



2017 North American Proficiency Testing Program 3rd Quarter Report - October 11, 2017

Laboratory ID
General

Soil Analysis	Units	n	Soil 2017-111		Soil 2017-112		Soil 2017-113		Soil 2017-114		Soil 2017-115					
			Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}	Median	MAD	Lab ^{1,2}		
Salinity																
Sat. Paste Moisture	%	20	47.5	3.09		53.8	3.90		55.9	4.00		42.8	3.29		43.9	3.15
pH - sp	Unit	26	7.59	0.080		6.53	0.110		5.30	0.100		6.77	0.135		6.58	0.145
ECe - sp	dS/m	27	0.910	0.120		0.800	0.110		0.980	0.090		0.700	0.060		0.370	0.050
HCO ₃ - sp	mmolc/L	11	8.48	1.06		5.77	1.02		0.990	0.210		3.45	0.600		2.25	0.460
Ca - sp	mmolc/L	24	3.85	0.885		5.72	1.20		1.89	0.210		3.92	0.525		2.24	0.246
Mg - sp	mmolc/L	24	2.02	0.491		2.54	0.515		3.17	0.354		1.78	0.177		0.749	0.107
Na - sp	mmolc/L	25	0.557	0.127		0.148	0.023		0.390	0.090		0.110	0.018		0.200	0.040
SAR - sp	value	21	0.350	0.050		0.090	0.014		0.235	0.045		0.080	0.011		0.175	0.027
Cl - sp	mmolc/L	14	0.320	0.038		0.570	0.049		0.612	0.055		0.170	0.026		0.395	0.050
SO ₄ - sp	mmolc/L	15	1.00	0.060		2.16	0.190		0.600	0.070		0.640	0.080		0.624	0.084
NO ₃ - sp	mmolc/L	10	0.150	0.036		0.029	0.006		5.54	0.635		1.41	0.280		0.047	0.007
B - sp	mg/L	13	0.300	0.032		0.140	0.029		0.086	0.016		0.166	0.034		0.070	0.012
Soil pH & EC																
Soil EC (1:1)	(dS/m)	39	0.420	0.040		0.350	0.044		0.417	0.097		0.302	0.031		0.190	0.017
Soil EC (1:2)	(dS/m)	51	0.310	0.045		0.230	0.029		0.306	0.056		0.192	0.026		0.120	0.012
pH (1:1) Water	Unit	93	7.91	0.060		6.56	0.060		5.35	0.050		6.83	0.060		6.57	0.065
pH (1:2) Water	Unit	31	8.06	0.080		6.68	0.080		5.49	0.090		6.93	0.076		6.70	0.060
pH (1:1) 0.01M CaCl ₂	Unit	26	7.45	0.050		6.19	0.065		4.94	0.045		6.42	0.052		6.06	0.045
pH (1:2) 0.01M CaCl ₂	Unit	11	7.40	0.070		6.20	0.136		4.99	0.060		6.40	0.050		6.04	0.069
Buffer pH, Lime Req.																
SMP Buffer pH	Unit	29	7.45	0.050		6.86	0.060		5.94	0.120		7.27	0.060		7.11	0.055
Adams-Evans Buf pH	Unit	10	7.80	0.050		7.56	0.065		7.12	0.080		7.82	0.070		7.78	0.085
Woodruff Buf. pH	Unit	22	7.17	0.040		6.77	0.030		6.05	0.105		6.96	0.027		6.85	0.035
Mehlich Buffer pH	Unit	9	6.83	0.090		6.29	0.040		5.73	0.065		6.49	0.025		6.39	0.045
Sikora Buffer pH	Unit	30	7.50	0.035		6.90	0.030		6.11	0.065		7.29	0.050		7.12	0.030
Titrateable Acidity	cmol/kg															
Inorganic Nitrogen (NO₃-N & NH₄-N)																
NO ₃ -N Cd. Rd.	mg/kg	68	15.6	0.710		6.92	0.425		53.0	3.67		25.4	1.45		10.1	0.489
NO ₃ -N ISE	mg/kg	14	17.2	1.45		8.00	1.23		56.4	4.45		26.9	2.75		11.4	1.02
NO ₃ -N CTA	mg/kg	2	17.0	0.263		9.31	1.19		51.9	4.05		25.4	1.10		11.4	0.325
NO ₃ -N Ion Chr.	mg/kg	1	12.9	0.000		5.96	0.000		51.7	0.000		22.0	0.000		8.27	0.000
NO ₃ -N Other	mg/kg	9	15.1	2.60		6.45	0.630		53.0	3.82		25.6	1.50		9.70	0.520
NH ₄ - N (KCl Extr.)	mg/kg	59	5.45	0.640		11.9	1.01		91.2	8.40		4.32	0.510		24.5	1.80
Phosphorus and Sulfur																
PO ₄ -P Bray P (1:10)	mg/kg	51	178	8.65		97.5	6.07		8.88	1.40		20.6	1.10		18.0	1.20
PO ₄ -P Bray P1 (1:7)	mg/kg	5	132	26.9		82.3	11.5		5.41	1.55		15.2	1.89		14.0	0.19
PO ₄ -P Olsen/Bicarb	mg/kg	55	124	9.00		48.1	4.10		14.6	2.60		12.9	1.30		12.9	1.48
PO ₄ -P AB-DTPA	mg/kg	3	80.3	12.0		20.4	1.66		23.4	9.78		11.7	1.39		10.6	1.80
PO ₄ -P Modified Morgan	mg/kg	8	179	13.5		25.7	3.15		2.19	0.226		13.1	1.30		3.80	0.900
PO ₄ -P True Morgan	mg/kg	8	169	19.0		27.4	1.35		1.78	0.230		12.6	0.600		3.62	0.400
PO ₄ -P Mod. Kewlona	mg/kg															
PO ₄ -P Stong Bray (1:10)	mg/kg	9	565	11.0		156	10.7		17.0	2.00		62.1	4.10		42.0	1.35
PO ₄ -P Water Soluble	mg/kg															
SO ₄ - S (PO ₄ Extr.)	mg/kg	33	8.29	0.924		17.0	2.55		22.6	4.45		5.18	0.763		4.88	0.980

Bases												
K Ammonium Acetate	mg/kg	78	1410	60.5	444	24.4	80.4	8.15	235	13.2	163	9.87
Ca Ammonium Acetate	mg/kg	74	3010	241	3040	234	420	30.5	1920	90.8	1510	100
Mg Ammonium Acetate	mg/kg	74	531	22.5	466	30.5	173	9.00	280	14.2	179	8.50
Na Ammonium Acetate	mg/kg	66	25.5	3.49	11.0	2.57	15.0	2.80	8.95	2.22	10.6	1.12
Bray Extractable K	mg/kg	5	1050	173	311	8.50	54.0	6.10	203	8.70	131	4.00
K- Olsen/Bicarb.	mg/kg	4	1120	39.5	362	6.00	82.6	4.90	221	1.00	155	5.50
K Modified Morgan	mg/kg	5	1350	58.0	420	40.0	73.0	4.00	211	9.00	152	7.00
K True Morgan	mg/kg	6	1000	86.0	291	12.0	72.5	3.80	190	11.5	129	6.00
Ca Modified Morgan	mg/kg	4	4830	142	3480	136	393	37.0	1960	140	1570	110
Aluminum KCL Extr.	mg/kg	7	0.411	0.311	0.463	0.263	12.8	1.30	0.400	0.085	0.750	0.275

Mehlich-1 Multi Element (scoop)												
Scoop Soil Mass	g	6	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000
P	mg/kg	8	395	57.1	84.5	8.31	10.2	1.51	57.73	4.285	24	2.77
K	mg/kg	8	903	69.9	254	20.28	61	2.9	173	10.1	114	5.61
Ca	mg/kg	8	4280	475.4	2989	362	507	32	2205	155	1432	68.4
Mg	mg/kg	8	590	62.00	446	32.4	176	9.7	294	20.9	164	8.20
Mn	mg/kg	7	37.4	5.26	80.1	6.710	75.3	6.46	54.29	5.130	112.2	6.56
Zn	mg/kg	7	2.61	0.580	4.87	0.504	6.280	0.250	2.640	0.238	1.5	0.085

Mehlich-3 Multi-Element (scoop)												
Scoop Soil Mass	g	30	2.03	0.070	1.86	0.090	1.90	0.089	2.14	0.060	2.00	0.100
Assumed Density	g/cm ³	19	1.04	0.065	0.935	0.068	0.969	0.069	1.07	0.033	1.01	0.100
Volume of Scoop	cm ³	25	2.00	0.000	2.00	0.000	2.00	0.000	2.00	0.000	2.00	0.000
Extractant Volume mL	mL	24	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000
P Colorimetric	mg/kg	8	233	10.8	106	6.55	7.50	1.50	23.5	1.79	20.0	1.00
P ICP-AES	mg/kg	53	254	13.4	121	6.70	12.0	1.90	34.8	2.87	24.7	1.45
K	mg/kg	57	1420	79.7	437	20.6	75.0	6.30	236	11.8	163	10.0
Ca	mg/kg	56	3840	194	3260	175	462	42.5	2200	122	1580	109
Mg	mg/kg	56	658	35.8	479	28.3	180	10.5	316	16.6	188	8.58
Na	mg/kg	44	26.6	4.37	11.0	1.80	17.1	2.01	9.48	1.47	12.0	1.68
S	mg/kg	48	18.3	1.84	27.6	2.79	36.3	2.78	13.0	1.66	9.85	1.64
Al	mg/kg	36	419	33.2	763	41.5	1850	112	264	14.2	520	28.0
Zn	mg/kg	52	6.61	0.530	7.13	0.555	5.30	0.375	3.36	0.265	1.83	0.171
Mn	mg/kg	52	155	12.0	149	12.3	67.3	5.25	171	12.4	218	15.7
Fe	mg/kg	52	71.8	5.78	158	10.9	404	37.5	88.8	6.71	266	14.7
Cu	mg/kg	53	2.10	0.130	2.54	0.190	1.68	0.280	0.845	0.080	1.80	0.140
B	mg/kg	39	2.71	0.200	1.06	0.090	0.46	0.088	1.54	0.140	0.530	0.096

Micronutrients												
Zn - DTPA	mg/kg	65	2.76	0.160	4.40	0.230	4.40	0.380	1.70	0.100	1.00	0.100
Mn - DTPA	mg/kg	52	16.1	2.20	73.6	7.26	62.5	5.09	32.1	3.98	79.1	9.61
Fe - DTPA	mg/kg	53	11.0	1.15	53.1	4.08	298	27.6	21.9	2.70	80.5	6.72
Cu - DTPA	mg/kg	55	0.790	0.050	1.70	0.100	1.40	0.100	0.300	0.020	1.20	0.100
Zn - HCl	mg/kg	3	7.22	0.580	7.70	0.170	8.20	0.090	3.50	0.070	1.90	0.020
Mn-H3PO4	mg/kg	8	29.5	5.52	62.5	3.02	64.6	5.29	39.3	3.50	82.6	5.46
Cl - Ca(NO3)2 Extr.	mg/kg	14	4.81	0.942	10.5	2.35	11.8	1.81	3.03	0.440	5.55	0.870
B - Hot Wat.	mg/kg	33	1.47	0.320	0.833	0.135	0.360	0.070	0.790	0.160	0.318	0.078
B-DTPA/Sorbitol	mg/kg	16	1.49	0.135	0.500	0.080	0.340	0.065	0.600	0.050	0.250	0.050

Soil Organic Matter												
Soil Kjeldahl N	%	17	0.250	0.023	0.265	0.015	0.320	0.020	0.168	0.012	0.130	0.010
Soil TN (combustion)	%	41	0.255	0.008	0.270	0.013	0.345	0.020	0.175	0.008	0.134	0.009
Soil TOC (Combustion)	%	12	2.53	0.223	2.90	0.099	4.71	0.465	1.71	0.155	1.29	0.050
Soil Total C (Combustion)	%	34	2.87	0.085	2.93	0.110	5.05	0.210	1.86	0.098	1.30	0.039

SOM - Walkley-Black	%	26	4.36	0.250	4.79	0.200	7.85	0.870	3.08	0.200	2.26	0.138
SOM - LOI (% Wt loss)	%	77	4.46	0.140	5.30	0.210	9.48	0.380	3.03	0.120	2.78	0.092
Other												
CaCO3 Content	%	13	2.700	0.348	1.02	0.190	0.525	0.070	0.550	0.076	0.446	0.059
CEC - Cation Displacement	cmol/kg	17	20.7	2.40	27.0	3.10	17.8	3.73	13.8	2.24	13.5	1.10
CEC - Estimation	cmol/kg	13	23.4	1.85	22.7	1.78	13.8	1.82	13.9	1.23	10.1	0.645
Soil Density (Scoop)	g/cc	11	1.17	0.029	1.07	0.040	1.12	0.031	1.22	0.040	1.14	0.050
Particle Size Analysis-Hydrometer												
Sand 2000 - 50 um	%	38	52.2	2.80	15.5	2.45	63.0	4.70	82.1	3.01	22.0	3.55
Silt 50 - 2 um	%	38	31.2	4.60	61.1	4.40	27.5	2.50	9.00	1.37	63.3	4.30
Clay 2 - 0 um	%	38	17.8	2.25	24.5	4.69	9.55	1.42	8.00	1.12	15.0	3.05
Particle Size Analysis- Pipette												
Sand 2000 - 50 um	%	5	53.0	2.000	10.0	3.00	62.2	0.200	83.0	1.30	15.8	0.500
Silt 50 - 2 um	%	5	29.2	1.50	64.0	3.55	28.0	2.00	7.20	0.400	68.0	2.70
Clay 2 - 0 um	%	5	17.8	2.00	26.0	2.69	10.2	2.78	10.0	1.20	16.0	2.07
Solvita CO2												
	ppm	7	169	45.3	186	73.4	98.0	20.0	113	15.0	123	21.3