



2009 North American Proficiency Testing Program
1st Quarter Report - April 25, 2009

Laboratory ID

Soil Analysis	Units	n	Soil 2009-101			Soil 2009-102			Soil 2009-103			Soil 2009-104			Soil 2009-105		
			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	%	26	61.0	4.69		47.9	3.92		55.7	4.50		33.5	2.89		38.1	3.08	
pH - sp	Unit	35	6.18	0.130		5.41	0.090		7.70	0.100		6.30	0.180		7.00	0.110	
ECe - sp	dS/m	37	0.310	0.080		0.560	0.067		1.81	0.100		0.145	0.026		0.660	0.060	
HCO ₃ - sp	mmol/L	15	2.14	0.741		1.39	0.290		6.02	2.31		0.800	0.200		1.40	0.300	
Ca - sp	mmol/L	28	1.83	0.373		2.35	0.468		5.31	0.485		0.590	0.131		4.22	0.525	
Mg - sp	mmol/L	28	0.897	0.250		0.695	0.141		4.76	0.474		0.360	0.070		1.31	0.140	
Na - sp	mmol/L	28	0.365	0.139		2.72	0.383		2.44	0.174		0.559	0.140		0.840	0.190	
SAR - sp	value	23	0.300	0.110		2.07	0.140		1.10	0.100		0.810	0.260		0.600	0.150	
Cl - sp	mmol/L	18	0.345	0.100		2.35	0.190		1.54	0.150		0.450	0.110		0.520	0.080	
SO ₄ - sp	mmol/L	17	0.370	0.082		0.920	0.110		2.51	0.223		0.190	0.060		0.850	0.090	
NO ₃ - sp	mmol/L	12	0.055	0.050		0.050	0.041		7.14	1.63		0.320	0.260		3.69	0.620	
B - sp	mg/L	14	0.080	0.032		0.060	0.025		0.339	0.051		0.041	0.011		0.060	0.020	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	32	0.121	0.021		0.297	0.017		0.910	0.098		0.093	0.025		0.373	0.033	
Soil EC (1:2)	(dS/m)	45	0.090	0.010		0.150	0.020		0.610	0.070		0.041	0.009		0.167	0.017	
pH (1:1) Water	Unit	79	6.31	0.090		5.72	0.080		7.92	0.080		6.54	0.130		7.23	0.090	
pH (1:2) Water	Unit	27	6.43	0.150		5.90	0.100		8.04	0.090		6.74	0.170		7.33	0.130	
pH (1:1) 0.01M CaCl ₂	Unit	24	5.70	0.070		5.19	0.080		7.66	0.075		5.85	0.085		6.86	0.060	
pH (1:2) 0.01M CaCl ₂	Unit	9	5.65	0.050		5.14	0.050		7.60	0.100		5.94	0.140		6.80	0.050	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	49	6.60	0.100		6.70	0.060		7.49	0.040		6.96	0.075		7.30	0.040	
Adams-Evans Buf pH	Unit	6	7.44	0.030		7.54	0.065		7.75	0.040		7.63	0.050		7.72	0.025	
Woodruff Buf. pH	Unit	24	6.53	0.090		6.53	0.055		7.18	0.020		6.77	0.055		7.00	0.030	
Mehlich Buffer pH	Unit	7	6.10	0.050		6.10	0.080		6.92	0.110		6.27	0.070		6.61	0.070	
Sikora Buffer pH		12	6.70	0.190		6.68	0.115		7.49	0.090		6.80	0.110		7.26	0.075	
Titrateable Acidity	cmol/kg	0															

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Inorganic Nitrogen (NO3-N & NH4-N)																	
NO3-N Cd. Rd.	mg/kg	57	1.58	0.380		0.700	0.500		75.4	4.69		2.18	0.480		22.3	1.69	
NO3-N ISE	mg/kg	19	2.56	0.840		1.84	0.760		75.0	14.2		3.10	0.520		22.0	2.00	
NO3-N CTA	mg/kg	5	4.50	0.500		4.00	1.10		79.8	4.45		4.06	0.540		24.1	2.43	
NO3-N Ion Chr.	mg/kg	0															
NO3-N Other _____	mg/kg	7	2.90	0.880		1.69	0.504		78.2	3.12		2.97	1.15		22.4	0.90	
NH4 - N (KCl Extr.)	mg/kg	49	7.20	1.061		11.4	0.92		4.00	0.767		2.60	0.522		8.64	0.754	
Phosphorus and Sulfur																	
PO4-P Bray P (1:10)	mg/kg	54	67.5	6.25		8.00	1.03		163	15.3		14.5	1.60		16.0	1.80	
PO4-P Bray P1 (1:7)	mg/kg	7	53.5	2.14		7.78	1.78		127	9.54		10.9	1.14		14.0	1.98	
PO4-P Olsen/Bicarb	mg/kg	55	38.0	4.00		5.00	1.00		113	12.9		14.0	2.00		8.67	1.39	
PO4-P AB-DTPA	mg/kg	2	17.7	17.5		2.16	1.74		54.4	45.6		4.40	4.22		2.02	1.92	
PO4-P Modified Morgan	mg/kg	4	8.30	0.45		1.75	0.200		135	23.6		3.05	0.600		2.75	0.750	
PO4-P True Morgan	mg/kg	2	16.7	5.05		1.15	0.150		172	3.20		2.52	0.280		2.90	0.200	
PO4-P Mod. Kewlona	mg/kg	1	52.9	0.00		6.72	0.000		189	0.0		15.4	0.00		16.5	0.00	
PO4-P Stong Bray (1:10)	mg/kg	10	109	13.0		10.3	1.84		559	95.4		170	14.2		45.3	2.13	
PO4-P Water Soluble	mg/kg	3	9.32	1.62		3.49	2.35		30.3	18.1		4.77	2.46		2.34	1.29	
SO4 - S (PO4 Extr.)	mg/kg	38	4.12	1.50		7.51	1.98		27.1	3.80		3.00	1.80		6.67	1.57	
Bases																	
K Ammonium Acetate	mg/kg	81	385	53.0		87.7	5.67		2230	205		131	13.0		140	10.0	
Ca Ammonium Acetate	mg/kg	75	2314	295		2824	222		3462	462		2080	181		2774	191	
Mg Ammonium Acetate	mg/kg	75	315	56.0		347	23.5		929	91.1		476	37.0		380	27.5	
Na Ammonium Acetate	mg/kg	60	18.4	6.40		120	11.5		91.0	14.9		60.4	9.33		36.2	6.85	
Bray Extractable K	mg/kg	4	282	24.1		60.0	0.45		1413	282		87.5	5.10		96.2	4.35	
K- Olsen/Bicarb.	mg/kg	4	377	8.5		60.9	7.35		1572	116		111	6.80		68.0	8.10	
K Modified Morgan	mg/kg	2	366	25.9		99.3	19.8		1993	477		139	26.7		162	35.4	
K True Morgan	mg/kg	3	349	42.0		56.0	13.2		1282	12.0		102	24.3		57.0	11.6	
Ca Modified Morgan	mg/kg	3	2298	285.6		2718	12.4		6572	92.0		2009	76.8		2646	86.0	
Aluminum KCL Extr.	mg/kg	5	1.00	0.200		1.00	1.00		0.140	0.140		0.850	0.850		0.490	0.440	

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Mehlich-1 Multi Element (scoop)																	
Scoop Soil Mass	g	6	5.00	0.00		5.00	0.00		5.00	0.00		5.00	0.00		5.00	0.00	
P	mg/kg	7	30.9	2.10		5.60	0.600		285	12.8		144	12.0		26.5	0.53	
K	mg/kg	6	257	18.0		50.1	6.35		1061	63.5		69.2	4.08		61.1	4.41	
Ca	mg/kg	6	2653	216		1916	93.9		3969	148		1953	101		2128	105	
Mg	mg/kg	6	313	31.0		241	11.7		747	34.5		388	21.0		303	13.0	
Mn	mg/kg	6	56.3	3.59		33.2	1.54		8.74	1.56		10.1	0.73		59.6	0.82	
Zn	mg/kg	6	6.46	0.57		1.74	0.163		0.316	0.105		1.52	0.011		2.72	0.116	
Mehlich-3 Multi-Element (scoop)																	
Scoop Soil Mass	g	25	1.59	0.120		2.04	0.128		2.01	0.110		2.25	0.050		2.20	0.117	
Assumed Density	g/cm ³	14	1.18	0.000		1.18	0.000		1.18	0.000		1.18	0.000		1.18	0.000	
Volume of Scoop	cm ³	29	2.00	0.300		2.00	0.300		2.00	0.300		2.00	0.300		2.00	0.300	
Extractant Volume mL	mL	26	20.0	0.00		20.0	0.00		20.0	0.00		20.0	0.00		20.0	0.00	
P Colorimetric	mg/kg	22	71.1	7.33		9.00	1.15		235	24.0		17.9	1.89		19.1	1.85	
P ICP-AES	mg/kg	38	81.5	8.09		13.0	1.79		246	19.7		19.0	1.67		20.7	2.10	
K	mg/kg	45	395	49.0		91.0	10.1		2228	138		129	15.0		152	14.9	
Ca	mg/kg	43	2449	257		2873	187		4650	360		2067	168		2800	191	
Mg	mg/kg	43	316	37.9		359	24.0		1118	73.3		507	38.3		414	27.0	
Na	mg/kg	30	16.2	7.49		114	14.4		87.0	7.85		55.6	3.25		33.9	6.84	
S	mg/kg	32	8.90	2.20		15.7	2.58		34.8	4.20		4.78	2.16		10.4	1.63	
Al	mg/kg	22	830	62.3		684	27.4		419	41.5		791	58.5		665	44.5	
Zn	mg/kg	34	7.67	1.22		2.83	0.49		9.00	0.820		2.11	0.205		4.40	0.39	
Mn	mg/kg	34	84.0	9.61		48.2	3.25		193	19.5		16.3	2.92		173	12.5	
Fe	mg/kg	31	281	40.4		202	14.3		88.2	8.83		246	19.0		116	10.9	
Cu	mg/kg	35	1.82	0.240		1.87	0.248		6.08	0.608		2.25	0.250		3.71	0.390	
B	mg/kg	28	0.580	0.175		0.543	0.123		4.40	0.500		0.300	0.130		0.625	0.140	

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Micronutrients																	
Zn - DTPA	mg/kg	74	5.50	0.910		2.04	0.279		3.79	0.266		1.30	0.100		2.23	0.175	
Mn - DTPA	mg/kg	56	42.5	7.50		39.7	2.53		13.2	2.65		5.24	0.872		35.9	2.49	
Fe - DTPA	mg/kg	59	104	24.7		71.6	7.81		11.6	1.34		53.1	7.65		16.5	2.07	
Cu - DTPA	mg/kg	62	1.35	0.250		1.40	0.100		2.80	0.260		1.60	0.190		1.92	0.178	
Zn - HCl	mg/kg	5	6.40	1.400		2.05	0.290		7.33	0.630		2.50	0.160		3.70	0.060	
Mn-H3PO4	mg/kg	12	42.5	8.83		23.8	1.52		12.0	3.51		5.22	0.450		38.1	2.08	
Cl - Ca(NO3)2 Extr.	mg/kg	15	5.00	1.10		36.3	2.23		25.5	2.00		4.40	0.900		6.45	0.750	
B - Hot Wat.	mg/kg	40	0.500	0.128		0.570	0.160		2.09	0.410		0.200	0.040		0.400	0.100	
B-DTPA/Sorbitol	mg/kg	9	0.290	0.110		0.170	0.040		2.89	0.110		0.150	0.050		0.300	0.060	
Soil Organic Matter																	
Soil Kjeldahl N	%	20	0.235	0.011		0.130	0.007		0.228	0.012		0.040	0.004		0.069	0.004	
Soil TN (combustion)	%	31	0.250	0.013		0.130	0.010		0.235	0.015		0.042	0.011		0.070	0.010	
Soil TOC (Combustion)	%	7	3.78	0.185		1.55	0.160		2.19	0.350		0.460	0.080		0.600	0.090	
Soil Total C (Combustion)	%	23	4.06	0.163		1.61	0.073		2.58	0.100		0.419	0.039		0.604	0.054	
SOM - Walkley-Black	%	37	6.28	0.710		2.74	0.240		3.82	0.380		0.740	0.080		1.05	0.110	
SOM - LOI (% Wt loss)	%	70	7.19	0.450		3.38	0.180		4.10	0.210		1.70	0.200		1.60	0.176	
CaCO3 Content	%	16	0.535	0.240		0.255	0.255		3.80	0.870		0.590	0.339		0.500	0.160	
CEC - Cation Displacement	cmol/kg	17	25.0	2.10		22.0	2.70		25.6	5.14		17.2	1.78		17.4	3.43	
CEC - Estimation	cmol/kg	14	17.9	1.70		20.7	3.33		32.4	3.35		16.2	1.60		18.3	2.20	
Soil Density (Scoop)	g/cc	11	0.900	0.040		1.18	0.048		1.16	0.035		1.30	0.050		1.29	0.050	
Particle Size Analysis																	
Sand 2000 - 50 um	%	35	21.6	5.00		30.4	4.40		16.9	4.15		71.1	3.12		38.5	4.50	
Silt 50 - 2 um	%	35	59.0	3.60		42.2	2.58		54.0	5.00		19.2	1.45		38.9	3.70	
Clay 2 - 0 um	%	35	18.0	3.00		28.4	2.39		28.5	3.55		10.0	2.00		23.5	1.92	

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