



**2015 North American Proficiency Testing Program
3rd Quarter Report - October 15, 2015**

**Laboratory ID
General**

Soil Analysis	Units	n	Soil 2015-111			Soil 2015-112			Soil 2015-113			Soil 2015-114			Soil 2015-115		
			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	%	27	24.5	1.70		34.3	2.10		35.9	2.48		40.2	2.20		55.2	4.03	
pH - sp	Unit	36	7.48	0.095		5.23	0.080		5.87	0.080		6.39	0.180		6.32	0.095	
ECe - sp	dS/m	36	2.86	0.340		0.530	0.060		0.670	0.077		0.618	0.132		0.862	0.098	
HCO ₃ - sp	mmolc/L	17	2.34	0.443		1.24	0.245		2.25	0.550		2.05	0.320		1.95	0.369	
Ca - sp	mmolc/L	32	15.1	1.82		2.27	0.375		1.93	0.385		4.84	1.06		5.51	0.545	
Mg - sp	mmolc/L	32	7.33	1.08		1.19	0.155		1.21	0.195		0.732	0.122		2.01	0.237	
Na - sp	mmolc/L	32	11.2	1.17		0.167	0.021		3.60	0.335		0.175	0.018		0.985	0.075	
SAR - sp	value	27	3.27	0.270		0.100	0.010		2.81	0.310		0.100	0.010		0.500	0.030	
Cl - sp	mmolc/L	21	3.18	0.580		0.185	0.032		2.59	0.500		0.370	0.080		0.490	0.089	
SO ₄ - sp	mmolc/L	22	21.6	2.75		0.775	0.108		1.61	0.335		1.00	0.100		0.850	0.130	
NO ₃ - sp	mmolc/L	13	5.95	1.26		1.67	0.378		0.045	0.009		1.68	0.347		1.68	0.347	
B - sp	mg/L	17	0.096	0.009		0.130	0.030		0.143	0.033		0.054	0.005		0.054	0.005	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	41	0.732	0.152		0.230	0.030		0.280	0.030		0.310	0.030		0.530	0.040	
Soil EC (1:2)	(dS/m)	48	0.476	0.056		0.140	0.020		0.145	0.025		0.200	0.020		0.300	0.020	
pH (1:1) Water	Unit	90	7.80	0.075		5.44	0.060		6.30	0.080		6.43	0.050		6.45	0.050	
pH (1:2) Water	Unit	32	7.78	0.150		5.54	0.130		6.40	0.165		6.50	0.108		6.50	0.100	
pH (1:1) 0.01M CaCl ₂	Unit	25	7.44	0.040		4.90	0.040		5.69	0.060		6.06	0.040		6.13	0.030	
pH (1:2) 0.01M CaCl ₂	Unit	11	7.43	0.120		4.88	0.060		5.69	0.040		6.03	0.070		6.11	0.060	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	29	7.50	0.040		6.62	0.080		7.04	0.060		7.07	0.060		6.97	0.065	
Adams-Evans Buf pH	Unit	10	7.92	0.045		7.60	0.040		7.70	0.050		7.71	0.060		7.56	0.070	
Woodruff Buf. pH	Unit	22	7.10	0.045		6.53	0.055		6.82	0.030		6.87	0.030		6.81	0.025	
Mehlich Buffer pH	Unit	3	6.68	0.050		5.96	0.070		6.28	0.020		6.39	0.030		6.27	0.020	
Sikora Buffer pH	Unit	22	7.56	0.050		6.70	0.050		7.10	0.050		7.12	0.065		6.96	0.060	
Titrateable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)

NO3-N Cd. Rd.	mg/kg	63	28.9	2.03	16.0	0.800	0.556	0.114	27.4	1.57	51.4	3.00
NO3-N ISE	mg/kg	14	29.5	1.50	15.4	1.55	1.33	0.274	25.8	4.12	45.9	5.50
NO3-N CTA	mg/kg	2	27.6	2.06	16.4	1.39	1.48	0.332	28.1	1.74	52.8	3.32
NO3-N Ion Chr.	mg/kg	3	28.2	0.400	15.3	0.500	0.256	0.056	27.6	0.900	52.6	3.70
NO3-N Other _____	mg/kg	11	31.5	3.46	16.3	0.900	1.75	0.363	28.2	2.70	52.7	7.20
NH4 - N (KCl Extr.)	mg/kg	52	1.16	0.244	5.60	0.730	11.6	0.635	19.7	1.61	5.35	0.750

Phosphorus and Sulfur

PO4-P Bray P (1:10)	mg/kg	52	65.4	4.41	69.0	4.06	78.0	5.50	35.8	1.80	11.7	0.985
PO4-P Bray P1 (1:7)	mg/kg	7	57.0	7.00	60.9	6.90	68.9	5.09	29.3	1.75	10.0	0.660
PO4-P Olsen/Bicarb	mg/kg	57	28.0	3.30	39.5	3.00	34.5	3.38	19.2	1.80	9.00	1.00
PO4-P AB-DTPA	mg/kg	2	20.8	1.58	19.3	3.51	11.1	1.15	7.23	2.48	4.38	3.08
PO4-P Modified Morgan	mg/kg	7	40.5	3.90	10.8	1.20	9.40	2.60	4.00	0.200	2.47	0.470
PO4-P True Morgan	mg/kg	7	39.6	1.60	12.0	0.700	11.6	0.900	4.31	0.190	2.10	0.120
PO4-P Mod. Kewlona	mg/kg	2	41.0	1.00	46.9	1.85	53.5	1.50	26.1	1.90	7.97	0.930
PO4-P Stong Bray (1:10)	mg/kg	9	158	6.70	104	4.60	95.9	4.98	61.0	1.09	34.7	1.86
PO4-P Water Soluble	mg/kg											
SO4 - S (PO4 Extr.)	mg/kg	31	88.0	14.9	4.80	0.628	8.30	1.24	9.34	1.61	7.75	1.73

Bases

K Ammonium Acetate	mg/kg	81	103	6.78	477	25.0	231	15.5	236	13.0	112	6.76
Ca Ammonium Acetate	mg/kg	75	1180	113	1080	84.7	1750	142	1440	93.5	3420	186
Mg Ammonium Acetate	mg/kg	75	210	19.6	190	15.5	571	40.8	84.8	7.15	508	28.0
Na Ammonium Acetate	mg/kg	65	127	13.1	9.20	1.47	133	14.6	9.06	1.44	46.0	4.85
Bray Extractable K	mg/kg	5	113	2.00	390	23.0	178	7.00	195	6.00	72.6	2.80
K- Olsen/Bicarb.	mg/kg	7	115	3.71	414	16.0	172	8.00	203	6.00	78.6	4.87
K Modified Morgan	mg/kg	5	88.0	1.00	458	37.0	193	16.0	223	20.0	99.0	2.00
K True Morgan	mg/kg	5	91.0	5.00	351	28.0	139	11.0	168	4.00	59.0	5.70
Ca Modified Morgan	mg/kg	4	1350	104	1120	108	1690	121	1590	102	3540	210
Aluminum KCL Extr.	mg/kg	5	1.00	0.250	1.02	0.490	0.700	0.545	0.300	0.290	0.500	0.351

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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	0.000
P	mg/kg	5	128	2.97	57.3	2.61	49.2	1.12	24.5	1.07	16.4	0.709
K	mg/kg	5	86.1	3.00	303	17.9	135	3.24	168	12.8	58.0	4.20
Ca	mg/kg	5	1480	65.1	1100	26.1	1180	31.5	1480	83.2	2600	160
Mg	mg/kg	5	248	4.86	178	10.5	404	14.4	80.7	1.83	386	7.03
Mn	mg/kg	5	18.5	0.610	103	3.32	45.4	2.03	150	8.97	34.3	3.23
Zn	mg/kg	5	16.4	0.570	3.77	0.502	1.37	0.213	1.23	0.220	1.74	0.273

Mehlich-3 Multi-Element (scoop)

Scoop Soil Mass	g	24	2.47	0.150	2.21	0.131	2.40	0.112	2.09	0.120	2.05	0.150
Assumed Density	g/cm3	14	1.20	0.060	1.17	0.034	1.22	0.040	1.13	0.055	1.09	0.075
Volume of Scoop	cm3	21	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	17	92.3	9.02	70.0	4.00	77.3	5.30	41.0	1.90	12.0	0.600
P ICP-AES	mg/kg	50	94.9	8.70	85.1	5.43	82.1	6.16	43.0	3.63	19.1	1.43
K	mg/kg	57	121	12.5	481	35.8	243	17.0	250	20.2	110	6.71
Ca	mg/kg	53	1480	152	1220	122	1840	168	1520	120	3480	245
Mg	mg/kg	53	275	23.0	205	16.4	607	54.8	89.4	9.12	525	40.5
Na	mg/kg	42	139	19.8	8.00	2.85	136	17.1	9.10	1.56	48.4	7.60
S	mg/kg	46	126	13.0	10.0	2.04	13.6	1.65	15.9	1.82	14.4	1.95
Al	mg/kg	34	333	26.5	429	27.1	596	46.4	869	73.0	695	45.5
Zn	mg/kg	48	18.0	1.26	4.80	0.300	2.40	0.300	1.50	0.200	2.42	0.180
Mn	mg/kg	49	88.4	6.36	179	13.9	75.7	5.58	342	29.0	74.0	5.71
Fe	mg/kg	47	115	8.04	191	12.3	108	8.67	138	14.0	213	12.6
Cu	mg/kg	49	27.1	2.37	0.830	0.180	1.21	0.150	1.60	0.110	3.48	0.230
B	mg/kg	35	0.570	0.120	0.447	0.049	0.590	0.128	0.462	0.043	0.462	0.043

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Micronutrients													
Zn - DTPA	mg/kg	70	6.05	0.760	3.18	0.255	1.50	0.195	0.600	0.090	1.50	0.100	
Mn - DTPA	mg/kg	54	3.79	0.448	102	7.19	53.1	4.28	102	11.7	26.2	3.18	
Fe - DTPA	mg/kg	57	9.88	1.82	79.5	7.40	21.0	2.44	23.7	3.55	62.4	5.58	
Cu - DTPA	mg/kg	59	11.1	1.27	0.620	0.059	1.07	0.100	0.940	0.070	2.52	0.140	
Zn - HCl	mg/kg	2	17.5	0.620	4.63	0.000	2.02	0.100	1.48	0.260	2.57	0.150	
Mn-H3PO4	mg/kg	8	13.5	1.33	96.4	2.21	36.3	2.40	135	12.6	25.1	3.20	
Cl - Ca(NO3)2 Extr.	mg/kg	18	30.1	2.95	2.70	0.455	30.3	2.25	4.80	0.476	7.75	1.12	
B - Hot Wat.	mg/kg	31	0.261	0.040	0.300	0.040	0.470	0.109	0.277	0.057	0.290	0.070	
B-DTPA/Sorbitol	mg/kg	16	0.205	0.050	0.207	0.024	0.260	0.040	0.175	0.025	0.220	0.035	
Soil Organic Matter													
Soil Kjeldahl N	%	23	0.038	0.005	0.131	0.012	0.051	0.006	0.105	0.010	0.190	0.020	
Soil TN (combustion)	%	40	0.040	0.009	0.140	0.008	0.052	0.007	0.112	0.008	0.200	0.012	
Soil TOC (Combustion)	%	10	0.302	0.028	1.29	0.064	0.504	0.020	0.940	0.035	2.06	0.045	
Soil Total C (Combustion)	%	31	0.319	0.019	1.33	0.060	0.510	0.030	0.970	0.030	2.06	0.054	
SOM - Walkley-Black	%	34	0.545	0.060	2.28	0.168	0.900	0.085	1.60	0.100	3.40	0.125	
SOM - LOI (% Wt loss)	%	74	0.753	0.095	2.40	0.122	1.30	0.140	2.23	0.145	4.36	0.240	
Other													
CaCO3 Content	%	16	0.520	0.110	0.337	0.059	0.400	0.096	0.450	0.088	0.450	0.088	
CEC - Cation Displacement	cmol/kg	22	6.30	0.940	12.5	2.20	16.0	2.07	11.8	2.81	27.1	4.24	
CEC - Estimation	cmol/kg	13	9.30	0.900	12.6	1.70	16.0	1.10	9.10	1.08	23.0	2.10	
Soil Density (Scoop)	g/cc	11	1.38	0.070	1.24	0.050	1.34	0.056	1.18	0.060	1.12	0.060	
Particle Size Analysis-Hydrometer													
Sand 2000 - 50 um	%	36	55.0	3.00	78.8	1.90	67.2	3.14	11.1	1.75	11.1	1.75	
Silt 50 - 2 um	%	36	34.7	2.40	11.0	2.25	11.2	1.30	67.4	3.40	57.5	2.50	
Clay 2 - 0 um	%	36	10.0	1.65	10.0	2.00	21.8	2.20	21.3	2.04	29.0	2.43	
Particle Size Analysis- Pipette													
Sand 2000 - 50 um	%	5	52.0	1.800	78.7	0.600	66.7	1.11	6.48	4.13	9.00	3.60	
Silt 50 - 2 um	%	5	37.0	0.800	10.7	0.070	11.5	0.550	68.9	8.00	63.5	1.50	
Clay 2 - 0 um	%	5	9.10	1.90	10.9	1.10	21.6	0.800	23.4	2.65	32.6	0.580	
Solvita CO2													
Solvita CO2	ppm	9	7.66	3.66	34.7	10.8	42.8	9.84	41.0	4.99	71.6	22.1	

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