Agricultural [Land Use](Discussion)

Discussion

9/8/2023

Discussion – How many Ag land uses should the model have?

*Green represents land uses receiving nutrient applications

Agricultural Land Uses
Ag Open Space
Double Cropped Land
Full Season Soybeans
Grain with Manure
Grain without Manure
Leguminous Hay
Other Agronomic Crops
Other Hay
Pasture
Silage with Manure
Silage without Manure
Small Grains and Grains
Specialty Crop High
Specialty Crop Low
Riparian Pasture Deposition
Permitted Feeding Space
Non-Permitted Feeding Space

How do we currently look at land in CAST?

No matter how many or how few land uses, the county applications and uptake remain the same

Ag sector

Yields and applications are summed by land use

Land Use A

Land Use B

Yields and applications are calculated at the crop and county level

Crop A

Crop B

Crop C

Crop D

Crop E

Crop F

Land Uses have more then applications

Loads

- the spatially-averaged and temporally-averaged nutrient loading export rate to a stream or other waterbody for a given land use.

Pounds per acre per year

Chesapeake Watershed scale

Assumptions:

- No management practices
- Independent of:
  - Local nutrient application rates,
  - Location within the watershed,
  - Physical characteristics.

Loading rate determination

- Ag Modeling Subcommittee
  - The Ag Land Use Loading Rate Subgroup
    - Determined ratios,
    - Modeling Workgroup adopted

- Related loading rates to a reference land use

Land class	Land Use	Loading Rate Ratio	Loading Rate (pounds per acre per year)
	Chesapeake Bay Average		
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

A few notes on BMPs and location:

BMPs can be specified by land use

- In practice, they rarely are

If high loading land uses are closer to the stream relative to lower loading land uses, the load is higher

- In practice, the crop and pasture land use types are spread around the county evenly

Discussion questions:

- Do we want load differences in space and time to be driven by these ratios or solely by the factors of Yield and Applications?

- Do we want to retain the ability to specify BMPs and land uses at finer scales?

Questions?