



Department of Environmental Science
and Technology

Agricultural Nutrient Management Program

Ammonium Conservation Coefficients

Background:

Previous MCE guidance recognized that tillage could be used after manure incorporation to conserve ammonium-N by limiting ammonia volatilization. However, there was no difference between various degrees of tillage intensity. Since quantitative data are lacking to assign conservation factors to specific types of tillage, we decided to use residue cover as a surrogate for incorporation and therefore amount of ammonia conservation achieved.

Tillage Information:

Conventional tillage:

- For the purpose of nutrient management planning, this will include any tillage that leaves <30% residue cover
- Examples include chisel-disc-chisel or Landsman®
- ammonium conservation maximized

Conservation tillage:

- Includes any tillage that leaves between 30 and 70% surface residue
- Assumed to be approximately 25 – 75% as effective as conventional tillage at conserving ammonium-N
- Mid-range value of 50% used to estimate conservation factor
- Examples include light discing, plug or spike aerators (such as Aerway®), seed bed conditioners and vertical till (such as Turbotill™)

No-till:

- Ammonium conservation minimized
- Residue cover >70%

**Ammonia conservation factors for liquid manures and organic residuals
(<10% dry matter, >90% moisture)**

Time to incorporation	Conventional tillage	Conservation tillage	No-till or tillage > 3 days
inject	1.0	1.0	1.0
< 1 hr	.95	.70	
1-3	.90	.68	
3-6	.75	.60	
6-12	.65	.55	
12-24	.60	.53	
1-2 days	.55	.50	
2-3 days	.50	.48	
>3 days (no-till)			.45

**Ammonia conservation factors for solid manures and organic residuals
(>10% dry matter, <90% moisture)**

Time to incorporation	Conventional tillage	Conservation tillage	No till or tillage > 3 days
< 1 hr	.96	.66	
1-3	.93	.64	
3-6	.78	.57	
6-12	.71	.53	
12-24	.63	.49	
1-2 days	.58	.47	
2-3 days	.53	.44	
>3 days (no-till)			.35

Ammonia conservation factors for poultry litter

Time to incorporation	Conventional tillage	Conservation tillage	No till or >14 days
< 1 day	.97	.85	
1-2 days	.92	.82	
3 days	.88	.80	
4 days	.84	.78	
5 days	.81	.77	
6 or 7 days	.77	.75	
8 – 14 days	.74	.73	
>14 days (no-till)			.72

3/6/09

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