Innovative BMP's: Manure Incorporation

Curtis Dell

USDA-ARS- PSWMRU

University Park, PA

Dairy and Swine Slurry Injection

Shallow Disk Injection

1. Commercially available
2. Limited soil and residue disruption
3. Greatly reduces NH_3 volitalization, odor emissions, and nutrient and sediment runoff

Dairy and Swine Slurry Injection

Sweep injector

1. Benefits similar to shallow disk injection
2. Provides subsurface mixing of manure and soil to reduce N leaching potential

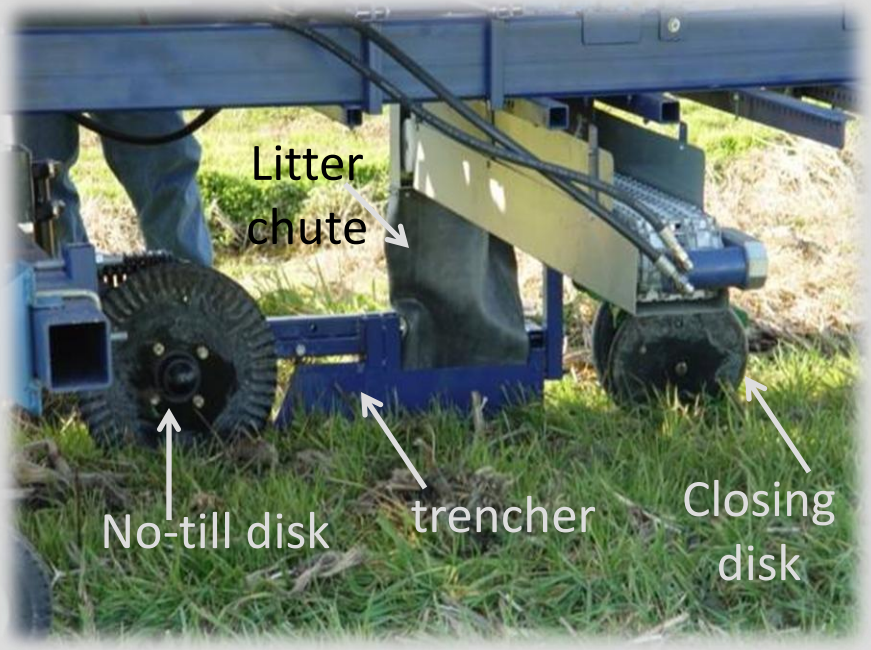
Other Slurry Application Methods

Soil Aerator

1. Improves manure infiltration, but not injection
2. Greatly reduces nutrient and sediment runoff
3. Inconsistent impacts on NH_3 and odor emissions

Poultry Litter Incorporation

“Subsurfer”



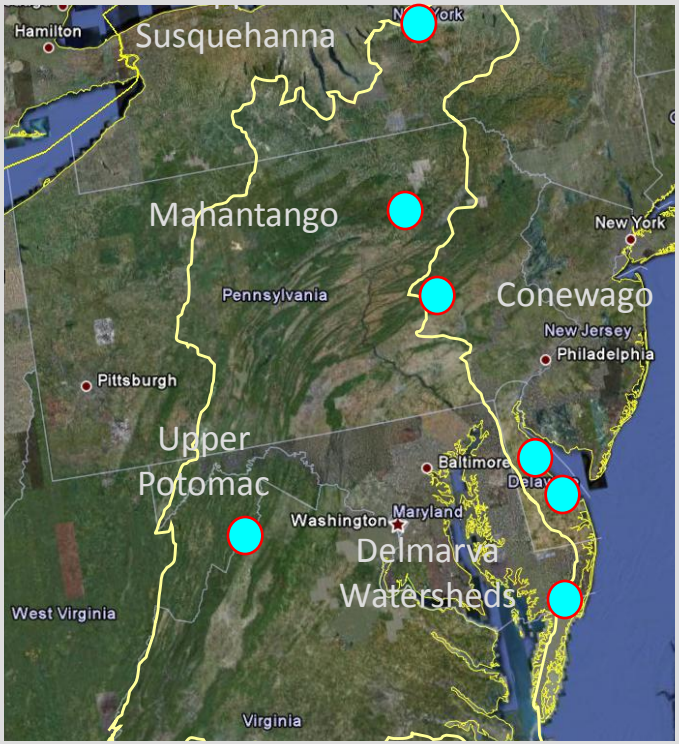
1. Generation One developed by Tom Way, USDA-ARS, Auburn, AL
2. 1-8 tons/acre
3. Variable row spacing: 10-40 in
4. 4 -10 injectors

Poultry Litter Incorporation

"Subsurfer"

1. Generation Two developed by Dan Pote, USDA-ARS, Booneville, AR
2. Fixed row spacing
3. More refined litter grinding and delivery systems
4. Commercially available in near future

Adapting ARS's "Subsurfer" to the conditions of the Chesapeake Watershed



1. Chesapeake Stewardship Fund Grant
2. Peter Kleinman and Doug Beegle: project coordinators
3. USDA-ARS, Penn State, Univ. Maryland, Univ. Delaware, Virginia Tech, and Cornell
4. Build 4 Subsurfers
5. Assess agronomic and environmental performance

Other Emerging Technologies

<u>Semi-Solid Manure Injection</u>

1. Prairie Ag Machinery Institute, Univ. of Manitoba
2. Not yet tested in the US