



## Heavy Metals

## Soil Report

Mehlich-3 Extraction

**Client:** Bobby Stallings  
7132 Hidden Valley Trail  
GARNER, NC 27529

**Advisor:** Everett Coates  
Wake County Septage  
PO Box 550  
Raleigh, NC 27602

Sampled County : Wake

Sampled: 09/30/2013 Received: 10/31/2013 Completed: 11/07/2013 Farm:

[Links to Helpful Information](#)

## Agronomist's Comments:

This report contains both routine soil test information as well as heavy metals data in a section labeled as Heavy Metals under soil test lab results. Using Mehlich 3 as a soil test extractant, background levels of these metals typically seen in NC soils when analyzed are as follows: arsenic (As)- 4.5 ppm, cadmium (Cd)- 0.1 ppm, chromium (Cr)- 0.2 ppm, lead (Pb)- 4.2 ppm, nickel (Ni)- 0.8 ppm, & selenium (Se)- 0.2 ppm (FY2005-2007). Although the above metals here are not believed to pose a concern for plant growth, continue to monitor these and note where elevated above background levels. This report was flagged with a "C" and/or "Z" to alert you that copper and/or zinc have accumulated in the soil and are approaching a level that could be detrimental to crop production. The C and Z symbols are printed on your report for soil test index levels of 2000 or more; for peanuts with zinc, the level is 300. This note is designed to be a "trigger" that allows enough time to either reduce the rate of application or find another field for application of biosolids and/or waste water. The CTL (critical toxic level) for Cu & Zn has been set at 3000 index; for peanuts with zinc, the level is 500. These levels are used by DENR as a benchmark to determine when application of waste products should be stopped. The CTL for copper and zinc was set to prevent levels from accumulating to the point where they become toxic to crops grown on a field. Note any lime and fertilizer recommendations. Jagathi Kamalakanthan 11/7/2013

Sample ID: 001	Recommendations: Crop	Lime (tons/acre)	Nutrients (lb/acre)									More Information
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Mg	S	Mn	Zn	Cu	B	
Lime History:	1 - Bermuda hay/past., M	0.0	180-220	0	120	0	0	pH\$	Z	0	0	<a href="#">Note: 12</a> <a href="#">Note: \$</a>
	2 - Small Grain (SG)	0.0	80-100	0	50	0	0	pH\$	Z	0	0	

Test Results [units - W/V in g/cm<sup>3</sup>; CEC and Na in meq/100 cm<sup>3</sup>; NO<sub>3</sub>-N in mg/dm<sup>3</sup>]:

Soil Class: Mineral

HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	S-I	Mn-I	Mn-Al1	Mn-Al2	Zn-I	Zn-Al	Cu-I	Na	ESP	SS-I	NO <sub>3</sub> -N
0.27	1.10	35.9	100	0.0	7.3	397	45	95	4	74	70	39	32	4533	4533	2375	0.2	1		

Heavy Metals (parts per million): Arsenic, 0.2 Cadmium, 0.2 Nickel, 0.7 Chromium, 0.1 Lead, 3.5 Selenium, 0.2

Sample ID: 002	Recommendations: Crop	Lime (tons/acre)	Nutrients (lb/acre)									More Information
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	Mg	S	Mn	Zn	Cu	B	
Lime History:	1 - Bermuda hay/past., M	0.0	180-220	0	180	25	0	pH\$	0	0	0	<a href="#">Note: 12</a> <a href="#">Note: \$</a>
	2 - Small Grain (SG)	0.0	80-100	0	100	\$	0	pH\$	0	0	0	

Test Results [units - W/V in g/cm<sup>3</sup>; CEC and Na in meq/100 cm<sup>3</sup>; NO<sub>3</sub>-N in mg/dm<sup>3</sup>]:

Soil Class: Mineral

HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	S-I	Mn-I	Mn-Al1	Mn-Al2	Zn-I	Zn-Al	Cu-I	Na	ESP	SS-I	NO <sub>3</sub> -N
0.22	1.39	8.0	100	0.0	7.4	233	22	94	5	41	121	68	61	864	864	468	0.1	1		

Heavy Metals (parts per million): Arsenic, 0.3 Cadmium, 0.1 Nickel, 0.3 Chromium, 0.3 Lead, 5.2 Selenium, 0.0



Reprogramming of the laboratory-information-management system that makes this report possible is being funded through a grant from the North Carolina Tobacco Trust Fund Commission.

Thank you for using agronomic services to manage nutrients and safeguard environmental quality.

- Steve Troxler, Commissioner of Agriculture

Bobby Stallings

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**Understanding the Soil Report: explanation of measurements, abbreviations and units****Recommendations**Lime

If testing finds that soil pH is too low for the crop(s) indicated, a **lime recommendation** will be given in units of either ton/acre or lb/1000 sq ft. For best results, mix the lime into the top 6 to 8 inches of soil several months before planting. For no-till or established plantings where this is not possible, apply no more than 1 to 1.5 ton/acre (50 lb/1000 sq ft) at one time, even if the report recommends more. You can apply the rest in similar increments every six months until the full rate is applied. If MG is recommended and lime is needed, use dolomitic lime.

Fertilizer

Recommendations **for field crops or other large areas** are listed separately for each nutrient to be added (in units of lb/acre unless otherwise specified). Recommendations for N (and sometimes for B) are based on research/field studies for the crop being grown, not on soil test results. K-I and P-I values are based on test results and should be > 50. If they are not, follow the fertilizer recommendations given. If Mg is needed and no lime is recommended, 0-0-22 (11.5% Mg) is an excellent source; 175 to 250 lb per acre alone or in a fertilizer blend will usually satisfy crop needs, SS-I levels appear only on reports for greenhouse soil or problem samples.

Farmers and other commercial producers should pay special attention to **micronutrient levels**. If \$, pH\$, \$pH, C or Z notations appear on the soil report, refer to [\\$Note: Secondary Nutrients and Micronutrients](#). In general, homeowners do not need to be concerned about micronutrients. Various crop notes also address lime fertilizer needs; visit [ncagr.gov/agronomi/pubs.htm](http://ncagr.gov/agronomi/pubs.htm).

Recommendations **for small areas, such as home lawns/gardens**, are listed in units of lb/1000 sq ft. If you cannot find the exact fertilizer grade recommended on the report, visit [www.ncagr.gov/agronomi/obpart4.htm#fs](http://www.ncagr.gov/agronomi/obpart4.htm#fs) to find information that may help you choose a comparable alternate. For more information, read [A Homeowner's Guide to Fertilizer](#).

**Test Results**

The first seven values [soil class, HM%, W/V, CEC, BS%, Ac and pH] describe the soil and its degree of acidity. The remaining 16 [P-I, K-I, Ca%, Mg%, Mn-I, Mn-AI1, Mn-AI2, Zn-I, Zn-AI, Cu-I, S-I, SS-I, Na, ESP, SS-I, NO<sub>3</sub>-N (not routinely available)] indicate levels of plant nutrients or other fertility measurement. Visit [www.ncagr.gov/agronomi/uyrst.htm](http://www.ncagr.gov/agronomi/uyrst.htm) for more information.

**Report Abbreviations**

<b>Ac</b>	exchangeable acidity
<b>B</b>	boron
<b>BS%</b>	% CEC occupied by basic cations
<b>Ca%</b>	% CEC occupied by calcium
<b>CEC</b>	cation exchange capacity
<b>Cu-I</b>	copper index
<b>ESP</b>	exchangeable sodium percent
<b>HM%</b>	percent humic matter
<b>K-I</b>	potassium index
<b>K<sub>2</sub>O</b>	potash
<b>Mg%</b>	% CEC occupied by magnesium
<b>MIN</b>	mineral soil class
<b>Mn</b>	manganese
<b>Mn-AI1</b>	Mn-availability index for crop 1
<b>Mn-AI2</b>	Mn-availability index for crop 2
<b>Mn-I</b>	manganese index
<b>M-O</b>	mineral-organic soil class
<b>N</b>	nitrogen
<b>Na</b>	sodium
<b>NO<sub>3</sub>-N</b>	nitrate nitrogen
<b>ORG</b>	organic soil class
<b>pH</b>	current soil pH
<b>P-I</b>	phosphorus index
<b>P<sub>2</sub>O<sub>5</sub></b>	phosphate
<b>S-I</b>	sulfur index
<b>SS-I</b>	soluble salt index
<b>W/V</b>	weight per volume
<b>Zn-AI</b>	zinc availability index
<b>Zn-I</b>	zinc index