IMPORTANCE OF STARTER FERTILIZER COMPOSITION

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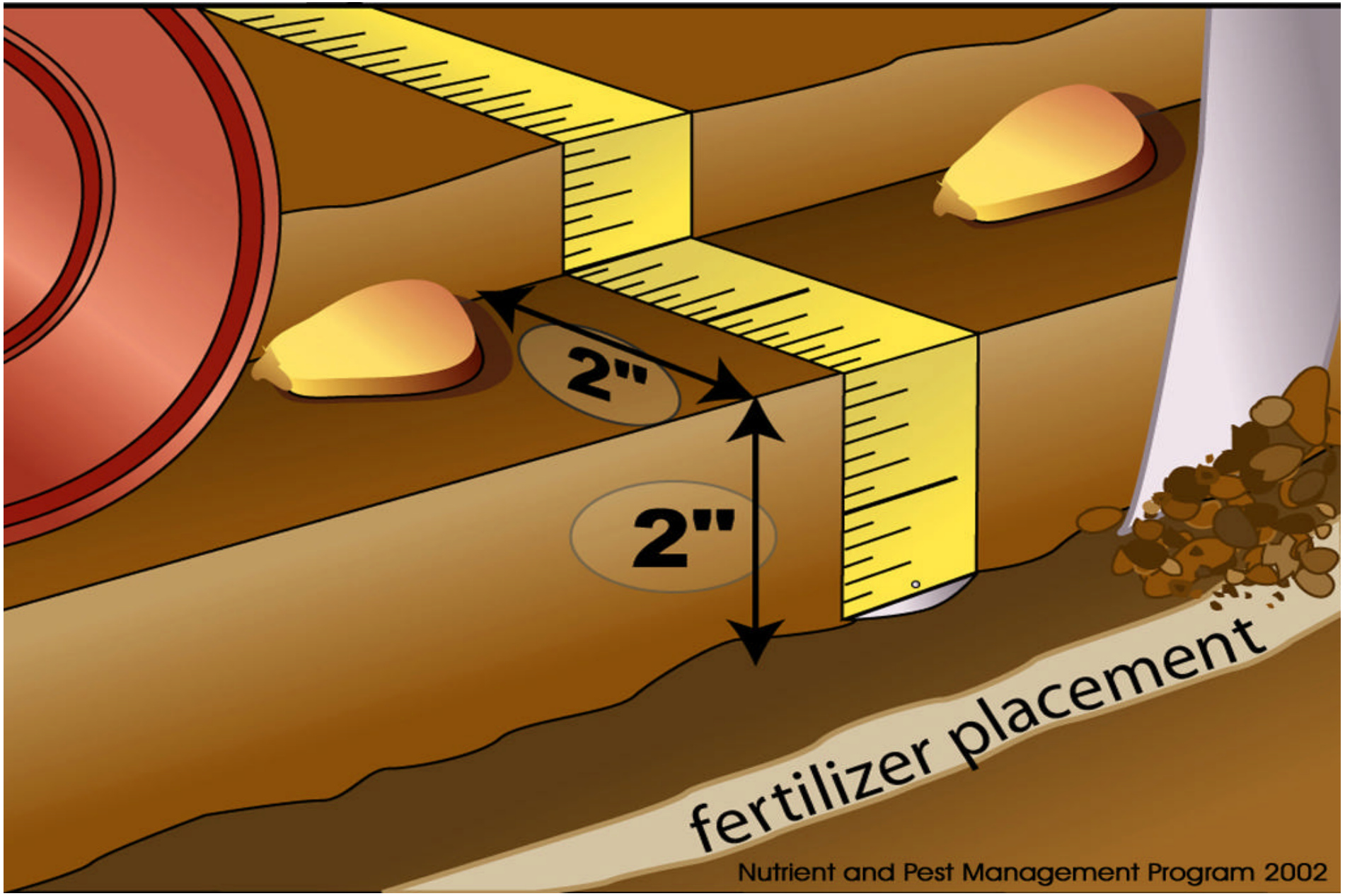
Importance of Starter Fertilizer Composition

- 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?


2"
2"
fertilizer placement
Nutrient and Pest Management Program 2002

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

Starter $N+P_2O_5+K_20$	Placement	Corn yield 3 yr. ave.
----lb/a-----		----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

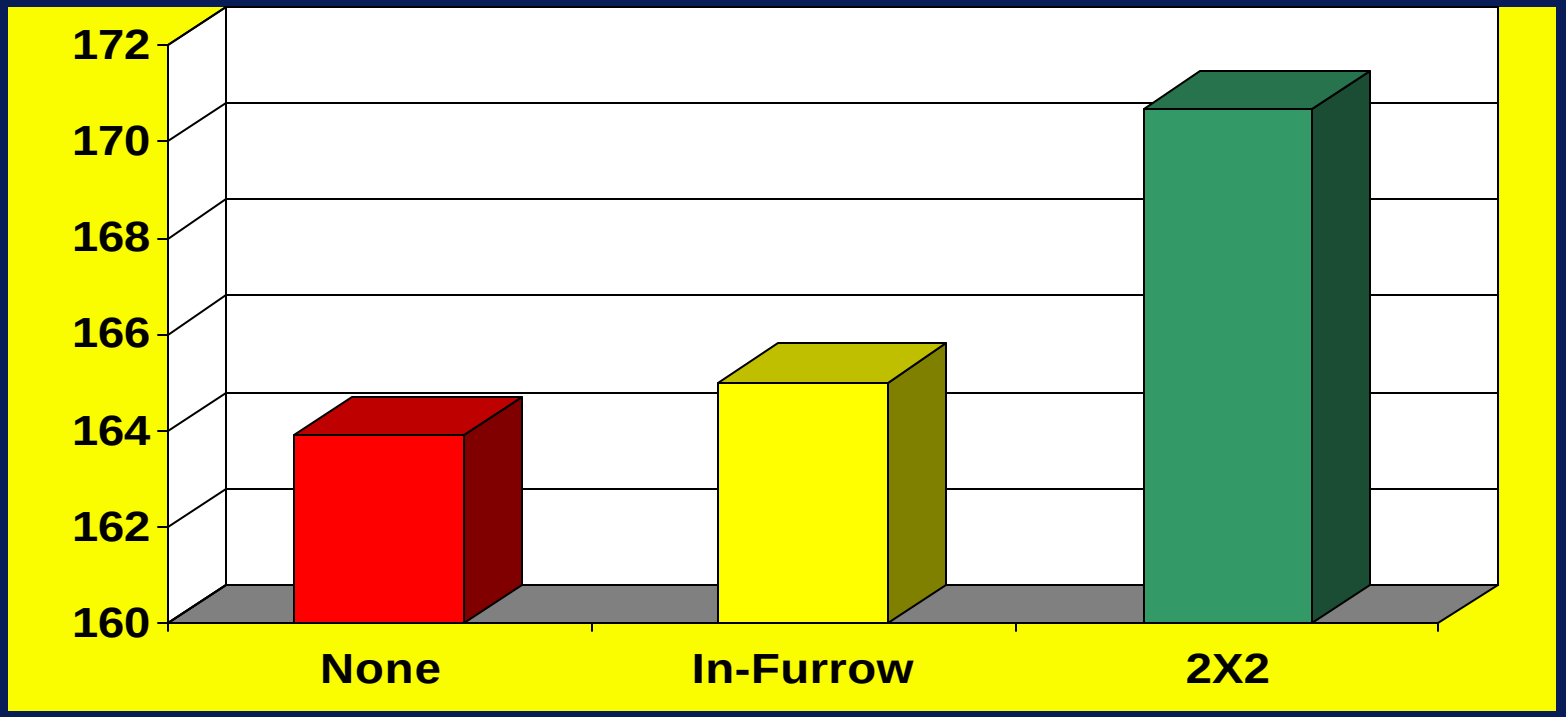
Wolkowski and Kelling, 1985

Corn Response to Starter Fertilizer

Fertilizer				Yield
N	P_2O_5	K_20	Placement	Bu/a
---------- lb/a ----------				
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)

The Andersons

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

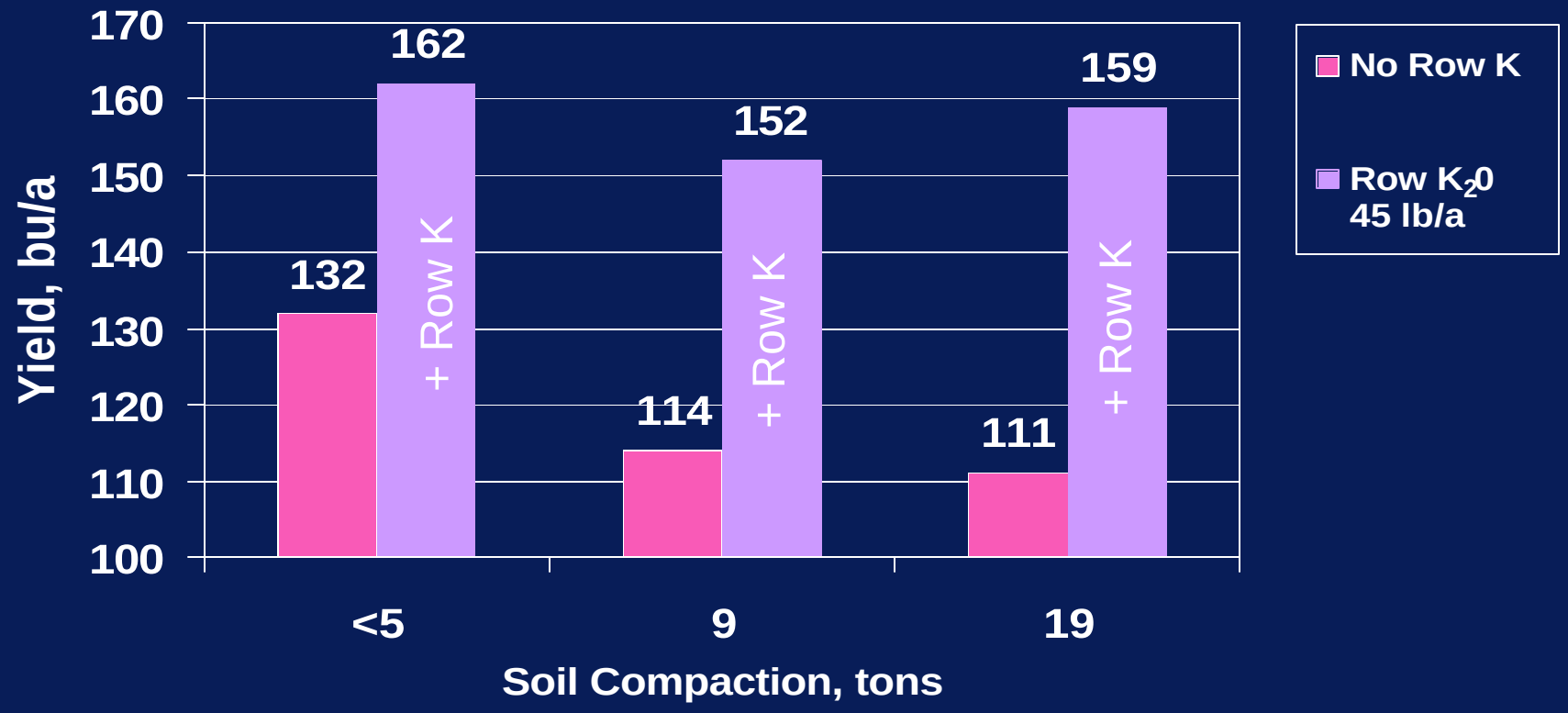
Tillage System	Advantage
	-- bu/acre --
Ridge-till	8
No-till	4-5
Chisel-disk	2

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 $N-P_2O_5-K_2O$	Moldboard plow	No-till	Mean
lb/acre	---------- 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.

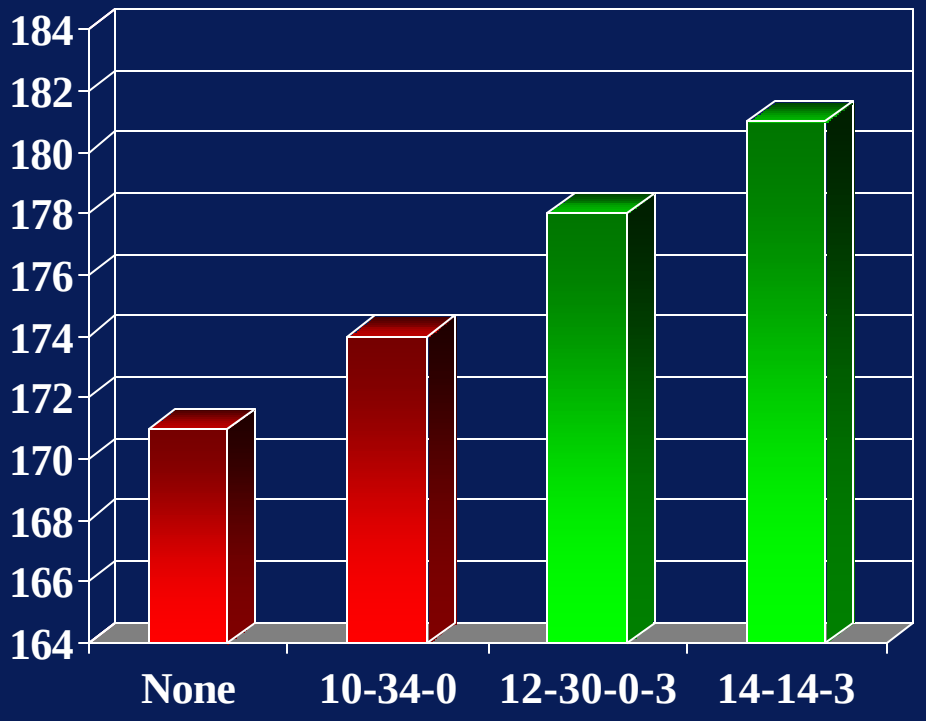
	Soil test K (ppm)		
Tillage	50-60	100-145	145-190
	------- Response, bu/acre -------		
Ridge-till	45	12	3
Chisel	13	7	8
Moldbrd.	20	5	7

* 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



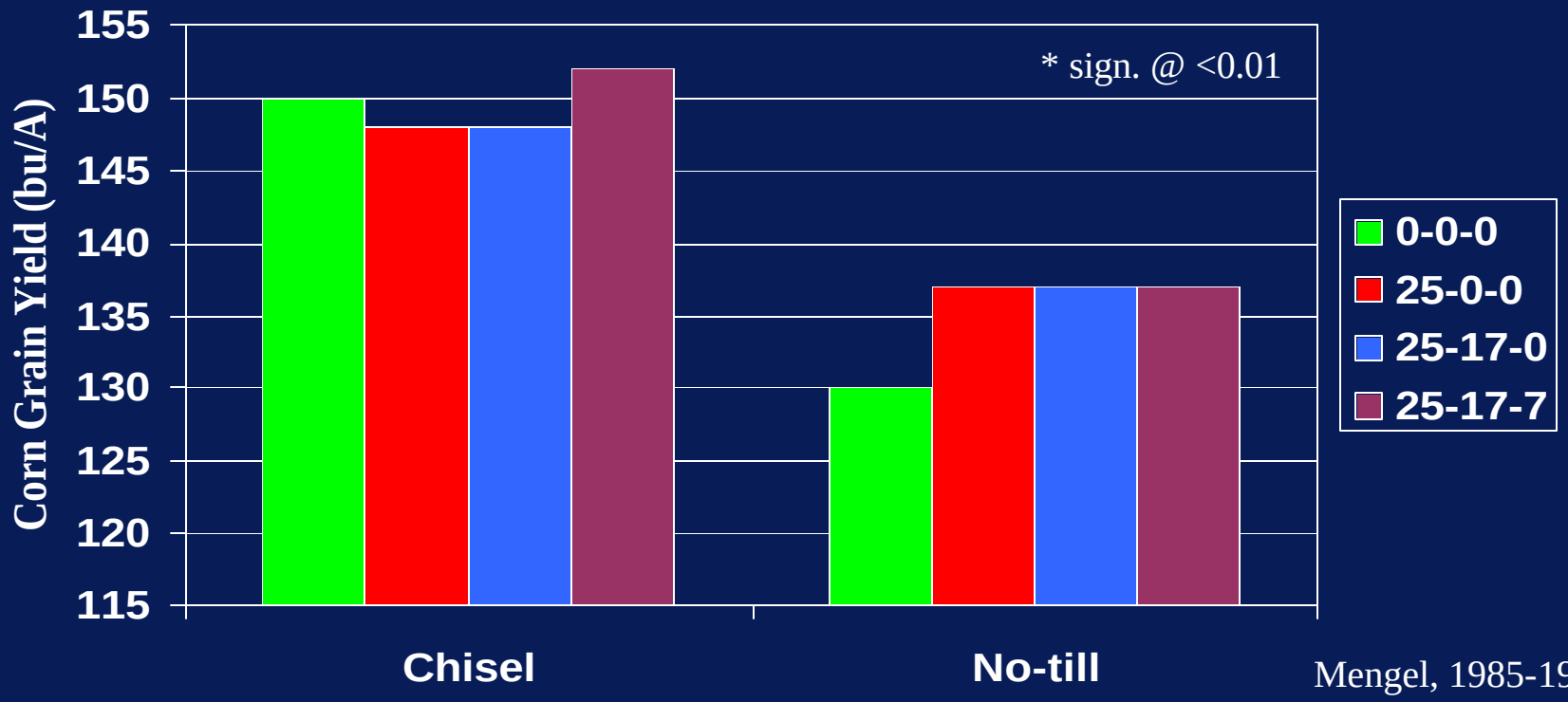
L. Murrell, Indiana, 5-yr. ave. yields; rate = 12 gal/acre

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



Mengel, 1985-1987

1999-2000 Liquid Starter Study- Penn. St.

- 4 locations, no-till following soybeans
- Replicated Strip Trial Design
- Six starter fertilizers varying in N, P, K and S plus check
- Early growth, nutrient content, yield, lodging and moisture
- Soil nutrient mapping

Corn response to starter fertilizers – Penn. (Roth & Beegle)

	L99	C99	L00	C00	Mean
			Bu/A		
No starter	103	140	172	143	140
50-0-0	103	138	180	139	140
50-30-0	103	132	181	136	138
30-30-0	104	133	180	139	139
30-30-0-10S	110	131	181	151	143
9-30-0	108	**133**	**169**	140	138
10-30-10	105	**141**	**180**	142	142
LSD (0.05)	8	6	6	6	

Average of four H-VH P testing locations

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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