United States Department of Agriculture

## CONSERVATION ENHANCEMENT ACTIVITY

## E590D

CONSERVATION STEWARDSHIP PROGRAM

# Reduce risks of nutrient losses to surface and groundwater by increasing setback awareness via precision technology

### Conservation Practice 590: Nutrient Management

**APPLICABLE LAND USE: Crop (Annual and Mixed), Crop (Perennial)**

**RESOURCE CONCERN: Water**

**ENHANCEMENT LIFE SPAN: 1 Year**

**Enhancement Description**

Utilize precision technology to increase Surface/Groundwater Setbacks & Associated Application Rate Restrictions (SGS&AARR) implementation during nutrient application by providing precise, real-time location information (geo-located) in the field to the equipment operator. While operating nutrient application equipment, the operator's location is continually updated and displayed on an integrated, in-cab or add-on GPS-enabled device visible to the operator at all times to reduce the risk of nutrient application in setback and/or sensitive areas. This allows the equipment operator to manually turn off or steer equipment to avoid applying nutrients in setback or sensitive areas. Done properly this helps to protect surface and ground water resources.

**Criteria**

- Implementation of this enhancement requires the use of components of precision agriculture technologies for nutrient management.

- Prior or current documentation of implementation of a nutrient management meeting all NRCS Conservation Practice (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.

- Documentation that all 590 surface/groundwater setbacks and associated

application rate restrictions (SGS &AARR) are geolocated in a file format that is overlaid on a current air photo and/or field map and visually displayed for the nutrient applicator. SGS&AARR includes, but are not limited to, state specific 590 surface/groundwater setbacks and sensitive areas including soils and bedrock restrictions.

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- Photo or written documentation of:
    - Field verification of SGS&AARR,
    - Creation of updated maps in a format compatible with the system on application equipment, and annual updating if new SGS&AARR are documented,
    - Equipment installation and testing to ensure fully functional system, and
    - Implementation of the system with each nutrient application.

- Subject to payment limitations, this enhancement will apply to all cropland acres operated by the producer meeting CSP 590.

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**Documentation and Implementation Requirements:**

**Participant will:**

- ☐ Prior to implementation, provide documentation for review by NRCS showing a record of implementing nutrient management meeting all NRCS Conservation Practice (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- ☐ Prior to implementation, a Qualified Individual will create an electronic file(s) with 590 criteria geo-located, compatible with all nutrient application equipment used on the farm and ensure compatibility with all equipment used. The Qualified Individual will provide copies, training, and operating instructions to all operators prior to nutrient application.
- ☐ Prior to implementation, the Qualified Individual will quality review all electronic files, and provide documentation for review to NRCS showing the system to be used by the equipment operator and electronic copies of site specific, field verified 590 maps including all SGS&AARR in a format readable by NRCS (KML files, shapefiles, or other mutually agreed upon format) via NRCS State Office designated delivery method.
- ☐ Prior to implementation, existing maps are reviewed, SGS&AARR are geolocated an in-field assessment for previously unmapped SGS&AARR is conducted and all maps updated and approved by a Qualified Individual to ensure all 590 criteria are documented and accurate.
- ☐ Prior to implementation, provide documentation of nutrient application equipment calibration.
- ☐ Prior to implementation, provide documentation to NRCS documenting the installation of equipment on tractors/equipment using a dedicated, fuse protected, power source or a factory installed power source, documentation of maps loaded onto devices, and documentation that system is fully functional and operational.

**Prior to initial implementation (one time)**

| Verification of purchase/usage of tablet/display system with internal/connected GPS receiver | Verification of purchase/usage of tablet/display system with minimum screen brightness of 450 NITS | Verification of installation/usage of tablet/display system with a dedicated, fuse protected, power source or a factory installed power source. |
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**Prior to initial implementation (one time, or when additional SGS/AARR are documented)**

| Field | Acres | Verification of current CPS 590 implementation by NRCS | Verification of calibration of nutrient application equipment by Qualified Individual | Verification of electronic maps and equipment compatibility by Qualified Individual |
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**Prior to initial implementation (one time, or when additional SGS/AARR are documented)**

| Field | Acres | Verification that the Qualified Individual has conducted an in-field assessment, geolocated all SGS&AARR in a compatible format and provided copies to NRCS | Verification of installation and functionality on all nutrient application equipment by Qualified Individual | Verification that the Qualified Individual has trained all equipment operators |
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- ☐ During implementation, keep records to document as applied records of nutrient applications (maps, photo documentation and/or tabular statistics).
- ☐ During implementation, update all electronic files when additional SGS&AARR are documented. Updated copies must be provided to NRCS annually.

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**NRCS will:**

- ☐ As needed, provide technical assistance to meet the criteria of the enhancement.
- ☐ Prior to implementation, provide and explain NRCS Conservation Practice Standard Nutrient Management (CPS 590) as it relates to implementing this enhancement.
- ☐ Prior to implementation, review documentation to verify a record of implementing nutrient management meeting all NRCS Conservation Practice Standard Nutrient Management (CPS 590) general criteria and additional criteria to minimize agricultural nonpoint source pollution of surface and groundwater.
- ☐ Prior to implementation, verify the development of site-specific geo-located maps. For each field, all SGS&AARR will be documented by the Qualified Individual via geo-location and included in the electronic file. NRCS staff will review to ensure that known site specific soils information and known sensitive area resource concerns are included.
- ☐ Prior to implementation, verify the development of a planned nutrient budget, yield goal, and planned nutrient applications by management zone.
- ☐ During implementation, evaluate any planned changes to verify the planned system meets the enhancement criteria.
- ☐ After implementation, review documentation and records to verify implementation of the enhancement.

**NRCS Documentation Review:**

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

_____ _____

NRCS Technical Adequacy Signature Date

# 2024 Alabama Supplemental Guidance for CSP Enhancement

**ENHANCEMENT NUMBER AND TITLE**: **E590D**: Reduce risks of nutrient losses to surface and groundwater by increasing setback awareness via precision technology

**Conservation Practice: E590** – Nutrient Management

BRIEF DESCRIPTION OF ENHANCEMENT: This is to utilize precision technology to increase Surface /Groundwater Setbacks & Associated Application Rate Restrictions (SGS&AARR) implementation during nutrient application. Application setbacks are separation distances between land application sites for animal manures, organic by-products, and areas that are to be protected. Using application setbacks will help minimize the odor and nuisance potential associated with animal manures and other waste.

*Important considerations:*

- Use application equipment that utilizes rate controllers, GPS guidance, automatic section control or any combination of all 3 to improve application rate and placement of nutrients.
- Use variable-rate nitrogen application based on expected crop yields, soil variability.
- Use variable-rate phosphorus, and potassium application rates based on site-specific variability in crop yield, soil characteristics, soil test values, and other soil productivity factors. Develop site-specific yield maps using a yield monitoring system.
- Use the data to further diagnose low and high- yield areas, or zones, and make the necessary management changes.
- See Title 190, Agronomy Technical Note (TN) 190.AGR.3, Precision Nutrient Management Planning.
- Use legume crops and cover crops to provide nitrogen through biological fixation and nutrient recycling. -CPS-7 NRCS, AL 590 February 2022
- When creating a new plan or modifying an existing plan soil test and other needed laboratory analysis should be taken within the past year.
- Use soil tests, plant tissue analyses, and field observations to check for secondary plant nutrient deficiencies or toxicity that may impact plant growth or availability of the primary nutrients.
- Use the adaptive nutrient management learning process to improve nutrient use efficiency on farms as outlined in the NRCS National Nutrient Policy in GM 190, Part 402, Nutrient Management.
- Potassium should not be applied in situations where an excess causes nutrient imbalance in crops or forages. Excess material should be collected and stored or field

PROVIDE REQUIRED DOCUMENTS AND IMPLEMENTATION REQUIREMENTS.

- ☐ Provide NRCS with the current and a suggested planned Nutrient Management Plan that includes A site-specific maps to develop management zones, a planned nutrient budget, yield goal, and applications by management zone (pounds/acre active ingredient nutrients, must include at a minimum N-P-K). Develop planned variable and flat rate application layers (maps and/or tabular statistics).
- ☐ Results of soil test with recommendations.

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- ☐ Results of applicable risk assessments, P index (attached if manure is used), N index and soil loss if crop land.
- ☐ Recommended nutrient application rates, application time, placement, and sources.
- ☐ Notify NRCS of any planned changes to verify the planned system meets the enhancement criteria,
- ☐ Provide maps of the area or location(s), digital images/photos of the area and indicate area on map, and dates of completed activity
- ☐ After implementation, make documentation and records available for review by NRCS to verify implementation of the enhancement.

This Nutrient Management Plan Includes:

**Table 1.** Site specific information on the 4R's (right rate, right time, right source and right placement) needed to implement nutrient management. Right rate and right time information may be omitted from this table if information is included on the soil test report.

| Track/Field | Crop/year(s) | Yield goal | N Index[1/] | Right Rate (lb/ac)[2/] N | $P_2O_5$ | $K_2O$ | Right Time[2/] | Right Source[3/] | Right Placement[4/] |
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1/ N index is the nitrogen leaching index. The leaching potential of N is high (h) throughout the state as a result of high average rainfall. As a result all N applications must be within 30 days of planting a crop or within 30 days of an actively growing crop to minimize N leaching, maximize N use efficiency and meet the requirements of the nutrient management standard. For more information on N leaching see Alabama Agronomy Technical Note AI-73, "N Leaching Index for Alabama".

2/ Right time and right rate information may be included on the attach soil test results and recommendation, if so indicated see soil test in table 1.

3/ Indicated planned nutrient source, commercial or organic waste (manure/litter). If the source is manure/litter insure that all applications comply with all federal, state and local regulations including but not limited to ADEM requirements and setbacks as indicated on the conservation plan maps.

4/ Indicated planned nutrient placement to minimized nutrient loss and maximize nutrient use efficiency. For example, broadcast on spreadable area as indicated on conservation plan maps or broadcast N starter, $P_2O_5$ and $K_2O$ and band sidedress N at the planned rate.

The attached documents support the full implementation of this Conservation Stewardship Enhancement.

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CSP Participant Name Date