



**University**  
*of* **Idaho**

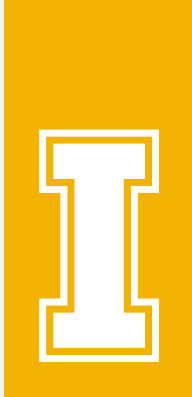
# **WHY ONIONS IN THE MIDDLE GET THE SHORT END**

**MIKE THORNTON, DERON BECK, KYLER BECK,  
RANSEY PORTENIER AND OKSANA MORGAN**

**PARMA RESEARCH AND EXTENSION CENTER**



Inner row stunting on drip irrigated onions- Parma, 2020



May 2020



August 2021



September 2021



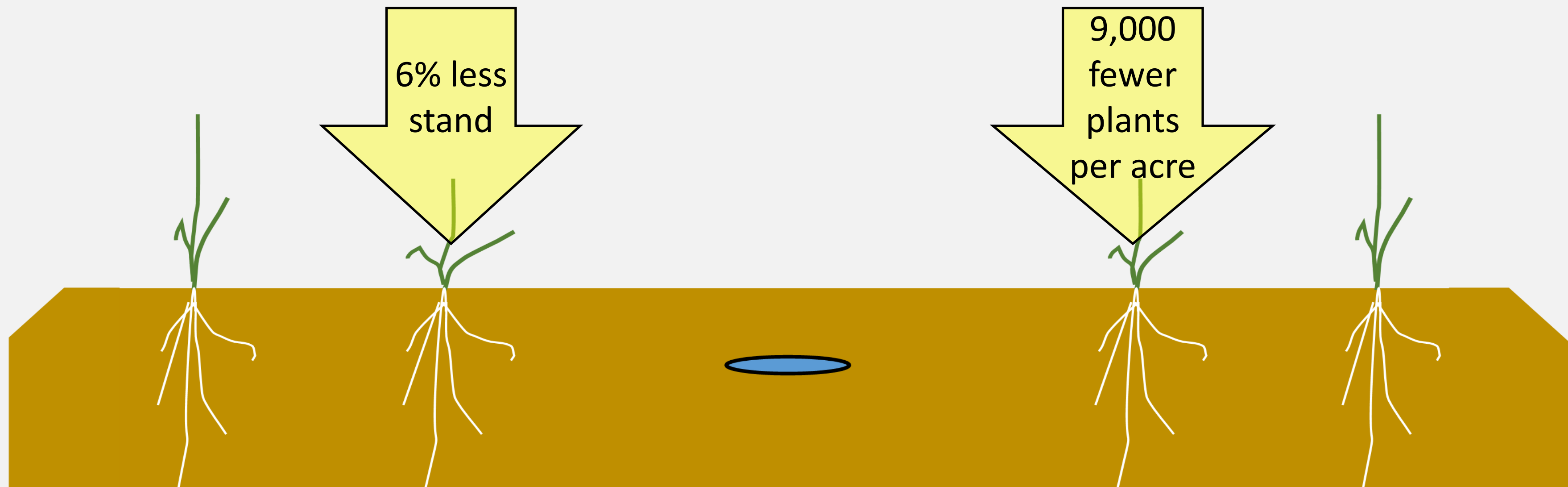
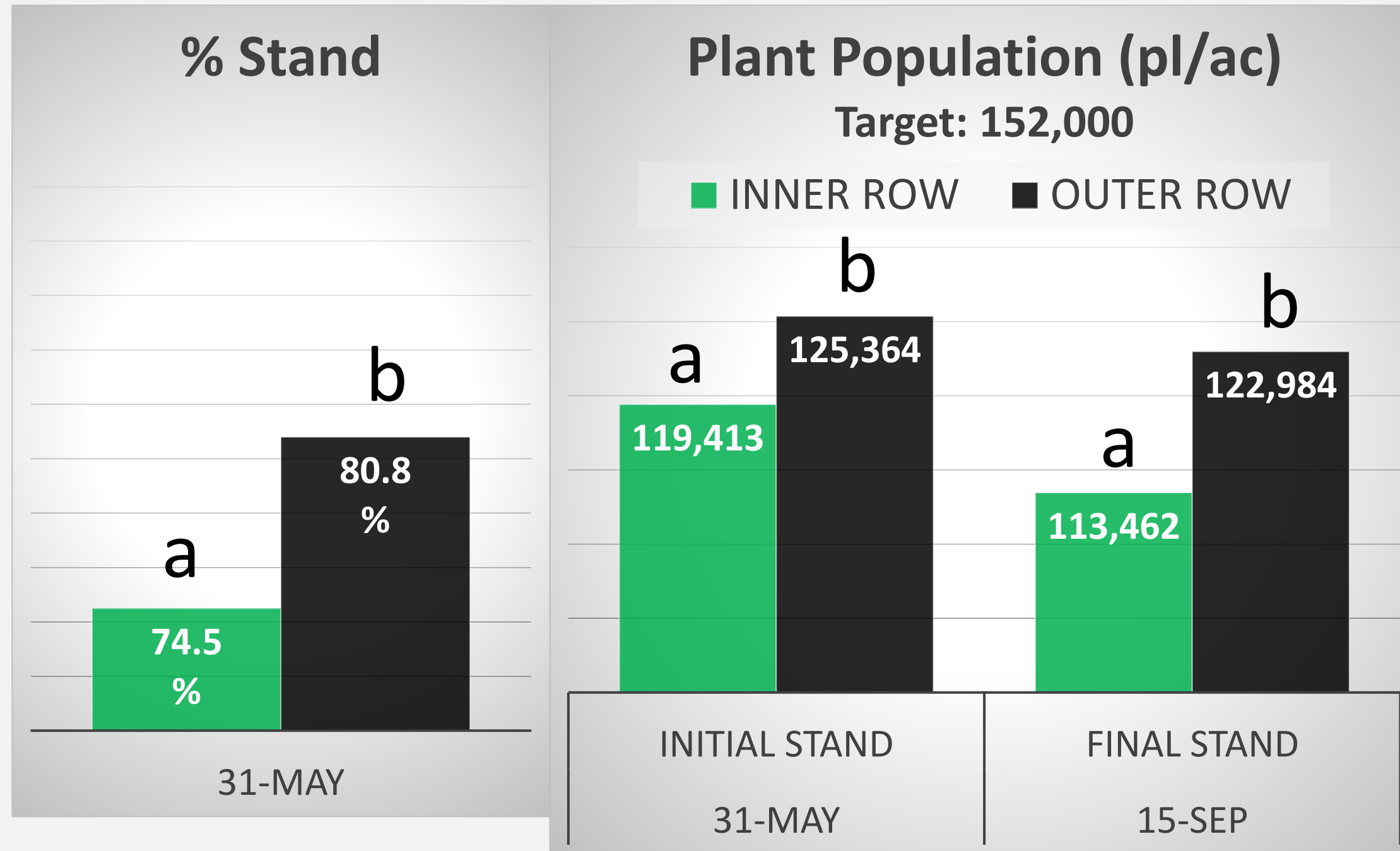
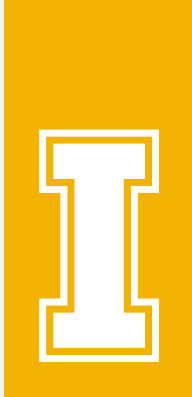
# KEY QUESTIONS

- Is it important?
- What causes it?
- Is there anything that can be done about it?

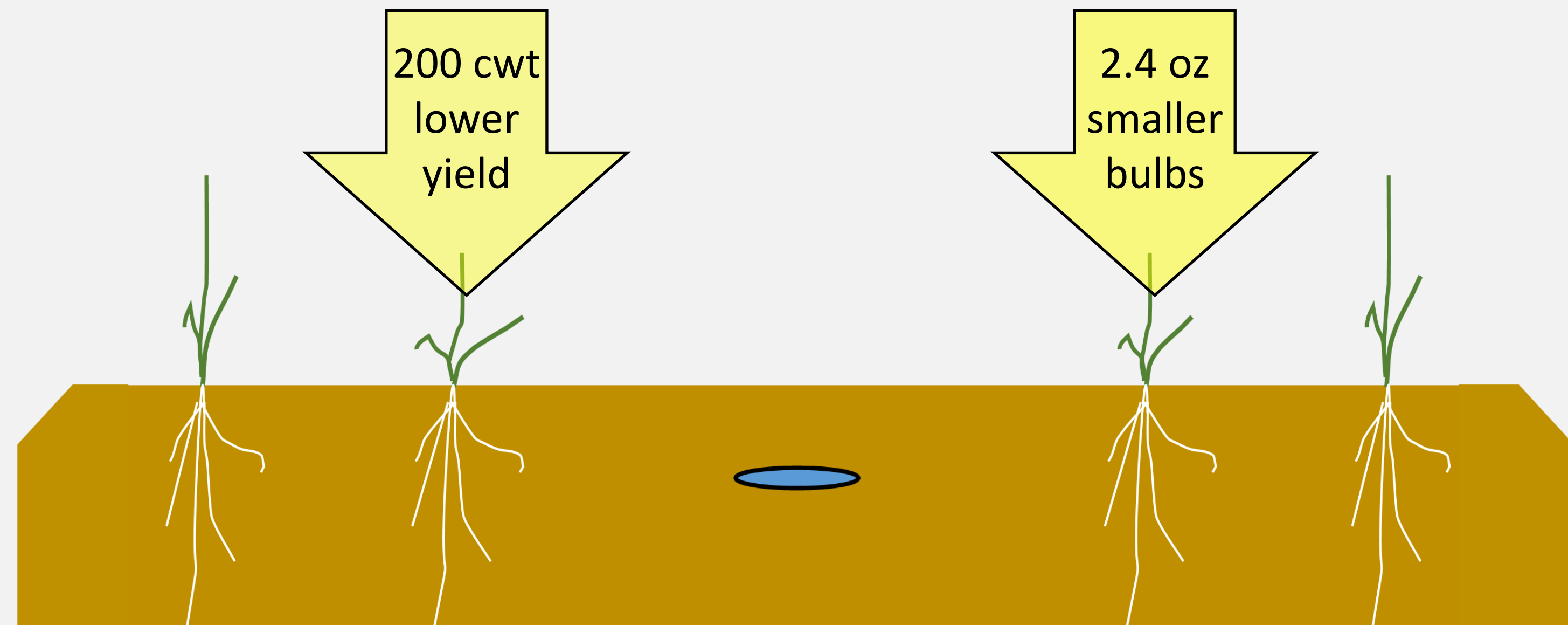
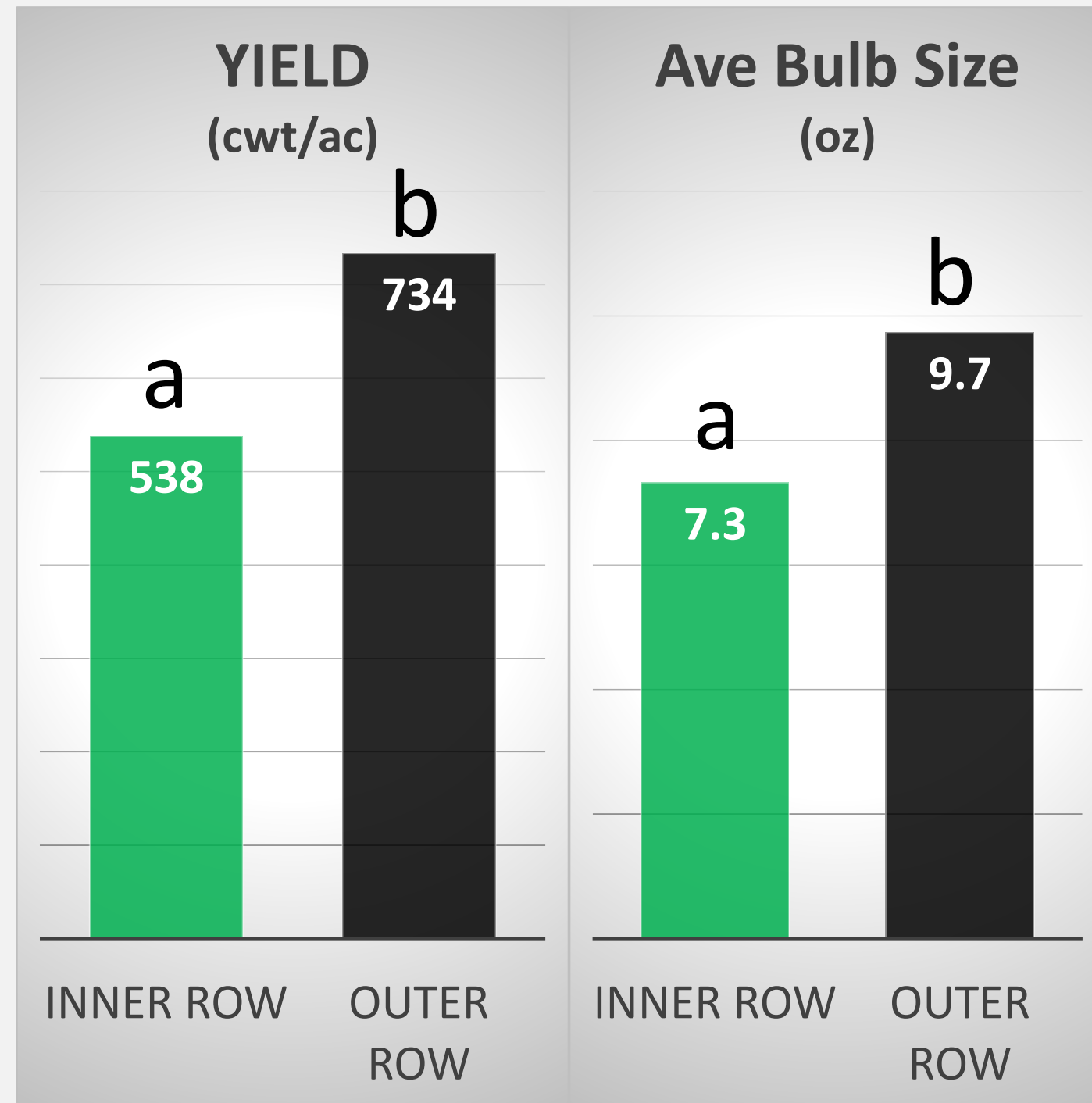
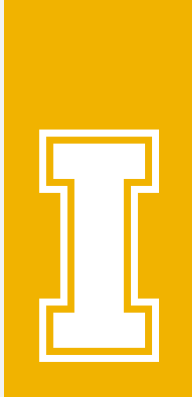




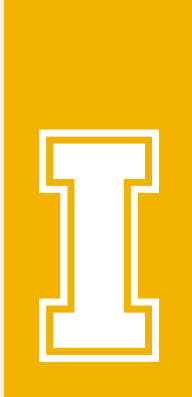
# 2021 Trial



# 2021 Trial



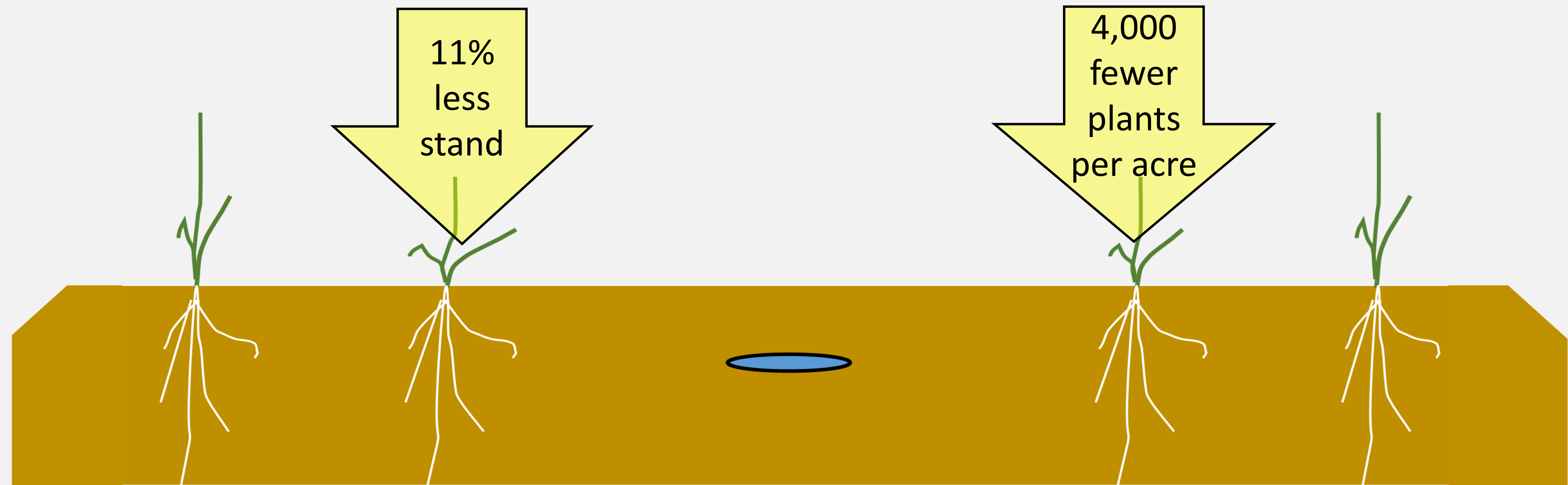
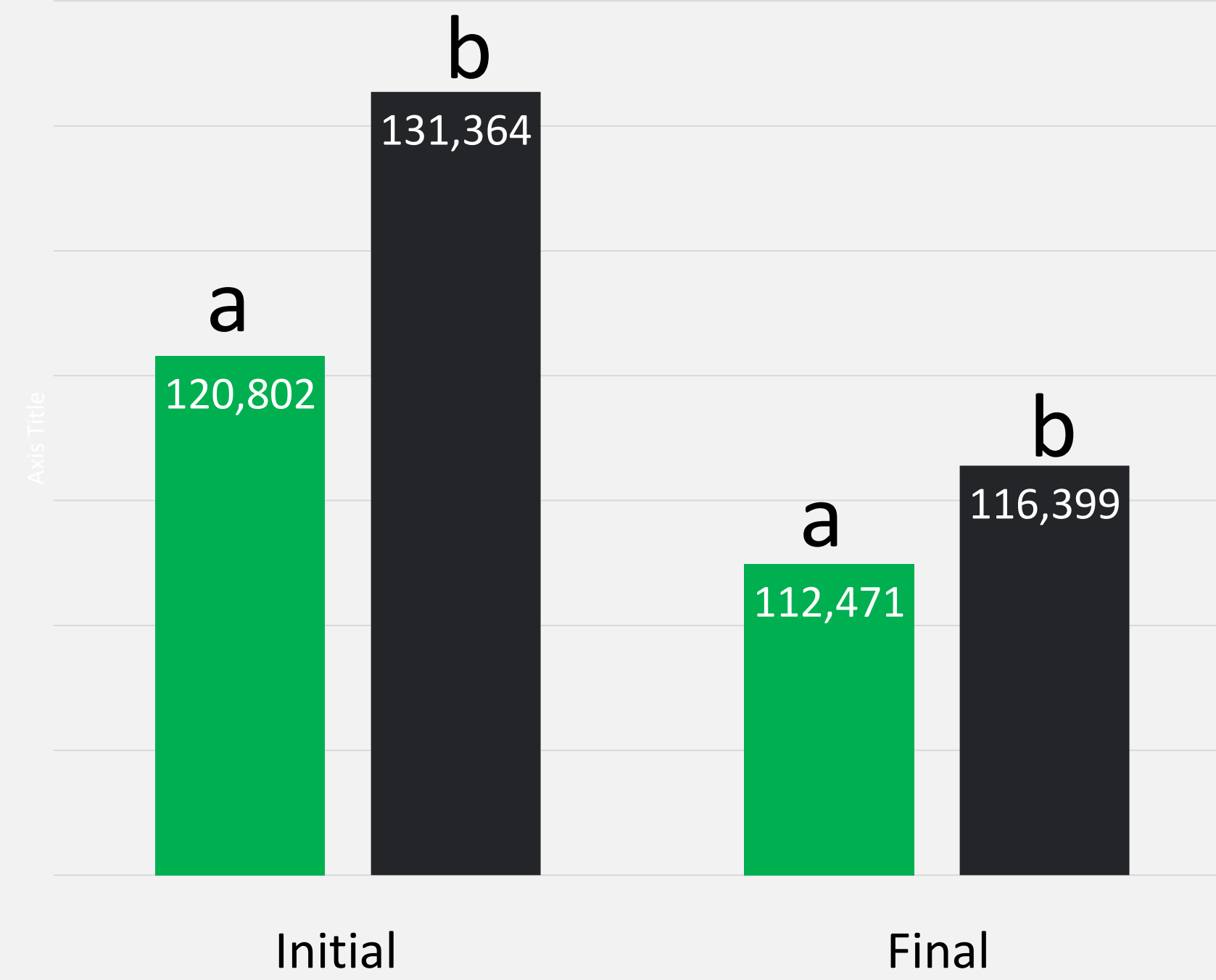
# 2022 Trial



### % Stand



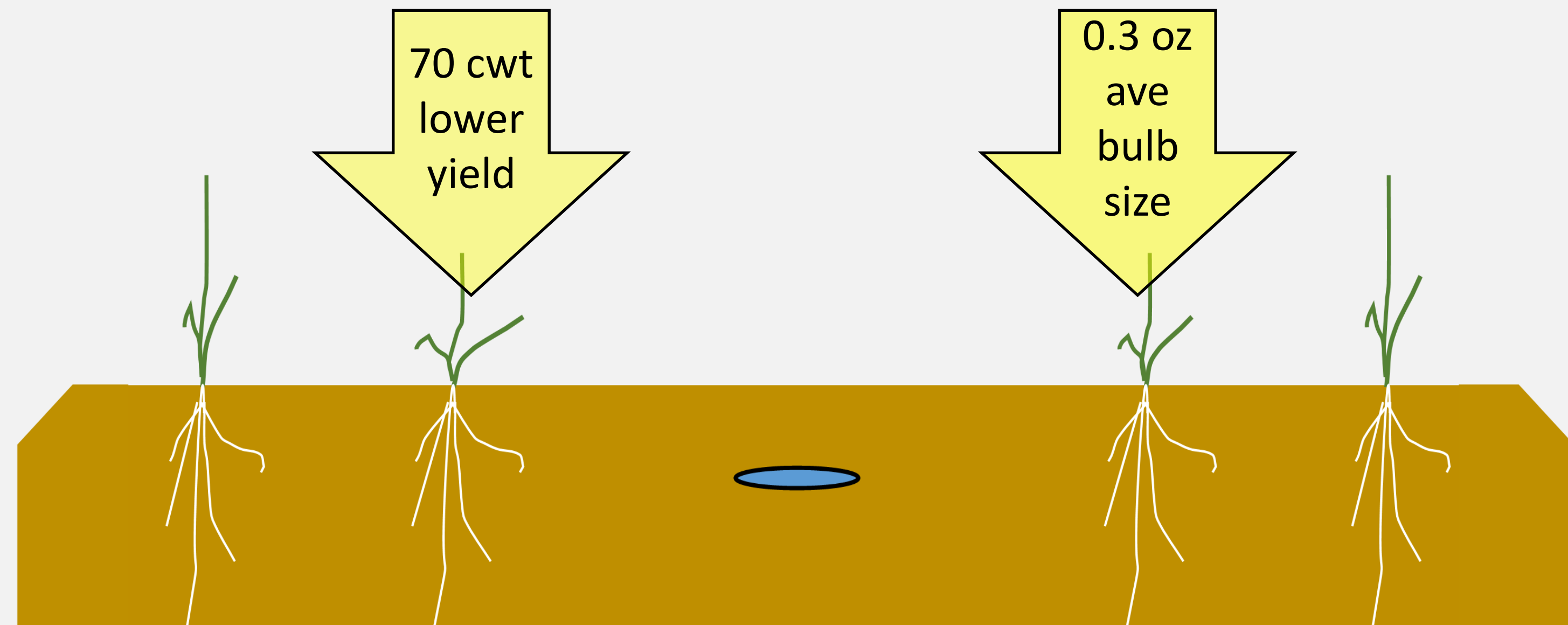
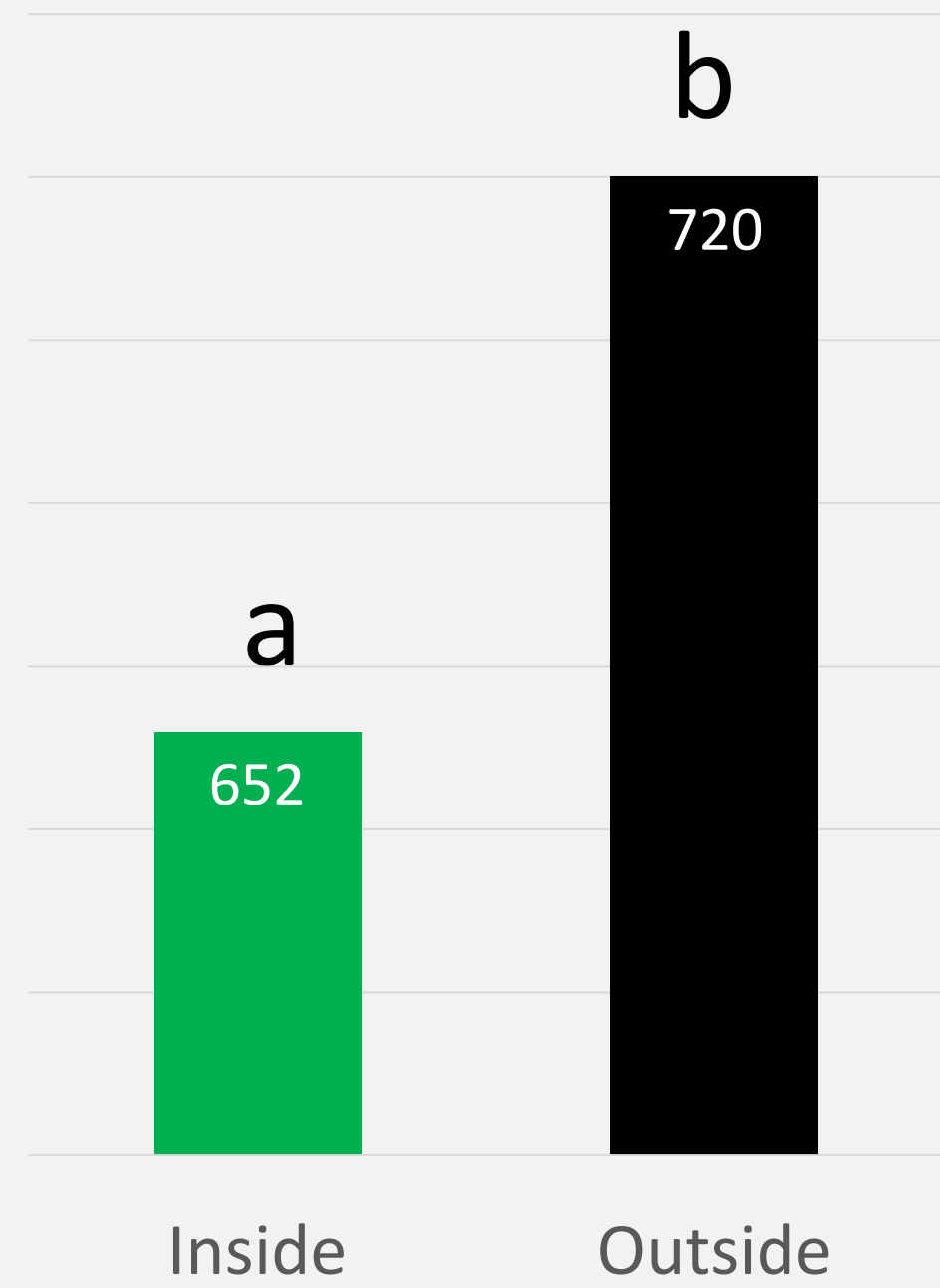
### Final Plant Population (pl/ac)





2022 Trial

2022 Trial



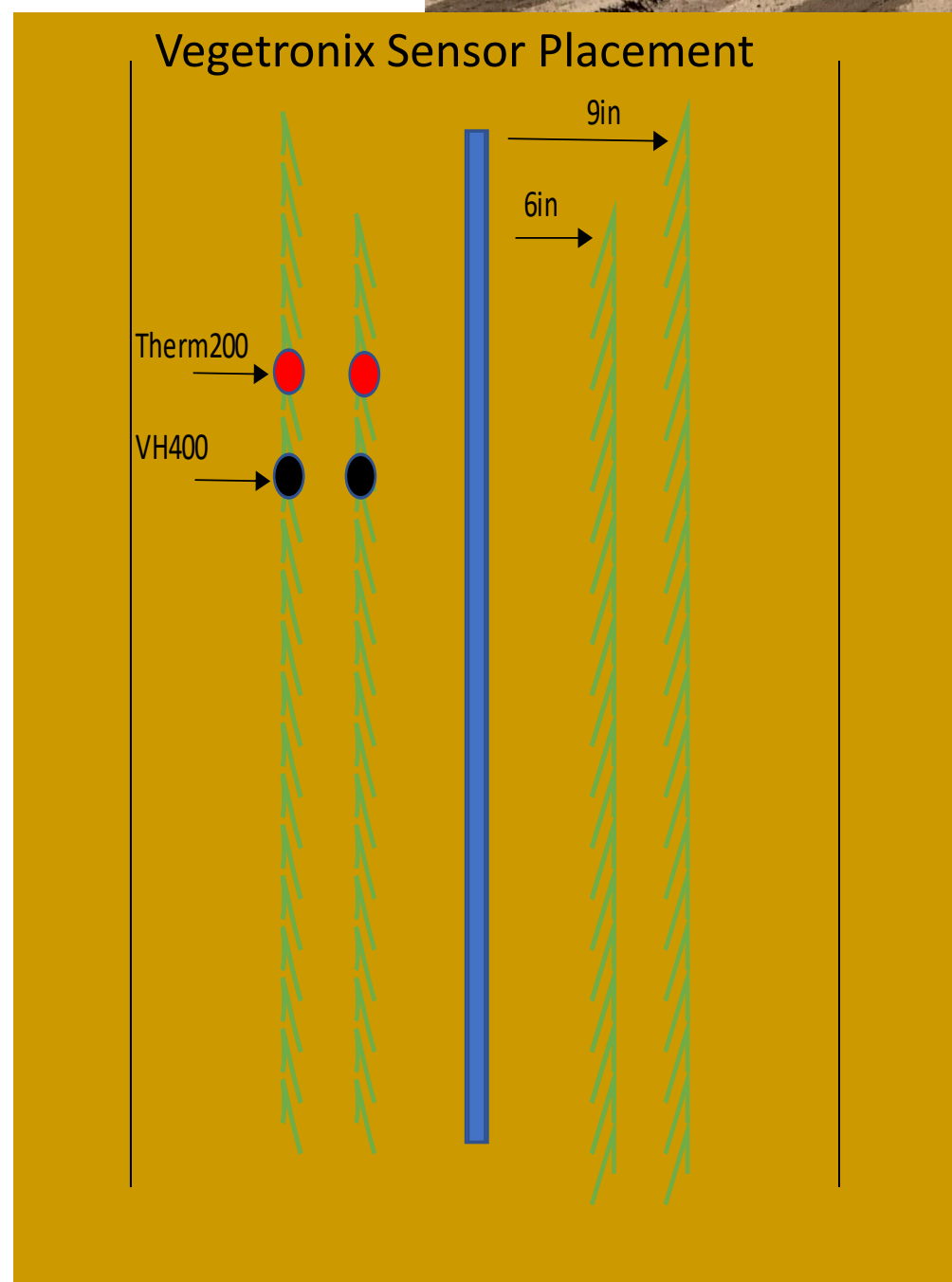
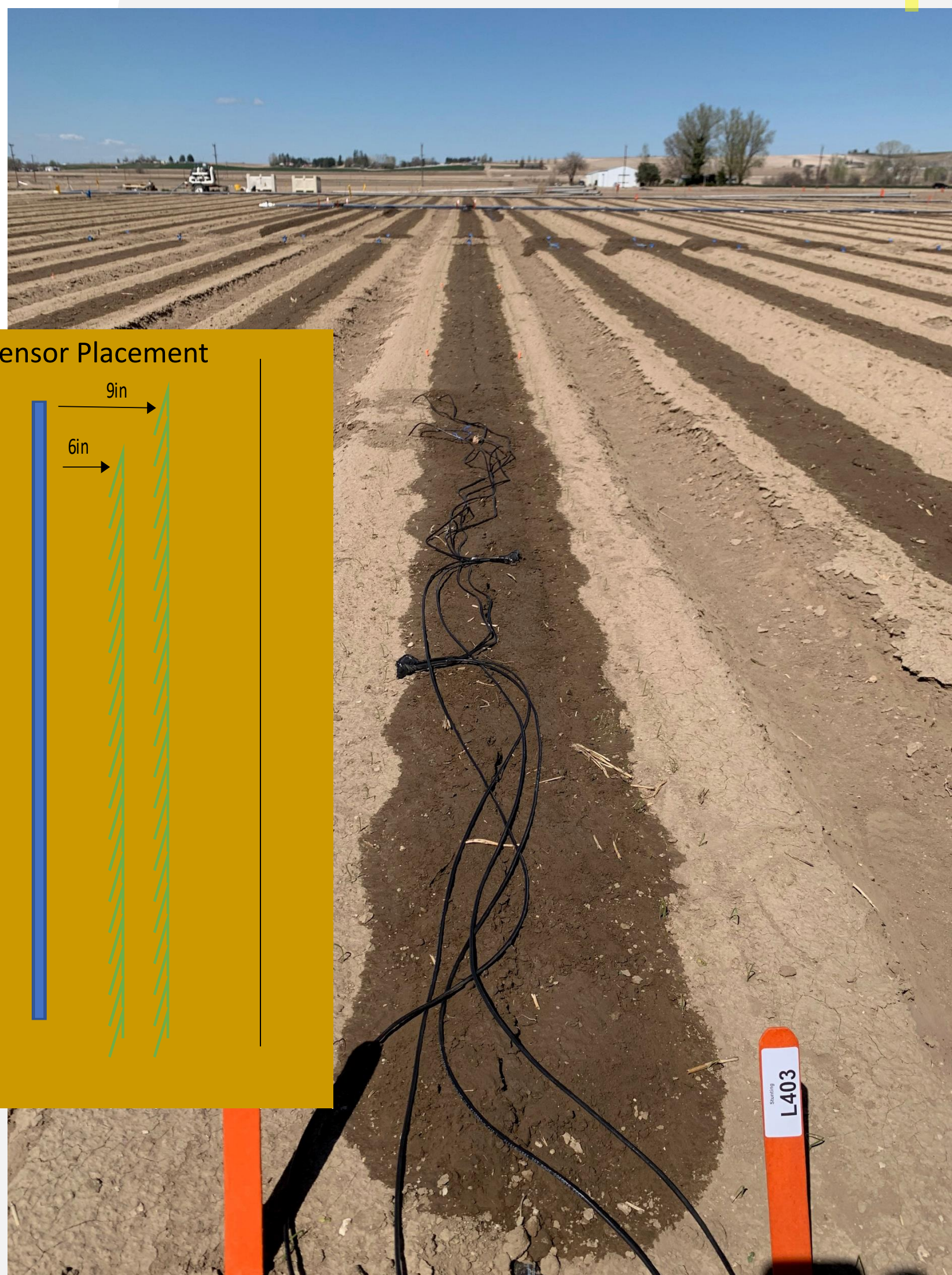
# KEY QUESTIONS

- Is it important?
- What causes it?
  - Fertilizer
  - Herbicide
  - Soil Moisture
  - Drip Placement
  - Other

Prior to fertilizer and herbicide applications

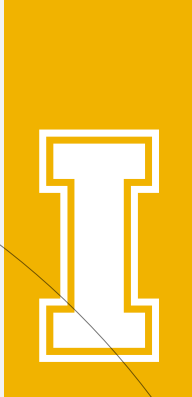






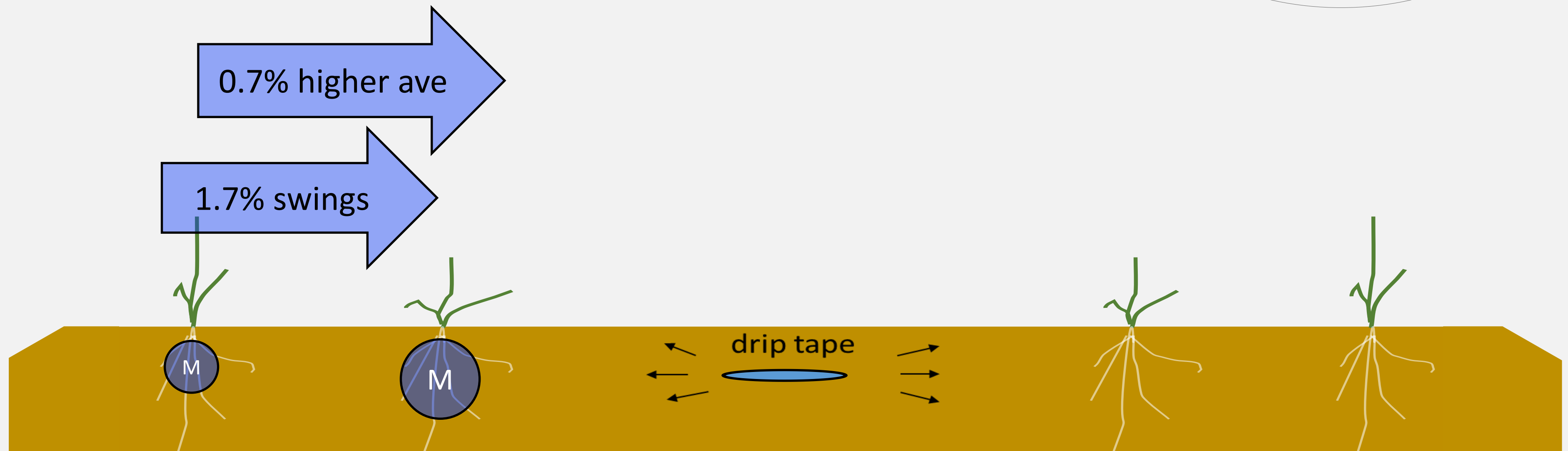
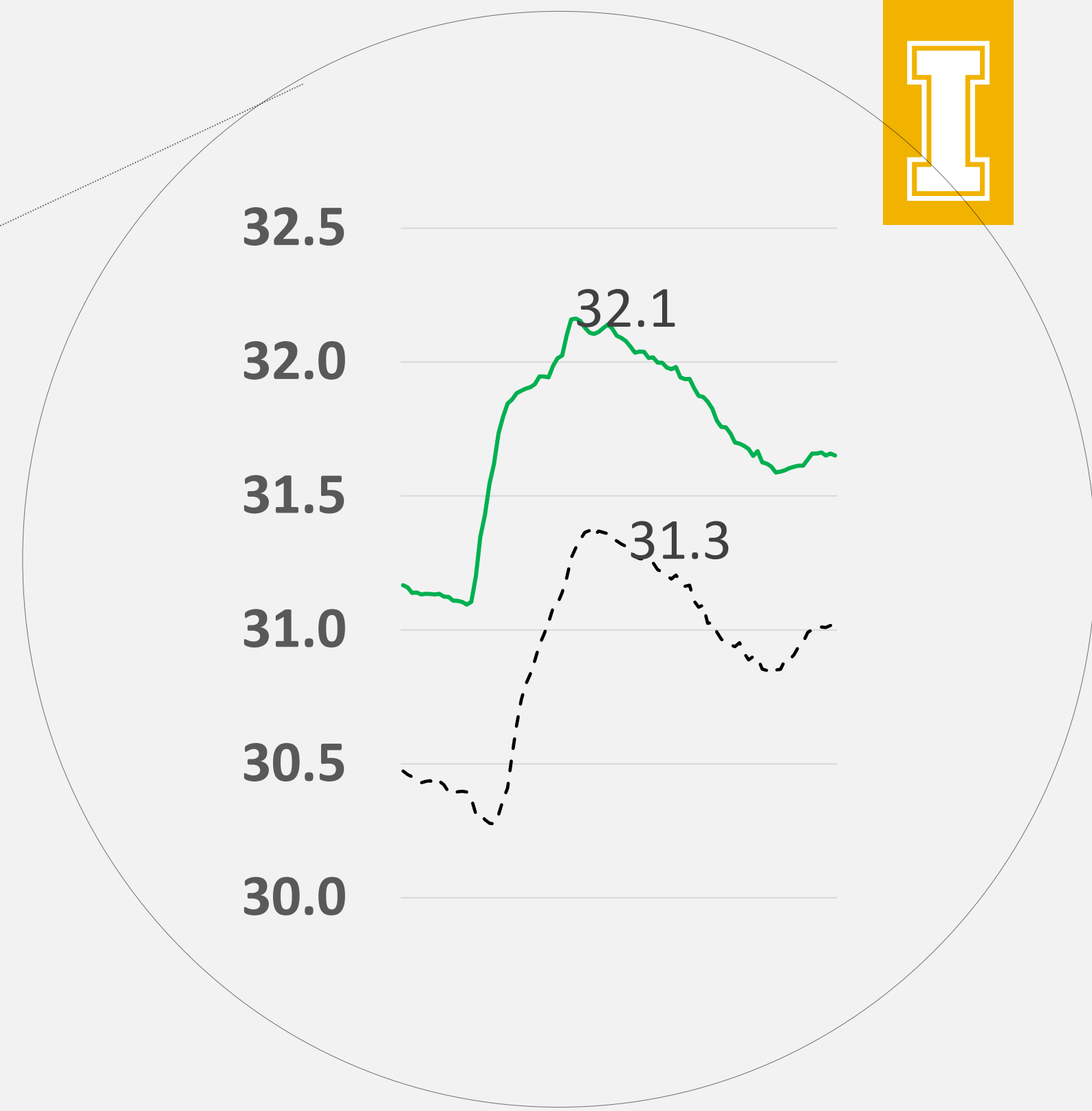
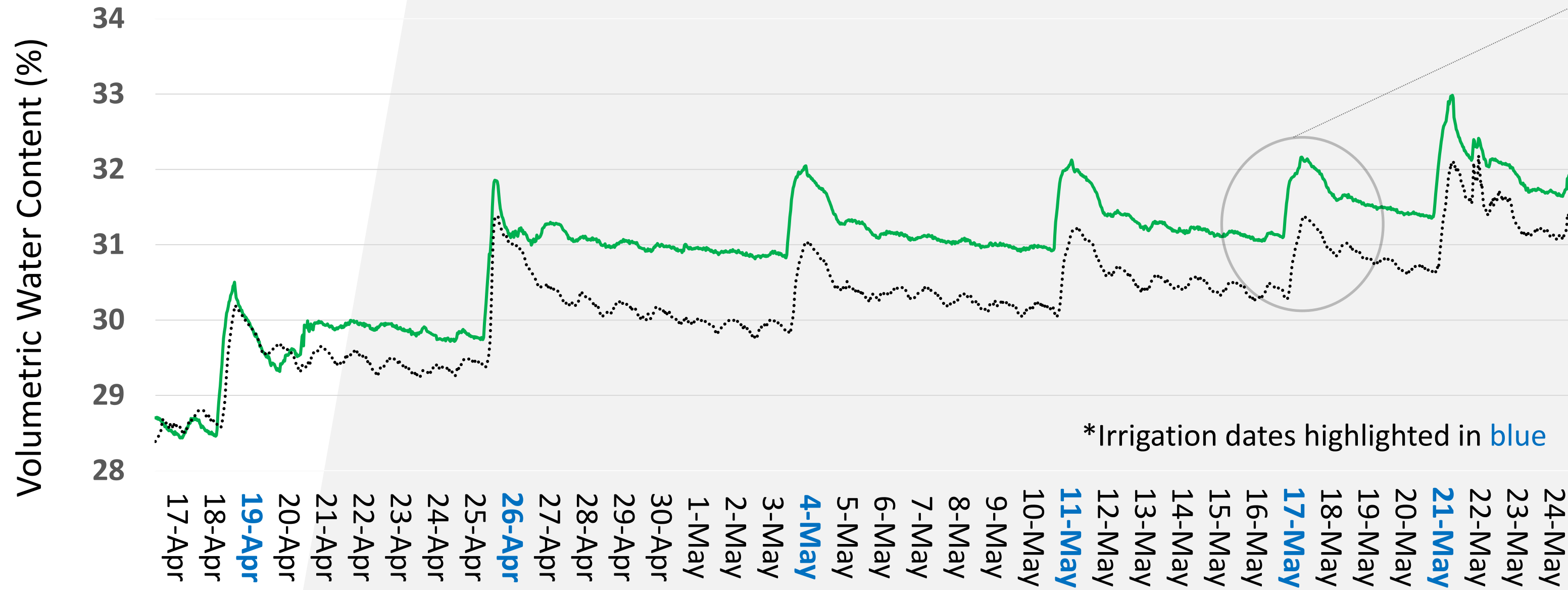


# 2021 Trial



## 2" Soil Moisture

— INSIDE ROW    ···· OUTSIDE ROW

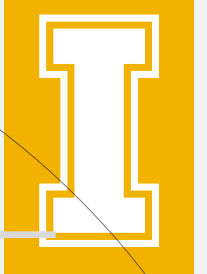
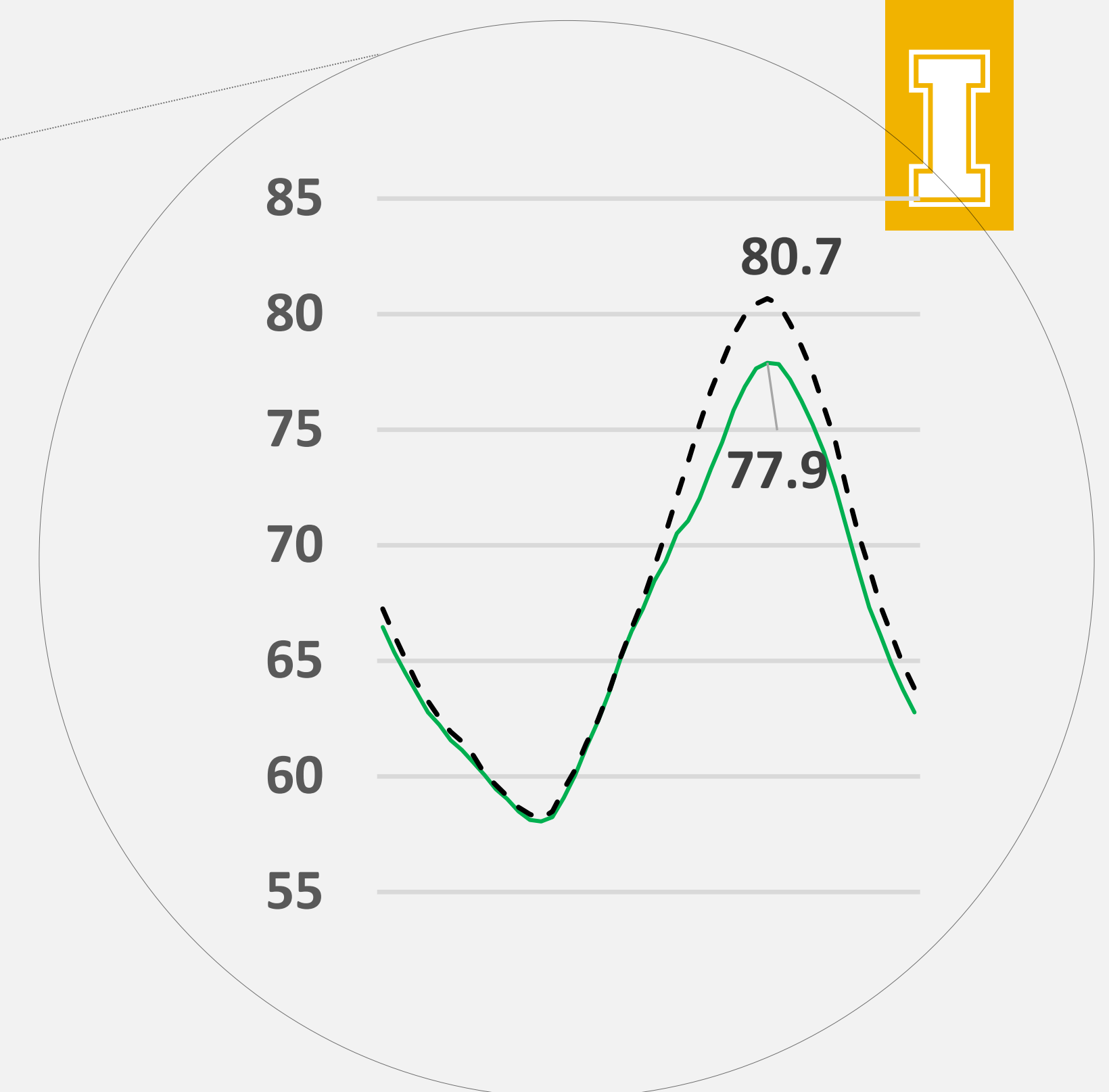
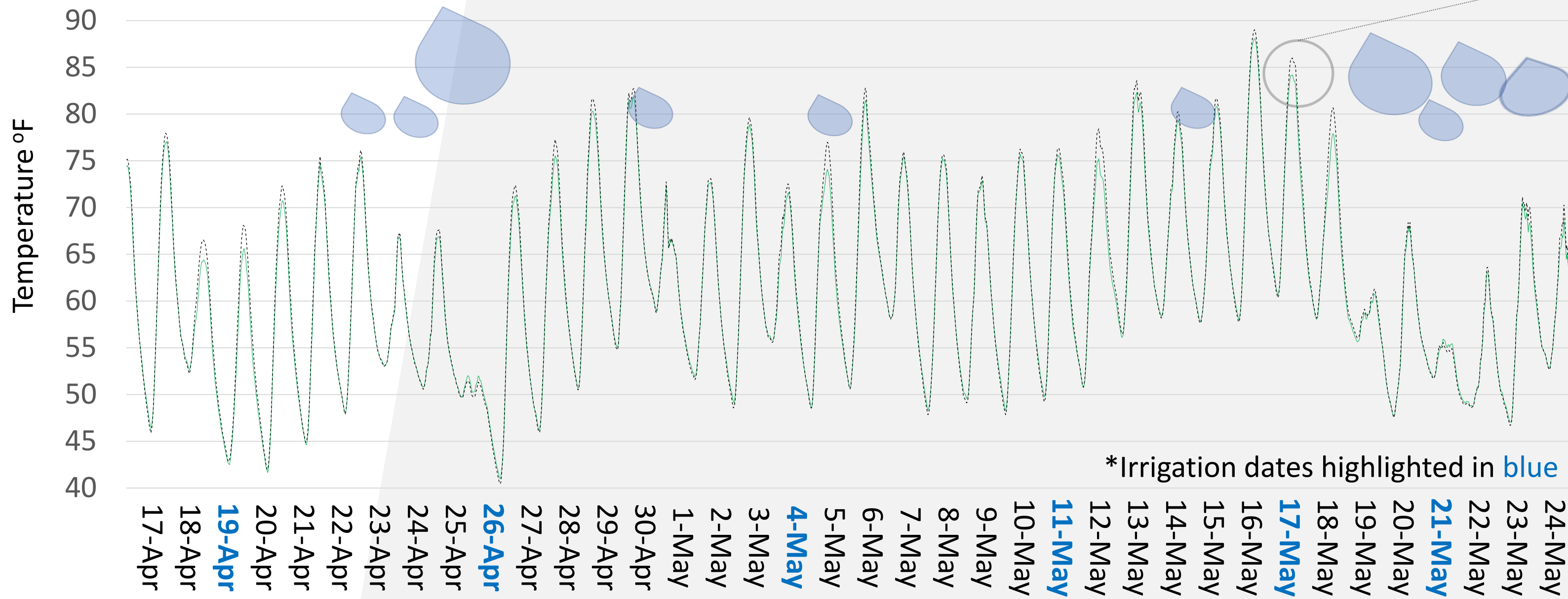




# 2021 Trial

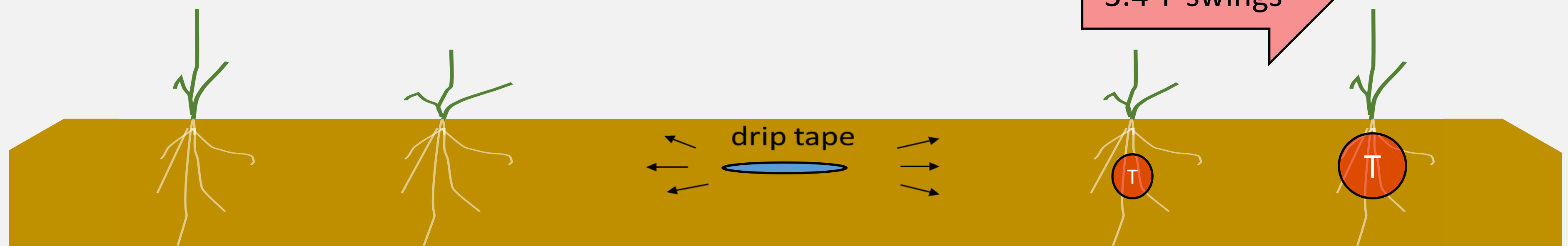
## 2" Soil Temperature °F

— INSIDE ROW    - - - - OUTSIDE ROW



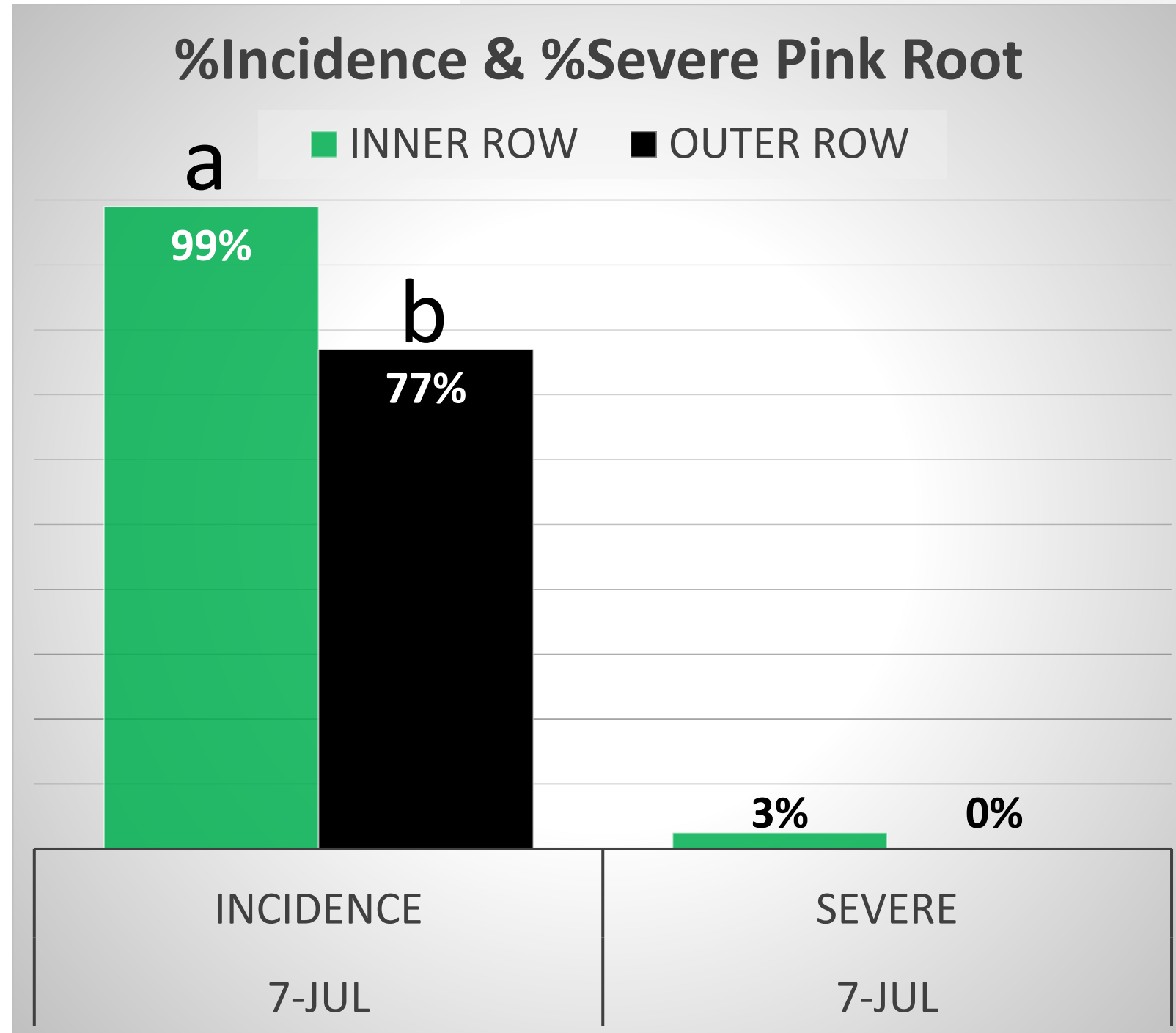
0.4°F higher ave

3.4°F swings

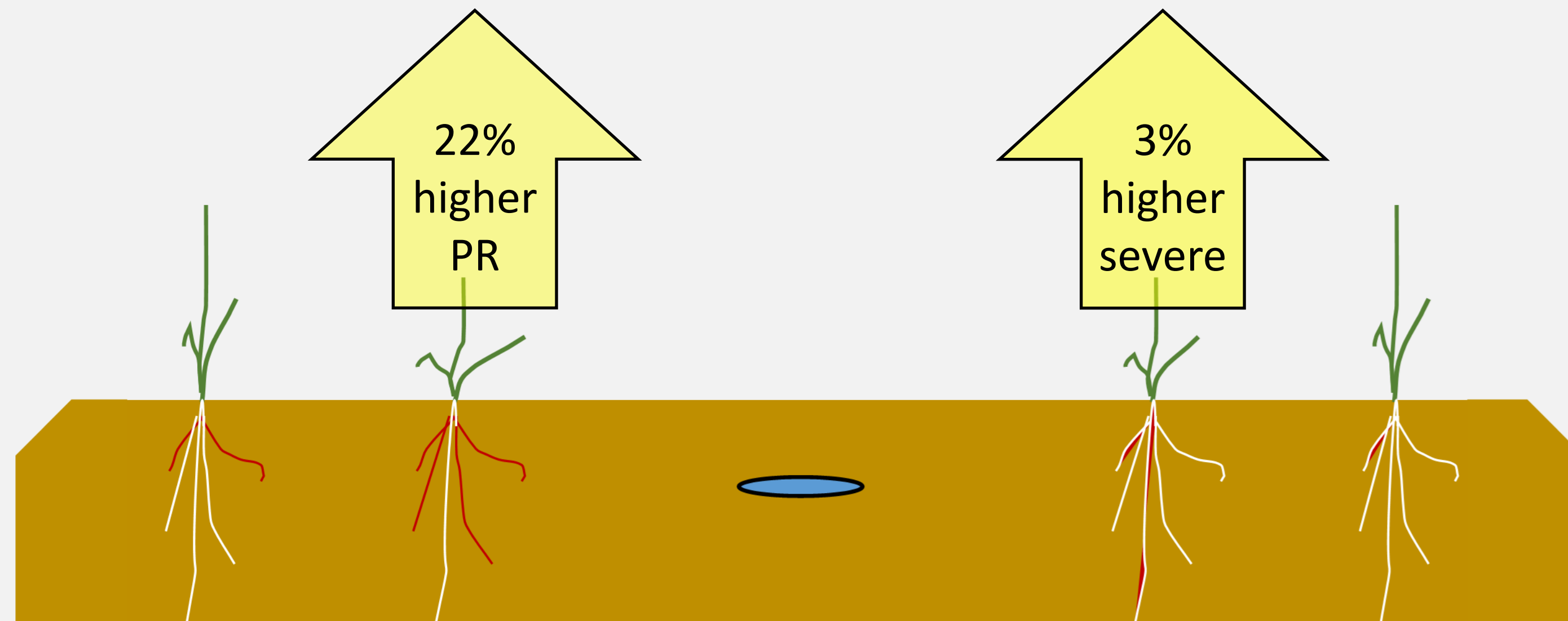




# 2021 Trial



Severe Infection  
>50% roots





**2021**

**Moisture & Temperature Monitor**

**Yield & Grade**

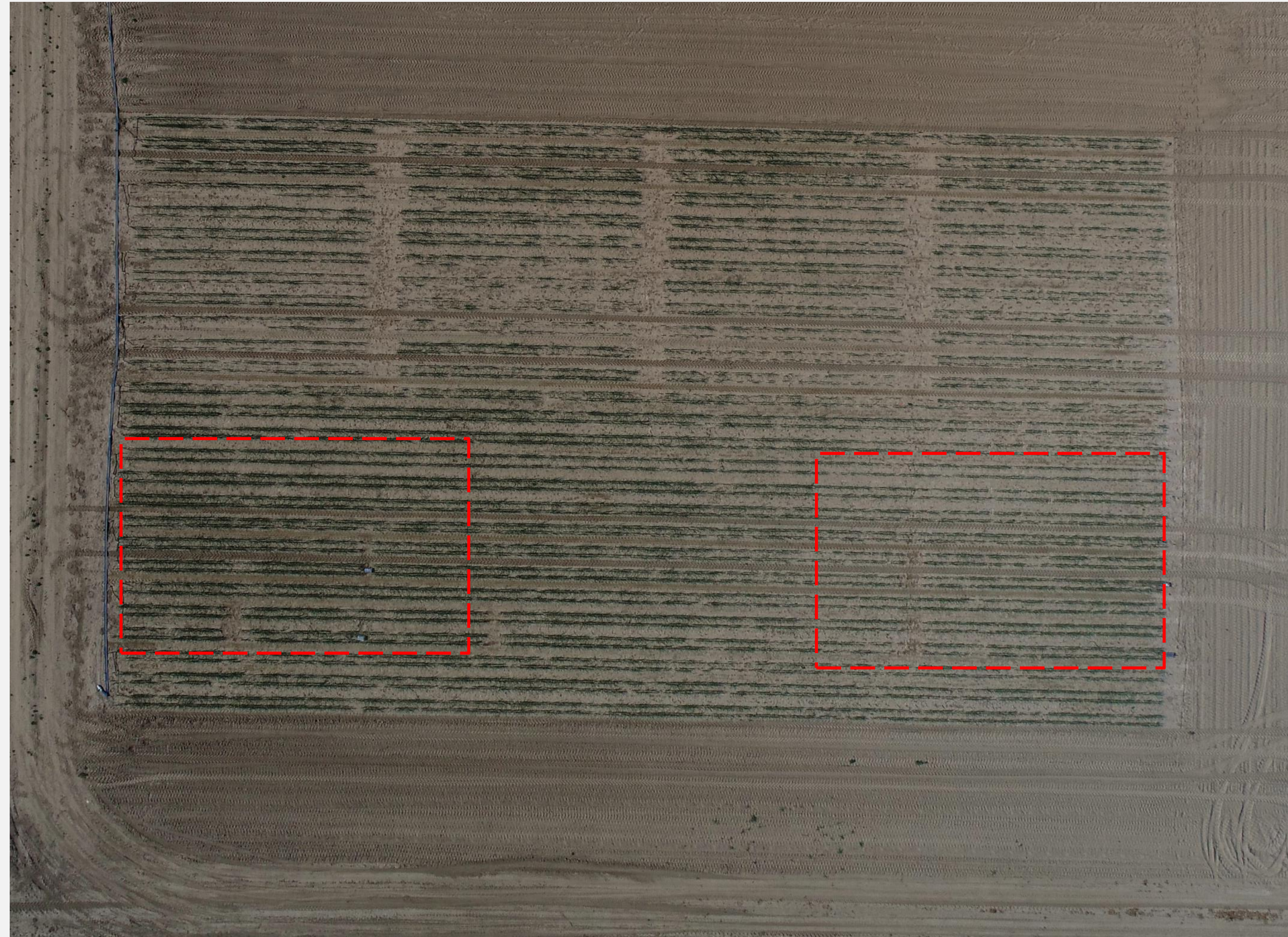
**Pink Root Severity**

**2022**

**Row Compaction**

**Soil Testing NO<sub>3</sub>, Salinity & pH**

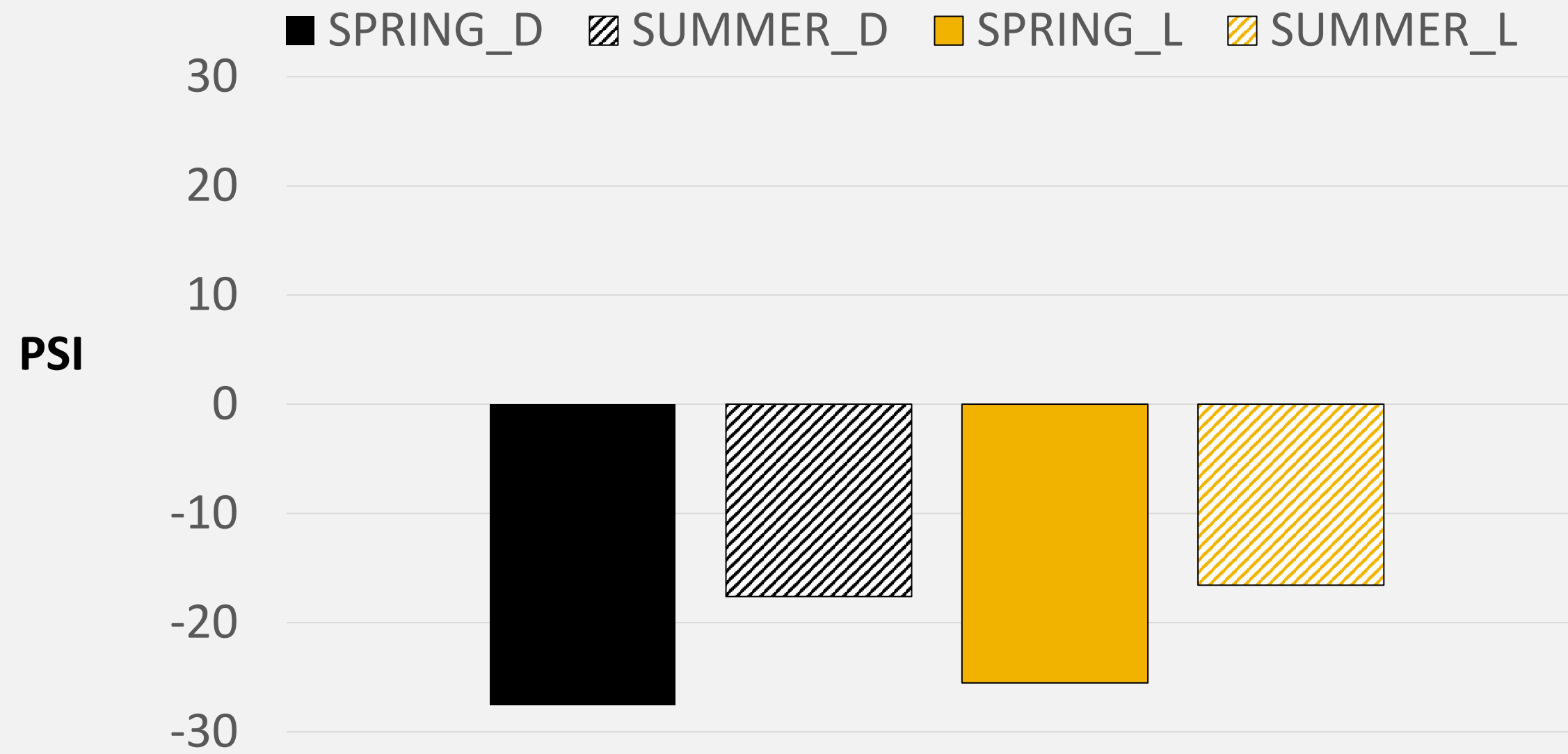
**Soil Type Differences (Dark vs Light)**



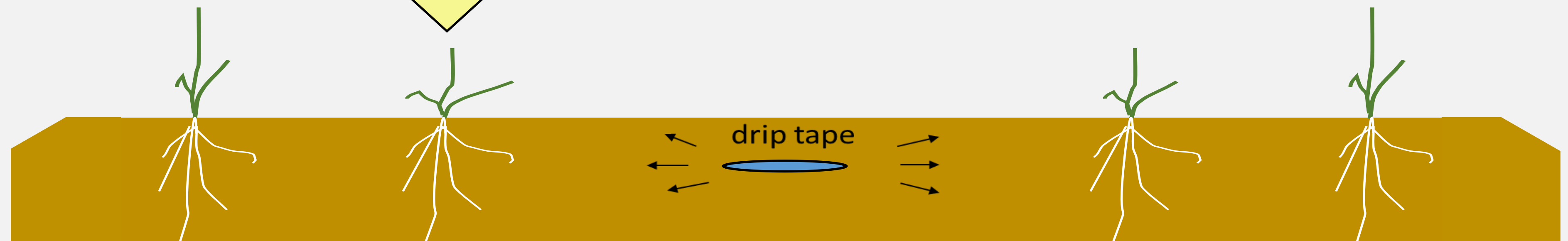




# Penetrometer @ 2" depth [Inside – Outside]



25 psi  
lower  
@ 2in

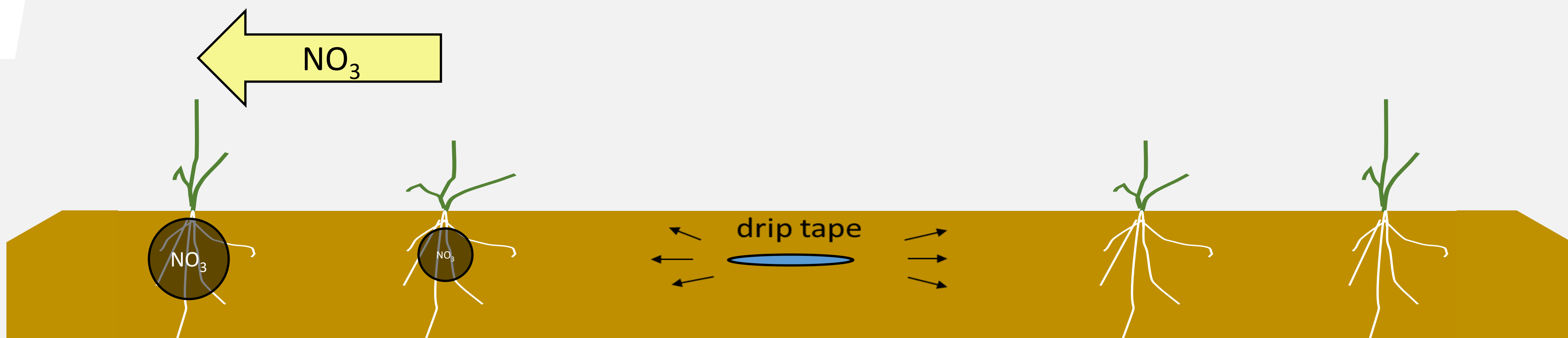
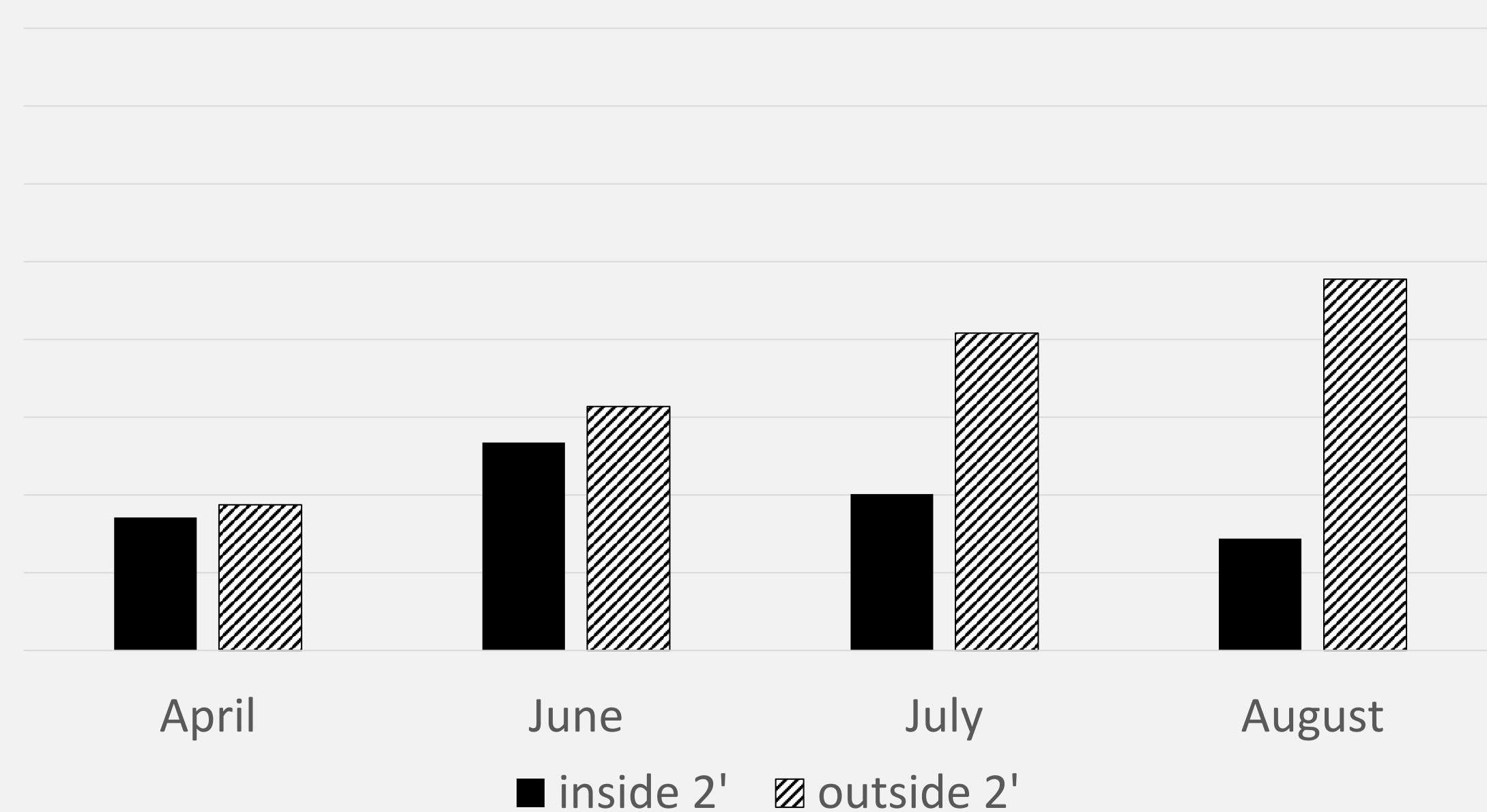
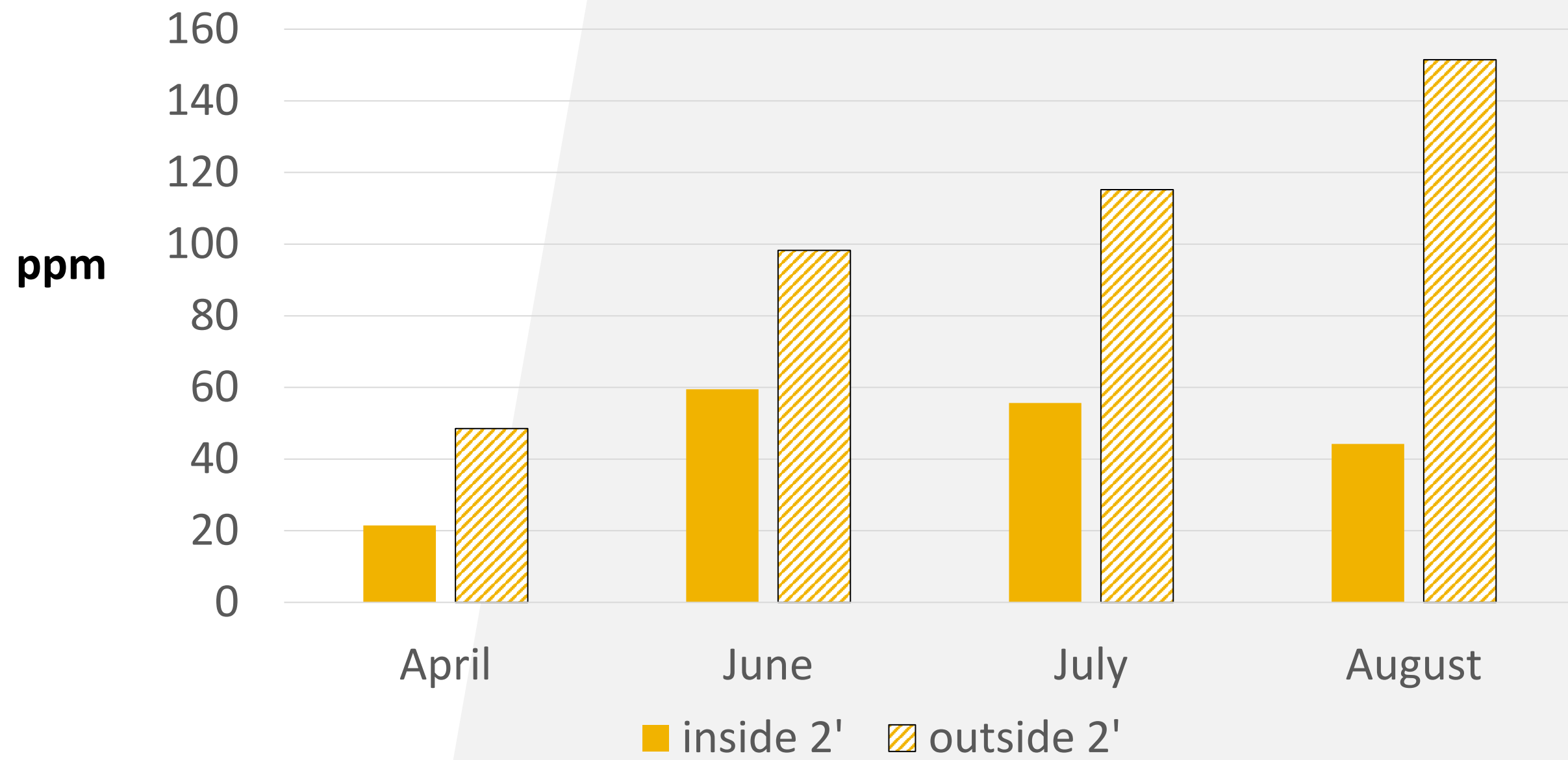






Light Soil Nitrates ( $\text{NO}_3$ )  
2" depth

Dark Soil Nitrates ( $\text{NO}_3$ )  
2" depth

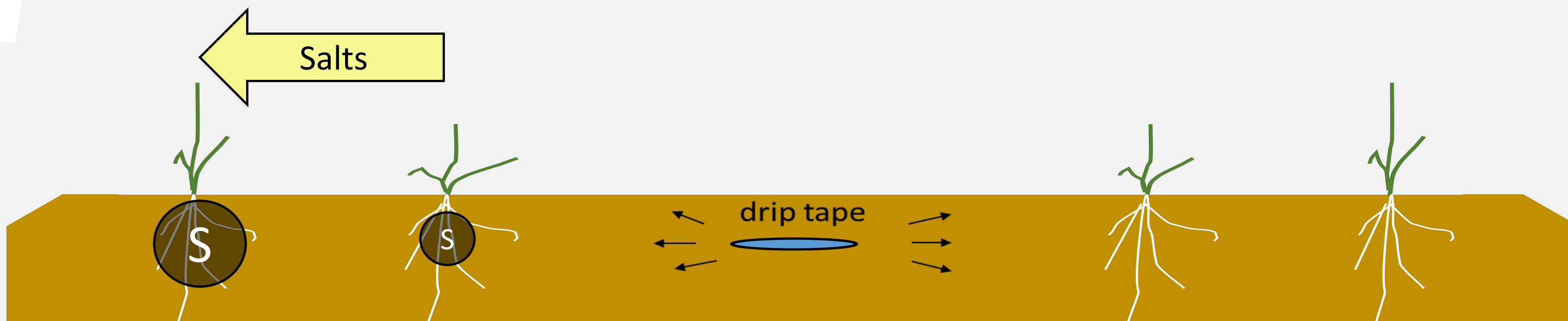
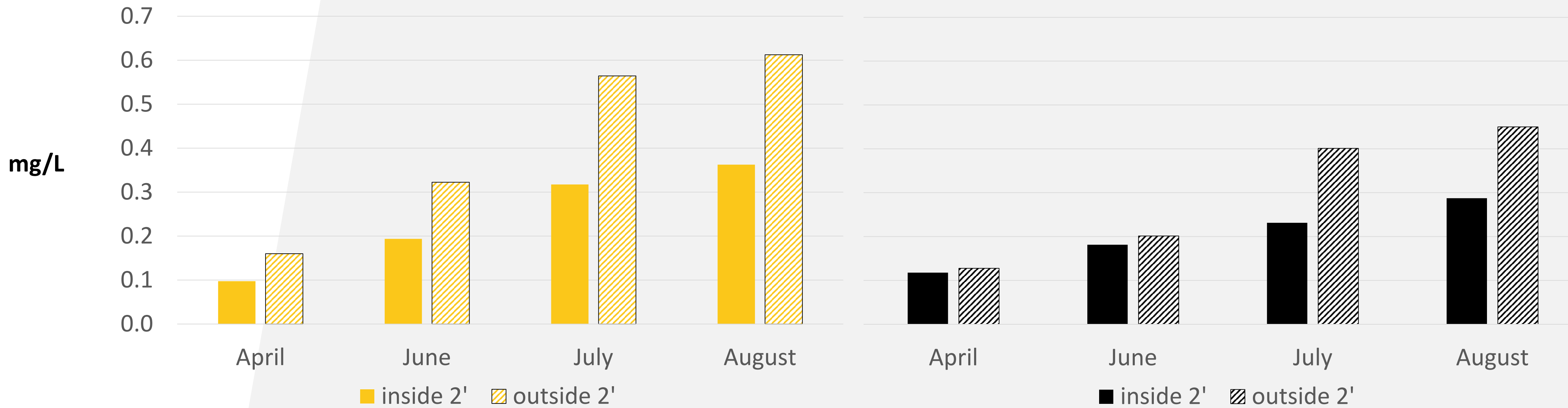






### Light Soil Salinity 2" depth

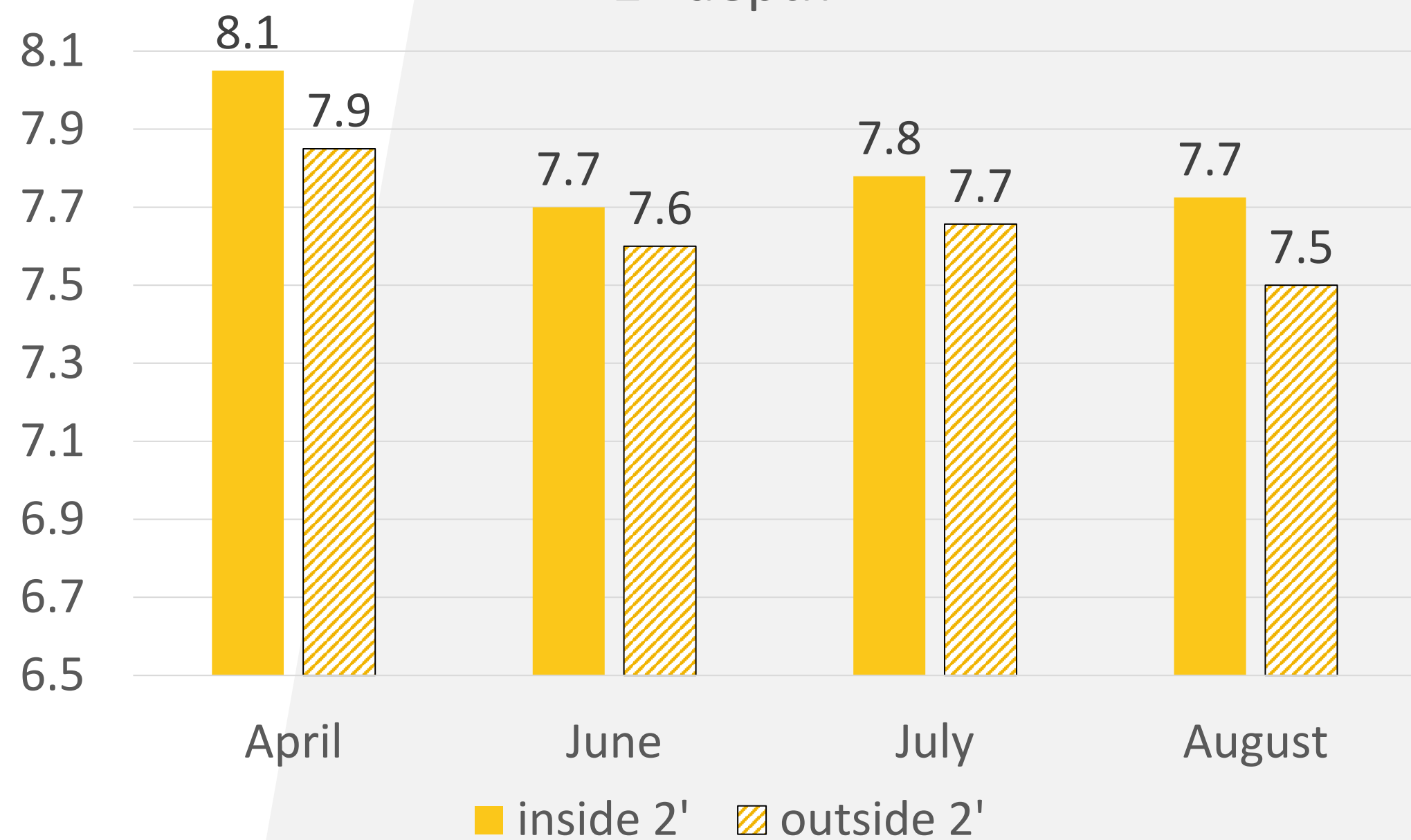
### Dark Soil Salinity 2" depth



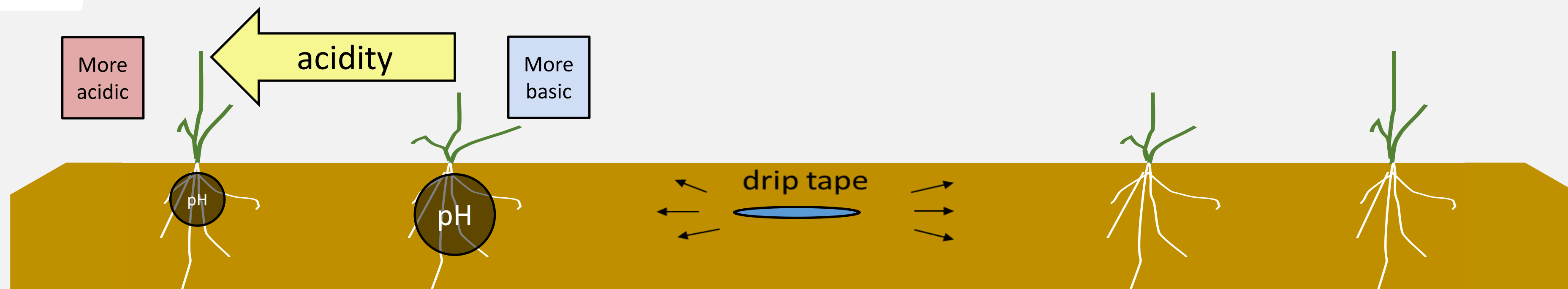
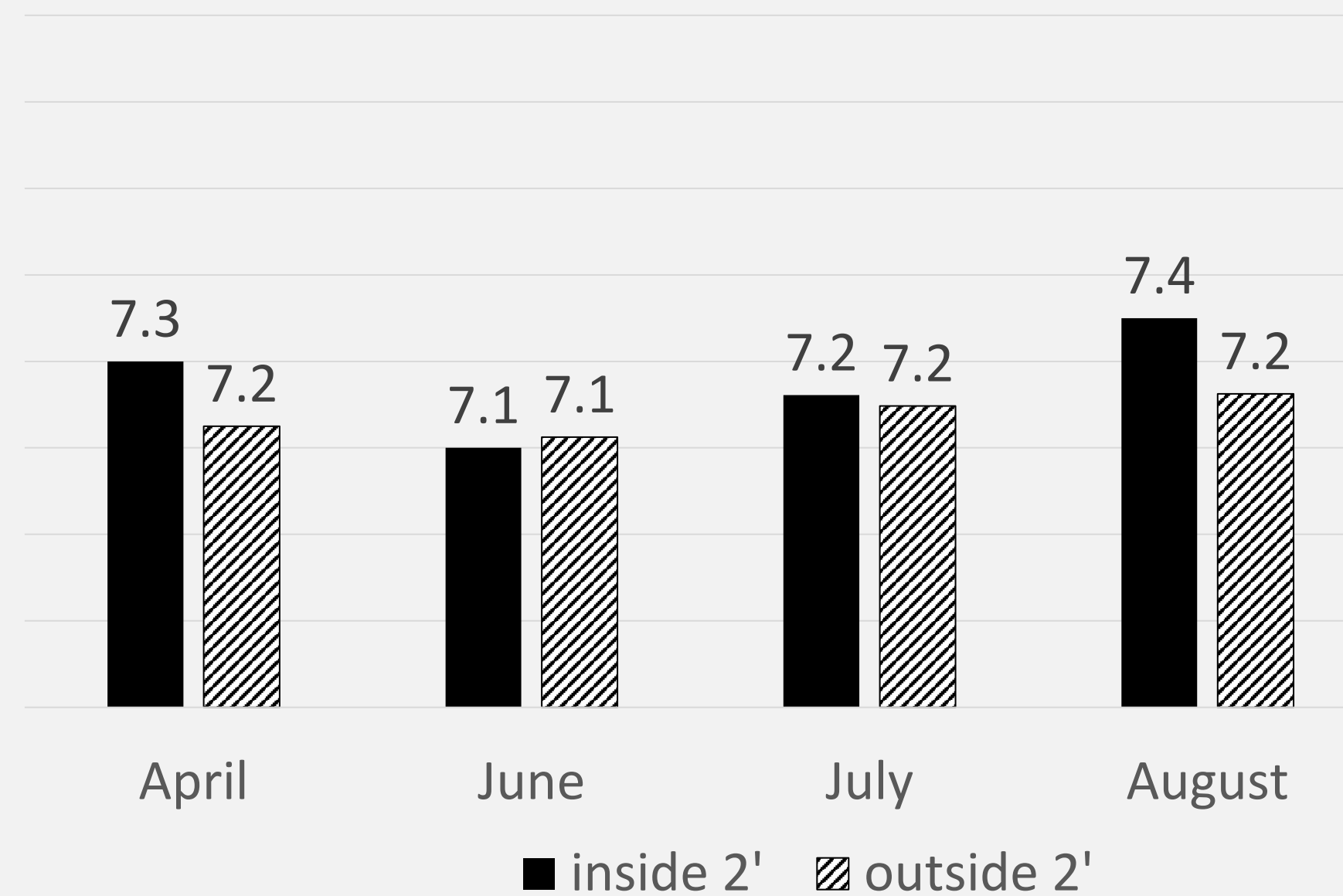




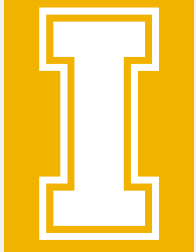
Light Soil pH  
2" depth



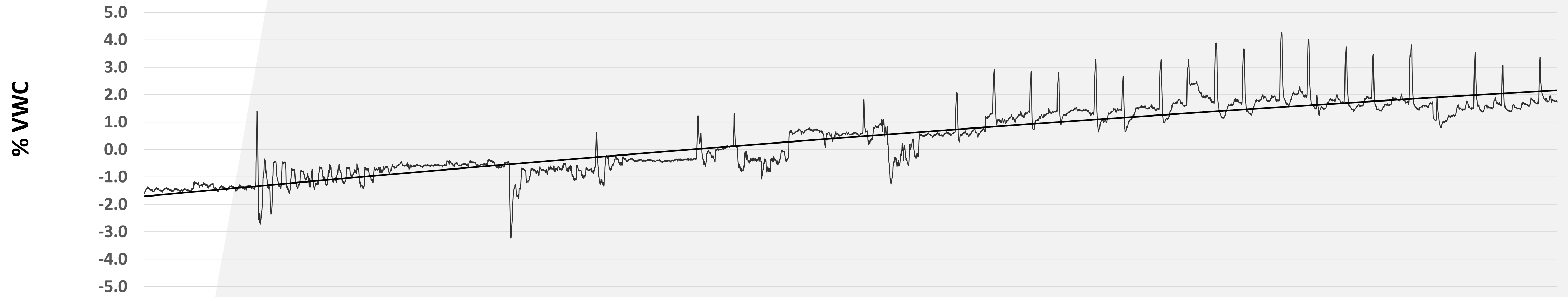
Dark Soil pH  
2" depth



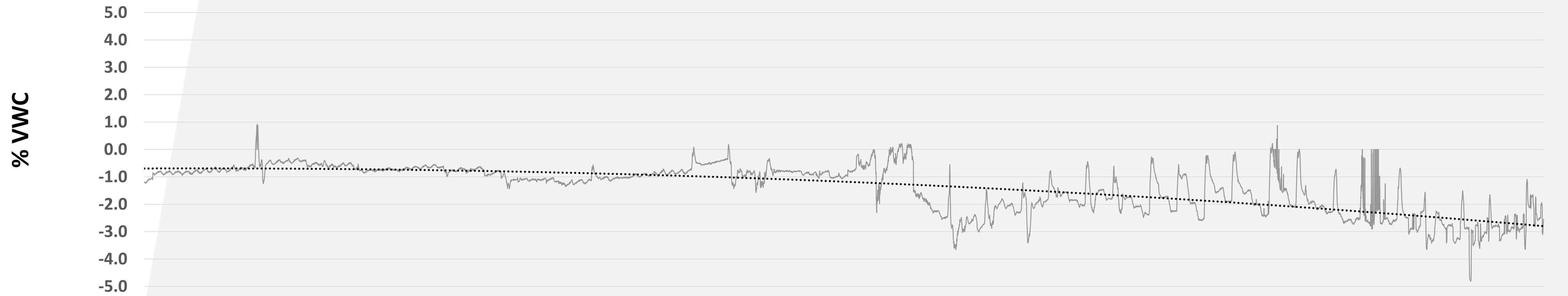




Soil Moisture Difference  
[inside – outside]  
Dark Soil



Soil Moisture Difference  
[inside – outside]  
Light Soil



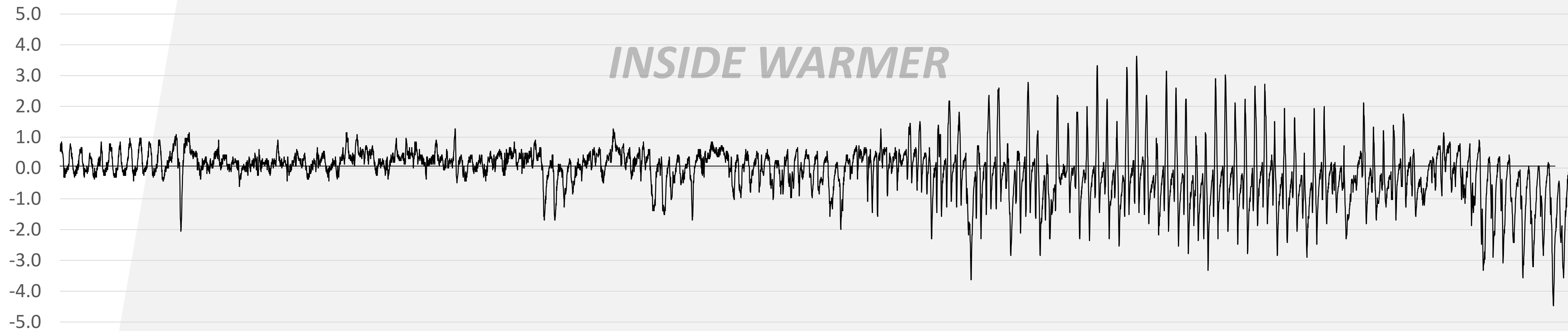
MARCH APRIL MAY JUNE JULY AUGUST





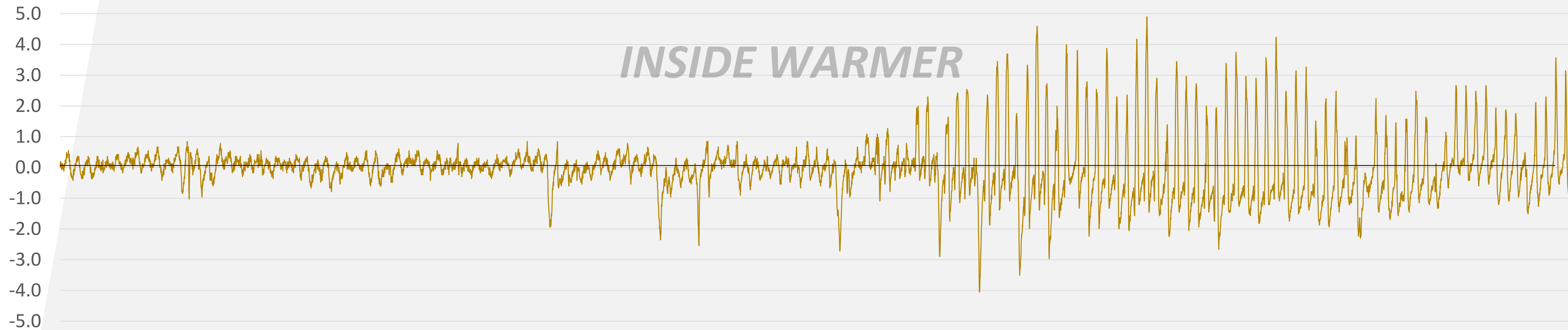
Temperature Difference  
[inside – outside]  
Dark Soil

*INSIDE WARMER*



Temperature Difference  
[inside – outside]  
Light Soil

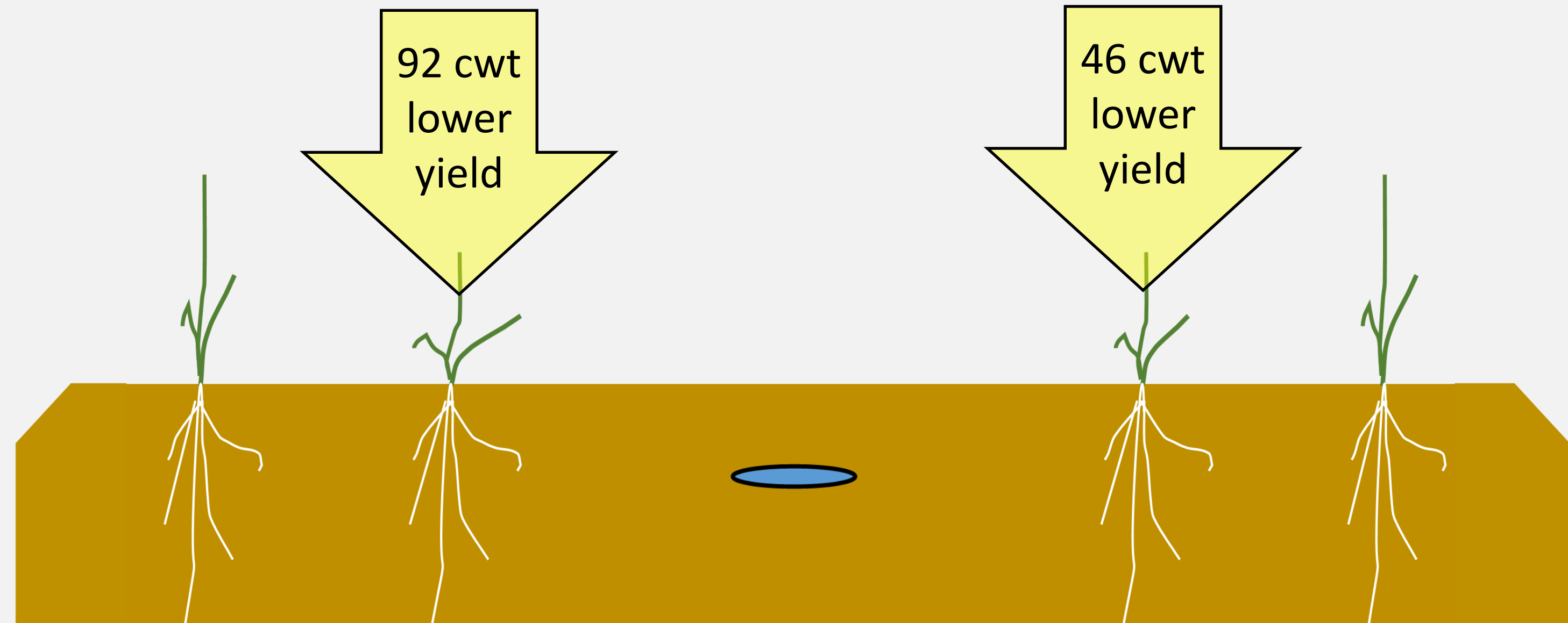
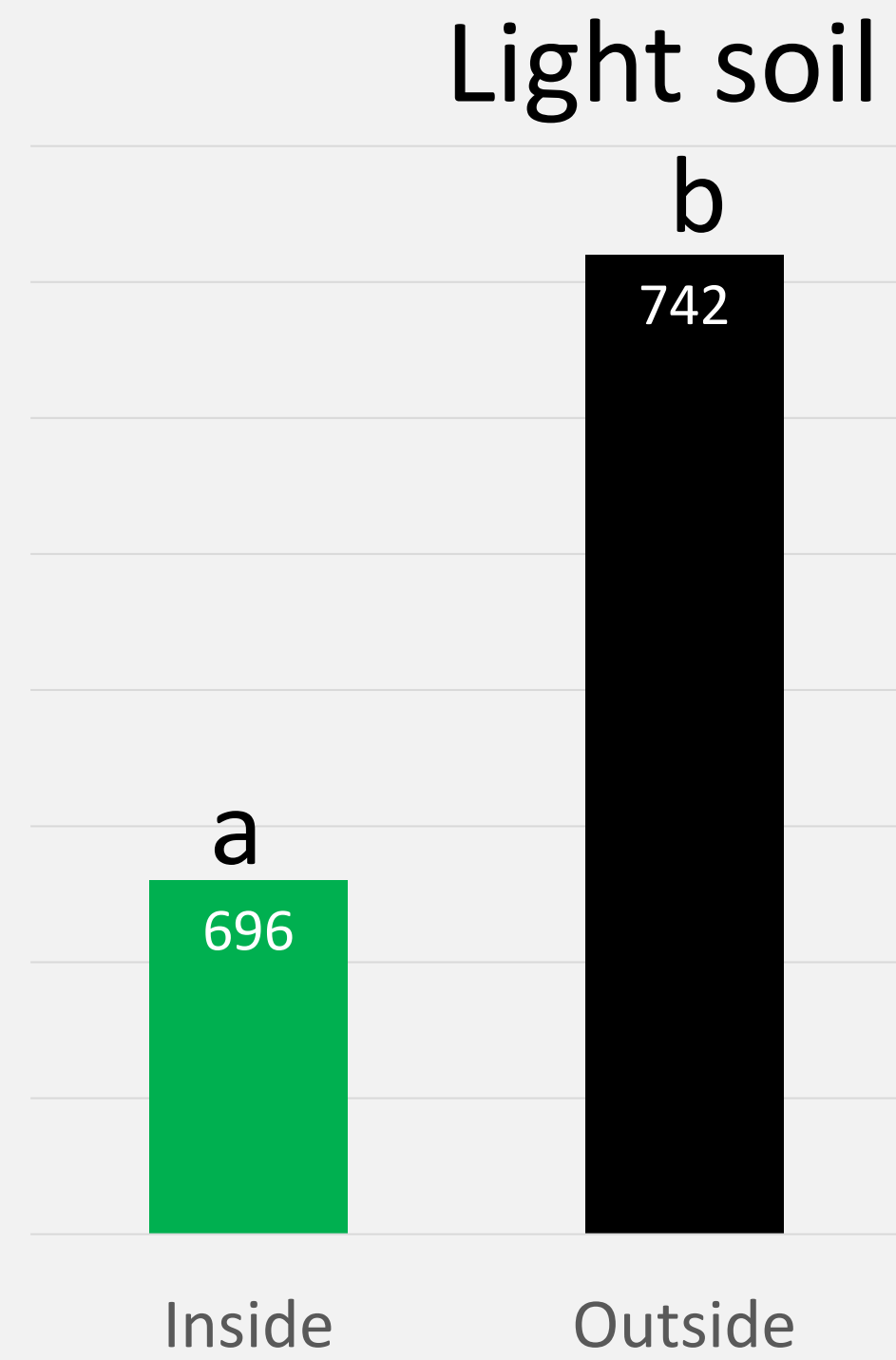
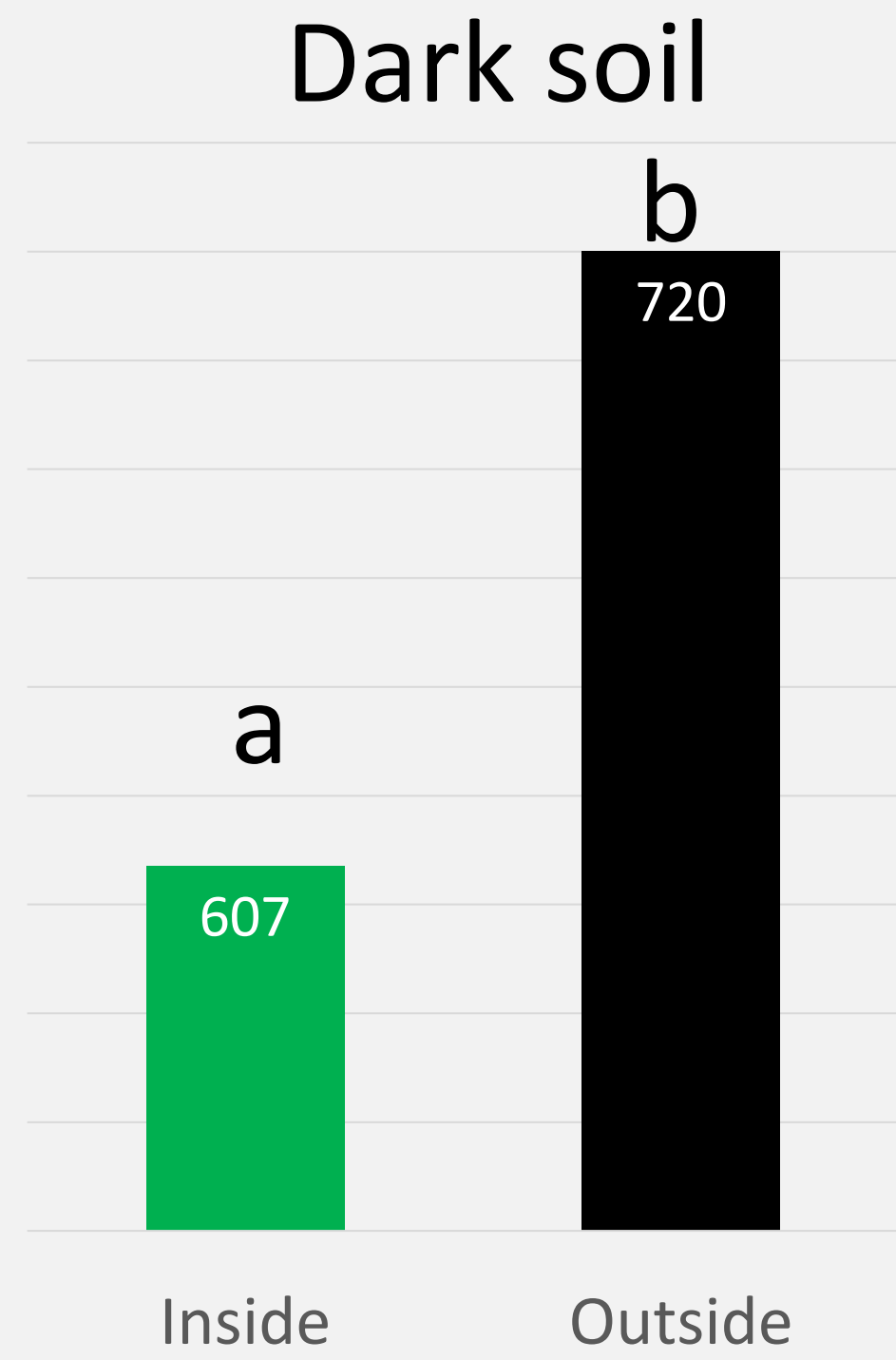
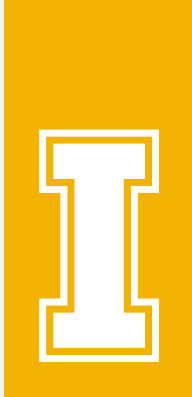
*INSIDE WARMER*



MAR 1	MAR 2	MAR 3	MAR 4	MAR 5	MAR 6	MAR 7	MAR 8	MAR 9	MAR 10	MAR 11	MAR 12	MAR 13	MAR 14	MAR 15	MAR 16	MAR 17	MAR 18	MAR 19	MAR 20	MAR 21	MAR 22	MAR 23	MAR 24	MAR 25	MAR 26	MAR 27	MAR 28	MAR 29	MAR 30	MAR 31	APR 1	APR 2	APR 3	APR 4	APR 5	APR 6	APR 7	APR 8	APR 9	APR 10	APR 11	APR 12	APR 13	APR 14	APR 15	APR 16	APR 17	APR 18	APR 19	APR 20	APR 21	APR 22	APR 23	APR 24	APR 25	APR 26	APR 27	APR 28	APR 29	APR 30	MAY 1	MAY 2	MAY 3	MAY 4	MAY 5	MAY 6	MAY 7	MAY 8	MAY 9	MAY 10	MAY 11	MAY 12	MAY 13	MAY 14	MAY 15	MAY 16	MAY 17	MAY 18	MAY 19	MAY 20	MAY 21	MAY 22	MAY 23	MAY 24	MAY 25	MAY 26	MAY 27	MAY 28	MAY 29	MAY 30	MAY 31	JUN 1	JUN 2	JUN 3	JUN 4	JUN 5	JUN 6	JUN 7	JUN 8	JUN 9	JUN 10	JUN 11	JUN 12	JUN 13	JUN 14	JUN 15	JUN 16	JUN 17	JUN 18	JUN 19	JUN 20	JUN 21	JUN 22	JUN 23	JUN 24	JUN 25	JUN 26	JUN 27	JUN 28	JUN 29	JUN 30	JUN 31	JUL 1	JUL 2	JUL 3	JUL 4	JUL 5	JUL 6	JUL 7	JUL 8	JUL 9	JUL 10	JUL 11	JUL 12	JUL 13	JUL 14	JUL 15	JUL 16	JUL 17	JUL 18	JUL 19	JUL 20	JUL 21	JUL 22	JUL 23	JUL 24	JUL 25	JUL 26	JUL 27	JUL 28	JUL 29	JUL 30	JUL 31	AUG 1	AUG 2	AUG 3	AUG 4	AUG 5	AUG 6	AUG 7	AUG 8	AUG 9	AUG 10	AUG 11	AUG 12	AUG 13	AUG 14	AUG 15	AUG 16	AUG 17	AUG 18	AUG 19	AUG 20	AUG 21	AUG 22	AUG 23	AUG 24	AUG 25	AUG 26	AUG 27	AUG 28	AUG 29	AUG 30	AUG 31	
MARCH																															APRIL																															MAY																															JUNE																															JULY																															AUGUST																														



# 2022 Trial

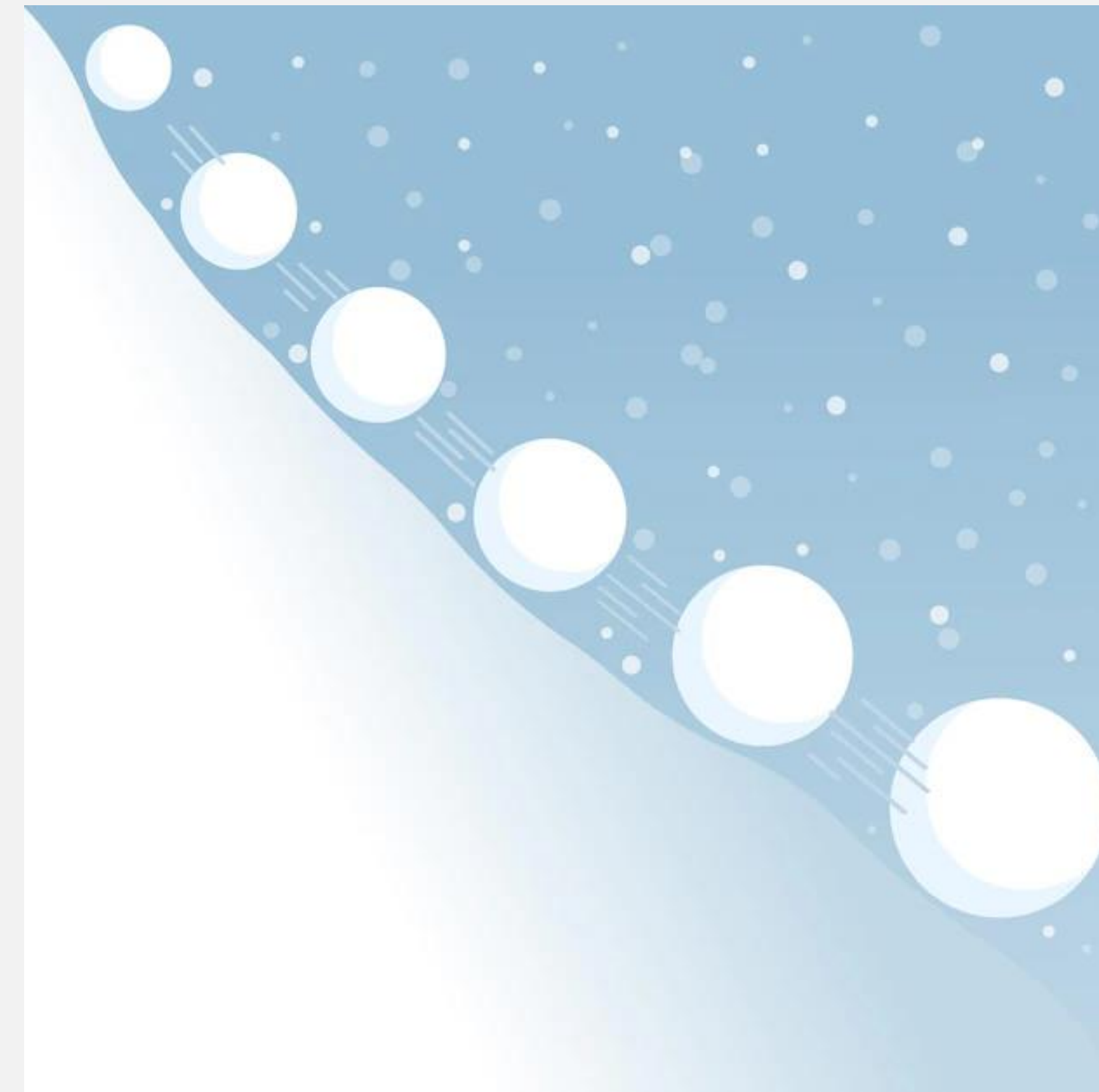




# KEY QUESTIONS

- What causes it?
  - Compaction
  - Soil temperature
  - Soil moisture
  - Nitrogen availability
  - Pink root

Could it be a combination of all of these?





# KEY QUESTIONS

- Is there anything that can be done about it?

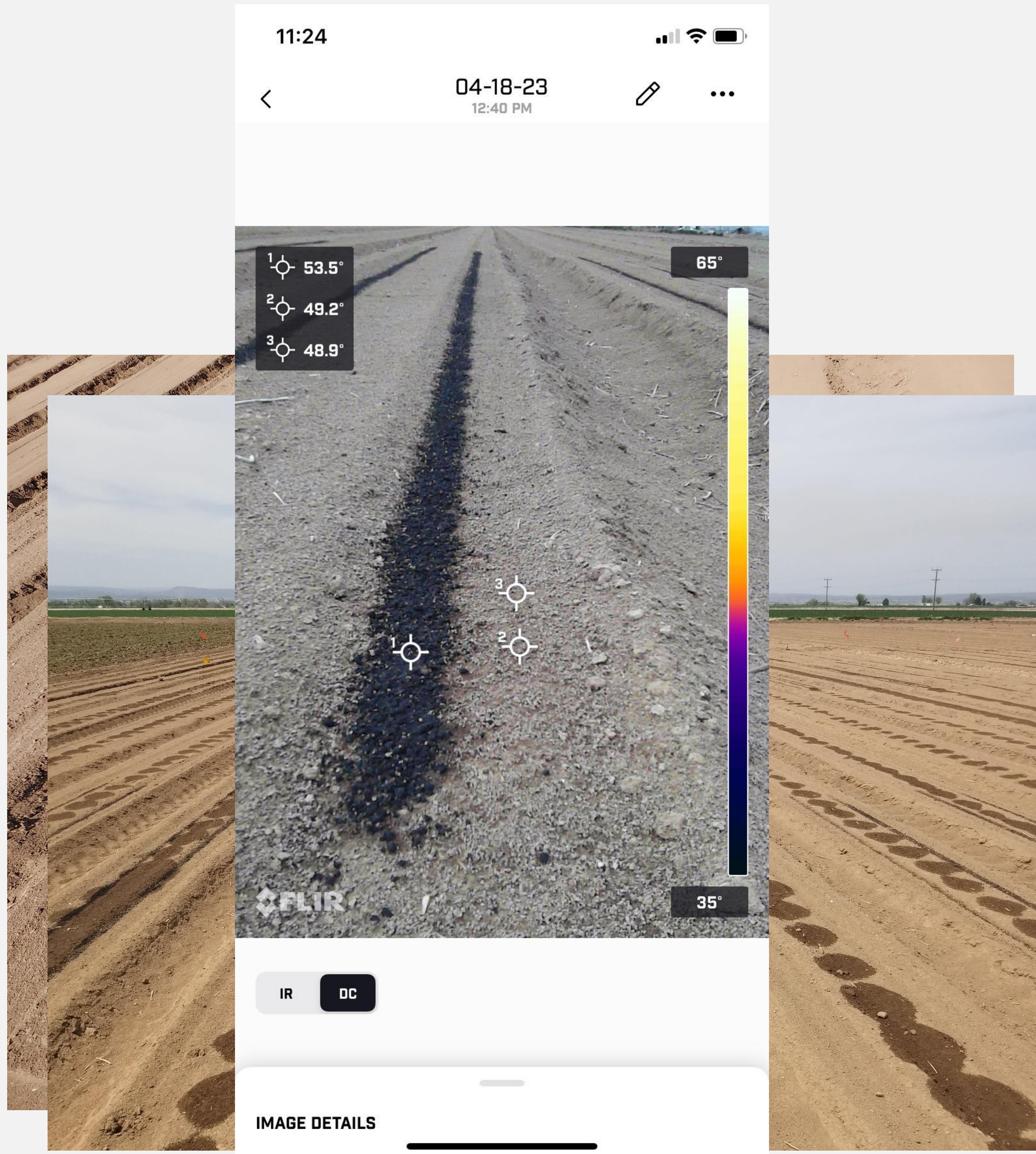


IMAGE DETAILS



# THANK YOU!!



- Funding provided by IE00C
- McCain Foods Onion Group
- Western Laboratories
- Nunhems

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