

COVER CROPS & SOILS

Laboratory of Jennifer L. Tank, Dept. of Biological Sciences, University of Notre Dame

the CHALLENGE: reducing nutrient loss from soils via tile drains

Tile drains transfer excess phosphorus (P) and nitrogen (N) from soils to adjacent streams. These reach sensitive downstream ecosystems, contaminating drinking water, fueling algal blooms and harming fish and mussels.

our STRATEGY

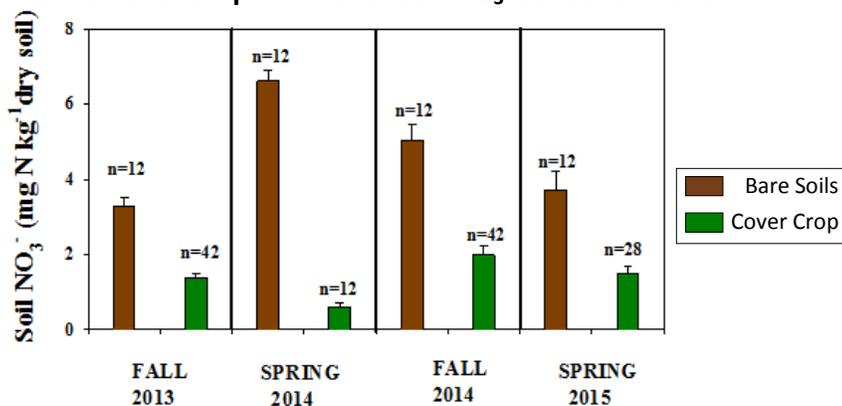
GOAL: Retain nutrients/soils on fields and reduce stream export.

Cover crops are planted after cash crop harvest and their growth coincides with critical times for nutrient export from tiles to streams. We are measuring their impact.



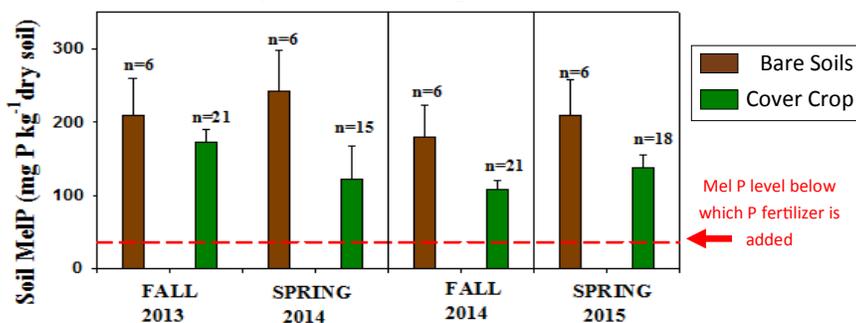
RESULTS so far

Do cover crops influence soil NO₃⁻ concentrations?



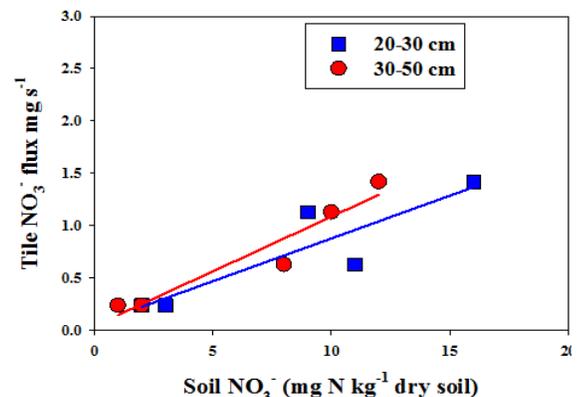
Soil nitrate-N concentrations were lower in cover crop fields than those without cover crops during both fall and spring over two years. This could indicate that bioavailable-N is tied up in cover crops during these seasons.

Do cover crops influence organic matter or soil P?



We have not seen any significant increase in soil organic matter or carbon in two years of sampling. In contrast, soil Mehlich III P was lower with cover crops than in fields without in spring and fall 2013-2015.

Can we correlate soil NO₃⁻ with tile drain losses to Shatto Ditch?



There was a positive relationship between soil and tile drain nitrate-N. This relationship suggests that cover crops could reduce NO₃⁻ loss from fields, keeping N on fields for future crop growth.

CONCLUSIONS

Cover crop fields had lower soil NO₃⁻ and Mehlich III P than fields without cover crops.

Decreases in soil NO₃⁻ were related to lower tile drain NO₃⁻, suggesting that cover crops could retain N and prevent leaching from agricultural fields.

We have not seen changes in soil organic matter but expect to see them over a longer time frame. With USDA RCPP funding we will continue to sample through 2019.