

COVER CROPS & SOIL HEALTH

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the CHALLENGE: reducing nutrient loss from soils via tile drains

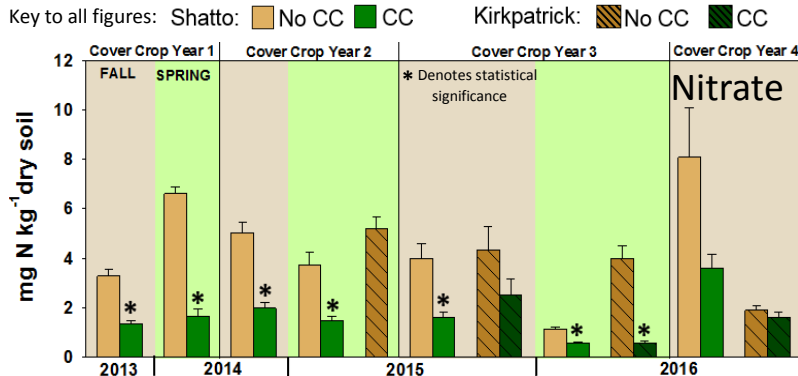
Tile drains transfer excess phosphorus (P) and nitrogen (N) from soils to adjacent streams. These reach sensitive downstream ecosystems, contaminating drinking water, fueling algal blooms and harming fish and mussels.

our STRATEGY

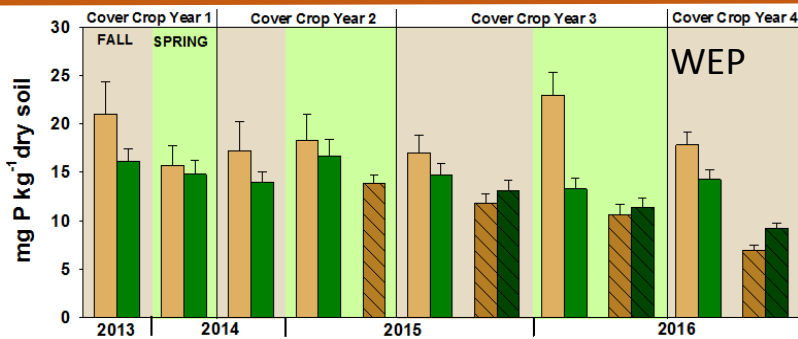
GOAL: retain nutrients/soils on fields and reduce stream export. Cover crops are planted after cash crop harvest and their growth coincides with critical times for nutrient export from tiles to streams/ditches. We are measuring cover crop impact on soil health, including key nutrients, in two watersheds: Shatto Ditch and Kirkpatrick Ditch.



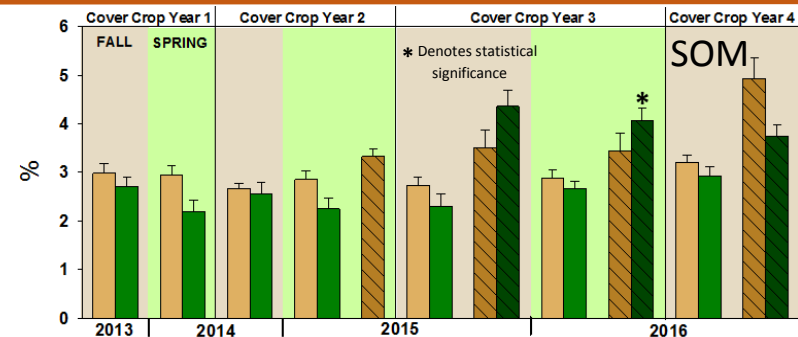
RESULTS so far



- **Soil Nitrate-N** concentrations are lower in cover crop fields than those without in both watersheds during Spring and Fall.
- Bioavailable-N is being tied up by active cover crop growth during these seasons.
- Decreases in soil nitrate-N correlate with reduced tile drain nitrate-N loss, suggesting that cover crops retain N and reduce leaching from agricultural fields.



- **Water Extractable Phosphorus (WEP)** is P that leaches readily from soils (e.g., w/ rainfall).
- There was no significant difference in WEP between cover crop fields and those without in either watershed or season.
- These results suggest that cover crops are not causing increased dissolved phosphorus loss to adjacent waterways.



- **Soil Organic Matter (SOM)** has not yet changed in cover crop fields in Shatto Ditch watershed; the benefit of cover crops appears to be delayed.
- In contrast, we have seen an increase SOM in cover crop fields in Kirkpatrick Ditch Watershed in only the first two seasons of soil sampling.

• **CONCLUSIONS:** cover crop fields had lower nitrate and no significant differences in WEP than fields without cover crops in both watersheds. We will continue to monitor the impact of cover crops on SOM.



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