

No-Till

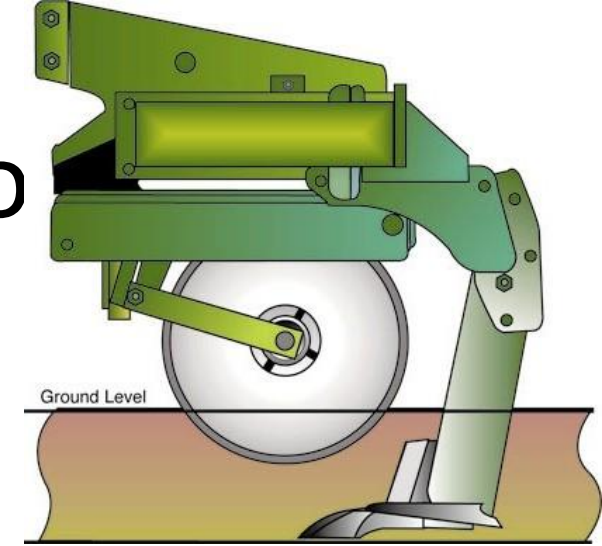
- Continuous No-Till is the most effective conservation practice for the maintenance or improvement of soil productivity
- However, it must be done correctly for this practice to be sustainable.

No-Till Management

- NRCS Definition:
 - No full width inversion tillage
 - Can utilize:
 - Low disturbance subsoil tillage
 - Low disturbance fertilizer injection
 - Low disturbance manure injection
 - Strip-tillage=30% or less of surface is cultivated
 - No-till drills and planters with fluted coulters

Subsoil Tillage in No

- Alleviate subsoil compaction
 - Shank maybe pulled to depths of 10-16 inches
- Not needed for shallow compaction



Fertilizer Injection

- Can be done with liquid, granular, and gaseous fertilizers
- Reduces volatilization and runoff losses



Manure Injection

- Greatly increases nutrient use efficiency and decreased runoff losses



USDA-ARS Subsurface Applicators (Subsurfers)



Variable Spacing

Developed by Dr. Tom Way

USDA-ARS Alabama

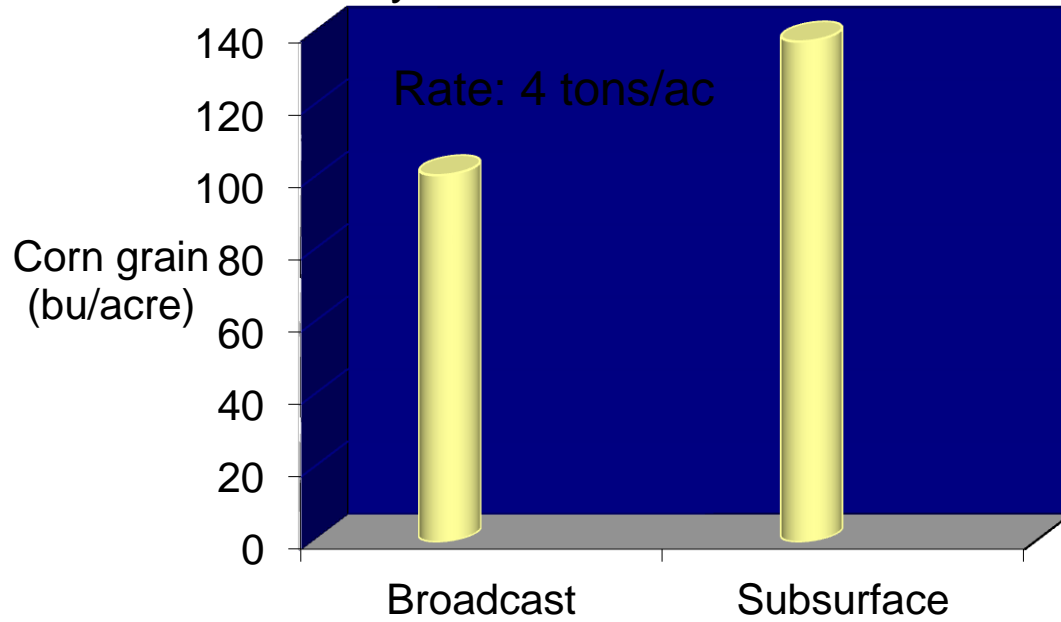


Fixed Spacing

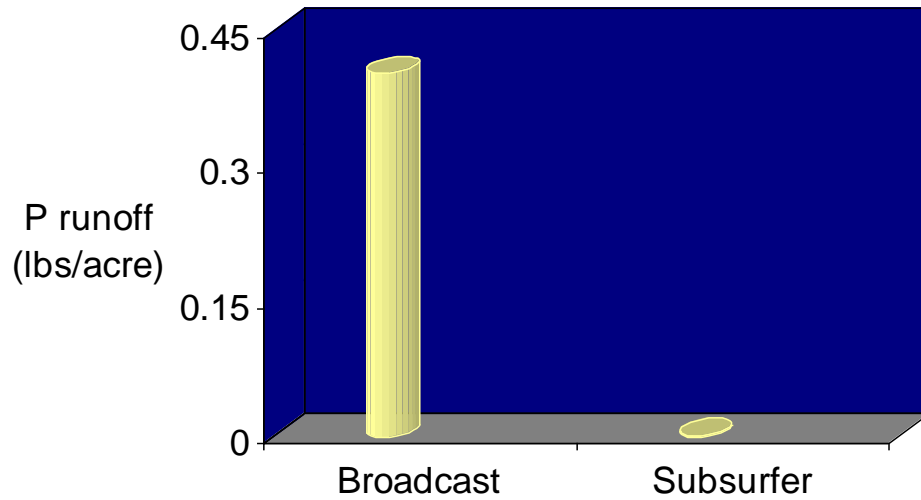
Developed by Dr. Dan Pote

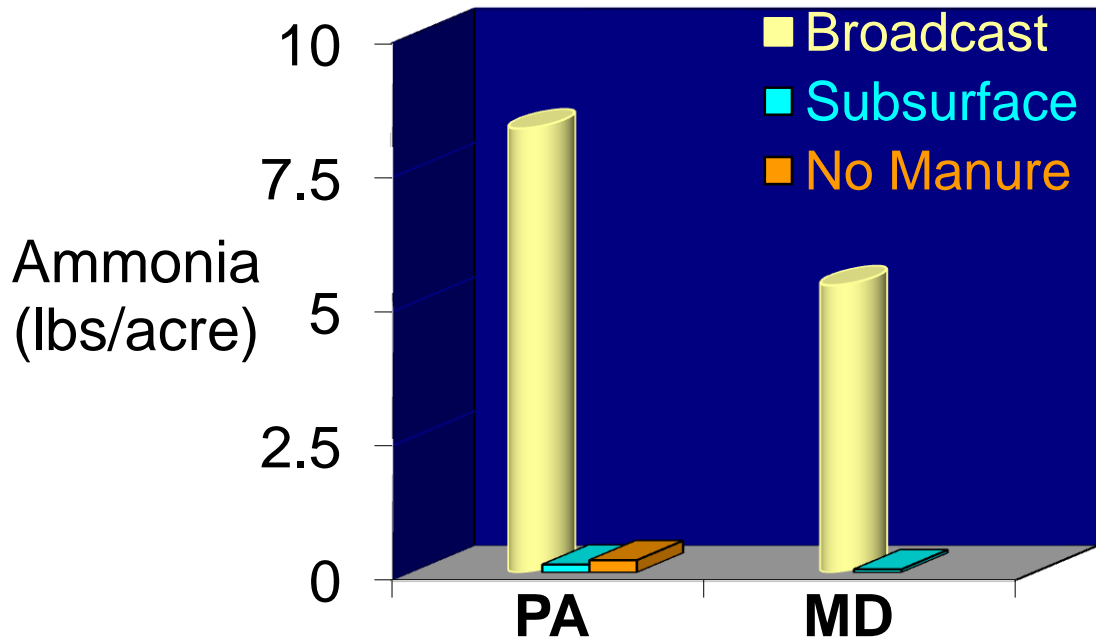
USDA-ARS Arkansas

Maryland Eastern Shore 2008 Yields



Pennsylvania 2008 Runoff Experiments

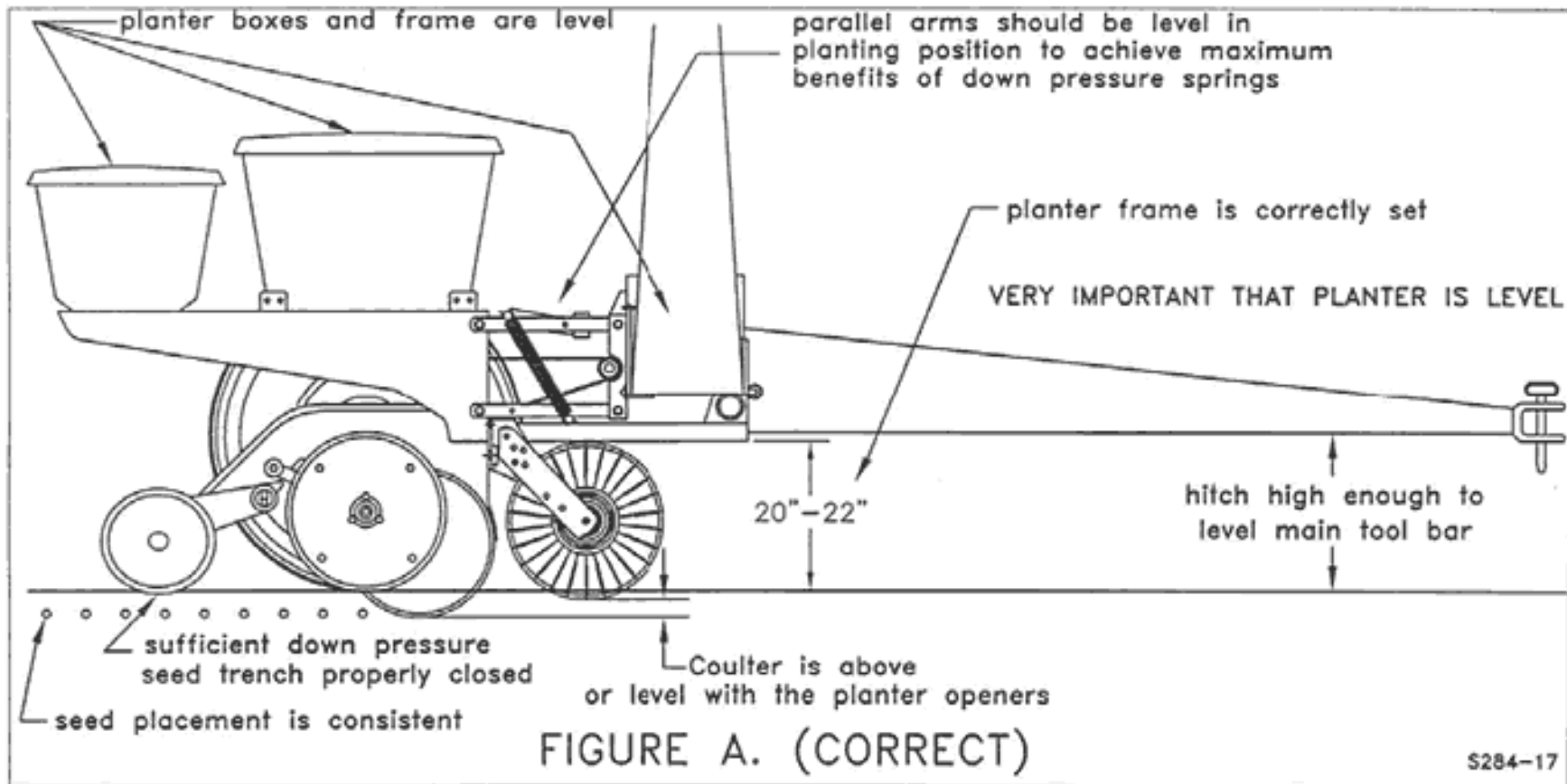




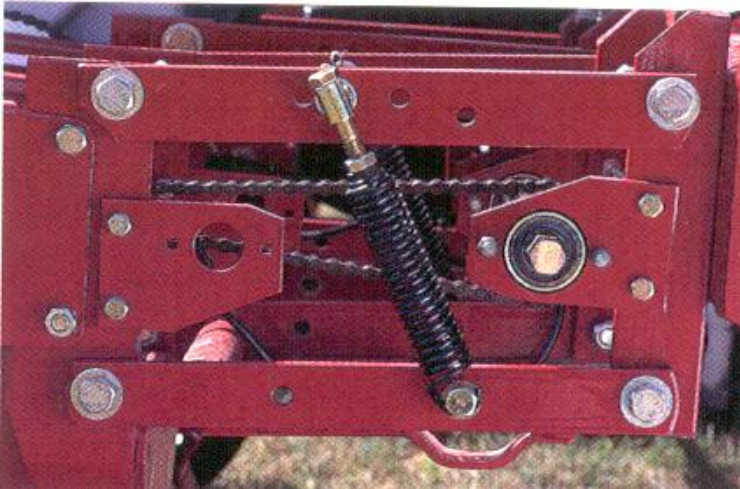
No-till Planters and Drills

- No-till planters and drills are **heavier**
- Designed to allow residue to flow through them
- Must be able to cut or move residue in the crop row
- Useful videos on Planters
- [Maintenance](#) and [differences](#) between NT and CT planters

Basic Planter

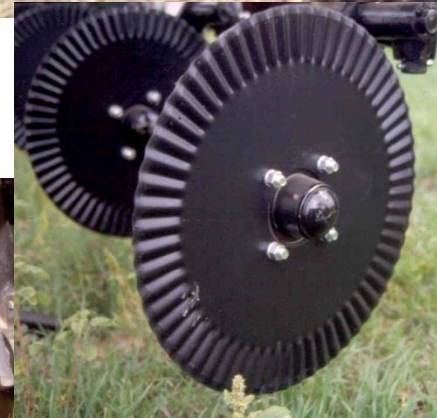


Down Force



Coulters

- Cut residue in front of openers
- Can 'hairpin' residue into seed slot
- Residue condition can seriously impact performance
- Reduce wear on opener disks



Row Cleaners

- Move residue from the opener path
- Should only tickle the surface
 - Should not move much soil
- Exposes soil that will now warm up quicker
- Gauge wheels have a smoother surface to operate on



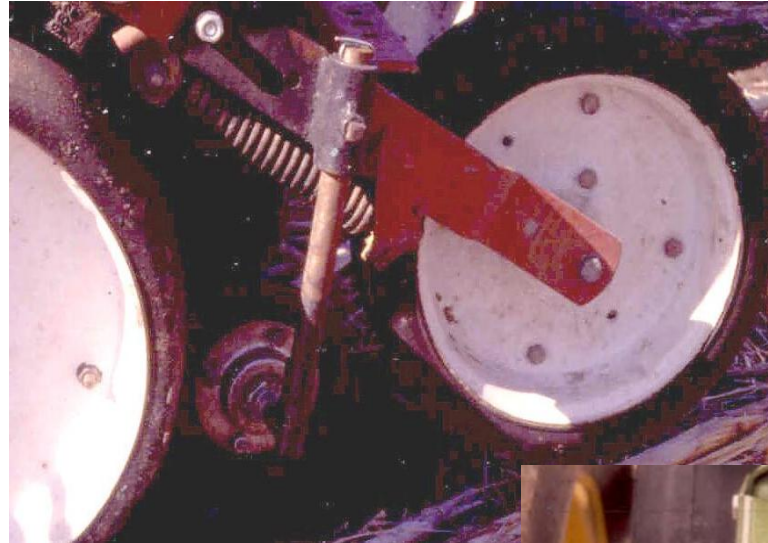
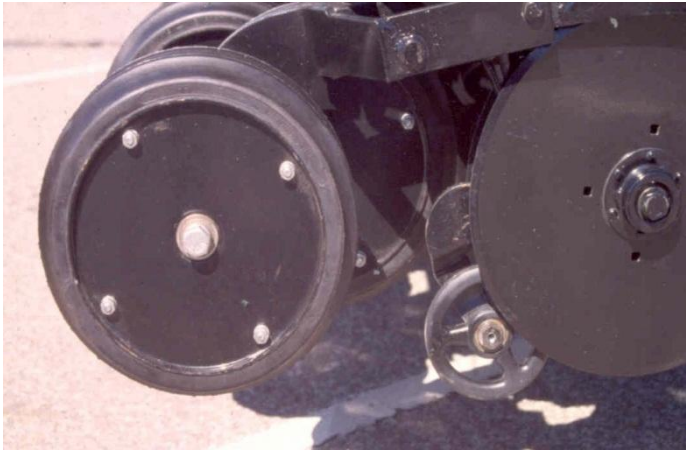
Combination Openers



- Might be the most popular
- Row cleaners move residue and coulters loosen soil for the opener disks
- Can work better than row cleaner in tough conditions (wheat stubble)



Seed-Soil Contact

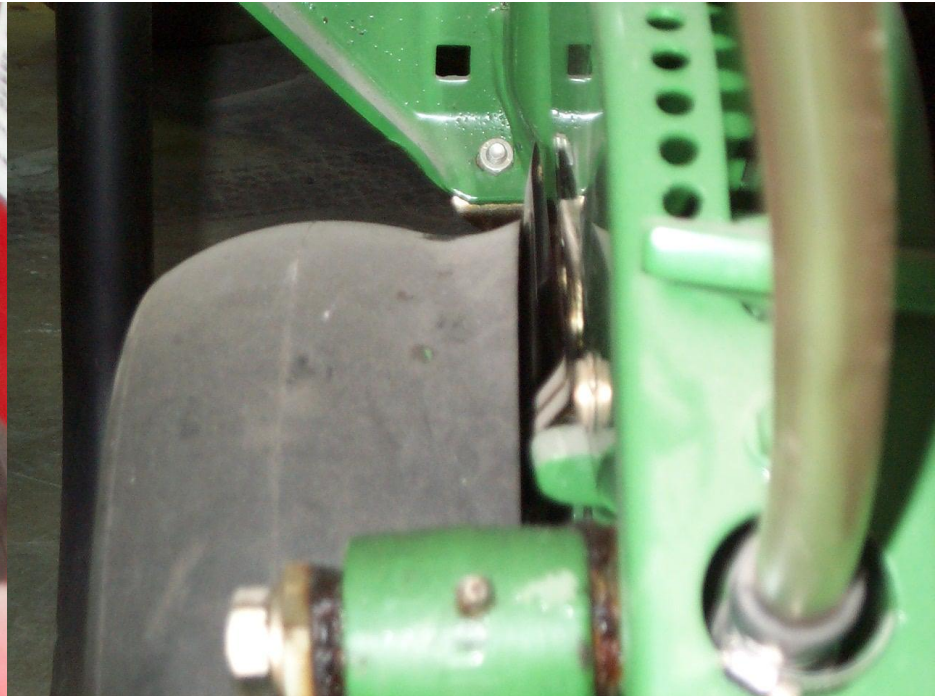


No-Till Closing Wheels



Case-IH Gauge Wheels

- Retrofit to Deere and White planters
- Allegedly reduce side wall compaction



No-Till Planter Options

- Surface residue and soil conditions can vary greatly
- Producers must select the combination of residue management equipment that works best in their conditions.
- Most often the best advice can come from a successful neighbor.

Adjustments before Attachments

- Adjustments ***ARE*** more important than attachments
 - Planter level
 - Well maintained
 - Attachment set correctly
 - Good seed-soil contact

No-till Drills

- Drills are used for narrow row crops
 - Less than 15 inches
- Again no-till drills must be designed to allow residue to flow through them
- They are also heavier than conventional drills



No-till Drills

- There are as many options for drills as for Planters
- Residue management is often achieved with a coulter caddy or sufficient down force to cut through residue with seed trench openers
- Hoe drills are also available for no-till



Benefits of No-Till Management

- Great reduction in soil erosion by wind and water
- Improved soil structure
 - Improved permeability
 - AKA, air, water, and root movement in the soil profile
 - Improved water holding capacity

Benefits of No-till

- Improved microbial activity
 - Improved nutrient cycling
 - Diversity can hinder outbreaks of pathogens and pests.
 - Results from the maintenance of elevated concentrations of active organic carbon and more stable soil moisture and temperature