



**2017 North American Proficiency Testing Program  
4th Quarter Report - January 8, 2018**

**Laboratory ID  
General**

Soil Analysis	Units	n	Soil 2017-116		Soil 2017-117		Soil 2017-118		Soil 2017-119		Soil 2017-120	
			Median	MAD	Median	MAD	Median	MAD	Median	MAD	Median	MAD
<b>Salinity</b>												
Sat. Paste Moisture	%	19	77.2	6.43	41.0	4.51	45.5	2.99	46.0	4.00	54.0	3.80
pH - sp	Unit	25	7.70	0.070	7.71	0.100	6.74	0.130	6.76	0.070	5.10	0.100
ECe - sp	dS/m	25	1.49	0.199	5.16	0.680	0.832	0.098	0.670	0.100	0.103	0.017
HCO3 - sp	mmolc/L	8	10.9	1.45	5.26	0.819	5.91	1.02	3.27	0.350	0.545	0.101
Ca - sp	mmolc/L	23	9.66	0.997	13.1	1.73	6.76	0.510	4.44	0.688	0.350	0.057
Mg - sp	mmolc/L	23	4.14	0.400	4.97	0.860	2.39	0.220	2.00	0.250	0.200	0.050
Na - sp	mmolc/L	23	1.08	0.171	35.8	4.74	0.557	0.127	0.096	0.012	0.261	0.039
SAR - sp	value	20	0.400	0.038	12.6	1.07	0.240	0.040	0.100	0.023	0.515	0.066
Cl - sp	mmolc/L	11	0.560	0.090	24.4	3.19	0.500	0.061	0.160	0.030	0.250	0.040
SO4 - sp	mmolc/L	13	2.53	0.250	26.6	3.60	1.17	0.197	0.680	0.090	0.130	0.030
NO <sub>3</sub> - sp	mmolc/L	10	0.682	0.159	0.604	0.142	0.133	0.031	1.95	0.379	0.060	0.013
B - sp	mg/L	10	0.320	0.010	0.271	0.035	0.050	0.008	0.145	0.015	0.020	0.003
<b>Soil pH &amp; EC</b>												
Soil EC (1:1)	(dS/m)	36	0.905	0.085	1.69	0.165	0.480	0.042	0.309	0.045	0.050	0.005
Soil EC (1:2)	(dS/m)	48	0.726	0.073	1.26	0.125	0.301	0.035	0.190	0.024	0.040	0.004
pH (1:1) Water	Unit	87	7.80	0.070	8.06	0.060	6.80	0.090	6.87	0.070	5.03	0.070
pH (1:2) Water	Unit	27	7.90	0.090	8.30	0.090	7.03	0.080	7.03	0.070	5.10	0.100
pH (1:1) 0.01M CaCl2	Unit	26	7.59	0.040	7.75	0.035	6.47	0.070	6.49	0.040	4.36	0.065
pH (1:2) 0.01M CaCl2	Unit	13	7.63	0.030	7.77	0.065	6.63	0.140	6.56	0.060	4.33	0.099
<b>Buffer pH, Lime Req.</b>												
SMP Buffer pH	Unit	27	7.48	0.050	7.52	0.040	7.00	0.080	7.28	0.085	6.13	0.157
Adams-Evans Buf pH	Unit	8	7.80	0.065	7.84	0.065	7.63	0.100	7.81	0.040	7.28	0.050
Woodruff Buf. pH	Unit	23	7.27	0.060	7.12	0.030	6.85	0.040	6.96	0.040	6.28	0.170
Mehlich Buffer pH	Unit	7	6.94	0.060	6.83	0.080	6.47	0.045	6.49	0.030	5.66	0.140
Sikora Buffer pH	Unit	28	7.50	0.030	7.58	0.040	7.00	0.070	7.31	0.040	6.05	0.150
Titrateable Acidity	cmol/kg											
<b>Inorganic Nitrogen (NO3-N &amp; NH4-N)</b>												
NO3-N Cd. Rd.	mg/kg	61	96.0	9.90	17.0	1.00	10.0	0.750	25.5	1.48	0.845	0.124
NO3-N ISE	mg/kg	15	107	19.5	19.0	2.42	11.1	2.11	26.4	5.11	1.61	0.205
NO3-N CTA	mg/kg	1	85.2	0.000	16.3	0.000	11.1	0.000	23.1	0.000	2.25	0.000
NO3-N Ion Chr.	mg/kg	2	101	8.60	15.2	2.85	9.19	1.82	23.7	3.30	0.586	0.115
NO3-N Other	mg/kg	6	96.7	3.83	16.8	1.29	9.81	1.07	25.9	1.99	1.69	0.810
NH4 - N (KCl Extr.)	mg/kg	50	16.9	2.27	5.25	0.815	6.07	0.725	4.36	0.660	8.17	1.30
<b>Phosphorus and Sulfur</b>												
PO4-P Bray P (1:10)	mg/kg	47	337	36.0	19.4	2.91	41.3	2.73	21.0	1.54	10.1	1.67
PO4-P Bray P1 (1:7)	mg/kg	4	246	12.3	14.0	1.92	32.8	3.40	17.4	0.480	6.95	0.800
PO4-P Olsen/Bicarb	mg/kg	52	438	65.6	22.3	2.09	24.0	1.20	12.3	1.20	6.00	1.13
PO4-P AB-DTPA	mg/kg	2	155	8.88	14.0	2.48	14.0	3.15	10.8	0.336	12.9	2.95
PO4-P Modified Morgan	mg/kg	5	784	16.0	33.5	0.900	7.70	0.700	13.1	0.400	0.900	0.422
PO4-P True Morgan	mg/kg	6	740	57.5	31.2	1.00	8.30	0.340	13.1	0.850	1.00	0.098
PO4-P Mod. Kewlona	mg/kg	2	710	20.0	44.5	0.500	32.5	1.50	16.0	1.00	5.90	0.900
PO4-P Stong Bray (1:10)	mg/kg	9	1140	137	111	5.70	94.1	6.10	62.0	4.00	17.8	2.95
PO4-P Water Soluble	mg/kg											
SO4 - S (PO4 Extr.)	mg/kg	28	26.8	4.76	110	17.3	9.36	1.98	5.10	0.673	11.9	2.63

Bases												
K Ammonium Acetate	mg/kg	75	2340	239	814	46.0	275	16.0	234	10.0	79.0	10.2
Ca Ammonium Acetate	mg/kg	68	5170	632	4240	602	3140	183	1930	88.0	121	29.1
Mg Ammonium Acetate	mg/kg	68	685	65.5	438	21.9	400	19.0	278	9.74	26.7	5.53
Na Ammonium Acetate	mg/kg	57	68.0	10.3	910	73.0	22.7	4.71	8.70	1.98	15.0	1.84
Bray Extractable K	mg/kg	4	1360	10.9	500	32.7	191	10.8	192	6.45	56.7	4.85
K- Olsen/Bicarb.	mg/kg	4	1810	146	597	9.50	230	3.50	221	5.00	71.8	4.40
K Modified Morgan	mg/kg	3	2410	128	723	55.0	237	3.00	214	4.00	83.0	2.70
K True Morgan	mg/kg	4	1660	40.0	466	25.0	183	9.00	195	10.0	64.3	5.60
Ca Modified Morgan	mg/kg	2	12400	55.5	16300	4.50	3400	306	1950	126	95.5	8.50
Aluminum KCL Extr.	mg/kg	6	0.800	0.470	0.125	0.111	0.270	0.241	0.340	0.312	120	24.5

Mehlich-1 Multi Element (scoop)												
Scoop Soil Mass	g	4	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.000	5.00	0.00
P	mg/kg	7	503	58.1	16.3	3.62	43.5	5.38	53.2	3.68	8	1.20
K	mg/kg	7	686	55.0	232	14.2	165	7.88	175	16.1	47	3.17
Ca	mg/kg	7	5060	599	5010	696	3040	71.2	2190	86.3	83	11.7
Mg	mg/kg	7	621	61.9	374	33.7	407	13.4	287	11.0	17	1.35
Mn	mg/kg	6	17.3	3.72	5.96	1.19	57.0	6.34	53.4	1.21	33.0	2.17
Zn	mg/kg	6	1.25	0.501	0.230	0.117	2.99	0.119	2.36	0.082	0.6	0.020

Mehlich-3 Multi-Element (scoop)												
Scoop Soil Mass	g	29	1.79	0.129	2.10	0.150	2.13	0.140	2.14	0.090	1.62	0.150
Assumed Density	g/cm <sup>3</sup>	19	0.900	0.060	1.11	0.069	1.10	0.081	1.09	0.058	0.813	0.092
Volume of Scoop	cm <sup>3</sup>	27	2.00	0.000	2.00	0.000	2.00	0.000	2.00	0.000	2.00	0.00
Extractant Volume mL	mL	24	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.000	20.0	0.0
P Colorimetric	mg/kg	12	842	88.0	60.3	6.67	51.3	4.20	22.9	2.05	11	0.83
P ICP-AES	mg/kg	49	930	54.6	63.8	4.57	56.5	3.76	33.6	2.02	12	1.17
K	mg/kg	55	2220	169	815	43.2	278	18.0	234	12.1	70	9.3
Ca	mg/kg	52	8020	498	5850	395	3430	231	2210	110	123	29.8
Mg	mg/kg	52	847	56.4	572	29.2	435	30.5	321	16.7	27	4.3
Na	mg/kg	38	71.0	7.13	911	96.5	23.9	4.50	10.0	1.93	15.0	2.00
S	mg/kg	41	48.7	3.61	187	14.3	17.2	1.80	11.9	1.56	15.0	2.29
Al	mg/kg	30	140	10.5	257	30.0	790	54.4	251	12.6	1594	118.5
Zn	mg/kg	48	58.9	4.30	3.49	0.310	4.38	0.320	3.44	0.205	0.9	0.150
Mn	mg/kg	47	135	13.6	132	9.48	105	9.45	162	14.9	35	2.8
Fe	mg/kg	47	141	16.1	49.6	4.01	249	18.2	81.0	7.79	188	16.4
Cu	mg/kg	48	4.03	0.415	2.49	0.200	2.24	0.180	0.800	0.080	0.50	0.100
B	mg/kg	37	6.00	0.740	2.44	0.260	0.760	0.110	1.55	0.130	0.240	0.029

Micronutrients												
Zn - DTPA	mg/kg	58	24.0	2.66	1.23	0.100	2.20	0.110	1.63	0.110	0.49	0.091
Mn - DTPA	mg/kg	44	44.5	5.02	11.6	1.60	30.7	3.83	29.9	4.27	23	2.84
Fe - DTPA	mg/kg	47	46.4	4.74	5.33	0.655	69.3	7.70	20.0	2.00	68	14.23
Cu - DTPA	mg/kg	47	2.62	0.270	1.10	0.100	1.43	0.110	0.300	0.030	0.40	0.085
Zn - HCl	mg/kg	2	48.9	7.74	0.870	0.630	5.49	0.540	4.03	0.540	1.05	0.185
Mn-H3PO4	mg/kg	8	18.2	2.80	8.10	1.93	39.9	3.54	40.3	3.60	25	5.44
Cl - Ca(NO3)2 Extr.	mg/kg	15	13.0	2.91	346	30.0	7.00	0.900	3.90	0.567	4.29	0.43
B - Hot Wat.	mg/kg	29	2.39	0.510	1.12	0.144	0.370	0.060	0.800	0.180	0.200	0.037
B-DTPA/Sorbitol	mg/kg	15	3.60	0.150	1.50	0.090	0.320	0.035	0.605	0.089	0.100	0.008

Soil Organic Matter												
Soil Kjeldahl N	%	12	0.628	0.036	0.103	0.008	0.150	0.008	0.174	0.010	0.149	0.007
Soil TN (combustion)	%	36	0.658	0.025	0.107	0.015	0.159	0.012	0.179	0.014	0.150	0.011
Soil TOC (Combustion)	%	9	7.52	0.320	1.14	0.150	1.68	0.058	1.86	0.148	1.92	0.057
Soil Total C (Combustion)	%	28	7.62	0.181	2.26	0.053	1.73	0.040	1.90	0.075	1.93	0.040

<b>SOM - Walkley-Black</b>	%	25	<b>11.8</b>	1.56	<b>1.70</b>	0.200	<b>2.87</b>	0.230	<b>3.09</b>	0.222	<b>3.20</b>	0.230
<b>SOM - LOI (% Wt loss)</b>	%	72	<b>12.1</b>	0.390	<b>1.98</b>	0.125	<b>3.21</b>	0.165	<b>2.99</b>	0.108	<b>4.39</b>	0.180
<b>Other</b>												
<b>CaCO3 Content</b>	%	9	<b>5.10</b>	0.510	<b>8.40</b>	0.800	<b>0.920</b>	0.080	<b>0.500</b>	0.094	<b>0.300</b>	0.240
<b>CEC - Cation Displacement</b>	cmol/kg	12	<b>37.0</b>	5.25	<b>18.0</b>	2.10	<b>19.8</b>	1.95	<b>13.3</b>	1.86	<b>13.1</b>	1.60
<b>CEC - Estimation</b>	cmol/kg	11	<b>37.2</b>	2.33	<b>32.9</b>	2.73	<b>20.6</b>	1.70	<b>13.6</b>	0.700	<b>9.7</b>	1.99
<b>Soil Density (Scoop)</b>	g/cc	12	<b>1.00</b>	0.022	<b>1.24</b>	0.030	<b>1.25</b>	0.043	<b>1.23</b>	0.030	<b>0.91</b>	0.026
<b>Particle Size Analysis-Hydrometer</b>												
<b>Sand 2000 - 50 um</b>	%	36	<b>38.7</b>	4.89	<b>28.0</b>	2.00	<b>28.0</b>	2.05	<b>83.9</b>	2.44	<b>20.0</b>	2.45
<b>Silt 50 - 2 um</b>	%	36	<b>39.5</b>	4.50	<b>50.6</b>	3.43	<b>46.3</b>	3.75	<b>8.94</b>	2.36	<b>52.9</b>	7.30
<b>Clay 2 - 0 um</b>	%	36	<b>19.8</b>	2.31	<b>22.0</b>	2.45	<b>25.0</b>	2.25	<b>8.00</b>	2.00	<b>24.8</b>	3.19
<b>Particle Size Analysis- Pipette</b>												
<b>Sand 2000 - 50 um</b>	%	2	<b>47.1</b>	9.05	<b>17.9</b>	7.15	<b>44.8</b>	19.8	<b>83.3</b>	1.25	<b>15.9</b>	0.10
<b>Silt 50 - 2 um</b>	%	2	<b>38.1</b>	9.95	<b>62.7</b>	9.65	<b>39.7</b>	9.30	<b>8.85</b>	1.21	<b>63.9</b>	6.85
<b>Clay 2 - 0 um</b>	%	2	<b>14.9</b>	0.900	<b>19.5</b>	2.50	<b>15.6</b>	10.5	<b>8.45</b>	0.550	<b>20.3</b>	6.75
<b>Solvita CO2</b>												
<b>Solvita CO2</b>	ppm	5	<b>209</b>	52.9	<b>65.9</b>	5.90	<b>186</b>	63.0	<b>134</b>	11.1	<b>44</b>	10.5