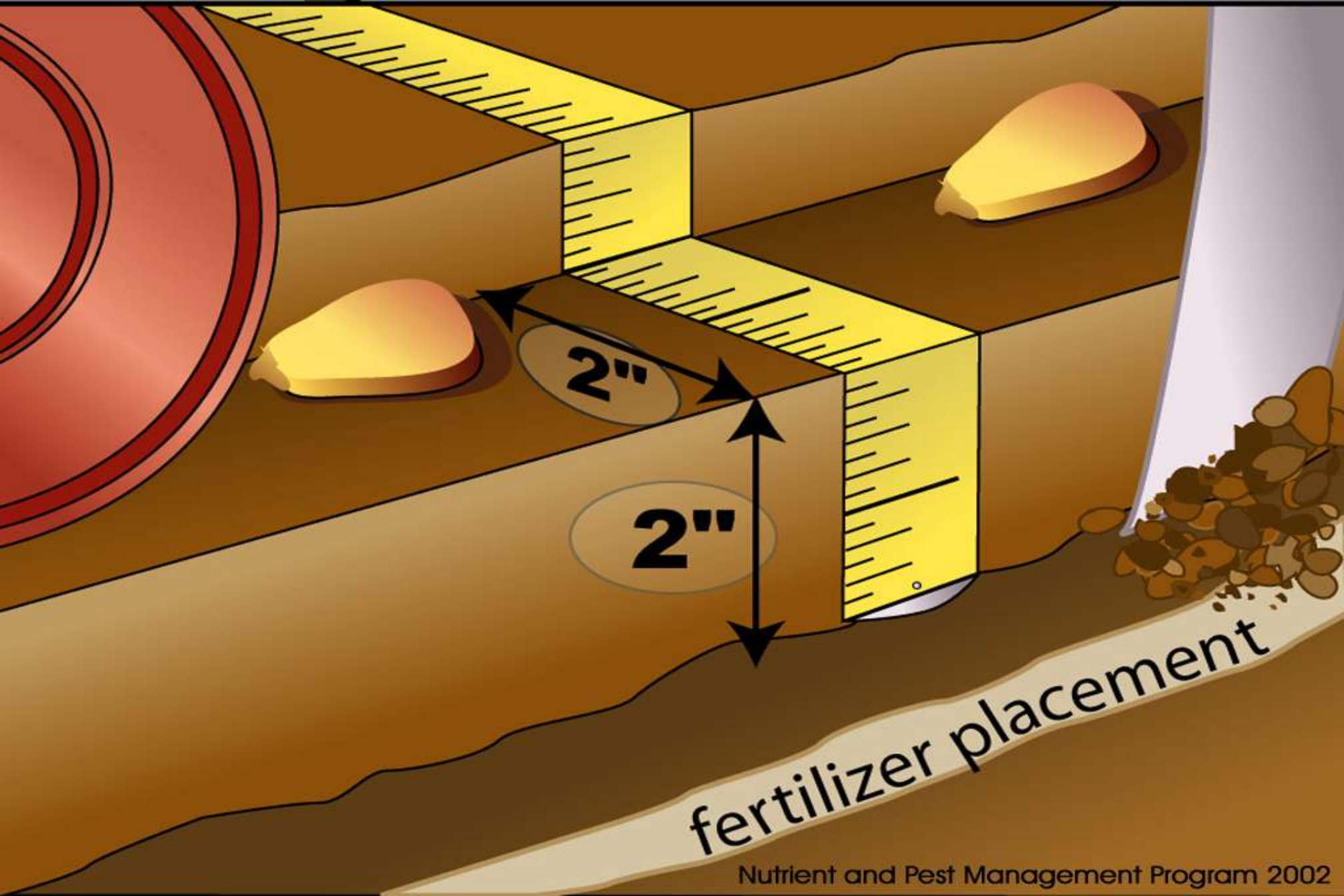

EVALUATING CORN STARTER FERTILIZER PROGRAMS

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Importance of Starter Fertilizer Composition

- Trend or interest toward lower rates and N or N-P composition
 - More interest in seed-placement
 - How good is 10-34-0 or similar N-P fertilizer as a starter?
 - Is a complete (N-P-K) fertilizer necessary?
-



fertilizer placement

Comparisons of liquid and dry starter fertilizers applied to corn, Arlington, WI

Starter N+P₂O₅+K₂O ----lb/a-----	Placement	Corn yield 3 yr. ave. ----bu/a----
0+0+0	-----	125
3.2+6.5+3.2 “cold”	seed	133
3.2+6.5+3.2 “hot”	seed	128
6+24+24 liquid	2x2	139
6+24+24 dry	2x2	137
LSD (0.10)		11

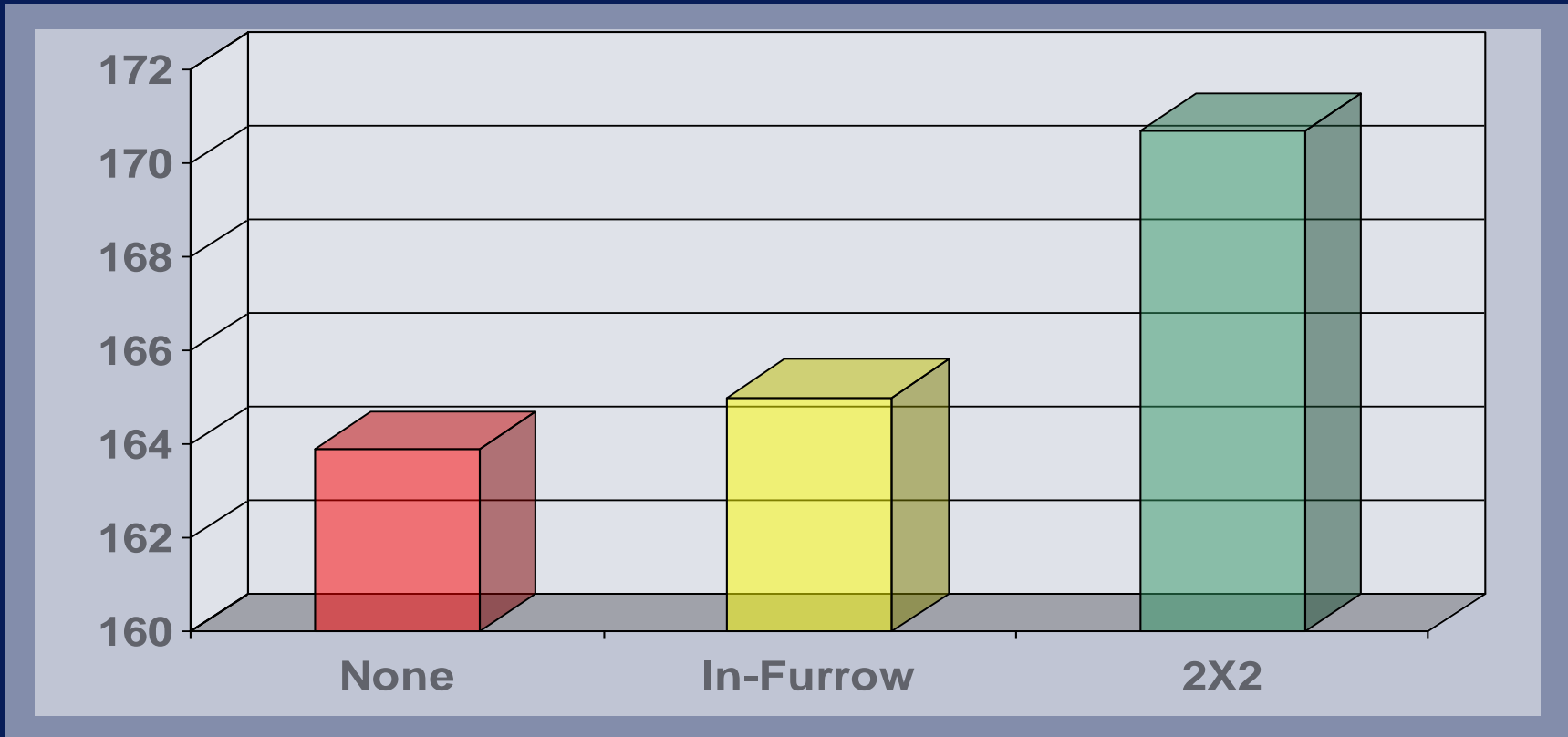
Wolkowski and Kelling, 1985

Corn Response to Starter Fertilizer

N	Fertilizer		Placement	Yield Bu/a
	P ₂ O ₅ lb/a	K ₂ O		
0	0	0	None	125
3.2	6.5	3.2	Seed	128
6	24	24	2x2	139
12	48	48	2x2	141

Arlington, WI, average of 3 years

1992-1996 Corn Starter Study



L. Murrell, Indiana, 5-yr. ave. yields; rates = 5 gal/a, 12 gal/a (2x2)



Importance of Potassium in Starter Fertilizers

- **Response to deep-banded K at high soil tests (ridge-till and no-till)**
 - **More frequent starter response at soil test K < 140 ppm**
 - **Offset soil compaction effects**
 - **More consistent starter response**
-

Yield Advantage of Deep-banded K Over Broadcast or Planter-band K

Tillage System

Advantage

-- bu/acre --

Ridge-till

8

No-till

4-5

Chisel-disk

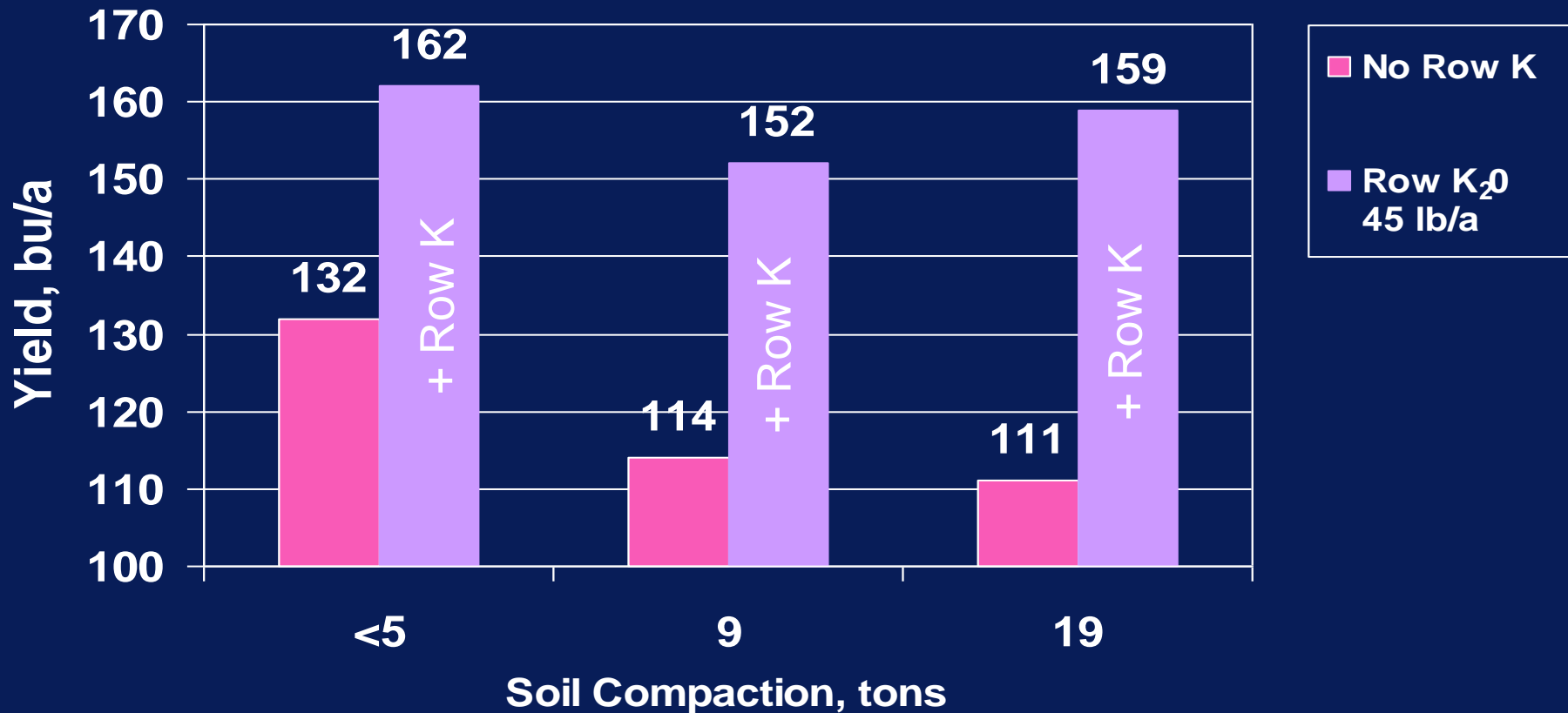
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Mallarino, Iowa

No-till Corn Yield Response to Starter Fertilizer in Selected Experiments

Location	Starter Treatment	Response
Missouri Scharf (1999)	N,P,K; 2 x 2	6 of 6 expts. 13 bu/a incr.
Iowa Buha et al. (1999)	N,P,K; 2 x 2	7 of 9 expts. 4-18 bu/a incr.
Wisconsin Bundy - Widen (1999)	N,P,K; 2 x 2	8 of 12 expts. 15 bu/a incr.
Illinois Ritchie et al. (1996)	N,P,K; 2 x 2	8 of 9 expts. 14 bu/a incr.

Row K Effects on Corn Yield with Increasing Soil Compaction



Wolkowski, Wis., Initial K Soil test = 102 ppm

TREATMENTS (Bundy & Widen, 1992)

- Starter Fertilizer (lb/acre)
 - Control (0 + 0)
 - P_2O_5 (25 + 0)
 - K_2O (0 + 25)
 - $P_2O_5 + K_2O$ (25 + 25)

All treatments contained 10 lb N/acre

Effect of Tillage and Starter Fertilizer on Corn Yield

Starter N-P ₂ O ₅ -K ₂ O lb/acre	Moldboard		Mean
	plow	No-till	
----- Yield, bu/acre -----			
10-0-0	153 b	143 b	148 c
10-25-0	157 b	149 ab	153 b
10-0-25	152 b	147 ab	150 bc
10-25-25	164 a	152 a	158 a

Average of four planting dates
(Bundy & Widen, 1992)

Effect of tillage and soil test K on corn response to starter fertilizer, Arlington, WI.

Soil test K (ppm)

Tillage	50-60	100-145	145-190
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----- Response, bu/acre -----

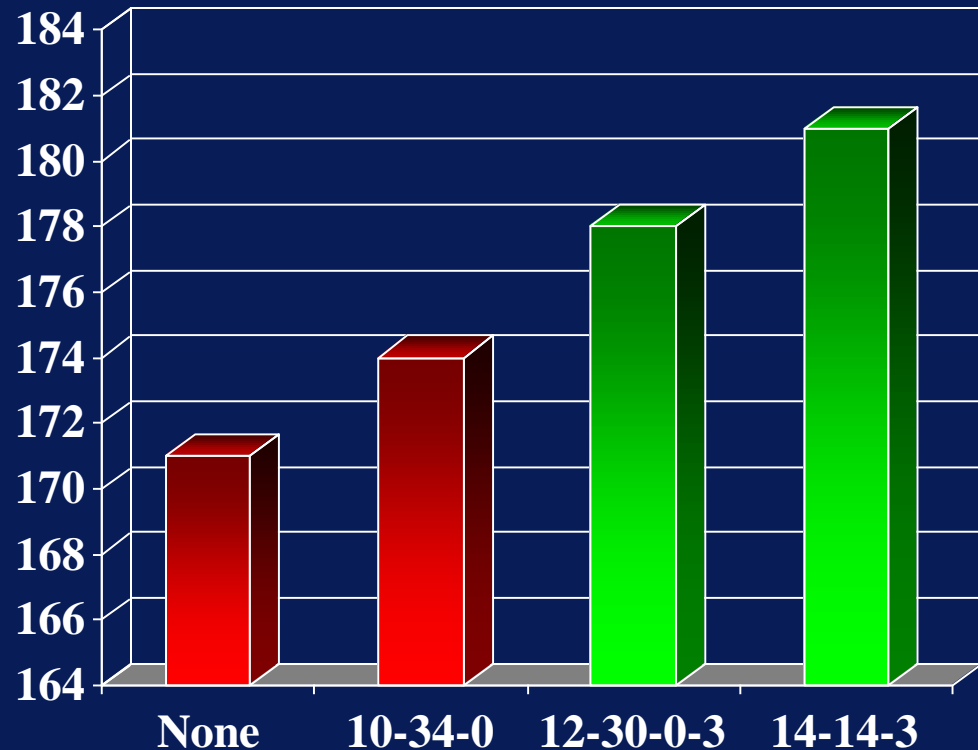
Ridge-till	45	12	3
Chisel	13	7	8
Moldbrd.	20	5	7

* Moncrief & Schulte; 8-48-12 starter fert.

Corn yield response to different starter fertilizers

140 pounds/acre used for all materials

- There is a starter formulation better than 10-34-0



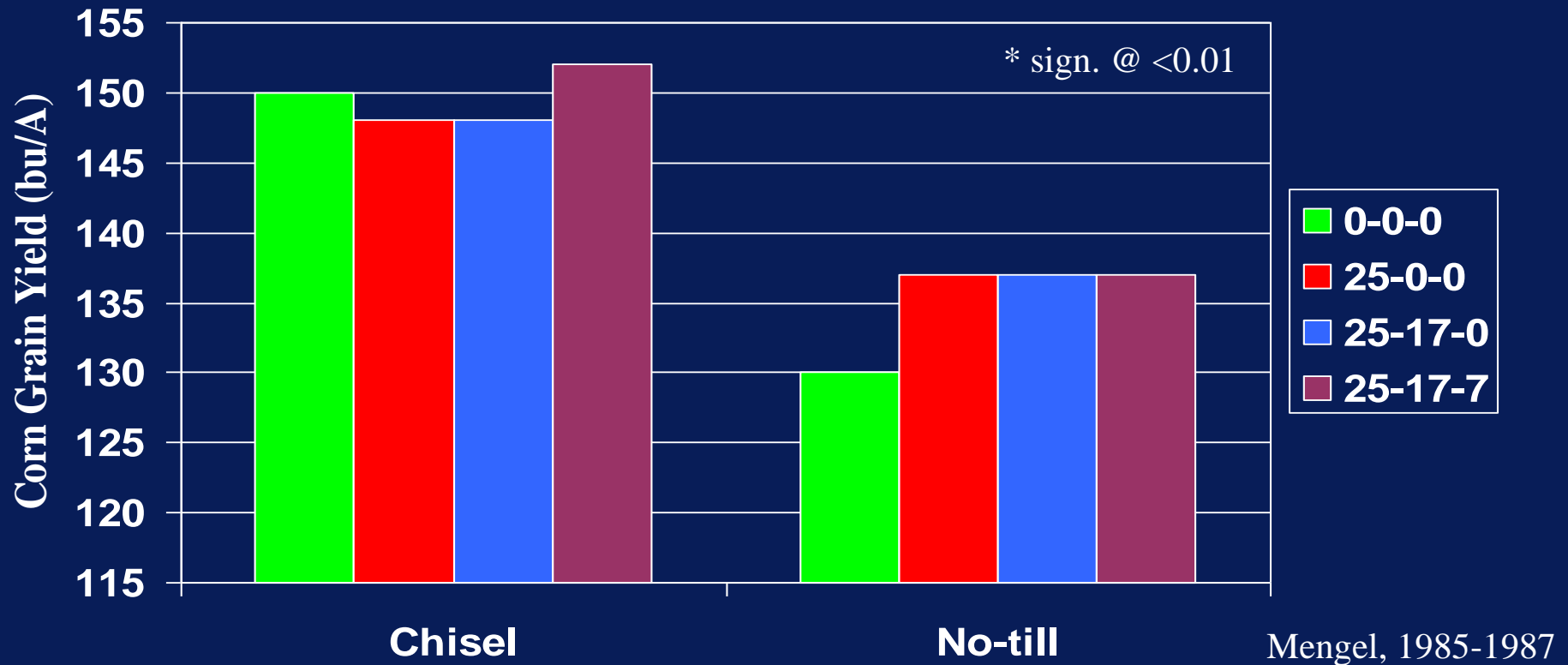
L. Murrell, Indiana, 5-yr. ave. yields; rate = 12 gal/acre

COMPARISON OF MAP AND DAP AS A CORN STARTER FERTILIZER COMPONENT

Treatment	Year		Mean
	1995	1996	
	-----Yield, bu/acre-----		
MAP (+S)	116	122	119
MAP (-S)	119	121	120
DAP (+S)	120	123	122
DAP (-S)	120	122	121
K only	119	113	116
Control	99	117	108
LSD (5%)	7.6	6.5	

(Fond du Lac Co.)

Starter Response To N- Indiana



Corn yield response to starter fertilizer placement, Kansas and Wisconsin

Placement	Yield	
	Kansas	Wisconsin
	----- bu/acre -----	
Control (none)	136	147
With seed	157	---
Broadcast	---	152
2 x 2	172	170
Surface band	175	163

Rate = 100/15-15-5 (KS); 100/9-23-30 (WI)

Summary

- **Seed-placed starter at low rates may not maximize response**
 - **Response maximized with 10-20-20 (liquid or dry) on high testing soils**
-

Summary

- **N or N-P starters may not maximize response**
 - **Potassium (K) in starters is important especially in reduced tillage or low K soils**
 - **Complete (NPK) starters give a more consistent response**
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