

Water Quality Enhancement Activity – WQL04 – Stalk or Leaf Tissue Tests for N Application

Enhancement Name

Use corn stalk and/or leaf tissue tests to adjust nitrogen application rates

Land Use Applicability

This enhancement is applicable on cropland.

Benefits

The use of either corn stalk nitrate testing or leaf tissue testing is an adaptive nitrogen management technique used to adjust nitrogen application rates in-season (leaf tissue test) or for the following crop year (stalk test). Test such as these help provide a thorough analysis of how nitrogen is being used by the current corn crop, giving a basis for adjustments to nitrogen rates. The end result is a more complete utilization of the nitrogen applied and less nitrogen remaining in the soil to be lost to the environment through nitrate leaching or soil emissions of nitrous oxide.

Criteria

1. This enhancement is specific to corn production and requires the use of 1 or more of the following activities:

- Corn stalk testing and analysis

Follow the procedure given in Purdue bulletin, “End-of-Season Corn Stalk Nitrate Test”, which is found in Section IV of the Michigan Field Office Technical Guide, G. Technical Tools, Nutrient Management, in the Nutrient Management References folder. Samples can be sent to the MSU Soil Testing Lab or any county Extension office.

According to MSU Extension Bulletin E2904, nitrate concentration between 450 and 2,000 ppm generally indicate good nitrogen use efficiency with optimum yields and limited residual soil nitrogen. Values below 450 ppm may indicate very efficient N use and optimum yields or a corn crop that ran short on N with some reduction in yield. Values above 2,000 ppm indicate more nitrogen was available than was necessary. Maintaining a database of stalk nitrate values from field to field and from year to year is a good way to fine-tune N management.

- Corn leaf tissue testing and analysis

For corn leaf tissue testing using the chlorophyll meter method, follow the procedure given in the Nebraska bulletin, “Using a Chlorophyll Meter to Improve N Management”. It is found in Section IV of the Michigan Field Office Technical Guide, G. Technical Tools, Nutrient Management, in the Nutrient Management References folder.

Michigan Enhancement Supplement

For corn leaf tissue testing using collected leaf tissue samples, follow the procedure given in A&L Fact Sheet No. 34, “Plant Tissue Sampling of Row Crops”. It is found in Section IV of the Michigan Field Office Technical Guide, G. Technical Tools, Nutrient Management, in the Nutrient Management References folder. Contact the MSU Soil Testing Lab or any county Extension office for forms and information on submitting tissue samples.

A range for tissue N in corn between 2.90% and 3.50% is considered a sufficient concentration.