

● Is Fall Deep Banded Fertilizer Superior

Dick Wolkowski
Extension Soil Scientist
UW-Madison



Fertilizer Placement Methods

- **Broadcast**
 - Incorporated
 - Topdress
- **Band**
 - Surface dribble
 - Seed placed
 - 2 x 2
 - Deep
- **Foliar**



Is Fertilizer Placement Still an Issue

- Many fields with high soil test
- Cost of planter attachments or separate tools
- Convenience and time savings
- Banding reduces loss of fertilizer
- Still looking for the magic bullet



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Why Banded Fertilizer

- **Precision placement**
 - Higher nutrient use efficiency
 - Avoid skips and overlapping
- **Limits fixation of P and K by the soil**
- **Early season response common**
- **Environmental incentives?**



Historically Starter “Was a Good Thing”

- Responsive soil test levels common
- Smaller planters
- Limited corn acreage per farm
- Lower availability of custom application
- Response often linked to P



Economic Response from Starter Fertilizer

- Starter fertilizers stimulate early plant growth and increase uptake
- Response more likely in no-till or compacted soil
- Interaction with accumulated heat units/planting date
- Lower grain moisture observed with starter
- Questionable yield response on high testing soils
- Effective management for rented land



Economics of Starter Fertilizer Attachments in Illinois No-Till Corn

Attachments on 8-row Planter	Total Planter List Price	Field Capacity
	\$	ac/hr
No attachments	26,400	9.3
2 x 2-banded fertilizer attachments	34,700	8.0

Starter attachments increased planter price 31 % and slowed planting 14 %

Hibbard et al., 1996



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Today's Question: Because of the Increasing Popularity of Strip-tillage

- Is fall deep banding a reasonable alternative to other fertilizer placements?
- Examine Wisconsin, Iowa, Ontario, Minnesota research



*FARM PROGRESS DAYS
1994*

Arlington Research Project

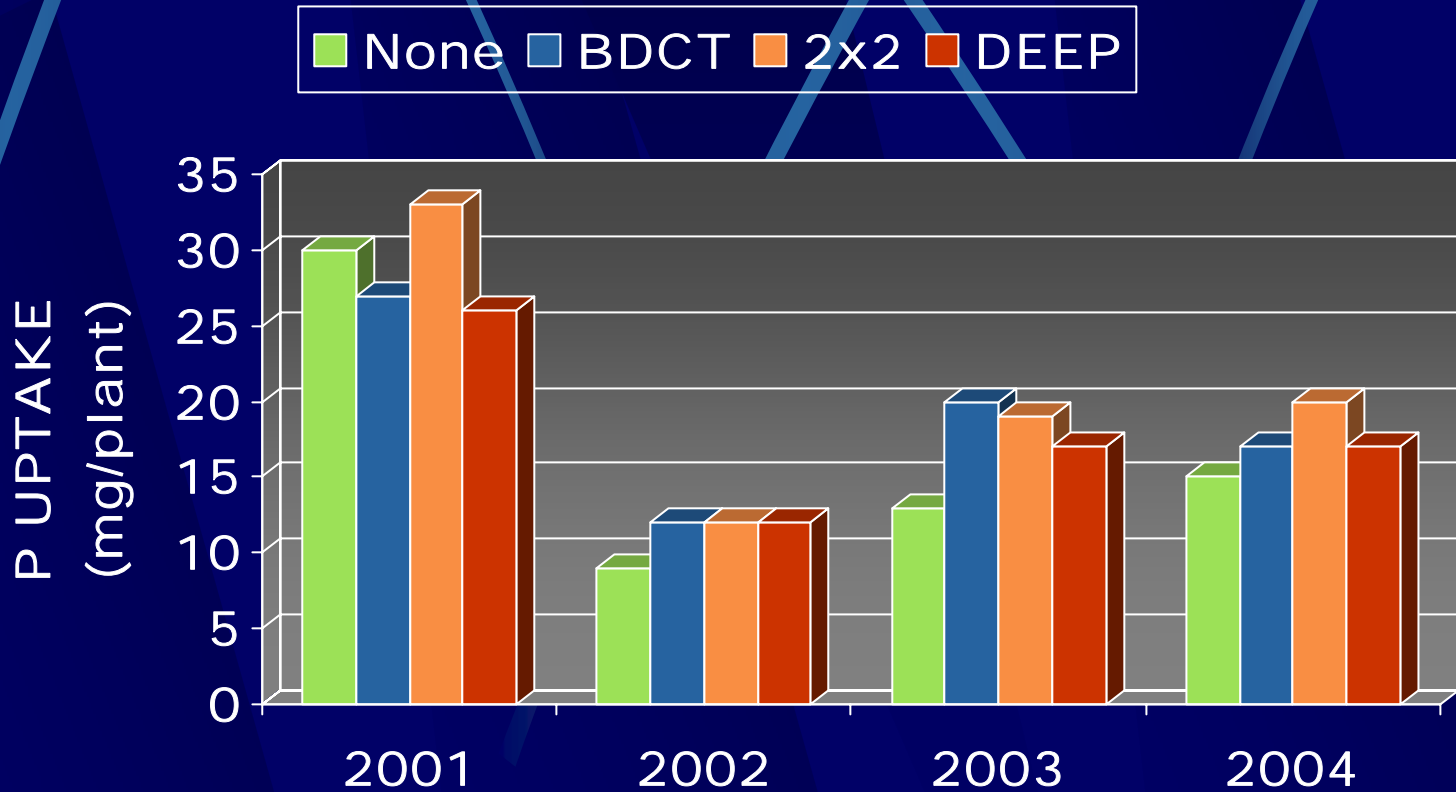
- **Tillage/rotation study since 1997**
 - **Plano silt loam soil**
 - **Strip-till added in 2000**
 - **Cont. corn, Soybean/corn, Corn/soybean**
 - **PK fertilizer: None, broadcast, deep, and row-placed at crop removal rate**
 - **Summarize 2001 – 2004, strip-till only**



Arlington Soil Test

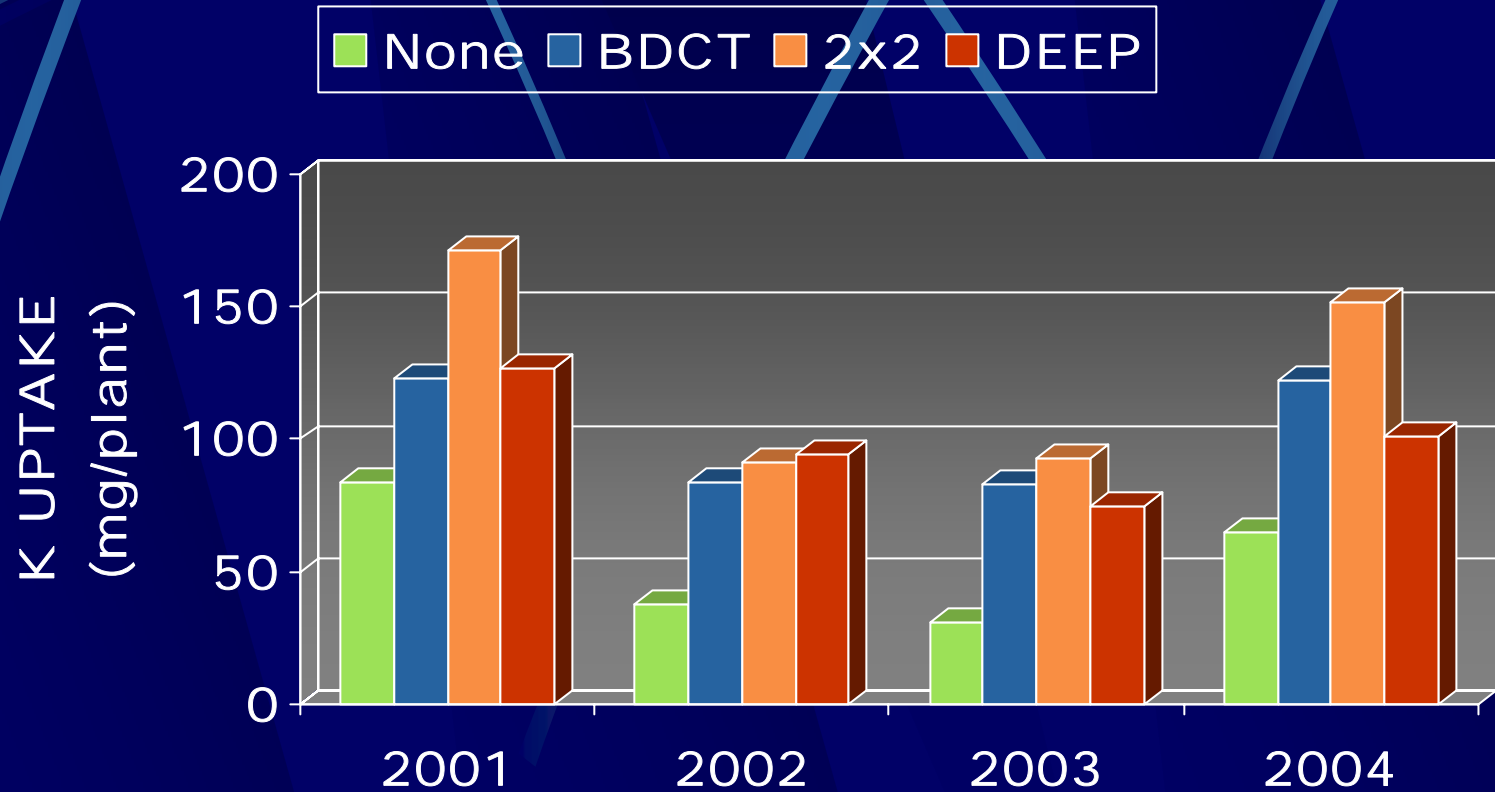
Year	pH		Soil test P (ppm)		Soil test K (ppm)	
	None	Bdct.	None	Bdct.	None	Bdct.
2001	6.7	6.7	41	51	99	110
2005	6.7	6.6	38	56	91	120

Early Season P Uptake in Strip-till



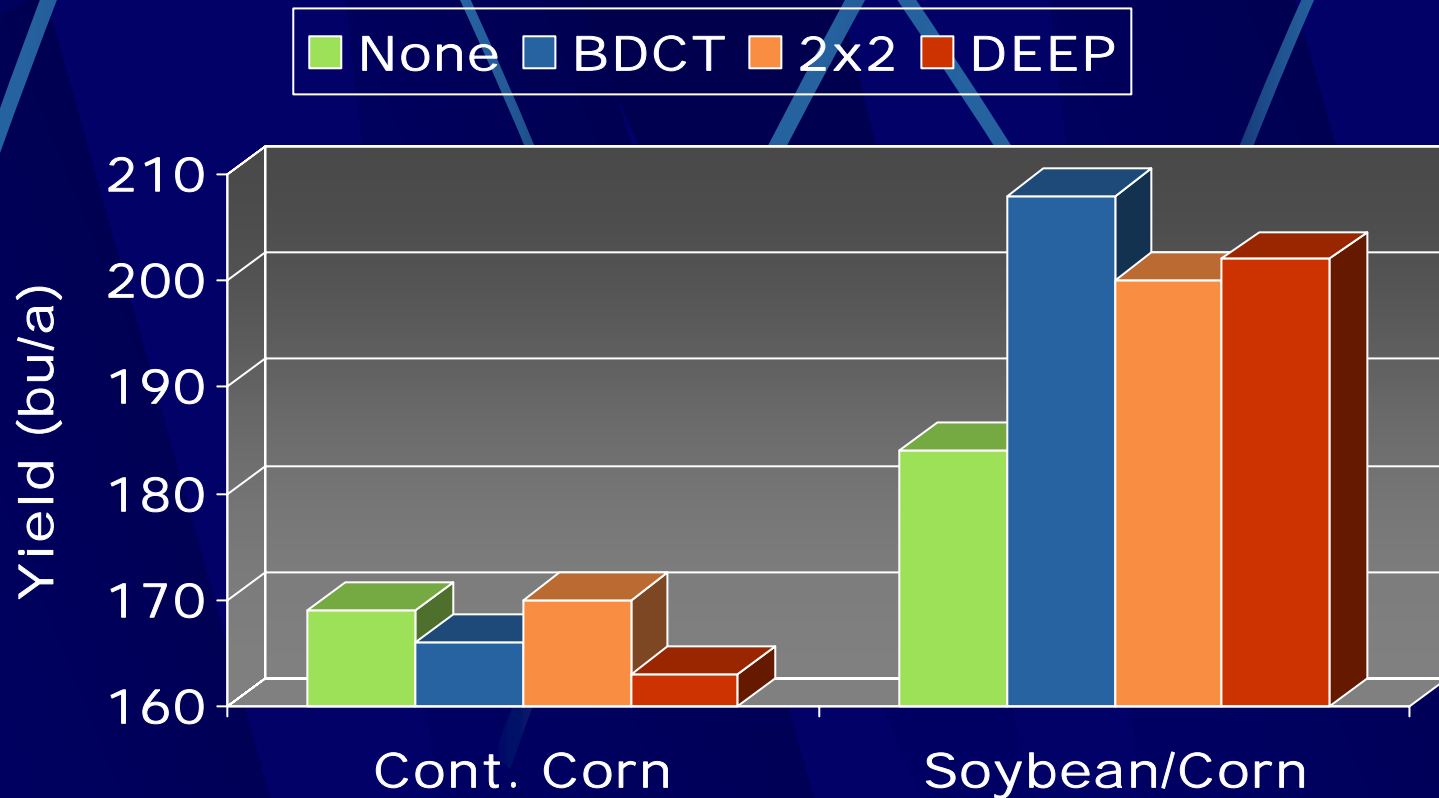
Soybean/Corn Rotation

Early Season K Uptake in Strip-till



Soybean/Corn Rotation

Corn Grain Yield in Strip-till, Arlington, Wis. 2001-2004



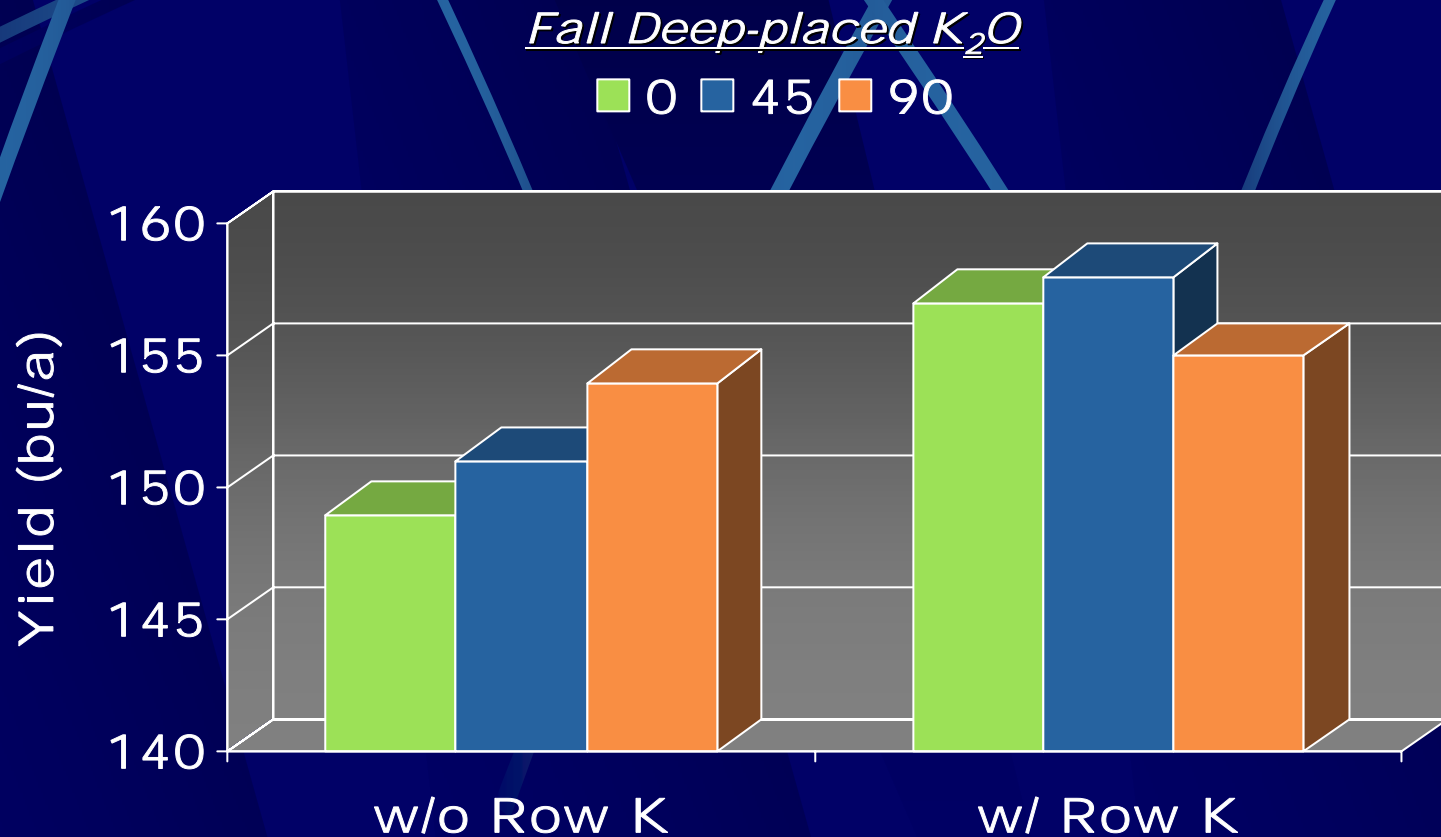
Four Year Avg.

Corn Yield Response to P and K Placement in No-till in Iowa

	Placement					
Nutrient	Control	Deep w/o	Broadcast	Deep	2 x 2	Pr>F
	----- bu/a -----					
<u>Small plots</u>						
P	137	139	143	145	144	0.76
K	145	142	146	150	146	0.01
<u>On-farm</u>						
P	136	138	144	142	N/A	0.24
K	136	138	142	146	N/A	0.02

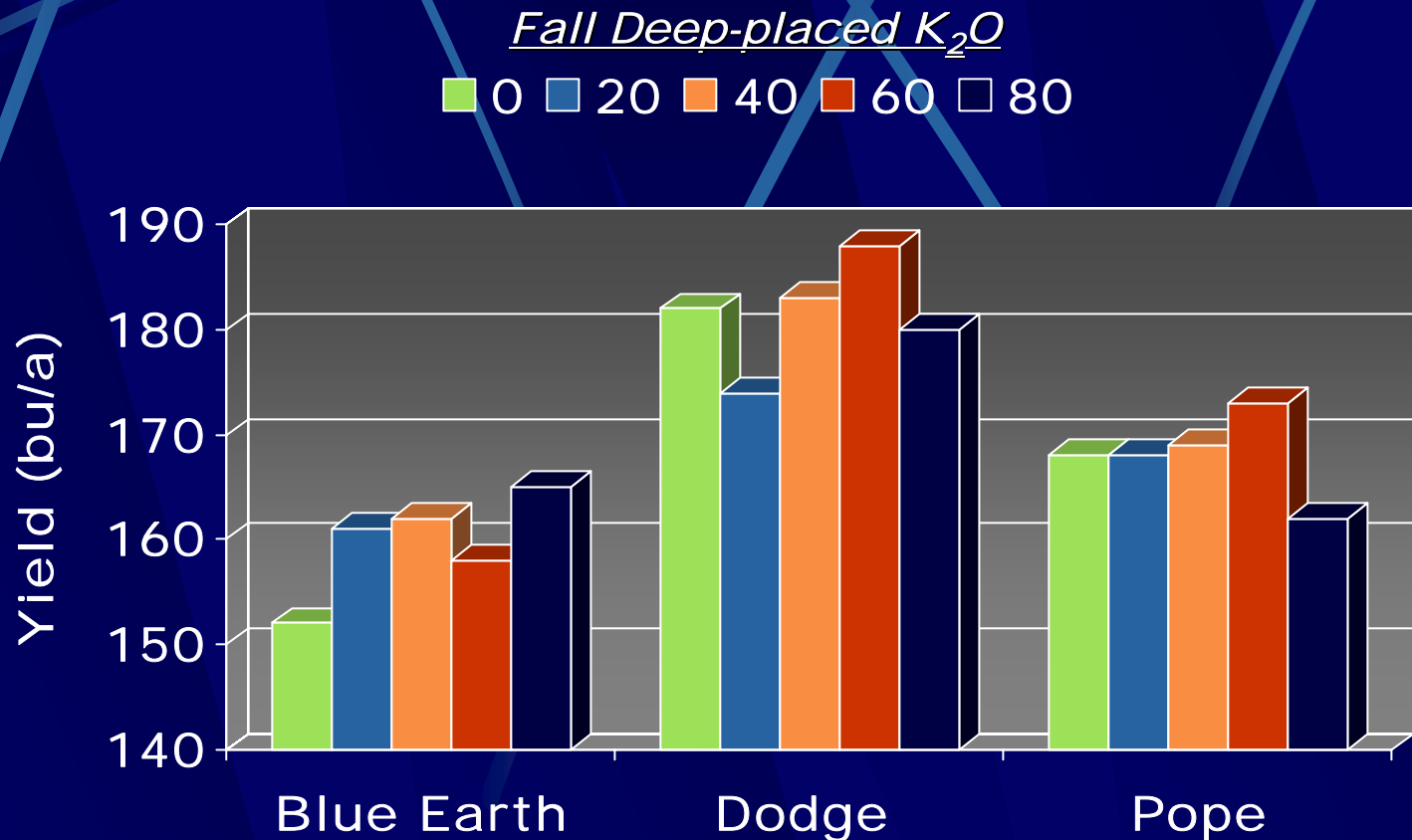
Mallarino et al., 1999

Corn Grain Yield in Strip-till as Affected by K Fertilization in Ontario



Vyn and Janovicek, 2001

Corn Grain Yield in Ridge-till as Affected by Deep K Placement in Minnesota



Rehm and Lamb, 2004

Summary

- Deep placement of fertilizer was generally not as effective as 2 x 2 for early season uptake of P and K
- Yield data did not show clear cut differences between placement methods
- K is the critical nutrient in no-till/strip-till
- Research data shows deep placement is a reasonable placement method on responsive soils
- Considerations:
 - crop residue
 - surface compaction
 - soil test level
 - equipment cost
 - time management
 - conservation requirements