

**Water Quality Enhancement Activity – WQL08 –Apply Split Applications of Nitrogen Based on a Pre-Sidedress Nitrogen Test on Cropland**

**Enhancement Description**

The use of a Pre-Sidedress Nitrogen Test (PSNT) to determine the need and/or rate of additional nitrogen to be applied during a sidedress application.

**Land Use Applicability**

This enhancement is applicable on corn grown on cropland.

**Benefits**

Sidedress applications of ammonia-N based on a PSNT may lower the total amount of ammonia fertilizers applied, therefore controlling the conversion of ammonia to nitrate and ultimately to nitrogen gas through nitric oxide (an ozone precursor) and nitrous oxide (a greenhouse gas). Nitrate, while taken up by plants as a nutrient, is also unstable in soil and can move with water through the soil into surface and ground water. Also, the above conversion processes produce nitrous oxide as a byproduct. Nitrous oxide is a potent greenhouse gas which has 310 times the global warming potential of carbon dioxide on a molecular basis. Using split applications of ammonia-N based on a PSNT will help to reduce nitrate contamination of surface and ground water, and reduce an enterprise's nitrous oxide emissions, improving its overall greenhouse gas footprint. The PSNT is primarily used to test if side-dress N fertilizer is needed on fields with a history of manure application. PSNT attempts to:

- Gauge the pool of potentially mineralizable organic N in the soil, and
- Link that pool with a likelihood of a yield response from additional N fertilizer at sidedressing time.

**Criteria for Applying Split Applications of Nitrogen Based on a Pre-Sidedress Nitrogen Test on Crop Land**

Refer to the report, "Soil nitrate test for corn in Michigan" by Darryl Warncke, MSU, which was posted to the Crop Advisory Team (CAT) Alerts for field crops on May 14, 2009. The pdf file of this report (titled 'PSNT for Corn in MI') can be found in Section IV of the Field Office Technical Guide, G. Technical Tools, Nutrient Management, in the Nutrient Management References folder.