

Finding 20 More Bushels

David M. Wolfskill

Mar-Anne Farms

January 15, 2014



Farming Operation



Dairy:
280 milk cows
30 dry cows
125 heifers
125 calves





No-Till Farming in the Mid-1980s

100% No-Till by the End of the 1980s

Acres: 1800 tillable, 50 pasture



What Happens Between the Beginning and the End



Long-term No-Till Soil & Biology

- Variety of soil levels
- Fertility levels
- Organic matter levels
- Worms



Fertility

- All fields tested every 3 years
- Do not allow soils to test below pH 6.7
 - Lime



Fertility

- P & K applied in the fall and winter, if needed.
- Manure applied properly on the surface
 - Bedded pack and liquid





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



Type of Earthworms

- Little Dwellers
 - Do not ingest large amount of soil
 - Ex. The manure or red worm



Type of Earthworms

- Top Soil Dwellers
 - Ingest large amount of soil
 - Live in the upper 2 to 3 inches of soil
 - Create mostly horizontal burrows



Types of Earthworms

- Subsoil Dwellers
 - Ingest substantial amounts of soil that they mix with residue
 - Live in permanent vertical burrows reaching 5-6 feet deep
 - Ex. nightcrawler



Benefits of Earthworms

- Water infiltration
- Soil aeration
 - Done by creating permanent burrows
 - By improving soil aggregation
 - Consume 4 to 10 percent of the top 6 inches of soil annually



Benefits of Earthworms

- Reduces soil compaction
- Improves soil organic matter
 - Can consume 2 tons of dry matter per acre per year



Benefits of Earthworms

- Improves plant available nutrients
 - Earthworm casts have a higher available nitrogen, phosphorus, potassium, and calcium content
- Soil pH
 - Earthworms excrements have a neutral pH



Benefits of Earthworms

- Beneficial microbes
- Nematode control
 - Earthworms eat harmful nematodes



TABLE 1. EARTHWORM POPULATIONS AS AFFECTED BY MANAGEMENT

Tillage	Management	Earthworms/Acre
Continuous corn	Plow	39,000
Continuous corn	No-till	78,000
Continuous soybeans	Plow	235,000
Continuous soybeans	No-till	549,000
Bluegrass-clover	Alleyway	1,568,000
Dairy Pasture	Manure	1,333,000
Dairy Pasture	Manure (heavy)	5,097,000

From *Earthworms and Crop Management* by E.J. Klavivko, 1993. Purdue University Cooperative Extension Service Agronomy Guide AY-279. Crop and management systems had been continuous for at least 10 years.



Corn Leaves Pulled into Worm Holes



**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



Worm Colony on Forest Ground



Individual Worm Mounds



Worm Holes in Soybean Field



What are the Four Functions of a No-Till Corn Planter?

- Prepare seed bed
- Open seed trench
- Seed drop
- Close trench



No-Till Corn Planter Row Cleaners/Residue Removes



**Row cleaners are directly linked to depth control.
They allow for uniform warming of the ground.**



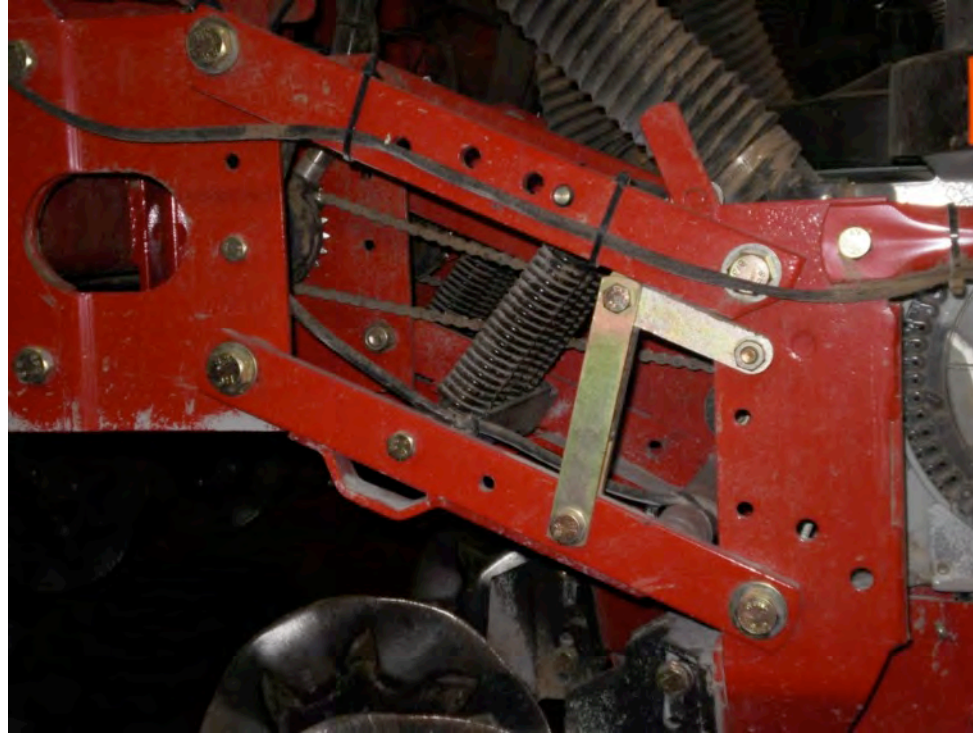
No-Till Corn Planter Row Units



No-Till Corn Planter Row Units



Linkage Wear Points



Annual/Daily Inspections



Seed Selection/Seed Spacing



At higher populations, the greater the need to watch seed drop.

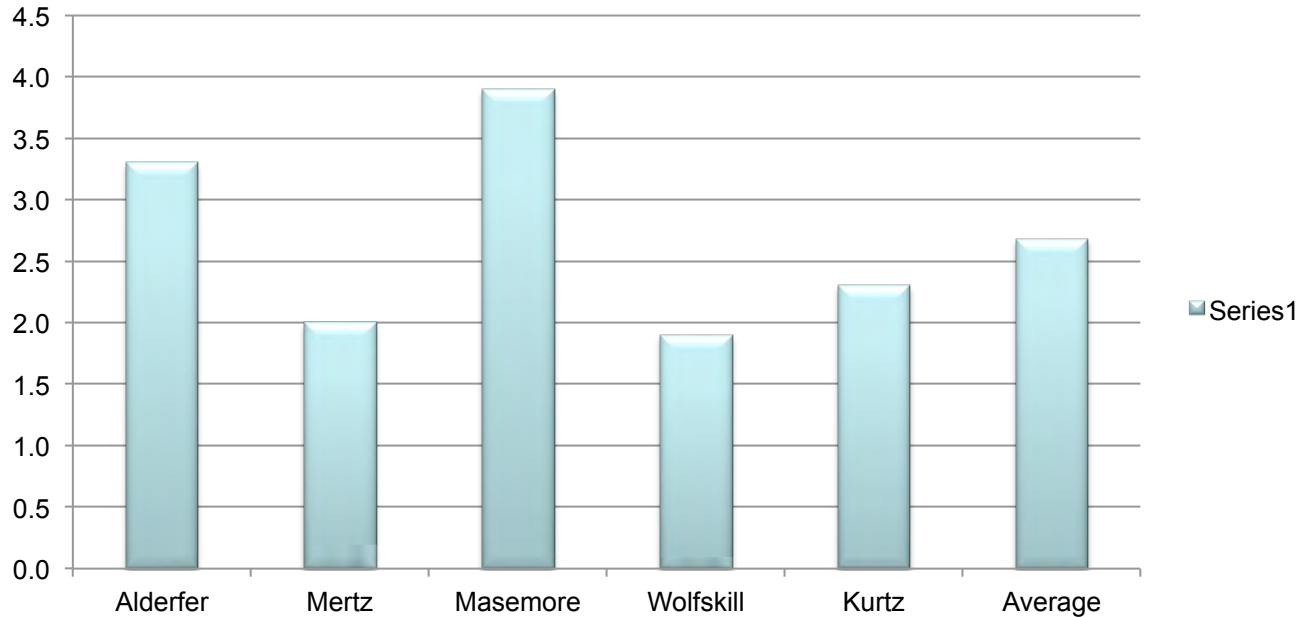


PA Corn Stand Deviation

- 70 fields were surveyed by County agents
- Grower may lose about 5 bushels for each *inch of deviation* in planter row
- Goal is to have *2 inches or less of deviation* between plants in row



Berks County Corn Stand Deviation Inches







No-Till Corn What went wrong?



What went wrong with the corn?

- No row cleaners/residue removers on front of unit?
- Incorrect depth at planting time (not enough weight on planter)?
- Row units dropping accurately?
- Trenches closed properly by closing wheels?





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



UFT No-Till Drill



UFT No-Till Drill



Double Cropped Soybeans after Barley



No-Till Seeding of Alfalfa



Barley Cover Crop After Corn Silage



Wheat Cover Crop After Corn for Grain



Wheat Cover Crop After Corn for Grain



Rye Cover Crop After Corn for Grain



Rye Cover Crop After Corn for Grain



How important is the Sprayer?



GVM – Predator 5185 sprayer



Sprayer Nozzle Tips



Crop Farmer's Bailout Package



2008 Competition Field at Harvest Time



Ranked 1st

NCG No-Till/Ridge-Till Competition

296.4 bu/Acre



2012 Competition Field at Harvest Time



Ranked 2nd

NCG No-Till/Ridge-Till Competition

307.37 bu/Acre



Lessons Learned



Lessons Learned





**22nd Annual
National
No-Tillage
Conference**

Springfield, Ill. • Jan. 15-18, 2014
An Honest No-Till Education



Thank you!

David M. Wolfskill
Mar-Anne Farms
3856 N Church St.
Wernersville, PA 19565
484-256-6051

