2020 North American Proficiency Testing Program
Quarter 2 Soil Report - Friday, July 3, 2020

Laboratory ID
General

Soil			Soil 2020-106			Soil 2020-107			Soil 2020-108			Soil 2020-109			Soil 2020-110		
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	%	15	**70.4**	7.20		**64.0**	4.70		**39.0**	3.50		**49.3**	3.26		**50.0**	3.05	
pH - sp	Unit	24	**6.94**	0.075		**6.95**	0.075		**7.33**	0.065		**4.96**	0.060		**5.94**	0.125	
ECe - sp	dS/m	23	**2.26**	0.210		**0.930**	0.060		**0.990**	0.110		**1.93**	0.210		**1.19**	0.110	
HCO3 - sp	mmolc/L	9	**4.43**	0.64		**3.75**	0.36		**3.62**	0.47		**0.410**	0.037		**1.08**	0.156	
Ca - sp	mmolc/L	18	**8.48**	1.31		**7.40**	0.440		**8.70**	0.940		**10.6**	0.924		**8.63**	1.19	
Mg - sp	mmolc/L	18	**4.86**	0.790		**1.18**	0.110		**0.905**	0.110		**3.68**	0.390		**1.27**	0.150	
Na - sp	mmolc/L	18	**1.98**	0.245		**0.222**	0.025		**0.370**	0.038		**0.510**	0.045		**0.400**	0.065	
SAR - sp	value	14	**0.800**	0.100		**0.110**	0.010		**0.190**	0.030		**0.200**	0.008		**0.176**	0.030	
Cl - sp	mmolc/L	12	**3.20**	0.405		**0.190**	0.016		**0.310**	0.070		**0.225**	0.021		**0.594**	0.098	
SO4 - sp	mmolc/L	12	**3.45**	0.360		**0.420**	0.045		**1.53**	0.092		**0.474**	0.050		**0.710**	0.082	
NO_3 - sp	mmolc/L	7	**6.39**	3.55		**4.36**	0.460		**3.56**	2.22		**13.3**	0.450		**7.21**	2.22	
B - sp	mg/L	10	**0.180**	0.034		**0.108**	0.022		**0.050**	0.009		**0.215**	0.026		**0.050**	0.004	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	38	**0.940**	0.098		**0.365**	0.040		**0.390**	0.048		**0.685**	0.055		**0.482**	0.044	
Soil EC (1:2)	(dS/m)	37	**0.770**	0.136		**0.317**	0.043		**0.283**	0.033		**0.503**	0.088		**0.350**	0.060	
pH (1:1) Water	Unit	77	**7.00**	0.090		**7.04**	0.071		**7.48**	0.054		**5.10**	0.070		**5.92**	0.060	
pH (1:2) Water	Unit	22	**7.10**	0.105		**7.15**	0.092		**7.59**	0.085		**5.22**	0.055		**6.00**	0.070	
pH (1:1) 0.01M CaCl2	Unit	25	**6.76**	0.040		**6.73**	0.070		**7.19**	0.039		**4.83**	0.040		**5.66**	0.035	
pH (1:2) 0.01M CaCl2	Unit	7	**6.70**	0.060		**6.72**	0.040		**7.10**	0.070		**4.86**	0.060		**5.68**	0.050	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	25	**7.06**	0.100		**7.11**	0.082		**7.35**	0.050		**6.30**	0.090		**6.93**	0.080	
Adams-Evans Buf pH	Unit	8	**7.71**	0.055		**7.70**	0.080		**7.82**	0.030		**7.35**	0.045		**7.66**	0.030	
Woodruff Buf. pH	Unit	20	**6.94**	0.040		**6.96**	0.040		**7.05**	0.030		**6.34**	0.040		**6.75**	0.040	
Mehlich Buffer pH	Unit	7	**6.57**	0.010		**6.56**	0.010		**6.74**	0.060		**5.84**	0.055		**6.30**	0.015	
Sikora Buffer pH	Unit	28	**7.20**	0.045		**7.20**	0.030		**7.41**	0.032		**6.41**	0.070		**7.01**	0.040	
Titratable Acidity	cmol/kg																
Inorganic Nitrogen (NO3-N & NH4-N)																	
NO3-N Cd. Rd.	mg/kg	62	**110**	16.4		**45.0**	6.05		**39.3**	2.15		**111**	12.6		**69.4**	4.13	
NO3-N ISE	mg/kg	7	**116**	24.6		**55.4**	8.75		**42.7**	5.20		**116**	7.25		**74.0**	10.7	
NO3-N CTA	mg/kg	1	**151**			**54.9**			**41.6**			**144**			**82.9**		
NO3-N Ion Chr.	mg/kg	2	**128**	7.50		**51.4**	0.350		**41.0**			**126**	5.50		**79.9**	1.90	
NO3-N Other _____	mg/kg	6	**125**	3.25		**50.0**	2.50		**38.7**	2.00		**122**	4.60		**75.0**	3.15	
NH4 - N (KCl Extr.)	mg/kg	46	**149**	21.8		**4.05**	0.675		**4.21**	0.510		**6.77**	0.570		**2.82**	0.460	
Phosphorus and Sulfur																	
PO4-P Bray P (1:10)	mg/kg	41	**434**	54.0		**149**	10.4		**45.3**	3.62		**99.2**	5.83		**43.6**	2.60	
PO4-P Bray P1 (1:7)	mg/kg	5	**322**	3.40		**93.6**	9.90		**35.7**	4.30		**94.6**	1.70		**34.8**	0.380	
PO4-P Olsen/Bicarb	mg/kg	50	**142**	14.6		**68.7**	6.50		**30.1**	2.06		**62.0**	4.00		**28.4**	1.48	
PO4-P AB-DTPA	mg/kg	1	**91.6**			**41.0**			**24.4**			**36.4**			**17.7**		
PO4-P Modified Morgan	mg/kg	4	**170**	17.5		**41.8**	2.45		**23.5**	3.40		**12.6**	0.750		**6.90**	0.900	
PO4-P True Morgan	mg/kg	7	**167**	6.20		**41.3**	1.20		**26.2**	0.700		**14.1**	0.300		**7.40**	0.200	
PO4-P Mod. Kewlona	mg/kg	2	**324**	22.0		**133**	1.00		**23.8**	1.85		**94.0**	5.45		**25.2**	3.80	
PO4-P Stong Bray (1:10)	mg/kg	11	**951**	68.6		**380**	11.0		**218**	6.50		**175**	5.00		**76.0**	3.92	
PO4-P Water Soluble	mg/kg	1	**15.1**			**10.5**			**4.11**			**23.4**			**3.05**		
SO4 - S (PO4 Extr.)	mg/kg	29	**32.5**	4.33		**5.09**	0.57		**10.2**	0.940		**5.44**	0.60		**7.00**	1.18	

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Bases													
K Ammonium Acetate	mg/kg	69	**697**	99.8	**364**	55.1	**165**	10.4	**698**	54.5	**208**	14.3
Ca Ammonium Acetate	mg/kg	63	**2,270**	322	**3,990**	505	**2,500**	229	**1,670**	144	**1,250**	101
Mg Ammonium Acetate	mg/kg	63	**352**	43.0	**147**	18.6	**87.5**	5.78	**207**	15.0	**70.2**	4.40
Na Ammonium Acetate	mg/kg	52	**56.1**	8.16	**13.8**	2.20	**13.8**	1.95	**16.8**	2.20	**12.1**	1.93
Bray Extractable K	mg/kg	4	**479**	53.4	**312**	27.0	**135**	8.00	**515**	19.8	**169**	11.4
K- Olsen/Bicarb.	mg/kg	3	**826**	5.00	**377**	4.00	**150**	2.00	**696**	4.00	**220**	4.00
K Modified Morgan	mg/kg	3	**809**	2.10	**385**	4.30	**148**	9.00	**755**	12.0	**207**	19.3
K True Morgan	mg/kg	5	**690**	17.0	**302**	17.0	**112**	1.20	**526**	6.00	**175**	7.00
Ca Modified Morgan	mg/kg	2	**3,570**	133	**5,030**	1,120	**3,020**	152	**1,740**	140	**1,270**	165
Aluminum KCL Extr.	mg/kg	5	**1.00**	0.280	**0.400**	0.100	**0.200**	0.022	**1.00**	0.478	**0.560**	0.233
Mehlich-1 Multi Element (scoop)													
Scoop Soil Mass	g	4	**5.00**		**5.00**		**5.00**		**5.00**		**5.00**	
P	mg/kg	10	**517**	69.8	**137**	27.4	**115**	14.8	**129**	20.2	**43.0**	4.55
K	mg/kg	10	**512**	43.0	**286**	36.7	**119**	8.80	**474**	31.7	**163**	12.0
Ca	mg/kg	10	**3,980**	421	**5,120**	612	**3,610**	306	**1,810**	106	**1,250**	30.9
Mg	mg/kg	10	**381**	21.0	**174**	15.2	**102**	6.08	**197**	14.1	**66.9**	4.16
Mn	mg/kg	9	**467**	71.5	**54.4**	05.2	**70.9**	2.82	**68.9**	5.20	**56.9**	6.40
Zn	mg/kg	9	**24.9**	2.57	**5.18**	0.82	**3.06**	0.300	**1.50**	0.180	**2.94**	0.170
Mehlich-3 Mult-Element (scoop)													
Scoop Soil Mass	g	22	**1.54**	0.060	**1.51**	0.090	**2.19**	0.110	**1.74**	0.100	**1.87**	0.111
Assumed Density	g/cm3	19	**0.805**	0.059	**0.792**	0.068	**1.16**	0.070	**0.902**	0.066	**0.990**	0.090
Volume of Scoop	cm3	24	**2.00**		**2.00**		**2.00**		**2.00**		**2.00**	
Extractrant Volume mL	mL	16	**20.0**		**20.0**		**20.0**		**20.0**		**20.0**	
P Colorimetric	mg/kg	12	**542**	108	**208**	5.50	**69.5**	3.50	**106**	6.00	**54.3**	2.02
P ICP-AES	mg/kg	47	**624**	42.0	**218**	10.4	**75.5**	2.92	**123**	6.44	**57.9**	3.05
K	mg/kg	50	**653**	39.5	**418**	27.8	**174**	8.44	**699**	41.9	**211**	13.0
Ca	mg/kg	48	**2,990**	214	**4,890**	458	**3,160**	116	**1,760**	106	**1,320**	81.2
Mg	mg/kg	48	**392**	23.4	**186**	13.5	**109**	5.30	**218**	12.7	**79.2**	4.46
Na	mg/kg	38	**56.0**	4.55	**28.2**	2.54	**15.8**	2.35	**17.1**	1.85	**13.9**	2.09
S	mg/kg	44	**48.0**	2.50	**11.7**	0.980	**17.6**	1.18	**12.4**	0.840	**12.4**	0.810
Al	mg/kg	31	**651**	26.8	**1,020**	63.0	**380**	21.3	**864**	69.4	**676**	39.9
Zn	mg/kg	46	**25.2**	1.80	**8.09**	0.505	**3.00**	0.240	**1.83**	0.150	**3.48**	0.220
Mn	mg/kg	44	**407**	30.6	**126**	14.4	**127**	18.4	**108**	7.08	**352**	40.4
Fe	mg/kg	44	**353**	31.2	**314**	22.6	**388**	43.6	**194**	13.9	**186**	9.90
Cu	mg/kg	42	**10.3**	1.18	**1.20**	0.110	**1.71**	0.260	**2.31**	0.190	**1.22**	0.090
B	mg/kg	35	**1.53**	0.080	**1.07**	0.090	**0.760**	0.110	**0.500**	0.060	**0.385**	0.075
Micronutrients													
Zn - DTPA	mg/kg	61	**12.5**	1.58	**2.86**	0.345	**1.40**	0.108	**1.33**	0.093	**1.78**	0.140
Mn - DTPA	mg/kg	47	**261**	35.4	**10.6**	2.38	**16.6**	2.70	**66.8**	7.20	**43.8**	06.2
Fe - DTPA	mg/kg	51	**192**	18.7	**54.3**	7.54	**74.8**	8.52	**83.8**	7.17	**49.0**	5.80
Cu - DTPA	mg/kg	52	**10.5**	1.35	**0.480**	0.072	**1.11**	0.090	**1.40**	0.155	**0.742**	0.058
Zn - HCl	mg/kg	3	**22.6**	6.05	**7.50**	1.42	**2.90**	0.610	**1.57**	0.170	**3.09**	0.810
Mn-H3PO4	mg/kg	14	**374**	59.5	**25.7**	3.45	**43.8**	7.78	**57.2**	8.41	**38.0**	6.55
Cl - Ca(NO3)2 Extr.	mg/kg	13	**64.7**	4.70	**4.21**	0.67	**5.46**	0.984	**4.00**	0.66	**10.6**	1.43
B - Hot Wat.	mg/kg	23	**1.10**	0.250	**0.600**	0.067	**0.310**	0.053	**0.500**	0.050	**0.288**	0.058
B-DTPA/Sorbitol	mg/kg	21	**0.770**	0.107	**0.350**	0.050	**0.280**	0.020	**0.259**	0.041	**0.150**	0.014
Soil Organic Matter													
Soil Kjeldahl N	%	11	**0.503**	0.022	**0.234**	0.014	**0.120**	0.001	**0.168**	0.007	**0.113**	0.004
Soil TN (combustion)	%	30	**0.530**	0.013	**0.246**	0.007	**0.122**	0.012	**0.172**	0.008	**0.118**	0.008
Soil TOC (Combustion)	%	11	**4.70**	0.210	**3.60**	0.120	**1.24**	0.103	**2.02**	0.100	**1.10**	0.080
Soil Total C (Combustion)	%	26	**4.85**	0.150	**3.78**	0.144	**1.28**	0.050	**1.99**	0.070	**1.08**	0.040

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SOM - Walkley-Black	%	19	**8.20**	0.600	**5.96**	0.322	**2.12**	0.123	**3.50**	0.100	**1.94**	0.135
SOM - LOI (% Wt loss)	%	65	**9.24**	0.300	**5.84**	0.180	**2.50**	0.100	**3.93**	0.130	**2.40**	0.100
Other												
CaCO3 Content	%	8	**1.12**	0.104	**1.28**	0.119	**0.845**	0.096	**0.400**	0.140	**0.400**	0.052
CEC - Cation Displacement	cmol/kg	10	**19.3**	2.12	**21.2**	4.94	**12.2**	2.00	**15.6**	1.74	**8.35**	0.595
CEC - Estimation	cmol/kg	11	**17.8**	2.58	**24.0**	3.76	**13.3**	2.02	**16.0**	1.99	**7.90**	0.800
Soil Density (Scoop)	g/cc	13	**0.900**	0.035	**0.870**	0.013	**1.27**	0.040	**1.01**	0.032	**1.10**	0.040
Particle Size Analysis-Hydrometer												
Sand 2000 - 50 um	%	29	**31.8**	4.80	**26.0**	4.40	**30.0**	3.30	**19.0**	4.00	**13.0**	1.31
Silt 50 - 2 um	%	29	**45.2**	4.56	**57.5**	4.80	**54.0**	3.42	**60.0**	4.00	**72.0**	4.00
Clay 2 - 0 um	%	29	**22.0**	3.80	**16.0**	3.00	**15.0**	2.03	**21.0**	3.00	**15.0**	1.95
Particle Size Analysis- Pipette												
Sand 2000 - 50 um	%	3	**24.0**	2.80	**21.0**	5.00	**23.5**	3.50	**10.0**	1.82	**6.00**	0.080
Silt 50 - 2 um	%	3	**51.0**	3.50	**63.0**	5.00	**60.0**	1.00	**68.0**	5.10	**78.0**	1.00
Clay 2 - 0 um	%	3	**24.3**	0.700	**16.0**	1.00	**15.0**	1.50	**22.0**		**15.0**	1.00
Solvita CO2	ppm	8	**119**	15.7	**111**	11.2	**61.0**	06.1	**27.1**	2.47	**74.0**	17.9

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