



**2013 North American Proficiency Testing Program
2nd Quarter Report - July 9, 2013**

**Laboratory ID
General**

Soil Analysis	Units	n	Soil 2013-106			Soil 2013-107			Soil 2013-108			Soil 2013-109			Soil 2013-110		
			Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}
Salinity																	
Sat. Paste Moisture	%	27	42.0	1.50		54.8	2.08		61.1	2.30		56.9	3.23		36.8	1.37	
pH - sp	Unit	35	6.40	0.100		6.64	0.135		6.10	0.090		7.33	0.100		5.47	0.110	
ECe - sp	dS/m	32	0.740	0.055		0.990	0.146		0.430	0.030		1.01	0.103		0.715	0.080	
HCO ₃ - sp	mmolc/L	10	1.67	0.286		3.35	0.476		3.20	0.571		5.15	1.09		1.46	0.284	
Ca - sp	mmolc/L	31	4.89	0.430		6.37	0.660		2.49	0.370		8.24	1.01		3.05	0.350	
Mg - sp	mmolc/L	31	0.740	0.100		2.80	0.265		1.17	0.150		1.02	0.111		1.79	0.204	
Na - sp	mmolc/L	31	0.180	0.024		0.306	0.051		0.280	0.070		0.400	0.043		0.920	0.090	
SAR - sp	value	25	0.100	0.007		0.140	0.010		0.200	0.040		0.170	0.040		0.600	0.055	
Cl - sp	mmolc/L	19	0.350	0.069		0.350	0.050		0.293	0.053		0.610	0.090		0.610	0.049	
SO ₄ - sp	mmolc/L	21	0.880	0.140		1.19	0.110		0.506	0.070		0.769	0.141		1.66	0.165	
NO ₃ - sp	mmolc/L	12	3.74	0.755		4.29	0.910		0.08	0.016		3.6	0.83		2.43	0.36	
B - sp	mg/L	11	0.060	0.010		0.100	0.020		0.059	0.007		0.099	0.019		0.750	0.140	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	29	0.300	0.020		0.424	0.046		0.200	0.030		0.634	0.051		0.260	0.040	
Soil EC (1:2)	(dS/m)	48	0.200	0.020		0.300	0.040		0.140	0.017		0.387	0.043		0.184	0.019	
pH (1:1) Water	Unit	80	6.50	0.077		6.63	0.067		6.23	0.070		7.60	0.090		5.60	0.110	
pH (1:2) Water	Unit	32	6.59	0.090		6.70	0.100		6.30	0.090		7.72	0.120		5.71	0.110	
pH (1:1) 0.01M CaCl ₂	Unit	23	6.16	0.070		6.35	0.050		5.73	0.065		7.33	0.060		5.15	0.050	
pH (1:2) 0.01M CaCl ₂	Unit	10	6.15	0.050		6.40	0.080		5.69	0.035		7.31	0.100		5.08	0.060	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	31	7.08	0.080		7.12	0.100		6.61	0.115		7.40	0.080		6.81	0.110	
Adams-Evans Buf pH	Unit	9	7.70	0.060		7.75	0.050		7.45	0.060		7.75	0.045		7.64	0.060	
Woodruff Buf. pH	Unit	22	6.89	0.030		6.92	0.030		6.60	0.090		7.15	0.045		6.70	0.090	
Mehlich Buffer pH	Unit	7	6.41	0.020		6.38	0.020		6.06	0.040		6.81	0.010		6.11	0.020	
Sikora Buffer pH	Unit	23	7.10	0.050		7.15	0.030		6.65	0.100		7.44	0.035		6.84	0.070	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	58	32.5	1.75	61.8	5.30	10.9	1.19	38.6	4.00	18.0	1.20
NO3-N ISE	mg/kg	15	31.3	3.00	56.5	9.75	9.87	1.67	40.0	6.90	18.0	1.70
NO3-N CTA	mg/kg	2	30.7	2.86	56.7	7.30	12.7	1.09	38.6	3.26	18.2	1.24
NO3-N Ion Chr.	mg/kg	1	71.1	0.000	91.4	0.000	0.130	0.000	4.62	0.000	47.9	0.000
NO3-N Other _____	mg/kg	10	33.3	1.21	65.2	7.10	11.1	1.03	39.8	4.48	17.8	1.10
NH4 - N (KCl Extr.)	mg/kg	53	16.0	1.71	2.48	0.480	15.1	1.60	11.2	1.24	5.11	0.890

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	43	36.3	1.80	66.0	5.50	67.1	4.00	16.5	3.11	108	5.00
PO4-P Bray P1 (1:7)	mg/kg	6	28.5	1.38	57.9	2.76	59.9	6.63	9.41	2.44	93.8	11.0
PO4-P Olsen/Bicarb	mg/kg	49	19.5	2.00	25.3	3.00	40.0	5.00	38.4	5.82	57.5	4.15
PO4-P AB-DTPA	mg/kg	2	7.11	0.210	14.8	0.665	16.8	1.17	15.8	2.88	28.2	0.975
PO4-P Modified Morgan	mg/kg	6	2.50	0.650	9.00	0.300	10.1	1.25	20.3	3.08	10.2	1.33
PO4-P True Morgan	mg/kg	8	4.00	0.350	10.8	0.679	13.6	0.600	21.9	3.38	14.5	1.30
PO4-P Mod. Kewlona	mg/kg	5	26.0	1.00	42.8	3.40	54.0	4.00	53.6	1.60	70.0	2.50
PO4-P Stong Bray (1:10)	mg/kg	8	62.0	3.02	108	2.50	107	4.35	457	49.3	284	40.8
PO4-P Water Soluble	mg/kg	1	3.88	0.00	4.65	0.000	11.7	0.000	18.5	0.00	46.3	33.5
SO4 - S (PO4 Extr.)	mg/kg	35	8.60	1.70	11.8	2.03	5.80	1.20	9.21	1.80	11.0	2.70

Bases

K Ammonium Acetate	mg/kg	68	238	17.3	181	20.5	440	58.0	382	37.0	427	24.4
Ca Ammonium Acetate	mg/kg	64	1450	77.5	1410	117	2560	259	6100	657	1040	79.0
Mg Ammonium Acetate	mg/kg	64	85.3	6.20	197	20.5	333	41.2	200	17.5	259	13.3
Na Ammonium Acetate	mg/kg	51	10.3	1.41	13.0	3.31	16.0	1.67	19.0	1.67	25.7	3.70
Bray Extractable K	mg/kg	4	192	6.00	149	7.17	292	8.50	261	16.5	343	11.0
K- Olsen/Bicarb.	mg/kg	7	207	5.53	201	7.15	417	27.0	354	11.1	397	17.0
K Modified Morgan	mg/kg	5	234	55.0	206	16.7	486	43.2	419	58.0	373	34.0
K True Morgan	mg/kg	5	187	8.00	172	5.29	353	15.0	279	23.8	340	13.5
Ca Modified Morgan	mg/kg	3	1430	307	1470	97.0	2500	183	30500	12700	974	208
Aluminum KCL Extr.	mg/kg	3	0.320	0.060	0.210	0.020	0.320	0.040	0.100	0.100	2.25	0.730

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Mehlich-1 Multi Element (scoop)

Scoop Soil Mass	g	4	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000
P	mg/kg	5	21.4	2.47	44.1	6.82	32.7	2.97	53.0	5.89	221	26.4
K	mg/kg	5	163	4.35	142	8.54	275	23.0	151	3.69	295	4.69
Ca	mg/kg	5	1400	5.53	1650	104	2870	420	4920	361	1200	49.0
Mg	mg/kg	5	77.4	4.38	215	15.2	358	46.4	139	6.97	232	10.3
Mn	mg/kg	5	212	39.3	30.2	7.13	107	29.7	2.18	0.550	46.2	3.15
Zn	mg/kg	5	1.26	0.090	2.85	0.100	6.15	0.211	0.100	0.060	8.78	0.500

Mehlich-3 Multi-Element (scoop)

Scoop Soil Mass	g	27	2.00	0.090	2.00	0.290	1.85	0.250	1.98	0.300	2.19	0.190
Assumed Density	g/cm ³	11	1.17	0.010	1.10	0.095	0.980	0.160	1.00	0.100	1.18	0.050
Volume of Scoop	cm ³	20	2.00	0.175	2.00	0.300	2.00	0.175	2.00	0.300	2.00	0.175
Extractant Volume mL	mL	24	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000
P Colorimetric	mg/kg	15	39.7	2.45	68.0	7.02	73.0	5.30	127	9.50	125	6.50
P ICP-AES	mg/kg	41	42.9	2.42	78.8	4.68	80.0	6.82	128	11.9	134	7.30
K	mg/kg	45	243	14.1	177	11.1	404	41.1	382	31.8	433	28.1
Ca	mg/kg	41	1510	96.4	1520	89.7	2600	251	10200	792	1130	117
Mg	mg/kg	41	89.1	7.10	223	16.6	336	37.9	237	18.5	288	17.0
Na	mg/kg	30	11.4	1.99	13.0	1.62	14.1	1.42	19.5	4.67	27.7	5.89
S	mg/kg	33	14.2	1.34	20.0	2.44	9.55	1.45	17.6	2.00	17.7	2.30
Al	mg/kg	23	909	47.0	770	62.0	796	72.0	134	13.3	569	48.0
Zn	mg/kg	38	1.61	0.185	3.65	0.340	8.02	0.920	7.31	0.610	11.3	0.790
Mn	mg/kg	36	361	33.0	77.6	7.57	117	7.19	38.0	4.90	65.6	4.84
Fe	mg/kg	36	153	10.8	255	19.9	252.4	25.6	32.8	3.68	276	17.8
Cu	mg/kg	38	1.73	0.165	2.22	0.215	1.39	0.170	7.15	0.700	3.05	0.265
B	mg/kg	31	0.548	0.122	1.09	0.190	0.730	0.083	1.46	0.200	0.890	0.150

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Micronutrients																
Zn - DTPA	mg/kg	61	0.640	0.060		1.52	0.170		5.83	0.924		2.80	0.310		6.72	0.520
Mn - DTPA	mg/kg	46	132	14.6		10.0	1.98		77.5	11.9		12.4	1.52		34.7	2.90
Fe - DTPA	mg/kg	49	28.2	4.40		52.0	6.75		89.0	11.0		9.67	1.16		84.0	8.90
Cu - DTPA	mg/kg	50	0.950	0.078		1.15	0.100		0.80	0.095		3.51	0.390		3.02	0.235
Zn - HCl	mg/kg	2	1.45	0.045		3.09	0.185		7.87	0.065		0.600	0.500		13.7	1.28
Mn-H3PO4	mg/kg	8	150	7.87		18.4	2.29		73.4	3.04		4.05	0.500		32.8	3.06
Cl - Ca(NO3)2 Extr.	mg/kg	15	5.10	1.10		7.30	1.35		5.35	0.765		11.2	2.51		8.05	1.10
B - Hot Wat.	mg/kg	33	0.317	0.038		0.695	0.155		0.555	0.125		0.550	0.076		0.820	0.195
B-DTPA/Sorbitol	mg/kg	17	0.200	0.030		0.380	0.060		0.250	0.030		0.850	0.096		0.550	0.050
Soil Organic Matter																
Soil Kjeldahl N	%	17	0.103	0.007		0.179	0.007		0.246	0.005		0.210	0.013		0.088	0.007
Soil TN (combustion)	%	37	0.115	0.011		0.193	0.009		0.270	0.011		0.302	0.018		0.096	0.012
Soil TOC (Combustion)	%	7	0.960	0.020		1.83	0.025		4.25	0.170		2.56	0.178		0.810	0.017
Soil Total C (Combustion)	%	26	0.970	0.030		1.86	0.029		4.32	0.073		4.65	0.065		0.837	0.023
SOM - Walkley-Black	%	30	1.50	0.110		3.20	0.278		6.97	0.670		3.82	0.330		1.51	0.120
SOM - LOI (% Wt loss)	%	68	2.23	0.150		3.81	0.133		7.44	0.360		4.37	0.215		1.90	0.141
Other																
CaCO3 Content	%	11	0.491	0.098		0.590	0.110		0.765	0.166		18.5	1.50		0.500	0.088
CEC - Cation Displacement	cmol/kg	19	10.8	1.24		11.2	1.40		24.1	2.31		25.5	4.47		10.2	0.970
CEC - Estimation	cmol/kg	11	8.90	0.40		9.60	1.30		17.3	1.63		36.5	6.90		11.4	1.60
Soil Density (Scoop)	g/cc	14	1.15	0.066		1.00	0.064		0.93	0.058		1.01	0.040		1.26	0.050
Particle Size Analysis-Hydrometer																
Sand 2000 - 50 um	%	34	10.0	1.90		25.6	3.40		23.3	4.10		16.4	2.05		50.0	2.50
Silt 50 - 2 um	%	34	67.0	3.00		58.3	3.96		58.0	3.00		29.3	3.00		39.6	2.60
Clay 2 - 0 um	%	34	23.0	2.90		15.9	3.20		18.2	3.20		53.7	3.24		11.0	2.00
Particle Size Analysis- Pipette																
Sand 2000 - 50 um	%	4	9.75	2.15		27.5	0.400		18.0	0.450		18.9	6.40		51.0	5.20
Silt 50 - 2 um	%	4	70.0	4.05		64.3	1.90		68.1	3.05		31.8	0.700		42.4	2.60
Clay 2 - 0 um	%	4	19.9	2.25		9.80	1.61		14.0	3.50		49.3	5.10		8.40	1.76

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