



**2014 North American Proficiency Testing Program
1st Quarter Report - April 15, 2014**

**Laboratory ID
General**

Soil Analysis	Units	n	Soil 2014-101			Soil 2014-102			Soil 2014-103			Soil 2014-104			Soil 2014-105		
			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	37.8	2.55		36.3	2.48		44.8	3.38		49.0	2.71		26.7	1.97	
pH - sp	Unit	32	6.34	0.130		5.42	0.145		7.59	0.090		4.70	0.165		5.10	0.135	
ECe - sp	dS/m	32	0.547	0.113		1.15	0.160		0.826	0.100		1.42	0.155		1.20	0.158	
HCO ₃ - sp	mmolc/L	12	3.82	0.905		0.39	0.035		5.27	1.14		0.360	0.055		0.265	0.065	
Ca - sp	mmolc/L	30	3.92	0.485		5.79	1.10		5.85	0.724		8.53	0.720		6.31	0.565	
Mg - sp	mmolc/L	30	0.655	0.155		2.54	0.360		1.30	0.163		2.11	0.176		2.71	0.297	
Na - sp	mmolc/L	30	0.181	0.023		0.860	0.090		0.540	0.039		0.521	0.086		0.357	0.033	
SAR - sp	value	26	0.117	0.014		0.410	0.026		0.285	0.021		0.228	0.040		0.175	0.043	
Cl - sp	mmolc/L	19	0.840	0.158		0.540	0.107		0.310	0.060		0.170	0.027		0.180	0.025	
SO ₄ - sp	mmolc/L	20	0.698	0.087		0.780	0.050		0.615	0.070		0.345	0.050		0.450	0.084	
NO ₃ - sp	mmolc/L	10	0.155	0.031		8.280	1.14		3.07	0.660		11.3	1.44		9.35	1.74	
B - sp	mg/L	14	0.030	0.005		0.071	0.011		0.114	0.014		0.100	0.020		0.066	0.014	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	37	0.170	0.020		0.370	0.042		0.490	0.060		0.460	0.060		0.300	0.050	
Soil EC (1:2)	(dS/m)	46	0.109	0.011		0.242	0.030		0.280	0.039		0.310	0.050		0.190	0.020	
pH (1:1) Water	Unit	90	6.45	0.070		5.59	0.085		7.90	0.100		4.89	0.085		5.30	0.100	
pH (1:2) Water	Unit	29	6.51	0.090		5.62	0.120		8.00	0.140		4.90	0.110		5.38	0.100	
pH (1:1) 0.01M CaCl ₂	Unit	24	5.98	0.045		5.24	0.050		7.54	0.095		4.59	0.070		4.92	0.040	
pH (1:2) 0.01M CaCl ₂	Unit	10	5.96	0.060		5.23	0.045		7.48	0.060		4.55	0.035		4.93	0.025	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	29	7.14	0.130		6.77	0.150		7.46	0.080		6.17	0.170		7.07	0.100	
Adams-Evans Buf pH	Unit	8	7.78	0.020		7.62	0.045		7.71	0.020		7.30	0.090		7.86	0.045	
Woodruff Buf. pH	Unit	22	6.86	0.040		6.66	0.060		7.12	0.040		6.20	0.150		6.78	0.050	
Mehlich Buffer pH	Unit	8	6.38	0.025		6.16	0.060		6.77	0.045		5.72	0.080		6.27	0.010	
Sikora Buffer pH	Unit	26	7.17	0.071		6.84	0.089		7.40	0.040		6.29	0.090		7.11	0.070	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	63	5.58	0.460	51.0	2.00	26.0	1.46	79.1	8.14	41.2	3.26
NO3-N ISE	mg/kg	16	6.45	0.740	50.5	4.90	26.0	1.94	67.8	7.97	45.4	5.65
NO3-N CTA	mg/kg	2	6.22	0.185	46.5	5.19	26.2	2.21	73.1	12.7	38.7	4.16
NO3-N Ion Chr.	mg/kg	2	2.20	2.08	66.0	26.2	11.2	10.5	32.0	29.5	73.6	41.1
NO3-N Other _____	mg/kg	8	5.90	0.723	48.5	2.50	25.9	1.61	84.0	3.68	40.5	1.45
NH4 - N (KCl Extr.)	mg/kg	51	5.70	0.490	2.36	0.233	5.43	0.660	2.43	0.430	1.79	0.246

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	48	34.4	2.55	216	13.6	22.1	2.94	89.6	8.20	127	10.2
PO4-P Bray P1 (1:7)	mg/kg	6	31.0	1.57	183	11.0	15.2	1.50	89.6	1.35	100	5.50
PO4-P Olsen/Bicarb	mg/kg	53	16.8	1.20	67.1	5.10	11.0	1.12	49.0	6.60	34.3	3.50
PO4-P AB-DTPA	mg/kg	2	11.7	4.66	35.9	6.95	5.1	1.57	26.2	11.2	27.8	7.77
PO4-P Modified Morgan	mg/kg	5	5.43	0.772	13.3	1.90	17.9	2.10	5.60	1.20	6.96	1.04
PO4-P True Morgan	mg/kg	8	6.93	0.275	16.8	0.700	15.7	1.75	6.72	0.260	7.95	0.710
PO4-P Mod. Kewlona	mg/kg	3	19.9	0.900	104	3.82	14.5	6.01	53.4	5.38	50.2	0.400
PO4-P Stong Bray (1:10)	mg/kg	10	52.6	2.23	289	14.1	300	60.7	171	7.00	203	13.5
PO4-P Water Soluble	mg/kg	1	2.84	0.000	9.75	0.000	3.43	0.000	3.74	0.000	3.32	0.000
SO4 - S (PO4 Extr.)	mg/kg	36	5.48	1.01	7.80	1.70	5.83	1.31	6.10	0.870	3.42	0.389

Bases

K Ammonium Acetate	mg/kg	76	197	10.5	209	11.3	1280	93.5	379	50.6	84.7	11.9
Ca Ammonium Acetate	mg/kg	70	1100	69.2	679	57.9	5340	548	1419	133	393	62.9
Mg Ammonium Acetate	mg/kg	70	60.2	6.23	110	7.92	415	26.0	126	14.3	56.7	5.75
Na Ammonium Acetate	mg/kg	56	9.00	1.65	19.1	4.15	28.6	6.25	17.4	2.20	9.00	1.68
Bray Extractable K	mg/kg	5	174	1.70	190	11.1	712	52.9	264	2.0	89.6	3.10
K- Olsen/Bicarb.	mg/kg	6	184	9.75	199	10.4	812	13.5	359	4.50	96.7	10.7
K Modified Morgan	mg/kg	4	179	5.00	190	9.00	1230	8.00	397	13.0	67.0	3.50
K True Morgan	mg/kg	6	162	5.50	179	5.50	607	31.5	293	14.0	82.0	5.00
Ca Modified Morgan	mg/kg	3	987	24.0	591	64.0	14500	444	1621	85.0	312	46.0
Aluminum KCL Extr.	mg/kg	5	0.970	0.430	2.60	1.60	0.670	0.190	6.800	1.36	7.00	3.00

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Mehlich-1 Multi Element (scoop)													
Scoop Soil Mass	g	5	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000	5.00
P	mg/kg	6	29.2	1.85	112	9.40	47.2	3.26	84.5	4.14	94.8	13.5	
K	mg/kg	6	142	4.92	168	3.30	320	11.3	236	21.7	68.8	2.57	
Ca	mg/kg	6	1010	41.6	748	20.6	4540	427	1720	120	469	18.7	
Mg	mg/kg	6	53.5	3.62	107	6.42	315	17.9	125	5.04	49.3	3.58	
Mn	mg/kg	5	74.6	1.96	26.9	1.69	4.06	0.531	30.2	1.88	9.50	0.720	
Zn	mg/kg	5	3.35	0.267	4.36	0.130	0.080	0.080	5.11	0.490	2.23	0.086	
Mehlich-3 Multi-Element (scoop)													
Scoop Soil Mass	g	26	2.14	0.142	2.19	0.190	2.00	0.093	1.78	0.220	2.52	0.170	
Assumed Density	g/cm3	13	1.18	0.040	1.18	0.060	1.16	0.060	1.01	0.158	1.26	0.079	
Volume of Scoop	cm3	20	2.00	0.025	2.00	0.025	2.00	0.025	2.00	0.025	2.00	0.025	
Extractant Volume mL	mL	25	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000	
P Colorimetric	mg/kg	18	34.0	1.55	214	17.8	36.2	2.60	87.7	5.65	126	12.2	
P ICP-AES	mg/kg	43	40.1	2.25	237	11.8	38.0	2.50	104	8.88	143	9.00	
K	mg/kg	48	198	12.0	213	16.5	1290	70.6	370	35.5	88.0	9.26	
Ca	mg/kg	45	1130	73.3	766	74.5	6840	415	1460	149	469	69.0	
Mg	mg/kg	45	66.5	6.54	123	10.6	511	25.9	124	11.0	70.0	7.24	
Na	mg/kg	32	8.67	1.33	19.3	4.00	26.8	4.10	16.3	3.25	9.80	1.50	
S	mg/kg	35	10.1	1.06	16.1	1.27	13.4	1.61	14.2	1.15	7.71	1.07	
Al	mg/kg	29	536	36.0	1010	55.0	473	45.0	1080	88.0	505	67.3	
Zn	mg/kg	39	4.50	0.300	5.82	0.400	2.20	0.170	5.51	0.510	3.20	0.400	
Mn	mg/kg	39	239	22.5	98.0	9.00	196	17.7	42.1	3.40	22.5	1.93	
Fe	mg/kg	37	104	8.00	185	13.2	43.5	4.49	251	18.0	215	17.5	
Cu	mg/kg	39	4.34	0.290	3.80	0.250	3.78	0.220	2.67	0.260	1.00	0.100	
B	mg/kg	31	0.370	0.055	0.500	0.080	1.69	0.170	0.575	0.111	0.370	0.068	

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Micronutrients													
Zn - DTPA	mg/kg	64	2.26	0.160	2.85	0.250	0.800	0.061	4.09	0.515	1.19	0.175	
Mn - DTPA	mg/kg	46	56.9	5.99	14.0	2.40	10.9	1.88	27.9	2.89	6.01	0.815	
Fe - DTPA	mg/kg	50	18.4	2.78	43.5	6.65	4.00	0.600	96.0	14.5	31.8	4.70	
Cu - DTPA	mg/kg	52	2.75	0.199	2.29	0.200	1.68	0.150	1.41	0.150	0.400	0.080	
Zn - HCl	mg/kg	2	4.53	0.060	5.65	0.140	1.05	0.575	5.70	0.130	3.18	0.20	
Mn-H3PO4	mg/kg	10	64.2	5.56	23.3	2.37	5.23	1.10	23.9	2.38	9.49	1.38	
Cl - Ca(NO3)2 Extr.	mg/kg	18	10.9	2.07	7.03	1.17	4.95	0.511	2.63	0.408	2.00	0.23	
B - Hot Wat.	mg/kg	38	0.230	0.042	0.350	0.064	0.699	0.125	0.394	0.073	0.115	0.024	
B-DTPA/Sorbitol	mg/kg	17	0.130	0.018	0.190	0.030	0.900	0.080	0.210	0.033	0.085	0.017	
Soil Organic Matter													
Soil Kjeldahl N	%	20	0.104	0.011	0.096	0.007	0.138	0.010	0.173	0.013	0.044	0.006	
Soil TN (combustion)	%	38	0.110	0.010	0.106	0.008	0.150	0.011	0.190	0.012	0.048	0.008	
Soil TOC (Combustion)	%	11	1.00	0.060	0.950	0.169	1.42	0.188	2.08	0.132	0.400	0.066	
Soil Total C (Combustion)	%	30	1.08	0.043	1.06	0.030	1.94	0.063	2.13	0.050	0.413	0.025	
SOM - Walkley-Black	%	31	1.99	0.124	1.65	0.240	2.60	0.200	3.65	0.413	0.764	0.094	
SOM - LOI (% Wt loss)	%	75	2.23	0.129	2.40	0.130	3.33	0.270	4.64	0.240	0.825	0.075	
Other													
CaCO3 Content	%	16	0.485	0.085	0.470	0.093	5.30	0.670	0.690	0.112	0.480	0.080	
CEC - Cation Displacement	cmol/kg	19	8.10	1.11	8.50	1.65	28.7	2.55	17.5	4.07	3.20	0.343	
CEC - Estimation	cmol/kg	10	7.25	0.800	7.40	1.50	34.5	2.40	15.3	3.20	3.60	0.550	
Soil Density (Scoop)	g/cc	12	1.23	0.040	1.27	0.043	1.12	0.050	0.93	0.045	1.49	0.048	
Particle Size Analysis-Hydrometer													
Sand 2000 - 50 um	%	36	28.9	3.61	36.5	2.50	12.9	2.12	35.6	2.81	82.2	1.89	
Silt 50 - 2 um	%	36	55.7	2.90	48.0	2.45	51.3	4.20	47.8	2.30	12.0	2.80	
Clay 2 - 0 um	%	36	14.7	2.60	14.8	2.00	35.6	5.80	16.2	3.15	5.00	0.750	
Particle Size Analysis- Pipette													
Sand 2000 - 50 um	%	3	24.3	0.060	35.4	2.790	4.00	0.550	30.5	1.22	86.5	1.65	
Silt 50 - 2 um	%	3	63.0	0.960	53.9	0.380	56.8	1.53	55.4	0.700	11.6	1.69	
Clay 2 - 0 um	%	3	12.9	1.12	13.4	0.240	35.2	0.200	14.6	0.380	2.45	0.100	
Solvita CO2													
Solvita CO2	ppm	10	51.9	9.08	18.4	2.82	22.0	3.02	14.0	0.839	6.16	0.551	

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