

Single- or Twin- Row Crops?

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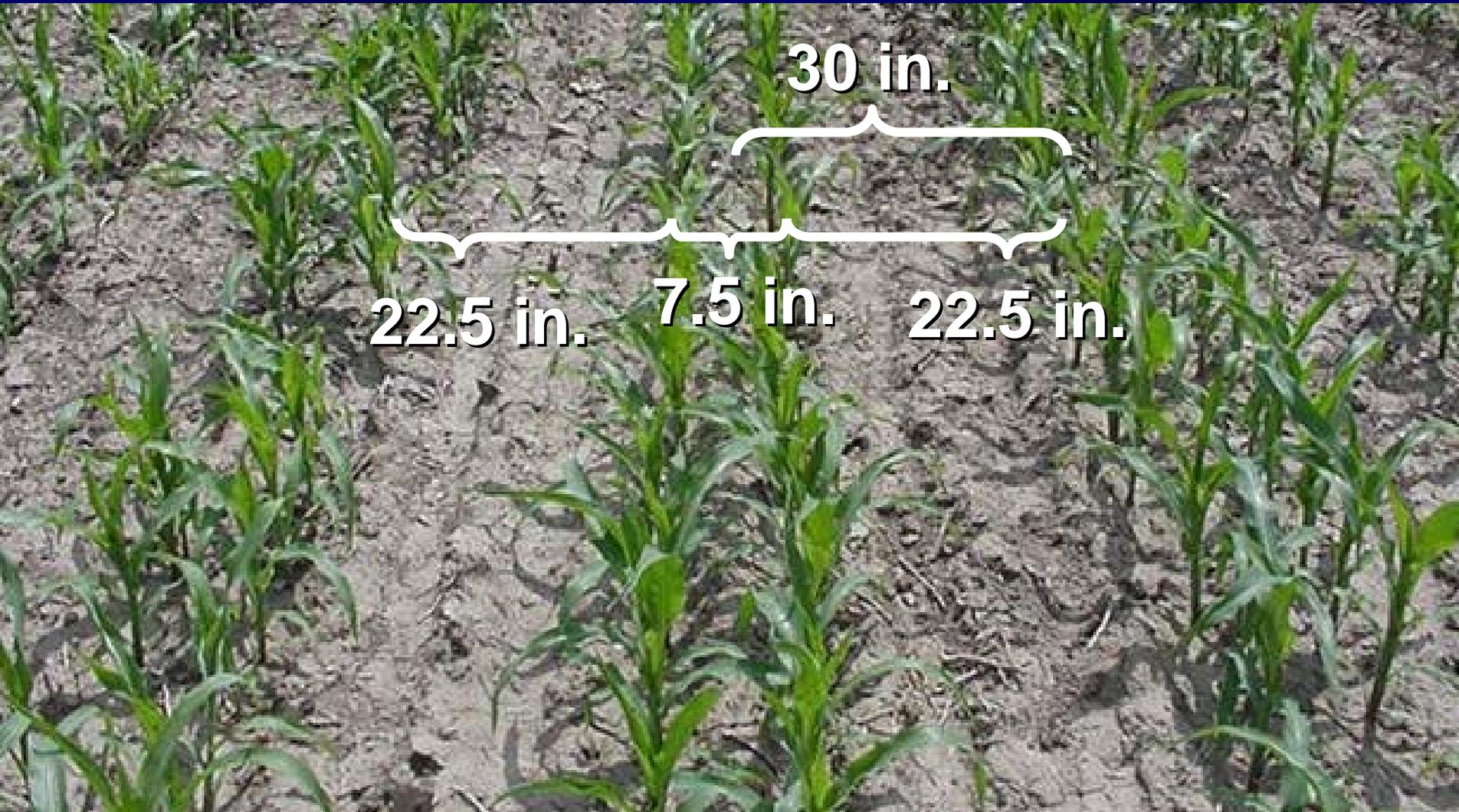


Physiological benefits of twin-rows

Experiences with twin-row crops in MO

- **Northeast MO – dryland**
 - **Corn**
 - **Soybean**
 - **Glyphosate application timings**
- **Southeast MO – irrigated (Henggeler)**
 - **Corn**
 - **Soybean**

Summary and Recommendations



30 in.

22.5 in.

7.5 in.

22.5 in.

What are the benefits of twin-rows?



Twin-row benefits

- Plant with the same planter



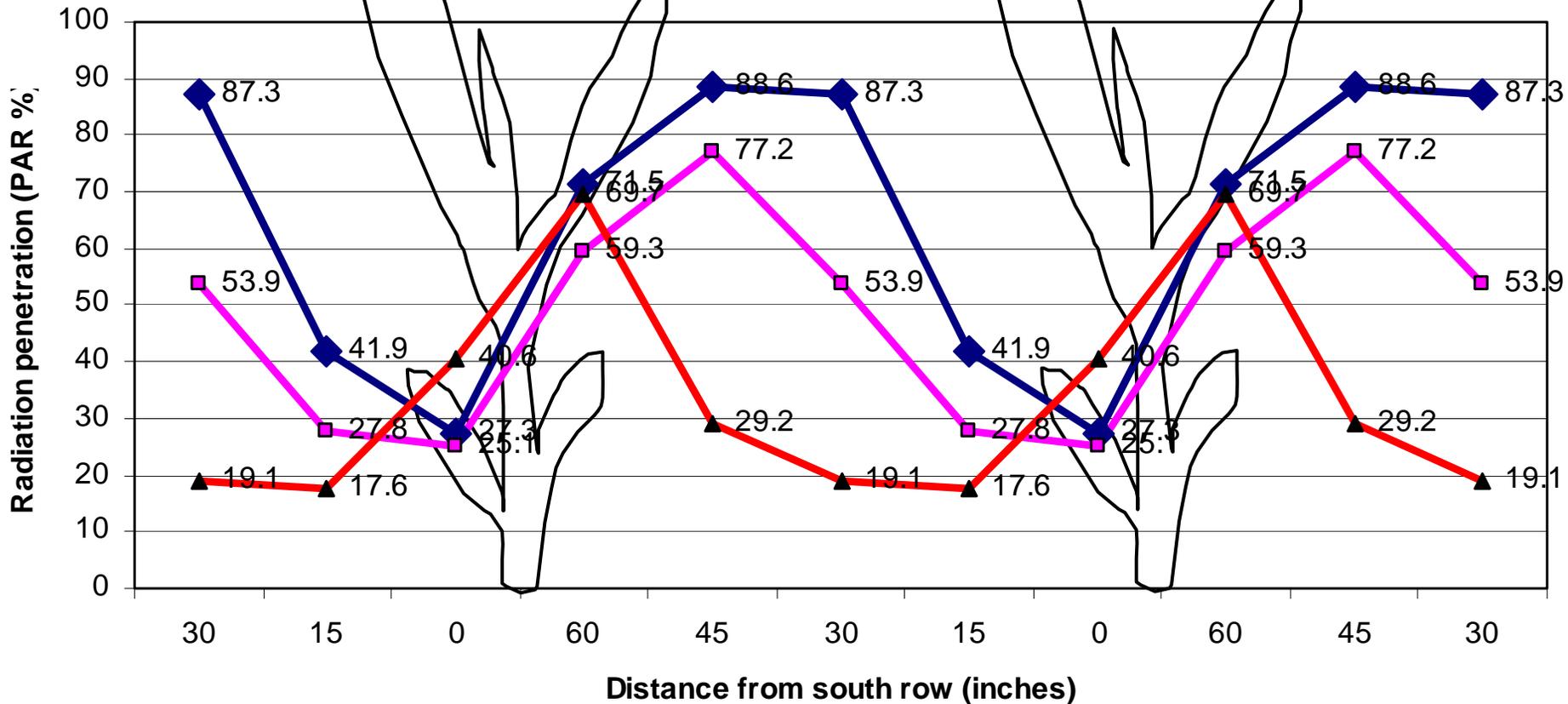
Twin-row benefits

- **No new harvest equipment required**

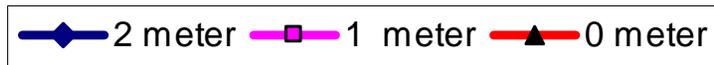


Twin-row benefits

- Increased light (PAR) interception

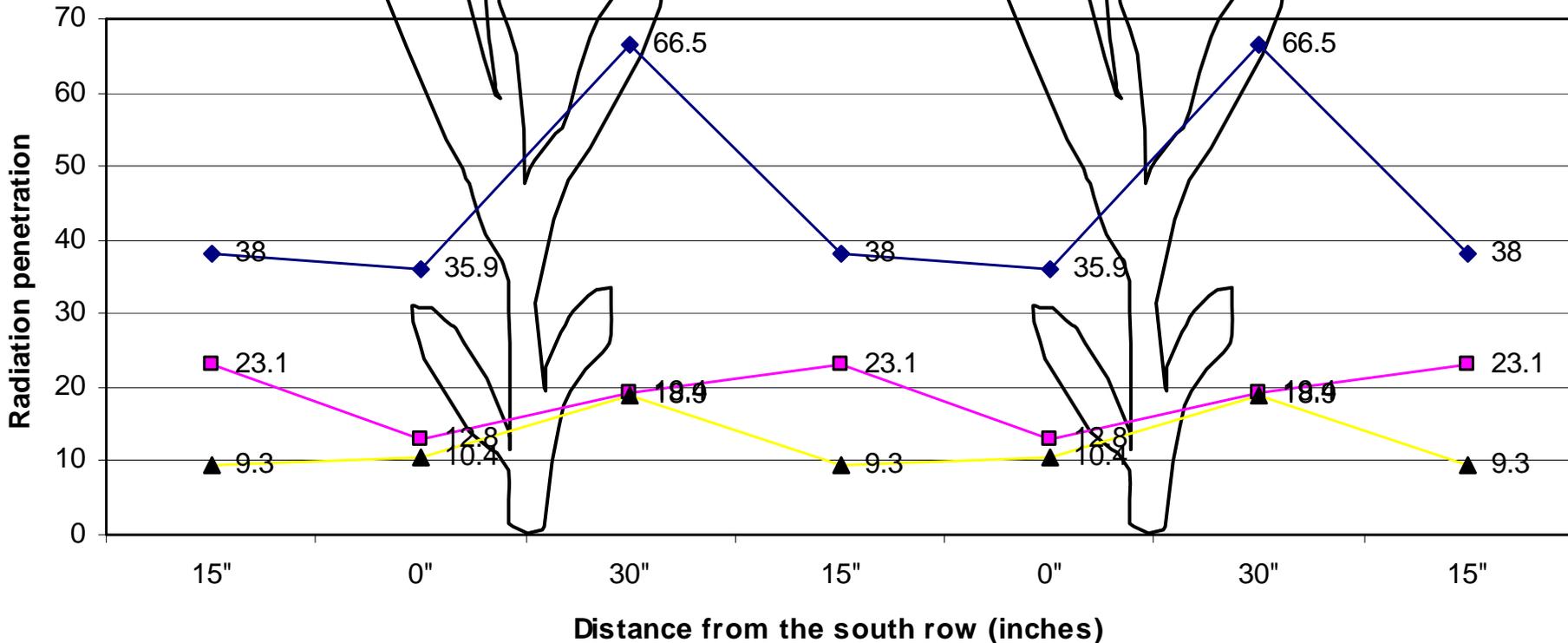


East-west rows, 2004



Twin-row benefits

- Increased light (PAR) interception



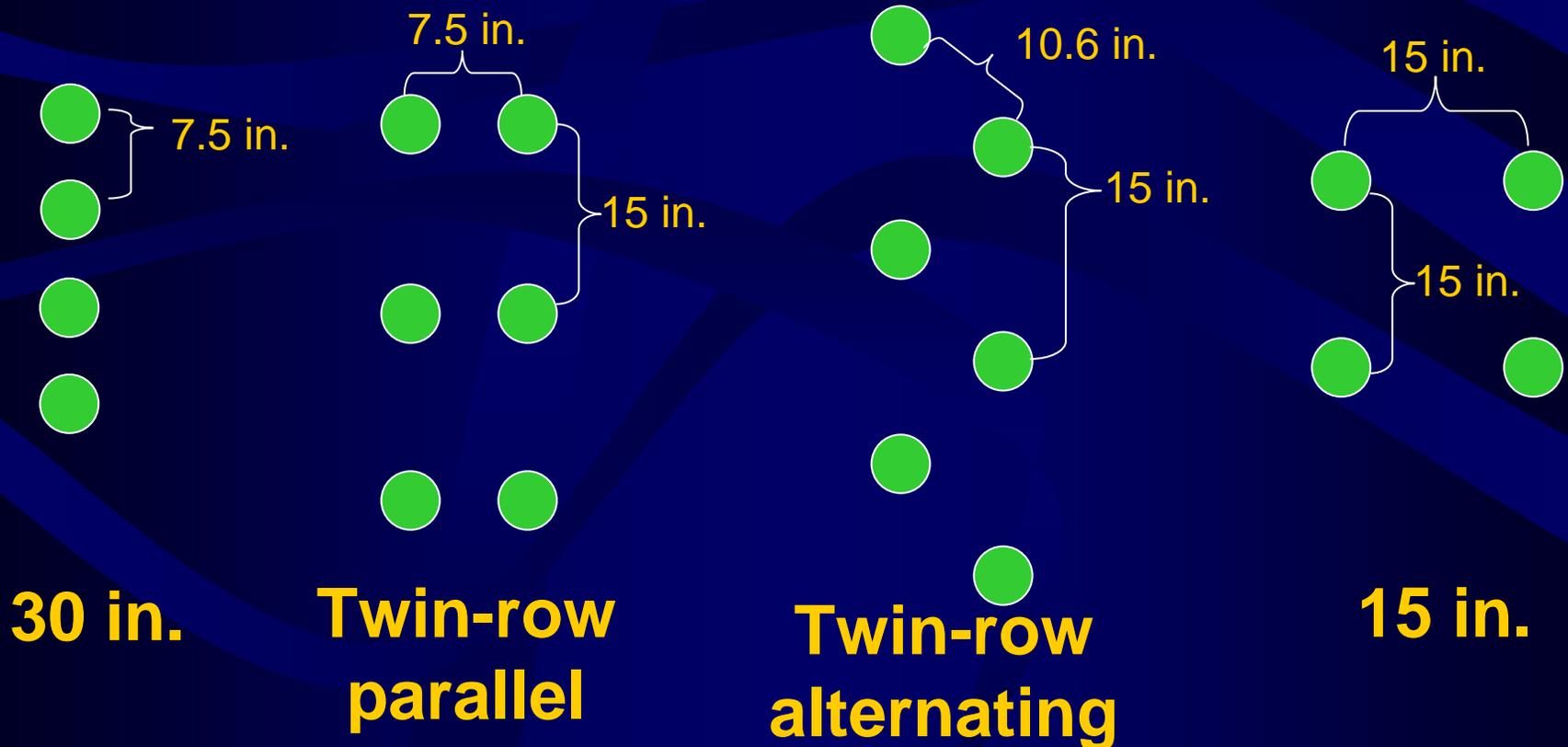
East-west rows, 2004

—◆— 2 meter —■— 1 meter —▲— 0 meter

Twin-row benefits

- Wider in-row plant spacing

In-row spacing at 28,000 plants/acre



Twin-row benefits

- Increased seeding rates
- Improved weed control
- Lower grain moisture at harvest
- Reduced incidence of disease
- Increased grain yield
- New technology



Twin-row Peanut Production

Two, 7 in. rows on 36 in. centers

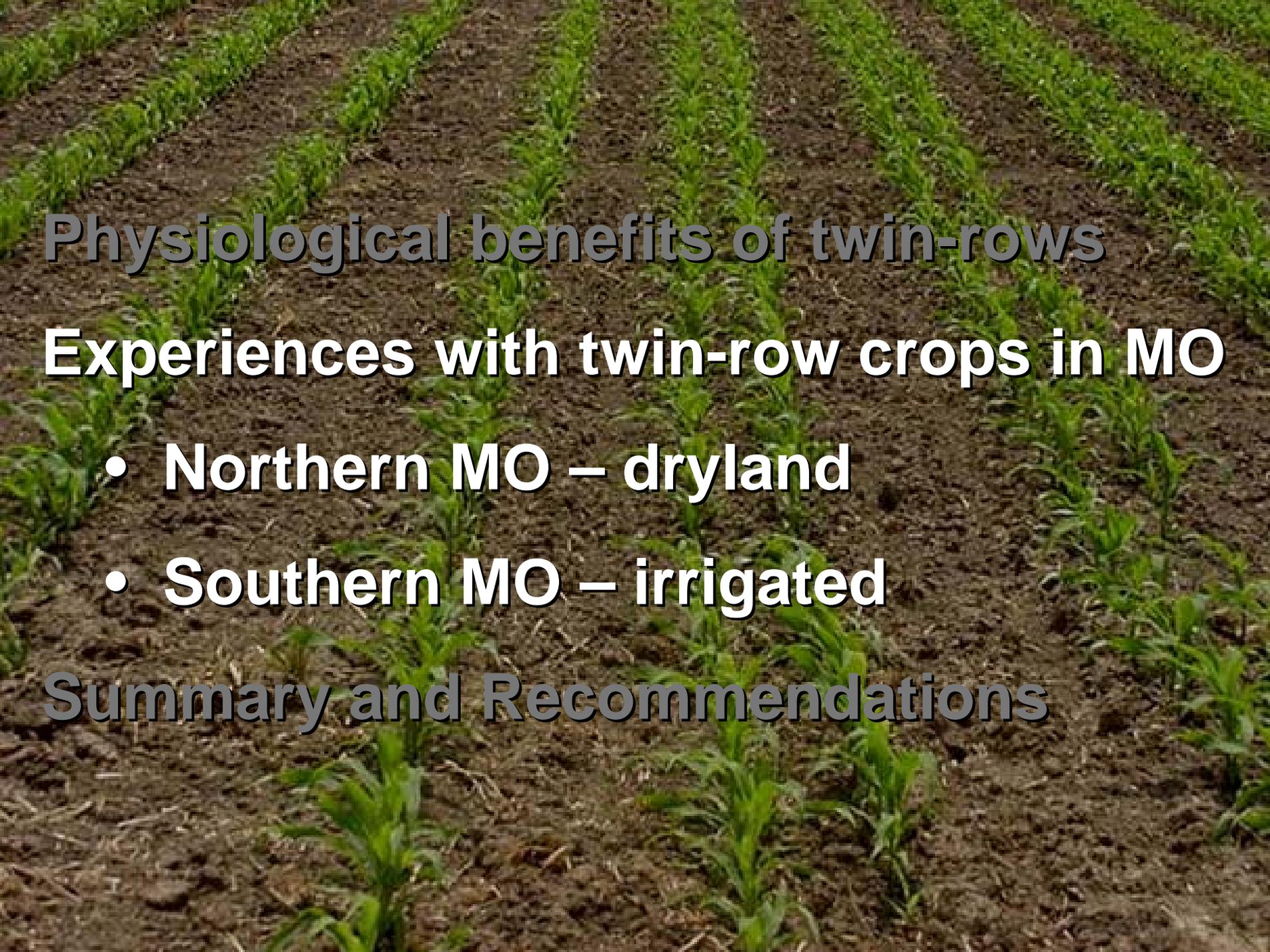
- Increased light interception
- Increased pod yield
- Improved market grade
- Reduced incidence of disease

(Jaaffar and Gardner, 1988; Jordan et al., 2002; Lanier et al., 2004)



Twin-row benefits

- **Plant with the same planter**
- **No new harvest equipment required**
- **Increased light interception**
- **Wider in-row plant spacing**
- **Increased seeding rates**
- **Improved weed control**
- **Lower grain moisture at harvest**
- **Reduced incidence of disease**
- **Increased grain yield**

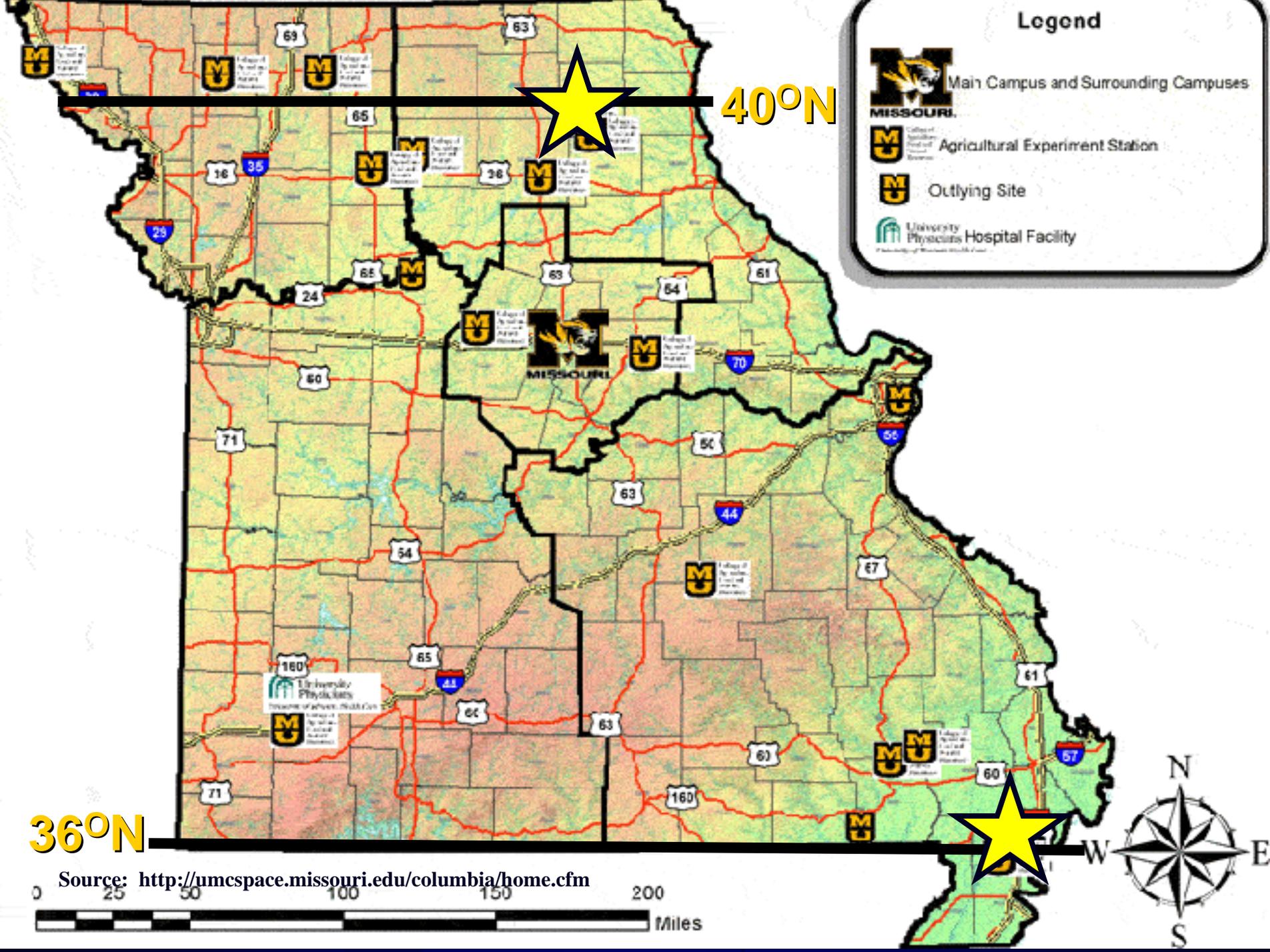


Physiological benefits of twin-rows

Experiences with twin-row crops in MO

- **Northern MO – dryland**
- **Southern MO – irrigated**

Summary and Recommendations



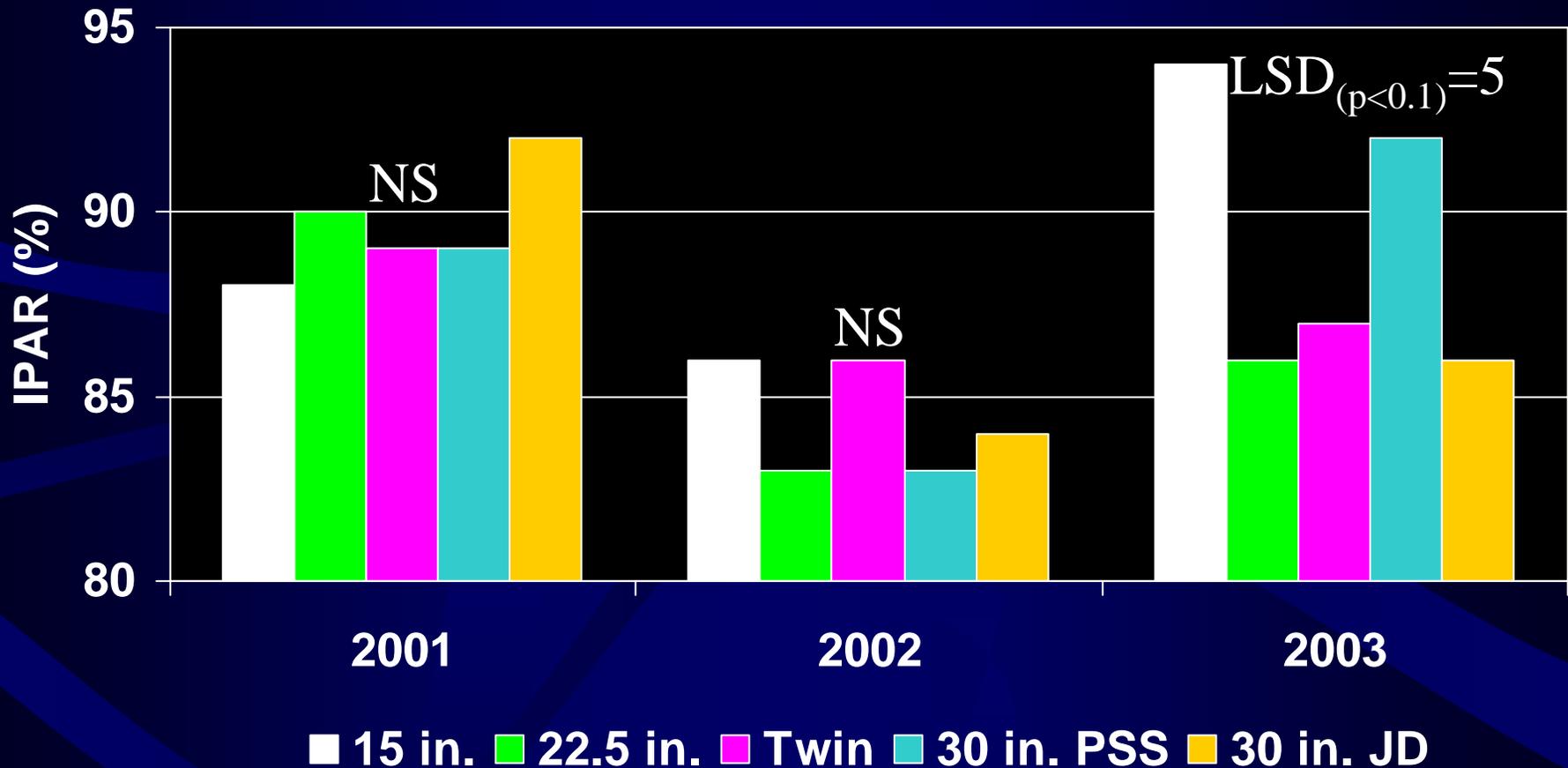




Conventional and No-till Corn Row Spacing and Density

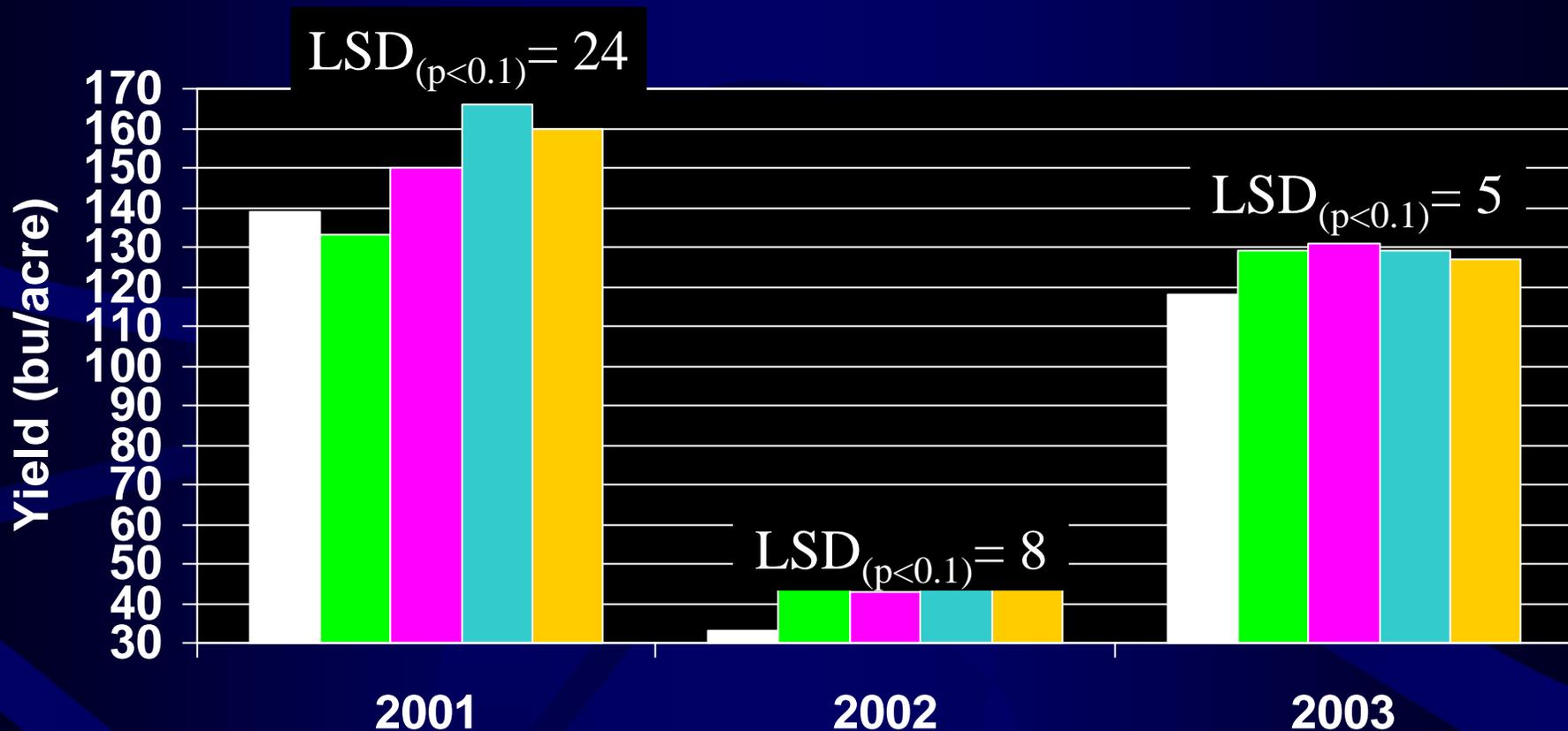


Corn Row Spacing IPAR in 2001-2003 (Conventional tillage)



Pioneer 34B24, No interaction between RS and Plant Density.
Data were averaged over 25, 30, 35, and 40K plants/acre.

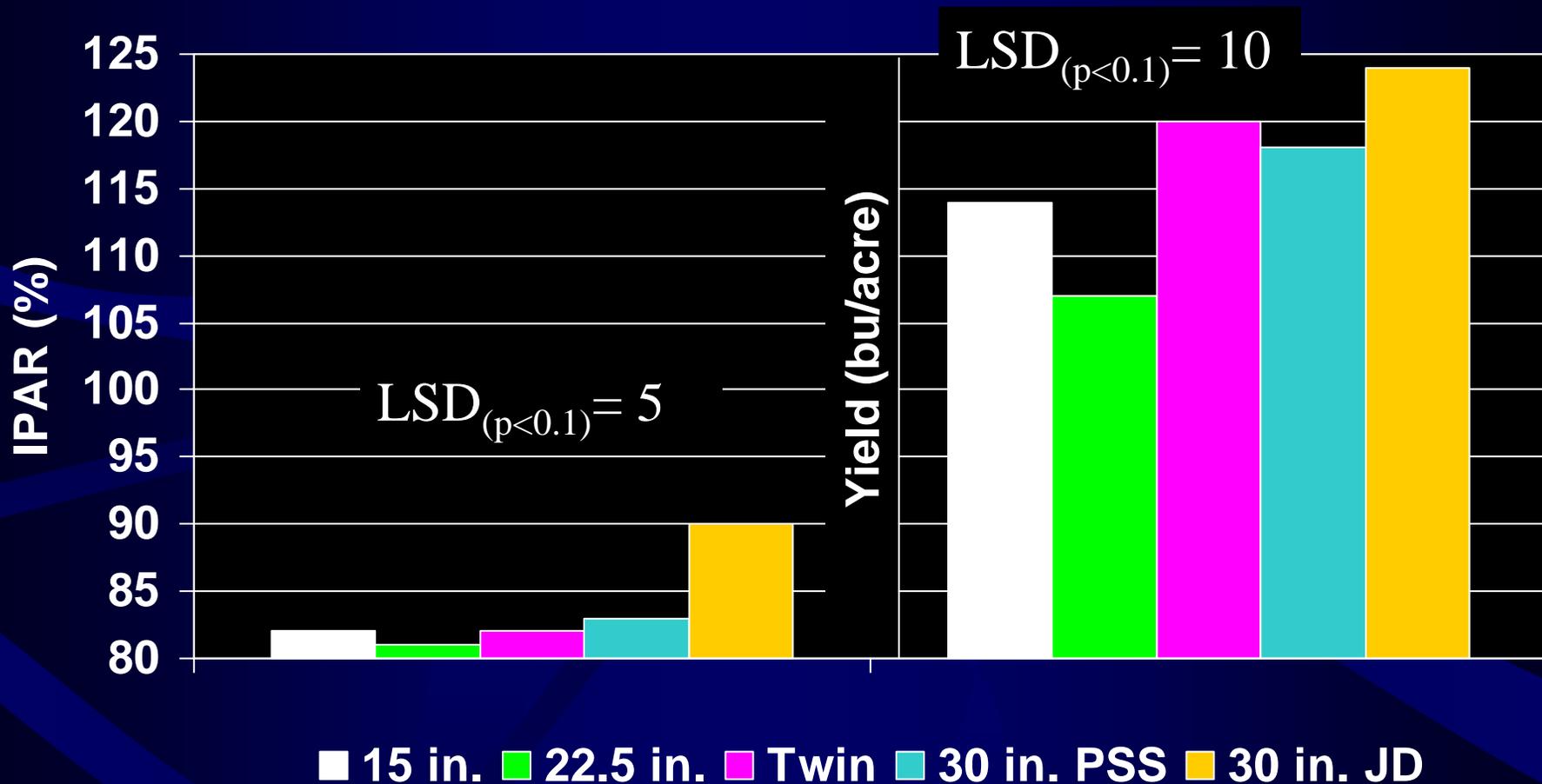
Corn Grain Yield in 2001-2003 (Conventional tillage)



■ 15 in. ■ 22.5 in. ■ Twin ■ 30 in. PSS ■ 30 in. JD

Pioneer 34B24, No interaction between RS and Plant Density
Data were averaged over 25, 30, 35, and 40K plants/acre.

Corn Row Spacing IPAR and Grain Yield (No-till) in 2001 and 2002



Garst 8342IT, No interaction between RS and Plant Density
Data were averaged over 25 and 30K plants/acre.

No-till Corn Emergence in 2001

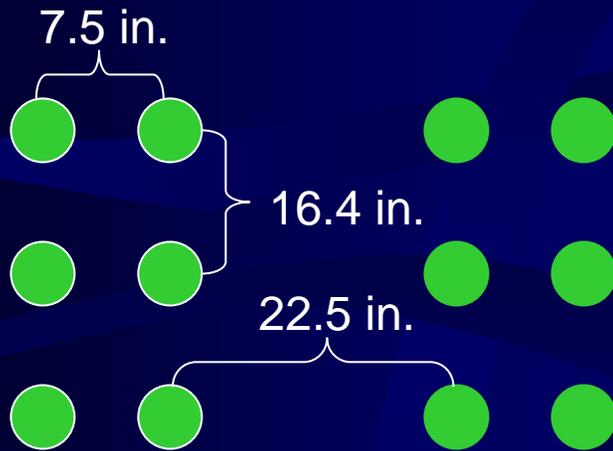


2-4 inches taller 4
weeks after planting

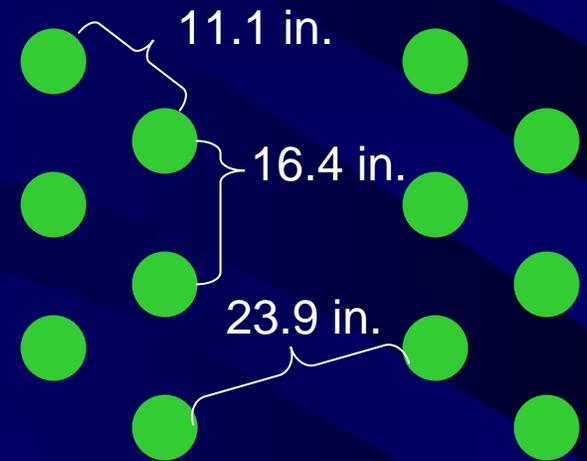
Twin-row Corn Plant Density and Arrangement



Twin-row Corn Plant Arrangement (25,000 plants/acre)

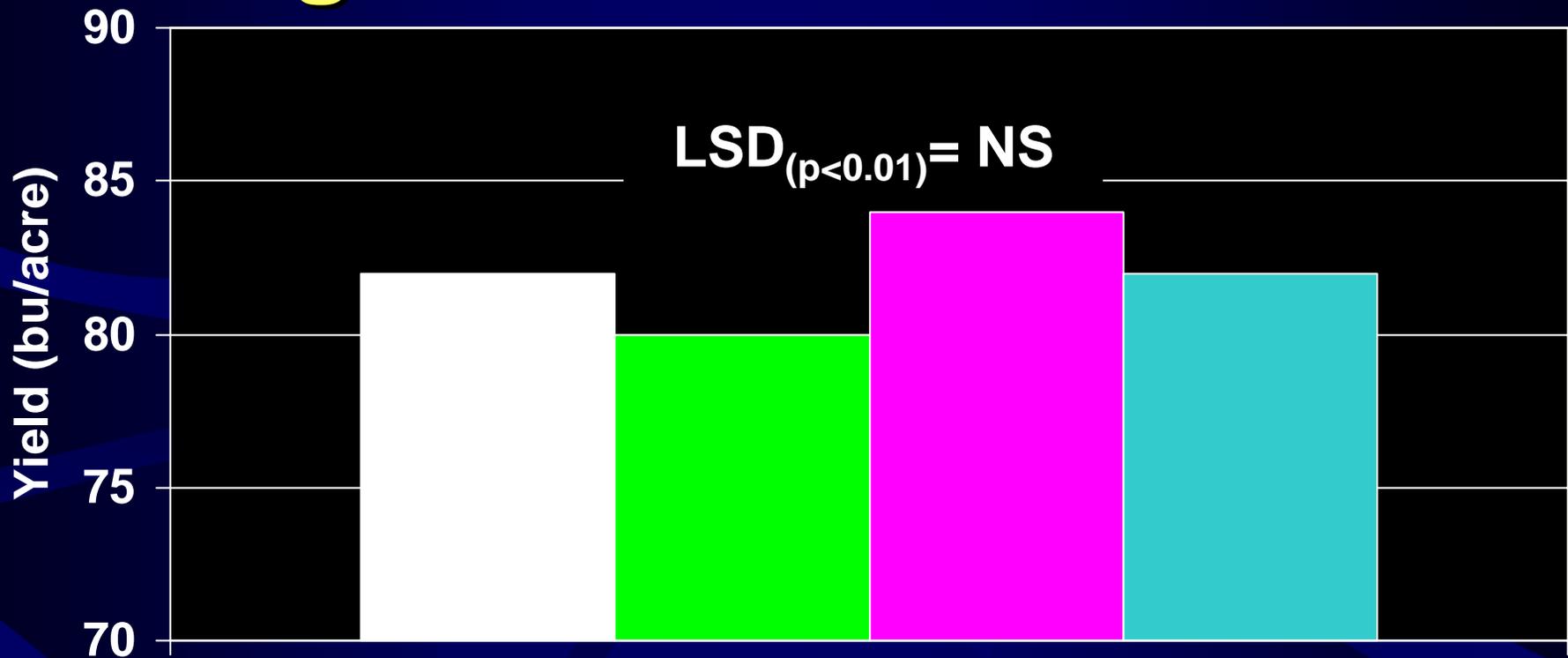


**Twin-row parallel
plant arrangement**



**Twin-row
alternating
plant arrangement**

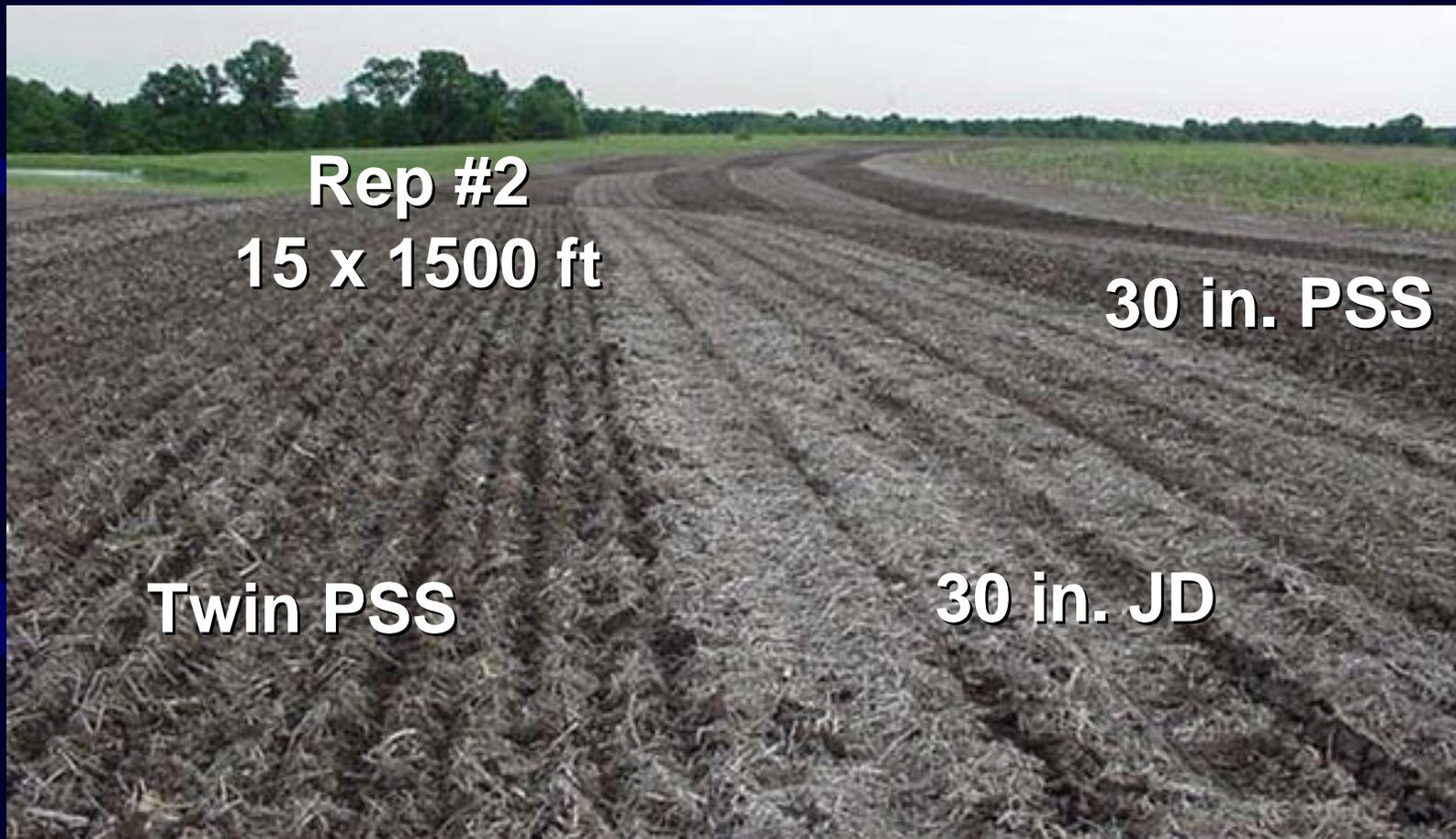
Twin-row Corn Plant Arrangement in 2001 and 2002



■ Twin-row parallel ■ Twin-row alternating ■ 30 in. PSS ■ 30 in. JD

Burrus 671RR, No interaction between RS and plant density.
Data were averaged over 25 and 35K plants/acre.

Twin- and 30 in. Wide-row Production in Large Contour Plots in 2001 and 2002





- **5 MPH @
30,000 s/a**
- **Burrus BX65**
- **Wheat-clover**
- **Garst 8464IT**
- **Soybean**

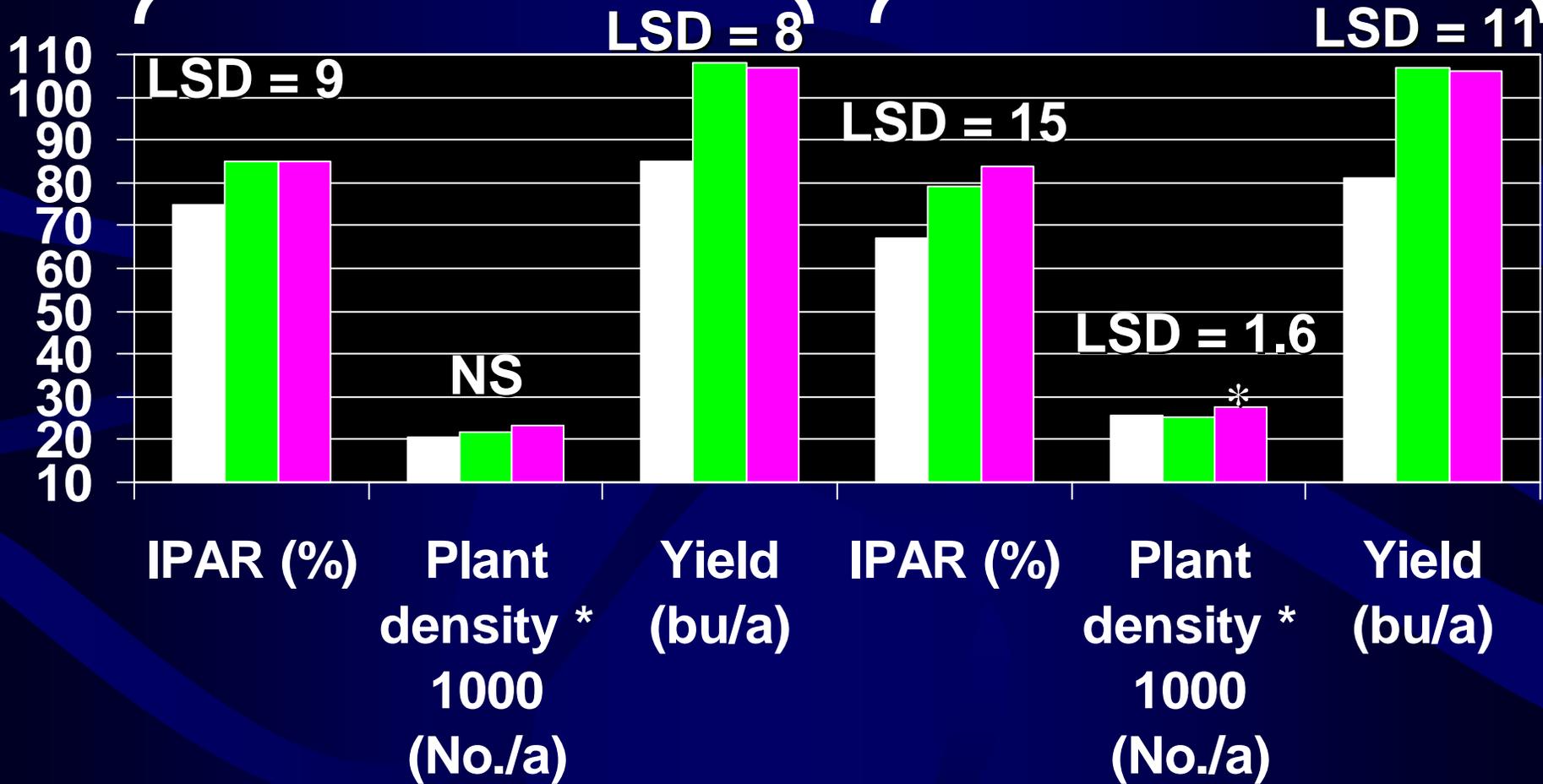
- **2.5 MPH**

IPAR, Harvest Density, and Grain Yield

in 2001

Garst 8464IT

Burrus BX65



■ Twin-row PSS ■ 30 in. PSS ■ 30 in. JD



IPAR, Harvest Density, and Grain Yield in 2002

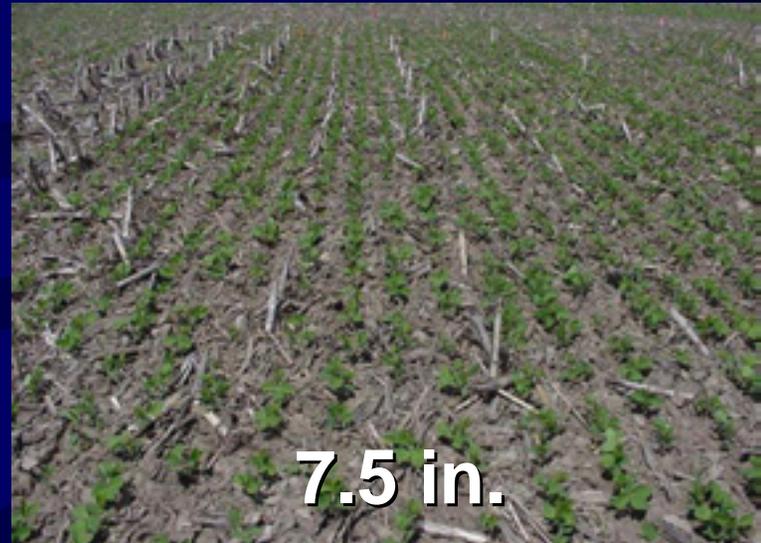


Cooperator Research in 2001 and 2002

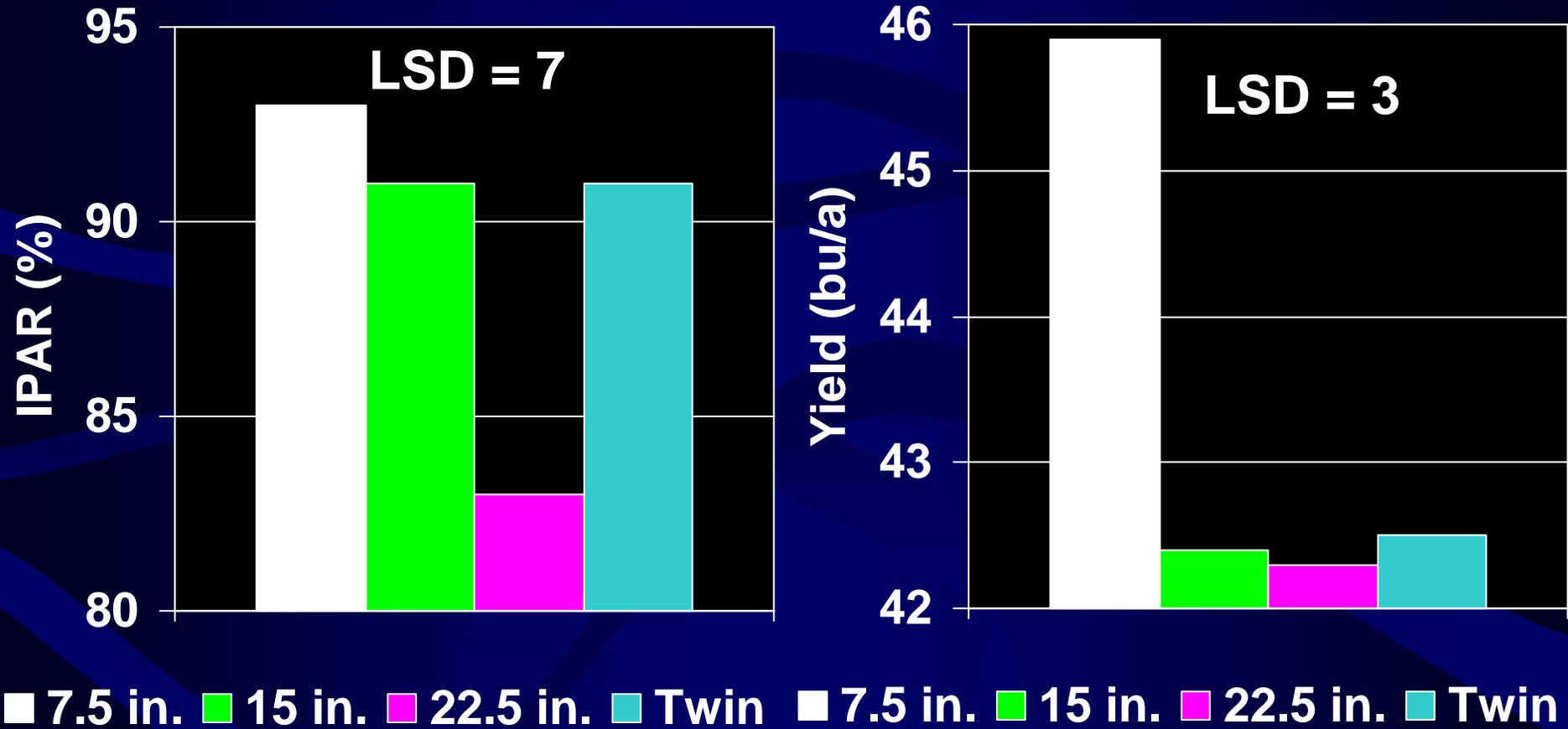
Palmyra 2001	Yield (bu/a)	Knox City 2002	Yield (bu/a)
30 in. Kinzie	170	30 in. JD1750	148
Twin-row PSS	159	Twin-row PSS	140
LSD (p=0.1)	10		NS



Twin- and Single-row Soybean in 2001 and 2002



Twin- and Single-row Soybean in 2001 and 2002



Pioneer 93B01

Glyphosate Application Timings in Twin- and Single-Row Corn and Soybean in 2002 and 2003



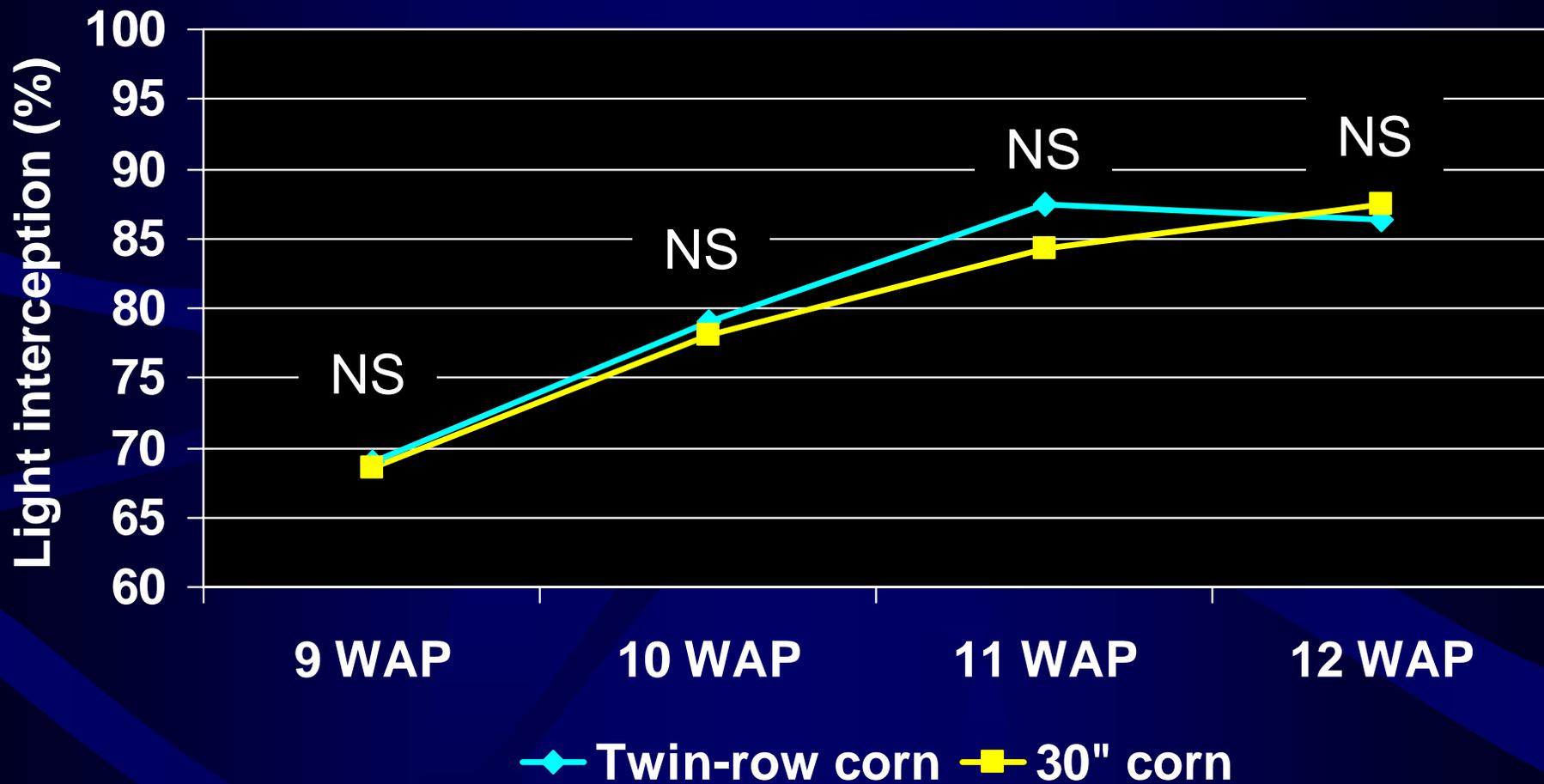


Wilcross 3149 @ 29,000 s/a

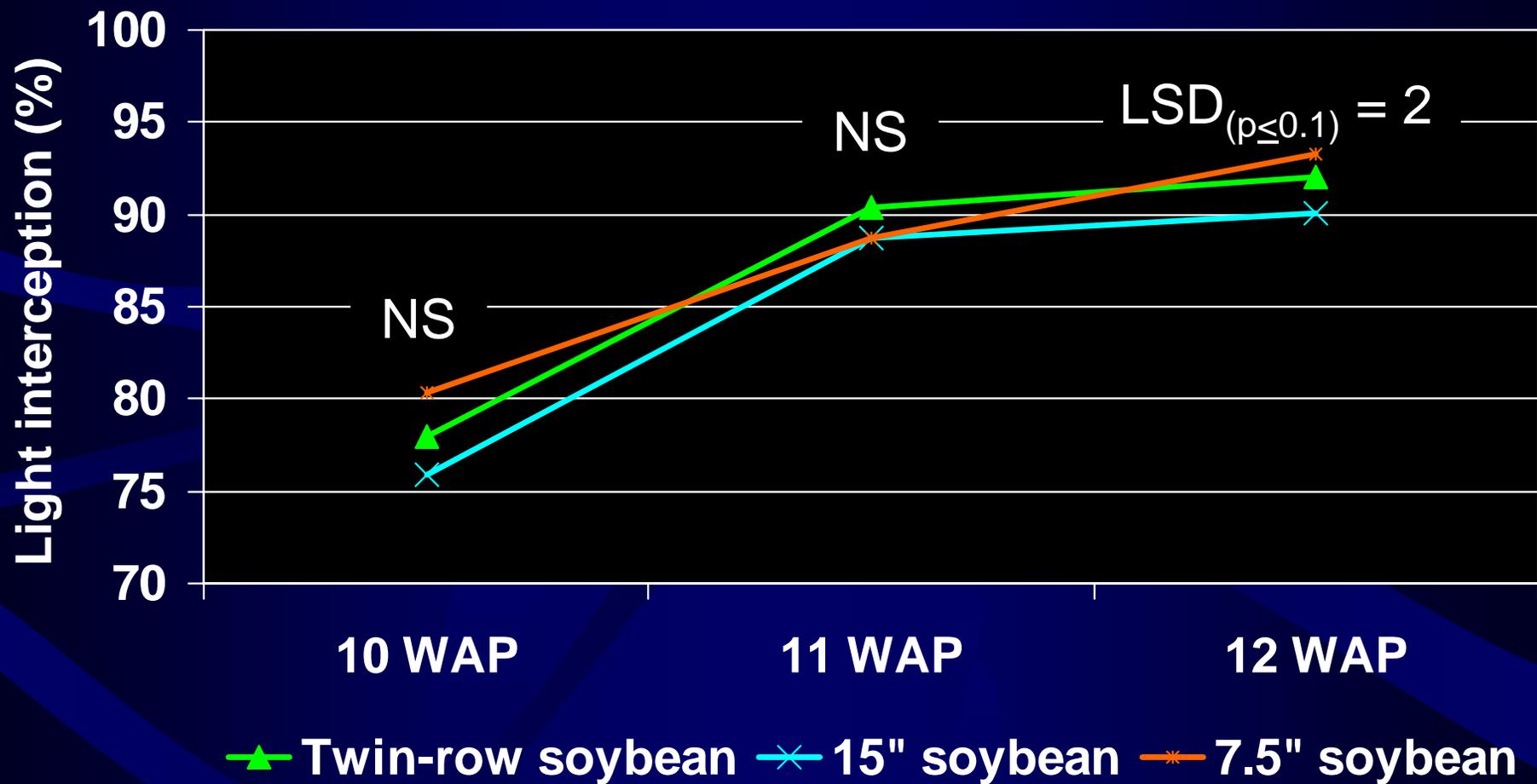


Asgrow 3701 @ 180,000 s/a

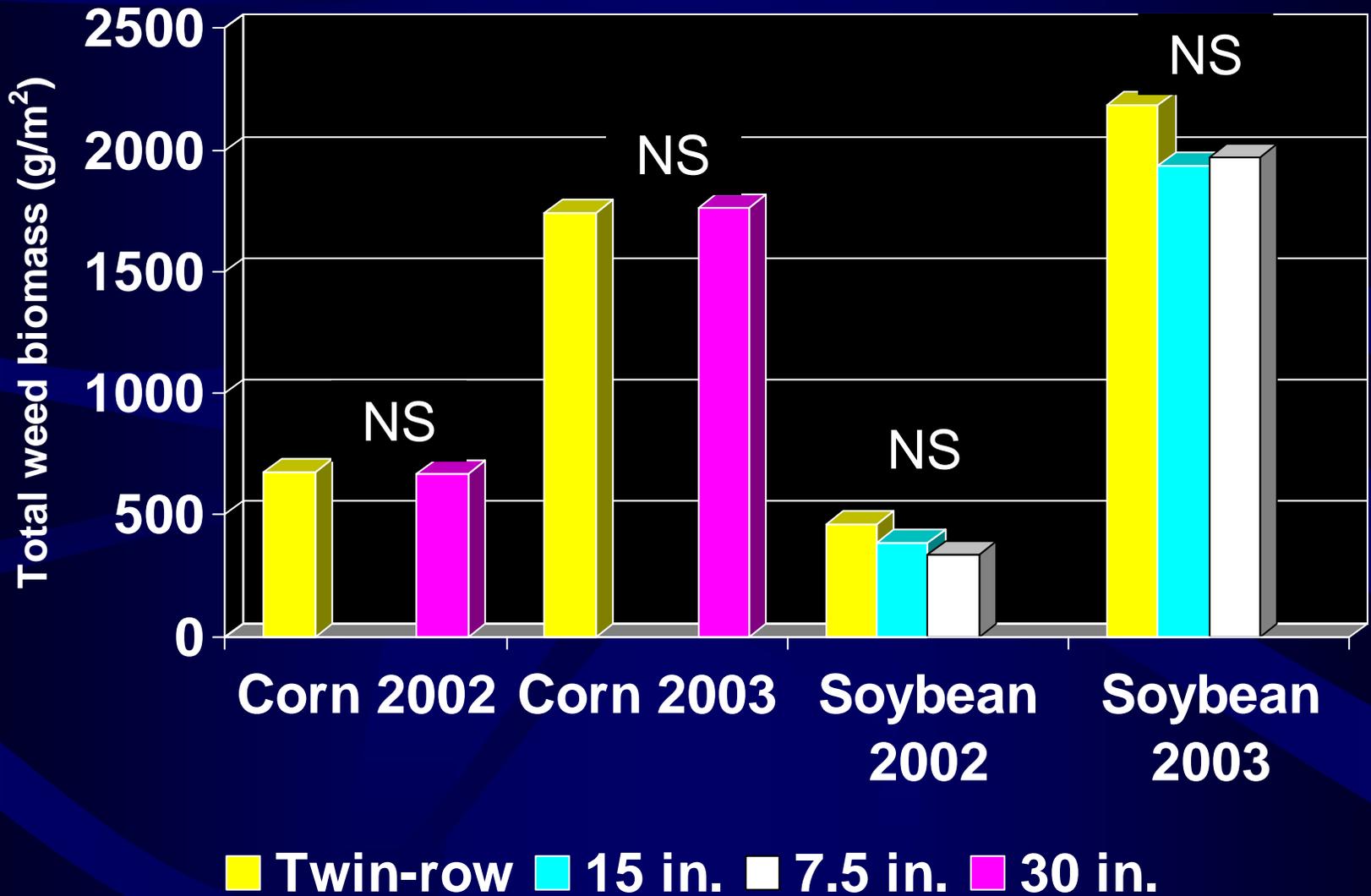
Weed-free Corn Intercepted PAR in 2002 & 2003



Weed-free Soybean Intercepted PAR in 2002 & 2003



Total Weed Biomass in 2022 and 2003



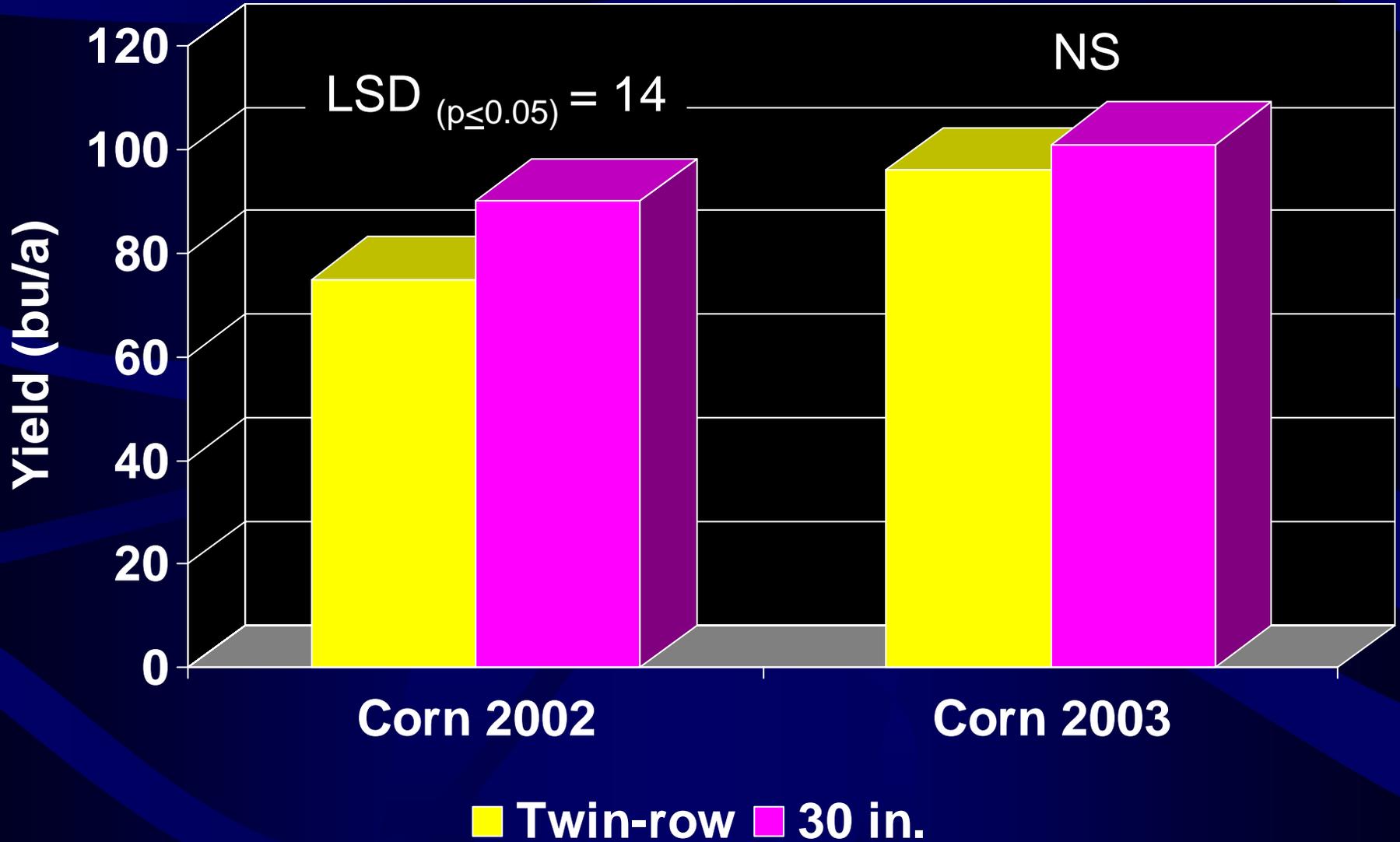
Row spacing main effect. Data were averaged over glyphosate application timing.

Summary:

1. Intercepted PAR was similar in twin- and 30 in. wide-row corn 9 to 12 weeks after planting (WAP).
2. 7.5 in. soybean intercepted 3% more PAR than 15 in. soybean 12 WAP.
3. Total weed biomass was similar in twin- and 30 in. wide-row corn, and similar in twin-, 15 in., and 7.5 in. soybean.

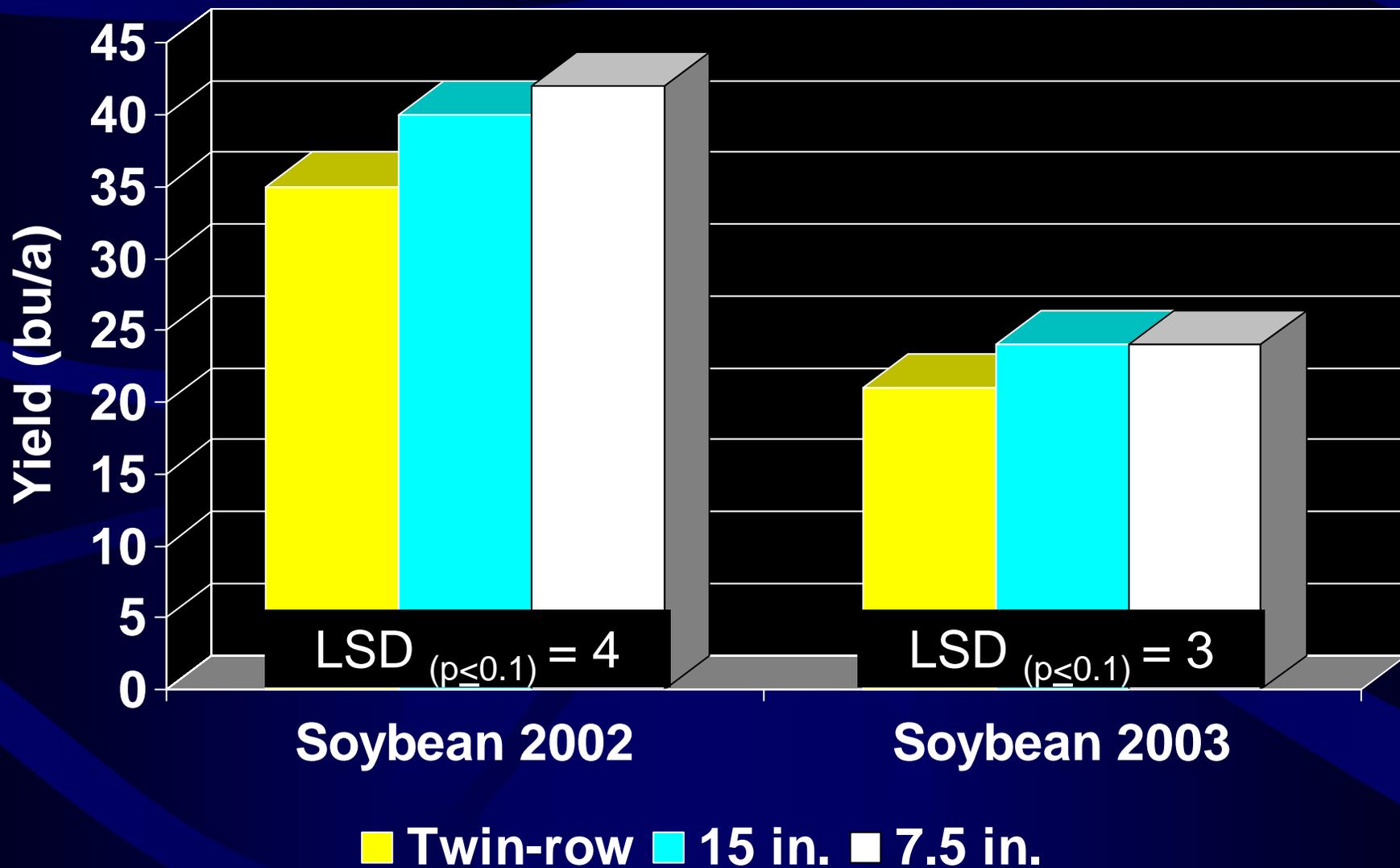


Corn Grain Yield in 2002 and 2003



Row spacing main effect. Data were averaged over glyphosate application timing.

Soybean Grain Yield in 2002 and 2003



Row spacing main effect. Data were averaged over glyphosate application timing.

Summary:

1. Corn grain yield was 15 bu/a greater in 30 in. wide-rows than twin-rows in 2002 while grain yields were similar in 2003.



2. Soybean grain yield was 3 to 7 bu/a greater in 7.5 and 15 in. rows than twin-rows.





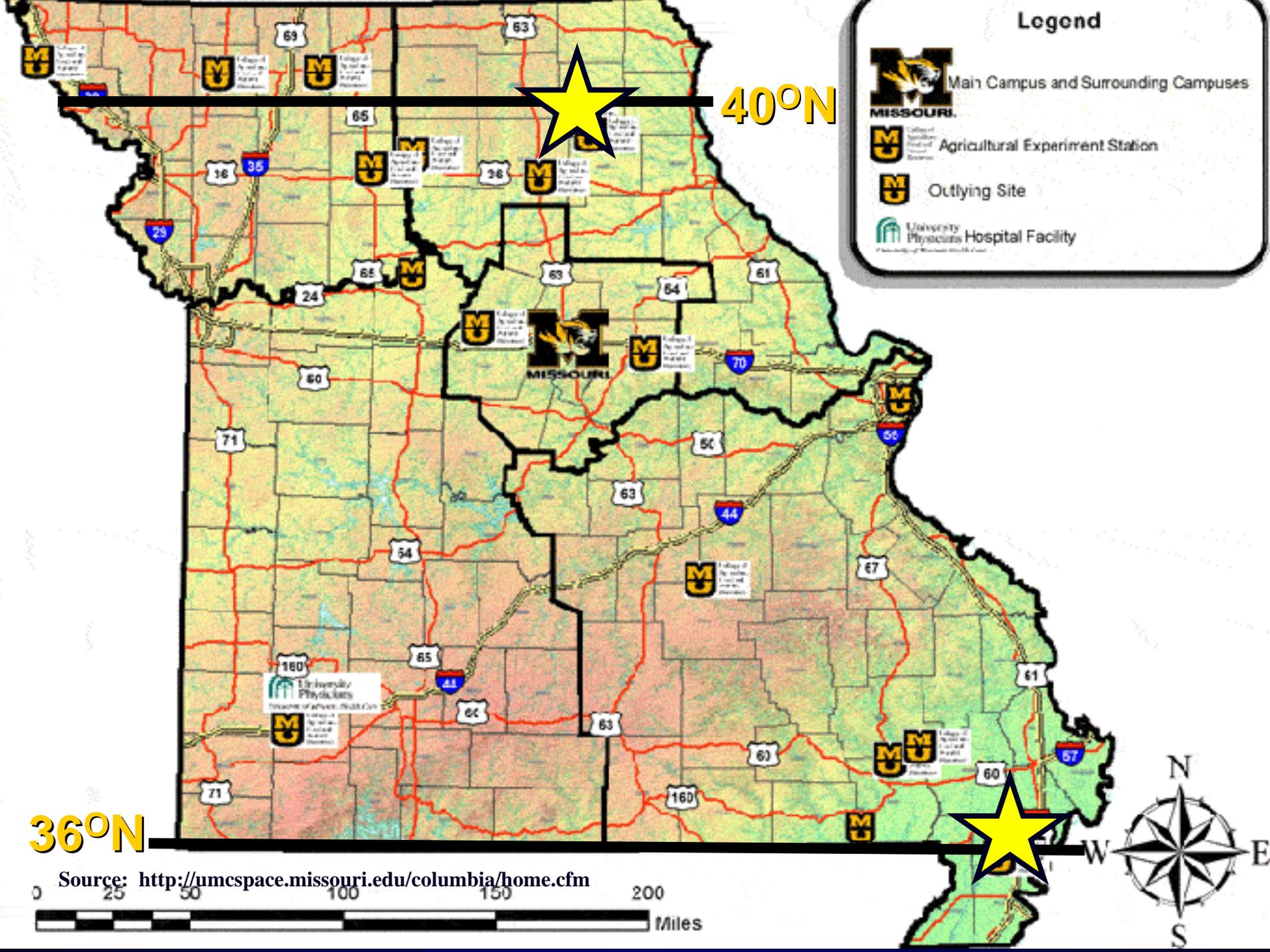
Twin-row



7.5 in.

- **2 in. glyphosate application timing**
- **7.5 and 15 in. soybean were more tolerant of late emerging weeds**

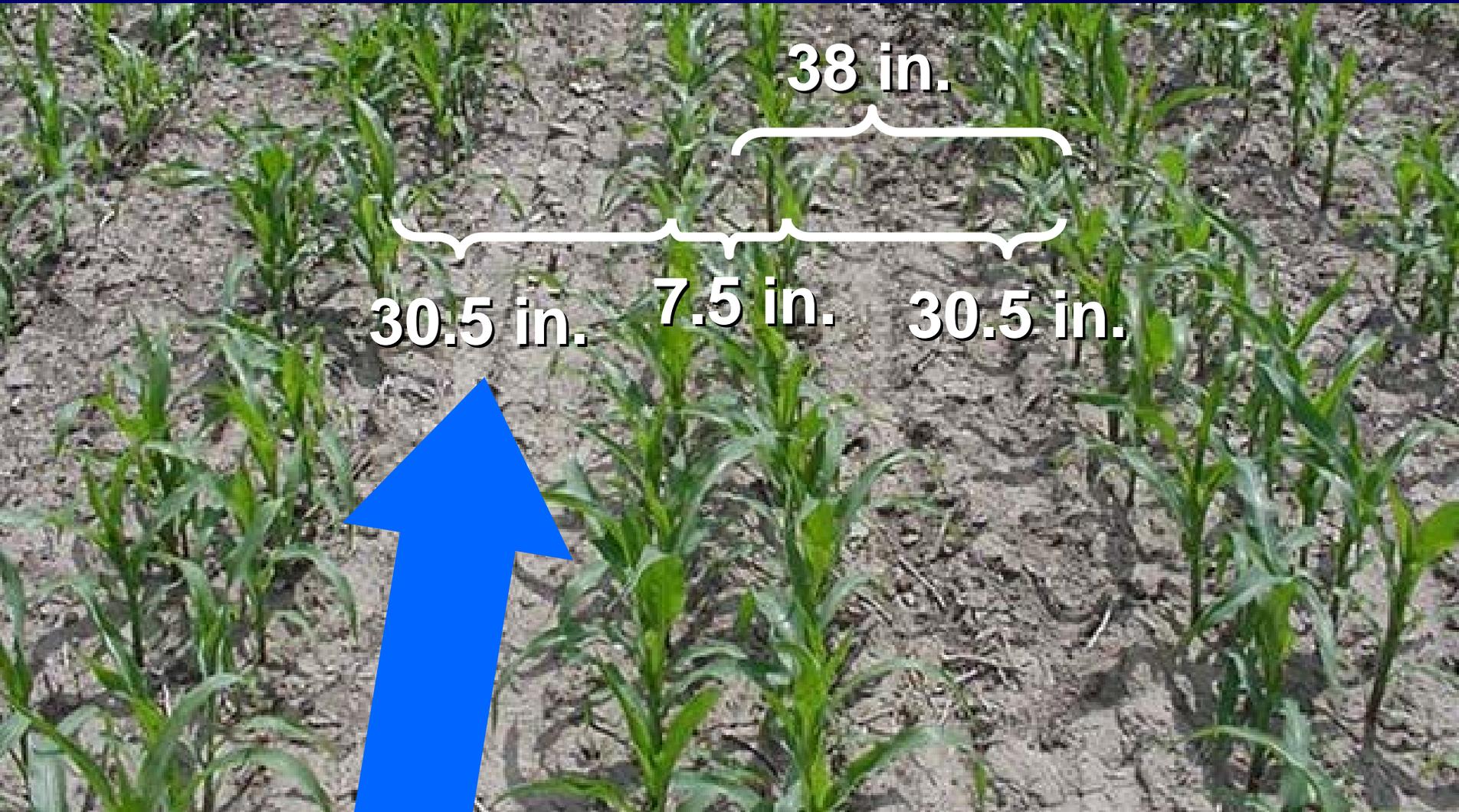




Twin- and Single-Row Irrigated Corn in 2003

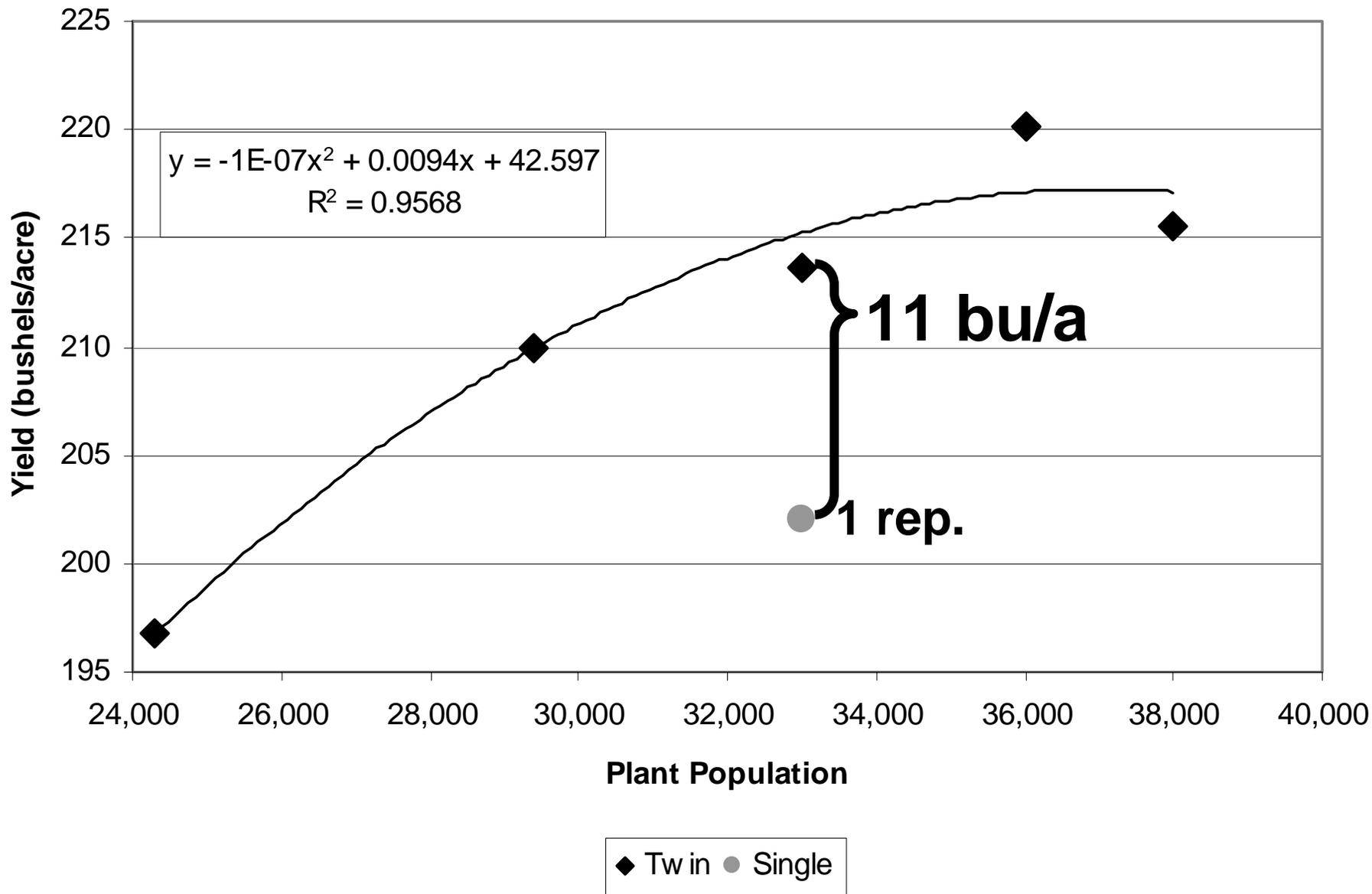
Joe Henggeler, David Reinbott, John Engram
Irrigation Specialist, Farm Management Specialist, and Scott Co. Farmer

Monosem and 900 Case IH



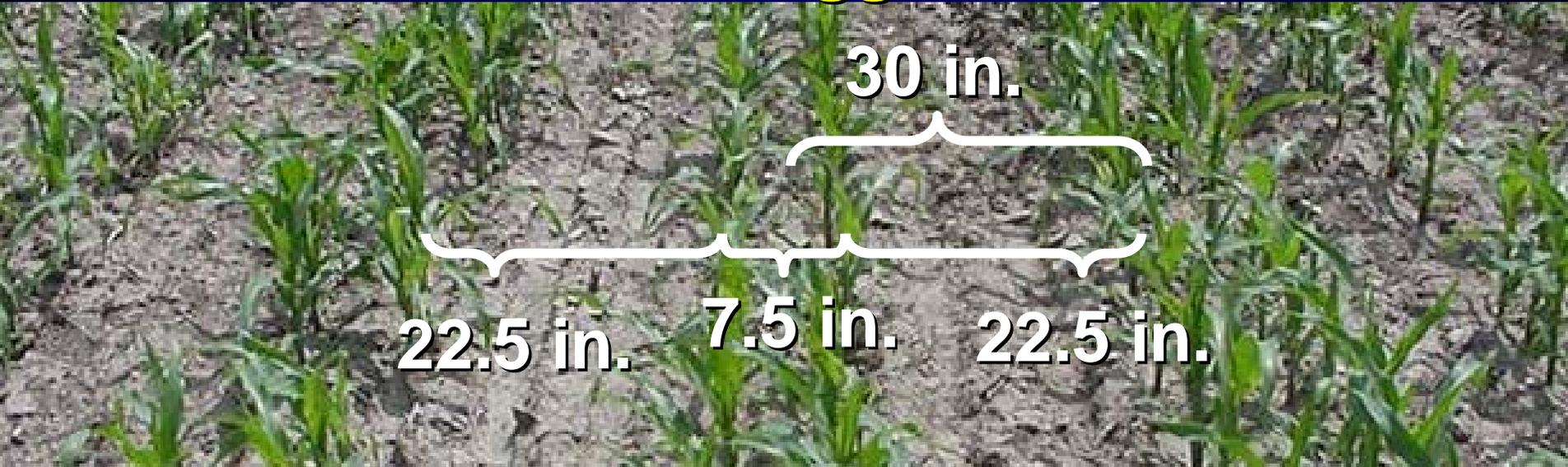
Flood irrigated

Twin- and Single-Row Irrigated Corn in 2003



Twin- and Single-Row Corn on Overhead Irrigated Sandy Soils in 2003

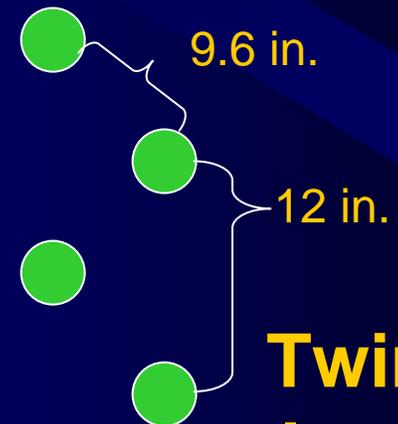
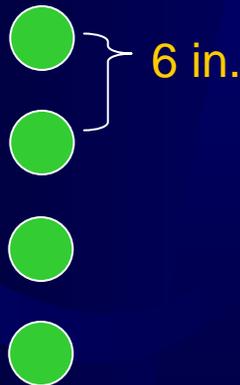
Joe Henggeler



34,850 plants/a

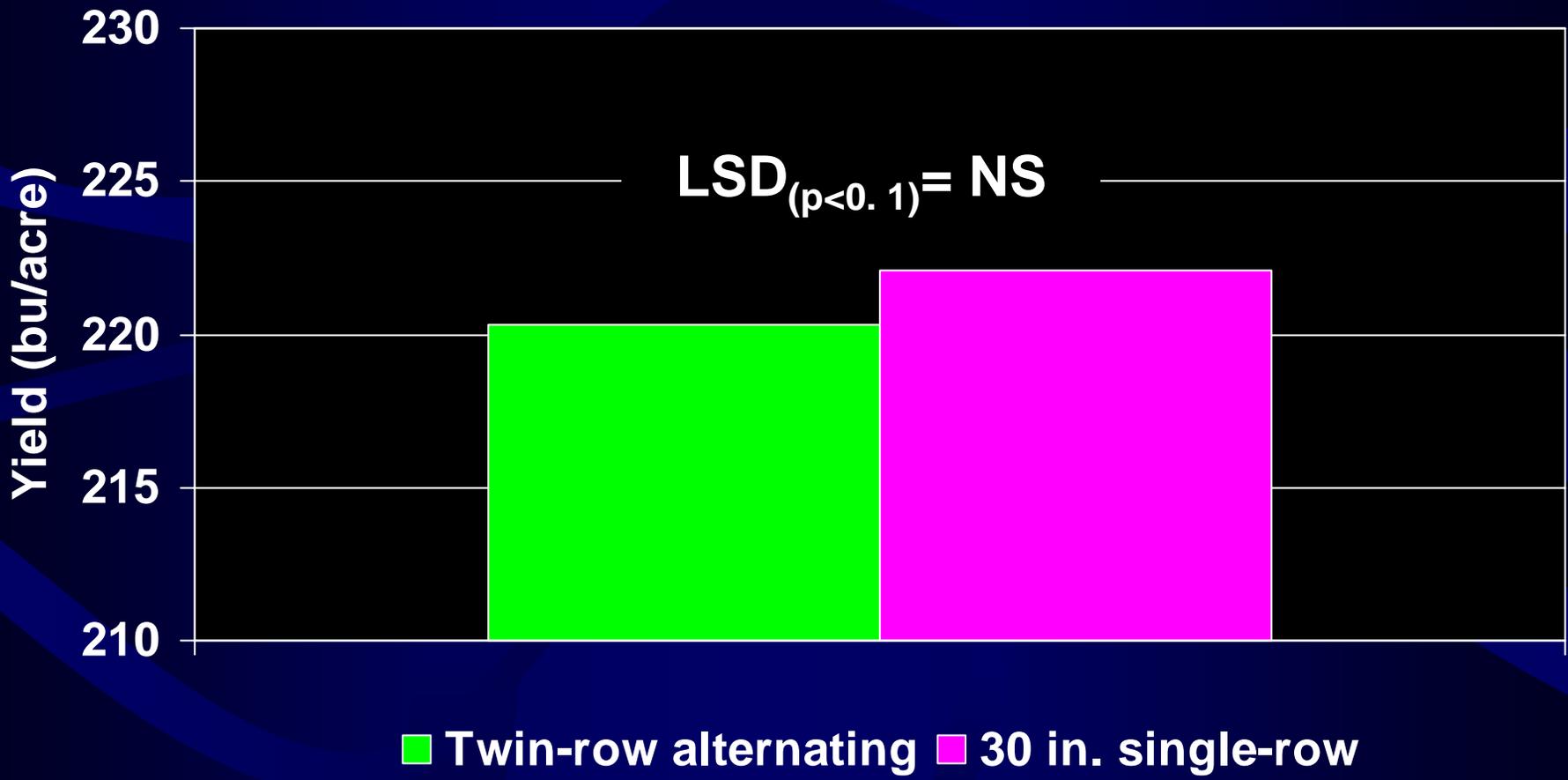
30 in. rows

30 in.



Twin-row
alternating

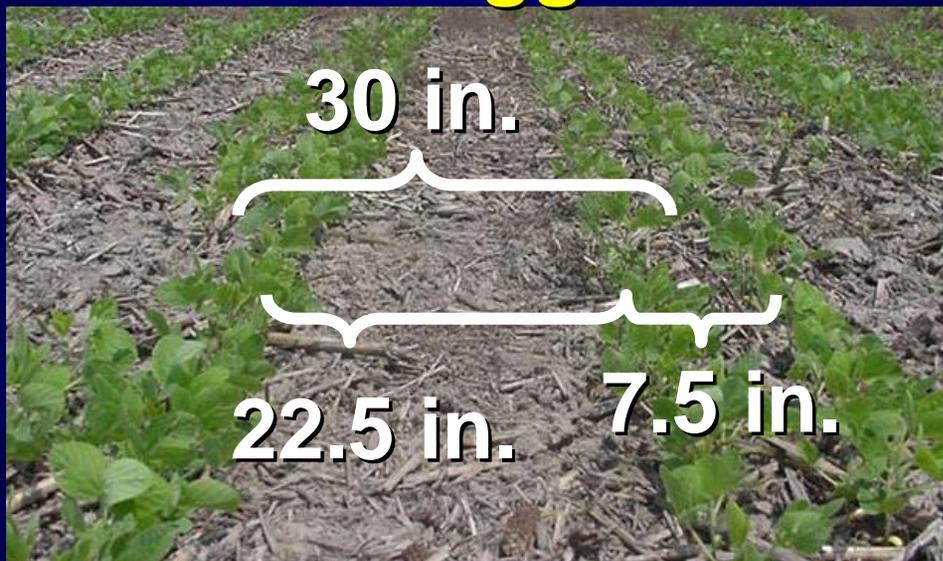
Twin- and Single-Row Irrigated Corn on Sandy Soils in 2003 (Hand Planted)



DK 64-11RR

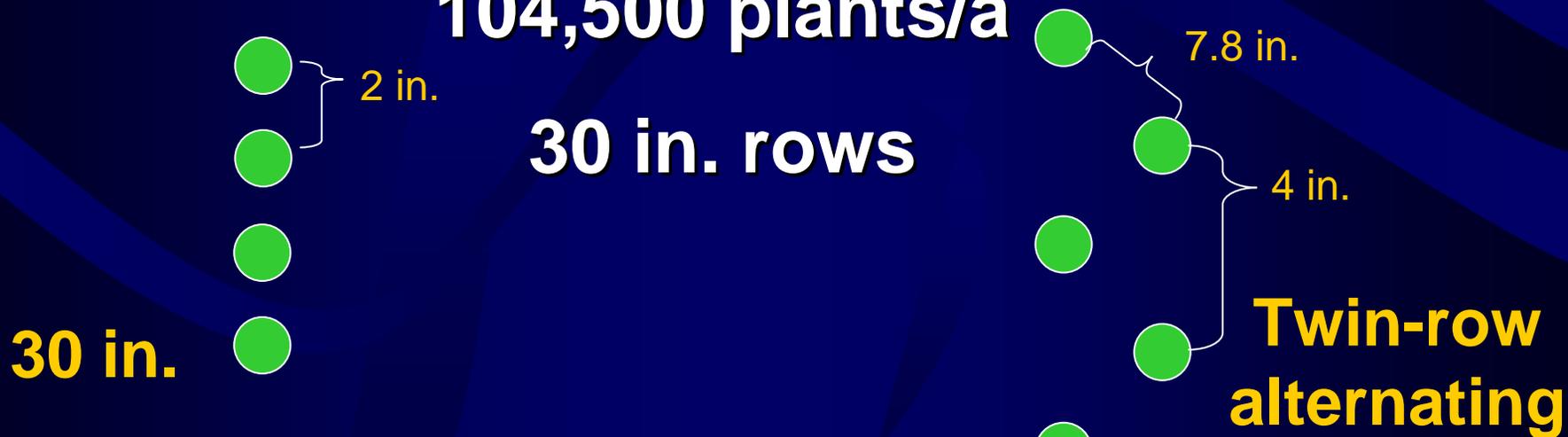
Twin- and Single-Row Soybean on Overhead Irrigated Sandy Soils in 2003

Joe Henggeler

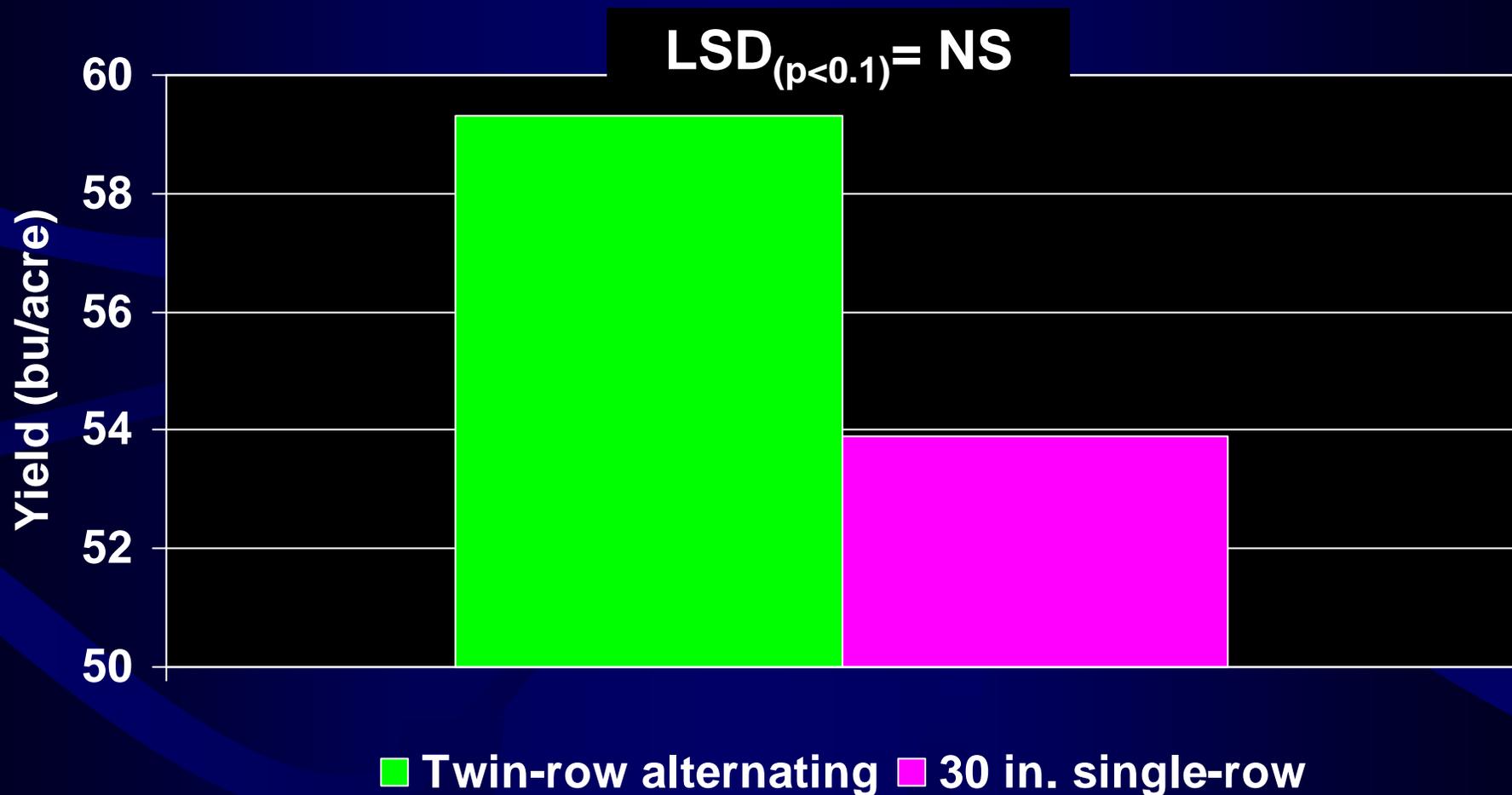


104,500 plants/a

30 in. rows



Twin- and Single-Row Irrigated Soybean on Sandy Soils in 2003 (Hand Planted)



Morsoy RT4480N

Summary: Twin-Row Corn IPAR and Grain Yield

	<	=	>
IPAR (%)	Site/years (average)		
30 in. PSS	3 of 11 (9)	8 of 11 (0)	0
30 in. planter	4 of 9 (12)	5 of 9 (0)	0
	Plant density was greater at 2 sites		
Yield (bu/a)			
30 in. PSS	3 of 15 (21)	12 of 15 (-3)	0
	ECB harvest loss 2 contour sites Weed interference was greater 1 site		
30 in. planter	3 of 15 (20)	12 of 15 (-1)	0
	ECB harvest loss 2 contour sites Plant density was greater at 1 site		
Irrigated Yield (bu/a)			
30 in. planter	1 of 1 (-2)		

Summary: Twin-Row Soybean IPAR and Grain Yield

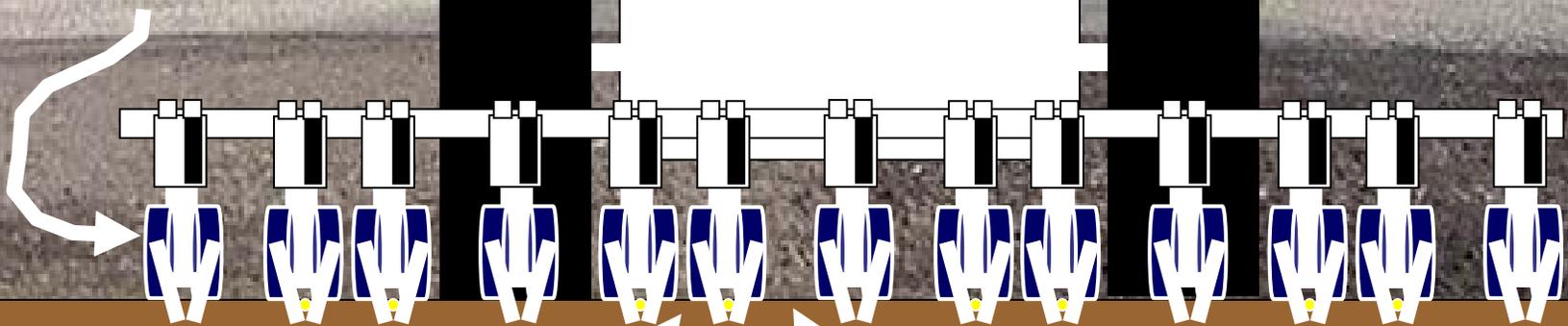
	<	=	>
IPAR (%)	Site/years (average)		
7.5 in.		4 of 4 (-2)	
15 in.		4 of 4 (1)	
22.5 in.			2 of 2 (8)
Yield (bu/a)			
7.5 in.	4 of 4 (4)		
15 in.	2 of 4 (4)	2 of 4 (0)	
	Weed interference		
22.5 in.		2 of 2 (0)	
Irrigated Yield (bu/a)			
30 in.		1 of 1 (5)	

Risks Associated with Twin-row Crops

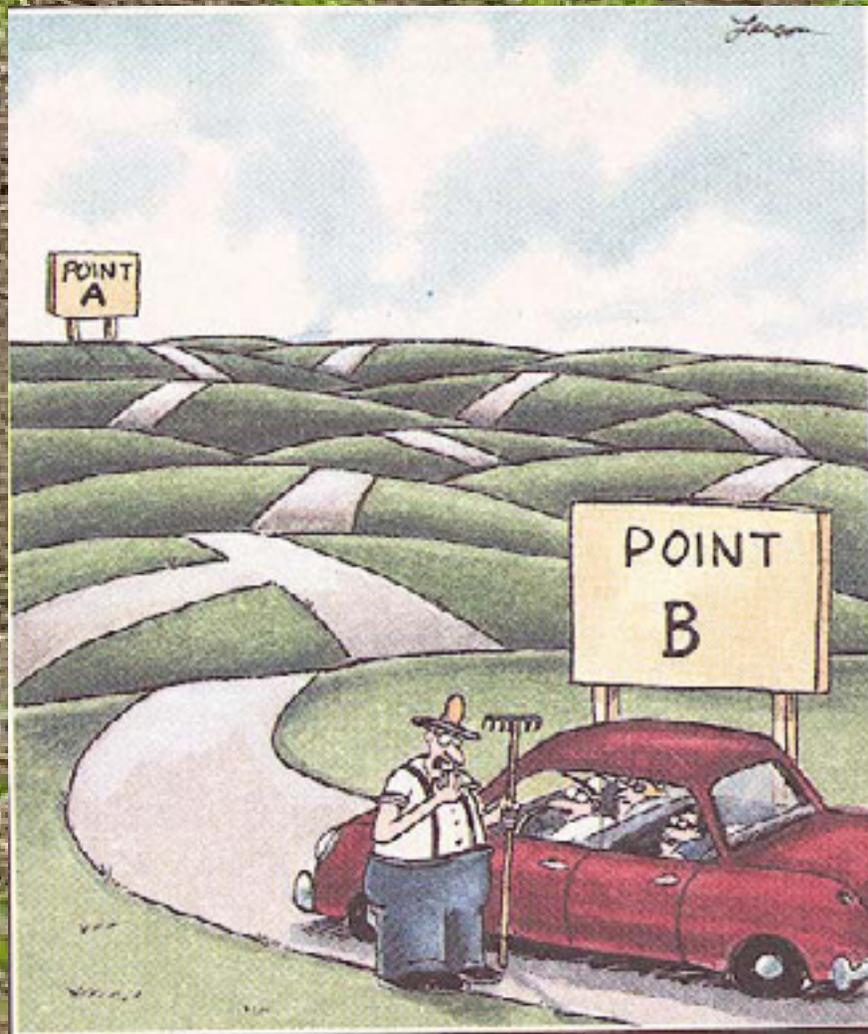
- **Banded insecticide cost – coated seed and rootworm resistant hybrids**
- **Increased risk of lodging in corn**
- **Increased insect management (ECB)**
- **Ability to compete with weeds**
- **Incidence of disease in corn**
- **Side-dress fertilizer applications**
- **Cultivation**
- **Reduced soybean grain yield**

Twin-row Corn

Depth
control
gauge
wheels



7.5 in. and 11.25 in. soybean



**“Well, lemme think. ... You’ve stumped me, son.
Most folks only wanna know how
to go the other way.”**