

# Biosolids/Septage: Phosphorus Impacts

Fred Hegeman P.E.,  
DNR Statewide Residuals Coordinator  
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# LANDSPREADING IMPACT

- **WISCONSIN:** ~9 Million Harvested Cropland Acres
- **Biosolids:** ~0.8%
- **Septage:** ~0.7%
- **Industrial Wastes:** ~3.7%
  - **Total Non Animal Residuals** ~5.5%
- **CAFOs:** ~10+%
- **TOTAL Animal Waste:** ~**50-60%**
- **Comm Fertilizer Only:** ~**35-45%**

# SOURCES OF FERTILIZER





# N vs. P REGULATIONS

## N Regs

- Older Regs
- Clean Water Act Amendments (1987)
- 40 CFR 503
  - NR 204
  - NR 113
- Nitrogen NM planning
- Not enough

## P Regs

- Soiltest P Upwards
- CAFOs
- NRCS 590 NM Plans
- Livestock Siting Ordinances
- Manure Storage Ordinances
- Cost Share
- WPDES Effluent Permits
- WHAT IS NEXT?

# BIOSOLIDS RATIOS

## Ratios

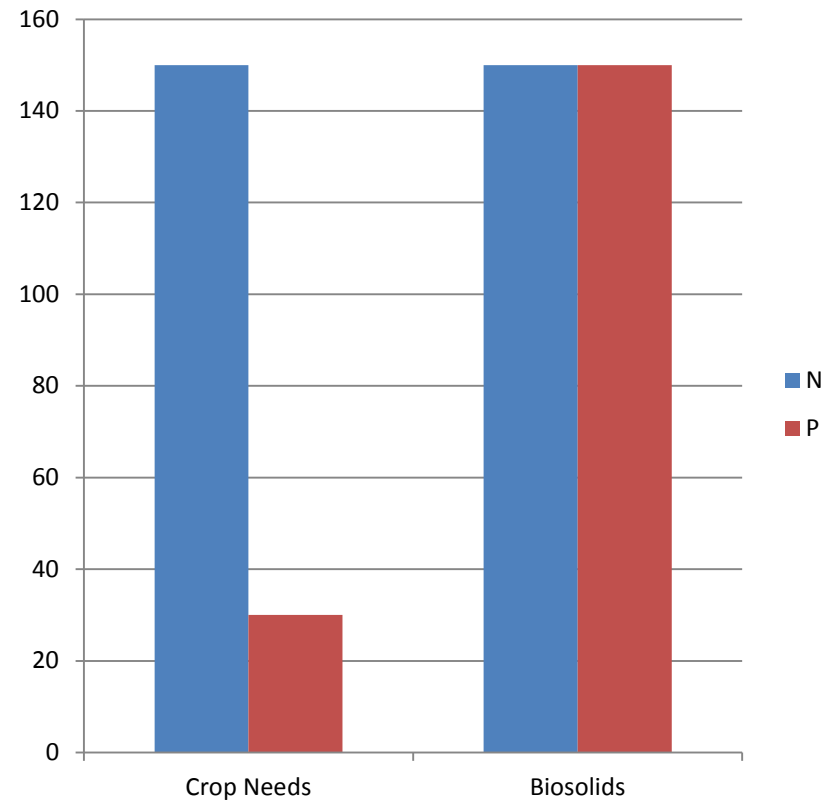
Crop Needs  $\neq$  Biosolids

- Nitrogen
- Phosphorus

## Biosolids Ratios

- Phosphorus ~5 times Nitrogen Needs

## Example

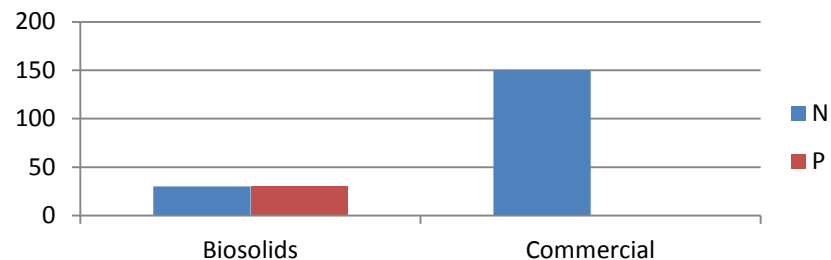


# BIOSOLIDS RATIOS

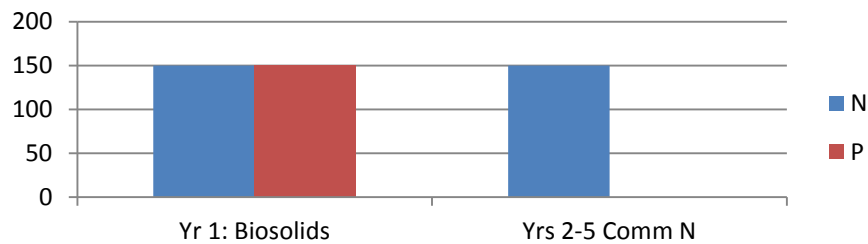
## Solutions

- Apply at Crop P Needs every year
  - Add Commercial N
  
- Apply at Crop N Needs over a rotation
  - Manage around P

## Apply Each Year



## Apply Biosolids 1 Every 5 Years—4 years Commercial N





# BIOSOLIDS UNKNOWNNS

- Total P  $\neq$  Crop Available P
  - Iron/Aluminum Salts & Lime
- Changing rates of Iron/Alum Salts
- Each WWTP is unique
- Ratio of Total P added to Soil  $\neq$  Incremental Soiltest P
- Many Others...as WWTPs attempt to reduce effluent P



# SEPTAGE & P

- 1992 EPA Study
  - ~ 165# of P if applied at 39,000 gal/ac
  - ~ 100# of N @ 39,000 gal/ac
- NOW
  - ~ 35-40# of P @ 39,000 gal/ac
    - [Wis. Liq. Waste Carriers (Ebeling Study)]
  - ~ 60# of N @ 39,000 gal/ac
- More Characteristic INFO needed





# TAKE HOME MESSAGES

- Soil Testing
  - Conduct Soil Tests
  - Understand Report
  - Increase testing to Annually
  - Monitor Trends
- Decrease Waste Loading
  - Replace Biosolids N w/Commercial N/Rotate
  - Know your waste
  - Avoid Animal Waste Sites
- SnapPlus Training
  - Talk the Talk
    - Nutrient Management Planners
    - Farmers/Producers
  - Walk the Walk
    - Manage around P
    - Use Commercial N
  - Calculate field risk
  - P-Index
- Other Benefits of NM
  - Improved Water Quality
  - Water Quality Trading Options



# QUESTIONS

Get answers to your phosphorus questions by:

- Submitting your questions to the panel.
- Do it now...during the break