



Nutrient Management (590)

Advanced Precision Nutrient Management System

Natural Resources Conservation Service (NRCS)

April, 2014

Advanced Precision Nutrient Management System 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 Precision 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 Precision Nutrient Management System Specifications

The planned Advanced Precision 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 the tolerable soil loss "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.

* 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.**

Deliverables to the NRCS field office:

- Soil test results (grid soil sampling) including PSNT tests
- PTDDT Pre-top dress tissue test results (if applicable)
- Crop rotation and yield records (yield records by nutrient management zones)
- Variable rate fertilizer application records by nutrient management zones (timing, form, placement and rate)
- Variable rate manure application records by nutrient management zones (timing, form, placement and rate)
- Variable rate lime application records by nutrient management zones (if applicable)
- NDVI reading records if Greenseeker technology was utilized
- Annual nutrient management balance records by nutrient management zones

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.