



## 2012 North American Proficiency Testing Program 2nd Quarter Report - July 31, 2012

Laboratory ID  
**General**

Soil Analysis	Units	n	Soil 2012-106			Soil 2012-107			Soil 2012-108			Soil 2012-109			Soil 2012-110		
			Median	MAD	Lab <sup>1,2</sup>	Median	MAD	Lab <sup>1,2</sup>	Median	MAD	Lab <sup>1,2</sup>	Median	MAD	Lab <sup>1,2</sup>	Median	MAD	Lab <sup>1,2</sup>
<b>Salinity</b>																	
Sat. Paste Moisture	%	27	26.5	2.20		42.4	2.23		38.9	2.75		49.0	2.06		37.0	1.98	
pH - sp	Unit	33	5.03	0.100		5.32	0.105		7.20	0.110		7.43	0.100		5.92	0.120	
ECe - sp	dS/m	32	1.24	0.105		1.60	0.067		1.33	0.125		2.45	0.145		0.700	0.125	
HCO <sub>3</sub> - sp	mmol/L	8	0.500	0.106		0.400	0.060		3.06	0.492		3.07	0.312		2.20	0.305	
Ca - sp	mmol/L	27	6.90	0.750		5.57	0.505		6.21	0.317		13.5	0.950		1.85	0.710	
Mg - sp	mmol/L	27	2.92	0.220		3.34	0.230		4.85	0.420		6.64	0.430		1.19	0.299	
Na - sp	mmol/L	27	0.350	0.074		3.24	0.195		1.22	0.190		4.70	0.380		3.56	0.560	
SAR - sp	value	27	0.185	0.028		1.57	0.085		0.510	0.085		1.49	0.090		2.80	0.300	
Cl - sp	mmol/L	15	0.165	0.016		0.574	0.050		1.24	0.085		1.78	0.120		2.32	0.330	
SO <sub>4</sub> - sp	mmol/L	17	0.470	0.096		0.610	0.090		2.69	0.230		2.85	0.250		1.73	0.240	
NO <sub>3</sub> - sp	mmol/L	13	9.64	0.890		12.3	0.835		5.26	1.05		16.3	2.05		0.060	0.020	
B - sp	mg/L	12	0.100	0.013		0.123	0.023		0.100	0.020		0.150	0.030		0.144	0.031	
<b>Soil pH &amp; EC</b>																	
Soil EC (1:1)	(dS/m)	36	0.240	0.016		0.525	0.075		0.480	0.080		0.920	0.130		0.300	0.040	
Soil EC (1:2)	(dS/m)	45	0.201	0.019		0.350	0.038		0.300	0.035		0.660	0.080		0.160	0.030	
pH (1:1) Water	Unit	82	5.24	0.080		5.52	0.080		7.40	0.095		7.63	0.075		6.34	0.100	
pH (1:2) Water	Unit	29	5.35	0.150		5.67	0.125		7.46	0.140		7.69	0.120		6.59	0.120	
pH (1:1) 0.01M CaCl <sub>2</sub>	Unit	24	4.90	0.080		5.17	0.070		7.04	0.095		7.39	0.085		5.77	0.075	
pH (1:2) 0.01M CaCl <sub>2</sub>	Unit	12	4.84	0.055		5.14	0.090		7.00	0.060		7.40	0.060		5.66	0.070	
<b>Buffer pH, Lime Req.</b>																	
SMP Buffer pH	Unit	33	7.07	0.080		6.70	0.090		7.33	0.050		7.45	0.050		7.08	0.049	
Adams-Evans Buf pH	Unit	9	7.82	0.040		7.54	0.080		7.80	0.060		7.83	0.030		7.70	0.090	
Woodruff Buf. pH	Unit	23	6.80	0.050		6.60	0.030		7.04	0.040		7.13	0.050		6.83	0.030	
Mehlich Buffer pH	Unit	8	6.25	0.050		6.03	0.055		6.69	0.060		6.81	0.020		6.28	0.040	
Sikora Buffer pH	Unit	25	7.15	0.050		6.70	0.080		7.39	0.030		7.44	0.040		7.10	0.030	
Titrateable Acidity	cmol/kg																

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### Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	58	43.1	3.16	73.2	2.81	46.0	2.20	124	8.00	0.720	0.139
NO3-N ISE	mg/kg	15	47.0	5.73	69.9	8.83	46.7	3.65	120	10.0	2.00	0.359
NO3-N CTA	mg/kg	3	41.2	7.24	59.3	10.6	48.3	0.350	76.4	1.10	3.40	1.40
NO3-N Ion Chr.	mg/kg											
NO3-N Other _____	mg/kg	8	47.0	4.85	75.0	7.00	48.7	4.67	124	11.5	0.895	0.162
NH4 - N (KCl Extr.)	mg/kg	47	1.71	0.390	3.97	0.335	7.40	0.430	2.00	0.490	10.9	0.790

### Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	48	126	10.8	73.8	5.20	66.0	3.96	10.9	3.70	77.0	5.00
PO4-P Bray P1 (1:7)	mg/kg	6	105	4.01	66.1	2.98	48.5	3.44	10.4	1.13	70.5	1.13
PO4-P Olsen/Bicarb	mg/kg	50	37.3	5.25	44.1	2.90	36.0	3.00	21.0	2.00	35.0	2.62
PO4-P AB-DTPA	mg/kg	1	20.3	0.000	17.3	0.000	16.0	0.000	9.17	0.000	10.5	0.000
PO4-P Modified Morgan	mg/kg	6	6.60	1.46	8.31	1.06	17.7	2.55	15.4	1.85	8.27	1.75
PO4-P True Morgan	mg/kg	6	8.44	1.02	11.3	0.825	21.8	2.40	17.3	2.60	11.1	1.46
PO4-P Mod. Kewlona	mg/kg	3	60.7	10.1	51.6	3.15	51.1	3.35	26.1	3.60	55.3	5.30
PO4-P Stong Bray (1:10)	mg/kg	9	196	16.0	166	17.0	148	4.00	58.0	5.00	93.0	3.33
PO4-P Water Soluble	mg/kg	1	2.73	0.000	6.68	2.22	3.14	1.36	1.45	0.555	8.05	2.15
SO4 - S (PO4 Extr.)	mg/kg	34	4.31	0.620	6.06	1.03	18.4	2.64	25.6	2.74	9.00	1.25

### Bases

K Ammonium Acetate	mg/kg	72	82.3	7.73	704	39.0	267	14.3	150	10.0	230	16.0
Ca Ammonium Acetate	mg/kg	67	383	62.9	1470	96.5	2140	133	4810	496	1820	189
Mg Ammonium Acetate	mg/kg	67	54.9	8.57	357	17.7	538	25.4	661	45.7	581	46.0
Na Ammonium Acetate	mg/kg	54	11.4	1.69	80.4	8.70	33.5	4.48	133	10.0	136	12.4
Bray Extractable K	mg/kg	4	90.4	5.30	513	5.26	209	5.80	109	10.8	179	9.50
K- Olsen/Bicarb.	mg/kg	6	95.9	11.2	589	15.3	224	23.2	110	7.37	167	9.00
K Modified Morgan	mg/kg	3	65.0	7.00	668	44.0	236	21.0	158	5.00	209	0.500
K True Morgan	mg/kg	6	77.8	0.555	468	33.0	185	7.00	88.3	3.30	132	7.00
Ca Modified Morgan	mg/kg	4	298	21.0	1480	54.6	2160	111	10200	390	1560	119
Aluminum KCL Extr.	mg/kg	5	3.00	0.640	1.12	0.455	0.535	0.285	0.745	0.250	0.755	0.410

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**Mehlich-1 Multi Element (scoop)**

<b>Scoop Soil Mass</b>	g	4	<b>5.00</b>	0.000	<b>5.00</b>	0.000	<b>5.00</b>	0.000	<b>5.00</b>	0.000	<b>5.00</b>	0.000
<b>P</b>	mg/kg	5	<b>90.1</b>	7.62	<b>130</b>	9.93	<b>71.5</b>	1.16	<b>4.17</b>	0.240	<b>46.2</b>	3.42
<b>K</b>	mg/kg	5	<b>72.7</b>	7.45	<b>454</b>	8.90	<b>191</b>	7.50	<b>42.1</b>	0.619	<b>133</b>	9.91
<b>Ca</b>	mg/kg	5	<b>532</b>	46.2	<b>1580</b>	64.0	<b>2530</b>	80.8	<b>4510</b>	240	<b>1200</b>	32.3
<b>Mg</b>	mg/kg	5	<b>53.3</b>	2.59	<b>328</b>	14.3	<b>594</b>	21.7	<b>630</b>	32.6	<b>405</b>	14.7
<b>Mn</b>	mg/kg	4	<b>7.76</b>	0.166	<b>40.2</b>	2.62	<b>28.3</b>	0.495	<b>2.86</b>	0.024	<b>43.7</b>	1.45
<b>Zn</b>	mg/kg	4	<b>2.45</b>	0.273	<b>1.39</b>	0.203	<b>5.94</b>	0.475	<b>0.042</b>	0.029	<b>1.44</b>	0.270

**Mehlich-3 Multi-Element (scoop)**

<b>Scoop Soil Mass</b>	g	26	<b>2.53</b>	0.193	<b>2.00</b>	0.088	<b>2.05</b>	0.072	<b>2.06</b>	0.065	<b>2.36</b>	0.094
<b>Assumed Density</b>	g/cm3	12	<b>1.22</b>	0.040	<b>1.12</b>	0.060	<b>1.18</b>	0.020	<b>1.18</b>	0.000	<b>1.18</b>	0.015
<b>Volume of Scoop</b>	cm3	21	<b>2.00</b>	0.000	<b>2.00</b>	0.000	<b>2.00</b>	0.000	<b>2.00</b>	0.000	<b>2.00</b>	0.000
<b>Extractant Volume mL</b>	mL	25	<b>20.0</b>	0.000	<b>20.0</b>	0.000	<b>20.0</b>	0.000	<b>20.0</b>	0.000	<b>20.0</b>	0.000
<b>P Colorimetric</b>	mg/kg	16	<b>132</b>	11.6	<b>76.9</b>	5.60	<b>77.7</b>	3.60	<b>39.0</b>	3.14	<b>74.7</b>	5.51
<b>P ICP-AES</b>	mg/kg	42	<b>143</b>	11.6	<b>83.0</b>	4.30	<b>84.0</b>	4.50	<b>41.9</b>	2.90	<b>83.7</b>	3.70
<b>K</b>	mg/kg	46	<b>86.7</b>	10.5	<b>713</b>	48.0	<b>277</b>	18.0	<b>153</b>	7.00	<b>245</b>	16.0
<b>Ca</b>	mg/kg	43	<b>491</b>	55.7	<b>1610</b>	97.2	<b>2490</b>	118	<b>5700</b>	397	<b>1910</b>	152
<b>Mg</b>	mg/kg	43	<b>71.0</b>	9.10	<b>381</b>	23.0	<b>625</b>	41.1	<b>836</b>	58.2	<b>625</b>	61.0
<b>Na</b>	mg/kg	32	<b>12.0</b>	1.88	<b>80.5</b>	8.15	<b>35.3</b>	6.29	<b>137</b>	12.2	<b>141</b>	20.7
<b>S</b>	mg/kg	34	<b>8.06</b>	1.57	<b>8.27</b>	1.07	<b>27.7</b>	2.50	<b>36.5</b>	4.39	<b>13.5</b>	1.72
<b>Al</b>	mg/kg	26	<b>506</b>	65.0	<b>798</b>	70.0	<b>699</b>	53.1	<b>299</b>	54.0	<b>607</b>	55.9
<b>Zn</b>	mg/kg	37	<b>3.32</b>	0.270	<b>1.97</b>	0.165	<b>8.05</b>	0.550	<b>3.64</b>	0.240	<b>2.54</b>	0.260
<b>Mn</b>	mg/kg	37	<b>24.6</b>	3.04	<b>78.3</b>	5.27	<b>76.8</b>	6.92	<b>38.5</b>	4.35	<b>75.8</b>	5.01
<b>Fe</b>	mg/kg	35	<b>225</b>	27.9	<b>180</b>	16.0	<b>271</b>	22.8	<b>161</b>	14.4	<b>112</b>	10.2
<b>Cu</b>	mg/kg	37	<b>1.03</b>	0.160	<b>2.38</b>	0.180	<b>8.78</b>	0.675	<b>8.33</b>	0.525	<b>1.31</b>	0.200
<b>B</b>	mg/kg	29	<b>0.340</b>	0.190	<b>0.463</b>	0.163	<b>1.77</b>	0.210	<b>2.50</b>	0.200	<b>0.632</b>	0.122

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Micronutrients												
Zn - DTPA	mg/kg	62	1.14	0.140	1.11	0.090	3.12	0.270	1.50	0.100	1.47	0.155
Mn - DTPA	mg/kg	47	3.96	0.560	38.0	3.13	5.20	0.796	3.87	0.950	53.0	4.44
Fe - DTPA	mg/kg	50	32.9	5.41	53.8	6.80	42.3	5.40	36.6	4.40	22.3	3.25
Cu - DTPA	mg/kg	52	0.400	0.075	1.55	0.150	3.67	0.390	3.32	0.370	1.08	0.125
Zn - HCl	mg/kg	2	3.37	0.425	2.70	0.955	9.36	0.685	5.30	1.52	2.70	0.810
Mn-H3PO4	mg/kg	10	7.93	0.805	30.9	2.65	16.3	2.69	3.58	0.855	34.5	2.08
Cl - Ca(NO3)2 Extr.	mg/kg	16	3.00	0.501	8.39	1.46	16.5	2.55	31.8	3.60	27.8	4.30
B - Hot Wat.	mg/kg	33	0.140	0.060	0.400	0.085	0.860	0.210	1.19	0.285	0.530	0.110
B-DTPA/Sorbitol	mg/kg	17	0.100	0.030	0.200	0.020	0.600	0.080	1.20	0.135	0.280	0.060
Soil Organic Matter												
Soil Kjeldahl N	%	12	0.048	0.005	0.104	0.009	0.251	0.012	0.252	0.018	0.057	0.007
Soil TN (combustion)	%	35	0.049	0.008	0.104	0.011	0.240	0.011	0.249	0.019	0.057	0.010
Soil TOC (Combustion)	%	9	0.450	0.024	1.09	0.038	2.50	0.041	2.77	0.123	0.528	0.038
Soil Total C (Combustion)	%	25	0.425	0.032	1.09	0.022	2.48	0.066	2.90	0.079	0.517	0.026
SOM - Walkley-Black	%	27	0.710	0.090	1.71	0.190	4.11	0.270	4.10	0.245	0.850	0.072
SOM - LOI (% Wt loss)	%	71	0.880	0.080	2.50	0.200	4.41	0.205	4.40	0.275	1.30	0.170
Other												
CaCO3 Content	%	8	0.255	0.056	0.600	0.149	1.10	0.185	3.41	0.845	0.440	0.108
CEC - Cation Displacement	cmol/kg	15	3.02	0.380	15.9	1.77	15.7	2.30	20.0	3.20	14.3	1.69
CEC - Estimation	cmol/kg	16	4.10	0.950	15.5	2.35	15.4	0.600	32.1	3.30	15.8	1.55
Soil Density (Scoop)	g/cc	13	1.48	0.030	1.14	0.040	1.21	0.045	1.18	0.010	1.36	0.030
Particle Size Analysis-Hydrometer												
Sand 2000 - 50 um	%	38	83.9	2.29	24.2	4.60	50.4	2.92	43.0	2.86	66.8	2.20
Silt 50 - 2 um	%	38	12.0	1.40	58.1	2.89	30.2	2.10	34.9	2.00	11.7	2.00
Clay 2 - 0 um	%	38	4.00	1.55	17.0	3.00	19.7	2.20	21.7	2.30	21.2	1.78
Particle Size Analysis- Pipette												
Sand 2000 - 50 um	%	5	87.2	0.500	23.2	0.970	49.3	0.465	44.1	1.25	67.5	1.10
Silt 50 - 2 um	%	5	10.3	1.30	63.4	4.15	34.2	2.16	35.9	1.15	10.0	1.09
Clay 2 - 0 um	%	5	2.50	0.240	13.8	2.78	16.7	1.83	18.7	2.52	21.2	0.930

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