

Vermont Nutrient Management Planner

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Conservation Service



Presentation Overview



- Regulations Related to Livestock Operations in Vermont
- Vermont Water Quality Programs
- Vermont Nutrient Management Planning Software

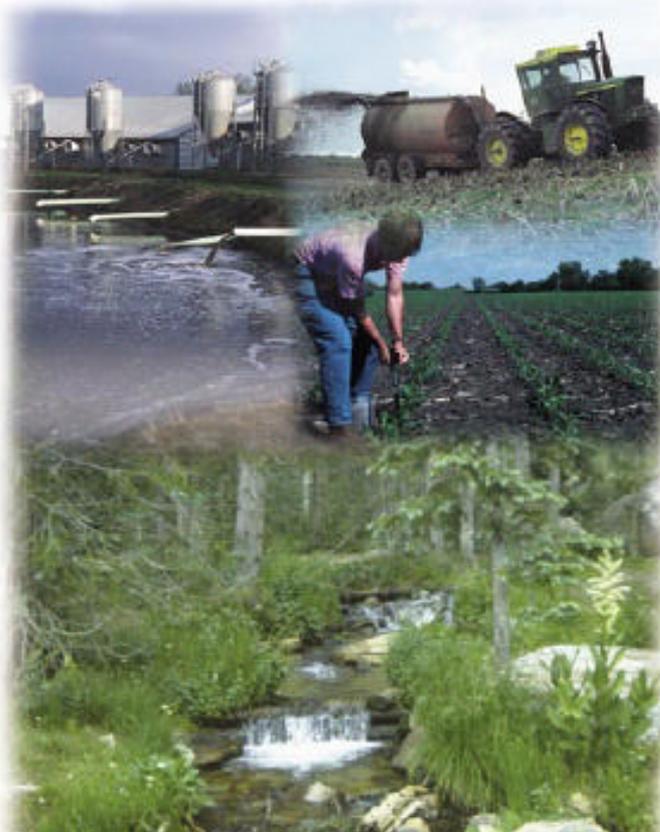
Addressing National Priorities

EPA
United States
Environmental Protection
Agency

Producers' Compliance Guide for CAFOs

**Revised Clean Water Act Regulations for Concentrated Animal
Feeding Operations (CAFOs)**

*A guide to complying with EPA's 2003 revisions to the National Pollutant Discharge
Elimination System Permit Regulations and Effluent Limitations Guidelines and Standards
for Concentrated Animal Feeding Operations*



Addressing Vermont Priorities



Vermont Agency Of Agriculture, Food & Markets

Vermont Agency of Agriculture, Food & Markets



Medium and Small Farm Operation

Rules for Issuance of General and Individual Permits

Regulations



Large and Medium Farm Operations, as well any operation that has a direct discharge, require a General Animal Waste Permit that includes a Nutrient Management Plan

Medium Farm Operation (MFO)



Medium Farm Operation means an animal feeding operation (AFO) which houses:

200 to 699 mature dairy cows, whether milked or dry;

300 to 999 cattle or cow/calf pairs;

750 to 2,499 swine weighing over 55 pounds;

150 to 499 horses;

3,000 to 9,999 sheep or lambs;

9,000 to 29,999 laying hens or broilers with a liquid manure system;

16,500 to 54,999 turkeys; or

any other animal type and number that the Secretary may deem appropriate

General Permit Scope



Ensure that permitted livestock operations generating animal waste do not have a direct discharge of waste to the waters of the state and operate in accordance with a Nutrient Management Plan. Farms must essentially develop a Comprehensive Nutrient Management Plan (CNMP), which includes:

- ✓ Manure and Wastewater Handling Plan;
- ✓ Land Treatment Plan;
- ✓ NRCS Nutrient Management Plan; and
- ✓ Record Keeping

USDA Environmental Quality Incentive Program 2005 Prioritization

Local Priority Resource Concerns

TMDL and Vermont 303(d) Impaired Waters from Agriculture

Resource Concerns Addressed

Manure and Wastewater Handling Systems/CNMPs

Cropland & Hayland Systems

Pasture & Grazing Systems

Riparian Area Systems

Forestry Systems

Fish & Wildlife Systems

Invasive Species Control

Innovative Practices

Organic Certification



EQIP 2005 Prioritization

Manure and Wastewater Handling System

The livestock operation is classified under the Federal/State CAFO/AFO regulations as potentially being included in the CAFO/AFO permit program, and is not yet meeting the CAFO/AFO requirements

Implementation allows the producer, regardless of the size of the operation, to address a significant contribution of pollutants to waters of the U.S.

“Significant Contributor”



Livestock “Significant Contributors”

livestock operations, regardless of size, where:

A water conveyance flows through the barnyard or other manure source where livestock and animal wastes are concentrated and discharge directly into a perennial water body (less than 200 feet);

A pipe conveys animal wastes or wastewater and discharges directly into a perennial water body; or a channel that conveys waste and/or wastewater and discharges directly into a perennial waterbody that is less than 200 feet from the source;

Wastes or wastewater from a barnyard or other manure source where livestock and animal wastes are concentrated and flow overland through a predominantly non-vegetated area or channel less than 200 feet, and discharges directly into a perennial water body.















2005 EQIP Applicants

Local Applicants	208
Non-Priority Applicants not ranked	13
Priority Applicants with an Ag. Waste Structure	57
MFOs >200 cows	16
MFOs / Significant Contributor	13
< 200 cows Significant Contributor	26
Local Work Group Priority	2
Applicants w/o an Ag. Waste Structure	28
MFOs > 200 cows	2
Others (grazers, vegetables, organic, etc.)	26



Plans Are Written In Cooperation With Producers To:



Assure proper containment of animal waste and process waste water

Assess resource concerns which exist on the property

Budget nutrient sources to optimize crop nutrient needs. Nutrient sources include commercial fertilizers, animal waste, mineralization of soil organic matter, accounting of previous manure applications and crop residues

Enhanced Integrated Crop Management Nutrient Management Plan Program



- \$6/acre for NMP development
- 100% of soil and waste testing costs
 - \$9.00 per soil test
 - \$30.00 per manure/waste test
- \$5,000 for an additional 3 years of NMP updates and implementation follow-up
 - \$2,000 for the 1st and 2nd year
 - \$1,000 for the 3rd year

Nutrient Management Planning



Technical Assistance

- Extension
- NRCS
- Crop Consultants (Traditional Crop Production)
- Technical Service Providers
- Farmer Driven with planner technical assistance
- Farmer Self Directed

Vermont Nutrient Management Planner



Vermont Nutrient Management Planner[Version 1.0 Dec. 22, 2005]

File Edit Records Tools View Help

Welcome

Welcome to the Vermont Nutrient Management Planner

The OnePlan process will assist you in developing your own natural resource conservation plan. You will select from a list of options where you wish to begin. For example, if you are routinely applying manure or other nutrients, you will likely begin with the Nutrient Management Planner of the Conservation OnePlan Program. For most other planning, you will begin with the Conservation Planner. In either case, you will be allowed to move from one Planner to the other at appropriate stages. The OnePlan process is a step-by-step approach that is designed to help the inexperienced user develop a farm or ranch plan that will help you identify resource problems and give you options to address them. In addition, your completed farm or ranch plan will help you qualify for State or Federal financial assistance, if available. Your OnePlan will be developed using a digital image and other geographic information of your own operation that is downloaded using the OnePlan Internet Mapping site.

Disclaimer: Plans developed using OnePlan are dependent on user inputs and the analysis of these inputs using the best scientific approaches. To assure accuracy, a professional planner should review final plans. OnePlan accepts no responsibility for regulatory compliance or plan accuracy.

Next

Getting Started . . .

In order to use this program, you must download an aerial Map of your farm or ranch area from the OnePlan Web site.

[Download Map](#)

Note: In order for the download button to work you must have a connection to the Internet. Internet Explorer 5.0 or higher is required. When you click "Download Map" you will automatically be connected to the OnePlan Web site map download page.

If you have already downloaded a map of your farm area then click "New Farm" to locate the file on your computer. If a map has not been downloaded then click "Download Map."

[New Farm](#)

To open an existing farm plan, click on "Open Existing File" and select the farm from the list.

[Open Existing File](#)

Internet Mapping



Vermont OnePlan Viewer - Microsoft Internet Explorer

Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

http://maps.vcgi.org/nrcs_oneplan_beta2a/ Go Links

Vermont OnePlan Mapping

Locate Your Farm [home](#) [help](#)

The Vermont OnePlan Mapping tool will assist you in locating your farm. Once you locate your farm, the tool will allow you to download aerial photography, soil data and other data needed for the development of your management plan.

Step 1: Select an Option
First choose one of the options to locate your farm.

Step 2: Select or Fill in Info
Then select or fill in the appropriate information for the option you selected.

Step 3: Map It
Click **Map It**. Doing so will popup another browser window with an interactive map.
For additional instruction refer to the [help](#) page.

Locating Options (select one)

- [By Address](#)
- [By Town](#)
- [By County](#)
- [By Latitude/Longitude](#)
- [By VT Stateplane XY](#)


This website is optimized for MSIE 5+. Other browsers are not supported.

NMP_SanAntonio.ppt C:\Documents and Sett... Inbox 012406 - Microsof... Vermont OnePlan Viewer... Vermont OnePlan Vie... 3:01 PM

➔ Locate farm using one of five options

Finding The Farm



mont OnePlan Mapping - Microsoft Internet Explorer

Vermont OnePlan Mapping

Locate Your Farm

Toolbar

4: Zoom in on your land

Click in the map once where you want to zoom in or click, hold and drag out a square in the area you want to zoom in to on the map.

5: Adjust the map

If you zoom too close, use the (Zoom-out tool) or (Zoom to previous tool). Use the hand tool to drag the map (pan/re-center) so your land area is in the center of the screen.

Note: To reduce download time, get as close to your land area as possible.

6: Click the download button (when active)

[Download](#)

The Download button will become active once you've

Layers

Visible Active

- Airports
- Town Names
- Interstate Exits
- Interstates Shields
- Interstates
- US Highway Shields
- US Highways
- VT State Highways
- County Boundaries
- Town Boundaries
- Zipcode Boundaries
- Ponds
- Lake Champlain
- Cities
- VT State Boundary

[Refresh Map](#)

Taskbar: Vermont OnePlan Viewer..., Vermont OnePlan Ma..., untitled - Paint, C:\Documents and Sett... 2:18 PM

➔ Zooming in using the town option

Downloading Local Data



Server User Prompt

Identify Your Farm

Layers

- Airports
- Cities and Villages
- Centers
- Interstate Exits
- Lake and Pond Labels
- Interstates Shields
- Interstates
- US Highway Shields
- US Highways
- VT State Highways
- Rail Lines
- County Boundaries
- Town Boundaries
- Zipcode Boundaries
- Road Names
- Roads
- Lakes and Rivers (polygon)
- Ponds
- Streams
- Buildings
- NAIP Imagery

4: Zoom in on your land

5: Adjust the map

6: Click the download button (when active)

Download

➔ Once the farm area is located local data is downloaded including: imagery; soils; watersheds; climate; and hydrography

Mapping The Farm



Mont Nutrient Management Planner (1/31/2006 Conservation Plan) [Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Map Your Farm

Jones Dairy Farm

Name your Farm
Jones Dairy Farm
No special characters like apostrophe, period, etc.

Record Field Data
Trace boundaries around each field.
Enter the field name:
SA Tract: FSA Field: Acres:
Do you own this field? Yes No
Land Use:
Distance to nearest receiving downstream waterway, (stream, ditch or any water delivery system) in feet.
You have finished one field, and you have another, click "Next Field" and map its boundaries. If you are finished, click "Next".

Next Field Import Fields

Delete Feature Back Next

ACTIVE TOOL: Draw Polygon Feature

Page # 6

- ➔ Name the Farm and delineate fields using a digitizing tool that calculates field size and soil characteristics

Importing Field Shape Files



Vermont Nutrient Management Planner (1/31/2006 Conservation Plan) [Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Map Your Farm

Jones Dairy Farm

Name your Farm

Jones Dairy Farm

Note: No special characters like apostrophe, period, etc.

Record Field Data

Place boundaries around each field.

Enter the field name:

2

FSA Tract: 5 FSA Field: 2 Acres: 36.7

Do you own this field? Yes No

Land Use: Crop

Distance to nearest receiving downstream waterway, (stream, ditch or any water delivery system) in feet: 0

If you have finished one field, and you have another, click "Next Field" and map its boundaries. If you are finished, click "Next".

Next Field Import Fields

Delete Feature Back Next

Hydrography Layer Soil Layer

1 - 53.3 Acres

2 - 36.7 Acres

3 - 22.8 Acres

Mapping Mode ACTIVE TOOL: Draw Polygon Feature Page # 6

➔ Import field boundaries from other GIS software including the NRCS Customer Service Toolkit

Mapping Other Farm Features



Mont Nutrient Management Planner (1/31/2006 Conservation Plan) [Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Map Your Farm

Jones Dairy Farm

Name your Farm

es Dairy Farm

No special characters like apostrophe, period, etc.

Record Field Data

Place boundaries around each field.

Enter the field name:

ay

SA Tract: FSA Field: Acres:

5 3 22.8

Do you own this field? Yes No

Land Use:

ay

Distance to nearest receiving downstream waterway, (stream, ditch or any water delivery system) in feet.

500

If you have finished one field, and you have another, click "Next Field" and map its boundaries. If you are finished, click "Next".

Next Field Import Fields

Delete Feature Back Next

Hydrography Layer Soil Layer

Corn1 - 53.3 Acres

Corn2 - 36.7 Acres

Hay - 22.3 Acres

ACTIVE TOOL: Draw Polygon Feature

Page # 6

➔ Map farmstead and field based features including buildings, barnyards, wells, springs and riparian areas

Nutrient Management



Vermont Nutrient Management Planner (1/31/2006 Conservation Plan)[Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Production Livestock Manure Crops Resource Concerns Application Nutrient Risks

1/31/2006

The Nutrient Management Module

Welcome to the Vermont OnePlan Nutrient Management Planner. This software is designed to better enable agricultural producers and professional planners to develop a Nutrient Management Plan (NMP) that meets all Vermont needs and requirements. If you are a producer using animal manure and/or commercial fertilizer as nutrient sources for your crops, a NMP can help you optimize crop nutrient needs, while minimizing ground and surface water impacts from phosphorus and nitrogen. NMPs are location specific, and written to reach crop production goals. They account for crop production, herd size, facility design, number of acres, soils, climate, and crop production. If the producer does not have enough acres to utilize nutrients produced on the facility, export of animal manure is considered.

Small farms meeting the definition of a Medium Farm Operation, as well as existing Medium Farm Operations (MFOs), are required to have a NMP as part of the new MFO program. In the past, only Large Farm Operations (LFOs) were required to obtain a permit. A NMP written accordingly will meet the requirements of the Vermont NRCS Conservation Practice Standard for Nutrient Management (code 590). If a farm receives NRCS cost-share for a waste management system, an NMP which meets the 590 standard is required.

Getting Started

To begin a Nutrient Management Plan for your Farm, check each of the following that apply:

- I have livestock on my Farm.
- I produce crops and/or have pasture(s).
- I apply Manure to my crops or pasture(s).

Click the "List of Items" button to see the items you need to know in order to complete a Nutrient Management Plan.

Who Needs a Certified Plan?

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→ Describe the basics to establish general navigation

Livestock Characteristics



Vermont Nutrient Management Planner (1/31/2006 Conservation Plan)[Version .913 Jan. 30, 2006]

Edit Records Tools View Help

roduction **Livestock** Manure Crops Resource Concerns Application Nutrient Risks

Livestock Units

A Livestock Unit is a group of animals housed together that produce manure with a characteristic nutrient content. To determine a Manure Livestock Unit, select or assign each parameter below:

Right click to Add or Delete entries)

Animal Class	Housing Type	# of Animals	Ave. Weight Per Animal	Bedding Type	# of Days per Year Housed in this Unit	Total Bedding all animals, tons/yr	Manure, Cubic Feet Per Animal Per Day	Give a Unique Name to this Livestock Unit
Lactating Cow	Freestall	50	1400	Legume hay (loose)	365	29.4	1.12	Milk Cow
Dry Cow	Freestall	20	1000	Compost	365	5.5	1.3	Dry Cow
Calves (< 6 months)	Freestall	15	200	Soil	365	0.8	0.32	Calf

Lactating Cow
Dry Cow
Heifer (6 - 18 months)
Calves (< 6 months)
Beef Cow
Yearling, high energy
Yearling, high forage
Broiler
Layer
Pullet
Turkey
Duck
Boar
Lactating Sow
Gestating Sow

Average Annual Herd Milk Production lbs/year

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- ➔ Grids with drop down cells allow you to describe your livestock units
- ➔ Animal numbers, weight, housing type etc. are all

Distributing Manure



Mont Nutrient Management Planner (1/31/2006 Conservation Plan)[Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Production Livestock **Manure** Crops Resource Concerns Application Nutrient Risks

Manure Distribution Nutrient Content

Determining the Distribution of Manure on Your Farm

Instructions: Enter selections below to determine the distribution of manure on your farm. Both the manure group name and tonnage are editable for non livestock groups that are added in the grid below. Make sure to enter tons for manually added manure sources, otherwise the percentage applied data will not be retained (need tons for percentages to be applicable). Right-click to add or delete entries.

Manure Groups

	Total Tons per	Remaining	Waste Storage Structure(s)		Solid Stack(s)		Separated Solid(s)		Compost		Pasture(s)		Click
	Year *	%	% Manure	Tons	% Manure	Tons	% Manure	Tons	% Manure	Tons	% Manure	Tons	
Milk Cow	943	0	70	660	30	283							
Dry Cow	313	0	40	125	60	188							
Calf	13	0	80	10	20	3							

* total tons per year includes bedding

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→ Determine manure groups by animal and other sources to track the waste stream that needs to be managed

Crop Rotation



Vermont Nutrient Management Planner (1/31/2006 Conservation Plan) [Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Production Livestock Manure **Crops** Resource Concerns Application Nutrient Risks

Rotation Patterns Crop Rotation Information

Crop Rotation

Describe every Crop Rotation used on your Farm: first name one Crop Rotation, then list each crop planted in that pattern by selecting from the crop pull down menu(s) for the respective year; then press the "Enter" button.

If you apply more than one Crop Rotation, repeat the above process for each rotation.

Rotation Name	Year	Crop	Avg Yield	Manure
Corn	1st	Corn Silage	20	<input checked="" type="checkbox"/>
	2nd	Corn Silage	20	<input checked="" type="checkbox"/>
	3rd	Hay, Alfalfa > 6	5	<input checked="" type="checkbox"/>
	4th	Hay, Alfalfa 20	4	<input checked="" type="checkbox"/>
	5th			<input type="checkbox"/>
	6th			<input type="checkbox"/>
	7th			<input type="checkbox"/>
	8th			<input type="checkbox"/>
	9th			<input type="checkbox"/>
	10th			<input type="checkbox"/>

Next Rotation

Save Rotation

Delete This Rotation

Copy Rotation

Help Back Next

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→ Describe the crop rotation and yields across the farm

Field Specific Crop Information



Mont Nutrient Management Planner (1/31/2006 Conservation Plan) [Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Production Livestock Manure **Crops** Resource Concerns Application Nutrient Risks

Rotation Patterns **Crop Rotation Information**

Crop Rotation Information for Individual Fields

Select a Field from the Drop Down Menu: When finished with all of the Fields, click "Next"

Select the Crop Rotation used on this field: Current Year Annual Manure N Availability (lb/yr)

Select the Year from the annual sequence of the Crop Rotation that this field is in currently:

Year	Crop	Yield Units/Acre	Manure Applied?	Fall + Spring Applied?	Manure Application		
					Method	Timing	Date
2005	Hay, Alfalfa 20-60% Legume	4	ton/acre <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Not incorporated	Not incorporated	April
2005					Not incorporated	Not incorporated	May - September
2006	Corn Silage	20	ton/acre <input checked="" type="checkbox"/>	<input type="checkbox"/>	Chisel	3-4 days	May - September
2007	Corn Silage	20	ton/acre <input checked="" type="checkbox"/>	<input type="checkbox"/>	Chisel	3-4 days	May - September
2008	Hay, Alfalfa > 60% Legume	5	ton/acre <input checked="" type="checkbox"/>	<input type="checkbox"/>	Not incorporated	Not incorporated	April
2009	Hay, Alfalfa 20-60% Legume	4	ton/acre <input checked="" type="checkbox"/>	<input type="checkbox"/>	Not incorporated	Not incorporated	April

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➔ Assign crop rotations to individual fields and describe the manure application strategy

Phosphorus Index Factors



Vermont Nutrient Management Planner (1/31/2006 Conservation Plan) [Version .913 Jan. 30, 2006]

Edit Records Tools View Help

Production Livestock Manure Crops **Resource Concerns** Application Nutrient Risks

Surface/Subsurf. Feat Well Water **Misc. P-Index Factors** Soil Test

Miscellaneous P-Index Factors

The selections made on this page will affect results of the P-Index as reported on the Phosphorus Risk page (51).

Introduction
The Phosphorus (P) Index is a tool developed to assess the potential phosphorus runoff from individual fields based on soil and field characteristics and on management practices. The Vermont Nutrient Management Planner calculates the P Index by factoring many of the inputs used for general planning purposes. Other factors used by the P Index are included on this page.

Instructions
To calculate the P-Index on each field the following input factors must be provided. Select a field/crop from the drop down menu and provide the requested information.

Field Acres

Elevation Zone
Select the elevation zone of the field. Higher elevations have more precipitation, and therefore more runoff.

Erosion Rate (RUSLE2)
Enter the estimated erosion rate (tons/acre/year) using RUSLE2. Choose the "Sediment delivery" option, as the P Index requires soil leaving the edge of the field. The official NRCS RUSLE2 program can be found online at: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm
 tons/acre/year

Manure Spreading Setback
Enter the width (in feet) of the manure spreading setback for this field. This value has no effect on calculated P index if manure application rate is zero.
 feet

Surface Cover %
Select the % surface cover. This value modifies the base runoff amount estimated from the location and elevation.

Vegetated Buffer Width
Enter the width (in feet) of buffer between field edge and the nearest pond, stream, or water pathway (e.g. drainage ditch). The buffer must consist of perennial vegetation. It may be harvested, but cannot have fertilizer or manure applied to it, except for initial establishment. If there is concentrated flow across it, it is not considered a buffer.
 feet

Sediment trap structure / other erosion control
If any NRCS-defined sediment trap structures are present, select them here. These reduce sediment to a much greater degree than does a vegetated buffer. "Misc. water / sed. diversion" can be used in unusual circumstances, such as topography that would likely trap virtually all of the eroded sediment leaving a field.

Calc P-Index F Values:

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➔ Input remaining field specific Phosphorus Index factor

Optimizing Nutrient Applications



Idaho OnePlan Conservation Planner

Edit Modules Records Tools View Help

Introduction Livestock Bio-Nutrients Sizing Crops Irrigation Resource Concerns **Application** Nutrient Risks

Introduction Application Schedule, Crop Budget **Commercial Fertilizer** Export Nutrients

Commercial Fertilizer Application and Nutrient Balance on Your Farm

Introduction
Nutrient application methods and timing can have a significant impact on crop growth, nutrient use efficiency, and potential off-site nutrient risks to water and air quality.

Instructions
Start by selecting a Field.
Current Crop:
Next, select the Method and Timing for Commercial Fertilizer applied to this Field.

Commercial Fertilizer Application Method and Timing
Select Method:
Select Timing:

Examine the "Annual Crop Nutrient Balance" for each of your Fields. The "Remaining Nutrients Required" boxes gives an indication of the amount of Nutrients needed for this years designated Crop for each Field.

* Crop Uptake Value. No Valid Soil Test Provided
** Less Than Crop Rotational P205 Uptake
(Total Rotational P205 Uptake/# of Crop Applications)

Potential Nutrient Deficit
 Acceptable Rate: Sustainable
 Caution: Approaching Unacceptable Rate
 Unacceptable Rate: May be a Resource Risk

Color codes are based on the Idaho Nutrient Management Standard for Bio-Nutrient Application:

Annual Field-Crop Nutrient Balance

lbs/acre	N	P205	K20
Crop Nutrient Requirements (N is prior to any credits/debits)	250	60	80
Nutrients from Soil	-36		
from Mineralized Nitrogen	0		
from Prior Crops	35		
from Prior Bio-Nutrients	-32		
from Irrigation Water	0		0
Nutrient Balance from above	217	60	80

	N	P205	K20
Solid Stack(s)	31	53	98
Separated Solid(s)	0	0	0

Estimated Remaining Nutrients Required:

Commercial Fertilizer Application:

Final Nutrient Balance:

(-) Negative Numbers Reflect Excess Nutrients

The "Remaining Nutrients Required", if any, will be applied as commercial fertilizer. Yes No

- ➔ Apply manure to fields
- ➔ Describe manure spreaders
- ➔ Determine the best nutrient application strategy

Summary



Point (farmstead) and Nonpoint (field-based) management is critical

Farmstead controls continue to be a focus

Field-based controls, especially nutrient management, are now a regulatory focus

Summary (continued)



Nutrient management planning is no longer primarily production driven

NMPs have complex technical requirements that result in comprehensive documents that are often :

- Poorly understood
- Difficult to develop
- Difficult to change and update
- Poorly Implementation and followed

Computer aided approaches that are used by farmers either on their own or with technical help are essential

Thank You

