

Nutrient Reporting in Maryland

Doug Parker

Director, California Institute for Water Resources

doug.parker@ucop.edu

Presentation to:

Nitrogen Tracking and Reporting System Tack Force

August 28, 2013



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

History of Nutrient Management in Maryland

University of Maryland Cooperative Extension Nutrient Management Program Created in 1988

- Voluntary
- Initial focus on nitrogen
- Initial target to animal/crop producers
- Nutrient Management Plans written by Cooperative Extension Advisors
- Recommendations based on agronomic needs as determined by UM Cooperative Extension Scientists
- Focus is on surface runoff and groundwater nitrogen



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

History of Nutrient Management in Maryland

Nutrient Management Plan Components:

- Soil tests
- Manure tests
- Other nitrogen crediting (cover crops)
- Balance **bioavailable nitrogen** needed to produce expected yields
- **Nitrogen** recommendations for about 20 Maryland Crops
- Account for crop rotations
- 3-year plans



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

History of Nutrient Management in Maryland

Mid-1990s saw large increases in Phosphorus in Chesapeake Bay
Previously believed to be controlled through sediment controls
Levels of Phosphorus saturate soils and become water soluble

Pfiesteria outbreak of 1997 turns attention to Phosphorus in
Chesapeake Bay



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

Maryland Water Quality Improvement Act of 1998

- **Landscapers, Parks, and Golf Courses**
- **Agriculture**
 - Crop Growers
 - Animal Producers and Users of Animal Manures
 - Poultry Companies
 - Poultry Litter Pilot Transport (Transfer)
 - Horticultural Industry Management
 - Cost Share Programs
 - Tax Credits



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Water Quality Improvement Act of 1998

All farms with more than \$2,500 in revenue or more than 8 Animal Units

- All Crop Growers Have and Implement a Nutrient Management Plan (phased-in over 5 year period)
- Soil Test and Phosphorus-Site Index Determine Type of Nutrient Management Plan
 - Nitrogen Based (N-Based)
 - Phosphorus Based (P-Based)
- Controls the Use of All Nutrients
 - Animal Manure, Commercial Fertilizer, Biosolids...



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

Maryland Water Quality Improvement Act of 1998

Funding for UMD to hire additional nutrient management plan writers (staff)

Training and certification for crop consultants, fertilizer dealers and farmers



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Water Quality Improvement Act of 1998

Required Certified Nutrient Management Plans be written every 3 years

Submit plans to Maryland Department of Agriculture

Plans confidential

Inspections by Maryland Department of Agriculture

Violations enforced by Maryland Department of Environment



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

Maryland Water Quality Improvement Act of 1998

Freedom of Information Act and law suites

- Plans no longer confidential

Change in Maryland Law

- Plans to be kept on farm.
- Can be reviewed and inspected by MDA or MDE
- Submit summary nutrient use to MDA (not confidential)



University of California

Agriculture and Natural Resources ■ California Institute for Water Resources

Maryland Nutrient Management Annual Implementation Report



**Maryland Department of Agriculture
NUTRIENT MANAGEMENT ANNUAL IMPLEMENTATION REPORT
for Calendar Year 2012**

*The Nutrient Management Annual Implementation Report is due by **March 1, 2013** and represents nutrient application and farm operation information for 2012. General Instructions, worksheets and other information are available at www.mda.maryland.gov; follow the "nutrient management" link.*

Part A: Farmer/Operator Information Did you also receive a 4-page MAFO/CAFO AIR form? Yes No

County:

MDA Operator No:

Operator Name

SS # / FEIN:

Farm/Operation Name

Telephone:

Mailing Address

City, State, Zip

Operator Owner/Operator



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report

Part B: Farm/Operation Information

Operation Crop Production Nursery/Greenhouse Organic Animal No-Land Other _____
Type Integrator Name _____

Total Farmed Acres including Pastures _____

Nutrient Sources (Check all that apply) Commercial Fertilizers Sewage sludge Animal Manure Other _____

Animal Type & Number Dairy _____ Beef _____ Poultry (in 1,000 per flock) _____ # Flocks per year _____

Poultry Houses _____ Total Area of all Poultry Houses (Square feet) _____

Swine _____ Sheep _____ Goat _____ Horse _____ Other: Type _____ Number _____

Manure Management

Total poultry litter generated _____ tons Last total litter cleanout date _____ Amount _____ tons NA

Total poultry litter collected _____ tons

Solid manure (not poultry litter) generated _____ tons NA Liquid manure/waste generated _____ gals NA

Manure collected and available for use _____ tons _____ gals NA

Total available storage _____ cu ft _____ gals _____ tons NA Date installed:

Number of manure storage structures ____ Type _____ (shed, tank, pit, other) Covered Uncovered ____ mo./yr.

____ Type _____ (shed, tank, pit, other) Covered Uncovered ____ mo./yr.



University of California

Agriculture and Natural Resources | California Institute for Water Resources

Maryland Nutrient Management Annual Implementation Report

Manure/Organics Imported/Exported		Imported		Exported	
		Tons	Gallons	Tons	Gallons
<input type="checkbox"/>	None	_____	_____	_____	_____
<input type="checkbox"/>	Manure	_____	_____	_____	_____
<input type="checkbox"/>	Biosolids/Sludge	_____	_____	_____	_____
<input type="checkbox"/>	Other organics	_____	_____	_____	_____

Liquid manure applied with injector or other sub-surface applicator, total acres _____

Conservation tillage, with 30% or more residue coverage at planting, total acres _____

Liquid manure incorporated within 48 hrs. with vertical tillage equipment (ex: "Turbo-Till"), total acres _____

Container nursery/greenhouse irrigation runoff and leachate capture and reuse, total acres _____

Poultry litter incorporated within 48 hrs. with vertical tillage equipment (ex: "Turbo-Till"), total acres _____

GPS Guidance Use (such as lightbar, autosteer, variable rate fertilizer application), total acres _____

Crop land under irrigation, total acres _____

Account ID Information Updates (List the Account ID's, and check if added or deleted from operation since your 2011 report. Attach additional pages if needed. For assistance, contact your MDA Regional Nutrient Management Office.)

No change of account ID(s)

Account ID	Added	Deleted	Account ID	Added	Deleted
_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report

Part C: Nutrient Management Consultant and Plan Information

Consultant Name (First) _____ (Last) _____

Certificate # _____ License # _____ Operator Certified Nutrient Management Plan Cost-Share Yes No

Plan Coverage Period: Starting Date (mm/dd/yyyy): _____ Ending Date mm/dd/yyyy _____



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report

Part D: Summary of Nutrient Applications by Crop (all operations)

1. This annual nutrient application report covers all crops, pasture, agricultural or horticultural products grown and associated nutrients applied during period from January 1 – December 31, 2012. The report is due to MDA by March 1, 2013.
2. Information on actual nutrient application must include crop acreage and all nutrient types used for each crop during 2012. If you did not apply nutrients, please list the crop and crop acreage, and then place zeros (0) in the nutrient columns.
3. Nutrients reported in this table should be reported as a total POUNDS applied for the entire crop, NOT on a per acre basis. The nutrient values for each source can be found in the "Summary of Nutrient Recommendations" in your Nutrient Management Plan.
4. To calculate the POUNDS of nutrients applied, multiply the nutrient value (N-P₂O₅-K₂O) by the crop acres where you applied nutrients. For example, 2 tons/acre of manure provided a nutrient value of 50-70-50 lbs/acre. When applied to 50 acres of corn, it would be reported as 2,500 - 3,500 - 2,500 lbs of N, P₂O₅ and K₂O in the manure column.
5. Combine ALL the fields and fertilizer use by crop type. For example, add together all nutrient inputs for all your corn acres. If there are several plantings of vegetable crops during a year, add together the total acres for each planting and total nutrients applied. If nutrients from manure/organic sources were applied during 2012 for a 2013 crop, list it as a separate crop entry, for example: corn 2013, 10,000 lbs. of N, 4,500 lbs of P₂O₅ and 6,000 lbs K₂O.
6. Include ALL nutrients applied during the calendar year. If your rotation includes small grains, please differentiate spring and fall nutrient applications. For example, spring topdress and fall starter applied to different small grain crops in 2012.

CROP Include Pastures	Acres	TOTAL POUNDS available nutrients applied from:												
		Commercial Fertilizer			Manure			Sewage Sludge			Other Organic Sources			
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	

Part E: Report Certification

This Nutrient Management Annual Implementation Report, to the best of my knowledge, truly and accurately reflects a summary of implementation records for my operation in 2012. A **valid nutrient management plan** for the 2013 agricultural production season will be developed and implemented.

Printed Operator's Name

Operator's Signature

Date

MDA-N-122-(10-15-12)



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report (CAFO/MAFO Addendum)

Part F: Summary of Nutrient applications by Field (CAFO/MAFO Operations) List all fields receiving manure (whether generated on site or imported) and provide the field size, crop or crops grown in 2012 and the yield goal, the soil test results for the growing year, the nutrient requirements in pounds of nutrient per acre of the crop grown, the manure application rate in pounds of nutrient per acre and whether other fertilizer was applied, including the number of pounds of nutrients from other fertilizers applied to that field. Field names must correspond with the nutrient management plan field names. Attach additional sheets if needed.

Field Name/ Management Unit	Acres	Crop & Yield Goal	Actual crop yield harvested	Soil Test Results (indicate ppm, mg/l, or lbs/a)	Nutrients Recommended for Crop/Yield Goal (in lbs nutrient per acre)		Nutrients from				
							Manure/Litter/ Process Wastewater Application Rate (in lbs nutrient per acre)		Commercial fertilizer, sewage sludge and other nutrient sources (in lbs nutrient per acre)		
							N	P ₂ O ₅	Type	N	P ₂ O ₅
A-1	30	corn grain 150 bu	130	P ₂ O ₅ 81 ppm	N 150	P ₂ O ₅ 20	N 7	P ₂ O ₅ 20	Type urea	N 150	P ₂ O ₅ 0



University of California

Agriculture and Natural Resources | California Institute for Water Resources

Maryland Nutrient Management Annual Implementation Report (CAFO/MAFO Addendum)

Part G: Manure Nutrient Content (Attach Lab Sheets)					
Lab Name	Sample I.D.	Sample Date	% moisture	Total N% dry basis	Total P₂O₅% dry basis



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report (CAFO/MAFO Addendum)

Part H: Land Application of Animal Waste

Total acres for land application covered by the nutrient management plan, _____ acres

Total crop acres under operator's control on which animal waste is applied, _____ acres

Total solid manure land applied, _____ tons

Total liquid manure land applied, _____ gals

Total poultry litter land applied, _____ tons



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report (CAFO/MAFO Addendum)

Part I: Recipients of Exported Manure or Poultry Litter, List the receivers of your manure or litter. (Use additional sheets if necessary)	
Name	Address



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Annual Implementation Report (CAFO/MAFO Addendum)

Part J: Unpermitted Discharges List all times during 2012 that unpermitted discharges of contaminated water occurred from the production area to surface waters, along with the date, time, quantity of discharge and the source (chicken house, manure shed, swale between chicken houses, etc.)

Date	Time	Quantity	Source



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**

Maryland Nutrient Management Calculation Worksheet



Maryland Department of Agriculture
NUTRIENT MANAGEMENT
2012 ANNUAL IMPLEMENTATION REPORT

CALCULATION WORKSHEET OF NUTRIENTS APPLIED FOR CROPS GROWN IN 2012

In general, most of the information you need to calculate the amounts of nutrients applied are located in the "Summary of Nutrient Recommendations" in your Nutrient Management Plan. If for any reason, your nutrient source or application rates have changed significantly from what's written in the plan, contact your consultant to update your nutrient recommendations. Use this worksheet to calculate your actual nutrient applications.

1. If you have followed your nutrient recommendations as written in your plan:

STEPS	Example			Your Plan Record		
	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
A. From the "Summary of Nutrient Recommendations" in your plan, locate the nutrient recommendations from your sources of nutrients for N, P ₂ O ₅ and K ₂ O in lbs/acre for a specific crop grown.	145	50	30			
B. Add up all the crop acres for the same crop (ex. corn).	200					
C. Calculate pounds of each nutrient applied N, P ₂ O ₅ and K ₂ O, by multiplying the application rate by crop acres (A x B).	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O



University of California

Agriculture and Natural Resources | California Institute for Water Resources

Nutrient Reporting in Maryland

Goals of the reporting program

Surface water Quality

Groundwater Quality

Environmental Quality

Public Health

determine what is reported

N P K

Micronutrients

Irrigation



University of California

Agriculture and Natural Resources

California Institute for Water Resources

Nutrient Reporting in Maryland

Use of reported data

Regulation

Education

Research

Access to data

Public

Limited

Private



University of California

Agriculture and Natural Resources

California Institute for Water Resources

Questions



University of California

Agriculture and Natural Resources ■ **California Institute for Water Resources**