



Nutrient Management (590) Advanced Nutrient Management Systems

Natural Resources Conservation Service (NRCS)

April, 2014

Advanced Nutrient Management Systems Jobsheet

Producer Name: _____

Contract # _____

**INFORMATION ON THIS JOB SHEET
IS CONSIDERED TO BE PART OF
THE CONTRACT AND/OR
CONSERVATION PLAN.**

Purpose

The purpose of this job sheet is to develop an Advanced Nutrient Management System for the operation that will meet all criteria of the 590 Nutrient Management practice standard.

Conditions Where Practice Applies

Practice applies on all lands where landowners wish to improve the nutrient budget for all crops and at the same time improve the soil and water quality by reducing the risk of nutrient leaching and runoff.

Advanced Nutrient Management Systems Specifications

The planned Advanced Nutrient Management System will meet all criteria of the 590 Nutrient Management practice standard. Implementation will result in the proper rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on Land Grant University recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Records demonstrating implementation of

the 4 R's of the nutrient management criteria will be required:

- Right fertilizer source
- Right rate
- Right timing
- Right placement

The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. The use of post-harvest soil and/or tissue tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing Phosphorus application rates and residual Nitrogen, thus reducing the potential for off-site impacts.

Based on the 590 Nutrient Management standard, the soil loss has to be at or below soil loss tolerance "T" and the N and P risk assessment tools has to be utilized to demonstrate that there is no risk for offsite movements of nutrients on fields receiving fertilizer.

Annual PSNT (Pre-side dress Nitrogen Soil Test) or PTDTT (Pre-top dress Tissue Test) to determine optimum Nitrogen application rates is required during the crop season. The PTDTT test could be replaced with the use of the *Greenseeker* sensor based N application according to the addendum to the 2013 AGR-1. (See attached.)

Grid soil sampling has to be utilized to establish nutrient management zone maps. Nutrient budgets have to be developed annually based on the different nutrient management units or zones.

NDVI sampling (normalized differenced vegetative index) or EC (electro conductivity index) type sampling or high definition aerial photography to establish

different nutrient management units or zones.

Nutrient balancing is done annually for each NM zones, units.

GPS guided variable rate fertilizer, manure and lime applications are required. This includes the split Nitrogen fertilizer applications.

Yield monitoring is required and yield monitoring maps are developed annually.

Utilization of slow release fertilizer products and/or utilization of Nitrogen inhibitor products, and similar additives are required.

Utilization of Chlorophyll meters, spectral analysis or similar advanced sensing technology to further refine nutrient application rates is also a criteria.

* The producer must attend a training course covering the precision nutrient management systems and advanced technology.



Title and location/date of Adaptive Nutrient Management System Course/Workshop:

Signature of applicant

| Certifications | | | |
|--|--|--------|-------|
| Job Sheet | Prepared by: | Title: | Date: |
| | Approved by: | Title: | Date: |
| Installation | Meets NRCS standards and specifications. | | |
| | Certification by: | Title: | Date: |
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* Please contact **Tibor Horvath Nutrient Management Specialist** for accepted courses and workshops/conferences at Tibor.Horvath@ky.usda.gov or 859-224-7413.

ADDENDUM TO 2012-2013 AGR-1 (Nitrogen recommendations on wheat)

Sensor Based Application:

Two algorithms have been developed specifically for Kentucky soils for the use of variable rate nitrogen applications on wheat using the Greenseeker® sensors. Field trials using the moderate to well drained soil algorithm has resulted in yield increases in intensively managed wheat averaging about 4 bu/ac and increased economical returns. Nitrogen should be applied at greenup as is customary, using tiller count and greenness of the crop. At that time, an N rate of 150 lb/ac N should be applied to either strips or small areas in the field. This will be used as a reference at Feekes 6 for the Greenseeker in making the variable rate N application. The difference between the NDVI readings in this N rich strip and any other reading in the field is termed the Differential NDVI in the algorithms below. It is recommended that a minimum rate of 20 to 30 lb/ac be applied even in areas where the Differential NDVI would approach or be at zero.

| FINAL ALGORITHMS FOR USE WITH GREENSEEKER® FOR VARIABLE RATE NITROGEN APPLICATIONS AT FEEKES 6 WHEAT ON MODERATE TO WELL DRAINED SOILS IN KENTUCKY | |
|---|-------------------------|
| Differential NDVI* | N Needed (lb/ac) |
| 0.015 | 25 |
| 0.02 | 40 |
| 0.03 | 55 |
| 0.04 | 70 |
| 0.075 | 85 |
| 0.11 | 97.5 |
| 0.175 | 110 |
| 0.24 | 125 |
| *Difference between the NDVI reading in the 150 lb/ac N rich strip and NDVI reading in other parts of the field. | |

| FINAL ALGORITHMS FOR USE WITH GREENSEEKER® FOR VARIABLE RATE NITROGEN APPLICATIONS AT FEEKES 6 WHEAT ON MODERATELY TO SOMEWHAT POORLY DRAINED SOILS IN KENTUCKY | |
|--|-------------------------|
| Differential NDVI* | N Needed (lb/ac) |
| 0.025 | 20 |
| 0.04 | 33 |
| 0.055 | 45 |
| 0.08 | 60 |
| 0.105 | 75 |
| 0.135 | 90 |
| 0.18 | 105 |
| 0.21 | 120 |
| *Difference between the NDVI reading in the 150 lb/ac N rich strip and NDVI reading in other parts of the field. | |