



**2014 North American Proficiency Testing Program
4th Quarter Report - January 15, 2015**

**Laboratory ID
General**

Soil Analysis	Units	n	Soil 2014-116			Soil 2014-117			Soil 2014-118			Soil 2014-119			Soil 2014-120		
			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	%	23	54.0	3.40		52.5	4.03		35.5	1.71		47.1	2.60		37.5	2.50	
pH - sp	Unit	28	6.48	0.175		7.18	0.175		5.50	0.200		5.75	0.140		7.00	0.120	
ECe - sp	dS/m	29	0.690	0.080		0.599	0.069		1.19	0.210		0.363	0.071		0.760	0.060	
HCO ₃ - sp	mmolc/L	10	3.94	0.780		5.11	0.685		0.520	0.044		0.555	0.078		1.88	0.260	
Ca - sp	mmolc/L	24	4.69	0.745		2.88	0.410		5.82	0.727		1.72	0.284		4.95	0.600	
Mg - sp	mmolc/L	24	1.93	0.275		1.66	0.215		2.70	0.380		0.750	0.150		1.62	0.174	
Na - sp	mmolc/L	24	0.130	0.013		0.114	0.012		0.900	0.152		0.160	0.018		0.860	0.080	
SAR - sp	value	20	0.100	0.025		0.100	0.013		0.415	0.070		0.130	0.030		0.475	0.065	
Cl - sp	mmolc/L	16	0.539	0.047		0.280	0.070		0.495	0.090		0.200	0.040		0.480	0.080	
SO ₄ - sp	mmolc/L	16	1.91	0.120		0.543	0.083		0.835	0.110		0.930	0.060		1.00	0.090	
NO ₃ - sp	mmolc/L	11	0.075	0.018		0.050	0.012		7.63	1.73		0.770	0.145		3.27	0.800	
B - sp	mg/L	11	0.130	0.020		0.120	0.010		0.060	0.008		0.093	0.013		0.064	0.006	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	37	0.336	0.036		0.329	0.033		0.360	0.040		0.250	0.030		0.370	0.048	
Soil EC (1:2)	(dS/m)	44	0.199	0.026		0.245	0.041		0.240	0.025		0.130	0.020		0.195	0.039	
pH (1:1) Water	Unit	85	6.50	0.100		7.43	0.080		5.60	0.090		5.91	0.090		7.24	0.090	
pH (1:2) Water	Unit	31	6.65	0.150		7.50	0.100		5.70	0.100		6.04	0.140		7.32	0.150	
pH (1:1) 0.01M CaCl ₂	Unit	27	6.10	0.050		6.91	0.040		5.25	0.050		5.41	0.060		6.84	0.070	
pH (1:2) 0.01M CaCl ₂	Unit	12	6.19	0.135		6.97	0.050		5.31	0.085		5.44	0.030		6.76	0.040	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	28	6.86	0.105		7.23	0.080		6.79	0.073		6.62	0.090		7.36	0.060	
Adams-Evans Buf pH	Unit	10	7.53	0.065		7.75	0.050		7.65	0.075		7.41	0.055		7.76	0.025	
Woodruff Buf. pH	Unit	23	6.75	0.040		7.01	0.040		6.65	0.080		6.54	0.060		7.02	0.060	
Mehlich Buffer pH	Unit	9	6.21	0.070		6.54	0.045		6.12	0.100		6.02	0.080		6.50	0.025	
Sikora Buffer pH	Unit	28	6.86	0.105		7.28	0.065		6.83	0.070		6.62	0.090		7.34	0.055	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	61	8.20	0.500	2.79	0.260	50.2	1.93	13.4	0.750	21.0	0.950
NO3-N ISE	mg/kg	17	8.00	1.00	3.77	0.770	49.5	3.50	13.0	1.00	20.8	1.25
NO3-N CTA	mg/kg	1	9.19	0.000	5.30	0.000	41.5	0.000	13.5	0.000	18.3	0.00
NO3-N Ion Chr.	mg/kg	3	22.0	1.40	8.83	6.260	51.0	0.460	19.0	2.19	28.2	5.78
NO3-N Other _____	mg/kg	8	8.49	0.525	2.89	0.670	48.6	3.35	14.0	1.25	20.8	1.65
NH4 - N (KCl Extr.)	mg/kg	50	7.45	0.760	4.48	0.580	3.09	0.580	43.2	3.15	10.0	0.975

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	46	95.0	8.00	185	16.3	211	9.13	30.3	1.38	17.1	1.15
PO4-P Bray P1 (1:7)	mg/kg	5	85.0	2.00	149	15.6	163	25.8	22.0	1.20	15.0	1.00
PO4-P Olsen/Bicarb	mg/kg	50	47.1	3.68	129	17.2	67.0	4.34	24.4	1.82	8.00	1.00
PO4-P AB-DTPA	mg/kg	2	17.9	1.57	78.3	8.73	34.7	3.22	7.56	1.56	2.93	0.425
PO4-P Modified Morgan	mg/kg	5	21.6	0.600	96.7	12.6	13.8	2.52	2.90	0.539	2.82	0.224
PO4-P True Morgan	mg/kg	8	25.7	1.95	100	12.0	16.4	1.25	3.50	0.500	3.50	0.820
PO4-P Mod. Kewlona	mg/kg	3	80.0	3.00	170	27.0	140	6.00	21.0	2.00	13.0	0.000
PO4-P Stong Bray (1:10)	mg/kg	9	147	3.00	353	45.5	282	24.0	65.5	2.35	46.8	2.21
PO4-P Water Soluble	mg/kg											
SO4 - S (PO4 Extr.)	mg/kg	32	16.0	1.61	5.50	0.712	7.57	1.32	7.46	1.55	6.60	0.900

Bases

K Ammonium Acetate	mg/kg	71	438	31.0	1080	61.0	211	9.00	314	11.4	148	8.80
Ca Ammonium Acetate	mg/kg	65	3040	213	3560	351	693	51.0	2310	114	2780	154
Mg Ammonium Acetate	mg/kg	65	449	31.1	590	33.5	115	9.50	399	23.4	386	24.5
Na Ammonium Acetate	mg/kg	52	12.1	3.03	11.0	1.31	19.0	2.08	12.1	1.38	32.0	5.05
Bray Extractable K	mg/kg	4	288	2.50	786	35.0	178	5.75	208	9.60	97.1	4.20
K- Olsen/Bicarb.	mg/kg	5	345	19.0	883	71.0	211	1.00	225	14.0	96.4	17.4
K Modified Morgan	mg/kg	4	411	17.5	990	10.9	187	12.7	268	23.0	123	8.89
K True Morgan	mg/kg	6	284	11.5	783	30.5	177	7.50	172	2.50	56.9	8.50
Ca Modified Morgan	mg/kg	3	3470	94.0	6770	222	630	42.0	2220	162	2590	44.0
Aluminum KCL Extr.	mg/kg	5	0.970	0.570	2.00	1.50	1.37	0.551	0.550	0.440	1.00	0.820

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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	77.3	5.35	123	3.14	114	16.0	12.6	1.37	28.2	2.61
K	mg/kg	6	239	4.32	579	18.1	174	1.14	165	5.19	60.2	3.95
Ca	mg/kg	6	2760	175	3960	189	782	21.1	1780	65.4	1980	39.0
Mg	mg/kg	6	430	36.9	579	35.5	112	5.72	320	16.2	292	20.6
Mn	mg/kg	5	59.1	2.28	62.9	4.00	37.2	0.985	113	5.49	54.4	0.770
Zn	mg/kg	4	4.66	0.327	1.29	0.264	4.28	0.155	1.74	0.090	2.33	0.110

Mehlich-3 Multi-Element (scoop)

Scoop Soil Mass	g	25	2.00	0.140	1.90	0.100	2.21	0.170	2.07	0.070	2.24	0.133
Assumed Density	g/cm3	14	1.09	0.088	1.05	0.132	1.18	0.040	1.13	0.050	1.18	0.030
Volume of Scoop	cm3	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	27	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000
P Colorimetric	mg/kg	14	97.6	4.84	248	13.2	219	2.52	38.6	2.50	20.2	1.10
P ICP-AES	mg/kg	49	116	6.57	265	18.7	240	11.5	43.3	3.50	21.8	1.30
K	mg/kg	53	430	24.1	1100	74.2	217	15.0	315	15.9	154	9.50
Ca	mg/kg	50	3290	245	4580	352	803	72.8	2400	109	2860	168
Mg	mg/kg	50	471	33.2	689	48.5	121	10.0	416	24.0	413	22.0
Na	mg/kg	36	9.19	1.32	10.0	1.92	18.7	3.45	10.3	1.33	31.4	3.98
S	mg/kg	39	24.1	2.10	12.0	1.57	16.8	1.10	14.0	1.22	10.3	1.59
Al	mg/kg	32	798	70.0	261	44.5	1100	70.0	920	50.0	659	48.8
Zn	mg/kg	46	7.08	0.575	6.68	0.525	5.70	0.500	2.39	0.196	3.80	0.300
Mn	mg/kg	46	143	14.4	107	9.60	99.0	13.4	147	6.00	159	9.00
Fe	mg/kg	44	167	15.4	342	28.5	193	15.2	398	40.4	90.0	8.00
Cu	mg/kg	46	2.69	0.250	3.36	0.365	3.90	0.230	2.60	0.230	3.41	0.220
B	mg/kg	36	1.11	0.140	1.60	0.275	0.415	0.079	0.800	0.131	0.57	0.140

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Micronutrients													
Zn - DTPA	mg/kg	62	4.31	0.287	4.00	0.284	2.72	0.195	1.60	0.100	1.73	0.140	
Mn - DTPA	mg/kg	48	53.8	6.50	6.99	1.05	22.1	2.25	121	9.40	41.0	4.00	
Fe - DTPA	mg/kg	50	59.3	8.74	78.4	6.03	42.6	6.77	182	22.0	10.1	1.40	
Cu - DTPA	mg/kg	52	1.60	0.100	2.56	0.210	2.23	0.225	2.30	0.200	1.80	0.150	
Zn - HCl	mg/kg	2	6.69	0.760	7.17	0.840	5.07	0.520	2.55	0.200	3.65	0.330	
Mn-H3PO4	mg/kg	9	45.8	7.00	62.2	9.40	33.8	1.20	84.6	9.59	43.7	3.10	
Cl - Ca(NO3)2 Extr.	mg/kg	20	9.27	1.62	4.05	0.569	7.00	0.930	3.85	0.624	6.42	1.51	
B - Hot Wat.	mg/kg	33	0.910	0.130	0.970	0.206	0.330	0.070	0.520	0.120	0.395	0.050	
B-DTPA/Sorbitol	mg/kg	17	0.460	0.040	0.680	0.044	0.170	0.040	0.300	0.060	0.270	0.038	
Soil Organic Matter													
Soil Kjeldahl N	%	14	0.255	0.016	0.278	0.015	0.095	0.008	0.168	0.008	0.067	0.007	
Soil TN (combustion)	%	36	0.271	0.020	0.295	0.015	0.104	0.008	0.178	0.013	0.075	0.008	
Soil TOC (Combustion)	%	9	2.76	0.141	3.50	0.090	0.990	0.100	1.77	0.068	0.570	0.070	
Soil Total C (Combustion)	%	28	2.89	0.087	3.85	0.093	1.06	0.035	1.84	0.077	0.588	0.035	
SOM - Walkley-Black	%	26	4.70	0.300	5.75	0.525	1.65	0.130	3.18	0.173	1.00	0.057	
SOM - LOI (% Wt loss)	%	72	5.36	0.245	6.12	0.211	2.42	0.115	3.82	0.180	1.60	0.173	
Other													
CaCO3 Content	%	10	1.04	0.485	3.81	0.415	0.450	0.310	0.500	0.220	0.540	0.440	
CEC - Cation Displacement	cmol/kg	15	21.4	3.20	22.1	2.59	6.79	1.42	20.6	2.80	15.1	2.76	
CEC - Estimation	cmol/kg	14	21.0	1.61	26.0	2.10	7.85	1.75	20.2	2.59	18.2	1.25	
Soil Density (Scoop)	g/cc	13	1.10	0.050	1.08	0.030	1.21	0.070	1.18	0.050	1.28	0.038	
Particle Size Analysis-Hydrometer													
Sand 2000 - 50 um	%	39	18.0	4.30	40.3	4.70	39.3	3.50	20.8	5.05	39.2	5.60	
Silt 50 - 2 um	%	39	57.3	4.60	41.4	2.40	46.0	2.95	48.5	4.80	37.0	5.10	
Clay 2 - 0 um	%	39	26.0	4.00	19.3	3.30	15.0	2.00	30.0	3.00	24.0	2.15	
Particle Size Analysis- Pipette													
Sand 2000 - 50 um	%	3	18.3	0.370	37.3	4.69	33.1	0.400	14.7	2.59	41.5	4.16	
Silt 50 - 2 um	%	3	60.0	5.70	39.1	1.81	53.4	0.900	57.1	3.40	31.2	2.92	
Clay 2 - 0 um	%	3	28.8	1.05	21.3	4.12	13.5	0.500	31.8	3.50	23.5	0.600	
Solvita CO2													
Solvita CO2	ppm	8	91.8	42.2	40.8	15.9	24.1	5.30	27.2	7.28	8.5	2.61	

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