



**2013 North American Proficiency Testing Program
3rd Quarter Report - October 9, 2013**

**Laboratory ID
General**

Soil Analysis	Units	n	Soil 2013-111			Soil 2013-112			Soil 2013-113			Soil 2013-114			Soil 2013-115		
			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	%	29	33.4	1.80		31.2	2.00		55.1	3.50		56.7	3.80		41.9	2.16	
pH - sp	Unit	34	6.72	0.165		7.08	0.115		7.01	0.105		7.13	0.090		6.44	0.130	
ECe - sp	dS/m	34	4.53	0.515		1.30	0.120		1.56	0.220		0.805	0.060		0.695	0.106	
HCO ₃ - sp	mmolc/L	12	5.09	0.849		6.39	1.17		5.12	0.730		2.59	0.640		1.55	0.320	
Ca - sp	mmolc/L	30	12.4	1.42		8.21	0.660		12.7	1.71		5.79	0.550		4.72	0.621	
Mg - sp	mmolc/L	31	10.9	1.40		3.29	0.374		1.31	0.200		1.40	0.170		0.717	0.100	
Na - sp	mmolc/L	31	5.96	0.440		2.28	0.190		2.08	0.160		0.440	0.066		0.170	0.018	
SAR - sp	value	28	1.80	0.105		0.920	0.055		0.800	0.045		0.210	0.020		0.100	0.012	
Cl - sp	mmolc/L	23	3.29	0.479		2.52	0.410		1.16	0.218		0.340	0.039		0.330	0.042	
SO ₄ - sp	mmolc/L	24	7.02	0.880		2.74	0.484		2.23	0.270		0.595	0.095		0.830	0.140	
NO ₃ - sp	mmolc/L	14	25.8	5.21		3.45	0.849		7.57	1.82		4.71	0.805		3.68	0.777	
B - sp	mg/L	13	0.220	0.020		0.140	0.011		0.042	0.004		0.050	0.004		0.050	0.006	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	35	1.43	0.320		0.480	0.103		0.680	0.110		0.700	0.120		0.310	0.040	
Soil EC (1:2)	(dS/m)	49	0.936	0.096		0.302	0.036		0.500	0.092		0.286	0.048		0.201	0.016	
pH (1:1) Water	Unit	87	6.87	0.065		7.31	0.075		7.17	0.070		7.44	0.065		6.53	0.060	
pH (1:2) Water	Unit	31	7.00	0.080		7.41	0.110		7.25	0.130		7.56	0.130		6.60	0.060	
pH (1:1) 0.01M CaCl ₂	Unit	25	6.63	0.070		7.00	0.100		6.98	0.090		7.20	0.100		6.20	0.100	
pH (1:2) 0.01M CaCl ₂	Unit	11	6.62	0.060		7.03	0.100		7.00	0.080		7.15	0.080		6.14	0.020	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	29	7.34	0.070		7.38	0.070		7.24	0.050		7.31	0.077		7.10	0.080	
Adams-Evans Buf pH	Unit	10	7.87	0.030		7.87	0.020		7.78	0.030		7.62	0.030		7.71	0.010	
Woodruff Buf. pH	Unit	21	7.00	0.060		7.04	0.040		7.00	0.040		7.06	0.090		6.88	0.030	
Mehlich Buffer pH	Unit	9	6.58	0.060		6.62	0.080		6.66	0.040		6.70	0.060		6.45	0.050	
Sikora Buffer pH	Unit	25	7.40	0.050		7.39	0.030		7.29	0.040		7.22	0.050		7.11	0.060	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	62	155	13.0	20.5	1.70	86.4	8.37	34.8	2.50	30.4	1.80
NO3-N ISE	mg/kg	16	154	25.2	23.0	3.00	89.3	11.5	32.2	3.75	30.2	2.90
NO3-N CTA	mg/kg	2	118	14.8	20.8	1.03	80.2	10.1	34.2	2.59	28.7	3.76
NO3-N Ion Chr.	mg/kg	2	348	40.1	4.05	4.05	28.3	28.0	37.6	15.3	33.5	15.4
NO3-N Other _____	mg/kg	12	151	18.4	20.0	1.58	90.5	7.15	34.0	3.60	29.9	1.55
NH4 - N (KCl Extr.)	mg/kg	54	7.50	0.870	3.57	0.680	5.60	0.930	7.90	1.00	17.1	1.40

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	45	340	47.3	58.0	4.00	70.4	4.70	43.0	3.40	36.8	2.10
PO4-P Bray P1 (1:7)	mg/kg	5	248	36.9	45.4	1.80	49.0	1.66	27.4	0.650	30.4	0.500
PO4-P Olsen/Bicarb	mg/kg	51	151	21.2	28.8	2.80	40.9	4.10	25.8	1.85	20.0	1.70
PO4-P AB-DTPA	mg/kg	2	98.9	8.06	15.5	0.725	19.9	0.235	5.34	0.665	6.44	0.465
PO4-P Modified Morgan	mg/kg	4	262	18.2	27.8	2.30	17.3	0.920	25.8	1.65	3.30	0.600
PO4-P True Morgan	mg/kg	8	247	28.5	32.3	1.85	18.0	0.652	27.1	2.40	4.05	0.400
PO4-P Mod. Kewlona	mg/kg	3	270	18.0	40.0	2.50	55.0	4.10	29.5	1.50	26.1	1.90
PO4-P Stong Bray (1:10)	mg/kg	8	408	71.4	245	36.1	135	8.25	1240	288.4	66.1	5.63
PO4-P Water Soluble	mg/kg											
SO4 - S (PO4 Extr.)	mg/kg	33	44.5	5.80	15.1	2.14	21.0	3.20	6.71	1.29	9.00	1.30

Bases

K Ammonium Acetate	mg/kg	72	921	110	324	30.0	165	11.7	318	20.9	237	13.0
Ca Ammonium Acetate	mg/kg	68	1150	124	1850	159	3730	425	6890	385	1450	89.0
Mg Ammonium Acetate	mg/kg	68	271	27.5	254	24.4	101	10.1	736	39.0	87.0	5.67
Na Ammonium Acetate	mg/kg	56	78.9	9.05	50.0	4.94	53.0	6.50	29.1	4.33	10.0	1.68
Bray Extractable K	mg/kg	4	858	83.6	269	13.7	131	8.35	162	8.50	197	4.35
K- Olsen/Bicarb.	mg/kg	8	756	45.0	274	15.7	173	11.4	202	19.5	205	9.32
K Modified Morgan	mg/kg	3	860	60.0	291	23.5	189	10.0	304	7.00	242	3.50
K True Morgan	mg/kg	6	708	19.5	228	6.00	148	9.00	135	5.00	177	3.00
Ca Modified Morgan	mg/kg	3	1400	12.0	1940	172	7690	558	7270	258	1540	54.0
Aluminum KCL Extr.	mg/kg	2	5.32	1.32	1.59	0.590	1.82	1.19	0.690	0.310	4.90	3.10

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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
P	mg/kg	6	361	34.1	194	7.70	15.8	4.43	676	109	25.5	5.44
K	mg/kg	6	732	82.0	223	9.54	95.2	8.62	97.8	6.75	157	6.30
Ca	mg/kg	6	1580	129	2200	53.0	4590	727	4390	746	1490	66.2
Mg	mg/kg	6	284	9.73	256	8.59	145	3.46	416	15.0	75.7	4.20
Mn	mg/kg	5	32.7	1.14	33.8	2.56	44.6	7.90	10.9	1.10	176	7.38
Zn	mg/kg	5	7.51	0.239	6.19	0.140	2.19	0.220	1.48	0.130	1.10	0.150
Mehlich-3 Multi-Element (scoop)												
Scoop Soil Mass	g	24	2.50	0.190	2.42	0.180	1.99	0.260	2.15	0.150	2.00	0.060
Assumed Density	g/cm ³	12	1.26	0.078	1.22	0.060	1.07	0.115	1.18	0.045	1.18	0.060
Volume of Scoop	cm ³	24	2.00	0.000	2.00	0.000	2.00	0.000	2.00	0.000	2.00	0.000
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	19	385	58.8	77.5	4.50	79.0	4.00	76.2	4.40	40.0	3.00
P ICP-AES	mg/kg	44	441	34.8	83.0	6.10	89.5	4.50	76.8	7.04	43.0	2.20
K	mg/kg	49	1030	82.0	349	23.1	168	13.0	312	20.0	248	13.5
Ca	mg/kg	46	1650	161	2130	190	4590	490	7210	387	1510	94.0
Mg	mg/kg	46	350	31.3	307	23.0	130	12.4	798	44.8	87.0	9.90
Na	mg/kg	33	87.8	9.24	50.0	5.20	52.0	5.40	28.3	5.02	7.00	1.19
S	mg/kg	35	64.0	5.69	22.7	2.47	30.1	2.51	11.3	1.33	14.7	1.30
Al	mg/kg	27	386	42.2	494	42.0	562	64.0	606	37.8	894	51.6
Zn	mg/kg	40	9.52	0.680	8.40	0.720	6.50	0.400	5.63	0.370	1.51	0.170
Mn	mg/kg	40	50.2	5.30	60.0	3.20	194	16.4	69.3	7.03	366	21.3
Fe	mg/kg	38	108	10.2	152	16.6	222	20.1	112	8.00	151	17.6
Cu	mg/kg	40	0.800	0.100	3.10	0.200	3.02	0.320	6.43	0.530	1.67	0.100
B	mg/kg	33	1.07	0.145	0.805	0.142	0.980	0.225	0.804	0.115	0.470	0.075

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Micronutrients												
Zn - DTPA	mg/kg	64	3.81	0.425	3.20	0.323	3.09	0.290	2.98	0.220	0.620	0.080
Mn - DTPA	mg/kg	49	19.6	2.10	13.3	1.18	31.5	3.82	11.8	1.18	125	12.4
Fe - DTPA	mg/kg	51	13.9	2.20	24.3	3.16	43.0	5.18	16.3	2.33	25.1	4.10
Cu - DTPA	mg/kg	53	0.440	0.060	1.63	0.145	1.60	0.130	2.61	0.190	0.950	0.070
Zn - HCl	mg/kg	2	8.87	0.935	9.02	1.02	6.41	0.345	6.77	0.220	1.61	0.115
Mn-H3PO4	mg/kg	9	32.0	3.42	25.6	2.75	38.1	6.42	9.25	0.750	153	13.0
Cl - Ca(NO3)2 Extr.	mg/kg	17	43.4	6.25	32.0	4.70	21.1	1.60	6.97	0.700	5.28	1.28
B - Hot Wat.	mg/kg	37	0.780	0.110	0.470	0.090	0.370	0.078	0.362	0.064	0.287	0.049
B-DTPA/Sorbitol	mg/kg	17	0.500	0.070	0.330	0.050	0.360	0.040	0.420	0.050	0.180	0.028
Soil Organic Matter												
Soil Kjeldahl N	%	21	0.115	0.005	0.074	0.004	0.241	0.021	0.146	0.008	0.108	0.012
Soil TN (combustion)	%	43	0.131	0.011	0.082	0.009	0.260	0.011	0.215	0.015	0.117	0.012
Soil TOC (Combustion)	%	8	0.900	0.020	0.700	0.057	2.77	0.085	1.78	0.140	0.935	0.040
Soil Total C (Combustion)	%	32	0.939	0.045	0.707	0.041	3.01	0.079	1.85	0.055	0.974	0.032
SOM - Walkley-Black	%	32	1.65	0.110	1.36	0.140	4.31	0.380	2.52	0.320	1.50	0.140
SOM - LOI (% Wt loss)	%	75	1.70	0.100	1.62	0.118	5.10	0.250	4.37	0.525	2.23	0.170
Other												
CaCO3 Content	%	14	0.482	0.119	0.951	0.180	2.33	0.304	1.99	0.405	0.360	0.051
CEC - Cation Displacement	cmol/kg	21	7.09	1.02	10.2	0.800	16.5	1.80	45.3	4.35	11.5	1.48
CEC - Estimation	cmol/kg	11	11.4	1.10	13.2	1.10	20.7	1.60	43.3	2.90	9.50	0.750
Soil Density (Scoop)	g/cc	13	1.41	0.025	1.38	0.050	1.02	0.045	1.22	0.025	1.18	0.050
Particle Size Analysis-Hydrometer												
Sand 2000 - 50 um	%	39	85.0	1.95	67.6	2.60	28.9	4.38	26.6	3.75	10.0	1.81
Silt 50 - 2 um	%	39	8.40	1.65	24.5	2.00	48.2	4.30	22.5	3.50	68.0	3.00
Clay 2 - 0 um	%	38	6.60	0.980	7.40	1.40	21.0	3.85	50.0	3.35	21.3	2.70
Particle Size Analysis- Pipette												
Sand 2000 - 50 um	%	4	89.8	0.800	72.0	0.800	29.9	5.20	21.9	3.26	5.10	1.69
Silt 50 - 2 um	%	4	5.60	1.38	23.9	0.705	55.0	1.60	32.0	3.53	75.2	1.45
Clay 2 - 0 um	%	4	5.60	0.850	4.86	1.10	15.1	1.50	49.4	0.300	20.0	1.22
Solvita CO2	ppm	3	36.4	20.7	25.2	5.44	101	12.1	22.6	3.81	26.4	2.77

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