Vertical Tillage
The What, How and Why
or Tillage for No Tillers

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Definition – the most difficult

- Vertical tillage is any type of deep tillage that doesn’t create a horizontal layer, and is performed with chisels, disk rippers, inline rippers, parabolic rippers and combination deep tillage tools.

- However I believe that a vertical tillage tool today is defined by not having a shank that lifts, stirs and mixes the soil

- Definition varies, is open to debate and what counts is what you believe
Objectives

"The main objective of using vertical tillage is to break up surface soil compaction, or smooth out areas in a field with shallow (2 to 3") rills from water erosion or ruts and tire tracks from tractors, combines, grain carts, trucks, and other equipment. It also is used to help improve rainfall penetration by breaking up crusts." DeAnn Presley, KSU

Another objective is to cut and size residue for easier handling and anchor it down
Description of Functions

- **Vertical Tillage**
  - Cut and size residue
  - Partially cover residue with soil
  - Break clods and smash residue
  - Break compaction
  - Aerate the soil
  - Dry and warm soil
  - Blacken the soil
  - Incorporate manure
  - Fluff of residue in the spring

- Different things to different folks
Brands – hard to keep track of

<table>
<thead>
<tr>
<th>Company</th>
<th>Model</th>
<th>Type</th>
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<tbody>
<tr>
<td>Case IH</td>
<td>330 Turbo</td>
<td>Processing</td>
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<tr>
<td>Great Plains</td>
<td>Turbo Till and Turbo Chopper</td>
<td>Processing</td>
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<tr>
<td>Krause</td>
<td>Excelerator</td>
<td>Processing</td>
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<td>Landoll</td>
<td>7431 VT Plus</td>
<td>Processing</td>
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<td>McFarlane</td>
<td>Reel Disk, Spiral Reel Stalk Chopper, Reel Till</td>
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<td>M&amp;W</td>
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<tr>
<td>Salford</td>
<td>RTS and RTS XT</td>
<td>Processing</td>
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<td>Summers</td>
<td>Super Coulter</td>
<td>Processing</td>
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<td>Sunflower</td>
<td>6630 Vertical Tillage System</td>
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<td>Twister</td>
<td>Processing</td>
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<tr>
<td>Aerway</td>
<td>Aerway</td>
<td>Aeration</td>
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<td>Soil Regeneration Unlimited</td>
<td>Curse Buster</td>
<td>Aeration</td>
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<td>Genesis Tillage</td>
<td>Gen-Till</td>
<td>Aeration</td>
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<td>HCC, Inc.</td>
<td>Smart-Till</td>
<td>Aeration</td>
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Equipment Types

- **Processing type**
  - Process residue
  - Prepare seedbed
  - Level seedbed

- **Aeration type**
  - Break compaction
  - Aerate the soil
  - Level seedbed

- **Rolling harrows**
  - Fluff
  - Aerate

*When we think vertical tillage do we only envision a combination of cutting and sizing coulters following by a harrow and rolling basket?*
# Residue Processing Brands

<table>
<thead>
<tr>
<th>Turbo-Till</th>
<th>330 Turbo</th>
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<tr>
<td><img src="image1.jpg" alt="Turbo-Till" /></td>
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<th>Super Coulter</th>
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<td><img src="image4.jpg" alt="Super Coulter" /></td>
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<td>Aeration Brands</td>
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<td><strong>Aerway</strong></td>
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<td><strong>Smart-Till</strong></td>
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<tr>
<td><strong>Curse Buster</strong></td>
<td><img src="image7.png" alt="Curse Buster Image" /></td>
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Equipment Set-ups

- No shanks
  - Not horizontal or deep zone tillage
- Gangs of coulters
  - Wavy or straight
  - Notched or edged
  - Concave or straight discs
  - Concave or straight discs
  - Angled or straight gangs
- Rolling tines
- Harrows
  - Rolling
  - Static
- Rolling baskets
Field Action

Greg Mueller, Salford Farm Machinery Co.

Dan Davidson, Agronomist, Telvent DTN
Compaction Management

- Compaction created by years of horizontal tillage with a disk, chisel, or field cultivator
- Processing types take out a surface crust
- Aeration types fracture the surface
- Tines – which is better
  - 3 or 4 tines
  - Twist designs
  - Additional weight
Field Operations

How to run

- **Speed** - be ready for the ride of your life
  - 8 to 10 to 12 mph

- **Horsepower** – don’t skimp
  - As little as 10 per foot when flat
  - As much as 15 per foot in the hills

- **Weight**
  - Big variable

- **Depth**
  - 2 to 4 inches for coulters
  - 6 to 8 inches for tines

- **Angle**
  - Parallel, angle or perpendicular
  - How much stalk do you leave standing
  - Wind a risk
Field Operations

- How to evaluate
  - Residue size
  - Residue anchored
  - Seed zone prepared
  - Seedbed leveled
  - Easier to observe

- Soil properties
  - Changes in bulk density
  - Aggregate stability
  - Water infiltration
  - Harder to measure
Evaluating Performance

- Corn Stalks
  - Sizing
  - Anchoring
  - Corn after corn
  - Tough Bt stalks
  - Rootballs
Evaluating Performance

VT tools are major investments so has to work

- Residue processing
- Residue anchored adequately
- How much soil is turned, too much or too little
- Are rootballs intact, split or flipped out
- Is it solving a compaction or crusting problem
- Is seedbed preparation adequate
- Will it guarantee faster and better emergence

Don’t hesitate to get out the broom
Setting a Goal

What do you want to accomplish
- Cut and size residue
- Incorporate residue
- Blacken the soil
- Prepare the seedbed
- Fluff up the residue and scratch the surface
- Loosen and aerate the soil

You have to decide
Buying Decision

- Understand the tool in terms of depth of tillage, level of disturbance, anchoring residue, able to perform in varying conditions
  - What’s your goal
  - Fall or spring passes or both
  - Crops and residue
  - Depth of tillage required
  - Field leveling
  - Do you have the horsepower
  - Price tag of $2,000 to $2,500 per foot of width
Conclusions

- They all work
  - They are also all different
- Decide what you want to accomplish
  - Processing or aeration
- Know your expectations
  - Test out a few types
  - Talk to other adopters
- With all the brands and options available don't rush to buy just because you are loyal to a brand and color
  - Find the one that works best for you.
- My 2 cents
Questions

More Information---
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Thank you