

NUTRIENT MANAGEMENT PLAN WRITING

Nutrient management planning steps

1. Collect and evaluate information about the overall farm.
2. Determine realistic yield expectations from producer records or soil specific information contained in this manual.
3. Inventory on-farm nutrients available in soils, manure, legumes, etc.
4. Establish nutrient requirements for the crop or rotation.
5. Evaluate field limitations based on environmental hazards or concerns.
6. Allocate on-farm and purchased nutrients to fields.
7. Identify nutrient timing and placement methods to maximize crop uptake and minimize environmental losses.

Initial Farm Visit

Collecting Background Information

This visit is very important. Complete and detailed information you collect at this time will reduce the number of return visits or calls you will have to make to your client. Plan ahead and be organized. Make an appointment with your client, and let him know this will take some time, perhaps several hours or more, so he can schedule the time needed and have the information you will need. The following pages contain an example of an approach for collecting background information. It may not be necessary in all cases but could be helpful when working with a client for the first time.

General Information

Date of Visit: ___ / ___ / ___

Owner Name: _____ Phone: _____

Farm Operator: _____ Phone: _____

Address: _____

City/State/Zip: _____

Extension Agent: _____ Phone: _____

Fertilizer Supplier: _____ Phone: _____

Salesman: _____ Phone: _____

Consultant: _____ Phone: _____

Are you scheduled to receive biosolids or other off-farm nutrient sources? ___ Yes ___ No

If yes, Supplier: _____

Field Representative: _____ Phone: _____

Who takes soil samples? ___ Self ___ Fertilizer Dealer ___ Consultant ___ Other

How often are soil samples taken? ___ 1 year ___ 2 years ___ 3 years

Do you have current samples of all fields to be included in Plan? ___ Yes ___ No

Where are the samples sent? ___ VA Tech ___ A&L ___ Other

Who makes recommendations?

___ Extension ___ Laboratory ___ Fertilizer Dealer ___ Consultant ___ Yourself

Are tissue samples taken? ___ Yes ___ No What crops? _____ , _____

Are soil nitrate tests taken? ___ PSNT before sidedressing corn

___ Pre-plant soil nitrate test for small grain

Manure Production & Storage Information

Do you have a Virginia Pollution Abatement Permit? _____ Yes _____ No

What local ordinances apply to your farming operation?

1. Dairy, Beef, Swine

Type & number of animals, average weight: _____ / _____

Percent of time confined: _____ %

Estimate of wastewater draining into storage: _____ gals/animal/day

Type of manure storage & capacity: _____ / _____

Frequency of clean out: _____ /year

Does Feed Lot drain into manure storage? _____ Yes _____ No

If Yes, total uncovered area that drains into storage: _____ sq. ft.

(✓ One) Paved _____ ; Unpaved _____

Does any roofed area drain into storage: _____ Yes _____ No

If yes, total area of roof(s) draining into storage: _____ sq. ft.

Manure Spreader: Type _____ , Capacity _____ , Width of pattern _____ ft.

Manure Analysis: TKN: _____ ; NH₄: _____ ; P₂O₅: _____ ; K₂O: _____

Average no. of days before incorporation: (✓ One)

Injected _____ , Immediate _____ , After 2 days _____ , After 4 days _____ ,
After 7 days or no incorporation _____ , Irrigated without incorporation _____ .

Acres available for land application of this manure: _____

After 7 days or no incorporation _____ , Irrigated without incorporation _____
Acres available for land application of this manure: _____

2. **Poultry**

Chickens/turkeys, bird/flock, no. of cycles/yr. _____ , _____ , _____

Number of flocks between total clean out: _____

Manure Spreader: Type _____ , Capacity _____ , Width of pattern _____ ft.

Manure Analysis: TKN: _____ ; NH₄: _____ ; P₂O₅: _____ ; K₂O: _____

Average no. of days before incorporation: (✓ One)

Injected _____ , Immediate _____ , After 2 days _____ , After 4 days _____ ,

After 7 days or no incorporation _____ , Irrigated without incorporation _____ .

Acres available for land application of this manure: _____

After 7 days or no incorporation _____ , Irrigated without incorporation _____ .

Acres available for land application of this manure: _____

General nutrient application for each crop or rotation(lbs./ac. plant food)

Crop	Pre-Plant Rate/Month	At Planting Rate/Month	Top Dress Rate/Month	Side Dress Rate/Month	Tillage *C/MT/NT
Corn					
Wheat/DC Soybeans					
Barley/DC Soybeans					
Corn /Rye Silage					
Hay/Pasture					
Alfalfa**					
Tall Grass Hay**					
Pasture**					

* C-Conventional, MT-Minimum till, NT- No-till

** Note percentage of legumes in forage mixes

Crop Acreage

Corn

Conventional: _____ ; No-till _____

Small Grain

Wheat _____ ; Barley _____ ; Oats _____ ; Rye _____

Soybeans

Early _____ ; Double Crop _____

Forage

Grass _____ ; Legume _____ ; Mixture _____ ; Hay/Pasture _____ ; Pasture _____

Other Crops

_____ / _____ ; _____ / _____ ; _____ / _____

Total Acreage* _____

*Do not add double crop acres in total

Annual acreage planted in cover crops

Crop Used _____ ; Acres _____

Biosolids Information

Tract & Field Numbers Permitted to Receive Biosolids

Tract: _____ Field Number: _____

Tract & Field Numbers already spread _____ Month/Yr. Applied _____

Amount of biosolids applied: _____ Dry tons/acre

Analysis (lbs. of plant food/dry ton):

_____ P₂O₅ _____ K₂O _____ TKN
_____ NH₄ _____ Ca _____ Mg
_____ CaCO₃ Equivalent

COMPONENTS OF A NUTRIENT MANAGEMENT PLAN

A complete Nutrient Management Plan is designed for proper management of nutrients through all stages of handling, application and utilization. Following the plan will result in a cost effective and environmentally sound use of plant nutrients. A plan also documents the proper rate and timing of nutrient applications. This is used to report progress of the participation of the agricultural community to protect and improve water quality. A complete description of the components of a nutrient management plan is outlined in the Nutrient Management Training and Certification Regulations. The following information offers a brief outline and explanation of the various parts of a plan. All plans must be written to the criteria set forth in the Regulations.

Plan Identification Sheet

The plan identification sheet is just what it sounds like. It is a page at the front of the plan which contains information such as the farmer's name and address, planner's name and certificate number and county and watershed code for the farm. Information about the acreage of each crop and the various animal enterprises on the farm are included as well to give a snapshot view of the plan.

Narrative

Use this section to describe the operation, and to assist with tailoring the plan to the individual. Describe the type of system (i.e. dairy, hog, poultry, etc.), list the number of animals of all maturities, the amount of manure produced, and how the farmer handles it. Explain how manure amounts were derived by either your own volume calculations or records the farmer has provided to document the amount of manure generated annually, such as number of loads of manure for each clean out. For farmers who are just beginning to manage their manure with a nutrient management plan, it may be a good idea to show the amount of nutrients supplied by the manure and translate those numbers into dollars of savings of purchased nutrients. Hopefully, this will act as additional incentive for your client to follow the plan. If there is excess manure, make note of the plan(s) in place to dispose of the manure such as finding other farmers to use it, reducing nutrient content of the manure so that less land will be needed in future plans or acquiring additional land to spread it on. List management considerations such as frequency of testing and the value of proper timing of manure applications to get the most benefit from its' nutrient content.

Describe cropping practices such as no-till or minimum till and how they relate to the application of nutrients in the plan. Document nitrogen credits given for legume crops and the important role cover crops play in capturing nitrogen between crops. Make note of the proximity of fields to streams, erosion control, environmentally sensitive areas, etc. and what precautions address each issue. Give directions on where additional help can be obtained for other farm

management and water quality objectives that are beyond the scope of this plan. Write statements that are clear, concise and to the point. If some information is already included on the balance sheet (e.g. timing, testing, tillage) it is not necessary to include it here.

For farmers with a VPA permit, a set of Special Conditions are required to be part of each plan. These conditions cover many items that would normally be included in the narrative. These documents must be included in the plan, without any alteration. In these cases, the narrative of the plan will be supplemental to the information listed in the Special Conditions document. Information in the narrative can not override or negate the guidance contained in the Special Conditions.

Plan Map

Use a copy of a Farm Service Agency aerial photograph whenever possible. These photographs will show established field boundaries, field numbers and acreage. If FSA photos are not available or if they are of poor quality, ask the Natural Resources Conservation Service if they have suitable photos. If not, take the time to draw a clear, neat map. This map should show field numbers (use FSA field numbers and/or the farmer's own numbering system), acreage, land use identification (e.g. cropland, pastureland, etc.), environmentally sensitive areas (i.e. wells, erosion control structures, drainageways, etc.) and anything else you feel is important to minimize the impact of nutrient application to the environment.

Plan Map Legend

A legend should explain any symbols used on the plan map. It can be on the map itself or included on a separate sheet directly following the map.

Soil Map

Soil Maps for the farm should be part of your office file and may be added to the plan if used to educate the farmer on the value of certain plan criteria. Delineate field boundaries and number each field using the format that was used on the plan maps. Some areas have been mapped but are not yet published. Check with NRCS for the availability of unpublished maps and individual farm soil surveys. If the soils map is not clear or is yet unpublished, insert available soil information on a copy of the plan map. The predominant or average soil productivity group should be clearly designated on the map just under the field number. The farmer should be asked about the feasibility of splitting large fields for fertilization purposes if soil productivity groups within the field vary significantly.

Yield Capability of Soils

To be cost effective and environmentally sound, all nutrient recommendations are based on the yield capabilities of the soil. Realistic yield expectations should be developed for each individual field using the VALUES information or the farmer's yield records. List the soil name, the soil productivity group, the producer's crops, and realistic yields for that soil. The VALUES data assumes a high level of management. If the planner has evidence to expect less than good management, it may be appropriate to reduce plan yields for specific crops in the plan.

The farmer's actual yield history may be used if a documented record of yields from at least the past five crop years is available by field. One should average the high three yields from the five year sequence with no further upward adjustment applied to determine planning yields. Yield contest or test plot yields should not be used unless they comprise the entire field.

Yields are not the only thing to be considered when developing an environmentally sound plan. Other soil characteristics such as erosion class, slope, coarse textures, and leaching index rating should be reviewed for each field. Any limitations should be listed as a note under the crop yields, and reflected in the plan recommendations.

Organic Nutrient Sources

Calculating nutrient availability from land applied organic materials is an important component of a nutrient management plan. Most organic materials that planners deal with will either be animal manures or biosolids. Once the plant available N, P₂O₅, and K₂O has been calculated, it is deducted from the Nutrient Needs for the crop to which the material will be applied, and subsequent residual N credit is given to following crops nitrogen needs.

Nutrient Balance Sheet

The balance sheet was developed in order to provide the land user with a ready reference regarding nutrient management recommendations. Land user name, FSA tract number, and County name should be listed across the top of the form. The columns used in the balance are explained below. All recommendations should be provided on a per acre basis.

1. **Field:** List the field numbers as they appear on the plan map. They can be grouped in any order which you feel best suits the farmer's operation. Separate recommendations should be made for each individual field, unless two or more

fields are of similar productivity group and soil test levels are similar.

2. **Size (Acres):** The acres can be given by field or as a total for each group identified on the page.
3. **Crop:** List the farmer's rotation(s) as they relate to each field. Allow one line for each crop in the rotation.
4. **Expected Yield:** Give the yield by crop as determined from VALUES for the soil productivity groups or from field yield history and document in plan which method was used.
5. **(Nutrient) Needs:** This is where nutrient crop needs are shown. Recommendations should be based upon soil test results for phosphorus and potassium for each crop. Nitrogen recommendations should be based on the planning yield specified in the VALUES database or from yield history.
6. **Legumes and Manure Residuals:** Show the amount of nitrogen credit given to legume cover crop or residue. Record nitrogen residuals from manures, biosolids, and other sources. Values for these sources should be explained in the plan narrative.
7. **Manure/Biosolids:** Fill in the amount of material which can be safely spread on each acre, limited preferably by phosphorus needs. In no circumstances should total plant available nitrogen applications exceed levels based upon VALUES productivity group or actual yield history. If too much manure is available for the application area, the plan should state that more land must be found, or the manure should be given or sold to another farmer with available land. Permitted operations will have specific language dealing with this issue, so know what is contained in the permit a write the plan to comply with that criteria IF it is more restrictive than plan writing criteria. Nutrient values shall be shown as the amount of plant food supplied per acre based on the total amount of material applied per acre.
8. **Net = Needs - applied N-P-K:** This is a balance column to show the farmer what nutrients have been applied versus the amount shown in the Nutrient Needs column. This is determined by subtracting the amount of residual nutrients and any organic sources recommended from the nutrient needs for that year's crop. Nutrients that have been applied in excess are shown in parentheses.
9. **Commercial N-P-K:** This column provides the farmer with recommendations regarding the amount of fertilizer which should be purchased. It should address the needs identified in Net = Needs - applied N-P-K column.

10. **Notes:** Special considerations regarding nutrient application, field conditions, tillage practices, etc. can be footnoted here. Use numbers to reference notes explained below the spreadsheet.

Assistance Notes

Use this sheet to record what transpired during your first and follow-up visits with the farmer. Write about such things as alternatives you provided, decisions made based on unusual circumstances, progress on plan implementation, or even if the farmer has a bad dog. These notes will help you and your successor understand what has already been discussed with the farmer and what needs further discussion. These notes should only be kept in **your** copy of the Nutrient Management Plan.

Personal Plan Notes

This is where **your** personal notes and calculations should be recorded. This will be important and very helpful to you because in some cases you may not be updating plans for two or three years, depending upon the expiration date of the plan. You may need some reminders of how and why you wrote the plan when you come back to it. You should keep a record showing details of how the recommendations were derived. Any special condition or unusual circumstances that existed at the time the plan is written should be documented so that it can be referred to when reviewing the plan at a later date, or to justify specific recommendations during an inspection.

For animal systems, particular attention should be taken to document and describe the operation, including number of animals of all maturities, overall management, and design of the facility as it exists at the time the plan is prepared. Changes to any part of the enterprise, disrepair or damage to structures or any system component may have an impact on nutrient content or volume of manure, which may dictate changes to the plan.

PLAN REVISION

Many factors can, and will, result in the need for revising the nutrient management plan. Even the best written plan can be refined to take advantage of what has been learned in the last season. For that reason, plans will always be going through some degree of amendment. Some specific factors may result in the need for significant revisions.

Scale of Operation Changes

On farms producing or utilizing manure, the number of animals being managed may change significantly over time. As this happens, the plan should be adjusted to reflect the new conditions. For example, a reduction in the size of a dairy herd will reduce the available nutrients from manure and increase the volume of mineral fertilizer to be purchased. Conversely, the addition of poultry houses to a farm may dramatically reduce the mineral fertilizer inputs for some of the fields managed in a plan. Such changes in the animal population may also drive significant changes in the crops grown and where manure can be utilized.

Land Use Changes

Changes in the predominant land use on (or adjacent to) the farm also requires modification of the existing plan. If land is taken out of production, the production objectives for the remainder of the farm may also be changed dramatically. The plan should be updated to reflect these changes.

Management Changes

As management improves there may also be opportunities to make changes in the fertilizer program itself. Follow-up may show the possibility of increasing efficiency by going to split fertilizer applications. Experience and record keeping may also indicate that previous yield

goals may have been optimistic or that realistic yields are possible with lower nutrient application rates than previously thought. Either situation would require a change in the plan.

With government programs and markets varying from year to year, the actual crops produced are also subject to change from year to year. While general plan principals will still apply, significant changes in rotations may also dictate a plan amendment.

Summary

The number of possible factors which can alter a nutrient management plan is clearly substantial. For that reason, a sincere effort on the part of the farmer to make realistic decisions about the future operation of his farm and follow-up with clients after the plan has been delivered is important to the success of the planning process. Because the goals are educational in nature, and perhaps compliance for some local or state regulations, it is important to continue to follow-up until the farmer is comfortable with the implementation of his plan. Once he has an understanding of the concepts, and is capable of interpreting the plan himself, the amount of support required should be significantly less. Having your clients increase their understanding and importance of nutrient management creates a desire do their best to follow the plan, but more importantly indicates you are delivering a good and beneficial service to your clients.