Maryland Nutrient Management

Consultant's Resource Notebook

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EPA REGION III
JUN 23 2011
NPDES ENFORCEMENT BRANCH
(3WP42)

Maryland Department of Agriculture
Nutrient Management Program
50 Harry S. Truman Parkway
Annapolis, Maryland 21401
410-841-5959

Introduction

This notebook contains a variety of resources that you will turn to over and over as you work with agricultural operators.

The design follows the outline of the "Fundamentals" course, allowing you to add notes and handouts. Space has been left intentionally for you to add materials in the future. The MDA Nutrient Management Program will help you keep your "Law, Regulations and Reference Manual" up to date. This notebook however, is yours. Use the internet references and continuing education courses to keep your notes up to date. Add materials that relate to the type of operations you work with.

Materials for "Fundamentals of Nutrient Management Course"

1) Textbook: "Chesapeake Bay Region Nutrient Management Training Manual"

   New version just released digitally:
   http://www.agnr.umd.edu/users/waterqual/themes/nutrient_management/manmh2006.htm

2) Notebook: "Maryland Nutrient Management: Law, Regulations and Manual"

3) Consultant's Resource Notebook

Course Description for "Fundamentals of Nutrient Management"

This two-day course provides instruction in the basic concepts of nutrient management required to pass the Nutrient Management Certification Exam. The exam consists of 100 multiple choice questions from nine knowledge areas. Eight of these knowledge areas are covered by the "Chesapeake Bay Region Nutrient Management Training Manual." Each of the Bay states uses this core question pool for its certification exam. The ninth knowledge area is specific to Maryland.

Knowledge Area	Percentage
1. General Nutrient Management	10
2. Basic Soil Science	12
3. Agricultural & Environmental Management	15
4. Sampling, Testing and Analysis	10
5. Basic Soil Fertility	15
6. Fertilizer Management	10
7. Manure Management	12
8. Biosolids (Sludge) Management	6
9. Technical Recommendations, Regulations & Incentives	10
Total	**100**

Reciprocity Agreements

Maryland, Pennsylvania, Virginia and Delaware have reciprocity agreements on training, exam standards, certification and continuing education credits. Persons seeking certification in Maryland who plan to work in PA, VA or DE need to consult their state nutrient management program for state-specific regulations and requirements.

Questions or comments should be directed to:

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Phone: 410-841-5959 Fax: 410-841-5950

Consultant's Resource Notebook
Table of Contents

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I. **Soil Science and Soil Fertility Tools**
- Maryland Leaching Indices for Nitrates and Soluble Nutrients
- Rainfall Data for Maryland Counties
- Sources for Soil Maps
- Soil pH Management and Determining Liming Rates

II. **Soil, Tissue & Manure Assessment**
- Soil Sampling Procedures for Nutrient Management
- Comparison of Soil Test Labs
- Equivalent Phosphorus Index Threshold Levels
- Making Decisions for Nitrogen Fertilization Using PSNT
- Plant Tissue Analysis
- Comparison of Some Labs Testing Plant Tissue
- Sampling Manure for Nutrient Content
- Comparison of Some Labs Testing Manure
- Sampling Litter for Nutrient Content in Poultry Houses

III. **Developing Nutrient Recommendations**
- MD's Agronomic Soil Capability Assessment Program (MASCAP)
- Phosphorus Removal by Crops in Mid-Atlantic
- The Maryland Phosphorus Site Index: An Overview

IV. **Management of Nutrient Sources**
- Manure Management
  - Manure Production Rate and Quantity Estimation
  - Density of Bedding Materials
  - Determining the Amount of Manure in a Pile or a Pool
  - Poultry Waste Production & Storage Calculation Sheet
  - Converting From Dry-weight to Wet-weight Basis
- Biosolids/Sludge
  - MDE: Sewage Sludge Utilization in Maryland
  - Guidelines for Application of Digested Sewage Sludge & Composted Sewage Sludge to Agricultural Land

V. **Certification and Licensing**
- Application for Consultant Certification & Application for License
- Guidelines & Procedures for Inspection of Certified Nutrient Management Plans
- Guidelines for Continuing Education & Request for Approval Form

VI. **Plan Development**

- Finding Watershed Codes on the Internet
- Watershed Codes & Watershed Map Order Form
- Plan Reporting Form
- Annual Implementation Report Form & Instructions

VII. **Incentives**

- Technical Assistance and Cost Share Program
- Income Tax Subtractions

Appendix 1: **Software & Internet Resources**

- Nutrient Management Resources on the Internet
- Nutrient Management Planning Software

Appendix 2: **Nutrient Recommendations not yet in the Reference Manual**

- Fertilizer Recommendations for Landscape Trees & Shrubs
- Mineralization Rates for Organic Nutrient Sources

Appendix 3: **Telephone Contacts**

- **Soil Sampling Procedures for Nutrient Management**

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For the Nutrient Management Advisor

Soil Sampling Procedures for Nutrient Management

1. **Define the management units.** A management area is an area that can and will be managed separately from any other. If different field areas have different soil types, past cropping histories, or different production potentials, these areas should be sampled separately and managed separately (See *Figure 1*). If it is impossible for a farmer to manage different areas separately, they should be treated as one management unit.

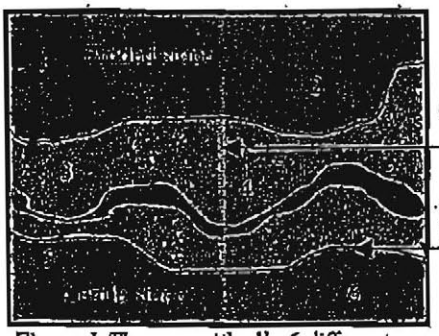

Figure 1: There are ideally 6 different management units in this field because of differences in landscape position and past management.

2. **Sample the management units.** Each unit should be sampled separately. Follow these steps for each management unit.
- Collect 15 to 20 samples in a clean plastic bucket.
- Take samples from throughout the entire area of the unit.
- Follow a sampling pattern similar to that in *Figure 2*.
- Avoid sampling unusual areas such as windbreaks, old fence lines, wet areas or areas near lime rock roads.
- Scrape away any surface residues.
- Sample to the correct depth (See *Figure 3*).
  - 2 inches for monitoring pH on no till cropland and pasture
  - 8 inches for fertility samples on cropland and pasture
  - 12 inches for PSNT

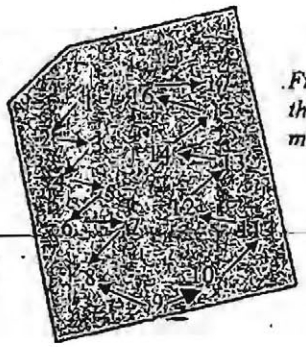

Figure 2: Sample from the entire area of the management unit.

3. **Mix the sample.** Thorough mixing is essential.
- Sieve the samples through the sieve into a receiving box. If the sample is hard or strongly aggregated, use a mallet to help break up soil aggregates.
- Transfer the soil to the ODJOB mixer. Roll the mixer at least 50 revolutions. Spread the sample out.
- Return the soil to the receiving box. Spread the sample out.

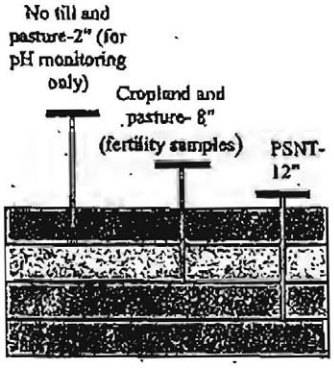

Figure 3: Sample to the correct depth.

Soil Sampling Procedures for Nutrient Management (continued)

- Take 5 scoops of soil from different parts of the sample to provide a total soil volume of approximately 1 pint.
- Place the soil into the sample bag.
- Take the soil back to the office.

4. **Drying the sample.**

- Spread the sample out in a warm place overnight to air dry it.
- DO NOT HEAT the soil.

5. **Label and place the soil into a soil bag.**

6. **Fill out the information sheet** as completely and accurately as possible.

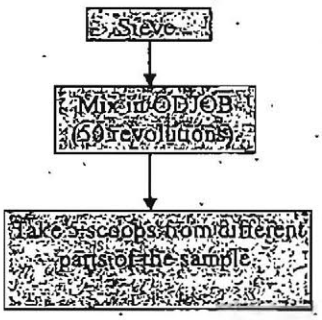

Figure 4: Thorough mixing is essential.

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