

Soybean Tillage and Response to Fertilizer Research



Intensive management trial, 2009



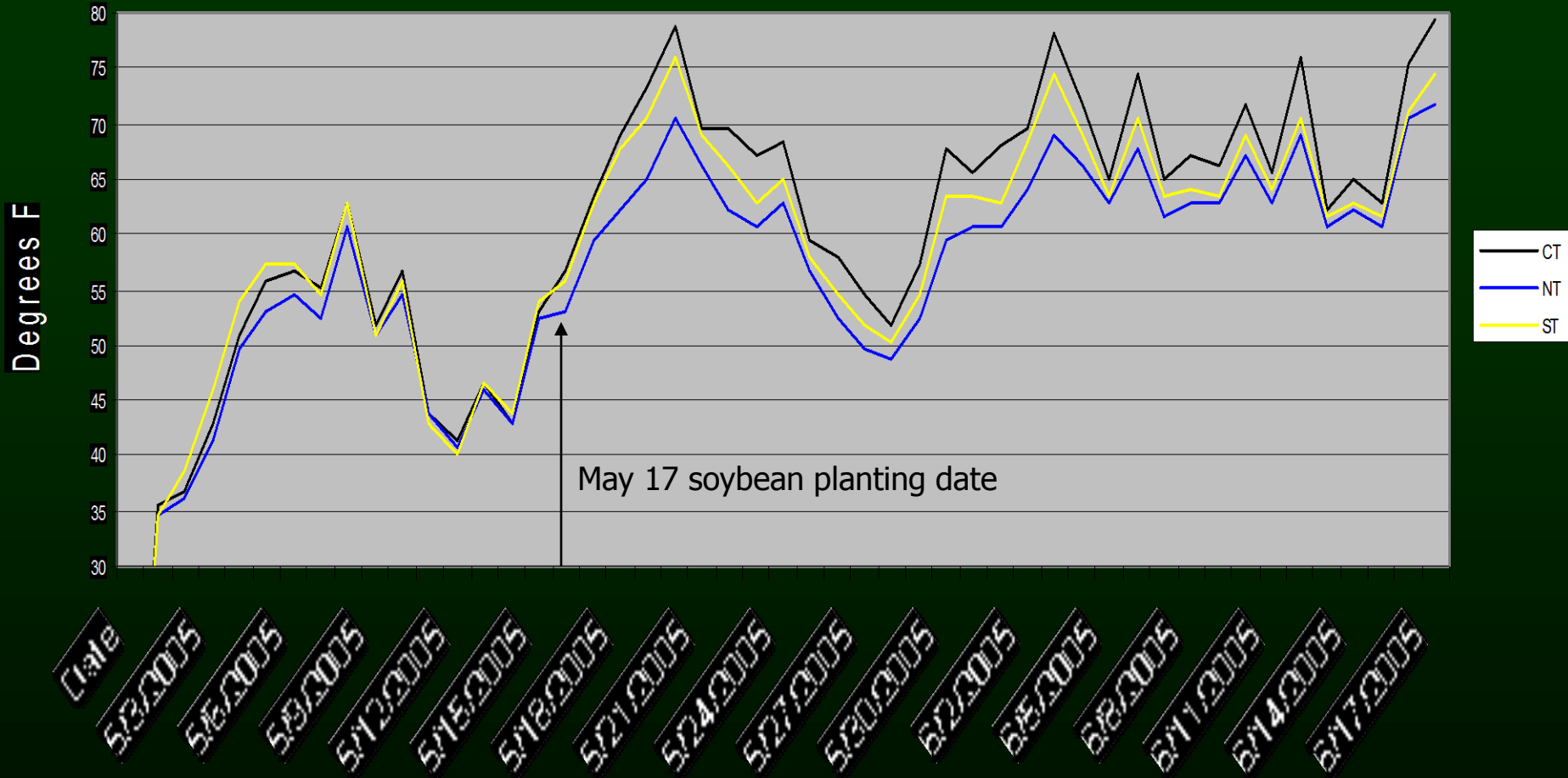
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Soybean tillage study

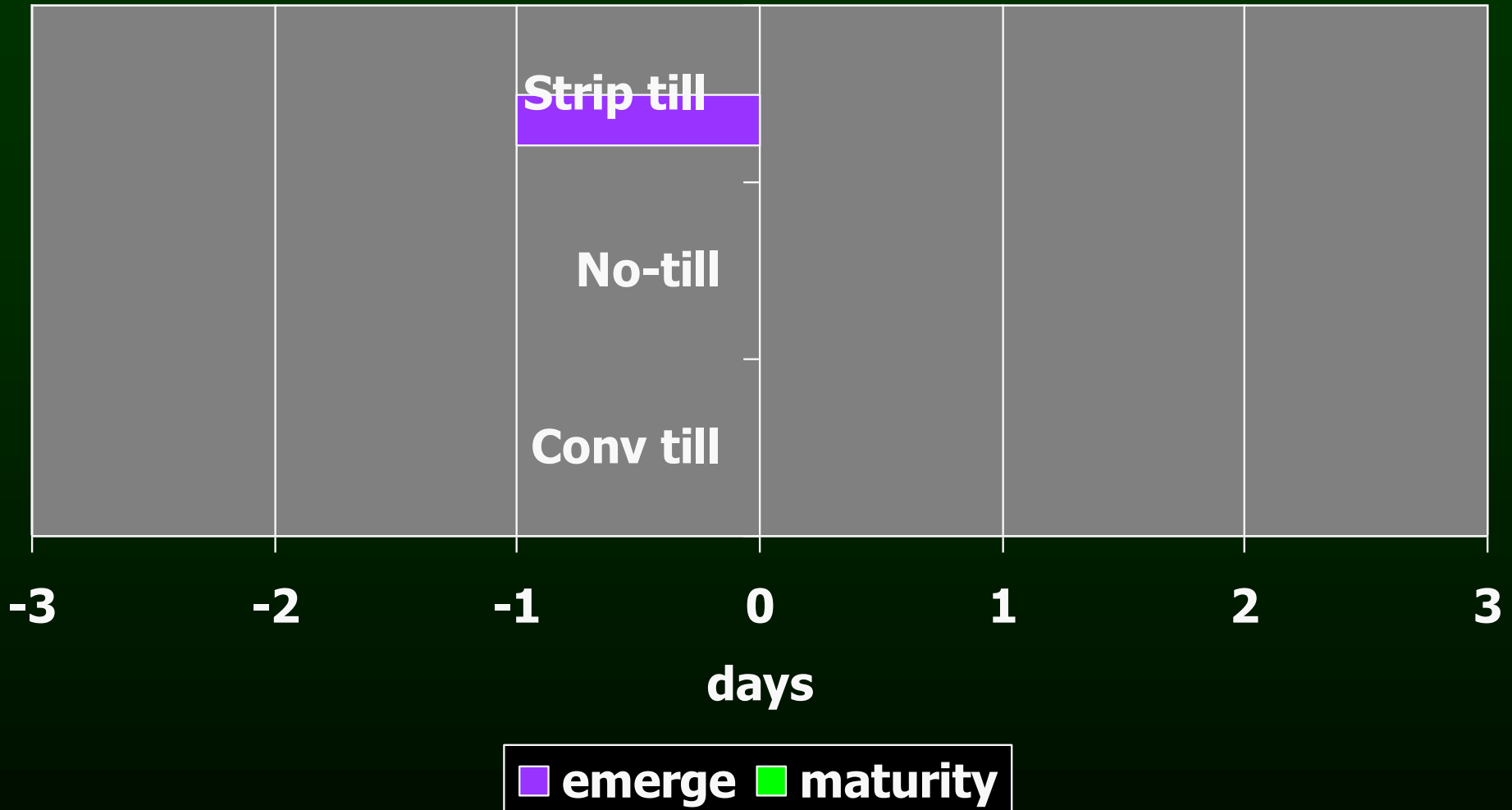


G. Endres and P. Hendrickson

Soil Temperature (2-inch depth), Carrington, 2005

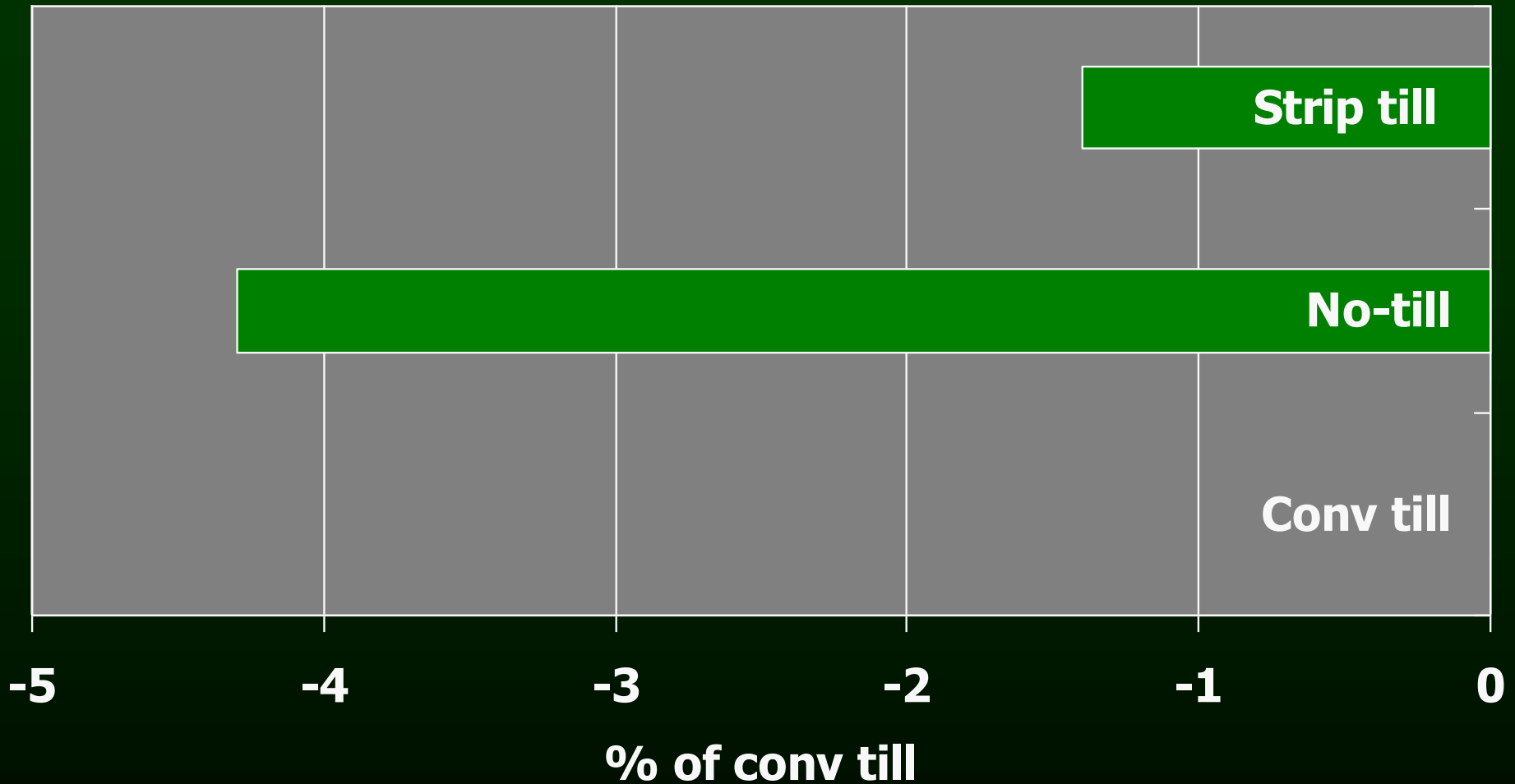


Soybean plant development differences among tillage systems, Carrington, 2005-06 and 2009*.



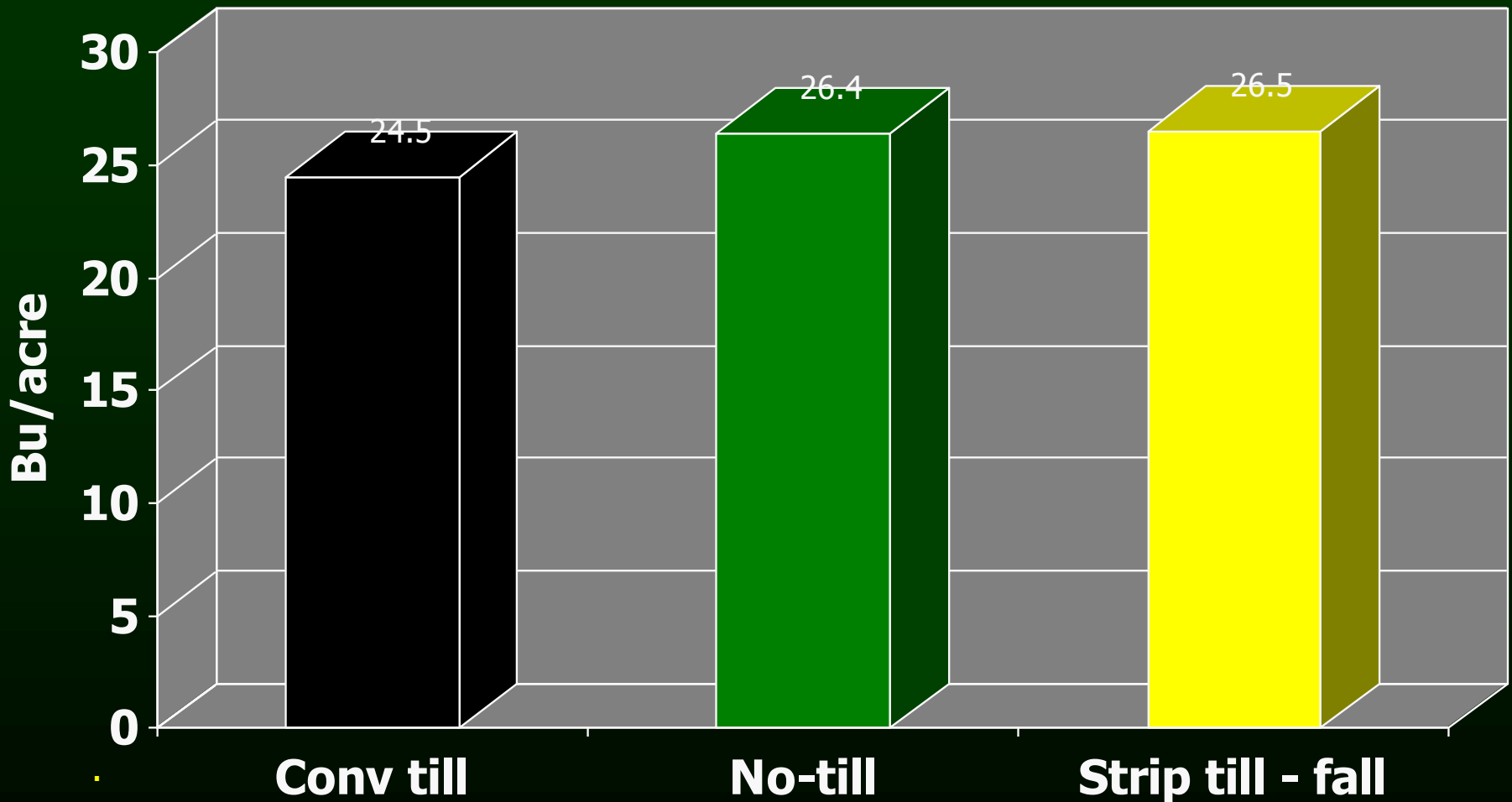
*Statistically significant (LSD=0.05): emergence=2006 and 2009; maturity (R8)=2009.

Soybean plant stand differences among tillage systems, Carrington, 2005-06 and 2009*.



*Statistically significant (LSD=0.05): 2009.

Soybean yield among tillage systems, Carrington, 2005-06, 2009*.



*21-inch rows: 2005; 30-inch rows: 2006 and 2009.



Carrington, 2009

Spring P soil analysis: 9 ppm

Fertilizer placement treatments :

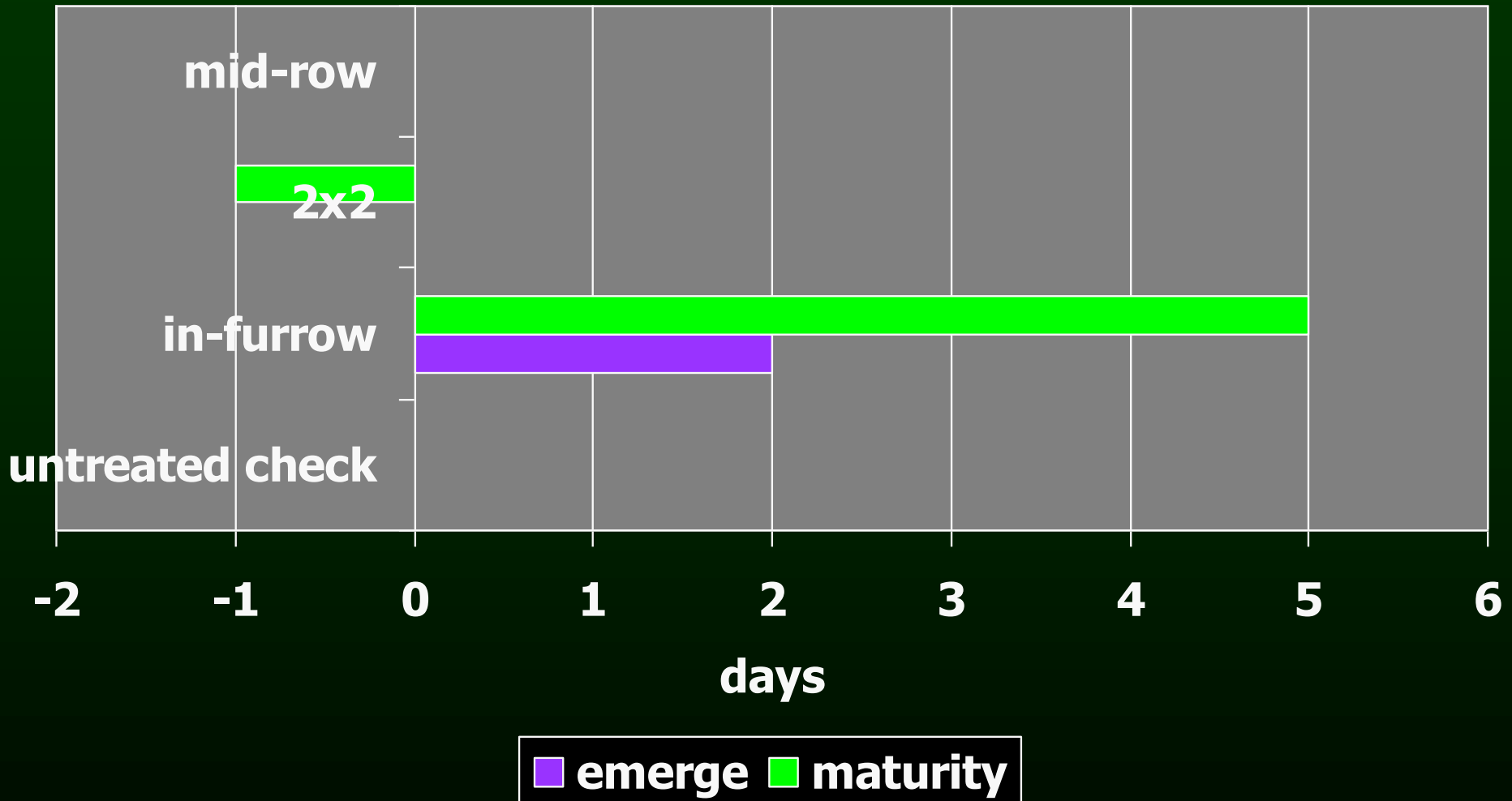
1. untreated check (ST)
2. spring mid-row band (ST)
3. spring in-furrow (ST)
4. spring 2x2 band (ST, conv till, NT)

2x2 10-34-0 placement in no-till during planting

6 gpa 10-34-0

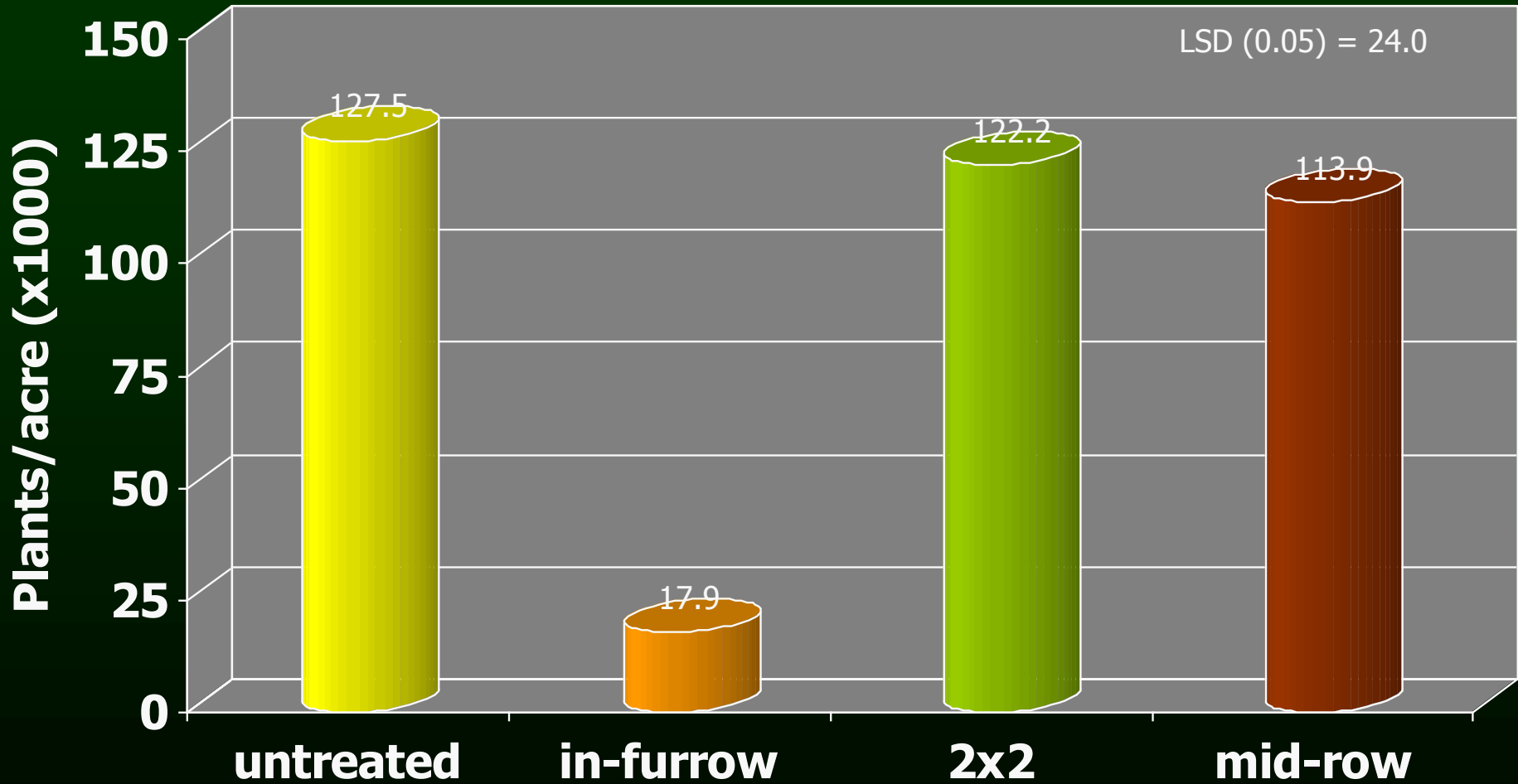
in-furrow 10-34-0 placement in strip till during planting

Strip till soybean plant development differences among fertilizer placement, Carrington, 2009*.



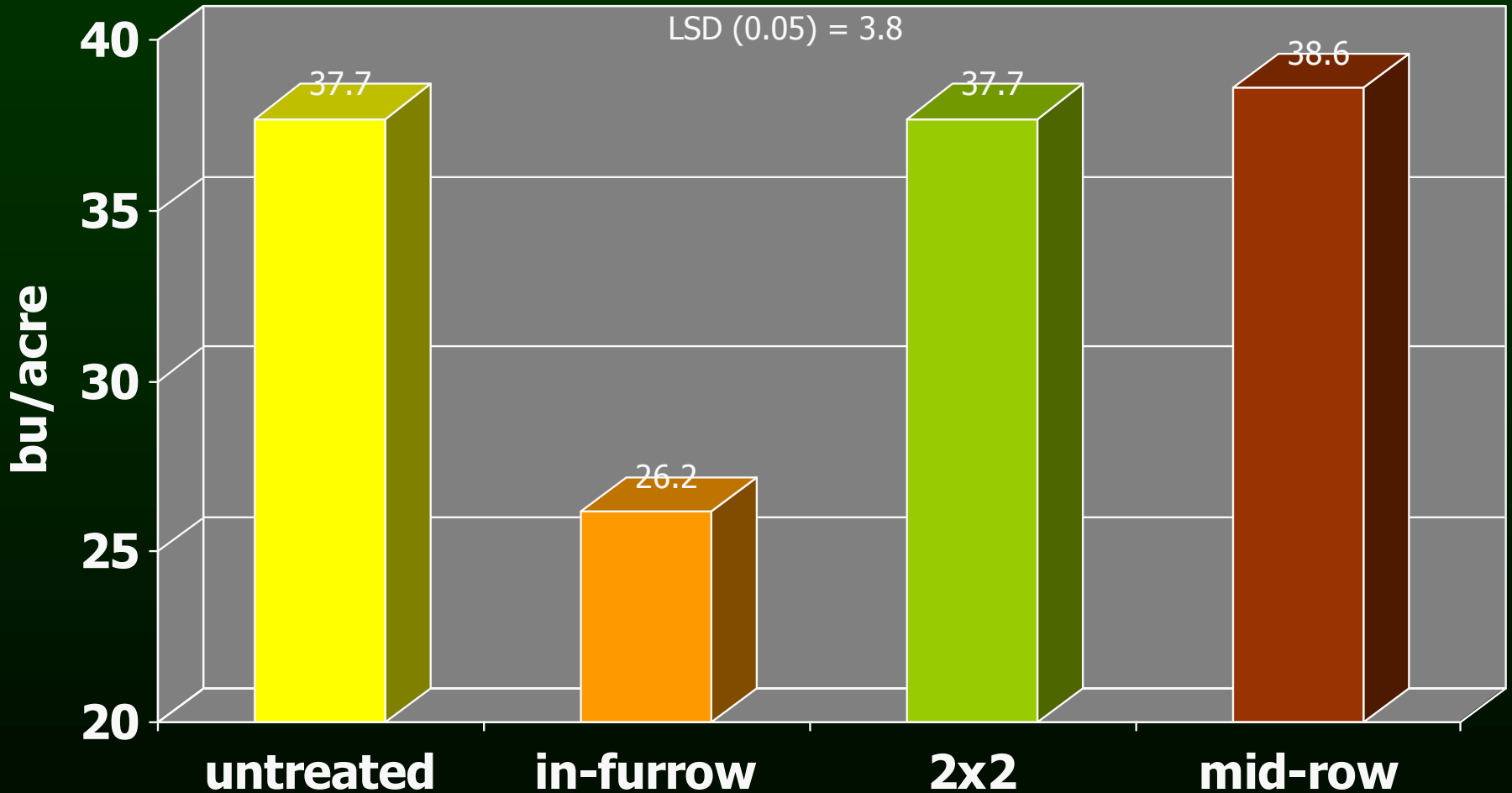
*Strip till=Oct 31, 2008; soybean planted May 22; 6 gal/A 10-34-0; Statistically significant (LSD=0.05): emergence=1; R8=1.

Strip till soybean stand among fertilizer placement , Carrington, 2009*.



*Strip till=Oct 31, 2008; soybean planted May 22; 6 gal/A 10-34-0; Stand counts taken June 10.

Strip till soybean yield among fertilizer placement , Carrington, 2009*.



*Strip till=Oct 31, 2008; Dairyland Seeds'401RR' planted May 22; 6 gal/A 10-34-0.

Irrigated soybean response to liquid fertilizer (10-34-0), Carrington, 2007*

10-34-0 at 8 gpa	Final stand	Seed yield
Application method	plt/A	bu/A
untreated check	116,535	48.6
broadcast	112,220	47.4
2x2	111,225	49.3
in-furrow	103,920	47.8
LSD 0.05	NS	NS

*Soil P = 11 ppm (med); conventional till;
'NT-0090 RR' soybean planted in 30-inch rows on June 6.

Dryland soybean response to liquid fertilizer (10-34-0), Carrington, 2008*

10-34-0 (gal/A)	Final stand	Seed yield
Application method	1000 plt/A	bu/A
untreated check	187.5	32.8
2x2 (4)	188.6	33.5
in-furrow (4)	33.2	24.5
in-furrow (8)	20.6	18.9
LSD 0.05	16.5	4.3

*Soil P = 17 ppm (v. high); 'DSR0401' soybean direct planted in 30-inch rows on May 21.

Phosphate Inoculants

- Contain soil fungus which acidifies immediate environment
- Crop response in soils with:
 1. >7 pH
 2. free carbonates (coated or 'occluded' P)
 3. \geq med P
- Up to 10 lb/acre P₂O₅ can be released for use by crop

Phosphate Inoculants

- NDSU research:
 - Soybean: 6 site-yr at Carrington (2002-06)
= no yield response

What can we do to profitably increase soybean seed yield and quality besides using best management practices?

Recent CREC research work (2005-09) with special soybean inputs ...

- farmer fertilizer blend
- Quickroots; Liquid sufl/can/soy mix*
- **Headline***
- 9.5-0-0-4+10Zn
- Max-In; Max-In MnNF
- X-tra Power; Sugar Mover
- UAN
- MegaGro; HappyGro
- SeedProd; CropProd
- BTN+; T1
- BioForge; Golden Harvest Plus GA
- NBS
- **CoRon***; zinc
- sugar
- N-Hibit; ProAct
- 6-0-0+9Zn*
- experimental foliar LCO*
- Micro500*; Sure-K*
- Soil Builder; Ag blend
- **Winfield Solutions** experimentals (5)*

*foliar products used in '09 trial

Special foliar inputs for soybean, Carrington, 2009.

(irrigated; 14 trts vs untreated check ; 4 reps)

■ **Soil**

- adequate nutrient levels (med or higher) except chloride (low)
- 7.5 pH; 3.8 organic matter; low soluble salts

■ **Application timing**

- **V3 and/or R2-3 soybean stages**

1. Fertilizers

2. Fungicides

3. Growth promoters

no yield increase with any treatment



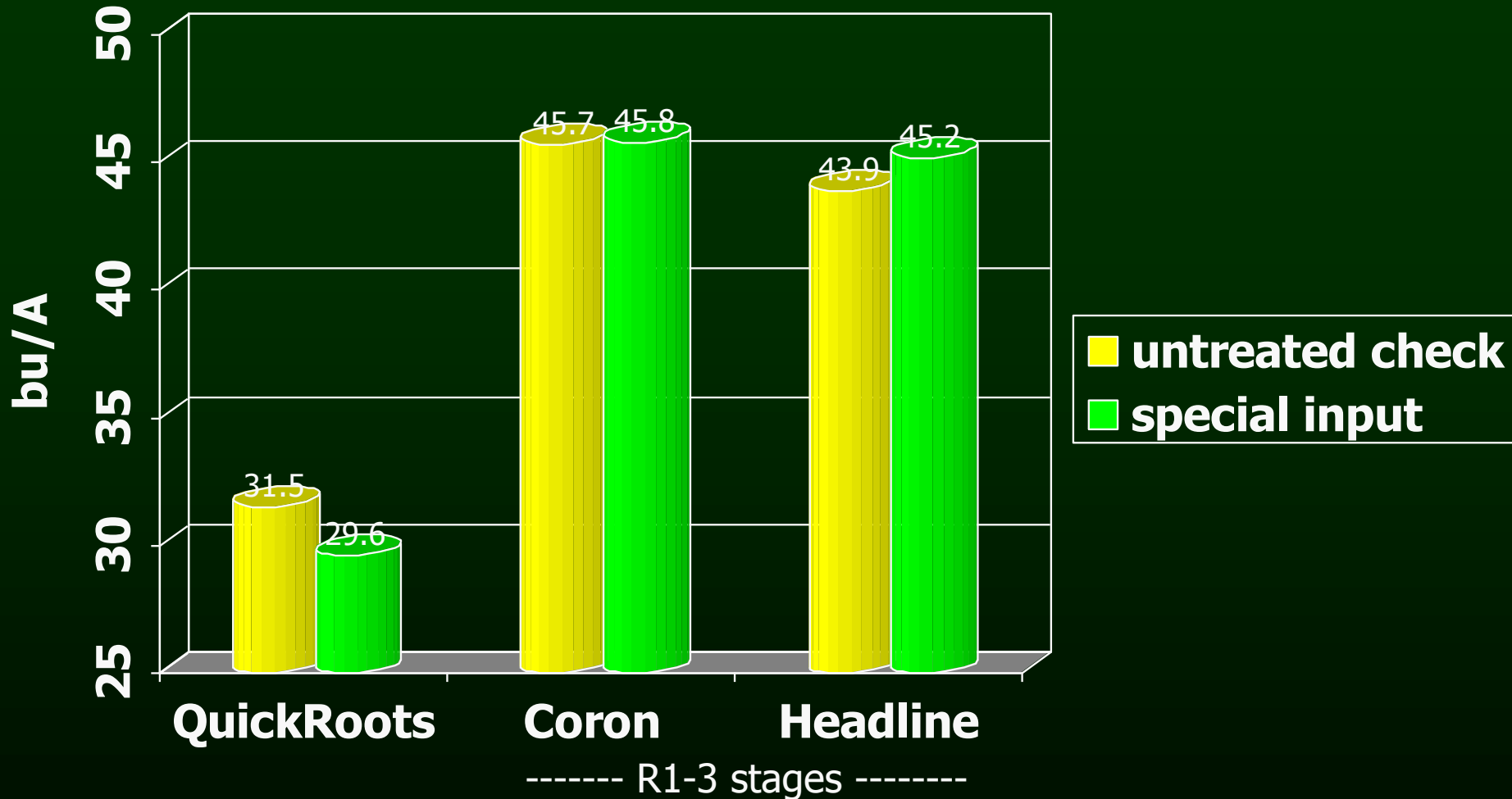
➤ **Yield of untreated check = 51.2 bu/acre**

Soybean performance with special inputs, Carrington, 2005-09.

				Increase vs. untreated check ¹		
Year	Environment	Number of treatments	Yield of untreated check bu/A	Seed yield bu/A	Test weight lb/bu	Protein %
2005	dryland	16	36.7	*	NS	NS
2006	dryland	21	26.2	NS	NS	NS
2007	irrigated	15	58.0	NS	NS	NS
2008	irrigated	16	47.3	NS	NS	NS
2009	irrigated	15	51.2	NS	NS	NS

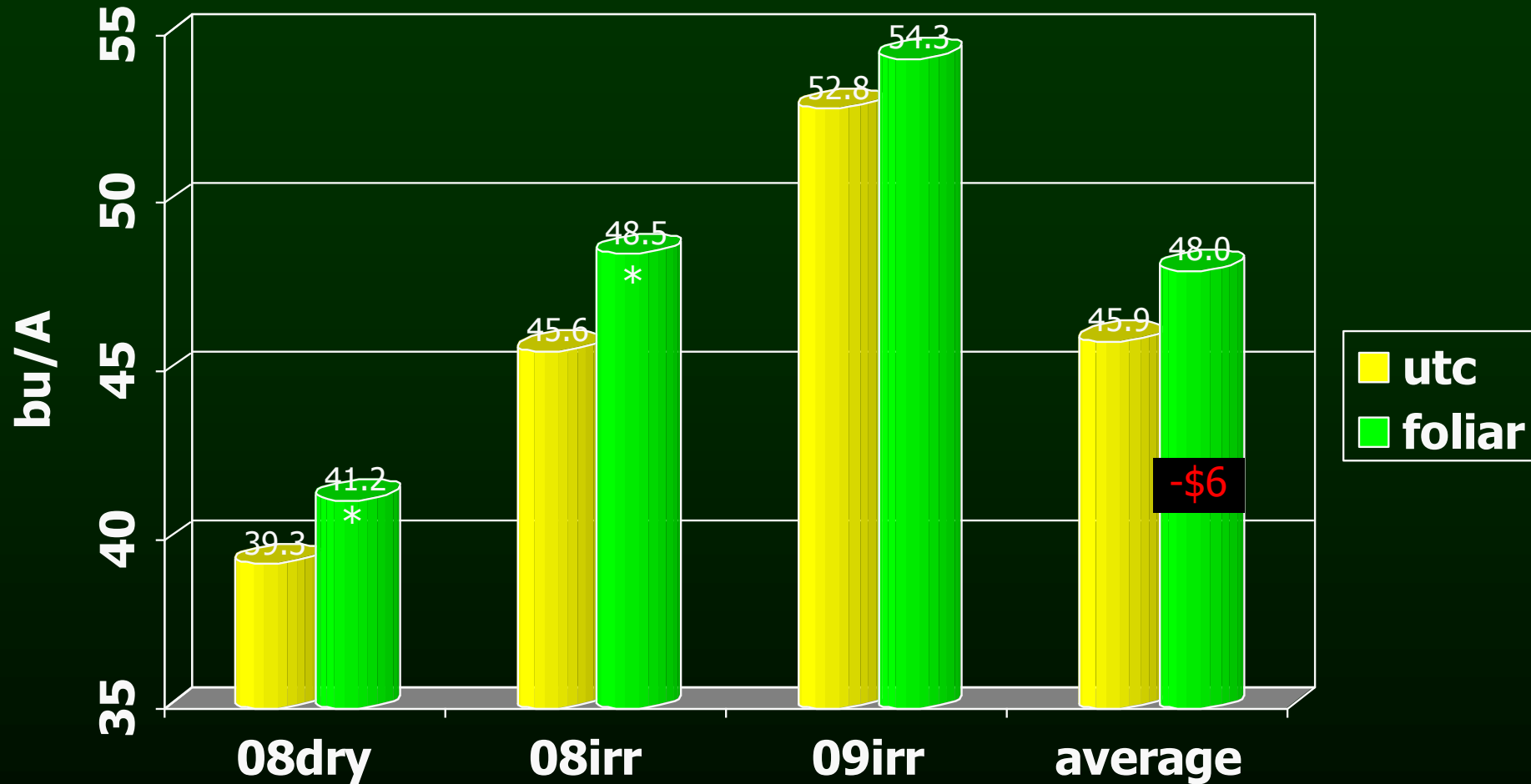
¹*=statistically significant (0.05); NS=no difference in yield compared to utc.

Soybean special input study, CREC, 2005-09: Seed yield with selected products*.



*QuickRoots: 2005-06; Coron: 2006-09; Headline: 2005-09.
No statistical difference (LSD 0.05) among products and years.

Soybean intensive mgmt study, CREC, 2008-09: Seed yield and economics with foliar inputs*



*V2-3: micro mix + LCO promoter fb R2-3: fungicide

Soybean seed and/or foliar application of nutrients, fungicides, and other special inputs?

- **NDSU research...**
 - Minimal and inconsistent yield/quality response → no recommendations on use
 - Will continue trials in future
- **On-farm test with low acreage and untreated checks**

Questions
or
Comments?