AMT Office Hours

8/8/2025

Tom Butler, EPA

On the docket:

- Inorganic Fertilizer
- Land Use Loading Rate Ratios
- Animal BMP excess

Inorganic Fertilizer

- June 2025
    1. Fertilizer Data Trend walkthrough
    2. Requested update to state supplied data
    3. State Scale fertilizer stock investigation
- July 2025
    - State Scale fertilizer stock analysis
    - Decision to move to state scale
- August 2025
    - Alternative fertilizer modeling presentation

Next steps

Continued:

- Examination of raw data
- Data trends for non reporting states
- Smoothing methods
- Data collection

As of 8/6/25

- Data supplied: DE, PA, WV
- Will be providing but haven’t yet: VA
- Looking into providing: MD
- Not collecting: NY

Questions?

Land Use Loading Rate Ratios

- February 2025
  - Created two new Land Uses:
    - Managed Pasture
    - Managed Hay
  - Designed to represent high application Land Uses
  - Require a factor that describes how N loads off the land
- July 2025
  - Loading Rate Ratio subgroup recommendation
  - Proposal vote
  - NO CONSENSUS

Unless we get feedback, we will use the following:

Jurisdiction	Method to determine Managed acres	Method to allocate NM	Managed Hay Nitrogen Application rate (lbs./acre)	Managed Hay Phosphorus Application rate (lbs./acre)	Managed Pasture Nitrogen Application rate (lbs./acre)	Managed Pasture Phosphorus Application rate (lbs./acre)	Source
DE	To be reported like construction acres (state provided in advance of progress runs)	Reported Core N NM on specific land use	120	40	60	30	Low end of VT LGU recommendation
MD	To be reported like construction acres (state provided in advance of progress runs)	Reported Core N NM on specific land use	120	40	60	30	Low end of VT LGU recommendation
NY	To be reported like construction acres (state provided in advance of progress runs)	Based on reported Core N NM acres	75	0-50 Dependent on Morgan Soil Test P	50	0-50 Dependent on Morgan Soil Test P	Cornell Nitrogen Guidelines for Field Crops in NY for Native and improved grasses (Pasture) and Grasses in a 1-2 cut system (Hay) Cornell Phosphorus Guidelines for Field Crops in NY for Native and improved grasses (Pasture) and Grasses in a 1-2 cut system (Hay)
PA	No managed acres	No NM acres	120	40	60	30	Low end of VT LGU recommendation
VA	To be reported like construction acres (state provided in advance of progress runs)	Reported Core N NM on specific land use	120	40	60	30	Low end of VT LGU recommendation
WV	Based on reported Core N NM acres	Based on reported Core N NM acres	120	40	60	30	TEST DATA (Provided by VA DCR)

Some background: Loading Rate Ratios

Chesapeake Bay Average			
Land class	Land Use	Loading Rate Ratio	Loading Rate (pounds per acre per year)
Cropland	Double Cropped Land	0.79	30.9
	Full Season Soybeans	0.71	27.7
	Grain with Manure	1.4	54.7
	Grain without Manure: **Reference land use**	1	39.1
	Other Agronomic Crops	0.45	17.6
	Silage with Manure	1.62	63.3
	Silage without Manure	1.16	45.3
	Small Grains and Grains	0.84	32.8
	Specialty Crop High	1.34	52.4
	Specialty Crop Low	0.31	12.1
Pasture	Ag Open Space	0.43	5.1
	Legume Hay	0.74	8.7
	Other Hay	1.04	12.3
	Pasture: **Reference Land Use**	1	11.8

CAST Ag Land Use Loading

- Land Classes
  - Basic split of ag into Cropland and Pasture

Chesapeake Bay Average			
Land class			
Cropland			
Pasture			

CAST Ag Land Use Loading

- Divided into Land Uses
  - Groups of crops we believe behave similarly.
- Reference Land Uses are determined for each class
  - Foundation for behavior of all other land uses

Chesapeake Bay Average			
Land class	Land Use		
Cropland	Double Cropped Land		
	Full Season Soybeans		
	Grain with Manure		
	Grain without Manure: **Reference land use**		
	Other Agronomic Crops		
	Silage with Manure		
	Silage without Manure		
	Small Grains and Grains		
	Specialty Crop High		
	Specialty Crop Low		
Pasture	Ag Open Space		
	Legume Hay		
	Other Hay		
	Pasture: **Reference Land Use**		

CAST Ag Land Use Loading

- Divided into Land Uses
  - Groups of crops we believe behave similarly.
- Reference Land Uses are determined for each class
  - Foundation for behavior of all other land uses

Chesapeake Bay Average			
Land class	Land Use		
Cropland	Double Cropped Land		
	Full Season Soybeans		
	Grain with Manure		
	Grain without Manure: **Reference land use**		
	Other Agronomic Crops		
	Silage with Manure		
	Silage without Manure		
	Small Grains and Grains		
	Specialty Crop High		
	Specialty Crop Low		
Pasture	Ag Open Space		
	Legume Hay		
	Other Hay		
	Pasture: **Reference Land Use**		

CAST Ag Land Use Loading

- Loading Rate Ratio
  - Relative loading behavior of Land Uses compared to the reference.

Chesapeake Bay Average			
Land class	Land Use	Loading Rate Ratio	
Cropland	Double Cropped Land	0.79	
	Full Season Soybeans	0.71	
	Grain with Manure	1.4	
	Grain without Manure: **Reference land use**	1	
	Other Agronomic Crops	0.45	
	Silage with Manure	1.62	
	Silage without Manure	1.16	
	Small Grains and Grains	0.84	
	Specialty Crop High	1.34	
	Specialty Crop Low	0.31	
Pasture	Ag Open Space	0.43	
	Legume Hay	0.74	
	Other Hay	1.04	
	Pasture: **Reference Land Use**	1	

CAST Ag Land Use Loading

- Loading Rate
  - Pounds/acre/year of nutrients delivered to the water from the land.
  - Modeling workgroups purview
    - Encompass physical transport
- WILL CHANGE with updated model

Chesapeake Bay Average			
Land class	Land Use	Loading Rate Ratio	Loading Rate (pounds per acre per year)
Cropland	Double Cropped Land	0.79	30.9
	Full Season Soybeans	0.71	27.7
	Grain with Manure	1.4	54.7
	Grain without Manure: **Reference land use**	1	39.1
	Other Agronomic Crops	0.45	17.6
	Silage with Manure	1.62	63.3
	Silage without Manure	1.16	45.3
	Small Grains and Grains	0.84	32.8
	Specialty Crop High	1.34	52.4
	Specialty Crop Low	0.31	12.1
Pasture	Ag Open Space	0.43	5.1
	Legume Hay	0.74	8.7
	Other Hay	1.04	12.3
	Pasture: **Reference Land Use**	1	11.8

Phase 7 CAST Ag Land Uses

- Two new Land Uses
  - Managed Hay
  - Managed Pasture
- Need to think about differences between new Land Uses and existing ones.

Chesapeake Bay Average			
Land class	Land Use	Loading Rate Ratio	Loading Rate (pounds per acre per year)
Cropland	Double Cropped Land	0.79	30.9
	Full Season Soybeans	0.71	27.7
	Grain with Manure	1.4	54.7
	Grain without Manure: **Reference land use**	1	39.1
	Other Agronomic Crops	0.45	17.6
	Silage with Manure	1.62	63.3
	Silage without Manure	1.16	45.3
	Small Grains and Grains	0.84	32.8
	Specialty Crop High	1.34	52.4
	Specialty Crop Low	0.31	12.1
Pasture	Ag Open Space	0.43	5.1
	Legume Hay	0.74	8.7
	Other Hay	1.04	12.3
	Managed Hay	?	?
	Pasture: **Reference Land Use**	1	11.8
	Managed Pasture	?	?

What did we do?

- Literature review
- Data processing
- Average ratio calculation
- Sought expert opinion

Literature Review:

Concerns:

- What do we mean by “managed”?
- No codified definition of managed vs unmanaged hay/pasture in literature

Solution:

- Managed pasture/hay = high application
- Unmanaged pasture/hay = low application

Literature Review

- Long-Term Leachate Water Quality Trends from a Broiler-Litter-Amended Udult in a Karst Region R.L. McMullen, K.R. Brye,* A.L. Daigh, D.M. Miller, E.E. Gbur, A.L. Pirani, M.A. Evans-White, and R.E. Mason 2014

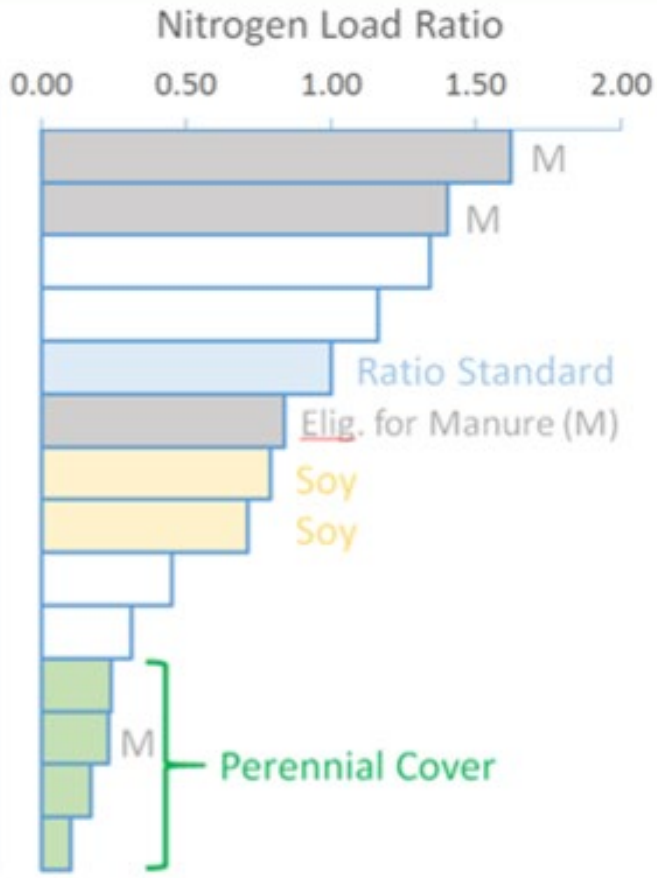
- "The impacts of nitrogen fertilisation and increased stocking rate on pasture yield, soil physical condition and nutrient losses in drainage from a cattle-grazed pasture, Monoghan et al 2005"

- Field-Scale Nitrogen and Phosphorus Losses from Hayfields Receiving Fresh and Composted Broiler Litter R. W. Vervoort,* D. E. Radcliffe, M. L. Cabrera, and M. Latimore, Jr. 1998

- Nutrient Losses from Fertilized Grassed Watersheds in Western North Carolina V. J. Kilmer,2 J. W. Gilliam,a J. F. Lutz,a R. T. Joyce,4 a4nd C. D. Eklund 1974"

A concern: Perennial Grass ratio (2016)

	Load Ratio	Std Err
Corn Silage Manure	1.62	
Corn Grain Manure	1.40	0.20
Specialty High	1.34	
Corn Silage *	1.16	
Corn Grain	1.00	
Sm Grain & Forage M.*	0.84	
Sm Grain & Soy	0.79	0.09
Full Season Soy	0.71	0.11
Other Ag Crops	0.45	
Specialty Low *	0.31	
Other Hay	0.24	0.06
Pasture Manure	0.23	0.06
Legume or Mix	0.17	0.02
Ag Open	0.10	0.01



* BPJ estimate by analogies to other crops

Figure 2. Nitrogen Load Ratio Relative to Corn (or Sorghum) Grain Without Manure

Additional rates from Chapter 2 table 2.7:

- **Ag**
- Full Season Soybean 27.7
- Other Agronomic 17.6
- Specialty Low 12.1
- Other Hay 12.3
- Pasture 11.8
- **Non - Ag**
- MS4 Construction 26.80
- MS4 Tree Canopy over Turfgrass 8.53
- Non-Regulated Turf Grass 11.19
- Harvested Forest 11.88

New VA proposal

- Perennial grasses should not exceed traditional row crops
- More details in the main meeting

Chesapeake Bay Average			
Land class	Land Use	Loading Rate Ratio	Loading Rate (pounds per acre per year)
Cropland	Double Cropped Land	0.79	30.9
	Full Season Soybeans	0.71	27.7
	Grain with Manure	1.4	54.7
	Grain without Manure: **Reference land use**	1	39.1
	Other Agronomic Crops	0.45	17.6
	Silage with Manure	1.62	63.3
	Silage without Manure	1.16	45.3
	Small Grains and Grains	0.84	32.8
	Specialty Crop High	1.34	52.4
	Specialty Crop Low	0.31	12.1
Pasture	Ag Open Space	0.43	5.1
	Legume Hay	0.74	8.7
	Other Hay	1.04	12.3
	Managed Hay	1.56	18.4
	Pasture: **Reference Land Use**	1	11.8
	Managed Pasture	1.52	17.9

Questions?

Animal BMP excess

May 2025

- Initial review request for processing of several animal BMPs

June 2025

- Continued discussion and fleshing out of request

July 2025 (outside of original meeting)

- Animal Waste Management Systems
- Mortality Disposal

August 2025

- Riparian fencing
- Next steps

Follow up questions:

Do we need to update the conversion factor for P7?

Does mortality disposal need a conversion factor that differs from AWMS?

Are animal submissions based on max capacity?

- If not, what is the prevalence of reaching max capacity?

Exclusion fencing:

- Do we need to revisit the default conversion?
  - Wider? Narrower?

AnimalName	Source	AverageAnimalCountPerSystem	MortalityFraction
pullets	Sales	9,734	0.08
turkeys	Production	3,744	0.15
hogs and pigs for breeding	Inventory	428	0.08
beef	Inventory	22	0.09
broilers	Production	198,096	0.05
dairy	Inventory	84	0.1
hogs for slaughter	Sales	74	0.05
horses	Inventory	7	0.01
layers	Inventory	1,720	0.08
other cattle	Inventory	43	0.03
sheep and lambs	Inventory	33	0.03
goats	Inventory	13	0.03

Today's Goal: Compile feedback

Green boxes = AMT decisions
Purple boxes = AMT recommendation

Question	Change required?	Suggested change
Do we need to update the AWMS conversion factor for P7?		
Do we need a unique conversion factor for MD that differs from AWMS?		
Are animal submissions based on max capacity?		
Do we need to revisit the default exclusion fencing conversion? (1000ft of fencing = 17.6 Animal Units)		
Should the default be wider? (10-foot width for narrow buffers and 35 for full buffers)		

Questions?

Thank you for attending office hours!

We will begin our main meeting at 09:00.