Ag Land Use Loading Rate Subgroup (Steering Committee) Progress Report

Tom Jordan and Gene Yagow

- Ad hoc Subgroup of Ag Modeling Subcommittee
- Task: Review Tetra Tech and WSI literature reviews and databases to develop relative loading rates for 16 agricultural land uses in the Phase 6 WSM.
- March 25th: Initial all-day review
- April 16th: Preliminary relative ratios for nitrogen provided to the Ag Working Group along with a request for additional resources for more detailed screening and analysis of the data.

Progress Report (cont.)

- Virginia Tech cooperative agreement provided resources – Gene Yagow contracted, mid-May.
- June: Application of refined criteria requested by the steering committee and additional analysis by Yagow.
- July: Steering Committee members undertook additional reviews for land uses or pollutants in their area of expertise.
- Hybrid justifications being developed to support relative loading rates for N, and modeling approaches for P and sediment ratios.

Update from the Ag Land Use Loading Rate Steering Committee

Draft Agriculture Relative Load Ratio Estimates (07/15/15)

Land Use	Manure	Relative N Loadings (leach. + runoff)	Notes & Updates	Relative P Loadings (sediment-attached P)	Relative P Loadings (dissolved P)	Relative Sediment Loadings (runoff)
Corn grain	No	1.00		1.00	1.00	1.00
Corn silage	No	1.09	in review			
Corn grain	Yes	1.27	likely increase			
Corn silage	Yes	1.59	in review			
Soybean, full seas.	No	0.88	likely decrease	Variability between landuses will be captured as a function of LRseg-based RUSLE2 erosion estimates, so no further relative ratios are proposed.	Variability between landuses will be captured as a function of LRseg-based APLE dissolved P estimates, so no further relative ratios are proposed.	Variability between landuses will be captured as a function of LRseg-based RUSLE2 erosion estimates, so no further relative ratios are proposed.
Small grain & Soybean	No	0.82				
Small grain & Forage	Yes	0.95				
Other Agronomic	Yes	0.55				
Legume or mixed Hay	Yes	0.16				
Grass or other Hay	Yes	0.14				
Pasture	Yes	0.11	in review			
Ag Open Space	No	0.04				
Special Crops, high	Yes	1.41				
Special Crops, low	Yes	0.32				

The Steering Committee has reservations about the old RUSLE rates for pasture and hay relative to cropland (too high) and would like to review the new RUSLE2 rates to ensure better relative representation of these land uses in P6.

Pasture/Hay Literature Review

J. Cropper

Parameter	Units	Average Loading Rates				Ratios to Pasture
		Pasture		Other Hayland		
		Range	(Mean)	Range	(Mean)	
Dissolved P	(lbs/ac)	0.10 - 1.3	(0.70)	0.30 - 0.83	(0.64)	0.91
Total P	(lbs/ac)	0.10 - 1.8	(0.95)	0.32 - 0.91	(0.70)	0.74
Sediment	(lbs/ac)	50 - 200				
Total N	(lbs/ac)	1.3 - 3.84			0.52	0.20

References:

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McMullen, R.L. and K.R. Brye. 2012. Leachate Water Quality from Pasture Soil after Long-term Broiler Litter Applications. Wayne E. Sabbe Arkansas Soil Fertility Studies. AAES Research Series 608. pp. 28.

Owens, L. B. and M. J. Shipitalo. 2006. Surface and Subsurface Phosphorus Losses from Fertilized Pasture Systems in Ohio. J. Environ. Qual. 35:1101 -1109.

Vadas, P. A., D. L. Busch, J. M. Powell, and G. E. Brink. 2014. Monitoring runoff from cattle-grazed pastures for a phosphorus loss quantification tool. Agriculture, Ecosystems and Environment 199 (2015) 124-131.