

Mississippi River Basin Initiative (MRBI) In-Field Monitoring and Evaluation (799)

Focus of the following guidance is for the In-Field (Tier I) monitoring and evaluation activities.

To date, the information provided from national NRCS has been general. The framework for Edge of Field monitoring indicates that monitoring conducted by participants should be similar in order to compare results. The similar activities are also necessary for developing practice payment scenarios and schedules.

A specific protocol for use in Missouri MRBI In-Field monitoring and evaluation has been developed. The protocol is used for identifying monitoring activities, monitoring equipment and for establishing payment.

The In-Field monitoring activities that are offered largely evaluate the soil- and plant tissue-based status of nitrogen for corn production. *These tests were developed to help fine-tune the application of nitrogen fertilizer to maximize agronomic and economic benefits for corn production systems, and have not been calibrated for other crops.* An additional benefit is that environmental impacts are reduced when these calibrated testing methods are followed.

Note that these tests do not directly measure water quality benefits when installing conservation practices. Rather, they utilize soil and plant indicators of sufficient but not excessive nitrogen fertilizer application.

1. In-Field Monitoring—Pre-Plant Soil Testing
 - a. Follow guidelines from UMC in **G9177, *Preplant Nitrogen Test for Adjusting Corn Nitrogen Recommendations***
 - b. Take samples no more than 30 days prior to the anticipated planting date. If weather conditions delay planting this must be documented.
 - c. Soil samples shall come from areas no greater than five acres
 - d. Soils are sampled for ammonium-N and nitrate-N
 - e. Soils are sampled to a depth of two feet
 - f. Test provides a nitrogen credit that will offset the recommended amount of nitrogen fertilizer.
2. In-Field Monitoring—Pre-Sidedress (Late-Spring) Soil Testing
 - a. Follow guidelines from Iowa State University **PM 1714, *Nitrogen Fertilizer Recommendations for Corn in Iowa***
www.extension.iastate.edu/publications/pm1714.pdf
 - b. Soil samples shall come from areas no greater than five acres
 - c. Soils are sampled for nitrate-N
 - d. For Missouri, soils are sampled to a depth of **two feet**
 - e. Follow published nitrogen fertilizer recommendations
3. In-Field Monitoring—Crop Canopy Color Sensing
 - a. Follow guidelines in the Agronomy Technical Note No. 35 at <http://www.mo.nrcs.usda.gov/technical/agronomy/technote35>
 - b. Corn plant tissue is tested using implement-mounted color sensors
 - c. Assistance is available from University of Missouri Extension to implement the activity
4. In-Field Monitoring—In-Season Crop Tissue Testing
 - a. Follow guidelines from the UMC Soil and Plant Testing Laboratory at <http://soilplantlab.missouri.edu/soil/plantsamples.aspx>. This site provides:
 - i. Crops for which recommendations are established

- ii. Suggestions for collecting and submitting samples
 - iii. Cost of sample analysis
 - b. Chlorophyll meter tissue testing shall follow procedures in the Agronomy Technical Note No. 35 at <http://www.mo.nrcs.usda.gov/technical/agronomy/technote35>
 - i. Establish monitoring sites representing areas no greater than 10 acres. Establish a procedure (flags, GPS waypoints, etc.) by which these sites can be relocated.
 - ii. Measure chlorophyll levels of leaves on between 15 and 30 plants at each monitoring site
- 5. In-Field Monitoring—Cornstalk Nitrate Tissue Testing (The On-Farm Network)
 - a. Follow the protocols established by the On-Farm Network CCPI Initiative given at <http://www.mo.nrcs.usda.gov/technical/OnFarmNetwork.html>
- 6. In-Field Monitoring—Soil Health Testing
 - a. Missouri gives no guidance regarding soil health testing. Some guidelines may be found at <http://hort.cornell.edu/soilhealth/extension/test.htm>
 - b. Provide a QA/QC plan for sample procedures and handling
 - c. Provide a rationale (data) that links soil health measurements at the site with reductions in nitrogen, phosphorus, and (or) sediment loads.
- 7. Develop Monitoring Plan—In-Field, for project area
 - a. The monitoring plan will include each field or area that has in-field monitoring activity(ies)
 - b. The plan will identify monitoring and evaluation activities.
 - c. The plan will identify the data collection process and frequency. The monitoring report time frame will be one year, recommend that reports be completed on NRCS fiscal year schedule. This would be coordinated with payment activities, which are based on fiscal year (October 1 through September 30).
 - d. The plan will include the annual activities and list the information that will be included in the annual report. The report and all the data will be prepared in Microsoft-compatible (Word, Excel, etc.) electronic format.
 - e. The monitoring plan will state that reports will be submitted to NRCS. The minimum reports will be a *In-Field Monitoring Report* that will identify which type and when in-field monitoring activities are used. *Annual Report of Monitoring Activities* that will include data for all the monitoring activities used within each year; and a *Final Report*.
- 8. The plan will identify when a final report will be prepared for the monitoring and evaluation activities for the project.
- 9. MRBI Contract
 - a. The items listed in the monitoring plan for 799 will be part of the contract.
 - b. The contract administration will use the monitoring plan to identify when an activity for payment has been completed. The coordination of the contract and the monitoring plan will serve as documentation for payment.