



Strip Tillage for Corn: New Developments for Successful Adoption

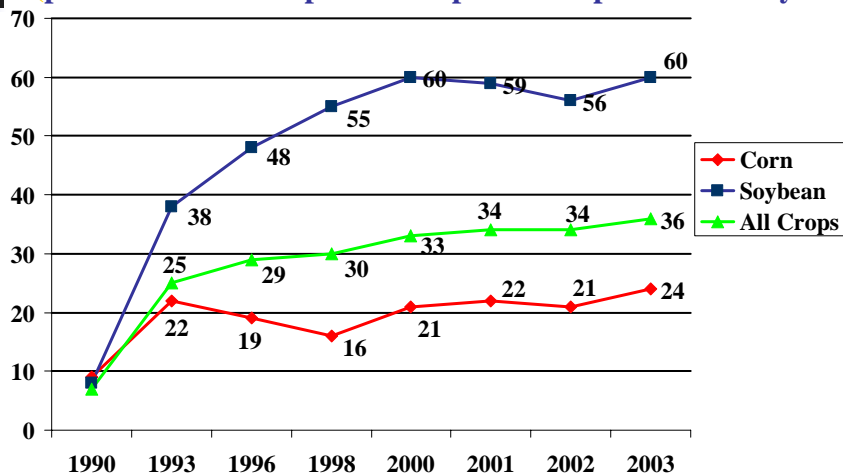
Tony J. Vyn,
with assistance from farmers, graduate
students, technicians, and colleagues

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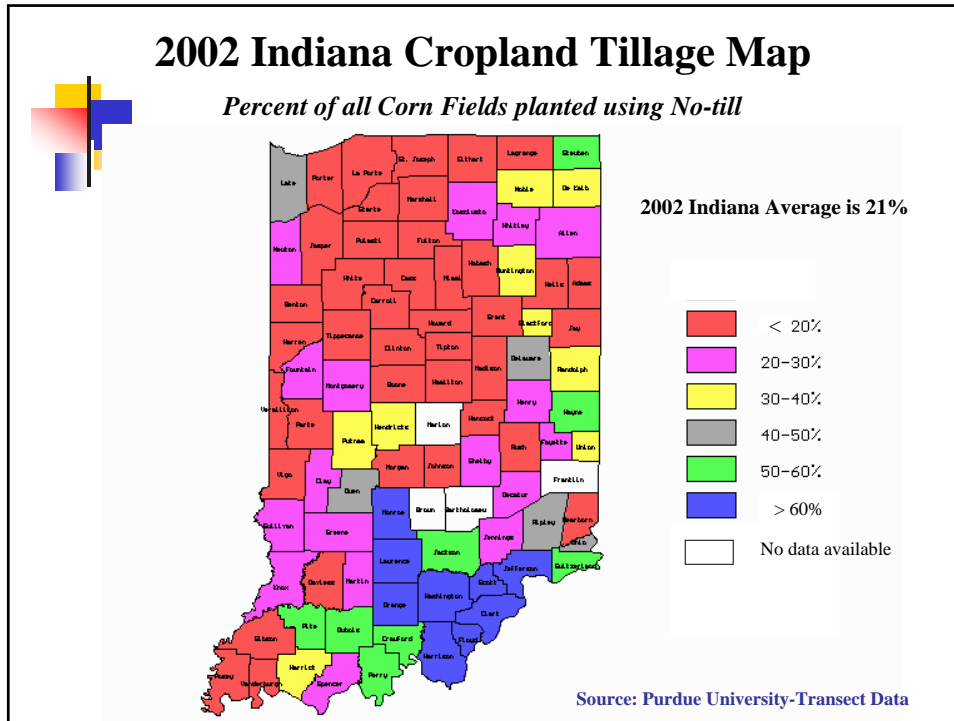


Indiana Tillage Data, 1990-2003

(percent of total cropland for specific crop in a no-till system)



Source: Purdue University-Transect Data



So What is Problem?



Planting Date?

Nutrient Availability?

Pests?

Yields?

Maturity?

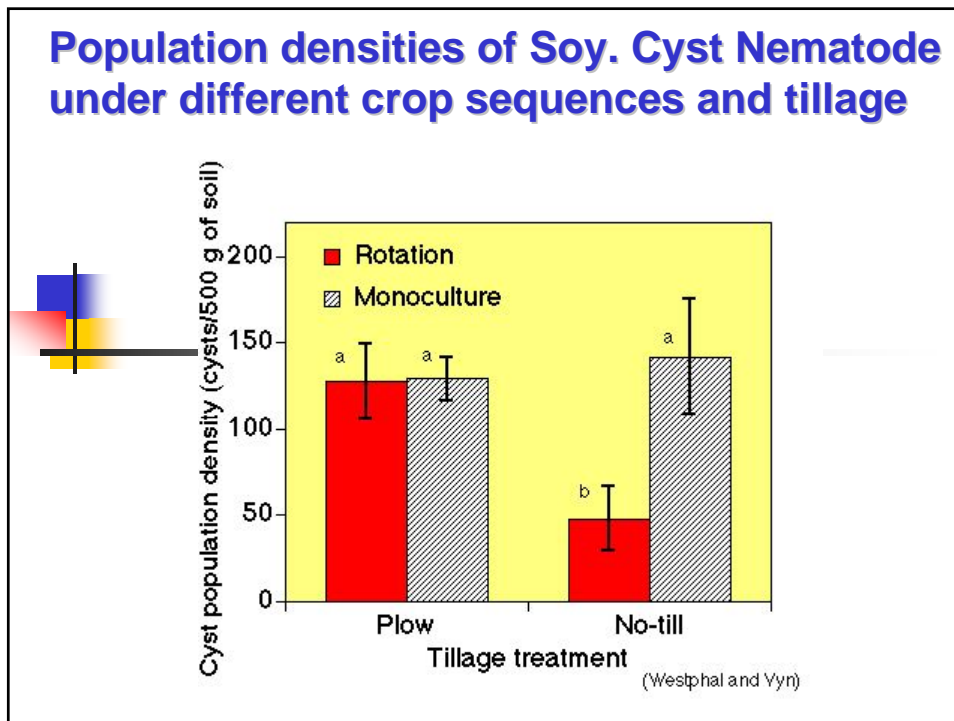
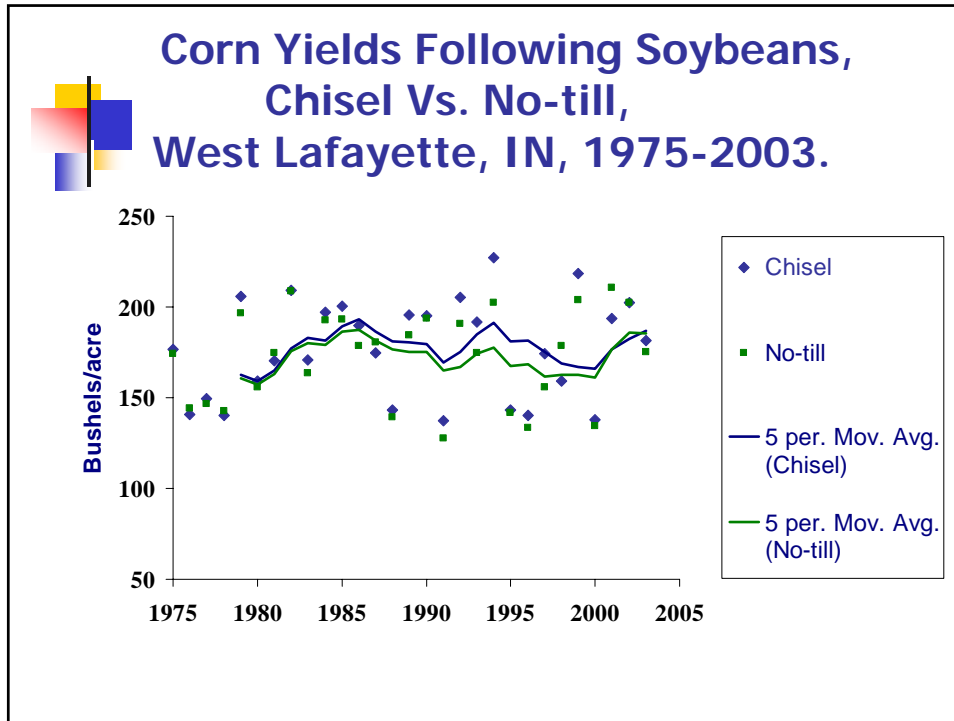


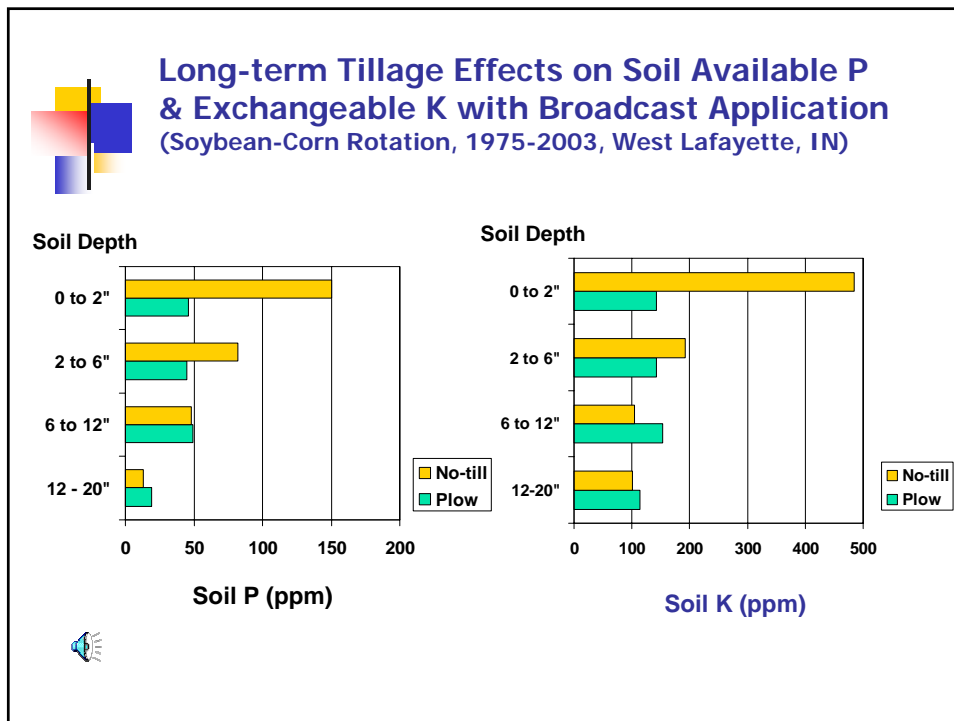
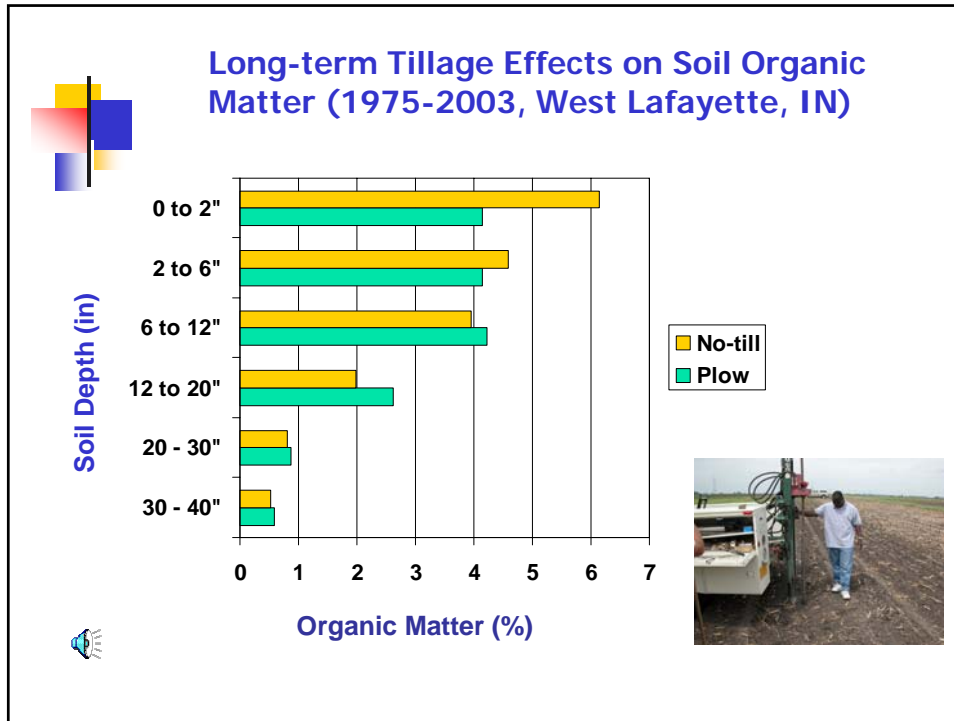
Poor Stand Establishment?



Corn Response to Tillage and Rotation West Lafayette, IN, (1975-2003)

Tillage	Corn/Soybean		Continuous Corn		Yield Gain for Rotation
	Bu/ac	% of plow yield	Bu/ac	% of plow yield	%
Plow	176	---	169	---	5
Chisel	177	100	164	97	8
Ridge*	182	103	167	99	9
No-till	173	98	146	87	18







Going Deeper??



Strip Tillage for Corn



Fall Strip-till Option?



What are we after?

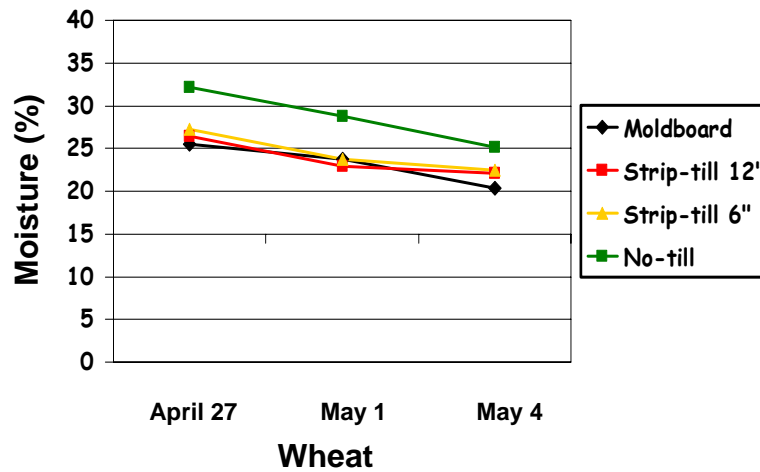
- **Yields**
(relative to no-till; stability)
- **Planting Timeliness**
(pre-plant soil conditions)
- **Fertilizer Placement Efficiencies**
(systems approach)

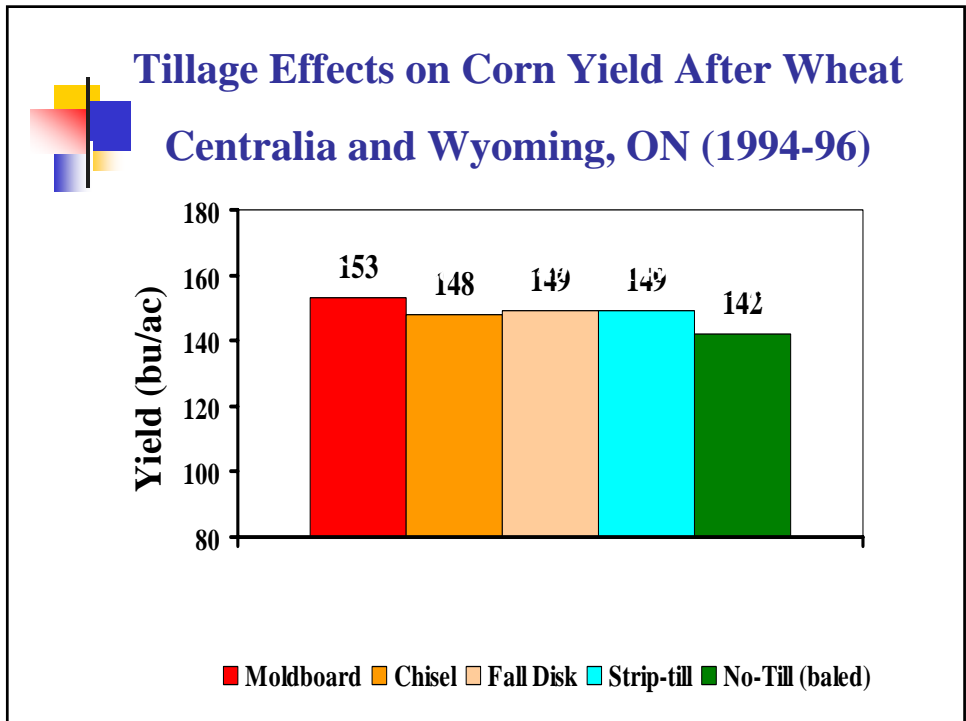


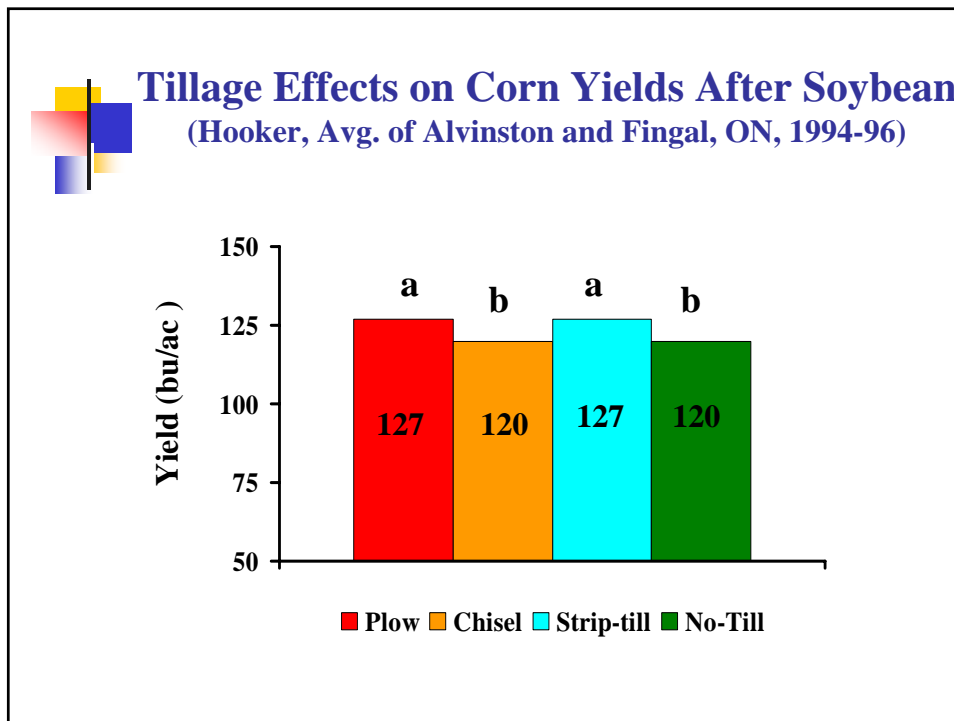
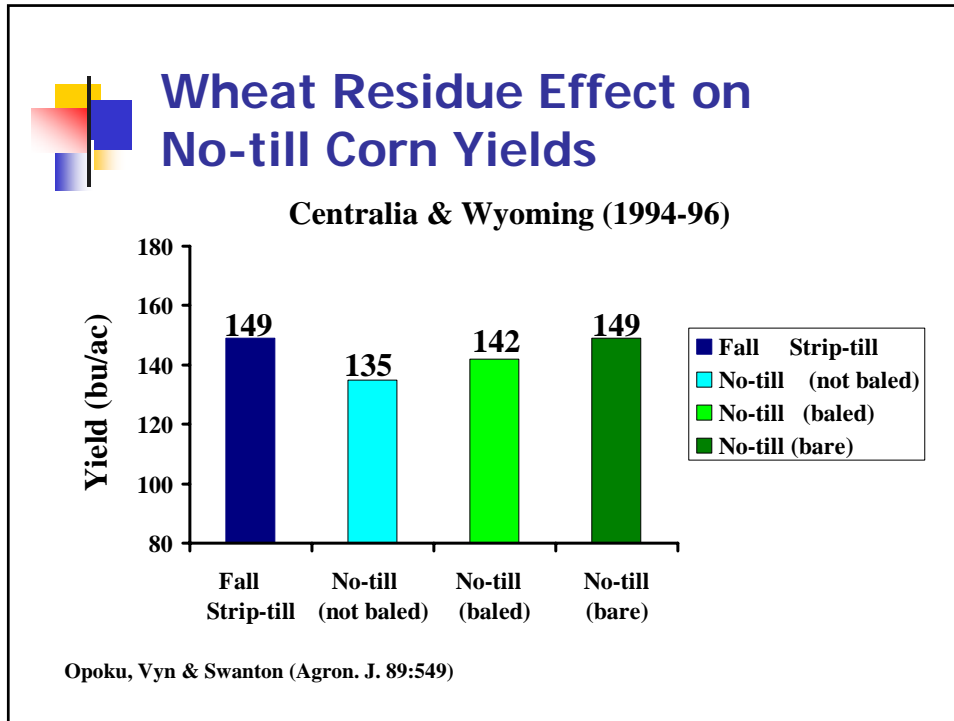
Berm Heights in Spring after Successful Strip Tillage



Soil Drying Pattern (0-6") after Wheat (ON, 1999)







Fall Strip-till 8" depth



**DMI 2500
with Mole Knife**



Fall Strip-till 12-14" depth

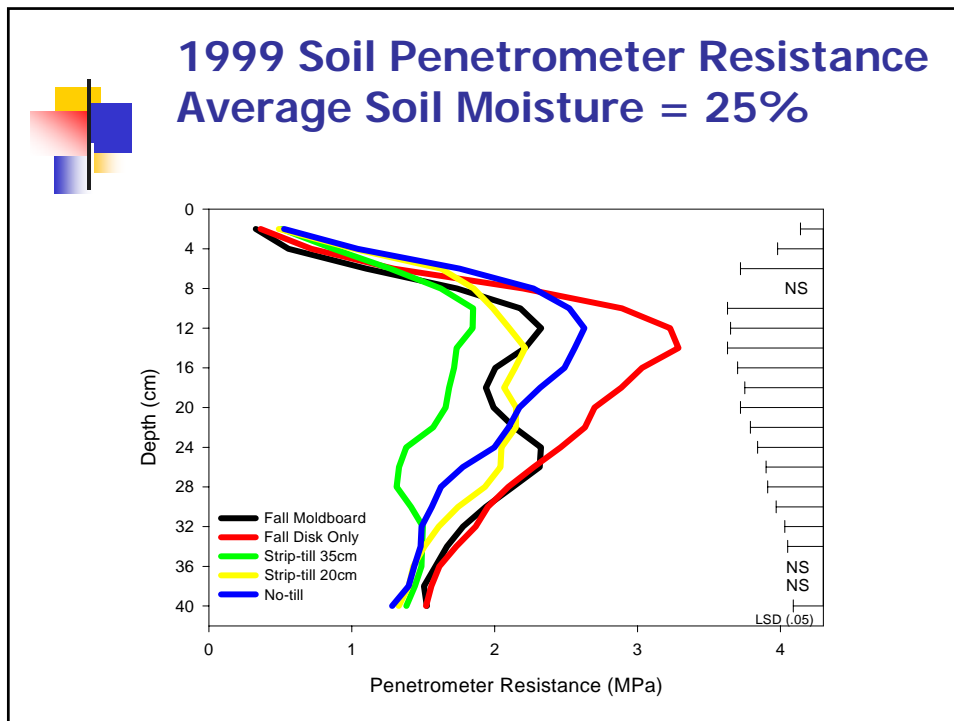
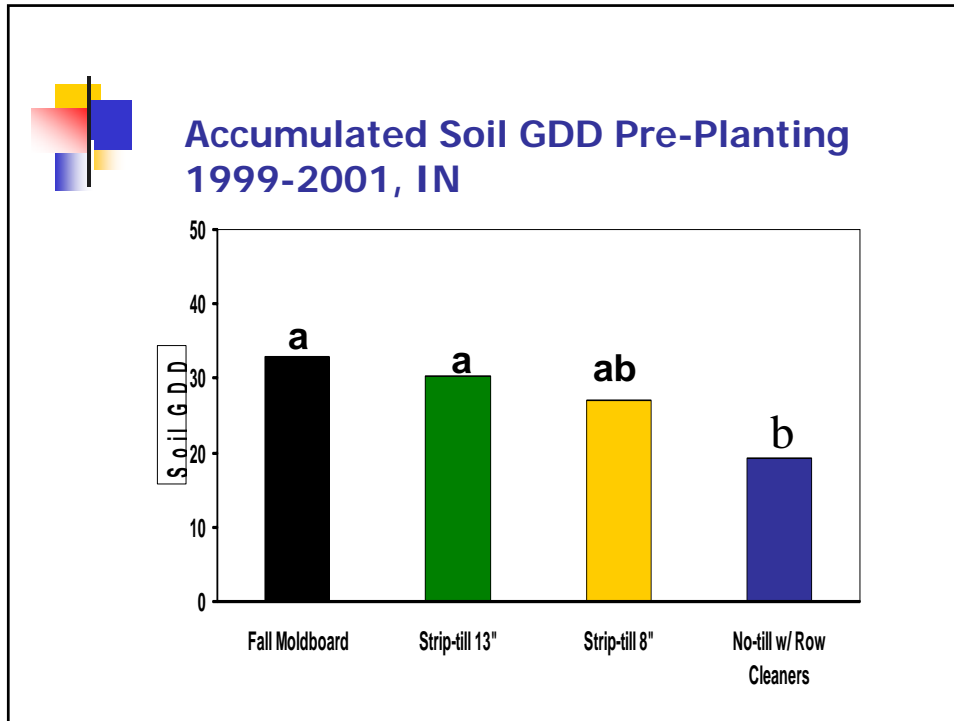


**John Deere 955
Deep Ripper**



**Rolling
Basket**





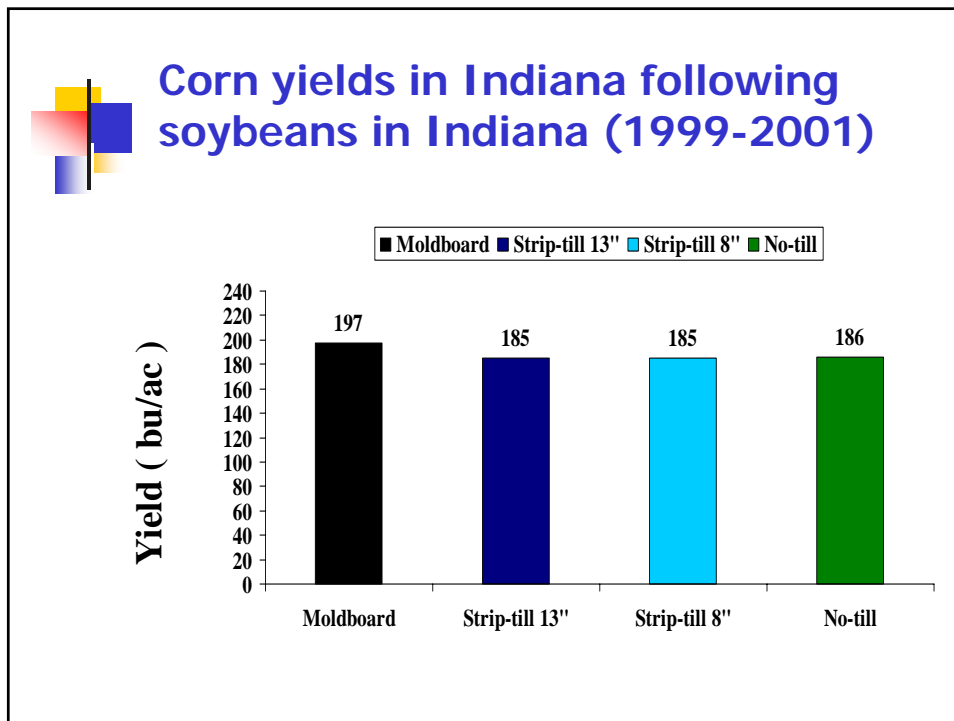
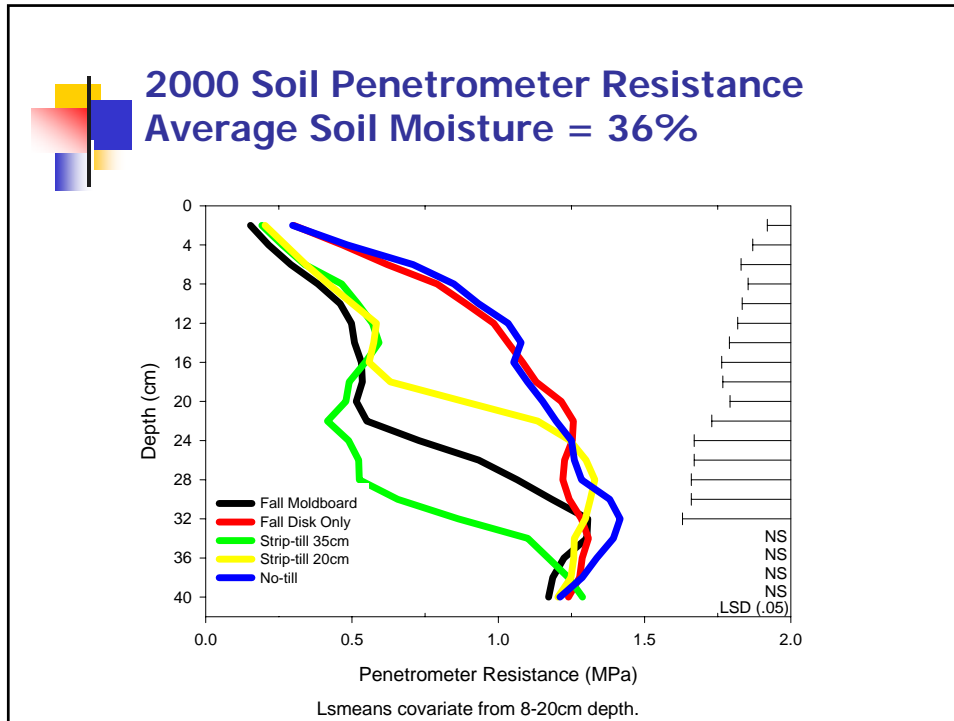


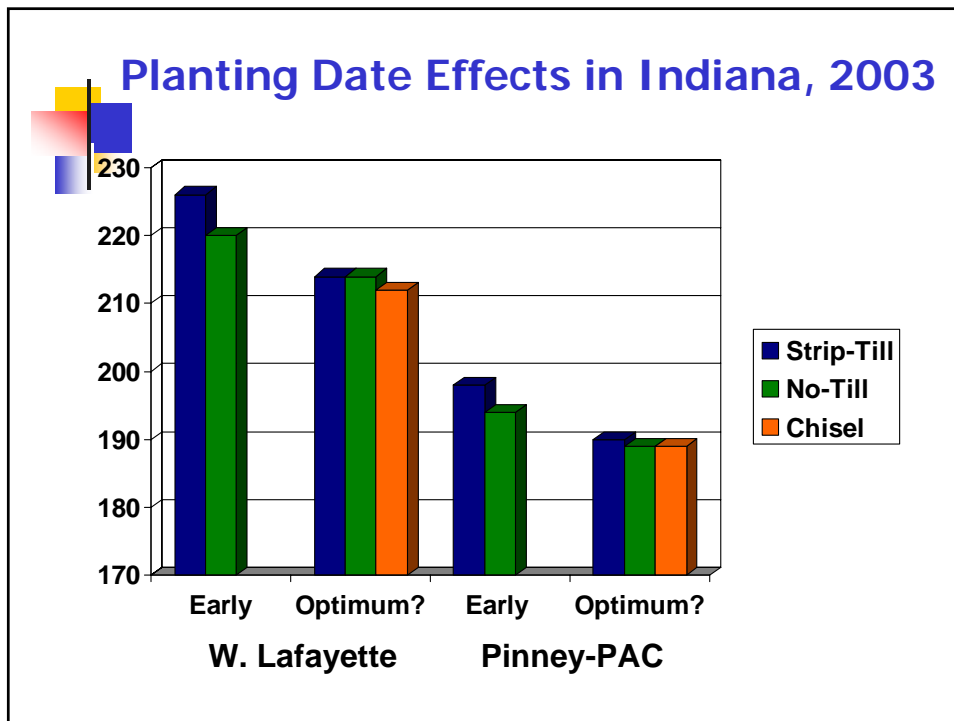
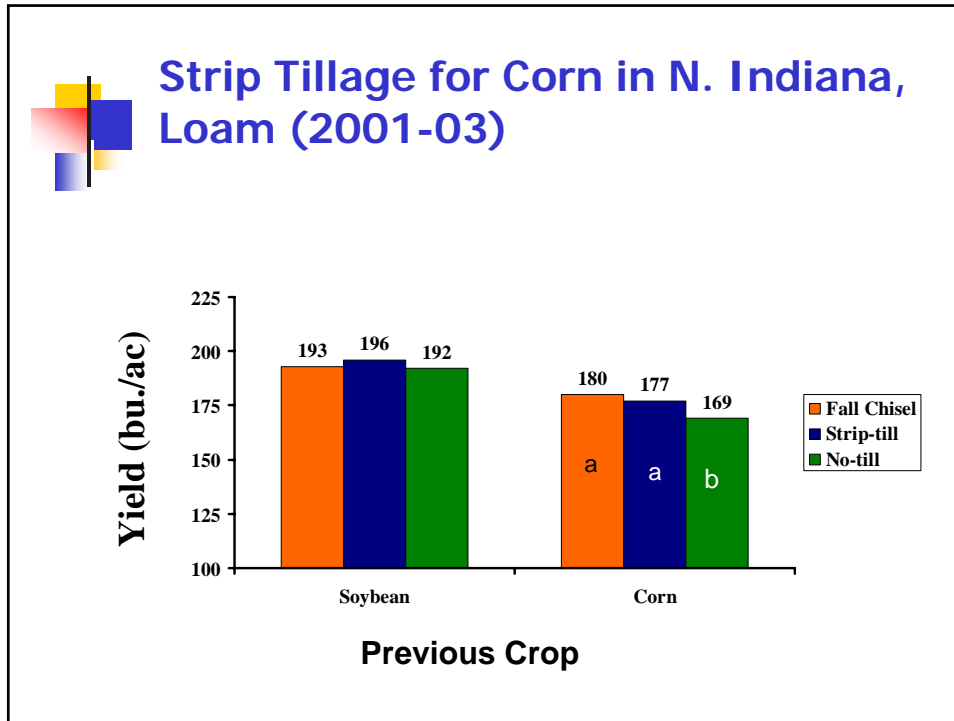


Photo Credit: Greg Stewart



Strip Tillage for Corn after Corn?







Recent Strip Tillage Options

1. Automatic Guidance Systems for Planting Ease
2. Berm Building Alternatives (disk, rolling basket)
3. Residue Clearance options
4. Fertilizer Banding Options



Strip Tillage with Fertilizer Banding





High Yield Corn Response to Placement

Sponsor: PPI-FAR 2001-2003

- 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")

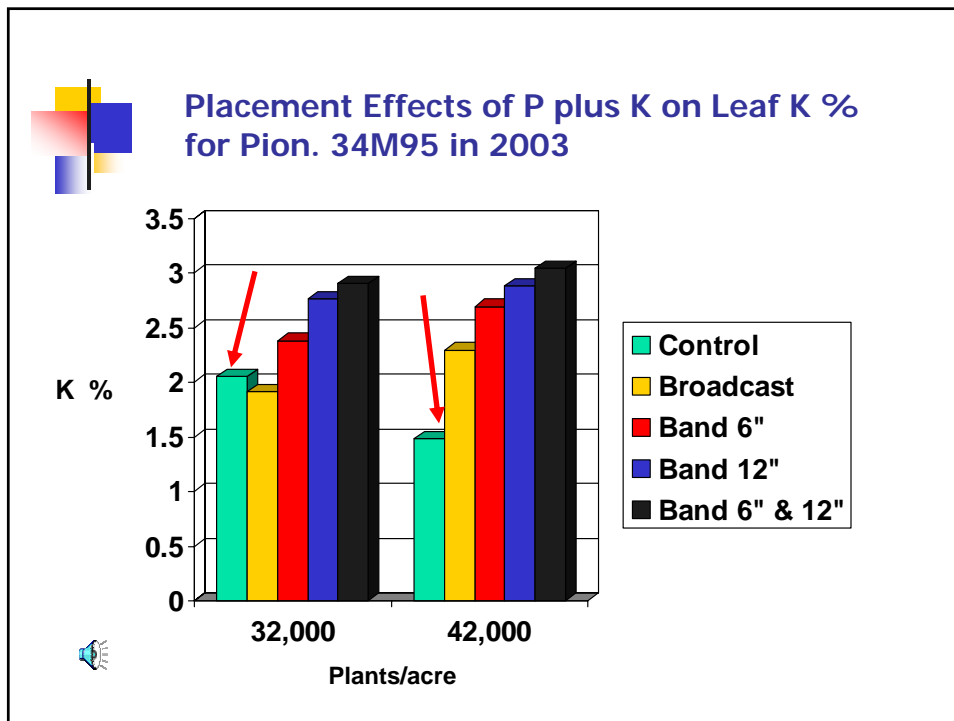
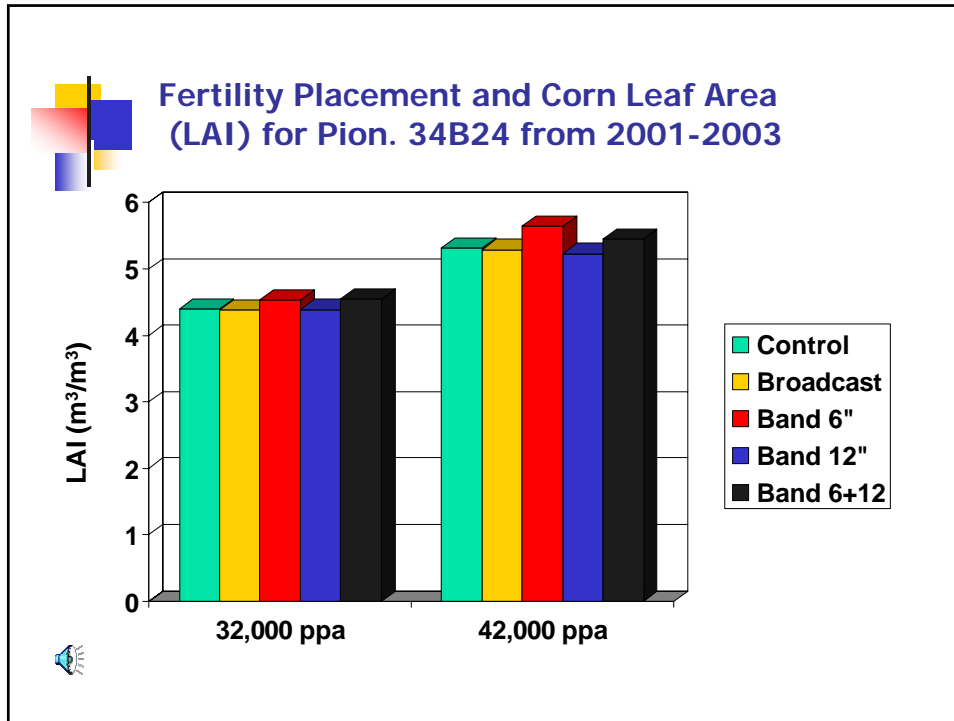


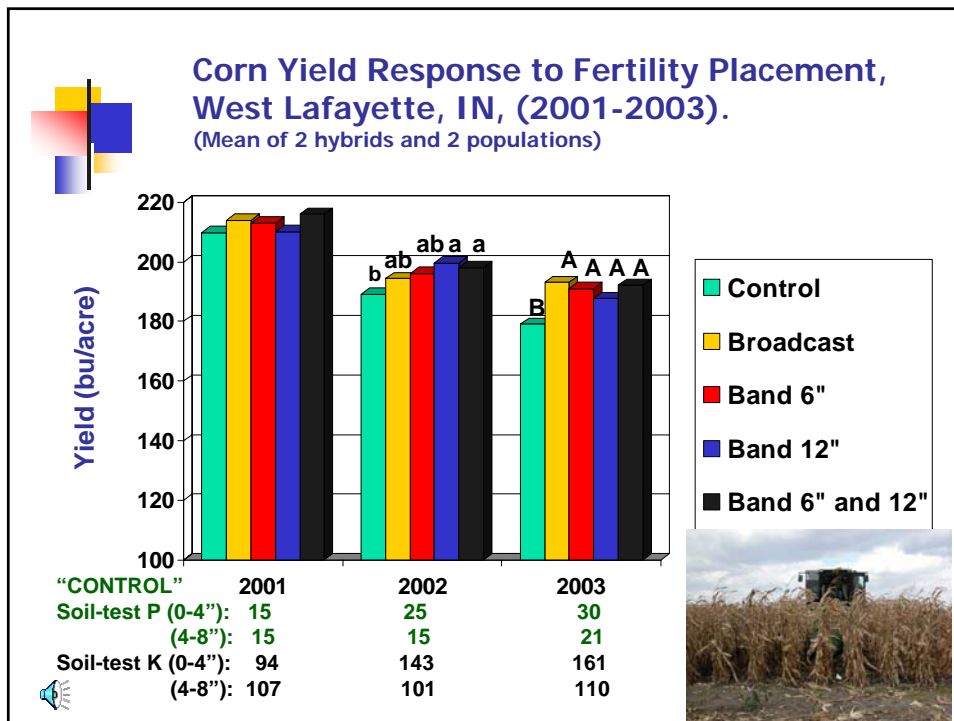
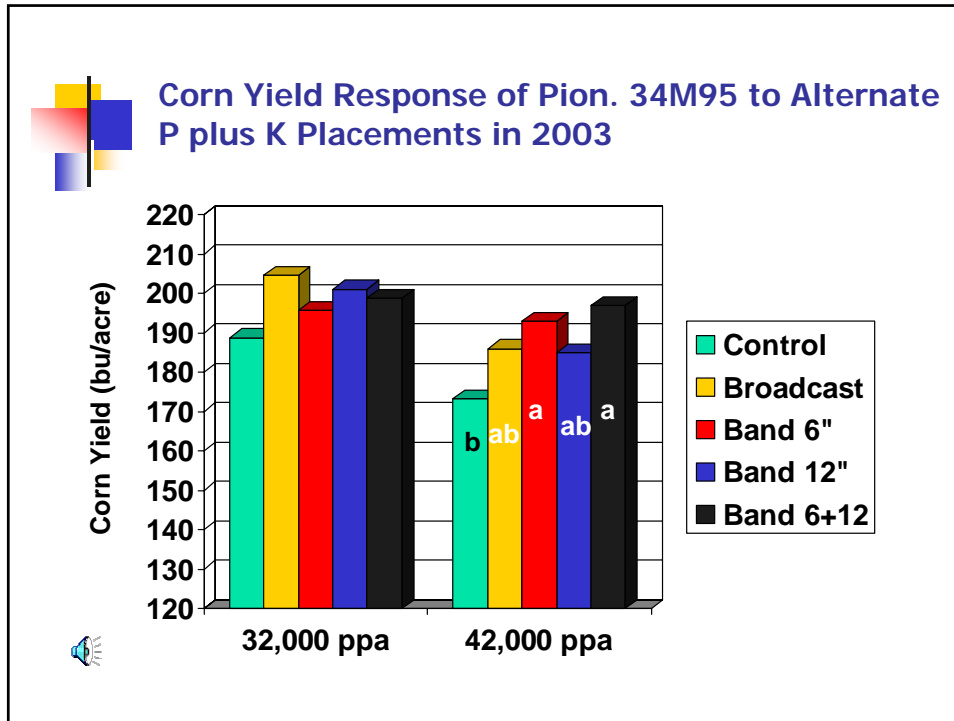
**Note: P_2O_5 rate was 88 pounds/acre, and K_2O rate was 115 pounds/acre
All plots received a uniform 2 x 2" starter of 14 - 28 - 14 (N,P,K).**

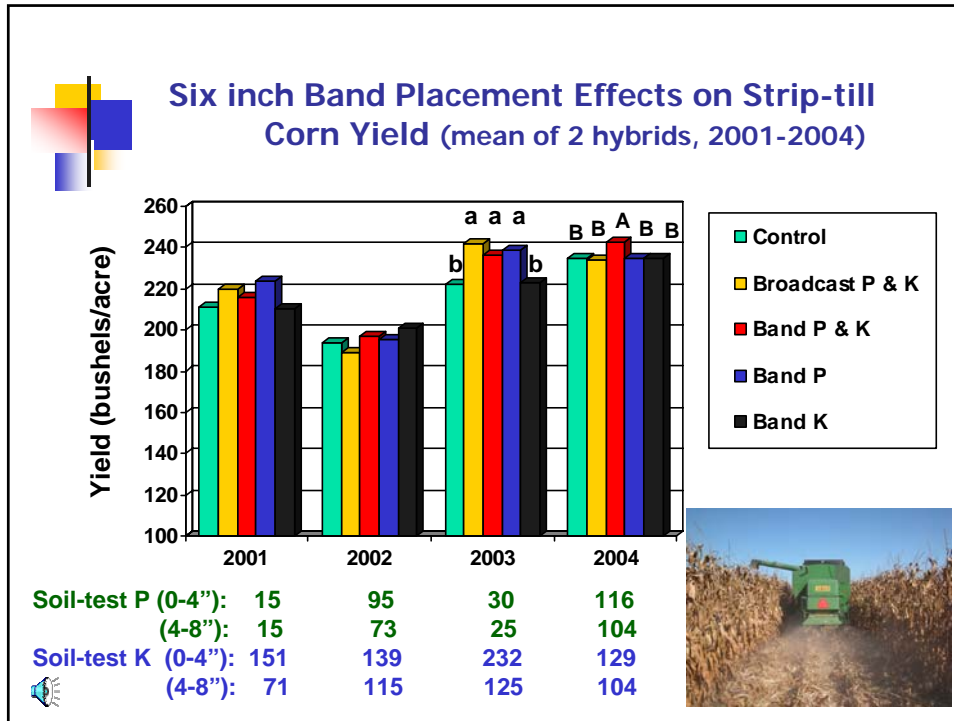


Strip Tillage with Nutrient Banding in Small-plot Research









Conclusions

1. No-till corn adoption lower than for soybean; reservations on increased adoption similar in most Mid-west farming areas.
2. Technology changes have improved success rate of No-till and Strip-till.
3. Strip tillage permits increased planting flexibility and opportunity for fertility placement.



Conclusions (continued):

- Fall strip-till provides warmer and drier soil conditions, relative to undisturbed no-till, in the spring before planting. These improved conditions may allow 2-3 days earlier planting in comparison to no-till.
- Fall strip-till resulted in lower penetrometer resistance in comparison to no-till at certain depth intervals.
- Deeper depths of fall strip tillage resulted in a yield advantage when no-till yields were below conventional-till yields.



Conclusions (continued):

- Deep banding of K increased plant K uptake through the R-1 stage (especially at high populations), but did not generally increase final corn yields, relative to broadcast K fertilizer, in our high yield trials at ACRE.
- Deep-banded K may still be more beneficial than broadcast K with certain corn hybrids, and certain environments (e.g. high corn plant populations, and highly stratified soils with moisture deficits during June-July).
- Relative corn yield advantages for deep banding versus broadcast K may be more likely when no starter fertilizer K is applied, and when total K application rates are lower than those we used. Does deep banding improve efficiency?



Thanks!

tvyn@purdue.edu

home page: [//www.agry.purdue.edu/staffbio/vyn](http://www.agry.purdue.edu/staffbio/vyn)



Acknowledgements

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