



## Nutrient Management Data Collection

Nutrient management plans are developed to guide manure and fertilizer applications for crop production and natural resource conservation. Developing a plan that meets crop nutrient needs while also reducing erosion, leaching, and runoff risks, requires a tremendous amount of farm and field data. This fact sheet was developed as a guide to data collection for cropland nutrient management planning according to NRCS 590 Standard<sup>1</sup>. Knowing what information is needed can make farm visits and the whole planning process more efficient.

### Schedule a Farm Meeting

The first step is to schedule a meeting with the farmer. For a productive meeting, a planner will likely need at least a day and probably more to prepare for the meeting.

### Pre-meeting Preparation

#### *General*

When starting any conservation management plan it is always worthwhile to check with the local USDA Service Center (NRCS and/or FSA) and the county Soil and Water Conservation District for prior work done with farm. This will require the landowner's permission, but can yield valuable information such as AEM Tier II Assessments, maps, plans from prior projects, etc.

#### *Maps*

While a 590 nutrient management plan will focus on cropland, some information about the farmstead will be needed to define nutrient sources and manure amounts. Maps of cropland tract and field boundaries and the farmstead(s) will form the base for future data collection and aid communication with the farmer. Individual field maps, overview maps showing all farmsteads and fields on a single

page, and farmstead maps are useful for tactical planning and communication during the planning process. As with all maps, a scale, key, and north arrow are important elements to include.

Field maps should include, either as an overlay or as separate maps, tract and field boundaries and identifiers, topography, soils, and any water resource features (streams, ponds, wells, sinkholes, etc.).

Farmstead map(s), enlarged from an FSA photograph or from digital data, are helpful in combining data on the location of nutrient sources. A flow diagram of the barn(s), silo(s), milking center(s), and storage systems on the farmstead map will improve understanding of the flow of nutrients on the farmstead, guide development of a nutrient sampling plan, and be helpful when calculating volumes of manure and process wastewater for the nutrient management plan.

#### *Data Collection Sheets*

Data collection sheets can be prepared prior to the first meeting with the farmer to guide and help organize data collection. When used in conjunction with farm maps, they can improve efficiency of data collection. If additional fields are identified by the farmer, these will need to be added to the field data list and maps.

Field information to collect includes:

- FSA field identifier (tract and field number).
- Field name used by farmer.
- Owned or rented.
- Acres.
- Predominant soil type and drainage class.
- Rotation and year in rotation.
- Fertilizer blends and rates commonly used by the farmer.
- Percent legume in all legume/grass sods that were killed in the past three years.
- Soil tests (yes/no and if yes, results).
- Artificial drainage (yes/no).
- Accessibility for manure spreading.
- Flooding frequency and seasonal wet areas.
- Manure (rate, method and timing) applied

<sup>1</sup> For Comprehensive Nutrient Management Plans (CNMPs), covering both farmsteads and cropland, refer to the CNMP Process Guideline in the NRCS electronic Field Office Technical Guide ([www.nrcs.usda.gov/Technical/efotg/](http://www.nrcs.usda.gov/Technical/efotg/)).

since last growing season.

- Manure applied in previous growing season.
- Manure applied two growing seasons ago.
- Tillage system used on each field.

A second data collection sheet can characterize manure production, handling, and storage. It is useful to refer to the farmstead map when collecting these data.

Manure source information to collect includes:

- Name of the barn(s).
- Number, type, and average weight of animals in each barn.
- Amount and source of bedding used.
- Amount of other process wastewaters produced, such as silage leachate, milking center waste, runoff, and the contribution of precipitation falling directly into the storage.
- Handling of manure and process wastewaters for each facility (e.g., transferred directly to spreaders, transferred to which storage, etc.).
- Type and size of spreader(s) used for each barn or, if it goes to storage, which storage facility.
- The type, location and capacity (tons/gallons and months) of storage(s), including consideration for 1 foot of freeboard, space to contain the 25 year, 24 hour storm, and settled solids.
- The emptying schedule of the storage and amount emptied each time.
- Nutrient composition of manures/process wastewaters.

### Field Data

Data from the first meeting can be used to formulate a soil and manure sampling work schedule. Fields in need of soil tests (NRCS 590 states that soils need to be sampled at least once every three years) can be identified. The most logical places to take samples for manure and process wastewaters can be identified also (see Agronomy Fact Sheets #1 and #38 for soil and manure sampling methods).

A field visit will be needed to collect field specific information. In addition to current agronomic soil tests (taken within the past 3 years), each field will also need to have:

- Percent slope, slope length, rock cover, and row gradient.
- Confirmation of stream type (none,

intermittent, or perennial).

- Surface flow distance to the nearest stream.
- Evidence of concentrated flows.
- Locations of hydrologically critical areas, soils shallow to bedrock, sinkholes, springs, closed depressions, wells of adjacent property owners, and/or evidence of historical water quality problems in the area.
- Notes on manure spreading setbacks.

This information is needed to calculate soil loss (T) with RUSLE2, the P-Index and N-Leaching Index and to create manure spreading maps.

### Putting It All Together

The information collected can be used to formulate a plan according to Cornell Nutrient Guidelines to get the most fertility benefits from manure and fertilizer in an environmentally sound manner (see Agronomy Fact Sheets #33 and #35). Spreadsheet programs can be used or pre-formatted software such as Cropware can be downloaded from the Nutrient Management Spear Program website.

### Additional Resources

- Nutrient Management Spear Program Agronomy Fact Sheet Series. <http://nmsp.css.cornell.edu>.
- Nutrient Guidelines for Field Crops in New York: [http://nmsp.css.cornell.edu/nutrient\\_guidelines/](http://nmsp.css.cornell.edu/nutrient_guidelines/).
- Cropware: A tool for nutrient management planning: <http://nmsp.css.cornell.edu/software/cropware.asp>.

### Disclaimer

This fact sheet reflects the current (and past) authors' best effort to interpret a complex body of scientific research, and to translate this into practical management options. Following the guidance provided in this fact sheet does not assure compliance with any applicable law, rule, regulation or standard, or the achievement of particular discharge levels from agricultural land.

For more information



Cornell University  
Cooperative Extension

Nutrient Management Spear Program  
<http://nmsp.css.cornell.edu>

Patty Ristow, Greg Albrecht, Karl Czymmek, Quirine Ketterings

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