2013 North American Proficiency Testing Program
4th Quarter Report - January 14, 2014

Laboratory ID
General

Soil			Soil 2013-116			Soil 2013-117			Soil 2013-118			Soil 2013-119			Soil 2013-120		
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	%	25	**50.8**	*3.64*		**39.6**	*2.14*		**42.8**	*3.20*		**41.0**	*2.90*		**40.6**	*2.41*	
pH - sp	Unit	32	**6.58**	*0.135*		**7.15**	*0.130*		**6.33**	*0.130*		**6.70**	*0.110*		**7.81**	*0.120*	
ECe - sp	dS/m	30	**1.16**	*0.100*		**0.415**	*0.047*		**0.685**	*0.095*		**1.33**	*0.125*		**0.674**	*0.040*	
HCO3 - sp	mmolc/L	10	**3.21**	*0.480*		**2.85**	*0.475*		**1.68**	*0.238*		**2.86**	*0.685*		**4.39**	*0.830*	
Ca - sp	mmolc/L	27	**7.50**	*0.780*		**2.03**	*0.150*		**4.80**	*0.710*		**7.20**	*0.770*		**5.10**	*0.620*	
Mg - sp	mmolc/L	27	**1.11**	*0.140*		**1.22**	*0.170*		**0.730**	*0.110*		**3.64**	*0.440*		**1.63**	*0.280*	
Na - sp	mmolc/L	27	**1.34**	*0.190*		**0.690**	*0.110*		**0.165**	*0.019*		**0.690**	*0.110*		**0.330**	*0.070*	
SAR - sp	value	22	**0.610**	*0.060*		**0.515**	*0.075*		**0.100**	*0.011*		**0.300**	*0.039*		**0.200**	*0.050*	
Cl - sp	mmolc/L	18	**3.02**	*0.390*		**0.541**	*0.081*		**0.350**	*0.058*		**0.450**	*0.070*		**0.330**	*0.050*	
SO4 - sp	mmolc/L	20	**1.63**	*0.195*		**0.460**	*0.086*		**0.890**	*0.170*		**1.45**	*0.179*		**0.540**	*0.072*	
NO_3 - sp	mmolc/L	12	**2.70**	*0.620*		**0.070**	*0.015*		**1.84**	*0.452*		**6.82**	*1.59*		**1.52**	*0.361*	
B - sp	mg/L	13	**0.090**	*0.012*		**0.174**	*0.026*		**0.060**	*0.007*		**0.090**	*0.008*		**0.140**	*0.026*	
Soil pH & EC																	
Soil EC (1:1)	(dS/m)	35	**0.480**	*0.045*		**0.151**	*0.029*		**0.300**	*0.020*		**0.470**	*0.060*		**0.310**	*0.020*	
Soil EC (1:2)	(dS/m)	48	**0.334**	*0.040*		**0.100**	*0.012*		**0.195**	*0.025*		**0.308**	*0.040*		**0.219**	*0.029*	
pH (1:1) Water	Unit	81	**6.75**	*0.065*		**7.34**	*0.070*		**6.50**	*0.060*		**6.90**	*0.085*		**8.05**	*0.105*	
pH (1:2) Water	Unit	30	**6.84**	*0.115*		**7.47**	*0.075*		**6.59**	*0.110*		**6.96**	*0.110*		**8.12**	*0.100*	
pH (1:1) 0.01M CaCl2	Unit	24	**6.44**	*0.075*		**6.80**	*0.085*		**6.17**	*0.065*		**6.60**	*0.075*		**7.67**	*0.100*	
pH (1:2) 0.01M CaCl2	Unit	13	**6.41**	*0.060*		**6.69**	*0.080*		**6.15**	*0.040*		**6.60**	*0.050*		**7.60**	*0.070*	
Buffer pH, Lime Req.																	
SMP Buffer pH	Unit	27	**7.20**	*0.060*		**7.38**	*0.030*		**7.10**	*0.100*		**7.25**	*0.050*		**7.50**	*0.070*	
Adams-Evans Buf pH	Unit	10	**7.74**	*0.055*		**7.87**	*0.035*		**7.69**	*0.070*		**7.84**	*0.060*		**7.82**	*0.070*	
Woodruff Buf. pH	Unit	22	**6.91**	*0.050*		**7.00**	*0.040*		**6.86**	*0.040*		**6.99**	*0.025*		**7.16**	*0.040*	
Mehlich Buffer pH	Unit	8	**6.45**	*0.035*		**6.50**	*0.040*		**6.39**	*0.025*		**6.45**	*0.036*		**6.87**	*0.010*	
Sikora Buffer pH	Unit	25	**7.20**	*0.050*		**7.37**	*0.040*		**7.11**	*0.040*		**7.29**	*0.040*		**7.51**	*0.040*	
Titratable Acidity	cmol/kg																

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Inorganic Nitrogen (NO3-N & NH4-N)													
NO3-N Cd. Rd.	mg/kg	59	**36.4**	*2.31*	**4.00**	*0.340*	**30.0**	*1.10*	**58.0**	*2.92*	**19.2**	*0.800*	
NO3-N ISE	mg/kg	18	**33.9**	*4.65*	**5.25**	*0.533*	**29.2**	*3.17*	**54.1**	*5.62*	**19.5**	*3.55*	
NO3-N CTA	mg/kg	2	**38.4**	*3.55*	**5.27**	*0.045*	**28.4**	*2.62*	**52.0**	*7.06*	**19.8**	*1.45*	
NO3-N Ion Chr.	mg/kg	1	**46.0**	*0.000*	**7.00**	*0.000*	**36.0**	*0.000*	**78.0**	*0.000*	**11.0**	*0.000*	
NO3-N Other _____	mg/kg	8	**37.0**	*4.66*	**4.61**	*0.890*	**31.8**	*1.66*	**58.0**	*5.36*	**20.0**	*1.95*	
NH4 - N (KCl Extr.)	mg/kg	53	**5.56**	*0.550*	**2.57**	*0.516*	**17.6**	*1.20*	**1.85**	*0.164*	**2.84**	*0.440*	
Phosphorus and Sulfur													
PO4-P Bray P (1:10)	mg/kg	44	**81.9**	*3.00*	**34.0**	*2.11*	**36.2**	*1.37*	**161**	*11.0*	**34.3**	*2.34*	
PO4-P Bray P1 (1:7)	mg/kg	9	**63.8**	*5.20*	**28.5**	*4.60*	**28.3**	*1.03*	**121**	*16.0*	**24.8**	*1.90*	
PO4-P Olsen/Bicarb	mg/kg	47	**43.4**	*3.85*	**14.5**	*1.50*	**19.1**	*1.20*	**61.0**	*4.00*	**17.0**	*1.38*	
PO4-P AB-DTPA	mg/kg	2	**23.2**	*4.79*	**10.4**	*3.40*	**12.1**	*7.11*	**21.1**	*14.9*	**12.1**	*5.56*	
PO4-P Modified Morgan	mg/kg	5	**28.0**	*1.30*	**14.1**	*1.20*	**3.14**	*0.360*	**41.9**	*0.900*	**26.0**	*4.25*	
PO4-P True Morgan	mg/kg	8	**34.0**	*0.200*	**17.3**	*1.05*	**4.30**	*0.295*	**46.2**	*5.38*	**29.5**	*1.13*	
PO4-P Mod. Kewlona	mg/kg	4	**46.5**	*10.5*	**18.6**	*3.04*	**20.9**	*4.65*	**97.0**	*13.0*	**27.7**	*6.27*	
PO4-P Stong Bray (1:10)	mg/kg	8	**177**	*4.00*	**220**	*14.2*	**64.2**	*2.10*	**233**	*22.3*	**206**	*37.8*	
PO4-P Water Soluble	mg/kg	1	**3.10**	*0.000*	**3.00**	*0.000*			**10.8**	*0.000*	**2.80**	*0.000*	
SO4 - S (PO4 Extr.)	mg/kg	32	**14.3**	*1.93*	**4.20**	*0.550*	**8.84**	*2.15*	**11.0**	*1.74*	**5.00**	*0.808*	
Bases													
K Ammonium Acetate	mg/kg	68	**311**	*26.2*	**613**	*28.0*	**242**	*12.7*	**278**	*15.7*	**387**	*23.4*	
Ca Ammonium Acetate	mg/kg	64	**2160**	*160*	**1290**	*81.5*	**1410**	*70.0*	**1230**	*85.8*	**4510**	*464*	
Mg Ammonium Acetate	mg/kg	64	**112**	*7.53*	**324**	*19.0*	**85.0**	*5.49*	**217**	*16.0*	**351**	*23.5*	
Na Ammonium Acetate	mg/kg	52	**36.5**	*4.58*	**24.2**	*4.68*	**8.40**	*1.50*	**16.2**	*2.80*	**15.3**	*3.31*	
Bray Extractable K	mg/kg	4	**262**	*16.4*	**554**	*23.0*	**200**	*8.00*	**263**	*21.8*	**275**	*5.50*	
K- Olsen/Bicarb.	mg/kg	7	**290**	*8.64*	**500**	*11.0*	**205**	*4.92*	**276**	*8.00*	**258**	*18.0*	
K Modified Morgan	mg/kg	4	**325**	*1.25*	**549**	*33.0*	**232**	*2.75*	**264**	*5.00*	**354**	*17.6*	
K True Morgan	mg/kg	6	**245**	*8.00*	**416**	*15.0*	**172**	*6.84*	**239**	*9.50*	**205**	*10.8*	
Ca Modified Morgan	mg/kg	3	**2370**	*40.5*	**1230**	*69.0*	**1370**	*84.5*	**1320**	*68.0*	**15500**	*382*	
Aluminum KCL Extr.	mg/kg	4	**0.535**	*0.415*	**1.35**	*0.550*	**0.850**	*0.505*	**0.285**	*0.150*	**1.50**	*0.600*	

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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	**89.8**	*5.88*	**192**	*12.9*	**24.0**	*2.49*	**149**	*3.67*	**28.6**	*1.16*		
K	mg/kg	5	**216**	*14.7*	**423**	*9.77*	**161**	*2.67*	**229**	*6.00*	**113**	*4.29*		
Ca	mg/kg	5	**2420**	*114*	**1540**	*64.0*	**1440**	*31.6*	**1590**	*71.9*	**4750**	*197*		
Mg	mg/kg	5	**114**	*5.98*	**314**	*4.60*	**79.0**	*2.45*	**251**	*2.14*	**343**	*11.6*		
Mn	mg/kg	5	**76.7**	*4.39*	**20.9**	*0.690*	**167**	*5.66*	**30.6**	*2.63*	**2.59**	*0.430*		
Zn	mg/kg	5	**10.9**	*1.08*	**3.70**	*0.064*	**1.17**	*0.120*	**7.92**	*0.320*	**0.073**	*0.068*		
Mehlich-3 Mult-Element (scoop)														
Scoop Soil Mass	g	28	**2.00**	*0.225*	**2.16**	*0.163*	**2.02**	*0.099*	**2.09**	*0.087*	**2.03**	*0.104*		
Assumed Density	g/cm3	11	**1.18**	*0.100*	**1.18**	*0.020*	**1.12**	*0.060*	**1.18**	*0.030*	**1.10**	*0.080*		
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*		
Extractrant Volume mL	mL	25	**20.0**	*0.000*	**20.0**	*0.000*	**20.0**	*0.000*	**20.0**	*0.000*	**20.0**	*0.000*		
P Colorimetric	mg/kg	16	**101**	*5.25*	**54.1**	*3.98*	**39.9**	*1.25*	**176**	*7.00*	**55.0**	*3.00*		
P ICP-AES	mg/kg	44	**114**	*5.91*	**58.0**	*3.80*	**43.6**	*2.39*	**197**	*11.1*	**60.3**	*2.72*		
K	mg/kg	47	**308**	*12.5*	**635**	*33.0*	**244**	*12.6*	**288**	*20.1*	**400**	*18.9*		
Ca	mg/kg	45	**2450**	*120*	**1490**	*119*	**1490**	*98.0*	**1520**	*112*	**6230**	*352*		
Mg	mg/kg	44	**128**	*9.43*	**371**	*18.5*	**92.3**	*8.95*	**256**	*16.7*	**494**	*25.6*		
Na	mg/kg	31	**34.5**	*4.31*	**24.2**	*3.22*	**8.06**	*1.30*	**18.7**	*4.57*	**15.9**	*3.68*		
S	mg/kg	36	**19.9**	*1.84*	**7.23**	*1.44*	**15.0**	*1.85*	**19.1**	*1.96*	**11.6**	*1.70*		
Al	mg/kg	28	**368**	*39.5*	**445**	*43.0*	**864**	*69.6*	**637**	*61.3*	**402**	*46.5*		
Zn	mg/kg	41	**12.2**	*1.00*	**4.96**	*0.360*	**1.56**	*0.200*	**9.67**	*0.700*	**4.50**	*0.370*		
Mn	mg/kg	40	**142**	*10.8*	**44.2**	*4.23*	**357**	*21.0*	**172**	*17.7*	**214**	*22.5*		
Fe	mg/kg	39	**374**	*42.0*	**119**	*12.7*	**139**	*10.7*	**191**	*17.0*	**58.8**	*6.80*		
Cu	mg/kg	41	**2.50**	*0.200*	**2.30**	*0.200*	**1.65**	*0.150*	**4.25**	*0.250*	**3.31**	*0.260*		
B	mg/kg	36	**0.815**	*0.088*	**0.720**	*0.120*	**0.490**	*0.080*	**0.995**	*0.160*	**2.18**	*0.320*		

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Micronutrients												
Zn - DTPA	mg/kg	57	**7.14**	*0.640*	**2.33**	*0.170*	**0.600**	*0.090*	**3.88**	*0.400*	**1.40**	*0.170*
Mn - DTPA	mg/kg	40	**44.2**	*3.63*	**7.05**	*0.885*	**118**	*11.3*	**10.0**	*2.34*	**13.2**	*1.85*
Fe - DTPA	mg/kg	44	**93.5**	*9.05*	**15.7**	*2.65*	**23.5**	*2.45*	**25.5**	*3.75*	**7.23**	*0.960*
Cu - DTPA	mg/kg	46	**1.70**	*0.195*	**1.12**	*0.120*	**0.900**	*0.100*	**2.02**	*0.180*	**1.11**	*0.135*
Zn - HCl	mg/kg	2	**11.4**	*1.34*	**5.31**	*0.510*	**1.53**	*0.305*	**4.17**	*4.16*	**4.98**	*4.46*
Mn-H3PO4	mg/kg	10	**57.7**	*3.45*	**13.3**	*1.10*	**149**	*8.71*	**19.9**	*2.40*	**5.12**	*1.23*
Cl - Ca(NO3)2 Extr.	mg/kg	17	**53.0**	*7.00*	**7.80**	*1.10*	**5.40**	*0.560*	**8.20**	*1.20*	**5.71**	*1.21*
B - Hot Wat.	mg/kg	34	**0.450**	*0.090*	**0.469**	*0.084*	**0.294**	*0.056*	**0.530**	*0.105*	**0.815**	*0.195*
B-DTPA/Sorbitol	mg/kg	17	**0.300**	*0.049*	**0.300**	*0.029*	**0.180**	*0.020*	**0.371**	*0.034*	**1.10**	*0.110*
Soil Organic Matter												
Soil Kjeldahl N	%	16	**0.177**	*0.015*	**0.070**	*0.006*	**0.110**	*0.008*	**0.128**	*0.011*	**0.140**	*0.010*
Soil TN (combustion)	%	38	**0.188**	*0.013*	**0.072**	*0.012*	**0.112**	*0.008*	**0.133**	*0.013*	**0.141**	*0.010*
Soil TOC (Combustion)	%	8	**1.88**	*0.095*	**0.702**	*0.016*	**0.994**	*0.030*	**1.21**	*0.083*	**2.76**	*0.352*
Soil Total C (Combustion)	%	31	**1.88**	*0.075*	**0.727**	*0.026*	**0.980**	*0.032*	**1.23**	*0.046*	**5.65**	*0.100*
SOM - Walkley-Black	%	29	**3.20**	*0.300*	**1.33**	*0.130*	**1.61**	*0.152*	**2.10**	*0.130*	**2.27**	*0.270*
SOM - LOI (% Wt loss)	%	71	**3.50**	*0.200*	**1.73**	*0.140*	**2.22**	*0.130*	**2.42**	*0.120*	**2.68**	*0.220*
Other												
CaCO3 Content	%	11	**0.620**	*0.320*	**0.570**	*0.118*	**0.485**	*0.088*	**0.780**	*0.158*	**15.0**	*2.03*
CEC - Cation Displacement	cmol/kg	19	**15.5**	*1.21*	**11.7**	*1.28*	**11.9**	*0.870*	**9.70**	*0.835*	**17.3**	*2.64*
CEC - Estimation	cmol/kg	13	**14.0**	*1.43*	**11.3**	*0.500*	**9.40**	*1.10*	**9.25**	*0.700*	**28.6**	*3.89*
Soil Density (Scoop)	g/cc	13	**1.05**	*0.050*	**1.24**	*0.040*	**1.15**	*0.035*	**1.21**	*0.030*	**1.15**	*0.050*
Particle Size Analysis-Hydrometer												
Sand 2000 - 50 um	%	37	**14.7**	*2.01*	**55.8**	*4.80*	**10.4**	*1.84*	**50.3**	*2.90*	**18.0**	*4.20*
Silt 50 - 2 um	%	37	**67.0**	*4.00*	**36.8**	*4.40*	**67.4**	*3.40*	**35.0**	*3.00*	**57.0**	*4.61*
Clay 2 - 0 um	%	37	**19.0**	*3.28*	**6.00**	*2.00*	**23.0**	*3.00*	**14.0**	*3.00*	**24.3**	*4.70*
Particle Size Analysis- Pipette												
Sand 2000 - 50 um	%	4	**13.2**	*3.90*	**56.1**	*0.600*	**7.95**	*3.15*	**57.0**	*1.50*	**15.8**	*1.30*
Silt 50 - 2 um	%	4	**72.6**	*3.70*	**39.1**	*0.500*	**72.9**	*1.30*	**34.2**	*2.20*	**61.0**	*3.85*
Clay 2 - 0 um	%	4	**14.4**	*2.25*	**4.80**	*0.100*	**19.2**	*2.70*	**14.1**	*1.20*	**18.8**	*3.15*
Solvita CO2	ppm	8	**39.0**	*4.85*	**14.0**	*3.33*	**24.3**	*3.53*	**21.5**	*2.44*	**14.3**	*2.88*

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