Preferred K Placement Choices for Corn in High Yield and Conservation Tillage Systems?

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Corn Yields after Soybean (1975-02)

- Fall plow
- No-till
- Fall plow (5 yr mov. avg.)
- No-till (5 yr mov. avg.)
Potassium Stratification
Long-Term Tillage (IN, 1975-94)

Moldboard

Chisel

No-till

Source: Holanda et al. (1998)
Conservation Tillage Doesn’t Alter K distribution appreciably
Strip Tillage with Fertilizer Banding
1. Does K placement Matter?
2. Implications for Management?
Strip Tillage for Corn in N. Indiana, Loam (2001-03)

![Bar chart showing yield (bu/ac) for Soybean and Corn with Fall Chisel, Strip-till, and No-till methods.

- Soybean:
  - Fall Chisel: 193
  - Strip-till: 196
  - No-till: 192

- Corn:
  - Fall Chisel: 180 (a)
  - Strip-till: 177 (a)
  - No-till: 169 (b)
Planting Date Effects in 2003

W. Lafayette

Early: Strip-Till, No-Till, Chisel
Optimum?: Strip-Till, No-Till, Chisel

Pinney-Pac

Early: Strip-Till, No-Till, Chisel
Optimum?: Strip-Till, No-Till, Chisel
Mean Soil-test K Stratification at Davis-PAC

Source: Vyn et al., Better Crops #4, 2002
Placement in presence of high soil K variability?
High oil corn yields in response to K placement (Davis-PAC 2000-01)

Source: Vyn et al., Better Crops #4, 2002
No-till Soybean Height Differences at Davis PAC in 2003

Broadcast plus Starter K (2000, 2002)
Impact of K Banding Depth in Corn?
High Yield Corn Response to Placement

Hybrids: 1. Pioneer 34B24
         2. Pioneer 34M95

Populations: 1. 32,000
             2. 42,000

P&K Fertilizer
Placements: 1. Control
            2. Broadcast
            3. Shallow Band (6”)
            4. Deep Band (12”)
            5. Shallow + Deep (6 and 12”)

Sponsor: PPI-FAR 2001-2003
Placement Effects on Leaf K %
Pion. 34M95 in 2003

![Bar chart showing the effect of placement on leaf K% for different plant densities and methods: Control, Broadcast, Band 6", Band 12", and Band 6" & 12". The chart compares two plant densities: 32,000 and 42,000 plants/acre.](chart.png)
Yield Evaluation
Yield Responses to Placement in 2001-2002

P & K Placement Effects on Yield
(mean of 2 hybrids and 2 populations)
Corn Yield Response of Pion. 34M95 to Alternate P plus K Placements in 2003

![Graph showing corn yield response to different placements and fertilizer rates.](image-url)

- **Control**
- **Broadcast**
- **6" Band**
- **12" Band**
- **6" plus 12"**

**Corn Yield (bu/acre)**

- **32,000 ppa**
- **42,000 ppa**
Consistency of Resource Availability in High Population Environments?
6-7” Placement Effects in 2003

- Control
- Broad. P & K
- Band P
- Band K
USB-FAR Projects in 2003

Split-split plot Treatments:

Prior Corn Hybrids (2)

Prior Fertility:
1. Control
2. Broadcast P and K
3. Band P and K (6”)
4. Band P alone
5. Band K alone

Potassium in 2003:
1. None
2. Broadcast
Row position effects on Exch. K ppm
High Yield Corn Plots, 2002
Row Position Effects on Soil K

![Bar graph showing soil potassium levels](image)

- **Mid 0-4" Row 0-4"**: Control, Surface, Band 6", Band 12", Band 6 + 12"
- **Mid 4-8" Row 4-8"**: Control, Surface, Band 6", Band 12", Band 6 + 12"

Axes:
- Y-axis: Soil K (units not specified)
- X-axis: Row positions and depths (0-4", 4-8")

Legend:
- Control
- Surface
- Band 6"
- Band 12"
- Band 6 + 12"
Conclusions

1. Strip tillage has numerous advantages for corn producers.

2. Banding of K has possible advantages in stratified soils, dry summers, and in high yield situations.

3. Banded K may be more beneficial with certain hybrids and environments (high populations)

4. More research required on rates, mixtures, and impact on no-till soybean.
Thanks!

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