Water Quality Enhancement Activity – WQL11 – Precision application technology to apply nutrients

Enhancement Description
The use of precision agriculture technologies to apply nutrients to fit variations in site-specific conditions found within fields**.**

Land Use Applicability
Cropland, Pastureland

Benefits
Precision agriculture methods are used to collect information needed to more precisely evaluate production input factors, accurately record crop yields, and precisely apply variable rates of nutrients. The primary benefit of precision agriculture techniques is the use of detailed information about within field variability to maximize nutrient use efficiency. Done properly this helps to protect surface and ground water resources.

Conditions Where Enhancement Applies
This enhancement applies to crop or pasture land use acres where:

- Crop or forage yields can be monitored and correlated to positions in the field in order to produce a geographically accurate yield map.
- Nutrients can be applied according to geographically defined management zone(s) (DMZ).

Criteria
Implementation of this enhancement requires the use of precision agriculture technologies for nutrient management. This enhancement requires the following activities:

1. Variable rate technologies (VRT) for nutrient application. This means computer-controlled equipment that adjusts fertilizer applications based on DMZ.
2. The use of yield monitoring systems. Measure yields in the field using combine-mounted sensors, volume meters or other suitable technologies. Use a GPS receiver with the equipment to correlate field location with yield to create a yield map.
3. Sample soils for nutrient analysis shall be based on DMZs.
4. As a minimum, use yield monitoring data and soils data to create DMZs maps. Apply all nutrients according to the requirements of the DMZ based on yield expectations from yield monitoring.
5. Soil tests for P and K must be no more than 3 years old. If soil or plant tissue tests are used for variable rate nitrogen application, the tests shall be current.

6. All nutrient application rates must not exceed the "Land Grant University (LGU) recommendations for the target yield expectation.

Adoption Requirements
This enhancement is considered adopted when the system as described in the criteria above have been implemented on the land use acreage. This includes the development of DMZs and the application of nutrients according to the requirements of the DMZ.

Documentation Requirements
Documentation for each field where this enhancement is applied:
1. A map showing the fields where the enhancement is applied,
2. Crops grown in each field and maps with yield monitoring results,
3. Soil sampling protocol,
4. Soil test results,
5. Map(s) showing management zones for each field,
6. Calibration of fertilizer application equipment, and
7. Nutrient application rates/amounts and application dates for each DMZ.

Note: In lieu of documenting each individual item listed in the Documentation Requirements, a Certified Crop Advisor plan that contains each of the items may be substituted.