



2017 North American Proficiency Testing Program 2nd Quarter Report - July 11, 2017

Laboratory ID
General

Soil Analysis	Units	n	Soil 2017-106			Soil 2017-107			Soil 2017-108			Soil 2017-109			Soil 2017-110		
			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	%	19	51.2	3.20	x	44.1	3.70	x	48.0	3.45	x	57.4	3.10	x	39.4	4.66	x
pH - sp	Unit	25	6.30	0.100		6.78	0.100		7.60	0.120		7.56	0.140		6.20	0.170	
ECe - sp	dS/m	27	0.605	0.085		0.620	0.059		2.21	0.130		0.754	0.060		0.4	0.040	
HCO ₃ - sp	mmolc/L	9	2.80	0.700		3.75	0.857		4.70	0.710		4.83	0.365		2.40	0.500	
Ca - sp	mmolc/L	23	3.38	0.331		3.94	0.360		12.8	1.07		6.13	0.660		2.51	0.350	
Mg - sp	mmolc/L	23	1.74	0.256		1.71	0.150		7.20	0.780		1.15	0.130		0.80	0.183	
Na - sp	mmolc/L	23	0.220	0.040		0.100	0.014		4.49	0.381		0.210	0.040		0.570	0.086	
SAR - sp	value	19	0.120	0.020		0.075	0.012		1.40	0.100		0.100	0.020		0.460	0.060	
Cl - sp	mmolc/L	15	0.308	0.017		0.165	0.021		2.16	0.200		0.160	0.013		0.700	0.074	
SO ₄ - sp	mmolc/L	16	1.42	0.161		0.653	0.093		16.4	1.78		0.515	0.094		0.89	0.100	
NO ₃ - sp	mmolc/L	9	0.290	0.069		0.982	0.152		0.827	0.186		1.47	0.234		0.080	0.020	
B - sp	mg/L	13	0.090	0.020		0.160	0.030		0.270	0.050		0.057	0.009		0.060	0.010	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	35	0.290	0.035		0.290	0.028		1.12	0.080		0.580	0.071		0.164	0.022	
Soil EC (1:2)	(dS/m)	46	0.221	0.023		0.181	0.021		0.796	0.073		0.313	0.047		0.100	0.010	
pH (1:1) Water	Unit	86	6.22	0.065		6.85	0.050		7.87	0.070		7.86	0.070		6.27	0.085	
pH (1:2) Water	Unit	30	6.31	0.080		6.93	0.080		7.98	0.080		7.91	0.060		6.33	0.085	
pH (1:1) 0.01M CaCl ₂	Unit	21	5.82	0.040		6.46	0.050		7.67	0.070		7.51	0.060		5.67	0.050	
pH (1:2) 0.01M CaCl ₂	Unit	13	5.84	0.039		6.45	0.100		7.70	0.060		7.50	0.060		5.69	0.090	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	26	6.92	0.074		7.26	0.050		7.50	0.050		7.43	0.035		6.92	0.065	
Adams-Evans Buf pH	Unit	10	7.63	0.055		7.78	0.070		7.76	0.050		7.67	0.120		7.70	0.115	
Woodruff Buf. pH	Unit	19	6.77	0.040		6.97	0.030		7.16	0.040		7.15	0.040		6.77	0.030	
Mehlich Buffer pH	Unit	12	6.23	0.045		6.49	0.040		6.89	0.225		6.86	0.095		6.28	0.055	
Sikora Buffer pH	Unit	25	6.93	0.050		7.30	0.040		7.50	0.035		7.40	0.035		6.95	0.050	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	55	31.8	2.70		25.7	1.26		32.0	2.10		29.3	1.35		4.7	0.360
NO3-N ISE	mg/kg	14	30.7	2.98		28.1	3.48		35.2	5.00		31.5	2.55		5.2	0.785
NO3-N CTA	mg/kg	1	31.3			25.5			31.0			28.3			5.7	
NO3-N Ion Chr.	mg/kg	2	29.7	3.30		22.7	2.35		28.9	2.10		26.0	3.00		3.6	0.950
NO3-N Other _____	mg/kg	8	28.0	1.82		24.8	1.55		28.2	2.65		25.6	2.33		4.1	0.675
NH4 - N (KCl Extr.)	mg/kg	47	7.53	0.730		4.00	0.590		20.6	1.43		3.30	0.440		3.30	0.490

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	45	328	31.4		21.8	2.08		30.7	6.30		21.7	2.30		30	2.27
PO4-P Bray P1 (1:7)	mg/kg	6	269	20.4		18.4	1.69		18.7	4.31		13.7	1.55		24	1.28
PO4-P Olsen/Bicarb	mg/kg	46	104	10.3		12.8	1.20		24.6	1.32		14.9	1.06		19	1.76
PO4-P AB-DTPA	mg/kg	2	69.8	5.66		13.0	1.42		13.4	2.77		7.83	1.87		13.0	2.54
PO4-P Modified Morgan	mg/kg	7	50.8	4.50		13.5	0.880		47.4	4.30		11.2	2.01		3.3	0.770
PO4-P True Morgan	mg/kg	7	51.6	3.60		13.1	1.40		40.5	4.30		12.0	1.00		3.4	0.290
PO4-P Mod. Kewlona	mg/kg	1	240			18.0			28.0			28.0			22	
PO4-P Stong Bray (1:10)	mg/kg	6	510	27.8		62.6	2.30		197	32.3		90.2	23.5		71	1.35
PO4-P Water Soluble	mg/kg															
SO4 - S (PO4 Extr.)	mg/kg	25	10.4	1.72		5.04	0.599		142	23.0		5.50	0.674		6.7	0.810

Bases

K Ammonium Acetate	mg/kg	68	339	38.6		237	14.0		631	29.0		636	35.0		141	11.5
Ca Ammonium Acetate	mg/kg	63	1070	86.0		1910	107		4910	703		6760	660		1310	105
Mg Ammonium Acetate	mg/kg	63	194	20.0		283	12.2		824	46.0		449	22.0		174	11.4
Na Ammonium Acetate	mg/kg	51	10.1	1.20		8.62	1.22		134	11.5		14.8	1.32		20.0	2.50
Bray Extractable K	mg/kg	4	276	11.8		214	16.5		417	47.8		367	27.1		119	16.0
K- Olsen/Bicarb.	mg/kg	5	405	2.00		227	6.00		446	8.00		384	5.00		133	4.00
K Modified Morgan	mg/kg	3	364	21.0		221	8.00		562	7.00		574	7.00		135	8.00
K True Morgan	mg/kg	5	346	6.00		194	11.0		368	67.0		290	40.0		111	2.00
Ca Modified Morgan	mg/kg	3	1130	79.0		1770	23.0		14800	348		18500	1370		1370	43.0
Aluminum KCL Extr.	mg/kg	4	0.332	0.200		0.471	0.030		0.305	0.105		0.350	0.090		0.471	0.20

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Mehlich-1 Multi Element (scoop)																							
Scoop Soil Mass	g	5	5.00		x	5.00		x	5.00		x	5.00		x	5.00								
P	mg/kg	8	327	33.2		58.6	6.95		19.2	3.11		6.25	0.576		34	5.84							
K	mg/kg	8	265	10.8		180	8.03		227	13.7		166	11.8		97	4.62							
Ca	mg/kg	8	1420	43.5		2120	162		5270	745		5670	721		1260	39.1							
Mg	mg/kg	8	183	5.74		282	12.1		564	38.8		313	29.1		157	5.84							
Mn	mg/kg	7	62.7	3.40		48.7	0.980		15.9	1.30		1.60	0.453		66.3	4.26							
Zn	mg/kg	7	13.1	0.080		2.52	0.100		0.153	0.123		0.042	0.071		2.3	0.256							
Mehlich-3 Multi-Element (scoop)																							
Scoop Soil Mass	g	22	1.77	0.130		x	2.19	0.070		x	2.19	0.085		x	2.03	0.074		x	1.95	0.125		x	
Assumed Density	g/cm3	15	0.905	0.085		x	1.12	0.050		x	1.13	0.050		x	1.05	0.070		x	1.040	0.100		x	
Volume of Scoop	cm3	23	2.00			x	2.00			x	2.00			x	2.00				x	2.00			x
Extractant Volume mL	mL	19	20.0			x	20.0			x	20.0			x	20.0				x	20.0			x
P Colorimetric	mg/kg	7	381	50.3			24.1	1.04			82.0	9.15			32.5	2.50				39	1.59		
P ICP-AES	mg/kg	47	409	32.0			34.3	2.30			86.7	5.20			36.0	3.01				40	2.62		
K	mg/kg	49	341	32.1			243	14.3			644	48.2			642	41.5				140	11.0		
Ca	mg/kg	49	1380	83.3			2230	143			6690	691			8940	1150				1390	96.0		
Mg	mg/kg	49	210	18.2			321	18.8			943	60.7			561	42.3				186	14.7		
Na	mg/kg	35	11.7	2.38			8.00	1.42			135	17.1			15.0	1.46				20.3	3.40		
S	mg/kg	42	20.0	2.10			12.3	1.30			187	12.4			12.0	2.00				12.1	1.58		
Al	mg/kg	29	904	41.9			261	26.0			247	36.8			469	39.3				845	61.0		
Zn	mg/kg	45	15.8	1.74			3.50	0.240			4.97	0.370			1.64	0.140				3.0	0.270		
Mn	mg/kg	44	160	17.5			177	18.9			132	10.3			176	18.7				179	21.7		
Fe	mg/kg	44	194	20.3			90.8	11.4			193	22.8			46.4	5.54				260	22.6		
Cu	mg/kg	45	4.18	0.440			0.840	0.080			4.50	0.380			2.47	0.260				1.49	0.110		
B	mg/kg	34	0.645	0.105			1.62	0.130			3.35	0.305			1.96	0.170				0.520	0.067		

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Micronutrients													
Zn - DTPA	mg/kg	56	5.75	0.645	1.70	0.115	2.19	0.180	0.800	0.100	1.37	0.128	
Mn - DTPA	mg/kg	47	43.0	2.98	28.8	4.20	40.3	3.70	10.0	1.43	48	5.90	
Fe - DTPA	mg/kg	49	23.5	4.20	23.0	2.28	43.9	5.90	9.56	1.39	61	9.80	
Cu - DTPA	mg/kg	48	2.41	0.245	0.300	0.020	3.15	0.246	0.710	0.090	1.00	0.100	
Zn - HCl	mg/kg	3	8.91	1.49	3.73	0.280	2.18	1.74	0.625	0.615	3.07	0.060	
Mn-H3PO4	mg/kg	7	60.6	3.50	36.5	2.03	20.8	1.45	2.44	0.599	53	3.02	
Cl - Ca(NO3)2 Extr.	mg/kg	16	5.29	0.759	2.85	0.300	43.0	5.10	4.92	0.903	10.30	1.04	
B - Hot Wat.	mg/kg	33	0.586	0.107	0.810	0.170	1.48	0.220	0.700	0.108	0.310	0.060	
B-DTPA/Sorbitol	mg/kg	13	0.260	0.060	0.630	0.024	2.10	0.115	1.04	0.080	0.203	0.024	
Soil Organic Matter													
Soil Kjeldahl N	%	10	0.132	0.004	0.179	0.004	0.150	0.007	0.232	0.007	0.108	0.005	
Soil TN (combustion)	%	37	0.134	0.009	0.180	0.010	0.153	0.008	0.236	0.013	0.105	0.005	
Soil TOC (Combustion)	%	9	1.21	0.030	1.85	0.131	1.28	0.057	2.53	0.109	1.03	0.032	
Soil Total C (Combustion)	%	29	1.24	0.040	1.84	0.110	1.90	0.070	3.36	0.103	1.03	0.031	
SOM - Walkley-Black	%	23	2.02	0.170	3.20	0.200	2.10	0.150	4.53	0.200	1.88	0.220	
SOM - LOI (% Wt loss)	%	63	3.00	0.100	3.02	0.160	2.68	0.120	4.90	0.200	2.35	0.100	
Other													
CaCO3 Content	%	10	0.485	0.096	0.575	0.119	5.46	0.770	5.75	0.800	0.505	0.090	
CEC - Cation Displacement	cmol/kg	11	13.1	3.17	13.6	2.50	23.8	3.33	33.6	3.44	12.8	2.45	
CEC - Estimation	cmol/kg	13	9.6	1.57	13.8	1.25	34.5	3.90	38.7	7.50	10.9	1.80	
Soil Density (Scoop)	g/cc	12	1.01	0.024	1.25	0.030	1.26	0.035	1.18	0.061	1.11	0.035	
Particle Size Analysis-Hydrometer													
Sand 2000 - 50 um	%	35	22.5	3.54	82.6	1.80	35.8	3.83	17.3	3.02	21.0	3.00	
Silt 50 - 2 um	%	35	57.5	3.50	9.00	1.40	28.7	2.87	49.6	3.60	60.0	2.20	
Clay 2 - 0 um	%	35	19.3	2.78	9.00	2.00	35.0	3.00	34.0	4.78	19.0	2.00	
Particle Size Analysis- Pipette													
Sand 2000 - 50 um	%	3	26.0	0.880	82.0		40.9	3.08	19.3	3.68	25.0	8.00	
Silt 50 - 2 um	%	3	57.0	1.00	7.00	1.00	27.0	3.00	48.0	7.92	57.0	7.00	
Clay 2 - 0 um	%	3	19.0	3.00	11.0	1.00	36.0	2.76	40.0	0.600	18.2	0.24	
Solvita CO2													
Solvita CO2	ppm	7	123	18.0	123	32.0	90.0	27.0	86.0	16.0	131	31.0	

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