



2020 North American Proficiency Testing Program
Quarter 3 Soil Report - Monday, October 12, 2020

Laboratory ID
352129

Soil	Soil 2020-111					Soil 2020-112			Soil 2020-113			Soil 2020-114			Soil 2020-115							
Analysis	Units	n	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	%	22	50.2	3.65	46.5	39.2	4.15	35.1	48.0	3.70	40.9	65.7	4.75	59.9	52.0	4.25	50.3					
pH - sp	Unit	30	7.08	0.105	6.8	* L	6.90	0.080	6.7	5.89	0.100	5.8	6.98	0.090	6.7	* L	7.58	0.130	7.3			
ECe - sp	dS/m	29	0.934	0.086	1.02	1.54	0.090	1.74	1.06	0.111	1.39	* H	0.910	0.080	1.08	0.550	0.080	0.73				
HCO3 - sp	mmolc/L	16	5.34	1.00	6.3	2.05	0.485	1.83	1.60	0.350	1.3	3.50	0.302	3.89	5.02	1.18	6.44					
Ca - sp	mmolc/L	25	6.29	0.370	7.35	* H	6.78	0.620	7.55	5.51	0.870	6.9	7.29	0.530	8.28	5.14	0.550	6.37				
Mg - sp	mmolc/L	25	2.53	0.176	2.86	4.50	0.300	5.04	2.80	0.300	3.43	1.15	0.110	1.3	1.49	0.140	1.8					
Na - sp	mmolc/L	25	0.700	0.060	0.738	0.650	0.067	0.737	0.300	0.052	0.559	** H	0.210	0.039	0.249	0.291	0.049	0.301				
SAR - sp	value	22	0.330	0.030	0.33	0.270	0.030	0.29	0.130	0.030	0.25	* H	0.100	0.010	0.11	0.165	0.035	0.15				
Cl - sp	mmolc/L	18	0.907	0.128	1.11	0.390	0.042	0.39	1.19	0.209	1.58	0.170	0.014	0.151	0.509	0.062	0.596					
SO4 - sp	mmolc/L	19	1.54	0.200	1.54	2.31	0.190	2.55	0.670	0.060	0.691	0.412	0.068	0.419	0.511	0.089	0.363					
NO3 - sp	mmolc/L	12	0.793	0.177	0.757	8.95	1.22	11.4	5.96	1.17	8.778	4.15	0.80	5.835	0.079	0.019						
B - sp	mg/L	15	0.210	0.030	0.203	0.118	0.022	0.107	0.070	0.009	0.0601	0.100	0.020	0.088	0.070	0.010	0.0544					
Soil pH & EC																						
Soil EC (1:1)	(dS/m)	38	0.473	0.058	0.56	0.537	0.130	0.73	0.500	0.042	0.61	* H	0.370	0.032	0.68	** H	0.390	0.060	0.3			
Soil EC (1:2)	(dS/m)	49	0.306	0.033	0.32	0.388	0.058	0.42	0.325	0.020	0.35	0.331	0.061	0.42	0.210	0.020	0.21					
pH (1:1) Water	Unit	87	7.23	0.070	6.8	** L	7.00	0.040	6.6	** L	5.94	0.060	5.6	** L	7.04	0.060	6.6	** L	7.96	0.042	7.5	** L
pH (1:2) Water	Unit	28	7.36	0.055	6.9	** L	7.10	0.059	6.7	** L	6.09	0.077	5.6	** L	7.15	0.148	6.7	* L	8.09	0.097	7.5	** L
pH (1:1) 0.01M CaCl2	Unit	24	6.89	0.045		6.69	0.030		5.64	0.035		6.72	0.035		7.51	0.035						
pH (1:2) 0.01M CaCl2	Unit	14	6.77	0.090		6.67	0.056		5.70	0.055		6.74	0.042		7.42	0.050						
Buffer pH, Lime Req.																						
SMP Buffer pH	Unit	27	7.20	0.040	7.3	7.13	0.050	7.2	6.90	0.080	7.1	7.12	0.050	7.2	7.42	0.030	7.5	* H				
Adams-Evans Buf pH	Unit	9	7.66	0.030		7.78	0.030		7.67	0.070		7.76	0.110		7.76	0.020						
Woodruff Buf. pH	Unit	20	6.99	0.025		6.95	0.020		6.76	0.060		6.95	0.040		7.12	0.030						
Mehlich Buffer pH	Unit	7	6.52	0.030		6.53	0.030		6.28	0.015		6.55	0.040		6.70	0.020						
Sikora Buffer pH	Unit	31	7.20	0.030		7.26	0.040		6.94	0.040		7.20	0.040		7.46	0.030						
Titrateable Acidity	cmol/kg																					
Inorganic Nitrogen (NO3-N & NH4-N)																						
NO3-N Cd. Rd.	mg/kg	71	20.3	1.54		66.0	6.00		47.7	2.53		45.0	5.00		3.14	0.440						
NO3-N ISE	mg/kg	6	22.0	1.47		63.4	3.96		46.7	2.14		42.1	6.00		3.86	0.762						
NO3-N CTA	mg/kg	1	23.4	0.000		65.7	0.000		53.3	0.000		52.4	0.000		6.74	0.000						
NO3-N Ion Chr.	mg/kg	1	22.9	0.000		66.7	0.000		52.3	0.000		51.0	0.000		3.62	0.000						
NO3-N Other	mg/kg	12	21.0	1.68	28.9	** H	69.8	8.84	42.1	* L	49.4	5.36	64.5	* H	45.2	7.70	6	** L	3.34	0.61	8.25	** H
NH4 - N (KCl Extr.)	mg/kg	53	27.8	2.34	21.4	* L	47.2	4.80	60.3	* H	64.2	4.53	49.5	* L	4.41	0.770	49.2	** H	6.86	0.698	3.27	** L
Phosphorus and Sulfur																						
PO4-P Bray P (1:10)	mg/kg	47	88.0	6.96		399	51.5		25.5	3.70		148	6.49		12.5	1.17						
PO4-P Bray P1 (1:7)	mg/kg	4	67.4	5.15		274	32.0		20.1	3.60		98.4	17.0		10.1	0.950						
PO4-P Olsen/Bicarb	mg/kg	58	62.0	4.57	64.9	76.4	10.2	74.6	25.0	2.40	27.9	68.8	8.26	84.2	7.15	1.15	12.4	** H				
PO4-P AB-DTPA	mg/kg	3	32.4	2.01		55.1	2.84		12.9	0.821		41.7	3.94		2.63	0.634						
PO4-P Modified Morgan	mg/kg	5	32.4	1.40		44.3	3.50		2.03	1.55		40.6	2.90		4.65	2.95						
PO4-P True Morgan	mg/kg	7	36.3	1.70		44.5	2.40		4.20	0.300		41.9	1.20		7.40	0.970						
PO4-P Mod. Kewlona	mg/kg	2	65.3	11.8		241	60.2		11.1	3.00		117	24.8		6.90	1.72						
PO4-P Stong Bray (1:10)	mg/kg	11	255	10.0		673	39.7		67.4	4.97		374	21.8		130	11.0						
PO4-P Water Soluble	mg/kg																					
SO4 - S (PO4 Extr.)	mg/kg	32	11.2	2.04		17.8	2.26		6.45	0.90		4.81	0.80		5.00	0.933						

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Bases																				
K Ammonium Acetate	mg/kg	77	860	58.2	1022	* H	196	12.2	217	128	6.43	162	** H	367	51.0	481	338	17.6	344	
Ca Ammonium Acetate	mg/kg	73	3,440	217	3871		1,420	116	1361	1,390	89.0	1556		3,940	487	5127	5,180	476	5343	
Mg Ammonium Acetate	mg/kg	73	536	28.8	630	* H	240	20.3	241	308	16.9	362	* H	148	18.1	191	492	25.3	516	
Na Ammonium Acetate	mg/kg	60	32.0	3.35	47.4	** H	17.5	2.86	28.5	* H	12.5	2.43	20.2	* H	14.0	3.00	20.4	18.1	2.98	18.2
Bray Extractable K	mg/kg	6	488	17.6			168	9.15		98.3	4.02			306	23.4		211	14.4		
K- Olsen/Bicarb.	mg/kg	3	683	4.00			177	11.0		115	1.00			370	1.00		239	5.00		
K Modified Morgan	mg/kg	3	840	24.0			160	11.5		122	0.000			414	6.00		304	2.50		
K True Morgan	mg/kg	5	519	10.0			167	16.0		99.0	15.2			306	5.00		173	1.00		
Ca Modified Morgan	mg/kg	2	3,500	175			1,450	152		1,500	103			5,040	1,120		5,720	1,600		
Aluminum KCL Extr.	mg/kg	4	0.614	0.350			0.641	0.619		0.305	0.105			0.702	0.385		0.184	0.134		

Mehlich-1 Multi Element (scoop)																			
Scoop Soil Mass	g	5	5.00	0.000			5.00	0.000		5.00	0.000			5.00	0.000		5.00	0.000	
P	mg/kg	9	167	25.6			294	21.6		14.8	1.10			120	18.1		29.5	3.41	
K	mg/kg	9	490	33.7			172	9.26		88.2	4.21			266	29.0		136	15.0	
Ca	mg/kg	9	3,210	159			2,180	286		1,100	61.4			5,030	280		5,210	452	
Mg	mg/kg	9	452	13.5			281	17.5		245	13.8			164	11.3		446	16.7	
Mn	mg/kg	8	114	6.27			144	10.2		393	31.9			53.7	12.4		26.3	4.82	
Zn	mg/kg	8	7.21	0.685			11.0	0.510		1.26	0.129			4.19	0.46		0.610	0.057	

Mehlich-3 Multi-Element (scoop)																			
Scoop Soil Mass	g	25	1.84	0.121			2.43	0.080		1.99	0.100			1.54	0.080		2.08	0.080	
Assumed Density	g/cm3	20	0.935	0.068			1.22	0.045		1.00	0.050			0.785	0.052		1.04	0.045	
Volume of Scoop	cm3	26	2.00	0.000			2.00	0.000		2.00	0.000			2.00	0.000		2.00	0.000	
Extractant Volume mL	mL	17	20.0	0.000			20.0	0.000		20.0	0.000			20.0	0.000		20.0	0.000	
P Colorimetric	mg/kg	12	108	7.12			525	24.8		37.0	4.39			211	4.67		16.6	1.82	
P ICP-AES	mg/kg	55	112	5.29			534	33.6		38.0	4.20			215	10.8		18.6	1.71	
K	mg/kg	53	833	33.5			203	12.8		127	6.82			416	26.7		336	14.5	
Ca	mg/kg	52	3,550	187			1,970	114		1,390	78.1			4,970	319		5,920	294	
Mg	mg/kg	52	564	22.8			299	18.8		312	14.4			184	12.4		576	18.7	
Na	mg/kg	41	31.7	2.39			20.4	2.05		13.8	1.74			27.5	3.32		20.0	1.65	
S	mg/kg	49	17.4	1.30			32.5	1.80		11.5	1.08			11.2	1.02		10.4	1.40	
Al	mg/kg	33	681	28.8			1,110	59.0		634	28.8			1,020	58.3		479	24.7	
Zn	mg/kg	49	10.8	0.570			11.9	0.890		1.53	0.132			8.19	0.700		1.97	0.165	
Mn	mg/kg	48	158	9.74			136	5.16		394	26.9			131	13.1		137	8.35	
Fe	mg/kg	48	189	17.9			406	41.3		565	39.7			325	23.4		54.8	3.16	
Cu	mg/kg	48	4.60	0.225			3.65	0.305		0.970	0.170			1.16	0.085		3.16	0.170	
B	mg/kg	40	1.32	0.125			0.975	0.125		0.520	0.073			1.08	0.126		1.03	0.111	

Micronutrients																			
Zn - DTPA	mg/kg	67	5.62	0.360	5.09		4.00	0.410	3.4	0.720	0.080	0.626		2.91	0.390	2.83	0.980	0.070	0.889
Mn - DTPA	mg/kg	54	99.0	7.90	108		68.8	6.45	62	263	19.5	278		12.4	1.90	10.9	15.8	1.70	14.1
Fe - DTPA	mg/kg	57	33.9	3.10	32.3		102	14.3	100	162	17.6	166		58.2	4.93	61	6.87	0.730	6.2
Cu - DTPA	mg/kg	58	2.56	0.185	2.46		2.36	0.240	2.18	1.62	0.092	1.57		0.460	0.060	0.479	1.50	0.105	1.39
Zn - HCl	mg/kg	4	11.1	0.195			12.6	0.700		1.68	0.225			8.55	0.270		2.02	0.145	
Mn-H3PO4	mg/kg	13	87.6	5.39			113	6.00		244	21.1			29.7	6.72		20.2	4.13	
Cl - Ca(NO3)2 Extr.	mg/kg	16	15.5	1.63			6.66	0.995		19.2	1.44			4.15	0.53		9.68	1.58	
B - Hot Wat.	mg/kg	30	0.930	0.218	0.257	* L	0.505	0.072		0.200	0.027			0.510	0.121	0.178	* L	0.405	0.051
B-DTPA/Sorbitol	mg/kg	20	0.690	0.075			0.387	0.051		0.210	0.025			0.350	0.050		0.476	0.050	

Soil Organic Matter																				
Soil Kjeldahl N	%	15	0.179	0.008	0.1802		0.180	0.017	0.2109	0.106	0.006	0.1054		0.240	0.013	0.244	0.128	0.012	0.1296	
Soil TN (combustion)	%	36	0.180	0.008			0.180	0.011		0.104	0.009			0.244	0.006		0.124	0.006		
Soil TOC (Combustion)	%	17	2.11	0.040	2.25	* H	2.17	0.120	1.93	0.830	0.030	0.8		3.69	0.110	7.52	** H	1.33	0.090	1.42
Soil Total C (Combustion)	%	34	2.10	0.080	2.27		2.22	0.184	2.43	0.850	0.030	0.92		3.79	0.102	7.72	** H	1.52	0.058	1.57

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SOM - Walkley-Black	%	28	3.63	0.195	3.85		3.82	0.324	4.04		1.57	0.130	1.65		5.90	0.380	7.25	* H	2.32	0.217	2.55	
SOM - LOI (% Wt loss)	%	68	4.29	0.235	6.51	** H	3.70	0.200	4.44	* H	2.02	0.119	3.18	** H	5.88	0.230	8.1	** H	2.91	0.187	4.86	** H
Other																						
CaCO3 Content	%	15	0.750	0.127	1.3	** H	0.495	0.100	0.5		0.509	0.063	0.4		1.15	0.095	1.9	** H	2.37	0.209	3.1	* H
CEC - Cation Displacement	cmol/kg	15	27.9	2.10	30		10.2	1.52	8.22		15.0	1.40	16.4		23.1	4.51	26.4		25.6	3.83	23.2	
CEC - Estimation	cmol/kg	12	23.9	1.60			10.7	2.44			11.4	1.30			25.0	3.00			31.9	3.30		
Soil Density (Scoop)	g/cc	12	1.04	0.031			1.36	0.050			1.12	0.055			0.878	0.025			1.18	0.035		
Particle Size Analysis-Hydrometer																						
Sand 2000 - 50 um	%	34	35.0	4.00	24	* L	85.3	2.26	80		12.8	2.22	4	* L	26.1	6.06	13		20.5	4.20	9	* L
Silt 50 - 2 um	%	34	38.8	3.08	57	** H	9.35	1.70	18	** H	64.0	3.85	78	* H	59.8	4.60	77	* H	57.0	4.85	78	** H
Clay 2 - 0 um	%	34	25.6	3.40	19		5.00	0.73	2	** L	23.0	3.00	18		14.4	3.55	10		23.0	3.80	13	* L
Particle Size Analysis- Pipette																						
Sand 2000 - 50 um	%	4	36.5	3.00			87.6	1.00			15.0	1.10			27.4	5.40			22.5	0.900		
Silt 50 - 2 um	%	4	39.2	2.50			8.50	0.750			64.5	0.600			59.4	2.00			57.4	2.00		
Clay 2 - 0 um	%	4	23.8	1.50			4.70	0.800			20.5	0.500			13.2	2.25			19.8	2.50		
Solvita CO2																						
	ppm	6	136	34.2			83.0	15.0			89.9	15.0			116	40.0			108	22.7		

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