



2014 North American Proficiency Testing Program
3rd Quarter Report - October 16, 2014

Laboratory ID
General

Soil Analysis	Units	n	Soil 2014-111			Soil 2014-112			Soil 2014-113			Soil 2014-114			Soil 2014-115		
			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	%	24	50.0	3.20		40.9	2.65		50.3	2.45		35.4	1.61		35.7	1.85	
pH - sp	Unit	31	7.70	0.100		5.47	0.080		6.80	0.110		5.50	0.130		6.96	0.080	
ECe - sp	dS/m	30	2.27	0.135		0.900	0.080		1.81	0.255		1.20	0.126		0.555	0.049	
HCO ₃ - sp	mmolc/L	12	3.44	0.855		1.23	0.156		4.25	0.685		0.500	0.050		1.34	0.195	
Ca - sp	mmolc/L	27	12.9	1.49		3.73	0.540		14.2	2.20		5.40	1.10		1.38	0.230	
Mg - sp	mmolc/L	27	7.65	0.926		2.59	0.500		2.17	0.370		2.55	0.446		2.64	0.491	
Na - sp	mmolc/L	27	4.95	0.610		0.300	0.020		0.780	0.080		0.870	0.120		0.530	0.043	
SAR - sp	value	25	1.49	0.090		0.195	0.014		0.270	0.030		0.430	0.060		0.370	0.070	
Cl - sp	mmolc/L	18	2.61	0.370		0.505	0.115		1.68	0.165		0.560	0.080		0.300	0.048	
SO ₄ - sp	mmolc/L	17	17.9	1.66		0.770	0.130		1.93	0.270		0.830	0.070		0.590	0.090	
NO ₃ - sp	mmolc/L	10	2.48	0.499		4.95	0.495		8.70	2.11		7.51	1.09		2.61	0.615	
B - sp	mg/L	11	0.280	0.040		0.095	0.004		0.060	0.010		0.068	0.002		0.210	0.019	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	41	1.11	0.100		0.380	0.040		0.650	0.061		0.370	0.050		0.270	0.030	
Soil EC (1:2)	(dS/m)	47	0.788	0.102		0.230	0.020		0.490	0.073		0.253	0.027		0.133	0.022	
pH (1:1) Water	Unit	93	7.88	0.090		5.70	0.100		6.85	0.080		5.58	0.080		7.17	0.110	
pH (1:2) Water	Unit	34	8.01	0.087		5.77	0.110		6.97	0.103		5.70	0.100		7.26	0.140	
pH (1:1) 0.01M CaCl ₂	Unit	24	7.67	0.090		5.30	0.060		6.68	0.065		5.23	0.075		6.70	0.060	
pH (1:2) 0.01M CaCl ₂	Unit	10	7.66	0.050		5.23	0.040		6.68	0.055		5.23	0.045		6.61	0.060	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	27	7.51	0.050		6.85	0.083		7.09	0.060		6.74	0.090		7.28	0.080	
Adams-Evans Buf pH	Unit	9	7.72	0.120		7.59	0.110		7.66	0.150		7.67	0.090		7.70	0.080	
Woodruff Buf. pH	Unit	22	7.19	0.050		6.67	0.070		6.94	0.050		6.60	0.070		6.97	0.060	
Mehlich Buffer pH	Unit	6	6.94	0.070		6.11	0.040		6.52	0.020		6.14	0.060		6.46	0.020	
Sikora Buffer pH	Unit	29	7.51	0.040		6.87	0.080		7.20	0.070		6.81	0.105		7.22	0.070	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	63	32.4	1.60	32.8	1.75	89.2	9.11	50.9	2.60	17.4	1.19
NO3-N ISE	mg/kg	16	33.3	2.95	32.1	2.39	82.6	11.2	49.6	7.20	17.6	1.90
NO3-N CTA	mg/kg	2	29.8	3.36	32.7	3.67	83.2	13.2	47.9	6.74	16.7	1.73
NO3-N Ion Chr.	mg/kg	3	28.9	6.08	31.0	1.01	86.0	9.37	53.0	6.96	17.0	2.91
NO3-N Other _____	mg/kg	9	32.0	2.00	34.8	3.04	80.8	10.8	50.1	1.86	17.4	1.27
NH4 - N (KCl Extr.)	mg/kg	55	19.0	1.10	13.8	1.20	8.00	0.990	2.81	0.390	2.45	0.585

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	49	15.2	2.55	29.1	2.05	45.7	2.53	214	12.5	19.2	1.80
PO4-P Bray P1 (1:7)	mg/kg	7	15.0	6.28	28.1	2.08	34.4	0.400	172	7.36	16.2	0.560
PO4-P Olsen/Bicarb	mg/kg	56	24.8	1.55	13.6	1.10	25.9	2.71	66.8	4.28	14.8	1.62
PO4-P AB-DTPA	mg/kg	2	11.1	1.08	6.18	3.18	14.1	3.08	34.1	3.46	6.35	0.345
PO4-P Modified Morgan	mg/kg	5	41.8	6.10	2.30	0.150	7.64	0.260	14.0	0.630	6.40	0.370
PO4-P True Morgan	mg/kg	8	35.5	2.95	3.72	0.590	8.17	0.440	16.5	0.515	6.64	0.600
PO4-P Mod. Kewlona	mg/kg	2	27.7	5.81	20.9	1.49	24.5	2.56	120	14.2	13.3	0.586
PO4-P Stong Bray (1:10)	mg/kg	9	195	12.9	55.0	6.00	79.3	4.70	282	18.5	118	12.1
PO4-P Water Soluble	mg/kg											
SO4 - S (PO4 Extr.)	mg/kg	33	137	16.7	8.00	0.901	18.6	2.58	8.00	2.00	4.00	0.795

Bases

K Ammonium Acetate	mg/kg	78	630	32.5	482	21.9	140	14.3	210	13.3	345	23.6
Ca Ammonium Acetate	mg/kg	73	5210	536	1400	97.7	2250	210	689	49.0	1340	89.0
Mg Ammonium Acetate	mg/kg	73	828	55.0	409	21.8	114	10.0	110	7.00	1240	86.9
Na Ammonium Acetate	mg/kg	60	133	12.4	14.7	3.60	20.4	3.76	17.8	3.84	23.7	3.63
Bray Extractable K	mg/kg	5	401	6.80	365	4.25	114	8.26	181	4.00	244	3.03
K- Olsen/Bicarb.	mg/kg	6	417	21.5	352	3.50	143	5.00	202	10.0	313	9.50
K Modified Morgan	mg/kg	4	557	19.0	455	40.0	147	5.50	195	23.5	306	17.0
K True Morgan	mg/kg	6	335	21.5	300	20.0	123	9.50	183	12.5	242	15.5
Ca Modified Morgan	mg/kg	3	14000	867	1330	31.0	3390	64.0	563	16.0	1190	60.0
Aluminum KCL Extr.	mg/kg	5	0.650	0.350	1.00	0.790	0.360	0.170	4.00	2.27	1.00	1.00

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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	14.2	4.00	33.5	1.83	24.2	2.29	106	8.12	82.8	4.29	
K	mg/kg	6	217	13.7	251	8.67	106	2.67	159	3.68	215	4.57	
Ca	mg/kg	6	4470	67.6	1100	31.7	3370	139	767	27.3	1170	33.8	
Mg	mg/kg	6	557	16.1	314	12.1	142	9.97	109	1.75	990	30.0	
Mn	mg/kg	5	14.2	1.33	157	10.4	115	18.8	36.7	1.73	40.1	2.76	
Zn	mg/kg	4	0.041	0.006	0.587	0.011	3.06	0.165	4.18	0.146	1.57	0.061	
Mehlich-3 Multi-Element (scoop)													
Scoop Soil Mass	g	24	2.22	0.120	2.16	0.145	1.89	0.195	2.28	0.170	2.30	0.130	
Assumed Density	g/cm3	13	1.18	0.070	1.15	0.040	1.06	0.120	1.18	0.050	1.18	0.052	
Volume of Scoop	cm3	22	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	17	81.0	6.70	27.0	2.00	50.0	3.00	219	12.0	26.0	2.67	
P ICP-AES	mg/kg	47	87.0	5.81	35.7	2.08	59.0	3.77	243	12.4	27.0	2.20	
K	mg/kg	53	647	37.0	487	22.2	142	8.67	214	13.5	350	20.0	
Ca	mg/kg	50	6670	430	1420	111	2650	237	788	71.0	1430	115	
Mg	mg/kg	50	938	48.9	421	26.0	128	8.29	119	10.0	1390	91.0	
Na	mg/kg	36	135	13.9	12.0	2.84	19.7	2.75	17.0	2.05	25.2	3.40	
S	mg/kg	40	175	9.25	14.5	1.50	26.6	1.64	16.7	1.42	6.20	1.20	
Al	mg/kg	32	201	45.4	585	40.2	874	50.5	1060	74.0	520	45.5	
Zn	mg/kg	45	4.93	0.370	1.16	0.195	3.82	0.380	5.70	0.420	2.40	0.250	
Mn	mg/kg	45	136	9.20	220	9.40	296	31.5	105	12.0	157	17.0	
Fe	mg/kg	43	210	17.7	94.3	8.68	209	23.3	197	21.8	206	16.6	
Cu	mg/kg	45	4.30	0.250	1.47	0.130	2.92	0.280	3.90	0.260	4.55	0.350	
B	mg/kg	34	3.30	0.360	0.428	0.103	0.700	0.140	0.425	0.055	0.895	0.165	

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Micronutrients													
Zn - DTPA	mg/kg	67	2.27	0.130	0.680	0.080	1.90	0.200	2.84	0.210	0.884	0.084	
Mn - DTPA	mg/kg	51	41.8	1.99	175	16.0	46.4	7.90	22.3	2.49	15.6	2.00	
Fe - DTPA	mg/kg	53	51.0	6.61	30.0	3.71	51.2	8.20	43.4	6.80	18.6	1.51	
Cu - DTPA	mg/kg	54	2.80	0.143	1.26	0.090	2.16	0.238	2.31	0.175	2.57	0.165	
Zn - HCl	mg/kg	3	1.57	1.33	1.32	0.510	3.75	0.000	5.51	0.370	3.10	0.430	
Mn-H3PO4	mg/kg	10	20.4	2.55	125	4.25	87.3	7.85	33.0	2.13	19.1	1.45	
Cl - Ca(NO3)2 Extr.	mg/kg	15	42.9	4.63	7.20	1.27	26.0	2.94	7.60	1.50	4.04	0.585	
B - Hot Wat.	mg/kg	40	1.34	0.315	0.395	0.055	0.350	0.080	0.290	0.047	0.615	0.145	
B-DTPA/Sorbitol	mg/kg	16	2.16	0.200	0.205	0.040	0.320	0.035	0.180	0.020	0.510	0.060	
Soil Organic Matter													
Soil Kjeldahl N	%	19	0.142	0.005	0.103	0.007	0.190	0.010	0.094	0.005	0.067	0.007	
Soil TN (combustion)	%	36	0.157	0.010	0.116	0.007	0.202	0.011	0.102	0.009	0.080	0.010	
Soil TOC (Combustion)	%	9	1.27	0.070	1.05	0.047	2.07	0.140	1.06	0.100	0.580	0.040	
Soil Total C (Combustion)	%	28	1.85	0.052	1.05	0.029	2.15	0.066	1.04	0.033	0.578	0.033	
SOM - Walkley-Black	%	34	2.12	0.120	1.88	0.130	3.30	0.370	1.61	0.132	1.00	0.115	
SOM - LOI (% Wt loss)	%	77	2.68	0.180	2.12	0.140	4.18	0.190	2.40	0.130	1.83	0.170	
Other													
CaCO3 Content	%	14	6.62	0.740	0.469	0.083	1.19	0.260	0.430	0.086	1.48	0.308	
CEC - Cation Displacement	cmol/kg	19	22.6	3.30	14.6	1.77	13.4	2.31	8.00	1.57	19.0	2.23	
CEC - Estimation	cmol/kg	13	37.9	3.81	15.1	1.70	14.1	1.56	8.70	1.67	19.3	1.45	
Soil Density (Scoop)	g/cc	11	1.27	0.050	1.17	0.074	1.02	0.050	1.24	0.060	1.28	0.050	
Particle Size Analysis-Hydrometer													
Sand 2000 - 50 um	%	37	36.0	3.70	27.5	3.50	24.0	3.40	37.4	2.60	42.0	3.00	
Silt 50 - 2 um	%	37	28.4	3.40	49.9	4.00	54.0	4.50	47.0	2.00	36.3	2.70	
Clay 2 - 0 um	%	37	36.2	3.20	22.4	2.40	22.5	3.50	14.8	2.30	22.5	2.50	
Particle Size Analysis- Pipette													
Sand 2000 - 50 um	%	5	36.0	2.90	25.0	4.60	20.4	1.14	35.0	0.850	42.0	1.87	
Silt 50 - 2 um	%	5	30.9	8.05	49.6	4.44	63.2	0.200	52.4	0.845	38.5	1.36	
Clay 2 - 0 um	%	5	30.7	3.00	20.8	4.80	17.5	0.390	12.0	0.230	19.6	0.660	
Solvita CO2													
Solvita CO2	ppm	9	13.1	1.48	20.7	3.10	82.3	19.6	21.7	3.28	9.30	1.25	

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