



# 2003 North American Proficiency Testing Program

## 3<sup>rd</sup> Quarter Report November 14, 2003

Laboratory ID

Soil	Soil 2003-111	Soil 2003-112	Soil 2003-113	Soil 2003-114	Soil 2003-115									
Analysis	Units	n	Median	MAD	Lab <sup>1</sup>	Median	MAD	Lab	Median	MAD	Lab	Median	MAD	Lab
<b>Salinity-SP</b>														
Sat. Paste Moisture	%	29	30.3	2.3	27.8	2.9	29.0	2.6	31.0	4.8	35.1	1.9		
pH - sp	Unit	35	5.92	0.14	6.27	0.13	7.34	0.14	5.80	0.10	6.60	0.13		
Ece - sp	ds/m	40	0.36	0.05	1.34	0.15	2.38	0.22	0.93	0.18	0.45	0.09		
HCO <sub>3</sub> - sp	mmol/L	15	0.87	0.46	0.75	0.35	1.32	0.49	0.97	0.57	3.32	0.56		
Ca - sp	mmol/L	30	1.52	0.30	7.75	1.15	19.4	3.1	2.97	0.54	2.73	0.51		
Mg - sp	mmol/L	30	0.59	0.17	4.50	0.60	3.5	0.57	2.13	0.27	1.90	0.40		
Na - sp	mmol/L	32	0.75	0.25	0.81	0.30	0.80	0.23	0.59	0.29	0.50	0.24		
SAR - sp	value	26	0.75	0.25	0.32	0.12	0.21	0.07	0.39	0.17	0.39	0.19		
Cl - sp	mmol/L	21	0.99	0.13	0.35	0.16	0.52	0.12	0.50	0.12	0.44	0.08		
SO <sub>4</sub> - sp	mmol/L	20	0.78	0.18	1.14	0.28	2.1	0.33	0.49	0.12	0.60	0.20		
NO <sub>3</sub> - sp	mmol/L	9	0.30	0.17	9.46	2.14	20.1	3.00	5.54	1.44	0.08	0.06		
B - sp	mg/L	17	0.12	0.02	0.10	0.02	0.08	0.02	0.26	0.05	0.10	0.01		
<b>Soil EC</b>														
Soil EC (1:1)	(dS/m)	37	0.15	0.03	0.40	0.07	0.60	0.16	0.39	0.06	0.19	0.03		
Soil EC (1:2)	(dS/m)	47	0.09	0.03	0.24	0.03	0.46	0.05	0.22	0.03	0.10	0.03		
<b>Soil pH</b>														
pH (1:1)	Unit	92	6.20	0.10	6.48	0.08	7.60	0.10	6.10	0.10	6.83	0.07		
pH (1:2)	Unit	31	6.33	0.08	6.57	0.08	7.66	0.14	6.30	0.17	6.90	0.10		
pH (1:1) 0.01M CaCl <sub>2</sub>	Unit	20	5.56	0.11	6.10	0.07	7.30	0.07	5.62	0.09	6.30	0.04		
pH (1:2) 0.01M CaCl <sub>2</sub>	Unit	15	5.56	0.06	6.15	0.05	7.40	0.05	5.67	0.07	6.30	0.04		
<b>Buffer pH</b>														
SMP Buffer pH	Unit	65	7.10	0.06	7.04	0.06	7.48	0.06	7.04	0.06	7.20	0.06		
Adams-Evans Buf pH	Unit	14	7.79	0.05	7.67	0.05	7.88	0.05	7.66	0.05	7.73	0.05		
Woodruff Buf. pH	Unit	20	6.80	0.05	6.82	0.04	7.10	0.06	6.77	0.04	6.90	0.06		
Mehlich Buf. pH	Unit	5	6.34	0.04	6.30	0.03	6.80	0.04	6.24	0.04	6.42	0.05		
Titrateable Acidity	cmol/kg	2	2.5	2.4	0.2	0.00	0.61	0.00	3.2	3.2	0.40	0.00		

1 - Values flagged exceed Warning Limits " \* " 2.5 x MAD (Median Absolute Deviation) and Control Limits " \* \* " 4 x MAD. " < " and " ND " values not recorded.

Soil	Soil 2003-111	Soil 2003-112	Soil 2003-113	Soil 2003-114	Soil 2003-115							
Analysis	Units	n	Median	MAD	Lab <sup>1</sup>	Median	MAD	Lab	Median	MAD	Lab	
<b>Nitrate (NO<sub>3</sub>-N)</b>												
Cd. Rd.	mg/kg	58	5.3	0.6	45.5	4.4	94.7	8.1	32.3	3.0	2.4	1.0
ISE	mg/kg	25	6.4	1.4	45.8	6.6	87.9	18.1	32.5	4.0	3.7	1.0
CTA	mg/kg	6	6.0	1.0	43.8	2.2	95.0	12.5	28.6	2.2	3.3	1.0
Ion Chromatography	mg/kg	2	2.6	2.5	42.4	8.9	87.5	13.7	92.0	55.0	2.8	0.8
Other	mg/kg	9	5.7	1.5	50.0	5.4	104	7.4	37.0	6.4	2.6	1.4
NH <sub>4</sub> - N (KCl Extr.)	mg/kg	51	12.4	1.4	17.0	2.0	1.1	1.0	1.6	1.0	5.0	1.0
Amino-N (Mulvaney)	mg/kg	4	105	14.0	239	22	224	7.5	121	4.0	134	4.5
<b>Phosphorus &amp; Sulfur</b>												
PO <sub>4</sub> -P Bray P1 (1:10)	mg/kg	57	38.0	4.0	25.0	2.5	52.0	7.9	55.0	5.5	31.0	3.0
PO <sub>4</sub> -P Bray P1 (1:7)	mg/kg	13	34.0	3.5	20.0	4.5	38	7.0	46.0	8.0	26.8	4.8
PO <sub>4</sub> -P Olsen/Bicarb	mg/kg	62	20.1	2.1	14.0	2.0	24.0	4.0	28.4	2.8	15.0	1.1
PO <sub>4</sub> -P AB-DTPA	mg/kg	1	3.6	-	16.2	-	152	-	0.0	-	157	-
PO <sub>4</sub> -P M. Morgan	mg/kg	8	5.9	0.9	6.4	1.2	29	1.7	10.9	1.9	5.7	0.9
PO <sub>4</sub> -P M. Kewlona	mg/kg	4	27.5	0.5	18.0	0.0	46	1.5	41	4.0	22.5	0.5
PO <sub>4</sub> -P Strg Bray P-2	mg/kg	10	65	6.4	41	2.4	111	10.5	109.6	14.0	94	9.6
PO <sub>4</sub> -P Water Soluble	mg/kg	1	3.8	-	2.9	-	5.4	-	10.2	-	4.5	-
SO <sub>4</sub> -S (PO <sub>4</sub> Extr.)	mg/kg	41	4.6	1.6	7.2	1.3	14	2.5	4.4	2.0	4.0	1.2
<b>Ammonium Ace. Bases</b>												
K	mg/kg	94	332	22	127	11	202	18	1120	94	244	17
Ca	mg/kg	86	1089	89	2184	190	3174	412	1445	109	1811	109
Mg	mg/kg	87	147	16	420	43.1	170	19	479	42	529	33
Na	mg/kg	71	17	5.0	16	4.8	18	5.0	15	5	16	5.0
K - Bray (1:10)	mg/kg	4	274	13	103	8	160	23	826	63.0	197	15.5
K - Bicarb.	mg/kg	8	303	15	99	19	185	19	843	46	201	20
K - Modified Morgan	mg/kg	6	274	36	97	18	172	23	867	208	184	32
Ca Modified Morgan	mg/kg	4	1024	64	1954	87	3712	185	1430	135	1658	60
Al KCL Extr.	mg/kg	5	0.28	0.44	0.12	0.50	0.19	0.50	0.19	0.50	0.32	0.50

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Soil	Soil 2003-111	Soil 2003-112	Soil 2003-113	Soil 2003-114	Soil 2003-115									
Analysis	Units	n	Median	MAD	Lab <sup>1</sup>	Median	MAD	Lab	Median	MAD	Lab	Median	MAD	Lab
<b>Mehlich-1 Multi Element</b>														
Soil Scoop Mass	g	12	4.95	0.16	5.13	0.22	4.41	0.59	4.69	0.31	5.03	0.17		
P	mg/kg	12	41.5	4.1	23	2.2	57.5	11.1	81.5	9.3	86.2	9.3		
K	mg/kg	12	224	20.8	71	6.4	135	16	639	43	154	11		
Ca	mg/kg	12	858	63	2123	101	4112	443	1045	60	1558	112		
Mg	mg/kg	12	115	9	368	28	179	20	341	32.7	436	28		
Mn	mg/kg	12	58.3	4.3	43.5	6.5	14.0	2.2	16.8	2.2	37.6	2.2		
Zn	mg/kg	12	0.72	0.04	4.40	0.31	2.41	0.44	0.50	0.16	0.92	0.12		
<b>Mehlich-3 Multi-Element</b>														
Soil Scoop Mass	g	32	2.11	0.47	2.41	0.41	2.04	0.38	2.15	0.33	2.24	0.49		
Scoop Volume	ml	18	1.10	0.10	1.18	0.07	1.00	0.12	1.07	0.09	1.18	0.07		
<b>P Colorimetric</b>														
P	mg/kg	21	39.8	1.8	26.0	2.0	56.0	10.0	51.0	4.5	32.1	2.9		
<b>P ICP</b>														
P	mg/kg	40	45.0	3.0	32.0	3.0	80.5	7.2	59.0	7.7	35.6	2.4		
K	mg/kg	52	332	21	125	12.1	218	22.0	1102	80	258	17		
Ca	mg/kg	51	1115	78	2528	231	3866	458	1452	135	2007	199		
Mg	mg/kg	51	150	17	470	43.0	196	24.3	490	45	587	58.0		
Na	mg/kg	32	16	5.5	18	4.0	19	6.3	14	5.0	18	5.6		
S	mg/kg	26	9.9	1.9	16.0	3.5	25	3	9.1	3.0	10.6	2.6		
Al	mg/kg	23	495	55	588	71	530	51	520	52	496	36		
Zn	mg/kg	42	1.25	0.23	6.20	0.90	3.6	0.48	0.93	0.29	1.50	0.18		
Mn	mg/kg	40	81	7.8	156.0	22.5	79	13.8	80	15.9	88	13		
Fe	mg/kg	38	185	31.6	101	18	87	13.5	63	11.9	83	12.0		
Cu	mg/kg	41	1.08	0.27	1.50	0.31	1.9	0.24	1.12	0.30	1.70	0.27		
B	mg/kg	35	0.37	0.24	0.70	0.20	1.20	0.28	0.68	0.21	0.67	0.14		

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<b>Analysis</b>	<b>Units</b>	<b>n</b>	<b>Median</b>	<b>MAD</b>	<b>Lab<sup>1</sup></b>	<b>Median</b>	<b>MAD</b>	<b>Lab</b>	<b>Median</b>	<b>MAD</b>	<b>Lab</b>					
<b>Micronutrients</b>																
Zn - DTPA	mg/kg	77	0.45	0.05		2.95	0.35		0.91	0.21		0.30	0.07		0.65	0.06
Mn - DTPA	mg/kg	67	60.0	4.9		32.5	6.8		1.4	0.7		22.2	4.2		25.3	2.5
Fe - DTPA	mg/kg	70	42.1	5.9		19.2	3.15		8.3	2.25		15.2	2.4		15.9	1.9
Cu - DTPA	mg/kg	70	0.62	0.11		0.40	0.10		0.28	0.08		0.57	0.12		0.90	0.10
Zn - HCl	mg/kg	7	1.21	0.21		6.00	0.80		3.7	0.30		1.01	0.17		1.80	0.37
Mn-H <sub>3</sub> PO <sub>4</sub>	mg/kg	8	47.8	3.8		35.6	1.8		9.0	1.4		15.8	2.95		23.3	1.7
Cl - Ca(NO <sub>3</sub> ) <sub>2</sub> Extr.	mg/kg	24	8.6	1.5		2.9	1.2		5.0	1.3		4.4	1.6		4.7	1.4
B - Hot Water	mg/kg	50	0.30	0.10		0.56	0.15		0.52	0.18		0.85	0.24		0.54	0.15
B - DTPA-Sorb	mg/kg	14	0.19	0.09		0.27	0.07		0.36	0.09		0.32	0.12		0.31	0.09
<b>Soil Organic Matter</b>																
Soil Kjeldahl N	%	24	0.062	0.008		0.160	0.012		0.184	0.016		0.106	0.010		0.101	0.007
Soil TN (combustion)	%	34	0.061	0.009		0.160	0.010		0.181	0.019		0.109	0.009		0.101	0.009
Soil TOC (combustion)	%	27	0.59	0.03		1.84	0.07		2.21	0.08		0.94	0.04		1.12	0.04
SOM - Walkley-Black	%	53	1.05	0.11		3.17	0.26		3.71	0.29		1.63	0.17		2.10	0.20
SOM - LOI (Raw Values)	%	67	1.30	0.10		3.35	0.21		3.75	0.25		2.20	0.19		2.37	0.17
CaCO <sub>3</sub> Content	%	12	0.35	0.34		0.25	0.19		0.72	0.39		0.20	0.10		0.35	0.28
CEC - Displacement	cmol/kg	27	9.0	0.76		15.5	1.1		15.4	1.60		15.7	1.6		14.3	1.10
- Estimation	cmol/kg	8	8.5	0.85		14.8	0.88		18.9	2.1		15.7	1.4		14.4	0.6
Scoop Density	mg/cm <sup>3</sup>	8	1.32	0.08		1.42	0.08		1.28	0.06		1.30	0.05		1.34	0.06
<b>Particle Size Analysis</b>																
Sand 2000 - 50 um	%	45	38.3	4.3		56.0	3.0		62.3	2.3		30.5	3.5		49.9	2.4
Silt 50 - 2 um	%	45	48.6	4.3		25.8	3.0		27.5	2.5		46.0	3.0		32.7	2.1
Clay 2 - 0 um	%	45	12.6	1.7		18.4	2.4		10.0	2.1		22.5	3.5		17.3	2.5

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