BERKS COUNTY CONSERVATION DISTRICT

DEP Manure Management Manual

COMPLETING A MANURE MANAGEMENT PLAN – PART 3

Manure Management Plan Summary (p.6)

- This section of the plan must list manure application rates by crop group
  - Summarized on the **Manure Management Plan Summary**

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Determining Planned Application Rates

- Before determining "Planned Application Rates" information for 4 other columns must first be identified
  - Crop groups and yields
  - Manure groups
  - Application seasons
  - Incorporation Timing
- Different combinations of these factors will create multiple "crop group scenarios"

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Determining Crop Groups & Yields

- List the crops grown on the farm that might receive manure
  - Consider crop rotation
- Same crop but different crop groups
  - Harvested differently
    - Corn Silage
    - Corn Grain
  - Following legume crops in the rotation
    - Corn Silage After Alfalfa
    - Corn Silage After Soybeans
    - Corn Silage After Corn
- List the expected optimum yield for each crop group

Manure Management Plan Exercise

COMPLETE CROP GROUP & YIELD COLUMN

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Manure Management Plan Summary (p.6)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)
Corn Silage (23 T/A)						
Corn Silage After Alfalfa (23 T/A)						
Grass Hay (4 T/A)						
Note: No manure is applied to alfalfa on this farm so it is not listed.						

Determining Manure Groups

- To determine manure groups on the operation first identify the different storage locations on the farm
  - Where do you physically get the manure to load in the spreader?
  - Examples
    - Storage tank
    - Box stalls
    - Stacking pad
    - Broiler house
- Second, note manure type
  - Liquid or solid
- Third, note the animal type
  - Dairy, swine, poultry, etc.
  - Some manure groups may come from multiple species
    - Example: beef cows and horses
- Finally, give the manure groups names that mean something to you

Manure Management Plan Exercise

COMPLETE MANURE GROUP COLUMN

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Manure Management Plan Summary (p.6)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)
Corn Silage (23 T/A)	Liquid Dairy					
Corn Silage After Alfalfa (23 T/A)	Liquid Dairy					
Grass Hay (4 T/A)	Liquid Dairy					
Corn Silage (23 T/A)	Solid Dairy					

Determining Application Seasons

- Important aspect of manure application management
  - Determines how much nitrogen will be available to the crop
- Two parts to this determination
  - When is the manure in a storage location land applied?
    - One manure group may have different application seasons
      - Dairy liquid – Spring
      - Dairy liquid – Fall
  - Which crops will a manure group be applied to?
    - Example: liquid manure on grass hay but not solid manure
- Typical application seasons
  - Spring (or summer)
  - Fall (early)
  - Winter (or late fall)

Manure Management Plan Exercise

COMPLETE APPLICATION SEASON COLUMN

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Manure Management Plan Summary (p.6)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)
Corn Silage (23 T/A)	Liquid Dairy	Spring				
Corn Silage After Alfalfa (23 T/A)	Liquid Dairy	Spring				
Grass Hay (4 T/A)	Liquid Dairy	Summer				
Corn Silage (23 T/A)	Solid Dairy	Spring				
Corn Silage (23 T/A)	Liquid Dairy	Fall				
Corn Silage (23 T/A)	Solid Dairy	Fall				
Corn Silage (23 T/A)	Solid Dairy	Winter				

Determining Incorporation Timing

- Second important aspect of manure application management
  - Determines how much nitrogen will be available to the crop
- Manure Application Rate Tables (Appendix 1)
  - Spring incorporation within 1 day
  - Spring incorporation with 1 week
  - Spring no incorporation
  - Fall
  - Winter with cover crop
  - Winter no cover crop
- Other methods of determining application rates will use the Nutrient Balance Worksheet incorporation options

Manure Management Plan Exercise

COMPLETE INCORPORATION TIMING COLUMN

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Manure Management Plan Summary (p.6)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)
Corn Silage (23 T/A)	Liquid Dairy	Spring		No Incorporation		
Corn Silage After Alfalfa (23 T/A)	Liquid Dairy	Spring		Inc. < 1 Week		
Grass Hay (4 T/A)	Liquid Dairy	Summer		No Incorporation		
Corn Silage (23 T/A)	Solid Dairy	Spring		No Incorporation		
Corn Silage (23 T/A)	Liquid Dairy	Fall		No Incorporation		
Corn Silage (23 T/A)	Solid Dairy	Fall		No Incorporation		
Corn Silage (23 T/A)	Solid Dairy	Winter		Cover Crop		
Corn Silage (23 T/A)	Liquid Dairy	Spring		Inc. < 1 Week		

Manure Application Method	
Spring	Incorporation within 1 day
	Incorporation within 1 week
	No Incorporation
Fall	No Incorporation
Winter	With cover crop
	No cover crop

Determining Planned Application Rates

- A manure application rate must be planned for each crop group scenario
  - A field by field allocation is not required
- Rates will be based on nitrogen or phosphorus
- Different rates depending on the scenarios developed here:
  - Crop group
    - Legumes in the rotation
    - Yield differences
  - Manure group
  - Manure group application season
  - Manure incorporation timing
  - Nitrogen or phosphorus basis
- A good starting point is to use your current manure application rates
  - If these rates are known pencil them in the column

Manure Spreader Calibration

- Must know actual manure application rates
  - Planned application rates are worthless without application equipment calibration
  - Calibration of equipment is the only way to know actual manure application rates
  - Calibration ensures that application rates are realistic, practical, and attainable
- Practical benefits of verifying actual application rates
  - Avoid over application of nutrients
    - Inefficient use of nutrients
      - Not available for other fields
    - False “need” for supplemental fertilizer
  - Avoid under application of nutrients
    - Decrease yield potential
- Ideally should be done before planning
  - Use current rates as basis for the plan
  - Later may require modification of the plan

Manure Spreader Calibration Factsheet

- Agronomy Facts 68: Manure Spreader Calibration
  - http://panutrientmgmt.cas.psu.edu/pdf/Facts68.pdf

Agronomy Facts 68

Manure Spreader Calibration

Manure spreader calibration is an essential and valuable nutrient management tool for maximizing the efficient use of available manure nutrients. Planned manure application rates listed in nutrient management plans must correlate with actual application rates. Calibrating the manure spreader is the only way to know actual manure application rates.

Manure spreader calibration combined with soil test recommendations and manure analysis results enable the determination of nutrient application rates that meet crop nutrient needs. The most critical and challenging aspect of both soil and manure analysis is obtaining a representative sample to submit to the laboratory. It is critical to learn and follow recommended soil and manure sampling procedures in order to obtain a representative sample and test results. The manure nutrient levels and crop nutrient requirements from test results are used to determine manure application rates that will adequately meet crop needs. Manure spreader calibration ensures that manure application rates are realistic, practical, and attainable.

Manure application rates are determined by equipment speeds and settings along with application management, such as overlaps. Manure spreader calibration can be used two ways in nutrient management planning:

Before planning— Spreaders can be calibrated to determine the rates that can be applied at typical application settings and speed. These rates are then used as the possible planned rates when the nutrient management plan is developed.

After planning— Spreaders can be calibrated to meet planned application rates by changing speeds, settings, or management. In this case, desired application rates are determined as the nutrient management plan is developed and the spreader is calibrated accordingly.

OVERVIEW OF SPREADER CALIBRATION

An application rate is defined as the amount of manure applied per unit of land area. For manure, it is usually expressed in tons per acre (solid) or gallons per acre (liquid). Generally, application rate equals the amount of manure applied (in tons or gallons) divided by the area covered (in acres).

Manure spreader calibration requires reliable estimates of both the amount applied and area covered. There are two common calibration techniques. The **swath or load-area method** involves measuring both the amount of manure in a typical spreader load and the land area covered by applying one load of manure. While this method can be used for all manures, it is the best method for liquid manure applicators. The **tarp or weight-area method** involves weighing the manure spread over a small surface and computing the amount of manure applied per acre. This method is the best method for solid manure applicators.

CALIBRATION METHODS

Below are descriptions of the two most common calibration methods.

Swath (Load-Area) Method

Liquid manure applicators used in pump-and-haul application systems are best calibrated by the swath or load-area method, which involves land applying a full load of manure and measuring the land area covered. If possible, choose an area that is typical of the land where manure will be spread. If appropriate, a relatively level area long enough for the load to be applied in a single pass makes measurements and calculations simpler. A rectangular field pattern should be used to make measuring easier. The application rate of PTO-driven spreaders depends on ground speed. Therefore, it is important to maintain a uniform ground speed throughout the swath length. Ground-driven spreaders deliver reasonably uniform application rates regardless of ground speed.

For liquid application equipment, application rates and patterns vary depending on ground speed or PTO speed, gear box settings, gate openings, operating pressures, spread widths, and overlaps. To change the application rates, adjust-

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College of Agricultural Sciences
Agricultural Research and Cooperative Extension

Manure Management Plan Exercise

COMPLETE LISTING OF TYPICAL APPLICATION RATES (IF KNOWN)

MANURE MANAGEMENT PLAN SUMMARY

Use Additional Sheets as Necessary

(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

Manure Management Plan Summary (p.6)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)
Corn Silage (23 T/A)	Liquid Dairy	Spring	9000 gal/A	No Incorporation		
Corn Silage After Alfalfa (23 T/A)	Liquid Dairy	Spring	9000 gal/A	Inc. < 1 Week		
Grass Hay (4 T/A)	Liquid Dairy	Summer	4000 gal/A	No Incorporation		
Corn Silage (23 T/A)	Solid Dairy	Spring	25 ton/A	No Incorporation		
Corn Silage (23 T/A)	Liquid Dairy	Fall	9000 gal/A	No Incorporation		
Corn Silage (23 T/A)	Solid Dairy	Fall	25 ton/A	No Incorporation		
Corn Silage (23 T/A)	Solid Dairy	Winter	25 ton/A	Cover Crop		
Corn Silage (23 T/A)	Liquid Dairy	Spring	9000 gal/A	Inc. < 1 Week		

Determining Planned Application Rates

- Three approaches may be used to determine manure application rates
  - MMM Appendix 1 – Manure Application Rate Tables ("C")
  - Nutrient Balance Worksheets ("NBS")
  - Nutrient Balance Worksheets incorporating the PA Phosphorus Index ("PI")
    - Developed by authorized (trained) specialist

MANURE MANAGEMENT PLAN SUMMARY
Use Additional Sheets as Necessary
(See Pages 10-12 of Manure Management Guidance Instructions)

Crop Group and Yield (a)	Manure Group (b)	Application Season (c)	Planned Application Rate from C, NBS, PI * (d)	Incorporation Timing (e)	Commercial Fertilizer Application Rate (f)	Fields where this crop group can be used (g)

	MMM Tables P Removal	Balance Sheet P Removal	MMM Tables N Based	Balance Sheet N Based	Balance Sheet P Index	Act 38 NMP
Time & Cost	Simple-Easy-Inexpensive				Complex-Difficult-Expensive	
Management Flexibility	Very Restrictive				Maximum Flexibility	
Written By Specialist	No	No	No	No	Yes (Authorized)	Yes (Certified)
			Soil Test > 200 ppm P Options			
Soil Tests	No	No	Yes (< 200 ppm P)	Yes (< 200 ppm P)	Yes	Yes
Manure Analysis	No	No	No	No	No	Yes
Specific Crop Information	No (based on averages)	Yes	No (based on averages)	Yes	Yes	Yes (plus manure specific)
Application Rates	Lower	Lower	Higher (less fields ?)	Higher (less fields ?)	All Fields (N or P)	All Fields (N or P)

MMM Manure Application Rate Tables

Liquid Dairy
Nitrogen Based Manure Application Rates

Corn Grain

Manure Application Method	Yield Groups (bu/A) 100-130 Manure gal/A	100-130 Fert N lb/A	131-160 Manure gal/A	131-160 Fert N lb/A	161-190 Manure gal/A	161-190 Fert N lb/A	191-220 Manure gal/A	191-220 Fert N lb/A	Manure Application Rate Adjustment: For each 1000 gal/A less than the rate in the table, apply lbs. N fertilizer listed below.
Spring Incorporation within 1 day	8000	0	10000	0	12000	0	14000	0	14
Spring Incorporation within 1 week	11000	0	14000	0	16000	15	16000	45	10
Spring No Incorporation	16000	20	16000	50	16000	80	16000	110	6
Fall	16000	20	16000	50	16000	80	16000	110	6
Winter with cover crop	5000	55	5000	85	5000	115	5000	145	11
Winter No cover crop	5000	80	5000	110	5000	140	5000	170	6

Corn Grain after Alfalfa

Manure Application Method	Yield Groups (bu/A) 100-130 Manure gal/A	100-130 Fert N lb/A	131-160 Manure gal/A	131-160 Fert N lb/A	161-190 Manure gal/A	161-190 Fert N lb/A	191-220 Manure gal/A	191-220 Fert N lb/A	For each 1000 gal/A less than the rate in the table, apply lbs. N fertilizer listed below.
Spring Incorporation within 1 day	4000	0	5000	0	6000	0	8000	0	14
Spring Incorporation within 1 week	5000	0	7000	0	9000	0	11000	0	10
Spring No Incorporation	9000	0	13000	0	16000	0	16000	20	6
Fall	9000	0	13000	0	16000	0	16000	20	6
Winter with cover crop	4000	0	5000	15	5000	35	5000	55	11
Winter No cover crop	5000	20	5000	40	5000	60	5000	80	6

Corn Grain after Soybeans

Manure Application Method	Yield Groups (bu/A) 100-130 Manure gal/A	100-130 Fert N lb/A	131-160 Manure gal/A	131-160 Fert N lb/A	161-190 Manure gal/A	161-190 Fert N lb/A	191-220 Manure gal/A	191-220 Fert N lb/A	For each 1000 gal/A less than the rate in the table, apply lbs. N fertilizer listed below.
Spring Incorporation within 1 day	5000	0	6000	0	8000	0	9000	0	14
Spring Incorporation within 1 week	7000	0	9000	0	11000	0	13000	0	10
Spring No Incorporation	13000	0	16000	0	16000	20	16000	40	6
Fall	13000	0	16000	0	16000	20	16000	40	6
Winter with cover crop	5000	15	5000	35	5000	55	5000	75	11
Winter No cover crop	5000	40	5000	60	5000	80	5000	100	6

Corn Silage

Manure Application Method	Yield Groups (ton/A) 17-21 Manure gal/A	17-21 Fert N lb/A	22-25 Manure gal/A	22-25 Fert N lb/A	26-29 Manure gal/A	26-29 Fert N lb/A	30-33 Manure gal/A	30-33 Fert N lb/A	For each 1000 gal/A less than the rate in the table, apply lbs. N fertilizer listed below.
Spring Incorporation within 1 day	9000	0	11000	0	14000	0	16000	0	14
Spring Incorporation within 1 week	13000	0	16000	0	16000	35	16000	65	10
Spring No Incorporation	16000	40	16000	70	16000	100	16000	130	6
Fall	16000	40	16000	70	16000	100	16000	130	6
Winter with cover crop	5000	75	5000	105	5000	135	5000	165	11
Winter No cover crop	5000	100	5000	130	5000	160	5000	190	6

Corn Silage after Alfalfa

Manure Application Method	Yield Groups (ton/A) 17-21 Manure gal/A	17-21 Fert N lb/A	22-25 Manure gal/A	22-25 Fert N lb/A	26-29 Manure gal/A	26-29 Fert N lb/A	30-33 Manure gal/A	30-33 Fert N lb/A	For each 1000 gal/A less than the rate in the table, apply lbs. N fertilizer listed below.
Spring Incorporation within 1 day	5000	0	6000	0	8000	0	9000	0	14
Spring Incorporation within 1 week	7000	0	9000	0	11000	0	13000	0	10
Spring No Incorporation	13000	0	16000	0	16000	20	16000	40	6
Fall	13000	0	16000	0	16000	20	16000	40	6
Winter with cover crop	5000	15	5000	35	5000	55	5000	75	11
Winter No cover crop	5000	40	5000	60	5000	80	5000	100	6

Nutrient Balance Sheets

Manure Management Plan
Nutrient Balance Worksheet

Crop Group	Yield	Fields where this crop group and manure group can be used.

Manure Rate Planning Basis (check planning option)	OPTION 1 P Removal	OPTION 2 N Based	OPTION 3 P Index
	• Crop Phosphorus Removal Rates • No soil tests required or • Fields with soil tests > 200 ppm P	• Nitrogen Based Rates • Soil tests required • Fields with soil test < 200 ppm P	• P Removal or N Based Rates • Soil tests required • Determined by required P Index evaluation of each field
	(Use the P_2O_5 column to determine acceptable rate)	(Use the N column to determine acceptable rate)	(Use appropriate column based on the P Index to determine acceptable rate)

Manure Group	Application Season	Incorporation Timing

Completion of N column required for all options; P_2O_5 column is optional for N based rates; K_2O is optional for all rates.

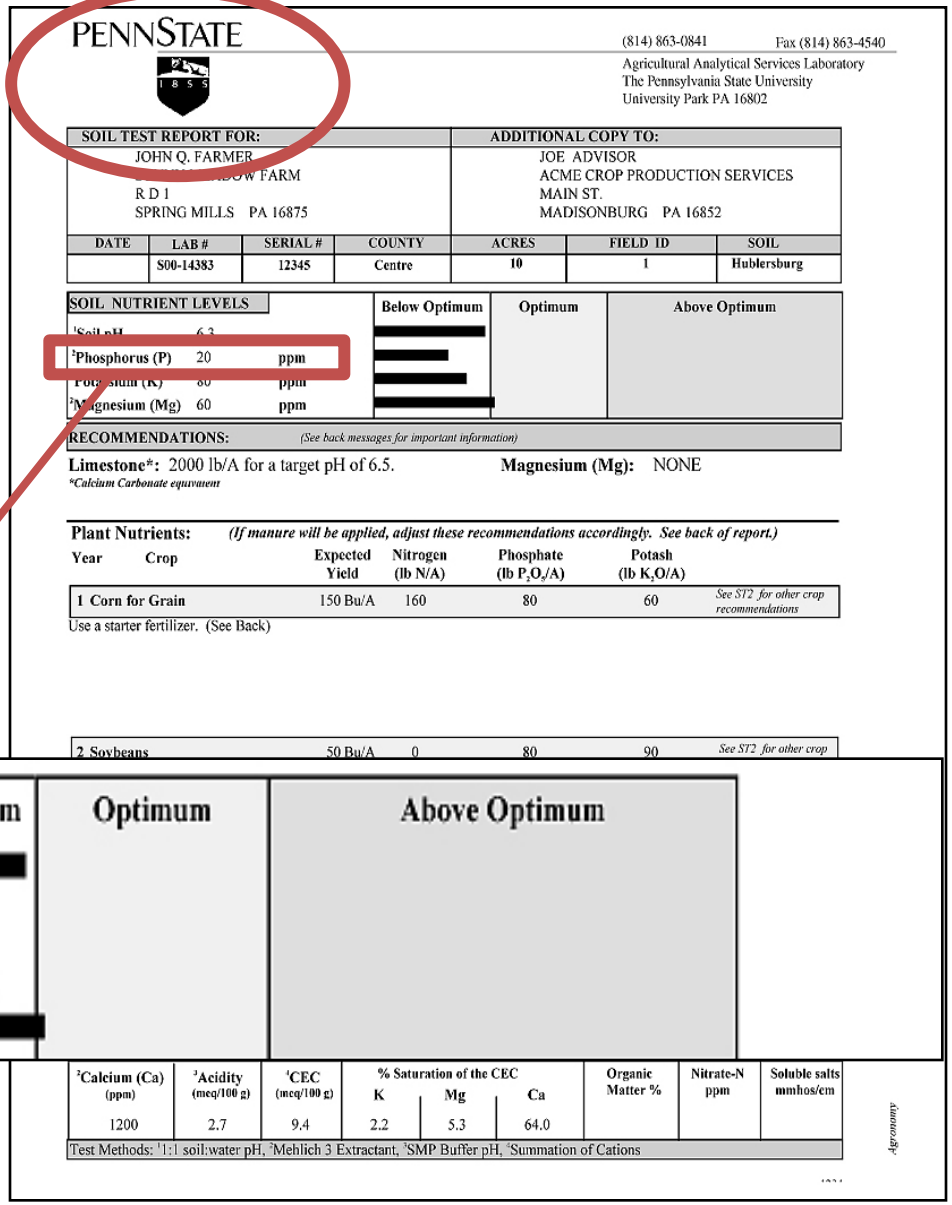
	N	P_2O_5	K_2O
A) Recommendation or Removal (lb/A) N – Soil Test or Tables 1 & 2 (AG Table 1.2-6;1.2-8) P_2O_5 & K_2O – Soil Test or Table 3 (AG Table 1.2-9)			
B) Fertilizer Applied (lb/A) (Regardless of Manure e.g. Starter)			
C) Other Organic Sources Applied (lb/A) (e.g. Biosolids, Other Manure)			
D) Residual Manure N (lb/A) Table 4 (AG Table 1.2-14B)			
E) Previous Legume N (lb/A) Table 5 (AG Table 1.2-7) or Soil Test Report			
F) Net Nutrient Requirement (lb/A) (A – B – C – D – E)			
G) Manure Nutrient Content (lb/ton or lb/1000gal) Table 6 (AG Table 1.2-13) or Manure Analysis Report			
H) Nitrogen Availability Factor Table 7 (AG Table 1.2-14A)			
I) Available Nitrogen (lb/ton or lb/1000gal) (G x H)			
J) Balanced Manure Rate (tons/A or gallons/A) For N: (F ÷ I) For P: (F ÷ G)			
K) Planned Manure Rate (tons/A or gallons/A) Must be less than or equal to the appropriate Balanced Rate for the Manure Rate Planning Basis being used			

The "Nutrient Balance at Planned Rate" below is used to determine additional fertilizer needs at the planned manure rate. The N column must be completed to determine additional nitrogen (N) fertilizer needs. Completion of the P_2O_5 and K_2O columns is optional and should be used to determine additional P_2O_5 and K_2O fertilizer needs **ONLY** if soil test recommendations were used in (Row A).

L) Nutrients Applied at Planned Rate (lb/A) For N: (K x I) For P & K: (K x G)			
M) Nutrient Balance at Planned Rate (lb/A) (F - L) (Indicate short or excess)			

Soil Test Reports

- Nitrogen based manure rate options require soil tests
  - Must be current within last 3 years
- N based rates can only be used on fields with P levels < 200 ppm



PENNSTATE

(814) 863-0841 Fax (814) 863-4540

Agricultural Analytical Services Laboratory
The Pennsylvania State University
University Park PA 16802

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
JOHN Q. FARMER [illegible] FARM R D 1 SPRING MILLS PA 16875	JOE ADVISOR ACME CROP PRODUCTION SERVICES MAIN ST. MADISONBURG PA 16852

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
	S00-14383	12345	Centre	10	1	Hublersburg

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	6.3				
[1]Phosphorus (P)	20	ppm			
[1]Potassium (K)	80	ppm			
[2]Magnesium (Mg)	60	ppm			

RECOMMENDATIONS: *(See back messages for important information)*

Limestone*: 2000 lb/A for a target pH of 6.5. **Magnesium (Mg):** NONE

**Calcium Carbonate equivalent*

Plant Nutrients: *(If manure will be applied, adjust these recommendations accordingly. See back of report.)*

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
1	Corn for Grain	150 Bu/A	160	80	60	*See ST2 for other crop recommendations*

Use a starter fertilizer. (See Back)

2	Soybeans	50 Bu/A	0	80	90	*See ST2 for other crop*

[2]Calcium (Ca) (ppm)	[3]Acidity (meq/100 g)	[4]CEC (meq/100 g)	% Saturation of the CEC K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
1200	2.7	9.4	2.2	5.3	64.0			

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 Extractant, [3]SMP Buffer pH, [4]Summation of Cations

Agronomy

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	6.3				
[1]Phosphorus (P)	20	ppm			
[1]Potassium (K)	80	ppm			
[2]Magnesium (Mg)	60	ppm			

Report Number:
R06236-0023
Account Number:
52425

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401
Fax No. (804) 271-6446 Email: office@al-labs-eastern.com

Send To: NO NAME INC
POB 888
FARMVIEW LN
RICHMOND, VA 232377

Grower: JOHN DOLE FARMS

Submitted By: JOHN DOLE

Farm I D:

Field I D:

SOIL ANALYSIS REPORT

Page: 1 **Date Received:** 8/23/2006 **Date of Analysis:** 8/24/2006 **Date of Report:** 8/25/2006

Analytical Method(s):
Mehlich III

Sample Number	Lab Number	Organic Matter %	Organic Matter ENR lbs/A	Organic Matter ENR Rate	Phosphorus Available ppm	Phosphorus Available Rate	Phosphorus Reserve ppm	Phosphorus Reserve Rate	Potassium K ppm	Potassium K Rate	Magnesium MG ppm	Magnesium MG Rate	Calcium CA ppm	Calcium CA Rate	Sodium NA ppm	Sodium NA Rate	pH Soil pH	pH Buffer Index	Acidity H meq/100g	C.E.C. meq/100g
#1	13167	2.9	97	M	624	VH			290	VH	75									7.7

Sample Number	Percent Base Saturation K %	Mg %	Ca %	Na %	H %	Nitrate NO3-N ppm	Nitrate NO3-N Rate	Sulfur SO4-S ppm	Sulfur SO4-S Rate	Zinc ZN ppm	Zinc ZN Rate	Manganes MN ppm	Manganes MN R	Aluminum AL ppm	Aluminum AL Rate
#1	9.7	8.2	73.2		8.9			25	M	9.5	VH	12			

ALE-Soil

Values on this report represent the plant available nutrients in the soil.
Rating after each value: VL (Very Low), L (Low), M (Medium), H (High), VH (Very High).
ENR - Estimated Nitrogen Release. C.E.C. - Cation Exchange Capacity.

Explanation of symbols: % (percent), pp
ms/cm (milli-mhos per centimeter), mec
Conversions: ppm x 2 = lbs/A, Soluble

amples are retained a
lysis prepared by:
S, INC.

Paul Chu, Ph.D.