

## Michigan Supplemental Enhancement Activity

### Water Quality and Air Quality Enhancement Activity – WQL08 – Split applications of nitrogen based on a PSNT or other crop-based indicators

#### Enhancement Description

Using pre-sidedress soil nitrate test (PSNT), tissue testing or chlorophyll meters to determine the need and/or rate of additional nitrogen to be applied during a sidedress/topdress nitrogen application.

#### Land Use Applicability

This enhancement is applicable on cropland.

#### Benefits

Efficient use of nitrogen (N) fertilizer is important for economical crop production as well as water and air quality enhancement. Split sidedress or topdress applications of fertilizer N may improve the efficiency of nutrient uptake and protect water and air resources. Pre-plant soil test nitrogen analysis can be poorly correlated with growing season soil N availability and does not provide sufficient insight upon which to base sidedress or topdress N applications. Additionally, sidedress or topdress applications based on a PSNT, tissue tests, or handheld chlorophyll meter tests may lower the total amount of fertilizer applied, including ammonia fertilizer, minimizing ozone damage and greenhouse gasses. Nitrate, while required by plants as a nutrient, is unstable in soil and can move with water through the soil into surface and ground water. Using split applications of N based on a PSNT, tissue tests, or chlorophyll meter tests will minimize nitrate contamination of surface and ground water, improve N use efficiency, and reduce harmful N emissions, improving the overall greenhouse gas footprint.

#### Criteria

For the PSNT, 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.

Refer to the ‘Michigan Enhancement Supplement WQL04 – Plant Tissue Testing and Analysis to Improve Nitrogen Management’ for guidance on tissue testing using either tissue samples or a chlorophyll meter.

For nitrogen management recommendations, follow MSU Extension Publication E2904, “Nutrient Recommendations for Field Crops in Michigan”, and MSU Extension Publication E2934, “Nutrient Recommendations for Vegetable Crops in Michigan”.