Conservation Tillage Phase 6 Panel Update

Panel Membership

Name	Affiliation	Role
Wade Thomason	VT	Panel Chair
Bill McCollum	DuPont Pioneer	Panel Member
Kevin Ganoe	Cornell	Panel Member
Dale Gates	NRCS	Panel Member
Mark Reiter	VT	Panel Member
Sjoerd Duiker	PSU	Panel Member
Bill Keeling	VADEQ	Watershed Technical Workgroup representative
Jeff Sweeney	CBPO	Modeling Team representative
Mark Dubin	UMD	AgWG Coordinator
Emma Giese	CRC	Staff

Proposal for Phase 6 strategy

Category	Description
Conventional/Hi Till	<15% cover
	15-30% cover, full width tillage
Low residue, strip till/notill	15-30% cover, strip till or NT, <40% soil disturbance, NRCS 329
new category	
Conservation tillage	30-60% cover, NRCS 345
High residue no tillage (HRTill)	>60% cover, min disturbance

Lo Residue NT/ST

- Objective is to capture the positive effect of long-term NT on soil structure and infiltration, in systems with less than 30% cover (year round)
- Will likely allow **no more than** ~40% soil disturbance

Where we are (proposed draft)

Conventional Tillage	Lo Res No-Till	Conservation Tillage	High Residue, Min Soil Disturbance
0-15% residue; 16-30% residue, full width tillage	16-30% residue	31-60% residue	>60% residue
TOTN High-Till	TOTN Lo Res No-Till Load Reduction Rel to High-Till Uplands -5% Coastal Plain -2%	TOTN Low-Till/Mulch-Till Load Reduction Rel to High-Till Uplands -10% Coastal Plain -4%	TOTN HR Till Load Reduction Rel to High-Till Uplands -14% Coastal Plain -12%
TOTP High-Till	TOTP Lo Res No-Till -9% Load Reduction Rel to High-Till Uplands Coastal Plain	TOTP Low-Till/Mulch-Till -24% Load Reduction Rel to High-Till Uplands Coastal Plain	TOTP HR Till Load Reduction Rel to High-Till Uplands -32% Coastal Plain -28%
TSS High-Till	TSS Lo Res No-Till Load Reduction Rel to High-Till -18%	TSS Low-Till/Mulch-Till Load Reduction Rel to High-Till -41%	TSS HR Till Load Reduction Rel to High-Till -79%

Sediment

- Began with strong (relatively) literature support for values in Conservation Till and HR Till
- Three additional data sources for sediment losses from long-term NT fields with low crop residue
- ~18% reduction in sediment loss for Lo Res NT compared to conventional till

Nitrogen

- From the papers below, developed a relationship between surface residue cover and surface N losses for that component multiplied by the surface water loss partitioning coefficient for Uplands vs Coastal Plain
- Additional references on N leaching reported mixed results

- McDowell, L. L., and K. C. McGregor. "Plant nutrient losses in runoff from conservation tillage corn." Soil and Tillage Research 4.1 (1984): 79-91.
- Shipitalo, Martin J., et al. "Effect of no-till and extended rotation on nutrient losses in surface runoff." Soil Science Society of America Journal 77.4 (2013): 1329-1337.
- Romkens, M.J.M, D.W. Nelson, and J.V. Mannering. "Nitrogen and Phosphorus composition of surface runoff as affected by tillage method." JEQ (1973). 2(2):292-295.
- Owens, L.B. and W.M. Edwards. Tillage studies with a corn-soybean rotation: Surface runoff chemistry. 1993. SSSAJ. 57:1055-1060.
- Chichester, F.W. 1977. Effectsof increased fertilizer rates on nitrogen content of runoff and percolate from monolith lysimeters. JEQ. 6(2):211-217.

Phosphorus

- Initial proposed DRAFT values based on review and summary of relevant literature
- "re-screening" available literature in the hopes of refining estimates by physiographic region
- Currently compiling this