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)9044-3136

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197

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

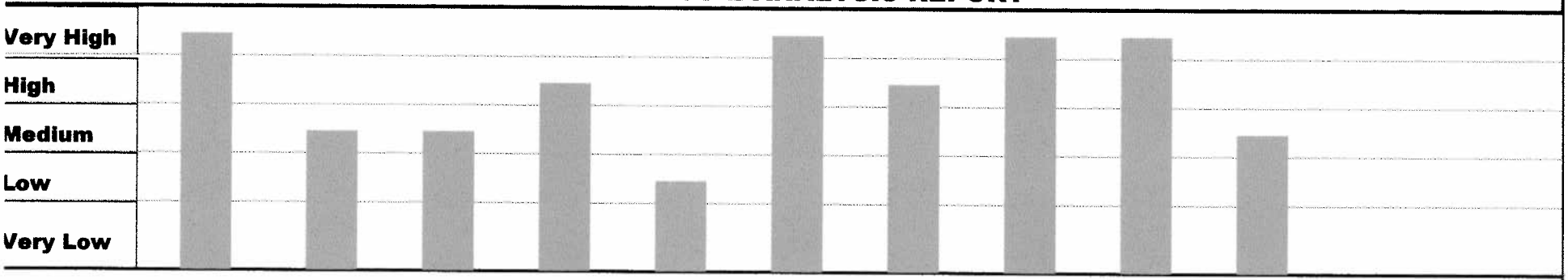
Send To: NATIONAL PARK SERVICE
1100 OHIO DR SW
ROOM 344
WASHINGTON, DC 20242

Grower: JAMES PILKERTON

Submitted By: JAMES PILKERTON

:ample Number: PRPA1 **Lab Number:** 11868 **Date Received:** 2/13/2009 **Date Reported:** 2/17/2009

GRAPHIC SOIL ANALYSIS REPORT



TEST RESULTS	P	K	Mg	Ca	S	Zn	Mn	Fe	Cu	B	Na	Soluble Salts
	Phosphorus	Potassium	Magnesium	Calcium	Sulfur	Zinc	Manganese	Iron	Copper	Boron	Sodium	
ppm	174	151	190	1800	12	10.1	44	395	5.4	0.6		

pH	ACIDITY	C.E.C.	PERCENT BASE SATURATION					ORGANIC MATTER	NITRATE	CHLORIDE	Aluminum		ENR
Soil pH	H meq/100g	meq/100g	K %	Mg %	Ca %	Na %	H %	%	NO3-N ppm	Cl ppm	Al ppm		lbs/A
6.2	1.5	12.5	3.1	12.7	72.1		12.1	1.6					64

CROP	YIELD GOAL	SOIL FERTILITY RECOMMENDATIONS - POUNDS PER 1,000 SQUARE FEET											
		Lime	N Nitrogen	P2O5 Phosphate	K2O Potash	Mg Magnesium	S Sulfur	Zn Zinc	Mn Manganese	Fe Iron	Cu Copper	B Boron	
:arden		0.0	1.5	0.5	2.5	0.00	0.58	0.00	0.00	0.00	0.00	0.03	

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ample Number: PRPA1 **Lab Number:** 11868 **Date Received:** 2/13/2009 **Date Reported:** 2/17/2009

Comments:

ample PRPA1: For more in depth explanation, go to our website www.al-labs-eastern.com and select the "Lawn and Garden" tab at the top of me page. At the bottom of the "Lawn and Garden" page, you find information explaining a soil test report and fertilizer recommendations. tp://al-labs-eastern.com/forms/LawnGardenSoilTestExplained.pdf

ample PRPA1: Phosphate is more efficient if applied near the plant, apply all phosphate beside the row. Broadcast N and/or K2O then mix into e soil. If there is no fertilizer meets the ratio, you can use single element fertilizer such as Urea, Triplesuper Phosphate and Muriate of Potash to hieve the requirements. Consult the enclosed instruction sheet on lime and fertilizer application.

ample PRPA1: Most vegetable crops need additional N about one month after emergence or transplanting. Sidedress 1.5-2.5 pounds of N for een leafy vegetables, tomatoes, peppers, sweet corn, etc., and 0.5-1.5 pounds of N for peas, beans, melons, cucumbers, carrots, root crops, etc. n tomatoes do not apply additional N until first fruit set are the size of a half dollar, two applications may be needed for long season varieties.

ample PRPA1: All recommended fertilizers are on actual elemental basis. To convert to product basis, divide the recommended quantity in the st page by the percentage of the active ingredient then multiply by 100.

ample PRPA1: Use Ammonium Sulfate as N source to supply sulfur.

ample PRPA1: Broadcast boron using Borax and mix into the soil to raise boron level. Note boron should not be applied in the band near the ant.

Paul Chu, Ph.D.

Report Number:
R09044-0136
Acount Number:
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Grower:JAMES PILKERTON

Submitted By:JAMES PILKERTON

ATTN: JAMES PILKERTON

Date Received: 2/13/09 **Date Reported:** 02/19/2009

REPORT OF ANALYSIS

LAB NO.	SAMPLE ID	ANALYSIS	RESULT	UNIT	METHOD
11868	PRPA1	Arsenic	7.3	mg/kg	SW 846-3051/6010B
		Cadmium	< 1	mg/kg	SW 846-3051/6010B
		Lead	93	mg/kg	SW 846-3051/6010B
		Mercury	0.6	mg/kg	SW 846-3051/6010B

Heavy metal interpretation available at www.al-labs-eastern.com. Go to "Lawn & Garden" tab at top of web home page.
At bottom of "Lawn&Garden" web page, click Heavy Metal Interpretation for Garden.

Paul Chu, Ph.D.

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INTERPRETING SOIL HEAVY METALS

INTRODUCTION

Soils normally contain low background levels of heavy metals. Excessive levels of heavy metals can be hazardous to man, animals and plants. Heavy metals regulated by the EPA are arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), nickel (Ni), selenium (Se), and Zinc (Zn). Information about typical sources of heavy metals and safe soil levels are provided below:

ARSENIC (As)

Component in manufacture of bronze materials, fireworks, ammunition, agricultural chemicals, laser materials, glass, semiconductor materials, wood preservatives, copper and lead alloys and insecticides (most of which are obsolete)

CADMIUM (Cd)

Component in manufacture of solder, electrical supplies, batteries, barriers to control nuclear fission, anticorrosive coatings for metals, bearing alloys, amalgam in dentistry and worm treatments for swine and poultry. Regular consumption of plants containing 3.0 ppm Cd can poison man and animals. It interferes with enzymes and other proteins. In livestock, it accumulates in the kidneys, spleen and liver. In humans, Cd interferes with the metabolism of calcium and phosphorus, causing a painful bone disease.

LEAD (Pb)

Component in manufacture of older paints, older plumbing hardware, ammunition, solder, metals, storage batteries, sound and vibration absorbers, lead gasoline, obsolete insecticides (lead arsenate), lead crystal and flint glass. Pb can cause health problems, particularly in children. It accumulates in the body and can build to toxic levels under continuous exposure. Concerns about Pb poisoning resulted in the elimination of Pb from gasoline, paint and plumbing lines.

NICKEL (Ni)

Component in manufacture of stainless steel, other corrosion-resistant alloys, coins, nickel steel for armor plates, burglarproof vaults, vegetable oils, ceramics and greenish glass, Al-Ni-Co magnets and Ni-Cd batteries. Plants containing more than 100 ppm Ni develop symptoms of toxicity. Toxicity in grasses or other monocots closely resembles iron deficiency.

SELENIUM (Se)

Essential nutrient in animal nutrition; component of dandruff shampoos and fungal infection treatments; used in manufacture of ruby-colored glasses and enamels, photoelectric cells, resistors, photographic emulsions, stainless steel, pigments, rubber, metal alloys, textiles, petroleum and medical therapeutic agents. Se benefits crop production and is essential to animal nutrition. Deficiency causes muscular dystrophy in livestock, known as "white muscle disease," and loss of hair.

ZINC (Zn) & COPPER (Cu)

Cu—Component in metal alloys, electrical wiring, some water pipes, preservatives for wood, leather and fabrics; and some agricultural fungicides. Zn—Widely used in industry to make dye, paint, rubber, wood preservatives and ointments. Cu and Zn are essential plant micronutrients. However, at high levels, they may be toxic to plants.

Table 1. Typical and unsafe heavy metal soil levels.

Heavy Metal	Typical Background Levels for Non-Contaminated Soil	[1]Unsafe for Leafy or Root Vegetables	[1]Unsafe for Gardens and Children Contact
Arsenic	3 to 12 ppm	>50 ppm	>200 ppm
Cadmium	0.1 to 1.0 ppm	>10 ppm	>50 ppm
Copper	1 to 50 ppm	>200 ppm	>500 ppm
Lead	10 to 70 ppm	>500 ppm	>1,000 ppm
Nickel	0.5 to 50 ppm	>200 ppm	>500 ppm
Selenium	0.1 to 3.9 ppm	>50 ppm	>200 ppm
Zinc	9 to 125 ppm	>200 ppm	>500 ppm

[1] Unsafe levels are general guidelines; actual toxicity will be affected by soil texture, organic matter, and pH.