2020 North American Proficiency Testing Program
Quarter 4 Soil Report - Friday, January 8, 2021

Laboratory ID
General

Soil			Soil 2020-116			Soil 2020-117			Soil 2020-118			Soil 2020-119			Soil 2020-120		
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	%	17	**55.0**	4.00		**57.0**	3.80		**53.1**	3.09		**65.1**	2.90		**25.0**	2.00	
pH - sp	Unit	26	**7.04**	0.065		**5.41**	0.150		**7.39**	0.075		**7.00**	0.100		**6.63**	0.100	
ECe - sp	dS/m	25	**1.80**	0.160		**0.930**	0.110		**1.00**	0.123		**0.940**	0.070		**0.860**	0.120	
HCO3 - sp	mmolc/L	10	**4.16**	0.50		**0.89**	0.145		**4.57**	0.48		**3.20**	0.615		**1.40**	0.245	
Ca - sp	mmolc/L	21	**9.32**	0.880		**5.50**	0.700		**6.90**	1.01		**7.33**	0.630		**3.56**	0.490	
Mg - sp	mmolc/L	21	**3.74**	0.441		**2.38**	0.240		**2.09**	0.330		**1.17**	0.100		**2.78**	0.310	
Na - sp	mmolc/L	21	**1.15**	0.110		**0.170**	0.030		**0.670**	0.092		**0.220**	0.021		**0.130**	0.020	
SAR - sp	value	17	**0.430**	0.030		**0.090**	0.020		**0.300**	0.030		**0.100**	0.010		**0.068**	0.008	
Cl - sp	mmolc/L	14	**0.530**	0.100		**0.225**	0.045		**0.795**	0.125		**0.165**	0.015		**0.280**	0.040	
SO4 - sp	mmolc/L	14	**1.89**	0.200		**1.14**	0.138		**0.947**	0.110		**0.440**	0.060		**0.795**	0.090	
NO_3 - sp	mmolc/L	10	**8.85**	1.61		**3.82**	0.60		**1.84**	0.44		**3.65**	0.64		**4.25**	0.79	
B - sp	mg/L	11	**0.210**	0.030		**0.110**	0.027		**0.080**	0.010		**0.090**	0.010		**0.140**	0.010	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	39	**0.831**	0.081		**0.445**	0.035		**0.660**	0.090		**0.370**	0.036		**0.220**	0.035	
Soil EC (1:2)	(dS/m)	44	**0.598**	0.040		**0.330**	0.020		**0.400**	0.043		**0.343**	0.044		**0.162**	0.023	
pH (1:1) Water	Unit	82	**7.17**	0.050		**5.42**	0.062		**7.68**	0.070		**7.05**	0.050		**6.82**	0.056	
pH (1:2) Water	Unit	25	**7.34**	0.090		**5.50**	0.100		**7.75**	0.140		**7.19**	0.080		**6.97**	0.130	
pH (1:1) 0.01M CaCl2	Unit	25	**6.93**	0.030		**5.09**	0.040		**7.36**	0.060		**6.71**	0.040		**6.35**	0.050	
pH (1:2) 0.01M CaCl2	Unit	12	**6.86**	0.090		**5.10**	0.032		**7.32**	0.090		**6.73**	0.040		**6.32**	0.055	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	23	**7.31**	0.060		**6.42**	0.070		**7.39**	0.060		**7.13**	0.070		**7.14**	0.050	
Adams-Evans Buf pH	Unit	10	**7.73**	0.045		**7.33**	0.110		**7.68**	0.065		**7.73**	0.110		**7.80**	0.045	
Woodruff Buf. pH	Unit	21	**7.05**	0.040		**6.39**	0.080		**7.10**	0.020		**6.98**	0.020		**6.88**	0.030	
Mehlich Buffer pH	Unit	7	**6.57**	0.030		**6.00**	0.050		**6.74**	0.060		**6.54**	0.020		**6.50**	0.020	
Sikora Buffer pH	Unit	29	**7.30**	0.040		**6.42**	0.065		**7.37**	0.030		**7.20**	0.050		**7.22**	0.050	
Titratable Acidity	cmol/kg																
Inorganic Nitrogen (NO3-N & NH4-N)																	
NO3-N Cd. Rd.	mg/kg	67	**89.7**	5.99		**52.8**	3.20		**37.1**	2.10		**44.5**	5.20		**20.8**	1.90	
NO3-N ISE	mg/kg	5	**89.0**	5.23		**57.1**	0.640		**42.3**	3.38		**49.5**	13.1		**25.0**	1.25	
NO3-N CTA	mg/kg																
NO3-N Ion Chr.	mg/kg	2	**102**	1.50		**59.3**	1.30		**41.6**	0.600		**53.4**	0.350		**21.2**	0.850	
NO3-N Other _____	mg/kg	9	**92.1**	6.00		**51.3**	3.00		**36.9**	2.33		**40.8**	6.58		**22.9**	3.48	
NH4 - N (KCl Extr.)	mg/kg	52	**7.95**	0.750		**45.0**	3.62		**15.1**	1.10		**4.69**	0.815		**21.1**	2.04	
Phosphorus and Sulfur																	
PO4-P Bray P (1:10)	mg/kg	46	**108**	7.00		**14.9**	1.86		**34.3**	06.7		**150**	8.70		**68.0**	4.86	
PO4-P Bray P1 (1:7)	mg/kg	5	**74.9**	15.4		**8.80**	0.780		**13.3**	2.88		**86.8**	29.0		**51.7**	9.85	
PO4-P Olsen/Bicarb	mg/kg	52	**69.7**	5.22		**16.6**	1.51		**29.7**	2.10		**68.0**	8.90		**31.4**	3.14	
PO4-P AB-DTPA	mg/kg	1	**35.5**	0.000		**14.8**	0.000		**11.0**	0.000		**35.3**	0.000		**17.0**	0.000	
PO4-P Modified Morgan	mg/kg	4	**88.6**	4.70		**2.60**	0.100		**17.3**	1.80		**41.6**	2.30		**7.77**	1.20	
PO4-P True Morgan	mg/kg	8	**68.9**	13.8		**2.90**	0.212		**17.3**	2.29		**40.6**	2.78		**9.25**	0.550	
PO4-P Mod. Kewlona	mg/kg	2	**89.8**	3.15		**7.51**	0.090		**32.5**	4.80		**138**	2.50		**45.0**	5.15	
PO4-P Stong Bray (1:10)	mg/kg	11	**368**	6.84		**39.1**	3.01		**151**	17.0		**366**	3.50		**121**	6.00	
PO4-P Water Soluble	mg/kg	1	**18.0**	0.000		**0.500**	0.000		**1.60**	0.000		**5.40**	0.000		**1.50**	0.000	
SO4 - S (PO4 Extr.)	mg/kg	29	**17.2**	2.10		**12.9**	2.43		**9.00**	1.68		**5.30**	1.18		**4.96**	0.60	

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Bases													
K Ammonium Acetate	mg/kg	69	**3,170**	269		**173**	12.2		**640**	32.0		**374**	46.0		**223**	25.2
Ca Ammonium Acetate	mg/kg	63	**3,370**	193		**1,890**	83.2		**5,970**	470		**3,890**	488		**783**	103
Mg Ammonium Acetate	mg/kg	63	**525**	22.0		**317**	13.9		**595**	25.0		**147**	19.0		**208**	22.3
Na Ammonium Acetate	mg/kg	52	**61.3**	4.70		**11.2**	1.97		**33.2**	3.61		**14.0**	2.90		**7.20**	0.98
Bray Extractable K	mg/kg	7	**1,690**	136		**124**	10.4		**366**	42.1		**315**	19.7		**201**	8.40
K- Olsen/Bicarb.	mg/kg	4	**1,970**	270		**153**	10.5		**402**	19.0		**375**	11.0		**193**	6.16
K Modified Morgan	mg/kg	3	**2,730**	97.0		**153**	9.50		**577**	31.5		**395**	8.00		**178**	15.0
K True Morgan	mg/kg	5	**1,770**	22.3		**106**	4.34		**274**	15.7		**297**	15.0		**152**	4.52
Ca Modified Morgan	mg/kg	2	**2,970**	409		**1,860**	208		**15,600**	9,410		**4,990**	797		**629**	141
Aluminum KCL Extr.	mg/kg	4	**0.650**	0.415		**1.04**	0.140		**0.381**	0.169		**0.502**	0.062		**0.480**	0.060
Mehlich-1 Multi Element (scoop)													
Scoop Soil Mass	g	6	**5.00**	0.000		**5.00**	0.000		**5.00**	0.000		**5.00**	0.000		**5.00**	0.000
P	mg/kg	11	**325**	19.4		**8.72**	2.02		**12.9**	1.06		**116**	22.0		**45.0**	3.95
K	mg/kg	11	**1,230**	151		**115**	3.58		**170**	8.40		**286**	43.4		**190**	13.4
Ca	mg/kg	11	**3,500**	312		**1,720**	73.1		**6,130**	886		**5,150**	482		**899**	28.0
Mg	mg/kg	11	**481**	47.6		**299**	10.5		**397**	26.4		**183**	24.8		**237**	19.9
Mn	mg/kg	9	**57.1**	7.97		**134**	4.22		**8.83**	0.942		**62.5**	14.7		**130**	5.60
Zn	mg/kg	9	**3.08**	0.330		**2.70**	0.150		**0.210**	0.047		**4.17**	0.69		**3.49**	0.117
Mehlich-3 Mult-Element (scoop)													
Scoop Soil Mass	g	25	**2.07**	0.066		**1.96**	0.073		**2.04**	0.070		**1.51**	0.080		**2.46**	0.080
Assumed Density	g/cm3	20	**1.04**	0.040		**0.986**	0.055		**1.03**	0.065		**0.758**	0.056		**1.22**	0.041
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
Extractrant Volume mL	mL	18	**20.0**	0.000		**20.0**	0.000		**20.0**	0.000		**20.0**	0.000		**20.0**	0.000
P Colorimetric	mg/kg	11	**149**	9.00		**20.0**	1.76		**63.6**	4.20		**210**	10.3		**92.0**	6.50
P ICP-AES	mg/kg	54	**155**	6.44		**25.8**	2.50		**67.6**	3.50		**214**	10.5		**101**	5.44
K	mg/kg	53	**3,010**	152		**176**	10.6		**637**	27.0		**433**	28.5		**245**	12.5
Ca	mg/kg	52	**3,730**	140		**2,030**	79.0		**8,360**	632		**4,930**	376		**954**	47.4
Mg	mg/kg	52	**603**	25.9		**342**	16.5		**709**	36.2		**190**	12.6		**251**	16.8
Na	mg/kg	41	**61.6**	3.64		**12.5**	2.54		**36.1**	4.24		**28.0**	2.96		**10.0**	1.80
S	mg/kg	48	**26.2**	1.20		**21.4**	1.40		**19.1**	1.61		**11.6**	0.770		**11.6**	1.04
Al	mg/kg	33	**446**	28.2		**774**	36.6		**299**	32.9		**999**	61.6		**810**	51.0
Zn	mg/kg	49	**4.14**	0.259		**2.57**	0.180		**3.30**	0.230		**8.22**	0.520		**3.38**	0.254
Mn	mg/kg	47	**117**	7.12		**126**	4.80		**127**	12.2		**134**	18.8		**121**	7.33
Fe	mg/kg	46	**121**	8.90		**496**	53.0		**90.5**	6.40		**311**	23.6		**426**	31.8
Cu	mg/kg	47	**1.80**	0.100		**1.55**	0.241		**3.75**	0.250		**1.11**	0.090		**1.00**	0.162
B	mg/kg	40	**2.06**	0.135		**0.780**	0.120		**1.53**	0.130		**1.10**	0.090		**0.630**	0.100
Micronutrients													
Zn - DTPA	mg/kg	62	**1.61**	0.110		**1.98**	0.180		**1.59**	0.110		**2.84**	0.421		**1.54**	0.235
Mn - DTPA	mg/kg	49	**21.8**	1.80		**94.0**	6.05		**30.6**	2.57		**11.3**	2.20		**62.9**	8.52
Fe - DTPA	mg/kg	52	**22.1**	3.40		**332**	28.6		**23.2**	3.57		**54.4**	6.50		**96.8**	18.5
Cu - DTPA	mg/kg	53	**0.900**	0.100		**2.35**	0.205		**2.15**	0.185		**0.500**	0.080		**0.670**	0.120
Zn - HCl	mg/kg	3	**4.40**	0.250		**2.80**	0.260		**2.92**	0.183		**8.60**	0.230		**4.10**	0.100
Mn-H3PO4	mg/kg	12	**35.2**	3.60		**88.0**	4.30		**12.6**	1.48		**31.6**	4.89		**89.5**	3.77
Cl - Ca(NO3)2 Extr.	mg/kg	16	**12.3**	2.41		**3.90**	0.45		**13.6**	2.50		**4.30**	0.62		**3.10**	0.52
B - Hot Wat.	mg/kg	29	**1.23**	0.156		**0.600**	0.088		**0.780**	0.180		**0.600**	0.139		**0.295**	0.044
B-DTPA/Sorbitol	mg/kg	19	**0.990**	0.080		**0.425**	0.069		**0.900**	0.070		**0.360**	0.060		**0.260**	0.060
Soil Organic Matter													
Soil Kjeldahl N	%	13	**0.269**	0.014		**0.246**	0.016		**0.168**	0.010		**0.238**	0.018		**0.070**	0.006
Soil TN (combustion)	%	35	**0.271**	0.011		**0.240**	0.010		**0.176**	0.014		**0.246**	0.007		**0.070**	0.007
Soil TOC (Combustion)	%	16	**2.70**	0.095		**2.54**	0.078		**1.68**	0.145		**3.70**	0.138		**0.668**	0.048
Soil Total C (Combustion)	%	32	**2.66**	0.120		**2.47**	0.125		**2.64**	0.105		**3.78**	0.173		**0.680**	0.038

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SOM - Walkley-Black	%	23	**4.73**	0.270	**4.36**	0.155	**2.76**	0.181	**5.90**	0.400	**1.26**	0.140
SOM - LOI (% Wt loss)	%	69	**5.15**	0.250	**4.80**	0.140	**3.50**	0.210	**5.80**	0.210	**1.35**	0.080
Other												
CaCO3 Content	%	10	**0.860**	0.134	**0.440**	0.075	**8.57**	0.685	**1.23**	0.151	**0.385**	0.071
CEC - Cation Displacement	cmol/kg	11	**27.5**	4.09	**17.7**	2.46	**29.0**	3.72	**21.7**	1.28	**6.30**	0.850
CEC - Estimation	cmol/kg	13	**30.5**	2.70	**18.1**	2.10	**36.0**	4.10	**23.4**	4.00	**7.00**	1.00
Soil Density (Scoop)	g/cc	15	**1.18**	0.040	**1.14**	0.030	**1.19**	0.040	**0.890**	0.020	**1.43**	0.040
Particle Size Analysis-Hydrometer												
Sand 2000 - 50 um	%	33	**54.5**	3.00	**17.7**	3.38	**10.7**	1.64	**23.5**	2.75	**70.0**	2.50
Silt 50 - 2 um	%	33	**29.2**	1.80	**60.0**	4.00	**43.0**	5.75	**60.0**	3.00	**20.0**	2.20
Clay 2 - 0 um	%	33	**15.4**	2.66	**22.4**	3.57	**43.0**	5.00	**15.0**	3.40	**10.6**	2.10
Particle Size Analysis- Pipette												
Sand 2000 - 50 um	%	4	**56.8**	1.50	**14.0**	3.60	**11.5**	7.52	**23.5**	5.85	**71.5**	0.900
Silt 50 - 2 um	%	4	**25.1**	2.10	**63.0**	2.25	**47.8**	0.200	**64.0**	3.15	**19.8**	1.00
Clay 2 - 0 um	%	4	**16.6**	3.00	**23.3**	2.00	**48.0**	0.200	**15.7**	1.80	**9.06**	0.500
Solvita CO2	ppm	6	**136**	44.7	**118**	35.1	**116**	37.1	**136**	34.6	**31.4**	17.4

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