

# Lab Update with Soil Sampling and Results Interpretation



**Robert Florence**  
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SPPC Laboratory Director

# Service Overview

## Soils



## Media / Substrate



## Plant Disease



## Plant Tissue



## Insects



## Forages



Picture: David McIntosh

# Soils Updates

## On-line Reports



**UT EXTENSION**  
INSTITUTE OF AGRICULTURE  
THE UNIVERSITY OF TENNESSEE

**Soil, Plant & Pest Center**

Email

Use another service to log in:

Password

Remember me?

(UT Employees Log in with current email and password)

## Volume Discounts

\$13.50 for 20 to 39 samples

\$12.00 for 40 + samples

\*Samples must be received at same time  
and results sent to one account



# Soils Updates

## Submission Sheets

**UT EXTENSION**  
INSTITUTE OF AGRICULTURE

**SOIL, PLANT AND PEST CENTER**  
5201 Marchant Drive  
Nashville, TN 37211-6112  
615.832.5850 Fax 615.832.4936  
ag.tennessee.edu/soil  
soilplantpestcenter@tennessee.edu

Order Total: \_\_\_\_\_

**Soil and Media Information Sheet**

Please print or use fillable form

**Customer Information**

Name: \_\_\_\_\_ County: \_\_\_\_\_ Date: \_\_\_\_\_  
Address: \_\_\_\_\_  Cash  Check  Credit Card  
City: \_\_\_\_\_ State: TN Zip Code: \_\_\_\_\_ Account Name or Online Order#: \_\_\_\_\_  
E-mail: \_\_\_\_\_ Phone Number: \_\_\_\_\_

**Sample Information**

**SOIL AND CONTAINER MEDIA ANALYSIS**

Enter sample identification, crop code(s) and check tests desired (X) for each sample submitted.

Sample ID (Four digit numeric)	Farm ID (State/County)	Crop Code(s)	* (Flux, Organic, C/N, Soluble, PIRT, S&P, Media, Particle)										Lab Use Only		
			Year	Macros: Nitro	Macro: Sulf	Macro: Phos	Macro: S&P	Macro: S&P	Macro: S&P	Macro: S&P	Macro: S&P	Macro: S&P		Macro: S&P	
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**Plus Test—\$15.00 Includes:** Soil pH, P, K, Ca, Mg, Zn, Mn, Fe, Cu, Na, S, Lime and Fertilizer recommendations provided for up to four (4) crop codes per sample.

1. For plus test, insert a full box of soil (1 cup). For best results, collect multiple subsamples of deep, for a composite sample representing the area of interest. Air-dry soil and fill box top. More samples may be needed if multiple analyses are wanted. Additional information can be found in TN 3261 or online at us.tennessee.edu/soil.

2. For getting media (Media Test) such as nursery, greenhouse etc. please send **any** a gallon of the material.

3. Place all soil/media samples in a package that will withstand shipping.

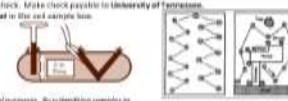
4. Payment can be made online with credit/debit card (link provided on our website) or check. Make check payable to University of Tennessee.

5. Please include submitters' street and check in an envelope in the shipping box, but not in the soil sample box.

6. Mailing address: Soil, Plant and Pest Center  
5201 Marchant Drive  
Nashville, TN 37211-6112

7. Samples cannot be tested until payment is received or arrangements are made. Plus Tests are normally analyzed and reported within 3-4 business days. If you do not receive results within 1 week of arrival at UT-EC, please contact us.

The University of Tennessee submitters and submitters acceptable for research and educational purposes. By submitting samples to the Soil, Plant and Pest Center, you are in your agreement with this action.



Field Crops

Lawn & Garden

Media / Substrate

Nitrate

# Sample Size

Field Soil



Need one proud cup

Need two cups if also want texture

Media / Substrate



# Sampling

Field



Management Zone



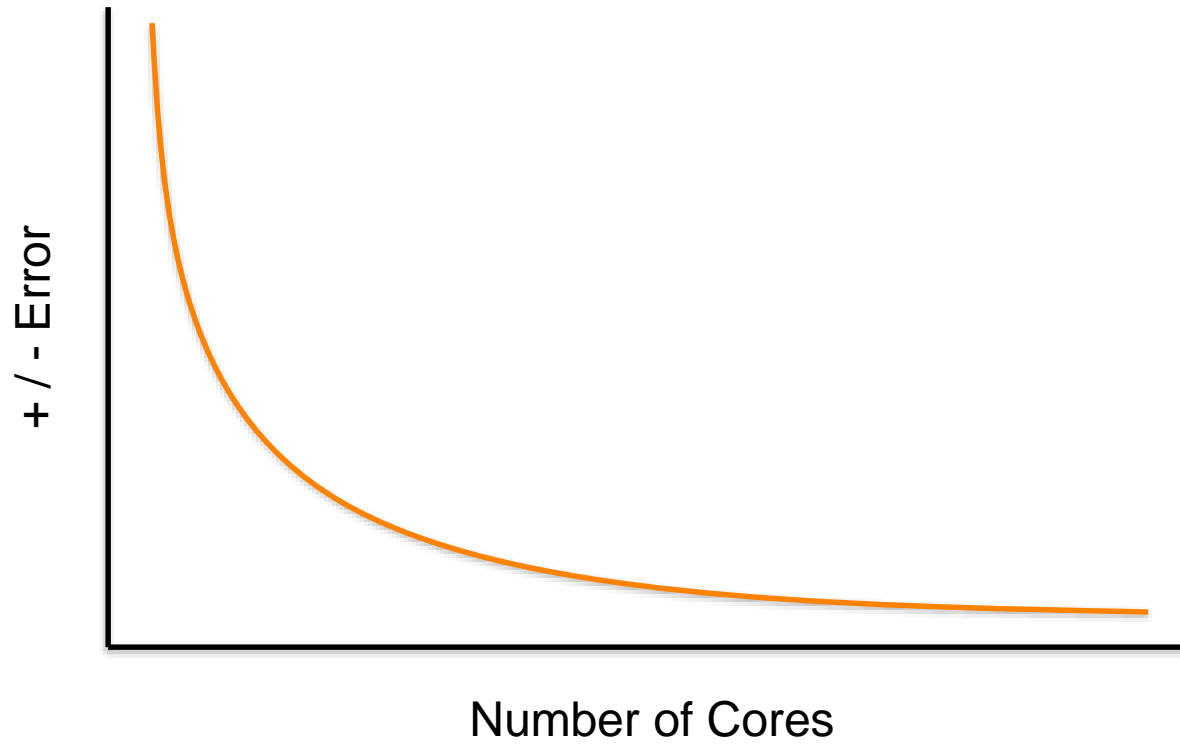
Grid area/point



One sample to represent no more than 10 acres

Fill your bucket, **mix well**, then fill the sample box.

# Sampling - Cores



# Sampling - Corea

Ground with a mean P level of 20 lbs. per Acre  
Ranges from 16 to 24

# Cores	Percent +/-
1	23
3	13
5	10
10	7

Assumes random and representative

16	18	21	21	17
23	21	24	19	23
20	17	20	17	19
16	24	20	18	22
23	22	16	24	19



# Sample Depth and Timing

## Phosphorus and Potassium

A consistent 0 to 6" depth

Anytime during the year but...

Well in advance if lime is needed.

Consistency from year to year.

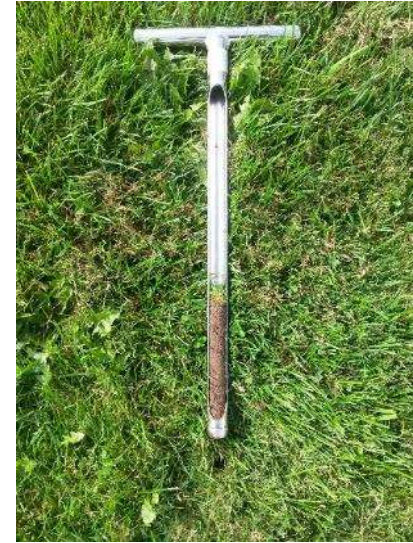


## Nitrate

A consistent 0 to 12" depth

When corn is about 1' tall

Every Year



# Constancy in Depth



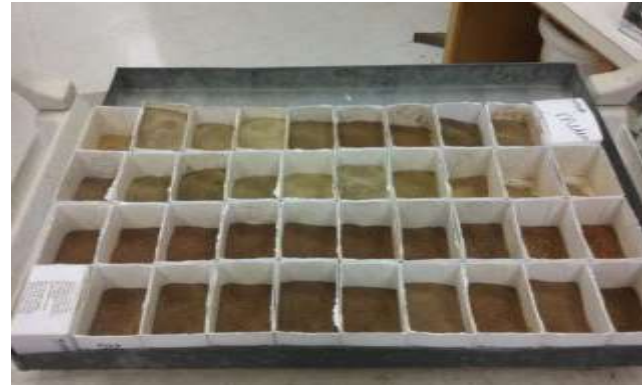
Depth	Average by depth			
Inches	lbs. P / acre			
0 - 2	50	36	29	24
2 - 4	22			
4 - 6	16			
6 - 8	6			

**Stratification** can occur in long term no till soils

# Once Samples are at Lab



# Preparation



# Testing

## Nutrients



## pH and Lime recommendation



# Report Explanation

## Mehlich 1 SOIL TEST RESULTS and RATINGS\*

Lab Number	Report Date	Farm ID	Sample Number	pH		P	K	Ca	Mg	Zn	Fe	Mn	B	Na
				Soil pH	Buffer Value									
550671	10/17/2017		12878	5.47	7.53	176 V	130 M	2170 S	223 S	11.1 S	27 S	51 S	0.5	7
550672	10/17/2017		121115	6.22		942 V	382 V	5567 S	324 S	23.2 S	26 S	52 S	1.4	16

Lab Number	Farm ID	Sample Number	S	Nitrogen		C	C/N	Organic Matter	Soluble Salts	Texture			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	Sand	Silt	Clay	Soil Texture
550671		Bio - Pond						2.3		20	60	20	Silt Loam
550672		Turf											

# Soil pH and Buffer pH

**Current Soil pH**  
(Where you are starting)



**Crop Target pH**  
(Where you are going)

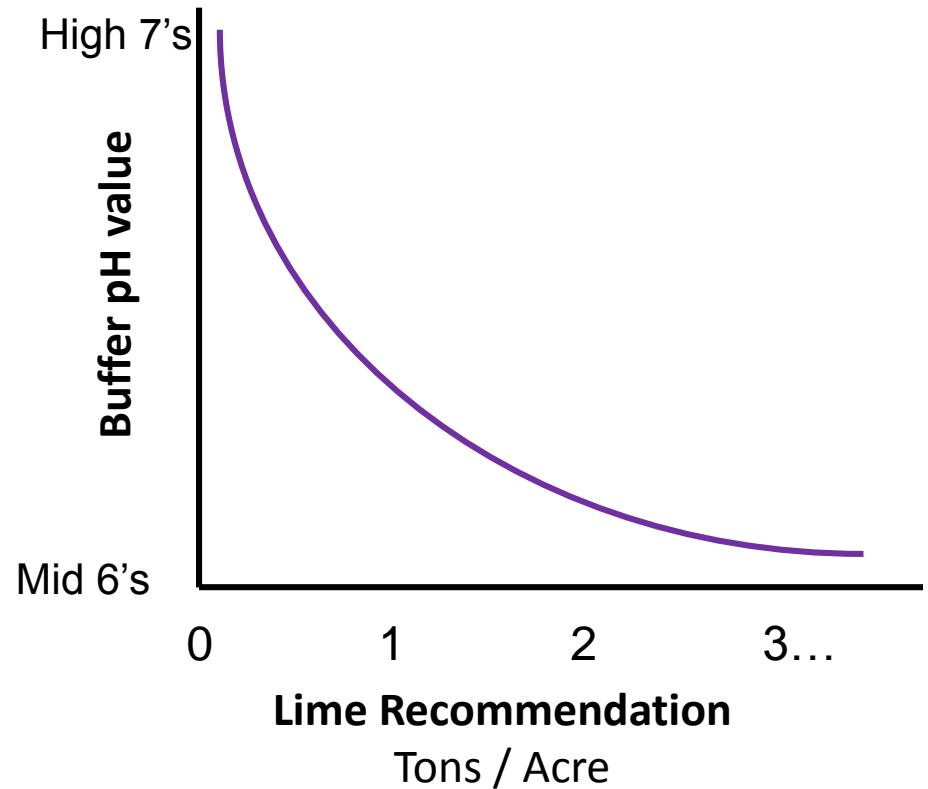
Blueberries: 4.8 to 5.5

Blackberries, strawberries: 5.6

Lawn, trees, roses: 6.1

Alfalfa: 6.4

**Buffer pH**  
(How hard the journey is to get there)



# Report Explanation

RECOMMENDATIONS-Fertilizer/Lime Applications and Rates									
Lab Number	Farm ID	Sample Number	Crop	(N)	(P2O5)	K2O	Application Rate	Limestone	Application Rate
550671		12878	Home Blueberries	-	-	-	pounds per 100 sq. feet	0	
550671		12878	Home Raspberries	-	-	-	pounds per 100 feet of row	10	pounds per 100 square feet
550671		12878	Home Garden Brambles	-	-	-	pounds per 100 feet of row	10	pounds per 100 square feet
550671		12878	Sweet Corn	90	0	50	pounds per acre	2	tons per acre
550672		121115	Vegetable Garden	-	-	-	pounds per 1,000 square feet	0	pounds per 1000 square feet
550672		121115	Peas, Southern	0-30	0	0	pounds per acre	0	tons per acre
550672		121115	Peppers	50	0	0	pounds per acre	0	tons per acre
550672		121115	Tomatoes	60	0	0	pounds per acre	0	tons per acre



# Liming

## Timing

Sooner the better

May take a year to fully react with the soil

## Incorporation

If possible incorporate.

Lime effectively won't work its way beyond 2-3" if not incorporated.

## Rate

Lime is given in pounds as 65% Relative Neutralizing Value (RNV)

65% RNV is state minimum to be a "Lime"

If RNV is greater than 65% then less product is needed.

If report calls for 2 Ton of 65% RNV lime per acre, but you have 90% RNV

Then you could use 1.44 Ton 90% RNV per acre

$$2 \text{ Ton} \times (65/90) = 1.44 \text{ Ton of 90\% RNV lime}$$

# Report Explanation

## Mehlich 1 SOIL TEST RESULTS and RATINGS\*

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Lab Number	Farm ID	Sample Number	S	Nitrogen		C	C/N	Organic Matter	Soluble Salts	Texture			
			LBS/ACRE	NO3-N ppm	Total N %	%	%	%	ppm	Sand	Silt	Clay	Soil Texture
550671		Bio - Pond						2.3		20	60	20	Silt Loam
550672		Turf											

# Report Explanation

## Nutrient Interpretations

### Phosphorus (P) and Potassium (K)

<b>Index</b>	<b>P</b>	<b>K</b>	<b>K Cotton</b>
	<b>Lbs. / acre</b>		
Low (L)	< 18	< 90	<140
Medium (M)	18 to 30	90 to 160	141 to 280
High (H)	> 30	> 160	>281
Very High (V)	> 120	> 320	>320

# Report Explanation

## Secondary and Micro-nutrients

**Sulfur** - All crops but bio-fuels and tobacco. Recommendation on coarse textured subsoil, or where deficiencies have been observed.

Tobacco does have a potassium sulfate recommendation

**Boron** - All crops, but cotton, when soil test B < 0.8 lbs. per acre  
Cotton has B recommendation when pH > 6 or when lime is used.

**Manganese** – Soybeans when pH > 7 and soil test Mn is less than 16 lbs. per acre.

**Zinc** – Corn when soil test Zn < 2 lbs per acre.

# Report Explanation

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Lab Number	Farm ID	Sample Number	Crop	N	P2O5	K2O	Application Rate	Limestone	Application Rate
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550672		121115	Peppers	50	0	0	pounds per acre	0	tons per acre
550672		121115	Tomatoes	60	0	0	pounds per acre	0	tons per acre

Don't forget to credit nutrients from multiple fertilizer sources

# Report Explanation

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# Pre-Sideress Nitrate Testing

<b>125 to 175 bu / acre yield history</b>	
ppm N-NO3	
< 17	Low
17 to 24	Medium
25 +	High

<b>175 + bu / acre yield history</b>	
ppm N-NO3	
< 35	Low
35 to 46	Medium
47 +	High

Not recommended to use on fields with banded N before sampling

Do not let wet samples sit in a hot truck or trunk!

# Plant Tissue

Nitrogen only \$15

Minerals only \$20

Nitrogen + Mineral \$33



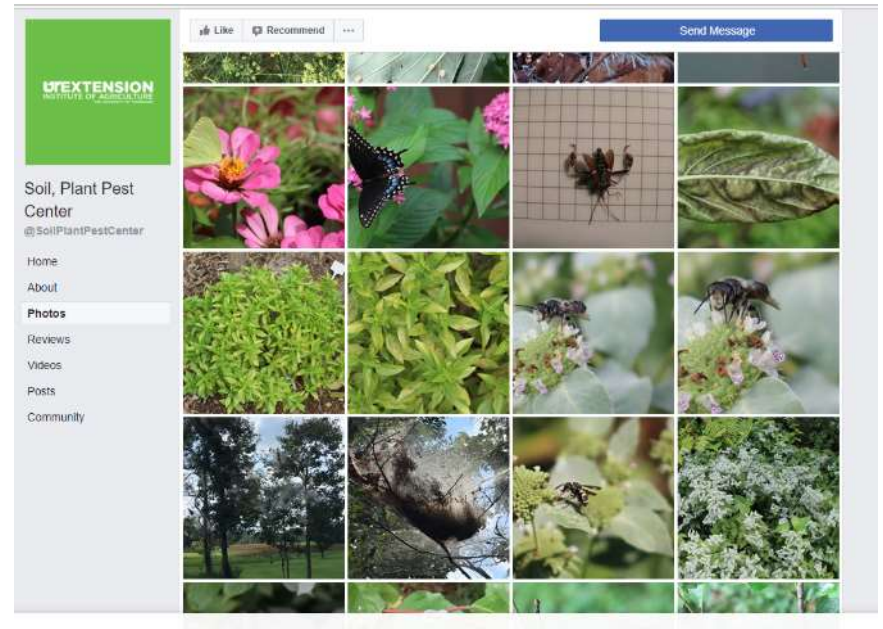
Sampling the right **part** at right **stage** is very important



# Plant Disease, and Insect Samples



Bruce Kauffman, Diagnostician



**Facebook Page**  
Dr. Alan Windham

# Contact

RobertF@utk.edu

615-835-4564

@Rocky\_TopSoil

[SoilPlantAndPest.utk.edu](http://SoilPlantAndPest.utk.edu)