

**Iowa Senate Natural Resources Committee**

**February 3, 2015**

**Summary**

Soil Nitrogen Cycling and Budgeting

- The primary reason for nitrate loss is not the mismanagement of nitrogen fertilizer. Most nitrate loss to Iowa waterways is caused by mismatched timing between the uptake of nitrate by crops and the natural microbial production of nitrate from nitrogen found in native soil organic matter.
- Average Iowa soil contains 10,000 pounds of nitrogen per acre in organic matter. This organic nitrogen is not susceptible to loss.
- However, when the soil is warm and moist, microbes transform the organic nitrogen to nitrate. This nitrate is susceptible to loss.
- Almost all nitrate loss to Iowa waterways occurs when soils are warm and moist, but crops are not rapidly using soil nitrate. If there is no crop to use soil nitrate, some is lost to waterways — especially during heavy precipitation.

Drainage and Nitrate Loss

- Nitrate is leached from the root zone of crops and primarily transported through subsurface flow pathways to downstream waters.
- Reaching water quality goals will require broad implementation of many practices.