
Performance of polymer-coated urea (ESN) as a nitrogen source for corn

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TREATMENTS -2004

- Control (0 lb N/a) + 40 lb S/a*
- Polymer-Coated Urea (ESN)
 - Split (Preplant & 4 wk): 100, 150, 200, and 250 lb N/a + 40 lb S/a.
 - Preplant: 100, 150, 200, and 250 lb N/a + 40 lb S/a.

*S source = gypsum

TREATMENTS - 2004

- Ammonium Sulfate
 - Split (4 & 6 wk): 100, 150, 200, and 250 lb N/a.
 - Preplant: 150 and 200 lb N/a.
 - Preplant + nitrification inhibitor (DCD): 150 and 200 lb N/a
 - Sidedress (4 wk): 150 and 200 lb N/a.
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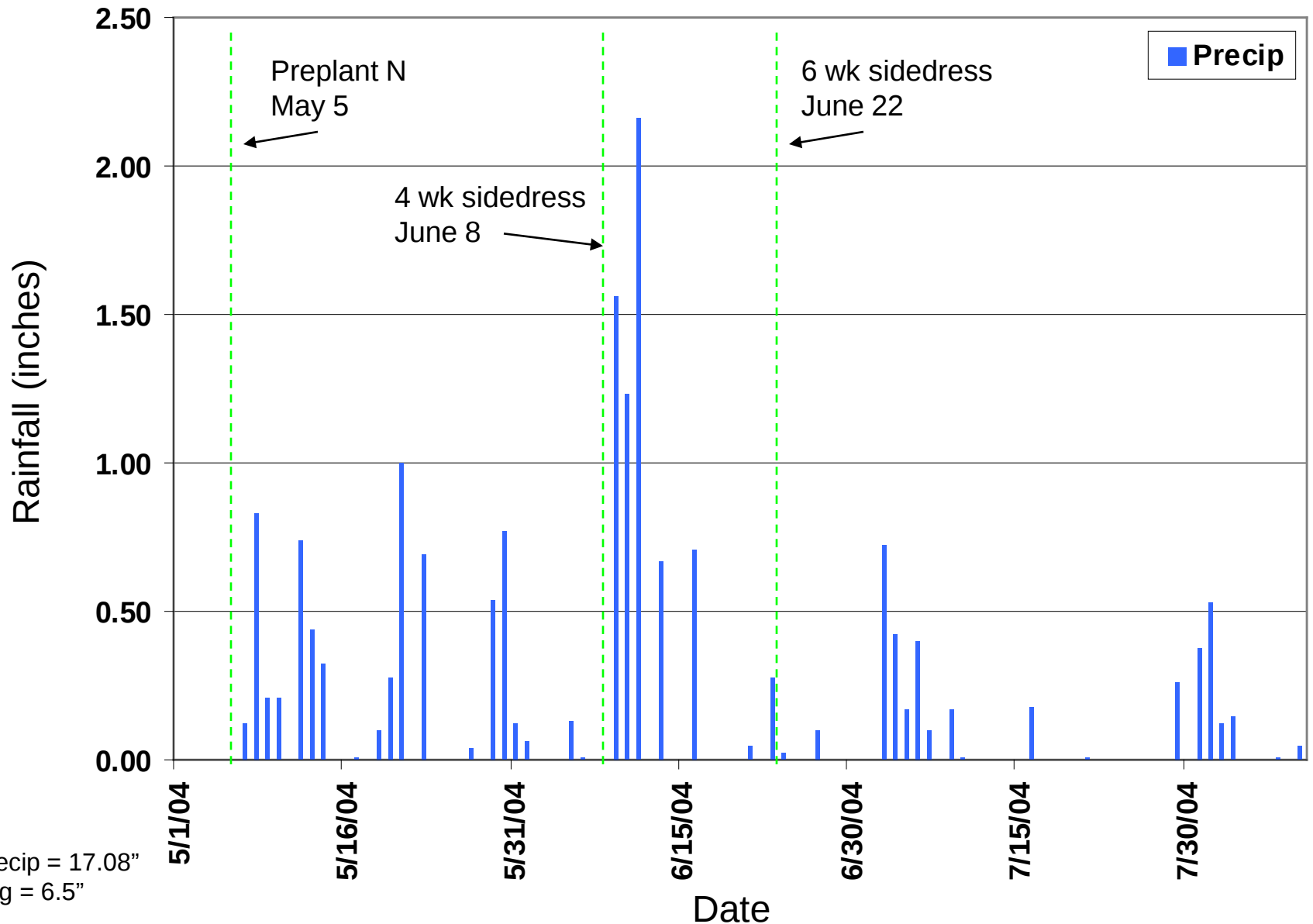
TREATMENTS - 2004

- Urea
 - Preplant: 150 and 200 lb N/a.
 - Sidedress (4 wk): 150 and 200 lb N/a + 40 lb S/a.
 - Sidedress (4 wk): 150 and 200 lb N/a w/o S.
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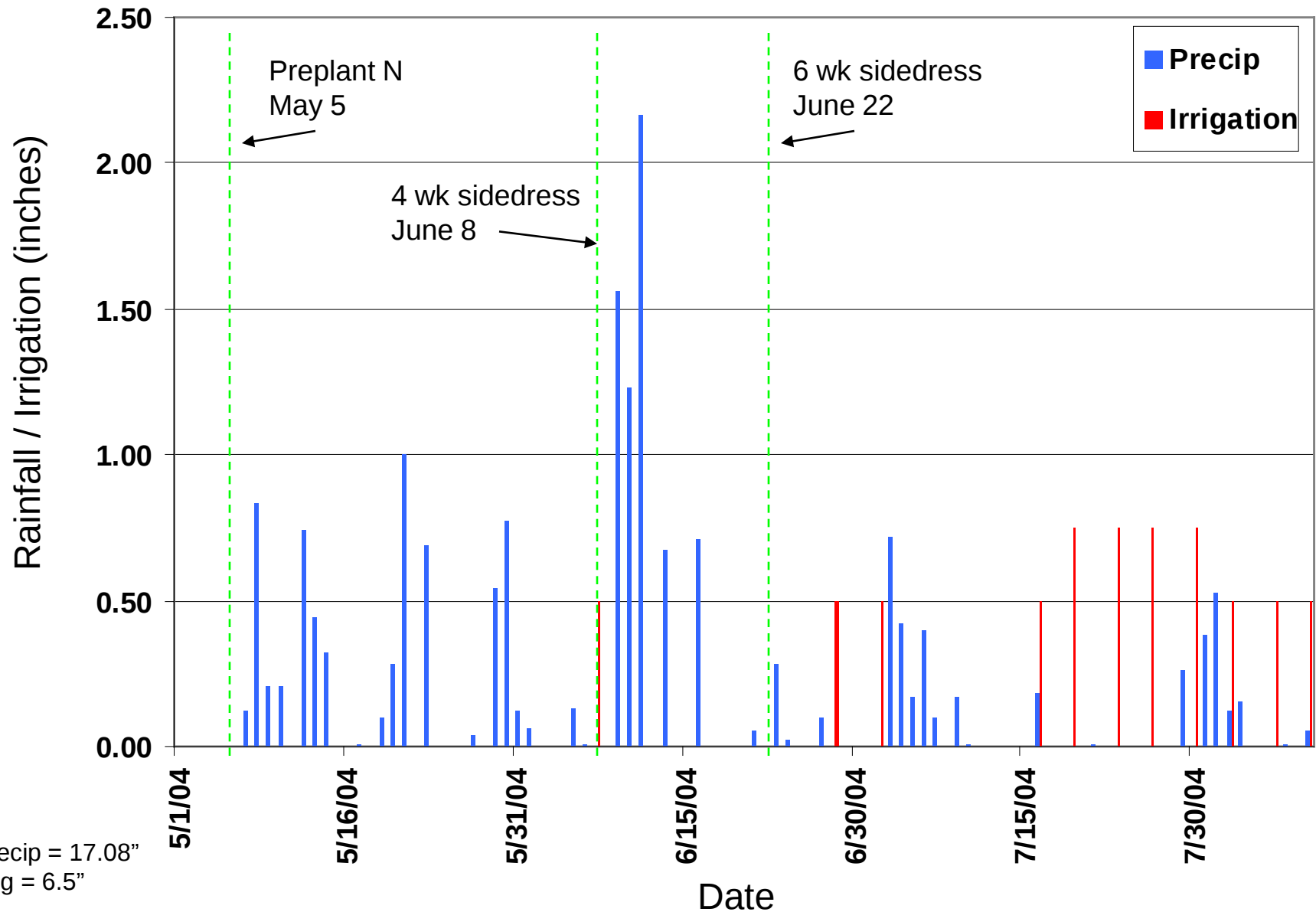
OBSERVATIONS -2004

- Rainfall and irrigation patterns
 - Visual appearance of 2004 nitrogen treatments
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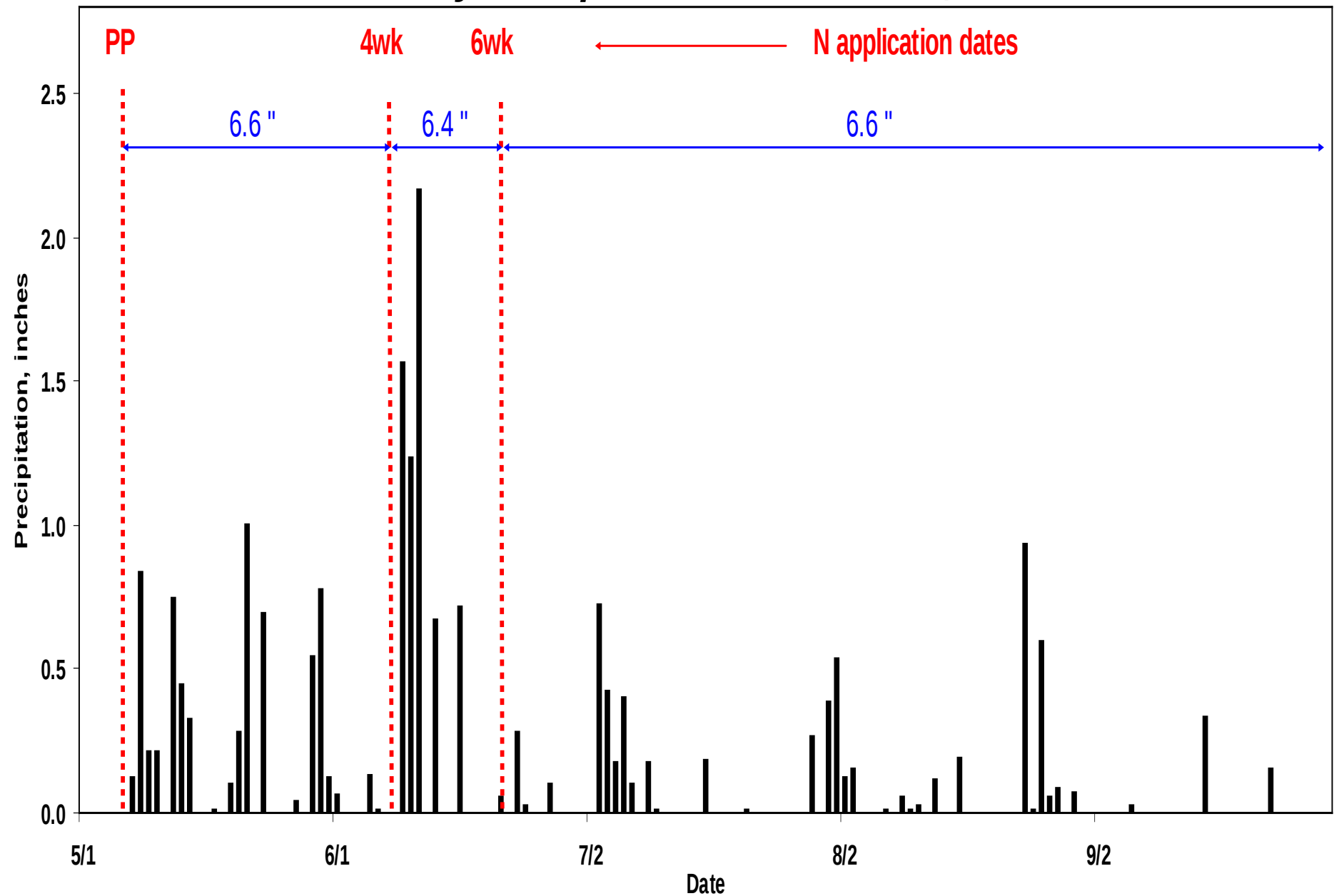
Timing of rainfall, irrigation, and N applications. Hancock, WI 2004

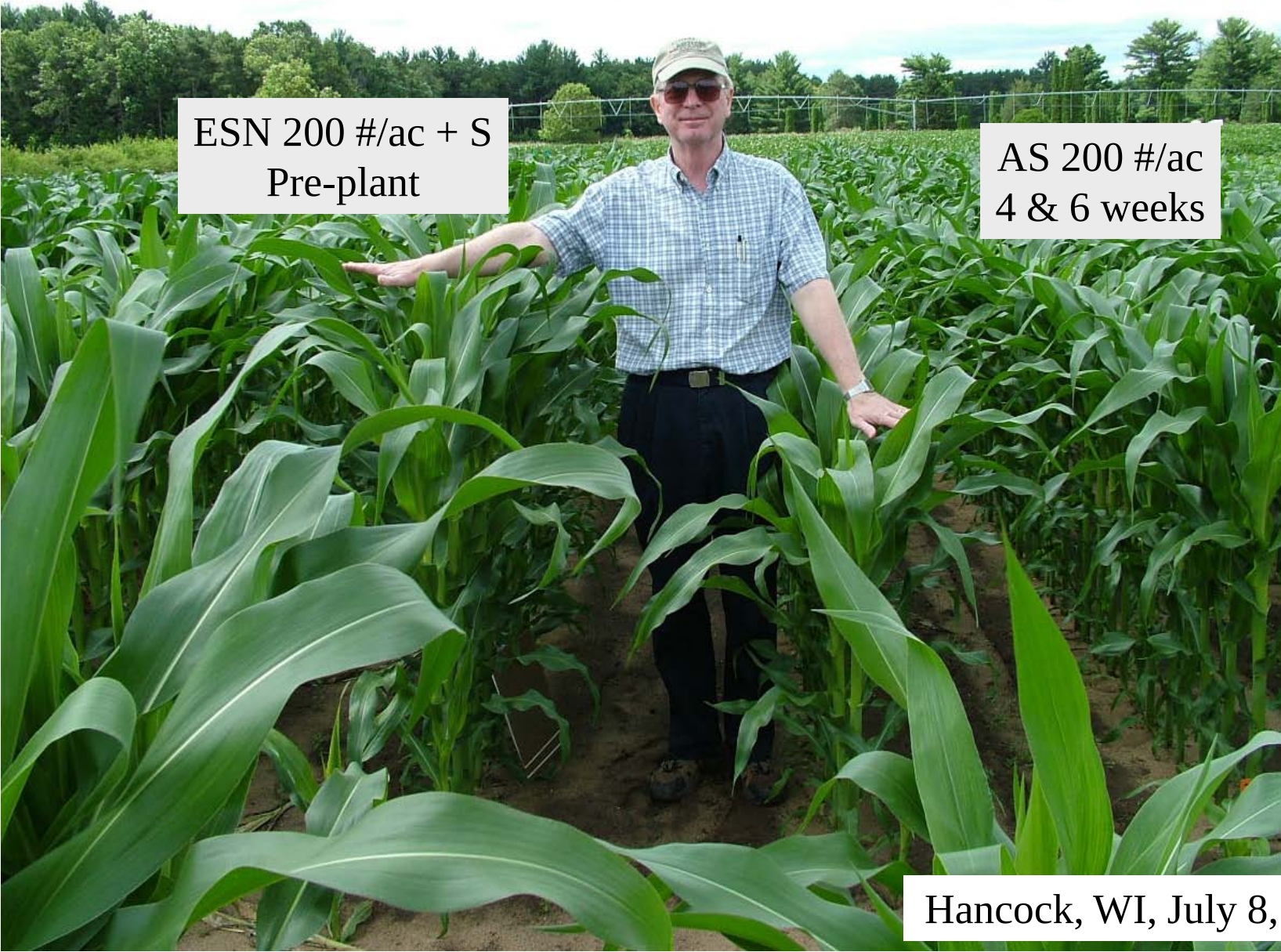


Timing of rainfall, irrigation, and N applications. Hancock, WI 2004



***Time of N application relative to precipitation
from May to September at Hancock, 2004.***



A man wearing a blue and white checkered shirt, dark pants, a baseball cap, and sunglasses stands in a cornfield. He is pointing with his right hand towards the left side of the frame. The corn plants are tall and green. In the background, there is a line of trees and a fence.

ESN 200 #/ac + S
Pre-plant

AS 200 #/ac
4 & 6 weeks

Hancock, WI, July 8, 2004



PCU/ESN, preplant
250 lb N/acre + sulfur
8 July 2004



Ammon. sulf., Split 4 & 6 wk
250 lb N/acre
8 July 2004



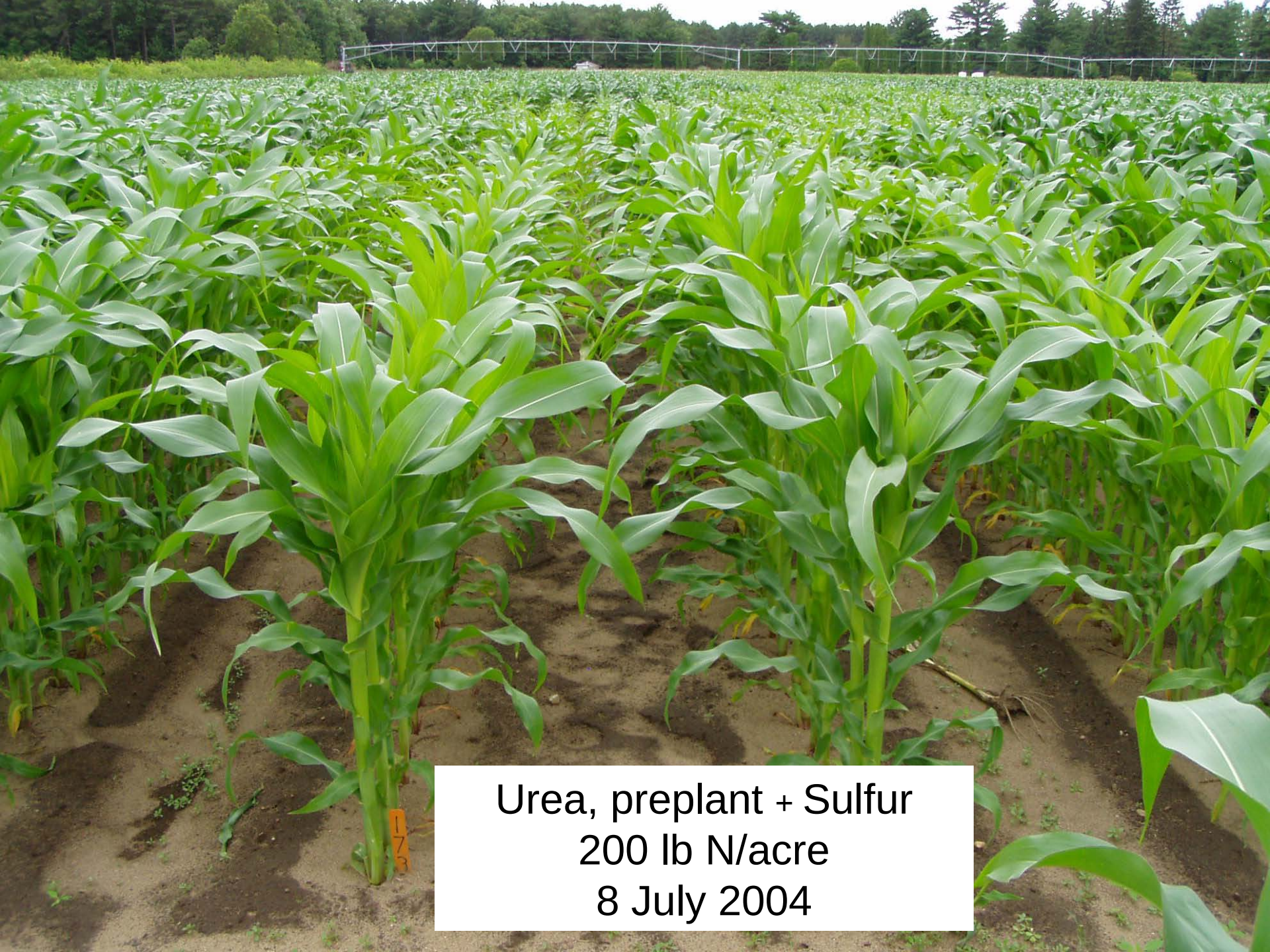
Control
No N+ Sulfur
8 July 2004



Ammonium sulfate, preplant
200 lb N/acre
8 July 2004



Ammonium sulfate, preplant + Nl
200 lb N/acre
8 July 2004



Urea, preplant + Sulfur
200 lb N/acre
8 July 2004



PCU/ESN, preplant
200 lb N/acre + sulfur
8 July 2004



Urea – Sidedress, 4 wk
200 lb N/acre + Sulfur
8 July 2004



Urea – Sidedress, 4 wk
200 lb N/acre , no Sulfur
8 July 2004



Ammonium sulf.-Sidedress, 4wk
200 lb N/acre
8 July 2004



Ammon. sulf., Split 4 & 6 wk
200 lb N/acre
8 July 2004



PCU/ESN, split, pp & 4 wk
200 lb N/acre + sulfur
8 July 2004

SUMMARY - 2004

- Rainfall patterns favored leaching
 - Preplant N treatments showed N deficiency (except PCU/ESN)
 - Sidedress or split N applications were superior to preplant
 - PCU/ESN shows potential for lowering N losses where all or part of the N is applied preplant
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N Source & timing effects on corn grain yield at Hancock, WI, 2004

N source	N timing	N rate, lb/acre		
		150	200	Mean
--- grain yield, bu/acre ---				
PCU (ESN)	PP	170	163	167c
	PP+4 wk	177	185	180b
Am. Sulf.	PP	126	137	132e
	PP+DCD	128	143	136e
	4 wk	179	183	181b
	4 wk & 6 wk	189	202	196a

No N control = 115 bu/acre

N Source/timing and N rate effects on corn grain yield at Hancock, WI, 2004

N source	N timing	N rate, lb/acre				
		100	150	200	250	Mean
----- grain yield, bu/acre -----						
PCU (ESN)	PP	147	170	163	174	164b
	PP + 4 wk	172	177	185	192	181a
Am. Sulfate	4 wk & 6 wk	181	189	202	194	192a
	Mean	167c	179b	184ab	187a	

No N control = 115 bu/acre

EONR = 207 lb N/acre, Yield @ EONR = 187 bu/acre

N Source & timing effects on corn grain yield at Hancock, WI, 2004

N source	N timing	N rate, lb/acre		
		150	200	Mean
--- grain yield, bu/acre ---				
Urea	PP + S	135	148	141de
	4 wk + S	144	159	151d
	4 wk w/o S	141	162	151d

No N control = 115 bu/acre

Optimum N rates and yield with several N source/timing options, Hancock, WI, 2004

N Source & timing	R ²	EONR lb/acre	Yield @ EONR bu/acre
ESN:PP	0.79	227	173
ESN:PP&4wk	0.88	215	190
Am. Sulf. 4&6 wk	0.95	193	202
Overall	0.99	207	187

N Source & timing effects on corn grain yield at Hancock, WI, 2004

		N rate, lb/acre		
N source	N timing	150	200	Mean
		--- grain yield, bu/acre ---		
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No N control = 115 bu/acre				

Nitrogen timing, placement and source effects on corn yield, Waseca, MN, 2004*

Timing	Placement	Source	Yield bu/a
Fall	band (4 in)	Urea	164
Fall	band (4 in)	ESN	168
Fall	bcast	ESN	149
PP	bcast incorp	Urea	179
PP	bcast incorp	ESN	176
Post plt	surf bcast	ESN	185
PP	inject	AA (120)	185
None	----	----	97

*corn after soybean, 100 lb N/acre rate for all treatments.

G. Randall, Univ. Minn. LSD (0.10) = 6.2 bu/acre