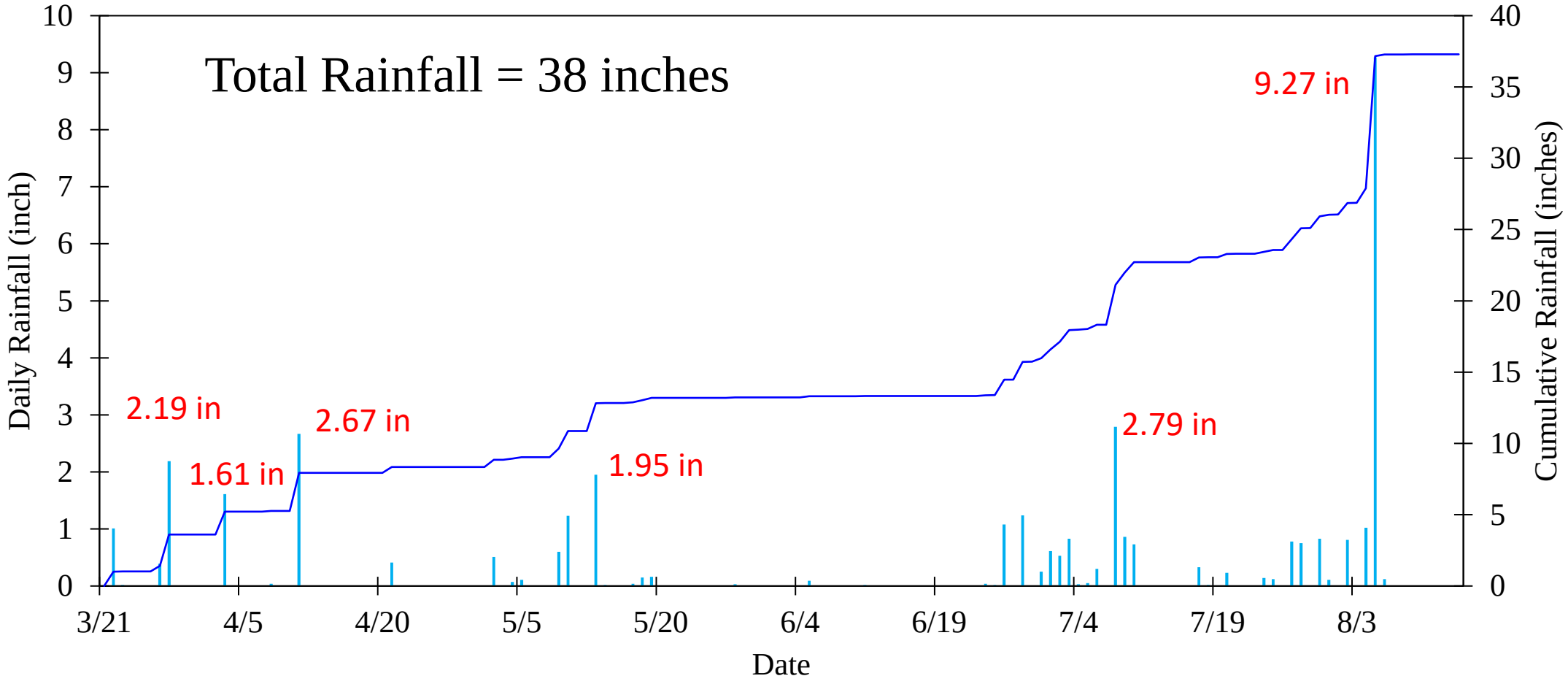
STEP Competition
2024 Results

2024 Participating Teams



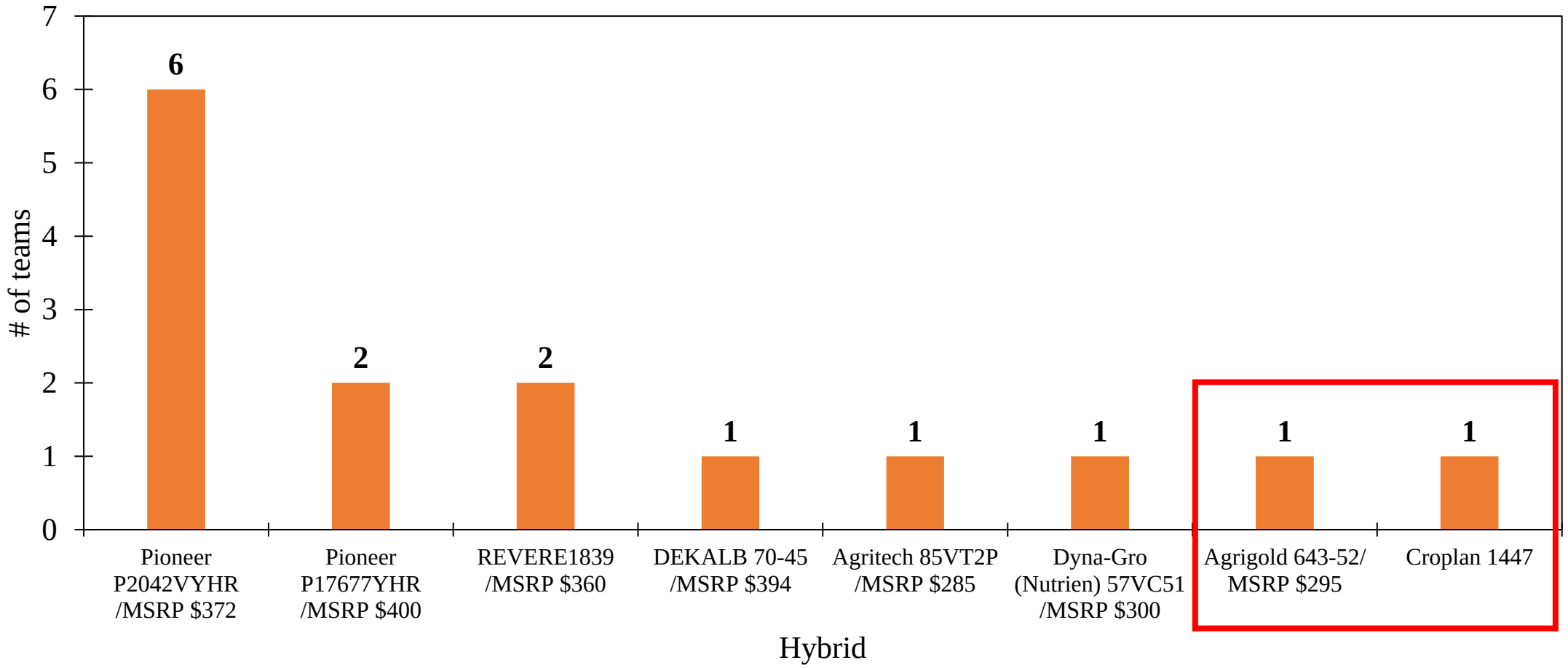
NFREC-SV	T1
Team_FDACS	T2
Control Freak	T3
Team Columbia	T4
Rootin Tuten	T5
Wilkerson Farms	T6
Suwannee Valley YFR	T7
Deas Farm	T8
The Corn Flakes	T9
Sanchez Farms	T10
Team Pursell	T11
The Corn Huskers	T12
Jackson Farms	T13
Team Quincey 2	T14
Riven Bend Farms	T15

Climate Data - Rainfall

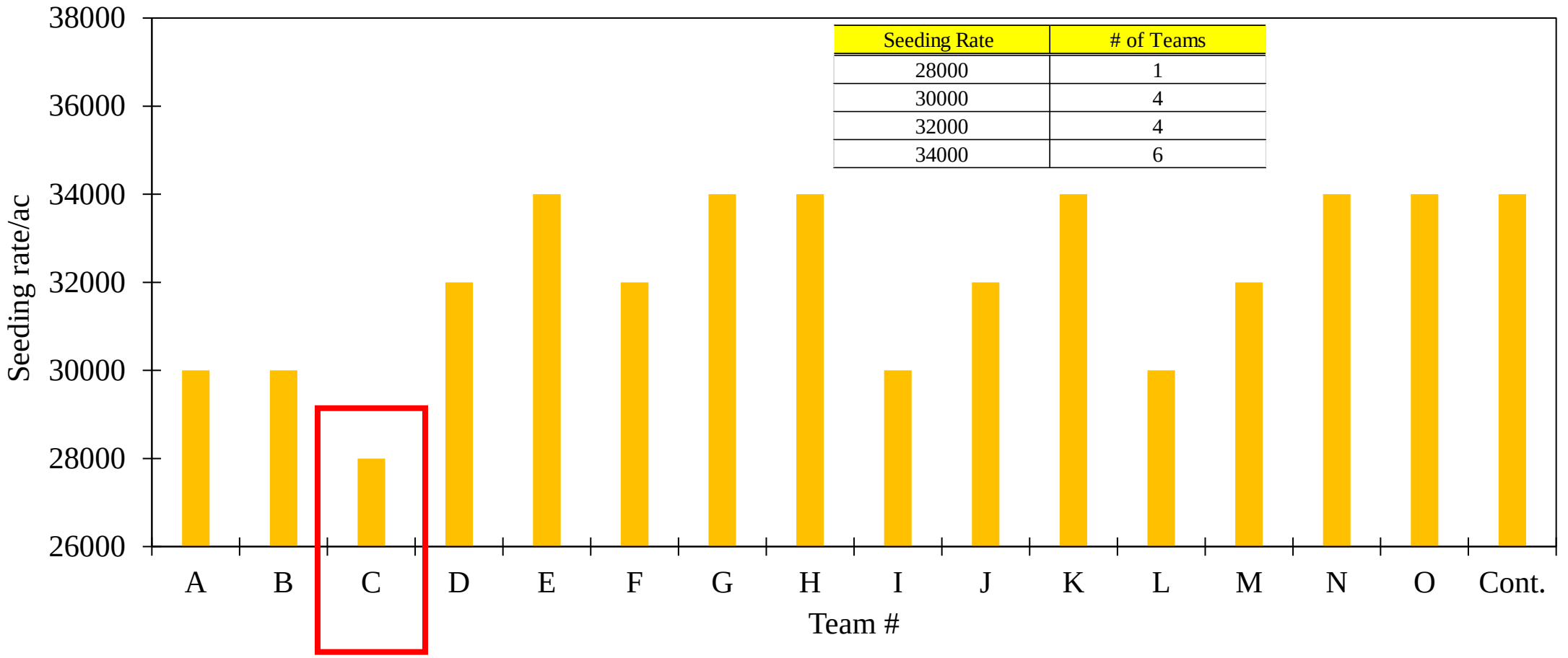



August 7th, 2024
Total Rainfall = 9.27 inches

Hybrid Selection

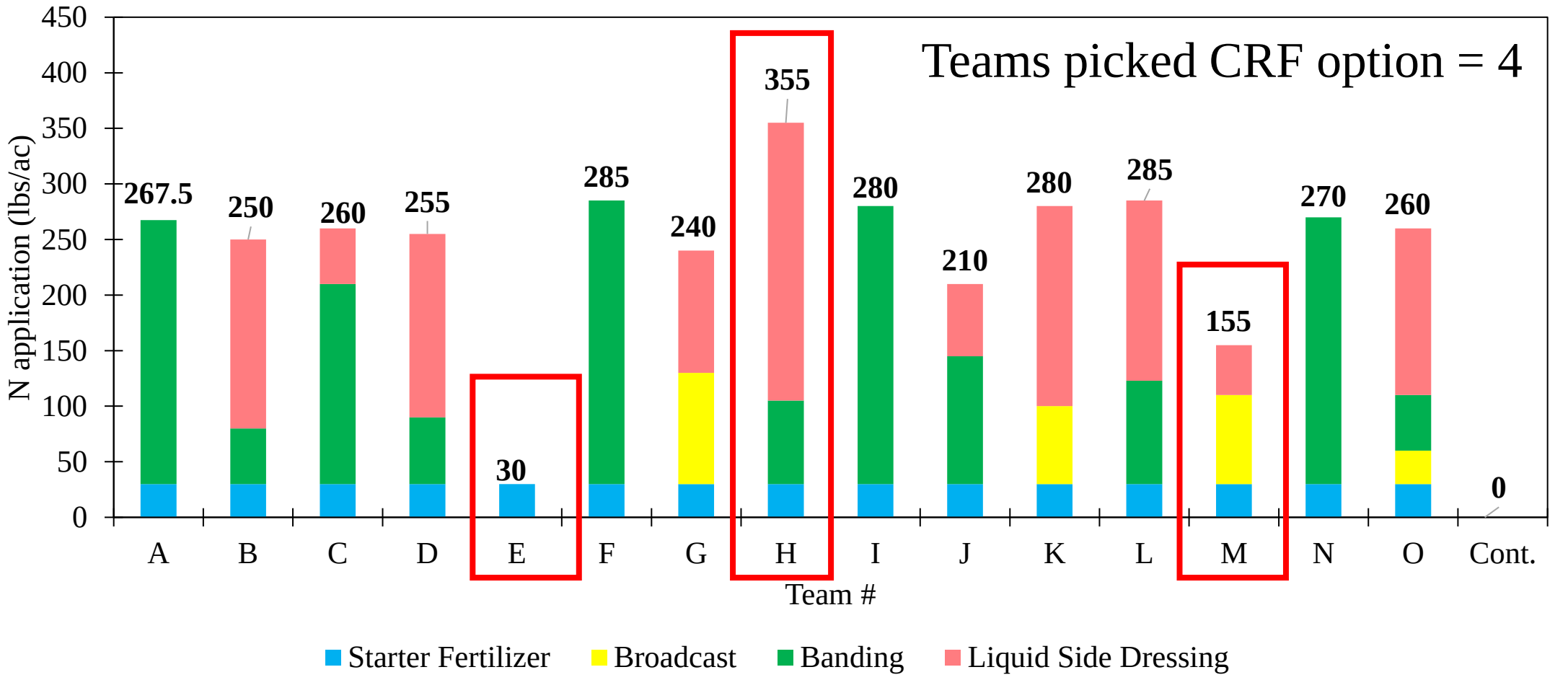


Seeding Rate

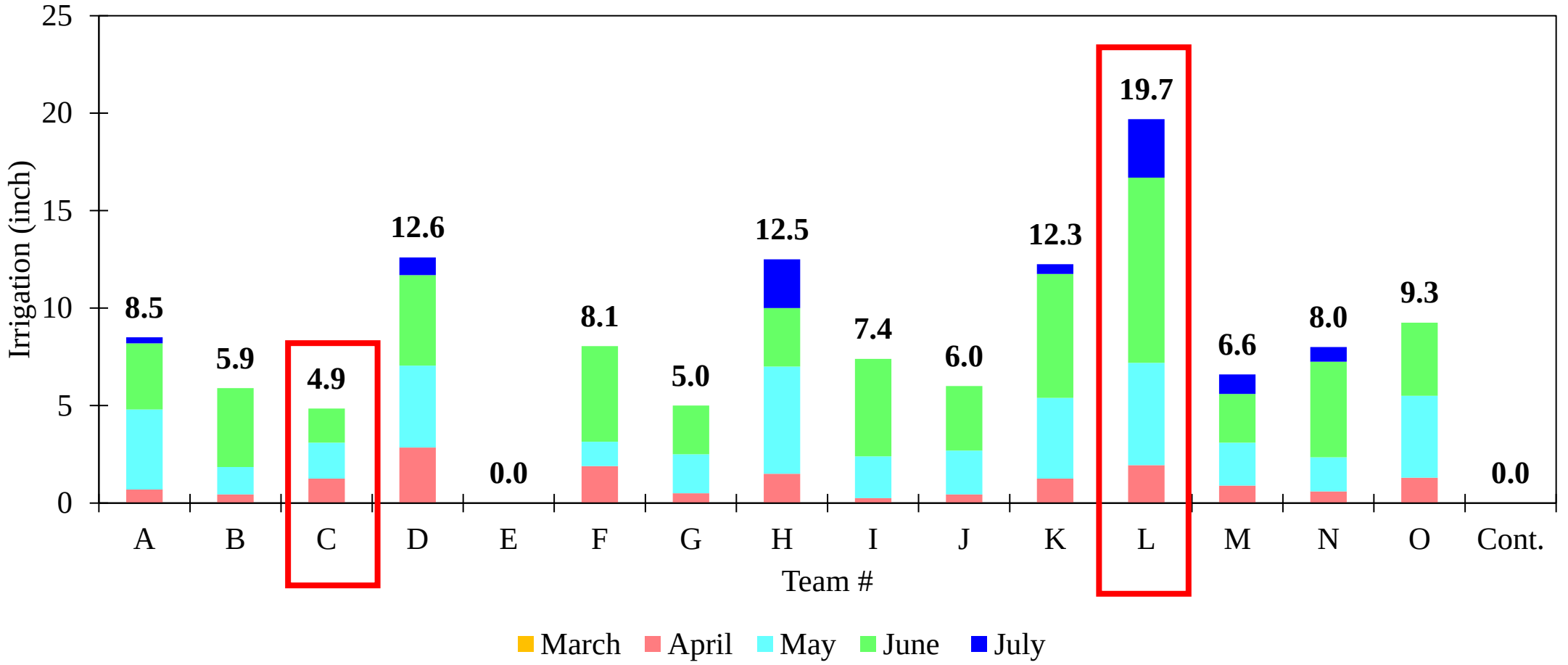


Seeding Rate	# of Teams
28000	1
30000	4
32000	4
34000	6

Nitrogen Application

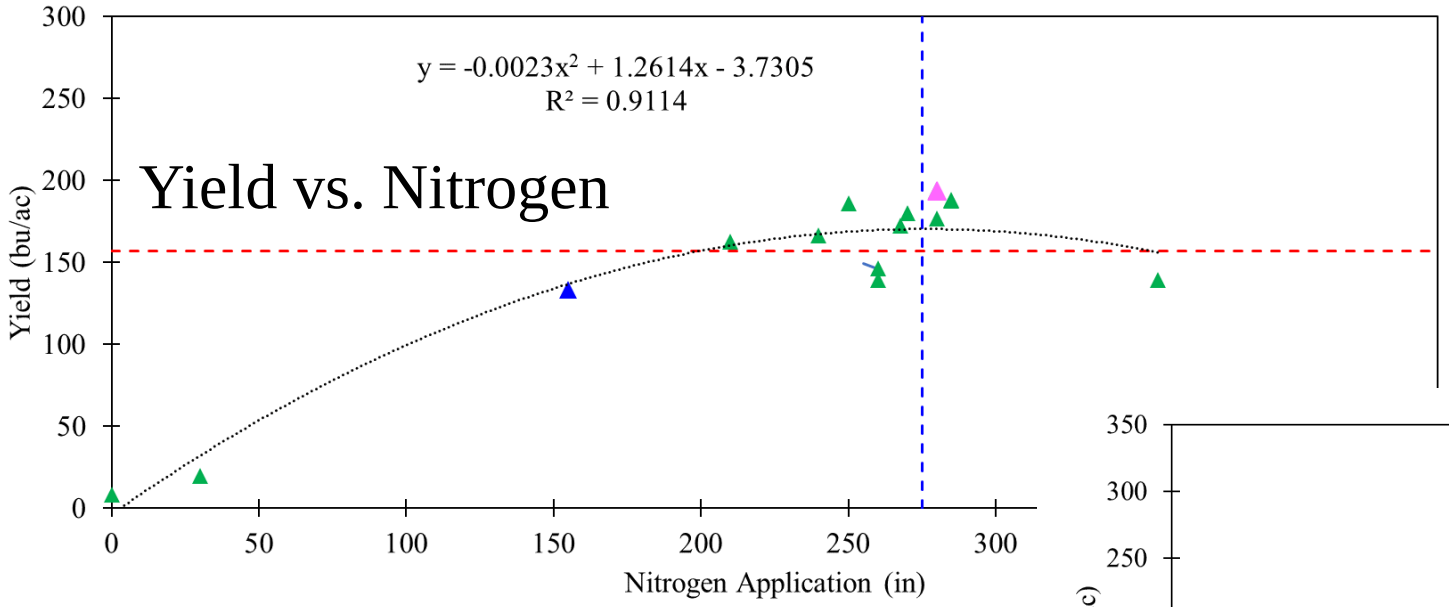


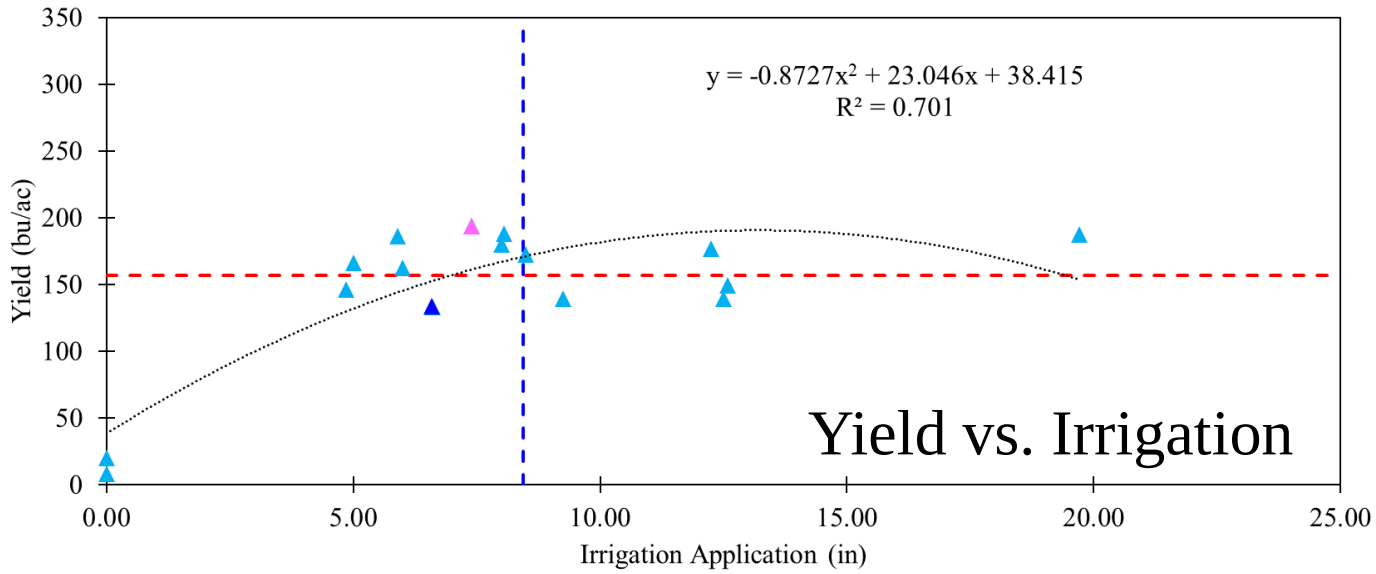
Irrigation Application



Yield Results

Yield vs. Nitrogen and Irrigation





Competition Results/ Awards

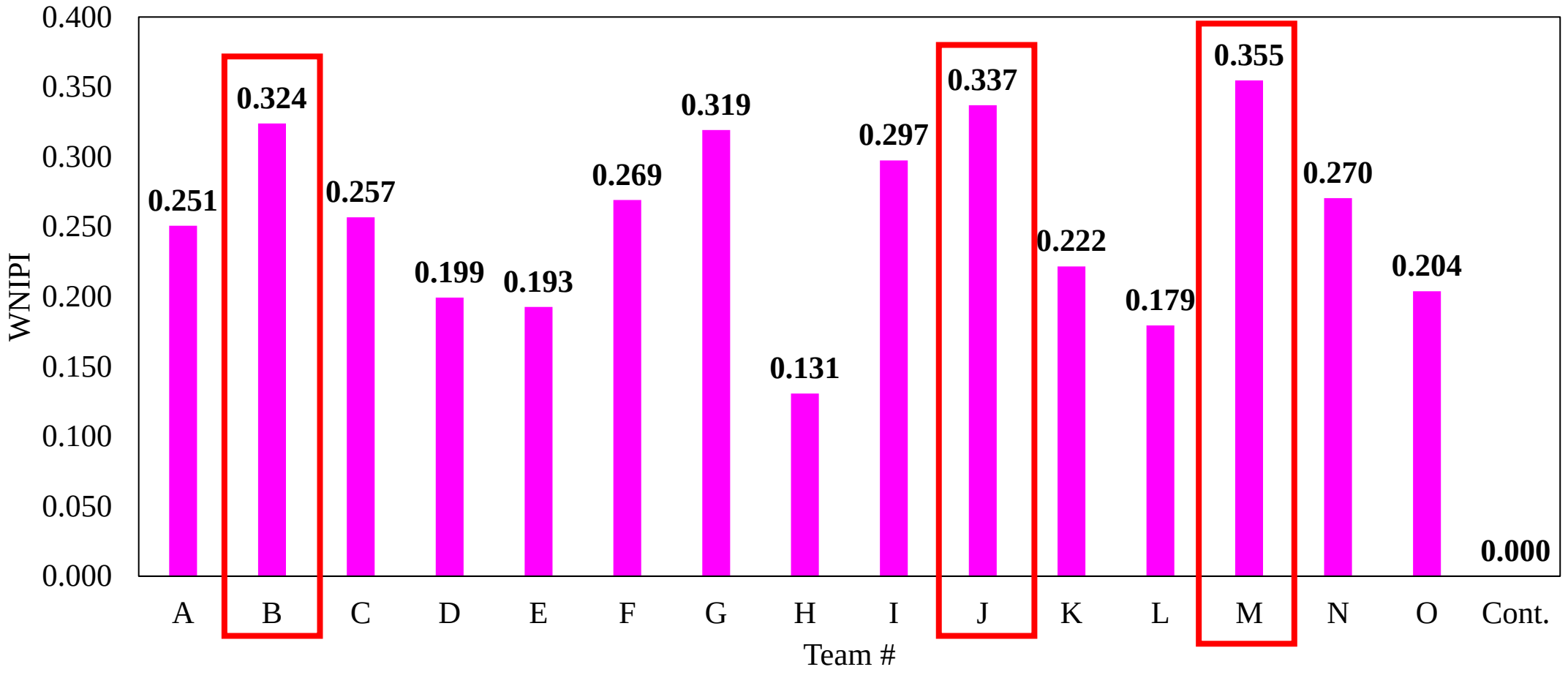
Highest Input-use Efficiency Award:

- The input use efficiency was calculated based on Water-Nitrogen Intensification Performance Index (WNIPI) which is an integrated index of water intensification performance index and nitrogen intensification performance as:

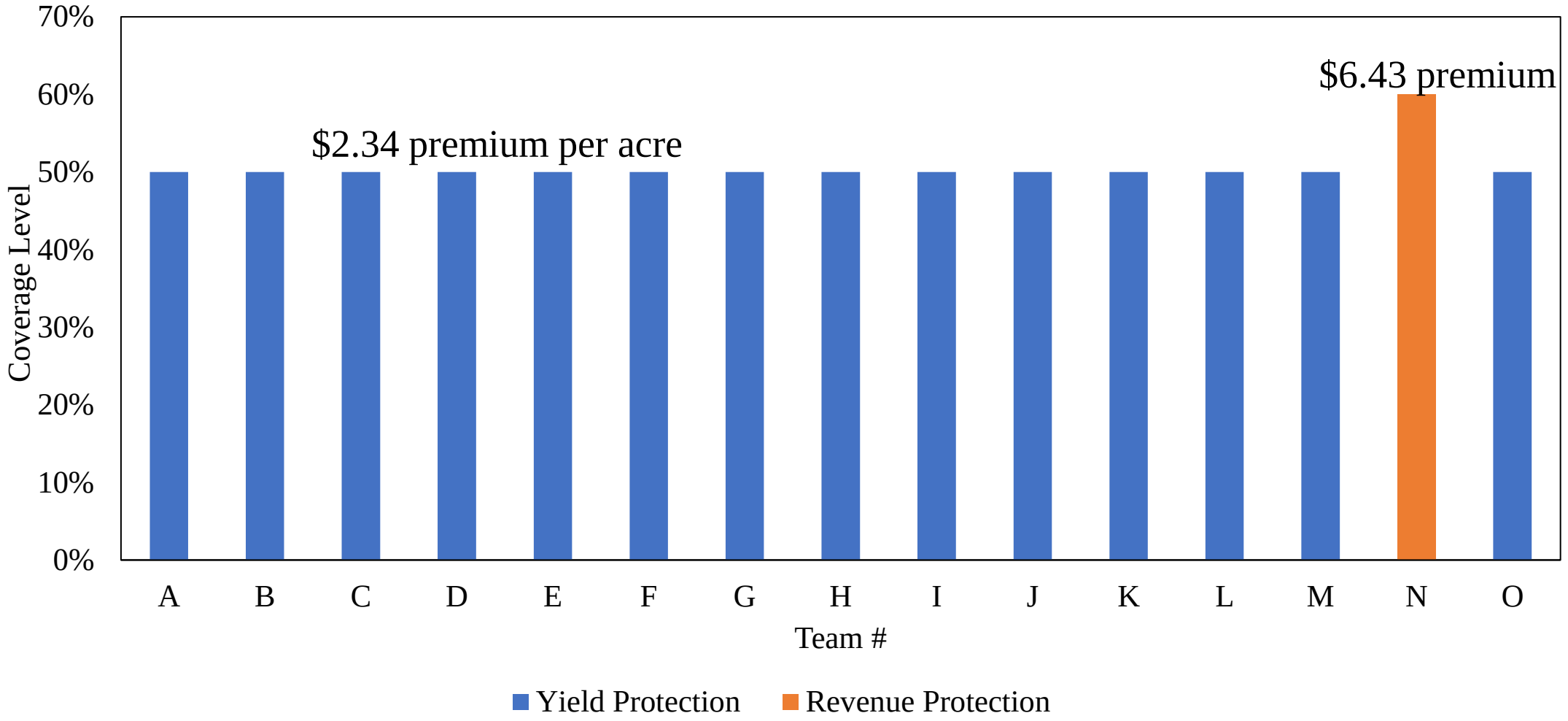
$$WNIPI = \frac{\left[\frac{Y - Y_n}{Y_n}\right]}{\left[\frac{ET_n + I}{ET_n}\right] * \left[\frac{U_n + N}{U_n}\right]}$$

where Y is the average plot yield (at 15.5% moisture), Yn is the yield of non-irrigated plot, ETn = evapotranspiration of non-irrigated plot, I is total cumulative irrigation applied, Un = aboveground N uptake of non-irrigated plot, and N = total N applied.

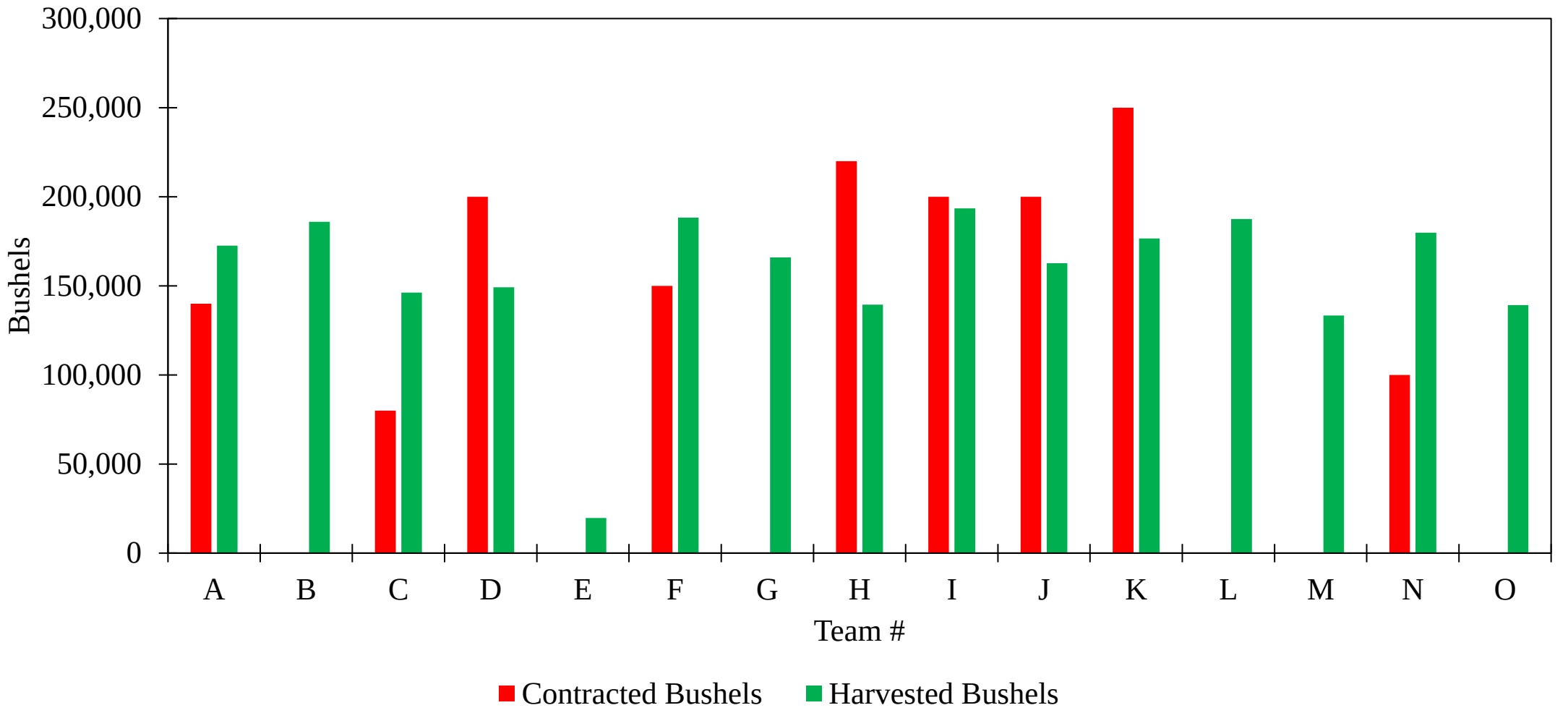
Water-Nitrogen Intensification Performance Index (WNIPI)



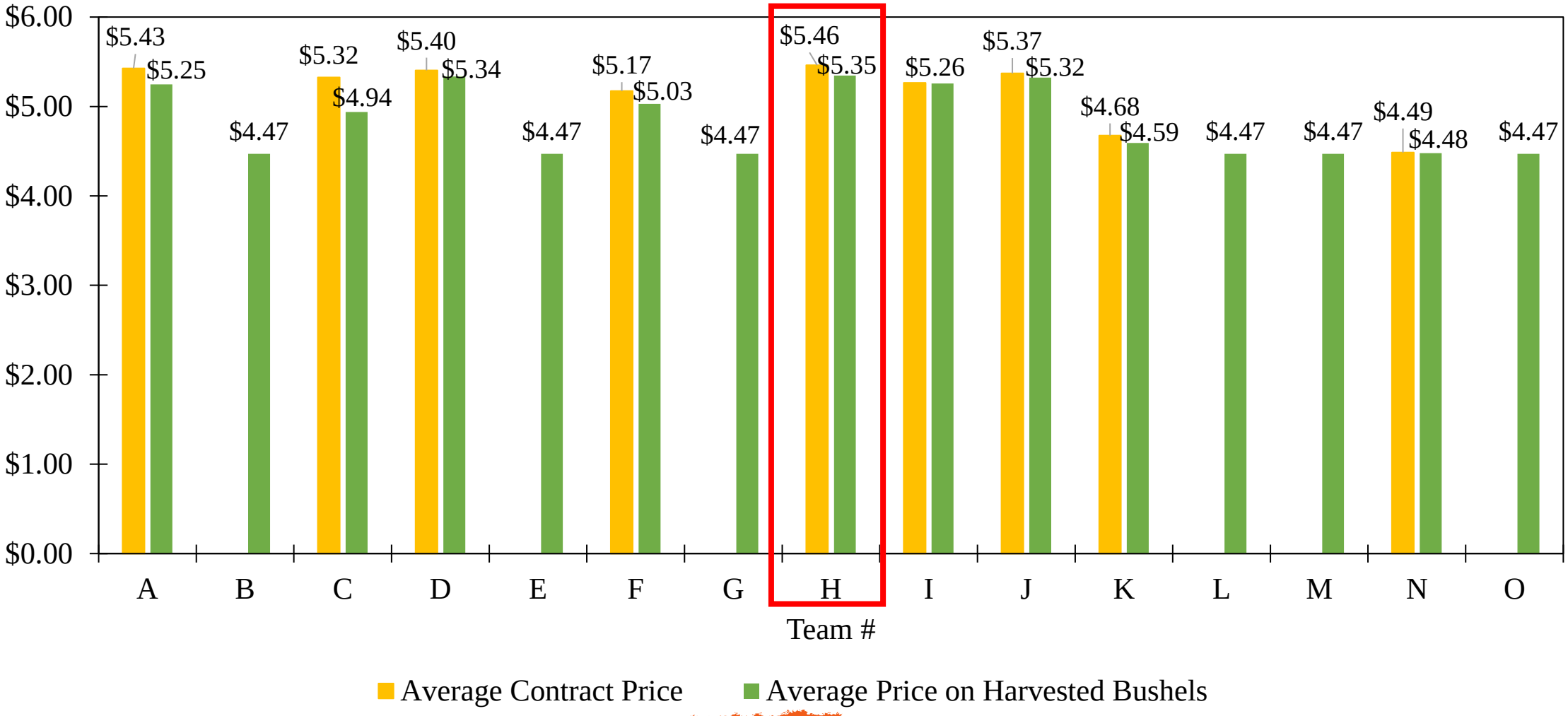
Crop Insurance Selections



Marketing: Bushels Contracted vs. Harvested



Team Contract Prices vs. All-Bushel Average



Profit Calculation

Profit per acre (gross profit from corn production) =

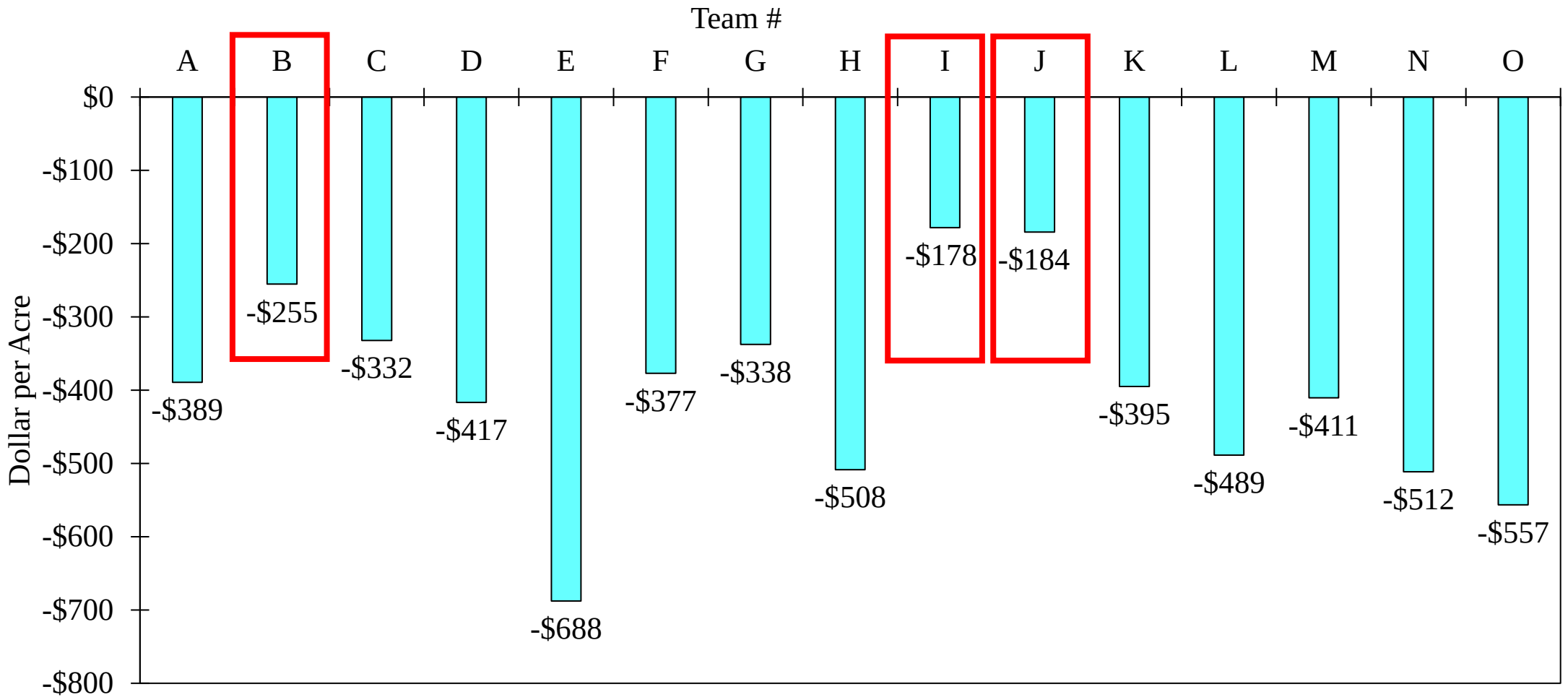
+Yield (bu/acre) times average farm-gate price ($/bu)

- STEP variable costs per acre

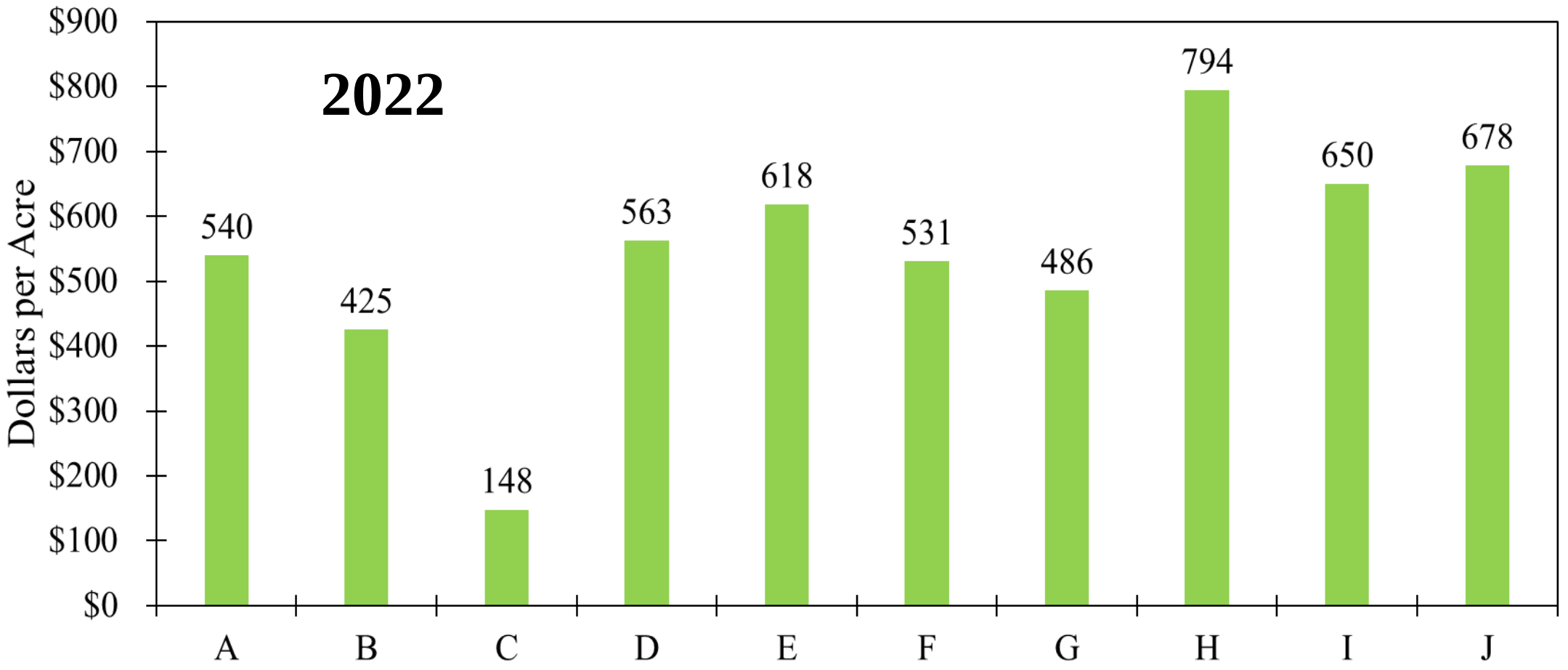
- Fixed production costs per acre

Average farm-gate price = weighted average delivered price minus $0.30/bu hauling charge.

Gross Profit (or Loss) per Acre (2024)



Gross Profit per Acre



Competition Results/ Awards

Thank you for your support!

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