

## NITROGEN LOSS FROM TILE DRAINS

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Nitrogen contributions to the Gulf of Mexico have increased hypoxia issues in recent years. Numerous efforts have targeted the reduction of nitrogen loads to the Mississippi River drainage basin to control the hypoxic zone. Agricultural tile drainage is a major contributor to nitrogen loads in the Mississippi River.

Research performed by the University of Wisconsin - Discovery Farms Program in collaboration with the United States Geologic Survey has established the importance of nitrogen fertilizer and manure application rate and timing with potential loss of nitrogen to tile drains. Manure applied to fields soon after corn silage was harvested resulted in a high conversion to nitrate and subsequent loss to tile drains in late fall through early spring. Abnormally high fall soil temperatures allowed for conversion of ammonium and organic nitrogen to nitrate and subsequent late fall and early spring precipitation carried nitrate to tile drains.

Under specific frozen ground conditions, elevated ammonium levels were observed in both surface runoff and tile drainage flow. A manure application on frozen ground, just prior to a runoff event, resulted in a high percentage of total nitrogen lost as ammonium. Ammonium comprised 97% of surface runoff and 84% of tile flow from a January rain on frozen ground event.

### References

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