2021 North American Proficiency Testing Program
Quarter 1 Soil Report - Wednesday, April 14, 2021

Laboratory ID
General

Soil			Soil 2021-101			Soil 2021-102			Soil 2021-103			Soil 2021-104			Soil 2021-105		
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	%	23	**61.7**	2.78		**54.5**	2.70		**48.6**	3.25		**49.8**	3.70		**45.0**	2.64	
pH - sp	Unit	33	**7.40**	0.060		**7.04**	0.070		**6.10**	0.130		**6.00**	0.200		**6.43**	0.100	
ECe - sp	dS/m	32	**2.69**	0.310		**1.52**	0.140		**0.865**	0.180		**1.52**	0.210		**0.458**	0.044	
HCO3 - sp	mmolc/L	18	**5.29**	0.83		**4.86**	1.00		**1.53**	0.293		**2.79**	0.48		**2.53**	0.469	
Ca - sp	mmolc/L	27	**15.1**	1.32		**7.15**	0.576		**5.44**	1.15		**11.5**	2.02		**3.14**	0.520	
Mg - sp	mmolc/L	27	**9.96**	0.900		**4.83**	0.370		**2.48**	0.282		**2.40**	0.238		**1.01**	0.170	
Na - sp	mmolc/L	27	**1.27**	0.120		**0.220**	0.032		**0.250**	0.040		**0.817**	0.077		**0.220**	0.026	
SAR - sp	value	23	**0.366**	0.036		**0.100**	0.010		**0.127**	0.027		**0.300**	0.020		**0.160**	0.020	
Cl - sp	mmolc/L	21	**2.17**	0.250		**3.81**	0.429		**0.230**	0.045		**0.830**	0.095		**0.480**	0.100	
SO4 - sp	mmolc/L	22	**2.42**	0.255		**1.68**	0.170		**1.11**	0.085		**0.905**	0.170		**0.765**	0.095	
NO_3 - sp	mmolc/L	14	**16.8**	1.66		**2.55**	0.56		**4.78**	1.00		**9.28**	1.40		**0.060**	0.013	
B - sp	mg/L	16	**0.385**	0.045		**0.500**	0.033		**0.220**	0.028		**0.025**	0.005		**0.060**	0.007	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	38	**1.20**	0.120		**0.578**	0.066		**0.465**	0.045		**0.439**	0.060		**0.194**	0.026	
Soil EC (1:2)	(dS/m)	43	**0.890**	0.067		**0.457**	0.063		**0.310**	0.020		**0.330**	0.050		**0.130**	0.020	
pH (1:1) Water	Unit	85	**7.50**	0.050		**7.10**	0.050		**6.14**	0.060		**5.62**	0.090		**6.50**	0.070	
pH (1:2) Water	Unit	26	**7.60**	0.060		**7.20**	0.065		**6.21**	0.105		**5.72**	0.184		**6.57**	0.075	
pH (1:1) 0.01M CaCl2	Unit	23	**7.35**	0.060		**6.85**	0.030		**5.81**	0.040		**5.40**	0.050		**6.03**	0.030	
pH (1:2) 0.01M CaCl2	Unit	14	**7.32**	0.070		**6.80**	0.035		**5.81**	0.035		**5.52**	0.145		**5.99**	0.020	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	27	**7.37**	0.050		**7.21**	0.050		**6.90**	0.050		**6.37**	0.072		**7.08**	0.055	
Adams-Evans Buf pH	Unit	8	**7.68**	0.100		**7.80**	0.095		**7.58**	0.055		**7.17**	0.080		**7.68**	0.075	
Woodruff Buf. pH	Unit	19	**7.16**	0.040		**6.99**	0.020		**6.73**	0.040		**6.36**	0.130		**6.85**	0.040	
Mehlich Buffer pH	Unit	7	**6.74**	0.070		**6.61**	0.020		**6.20**	0.040		**5.98**	0.045		**6.38**	0.020	
Sikora Buffer pH	Unit	30	**7.37**	0.035		**7.30**	0.035		**6.91**	0.060		**6.44**	0.056		**7.13**	0.060	
Titratable Acidity	cmol/kg																
Inorganic Nitrogen (NO3-N & NH4-N)																	
NO3-N Cd. Rd.	mg/kg	71	**157**	12.5		**38.9**	3.04		**48.7**	2.71		**68.1**	4.00		**7.40**	0.520	
NO3-N ISE	mg/kg	5	**152**	12.4		**39.5**	1.51		**50.0**	0.680		**66.9**	3.92		**10.0**	2.80	
NO3-N CTA	mg/kg	1	**194**	0.000		**41.0**	0.000		**48.9**	0.000		**69.4**	0.000		**9.80**	0.000	
NO3-N Ion Chr.	mg/kg	1	**210**	0.000		**96.0**	0.000		**127**	0.000		**79.3**	0.000		**16.8**	0.000	
NO3-N Other _____	mg/kg	11	**166**	15.6		**40.2**	3.27		**48.2**	1.66		**67.9**	4.11		**8.57**	0.735	
NH4 - N (KCl Extr.)	mg/kg	55	**47.2**	4.55		**105**	10.0		**7.54**	0.840		**12.9**	1.29		**26.5**	2.36	
Phosphorus and Sulfur																	
PO4-P Bray P (1:10)	mg/kg	47	**44.0**	3.00		**122**	8.20		**36.0**	2.00		**39.0**	3.00		**19.1**	1.57	
PO4-P Bray P1 (1:7)	mg/kg	6	**36.3**	2.80		**99.6**	3.10		**33.2**	5.80		**24.9**	3.11		**17.6**	2.31	
PO4-P Olsen/Bicarb	mg/kg	62	**38.0**	3.76		**51.9**	4.90		**24.2**	2.10		**20.0**	2.30		**12.7**	1.70	
PO4-P AB-DTPA	mg/kg	2	**21.0**	2.26		**32.1**	5.52		**14.0**	2.92		**16.5**	8.57		**9.37**	2.51	
PO4-P Modified Morgan	mg/kg	4	**39.0**	4.95		**18.6**	2.40		**12.6**	0.500		**1.90**	0.600		**3.65**	0.300	
PO4-P True Morgan	mg/kg	8	**39.4**	0.750		**19.6**	1.12		**13.6**	1.07		**2.20**	0.330		**4.30**	0.452	
PO4-P Mod. Kewlona	mg/kg	2	**47.8**	8.25		**91.6**	8.35		**27.4**	4.65		**16.5**	0.500		**12.0**	1.95	
PO4-P Stong Bray (1:10)	mg/kg	10	**138**	3.00		**212**	9.05		**89.0**	8.66		**57.8**	2.70		**43.1**	3.00	
PO4-P Water Soluble	mg/kg																
SO4 - S (PO4 Extr.)	mg/kg	29	**23.1**	4.83		**14.0**	1.80		**8.12**	1.15		**12.1**	1.78		**6.25**	1.36	

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Bases												
K Ammonium Acetate	mg/kg	78	**1,210**	100	**266**	19.5	**254**	14.0	**64.8**	5.75	**162**	8.00
Ca Ammonium Acetate	mg/kg	73	**4,960**	470	**1,330**	98.2	**2,530**	146	**1,930**	171	**1,470**	78.0
Mg Ammonium Acetate	mg/kg	73	**1,080**	74.0	**300**	16.7	**416**	21.3	**149**	10.8	**175**	9.18
Na Ammonium Acetate	mg/kg	62	**47.7**	5.97	**09.6**	1.48	**15.1**	3.12	**26.2**	3.42	**11.0**	1.53
Bray Extractable K	mg/kg	7	**736**	30.7	**212**	11.0	**183**	2.00	**43.3**	3.30	**123**	2.80
K- Olsen/Bicarb.	mg/kg	4	**1,020**	62.0	**263**	3.00	**218**	4.50	**53.3**	0.920	**152**	4.00
K Modified Morgan	mg/kg	3	**1,210**	4.00	**270**	6.00	**236**	8.00	**61.5**	3.50	**156**	5.50
K True Morgan	mg/kg	6	**736**	37.5	**223**	10.8	**163**	14.0	**40.9**	2.84	**122**	10.3
Ca Modified Morgan	mg/kg	3	**7,160**	606	**1,720**	21.0	**2,590**	135	**2,530**	45.0	**1,620**	171
Aluminum KCL Extr.	mg/kg	4	**0.726**	0.294	**0.750**	0.322	**0.915**	0.085	**1.00**	0.500	**0.658**	0.350
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	8	**54.6**	1.36	**82.5**	7.36	**66.9**	3.46	**12.6**	1.93	**24.6**	1.94
K	mg/kg	8	**579**	37.7	**215**	10.7	**154**	11.5	**33.4**	1.48	**114**	4.32
Ca	mg/kg	8	**4,740**	721	**1,710**	63.6	**2,530**	100	**2,290**	41.8	**1,370**	45.1
Mg	mg/kg	8	**915**	38.4	**337**	27.2	**376**	22.5	**136**	4.22	**156**	1.47
Mn	mg/kg	7	**43.3**	6.66	**416**	35.6	**111**	5.49	**64.6**	2.99	**121**	5.56
Zn	mg/kg	7	**0.730**	0.130	**4.83**	0.130	**3.09**	0.220	**1.13**	0.030	**1.41**	0.040
Mehlich-3 Mult-Element (scoop)												
Scoop Soil Mass	g	25	**1.84**	0.070	**1.83**	0.090	**2.03**	0.055	**1.85**	0.120	**1.98**	0.130
Assumed Density	g/cm3	19	**0.920**	0.045	**0.915**	0.045	**1.03**	0.040	**0.930**	0.070	**0.990**	0.060
Volume of Scoop	cm3	24	**2.00**	0.000	**2.00**	0.000	**2.00**	0.000	**2.00**	0.000	**2.00**	0.000
Extractrant Volume mL	mL	16	**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	**65.4**	3.60	**153**	4.20	**42.3**	2.70	**32.3**	1.85	**20.8**	1.30
P ICP-AES	mg/kg	53	**72.5**	3.00	**164**	9.30	**48.1**	2.46	**43.6**	5.17	**26.0**	1.50
K	mg/kg	51	**1,150**	60.5	**263**	12.5	**249**	8.68	**62.0**	4.00	**162**	6.30
Ca	mg/kg	50	**5,500**	290	**1,570**	87.3	**2,800**	127	**2,290**	161	**1,580**	76.4
Mg	mg/kg	50	**1,200**	67.5	**332**	18.6	**444**	14.6	**158**	8.10	**189**	10.1
Na	mg/kg	41	**47.0**	1.90	**12.0**	1.71	**16.6**	2.00	**26.2**	1.90	**12.0**	1.98
S	mg/kg	46	**36.9**	2.30	**24.6**	1.40	**14.5**	0.921	**21.9**	1.16	**11.3**	1.20
Al	mg/kg	33	**532**	33.0	**833**	42.7	**392**	18.9	**1,230**	81.0	**500**	30.8
Zn	mg/kg	46	**3.30**	0.200	**4.34**	0.320	**4.08**	0.255	**1.52**	0.180	**1.71**	0.170
Mn	mg/kg	46	**103**	5.85	**358**	27.7	**253**	11.5	**67.7**	2.91	**205**	12.0
Fe	mg/kg	46	**182**	14.1	**362**	28.5	**135**	11.4	**222**	14.7	**236**	13.3
Cu	mg/kg	46	**4.74**	0.340	**1.63**	0.183	**1.58**	0.090	**1.10**	0.105	**1.69**	0.160
B	mg/kg	38	**4.93**	0.315	**1.86**	0.153	**1.14**	0.090	**0.260**	0.031	**0.480**	0.080
Micronutrients												
Zn - DTPA	mg/kg	68	**1.31**	0.110	**2.23**	0.195	**2.58**	0.196	**0.800**	0.100	**0.940**	0.080
Mn - DTPA	mg/kg	55	**29.1**	3.57	**175**	18.0	**99.6**	12.3	**58.9**	5.10	**88.9**	7.76
Fe - DTPA	mg/kg	58	**53.0**	6.05	**127**	13.9	**49.4**	6.02	**99.8**	14.6	**63.2**	9.00
Cu - DTPA	mg/kg	60	**2.32**	0.225	**1.60**	0.198	**0.920**	0.090	**0.642**	0.058	**1.28**	0.100
Zn - HCl	mg/kg	4	**3.68**	0.240	**5.36**	0.935	**4.29**	0.130	**1.40**	0.315	**1.60**	0.275
Mn-H3PO4	mg/kg	12	**24.0**	2.76	**377**	23.6	**79.6**	5.87	**55.6**	5.44	**90.1**	6.62
Cl - Ca(NO3)2 Extr.	mg/kg	16	**39.2**	4.42	**63.4**	6.10	**3.42**	0.32	**11.0**	0.985	**6.05**	1.00
B - Hot Wat.	mg/kg	31	**2.56**	0.439	**1.34**	0.150	**0.780**	0.111	**0.185**	0.028	**0.295**	0.044
B-DTPA/Sorbitol	mg/kg	23	**2.42**	0.220	**1.14**	0.067	**0.510**	0.045	**0.185**	0.024	**0.210**	0.025
Soil Organic Matter												
Soil Kjeldahl N	%	14	**0.354**	0.006	**0.189**	0.010	**0.200**	0.010	**0.202**	0.008	**0.130**	0.009
Soil TN (combustion)	%	35	**0.370**	0.015	**0.190**	0.009	**0.204**	0.008	**0.209**	0.010	**0.130**	0.010
Soil TOC (Combustion)	%	17	**3.93**	0.078	**2.00**	0.057	**2.27**	0.070	**2.33**	0.052	**1.34**	0.048
Soil Total C (Combustion)	%	30	**4.10**	0.125	**2.10**	0.060	**2.28**	0.112	**2.31**	0.065	**1.31**	0.048

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SOM - Walkley-Black	%	22	**6.49**	0.340		**3.48**	0.151		**3.74**	0.250		**3.86**	0.215		**2.23**	0.132
SOM - LOI (% Wt loss)	%	72	**7.02**	0.300		**4.05**	0.146		**3.80**	0.150		**4.82**	0.190		**2.72**	0.115
Other																
CaCO3 Content	%	15	**2.47**	0.35		**1.10**	0.195		**0.630**	0.093		**0.600**	0.093		**0.300**	0.036
CEC - Cation Displacement	cmol/kg	15	**39.4**	3.50		**12.4**	1.50		**22.0**	3.17		**18.8**	2.28		**12.1**	1.11
CEC - Estimation	cmol/kg	11	**40.0**	1.50		**10.2**	0.700		**19.1**	0.900		**15.0**	1.13		**10.0**	0.300
Soil Density (Scoop)	g/cc	12	**1.08**	0.040		**1.07**	0.022		**1.18**	0.026		**1.08**	0.031		**1.18**	0.030
Particle Size Analysis-Hydrometer																
Sand 2000 - 50 um	%	31	**41.0**	4.00		**22.0**	4.00		**59.0**	2.00		**24.0**	3.70		**22.0**	3.00
Silt 50 - 2 um	%	31	**39.6**	4.60		**57.5**	3.50		**21.3**	3.20		**54.0**	5.10		**61.2**	3.80
Clay 2 - 0 um	%	31	**18.9**	3.10		**20.0**	2.10		**18.8**	2.20		**22.4**	2.60		**16.6**	2.60
Particle Size Analysis- Pipette																
Sand 2000 - 50 um	%	4	**44.0**	5.00		**25.5**	4.50		**61.0**	2.00		**29.5**	6.00		**21.0**	3.00
Silt 50 - 2 um	%	4	**37.0**	0.000		**58.0**	1.50		**22.5**	0.500		**53.5**	1.50		**63.5**	2.50
Clay 2 - 0 um	%	4	**17.0**	5.00		**18.5**	2.50		**18.5**	0.500		**19.5**	3.50		**15.5**	1.00
Solvita CO2	ppm	6	**125**	23.8		**135**	34.2		**107**	13.8		**200**	55.2		**130**	44.0

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