



**2011 North American Proficiency Testing Program
4th Quarter Report - January 23, 2012**

**Laboratory ID
General**

| Soil Analysis | Units | n | Soil 2011-116 | | Soil 2011-117 | | | Soil 2011-118 | | | Soil 2011-119 | | | Soil 2011-120 | | |
|----------------------------------|---------|----|---------------|-------|--------------------|--------|-------|--------------------|--------|-------|--------------------|--------|-------|--------------------|--------|-------|
| | | | Median | MAD | Lab ^{1,2} | Median | MAD | Lab ^{1,2} | Median | MAD | Lab ^{1,2} | Median | MAD | Lab ^{1,2} | Median | MAD |
| Salinity | | | | | | | | | | | | | | | | |
| Sat. Paste Moisture | % | 22 | 33.3 | 1.99 | | 30.6 | 1.85 | | 39.4 | 2.04 | | 46.1 | 2.25 | | 39.8 | 1.50 |
| pH - sp | Unit | 30 | 4.5 | 0.12 | | 5.7 | 0.10 | | 6.8 | 0.11 | | 7.2 | 0.12 | | 7.8 | 0.08 |
| ECe - sp | dS/m | 30 | 0.999 | 0.101 | | 1.56 | 0.075 | | 0.700 | 0.050 | | 0.935 | 0.110 | | 0.410 | 0.062 |
| HCO ₃ - sp | mmol/L | 9 | 0.328 | 0.033 | | 0.62 | 0.062 | | 2.00 | 0.200 | | 3.08 | 0.308 | | 3.80 | 0.530 |
| Ca - sp | mmol/L | 25 | 4.48 | 0.540 | | 6.30 | 0.590 | | 3.48 | 0.220 | | 4.87 | 0.480 | | 3.97 | 0.510 |
| Mg - sp | mmol/L | 25 | 3.02 | 0.400 | | 4.25 | 0.380 | | 1.98 | 0.210 | | 4.62 | 0.530 | | 0.625 | 0.100 |
| Na - sp | mmol/L | 25 | 0.330 | 0.033 | | 3.05 | 0.252 | | 0.91 | 0.129 | | 0.230 | 0.023 | | 0.209 | 0.021 |
| SAR - sp | value | 21 | 0.200 | 0.020 | | 1.38 | 0.120 | | 0.528 | 0.070 | | 0.110 | 0.011 | | 0.160 | 0.016 |
| Cl - sp | mmol/L | 19 | 1.00 | 0.120 | | 1.27 | 0.095 | | 0.405 | 0.041 | | 0.420 | 0.080 | | 0.231 | 0.023 |
| SO ₄ - sp | mmol/L | 18 | 0.290 | 0.041 | | 2.16 | 0.085 | | 1.25 | 0.092 | | 1.11 | 0.090 | | 0.320 | 0.030 |
| NO ₃ - sp | mmol/L | 12 | 6.96 | 0.895 | | 10.1 | 0.810 | | 2.77 | 0.277 | | 2.95 | 0.295 | | 0.070 | 0.007 |
| B - sp | mg/L | 10 | 0.119 | 0.005 | | 0.189 | 0.019 | | 0.105 | 0.010 | | 0.030 | 0.003 | | 0.080 | 0.005 |
| Soil pH & EC | | | | | | | | | | | | | | | | |
| Soil EC (1:1) | (dS/m) | 31 | 0.290 | 0.050 | | 0.480 | 0.054 | | 0.248 | 0.048 | | 0.380 | 0.080 | | 0.270 | 0.027 |
| Soil EC (1:2) | (dS/m) | 45 | 0.210 | 0.025 | | 0.314 | 0.032 | | 0.171 | 0.019 | | 0.283 | 0.026 | | 0.160 | 0.029 |
| pH (1:1) Water | Unit | 75 | 4.7 | 0.07 | | 5.9 | 0.06 | | 7.0 | 0.06 | | 7.3 | 0.06 | | 8.1 | 0.10 |
| pH (1:2) Water | Unit | 29 | 4.9 | 0.11 | | 6.0 | 0.06 | | 7.0 | 0.12 | | 7.4 | 0.09 | | 8.3 | 0.16 |
| pH (1:1) 0.01M CaCl ₂ | Unit | 24 | 4.4 | 0.06 | | 5.6 | 0.07 | | 6.6 | 0.08 | | 7.0 | 0.09 | | 7.7 | 0.10 |
| pH (1:2) 0.01M CaCl ₂ | Unit | 11 | 4.4 | 0.03 | | 5.6 | 0.05 | | 6.6 | 0.06 | | 7.0 | 0.06 | | 7.6 | 0.05 |
| Buffer pH, Lime Req. | | | | | | | | | | | | | | | | |
| SMP Buffer pH | Unit | 33 | 6.3 | 0.08 | | 7.1 | 0.06 | | 7.3 | 0.04 | | 7.3 | 0.04 | | 7.5 | 0.07 |
| Adams-Evans Buf pH | Unit | 8 | 7.5 | 0.16 | | 7.7 | 0.04 | | 7.9 | 0.04 | | 7.8 | 0.03 | | 7.8 | 0.02 |
| Woodruff Buf. pH | Unit | 24 | 6.3 | 0.15 | | 6.8 | 0.05 | | 7.0 | 0.03 | | 7.0 | 0.03 | | 7.1 | 0.04 |
| Mehlich Buffer pH | Unit | 10 | 5.8 | 0.07 | | 6.3 | 0.05 | | 6.5 | 0.06 | | 6.7 | 0.06 | | 6.9 | 0.07 |
| Sikora Buffer pH | Unit | 24 | 6.3 | 0.06 | | 7.1 | 0.06 | | 7.3 | 0.05 | | 7.3 | 0.05 | | 7.5 | 0.06 |
| Titrateable Acidity | cmol/kg | 1 | 4.11 | 0.000 | | 1.36 | 0.000 | | | 0.000 | | 1.36 | 0.000 | | 1.81 | 0.000 |

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Inorganic Nitrogen (NO3-N & NH4-N)

| | | | | | | | | | | | | |
|---------------------|-------|----|------|-------|------|-------|------|-------|------|-------|------|-------|
| NO3-N Cd. Rd. | mg/kg | 51 | 39.4 | 2.14 | 53.5 | 4.33 | 21.4 | 1.10 | 45.0 | 2.90 | 2.54 | 0.460 |
| NO3-N ISE | mg/kg | 15 | 39.5 | 5.50 | 58.0 | 6.70 | 22.0 | 3.30 | 44.4 | 8.93 | 4.00 | 0.400 |
| NO3-N CTA | mg/kg | 3 | 48.0 | 6.30 | 46.0 | 6.89 | 22.9 | 0.10 | 38.0 | 0.06 | 3.03 | 0.033 |
| NO3-N Ion Chr. | mg/kg | 1 | 40.5 | 0.000 | 51.7 | 0.00 | | 0.00 | | 0.00 | | 0.000 |
| NO3-N Other _____ | mg/kg | 9 | 40.3 | 1.10 | 52.1 | 2.10 | 21.5 | 1.60 | 45.0 | 3.00 | 2.79 | 0.279 |
| NH4 - N (KCl Extr.) | mg/kg | 46 | 3.19 | 0.435 | 2.40 | 0.500 | 17.6 | 0.900 | 5.00 | 0.650 | 3.20 | 0.400 |

Phosphorus and Sulfur

| | | | | | | | | | | | | |
|-------------------------|-------|----|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| PO4-P Bray P (1:10) | mg/kg | 46 | 199 | 13.6 | 49.0 | 3.22 | 67.6 | 4.42 | 45.0 | 3.70 | 14.0 | 1.40 |
| PO4-P Bray P1 (1:7) | mg/kg | 7 | 170 | 13.0 | 40.8 | 1.24 | 54.0 | 3.80 | 34.0 | 2.00 | 11.8 | 1.20 |
| PO4-P Olsen/Bicarb | mg/kg | 50 | 72.7 | 6.10 | 27.0 | 3.00 | 28.0 | 2.95 | 21.0 | 2.00 | 12.1 | 1.10 |
| PO4-P AB-DTPA | mg/kg | 2 | 35.5 | 3.55 | 16.6 | 2.45 | 21.3 | 1.75 | 13.4 | 2.65 | 5.75 | 0.150 |
| PO4-P Modified Morgan | mg/kg | 3 | 11.5 | 0.500 | 8.40 | 0.840 | 11.8 | 2.80 | 13.0 | 2.50 | 10.7 | 1.30 |
| PO4-P True Morgan | mg/kg | 6 | 13.5 | 0.800 | 9.90 | 0.600 | 12.8 | 0.700 | 11.6 | 0.950 | 13.6 | 0.600 |
| PO4-P Mod. Kewlona | mg/kg | 2 | 135 | 15.5 | 27.0 | 4.00 | 36.0 | 8.00 | 35.0 | 0.000 | 18.5 | 4.50 |
| PO4-P Stong Bray (1:10) | mg/kg | 8 | 256 | 18.0 | 317 | 49.3 | 132 | 6.00 | 97.3 | 3.10 | 47.8 | 10.0 |
| PO4-P Water Soluble | mg/kg | 4 | 0.580 | 0.058 | 1.72 | 0.172 | 0.420 | 0.042 | 0.470 | 0.047 | 0.180 | 0.018 |
| SO4 - S (PO4 Extr.) | mg/kg | 32 | 7.07 | 0.707 | 13.0 | 3.00 | 9.10 | 1.75 | 10.5 | 1.05 | 4.60 | 0.460 |

Bases

| | | | | | | | | | | | | |
|---------------------|-------|----|------|------|------|-------|-------|-------|------|-------|-------|-------|
| K Ammonium Acetate | mg/kg | 68 | 167 | 8.08 | 336 | 29.7 | 154 | 6.42 | 146 | 8.00 | 301 | 20.9 |
| Ca Ammonium Acetate | mg/kg | 65 | 438 | 40.0 | 1020 | 90.7 | 960 | 56.0 | 1890 | 99.3 | 5090 | 501 |
| Mg Ammonium Acetate | mg/kg | 65 | 114 | 8.00 | 271 | 23.1 | 155 | 9.00 | 520 | 30.5 | 218 | 16.6 |
| Na Ammonium Acetate | mg/kg | 50 | 12.6 | 1.26 | 59.2 | 4.12 | 22.1 | 3.35 | 11.8 | 1.18 | 11.7 | 1.17 |
| Bray Extractable K | mg/kg | 4 | 144 | 5.63 | 329 | 2.00 | 153 | 5.50 | 130 | 3.50 | 208 | 6.98 |
| K- Olsen/Bicarb. | mg/kg | 5 | 156 | 2.00 | 284 | 12.8 | 172 | 4.00 | 145 | 11.0 | 219 | 3.00 |
| K Modified Morgan | mg/kg | 2 | 157 | 3.00 | 293 | 13.0 | 145 | 3.50 | 141 | 3.00 | 281 | 13.5 |
| K True Morgan | mg/kg | 6 | 140 | 5.00 | 236 | 9.00 | 146 | 3.00 | 123 | 6.00 | 157 | 5.65 |
| Ca Modified Morgan | mg/kg | 3 | 423 | 52.0 | 889 | 28.9 | 945 | 61.0 | 1970 | 67.0 | 16400 | 95.0 |
| Aluminum KCL Extr. | mg/kg | 5 | 78.0 | 2.00 | 1.00 | 0.250 | 0.090 | 0.009 | 2.00 | 0.200 | 2.50 | 0.250 |

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Mehlich-1 Multi Element (scoop)

| | | | | | | | | | | | | |
|------------------------|-------|---|-------------|-------|-------------|-------|-------------|-------|-------------|-------|--------------|-------|
| Scoop Soil Mass | g | 4 | 5.00 | | 5.00 | | 5.00 | | 5.00 | | 5.00 | |
| P | mg/kg | 5 | 89.6 | 5.35 | 242 | 7.11 | 71.6 | 7.57 | 43.4 | 0.861 | 2.35 | 0.235 |
| K | mg/kg | 5 | 126 | 3.75 | 242 | 11.8 | 142 | 4.48 | 120 | 2.25 | 88.6 | 0.940 |
| Ca | mg/kg | 5 | 484 | 10.6 | 1310 | 53.0 | 1220 | 55.0 | 2470 | 126 | 5420 | 303 |
| Mg | mg/kg | 5 | 120 | 2.19 | 249 | 13.5 | 175 | 7.30 | 665 | 31.1 | 174 | 8.85 |
| Mn | mg/kg | 5 | 26.2 | 0.360 | 22.2 | 0.760 | 57.8 | 0.820 | 40.1 | 1.07 | 1.27 | 0.240 |
| Zn | mg/kg | 5 | 3.22 | 0.006 | 2.82 | 0.130 | 3.18 | 0.090 | 5.65 | 0.153 | 0.056 | 0.006 |

Mehlich-3 Multi-Element (scoop)

| | | | | | | | | | | | | |
|-----------------------------|-------------------|----|--------------|-------|--------------|-------|--------------|-------|-------------|-------|--------------|-------|
| Scoop Soil Mass | g | 29 | 2.15 | 0.150 | 2.56 | 0.090 | 2.26 | 0.150 | 2.11 | 0.090 | 2.28 | 0.120 |
| Assumed Density | g/cm ³ | 13 | 1.18 | 0.000 | 1.18 | 0.000 | 1.18 | 0.000 | 1.18 | 0.000 | 1.18 | 0.000 |
| Volume of Scoop | cm ³ | 23 | 2.00 | 0.300 | 2.00 | 0.300 | 2.00 | 0.300 | 2.00 | 0.300 | 2.00 | 0.300 |
| Extractant Volume mL | mL | 29 | 20.0 | 0.000 | 20.0 | 0.000 | 20.0 | 0.000 | 20.0 | 0.000 | 20.0 | 0.000 |
| P Colorimetric | mg/kg | 22 | 207 | 14.9 | 60.5 | 7.00 | 75.5 | 3.95 | 48.0 | 2.53 | 33.0 | 1.70 |
| P ICP-AES | mg/kg | 39 | 227 | 17.0 | 63.4 | 6.41 | 82.9 | 6.34 | 56.6 | 4.33 | 36.5 | 2.50 |
| K | mg/kg | 46 | 173 | 14.6 | 383 | 33.2 | 166 | 12.3 | 160 | 11.7 | 334 | 25.7 |
| Ca | mg/kg | 42 | 510 | 47.3 | 1130 | 87.9 | 1150 | 70.0 | 2170 | 148 | 7210 | 626 |
| Mg | mg/kg | 42 | 131 | 8.90 | 325 | 19.3 | 196 | 12.3 | 622 | 44.7 | 301 | 16.5 |
| Na | mg/kg | 32 | 11.8 | 1.18 | 65.1 | 9.02 | 24.6 | 3.97 | 11.9 | 1.19 | 14.0 | 1.40 |
| S | mg/kg | 33 | 20.9 | 2.10 | 20.0 | 2.01 | 15.8 | 1.51 | 21.2 | 2.70 | 9.6 | 1.49 |
| Al | mg/kg | 25 | 1310 | 64.0 | 395 | 39.5 | 523 | 38.5 | 765 | 61.0 | 282 | 51.9 |
| Zn | mg/kg | 37 | 3.92 | 0.32 | 3.70 | 0.398 | 3.67 | 0.315 | 7.30 | 0.600 | 0.900 | 0.120 |
| Mn | mg/kg | 36 | 49.9 | 4.70 | 45.7 | 4.95 | 59.5 | 5.17 | 107 | 14.3 | 97.2 | 12.3 |
| Fe | mg/kg | 34 | 305 | 26.7 | 228 | 24.1 | 376 | 37.2 | 199 | 26.0 | 31.6 | 3.45 |
| Cu | mg/kg | 37 | 2.26 | 0.227 | 1.26 | 0.220 | 2.58 | 0.270 | 9.20 | 0.800 | 1.77 | 0.234 |
| B | mg/kg | 29 | 0.500 | 0.050 | 0.580 | 0.058 | 0.650 | 0.065 | 1.30 | 0.220 | 1.34 | 0.230 |

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| Micronutrients | | | | | | | | | | | | |
|-----------------------------------|---------|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Zn - DTPA | mg/kg | 63 | 2.33 | 0.230 | 2.00 | 0.240 | 1.63 | 0.165 | 3.57 | 0.270 | 0.470 | 0.080 |
| Mn - DTPA | mg/kg | 45 | 18.3 | 1.46 | 13.1 | 1.62 | 30.0 | 2.40 | 16.1 | 1.88 | 5.27 | 0.570 |
| Fe - DTPA | mg/kg | 48 | 72.5 | 13.5 | 52.9 | 6.22 | 71.1 | 5.72 | 46.5 | 3.50 | 5.00 | 0.500 |
| Cu - DTPA | mg/kg | 50 | 1.50 | 0.105 | 0.990 | 0.110 | 1.44 | 0.135 | 4.03 | 0.380 | 0.555 | 0.055 |
| Zn - HCl | mg/kg | 3 | 3.74 | 0.290 | 4.50 | 0.450 | 3.75 | 0.375 | 7.17 | 0.717 | 0.245 | 0.025 |
| Mn-H3PO4 | mg/kg | 10 | 22.7 | 2.30 | 15.0 | 1.24 | 45.5 | 3.50 | 27.5 | 2.98 | 2.71 | 0.271 |
| Cl - Ca(NO3)2 Extr. | mg/kg | 14 | 13.6 | 1.30 | 16.8 | 1.20 | 5.00 | 0.500 | 6.47 | 0.647 | 3.00 | 0.600 |
| B - Hot Wat. | mg/kg | 38 | 0.288 | 0.029 | 0.360 | 0.080 | 0.360 | 0.080 | 0.527 | 0.053 | 0.510 | 0.051 |
| B-DTPA/Sorbitol | mg/kg | 13 | 0.200 | 0.020 | 0.230 | 0.030 | 0.230 | 0.040 | 0.470 | 0.060 | 0.695 | 0.095 |
| Soil Organic Matter | | | | | | | | | | | | |
| Soil Kjeldahl N | % | 15 | 0.099 | 0.011 | 0.060 | 0.003 | 0.083 | 0.005 | 0.232 | 0.011 | 0.088 | 0.007 |
| Soil TN (combustion) | % | 35 | 0.106 | 0.013 | 0.064 | 0.013 | 0.089 | 0.012 | 0.258 | 0.013 | 0.092 | 0.012 |
| Soil TOC (Combustion) | % | 8 | 1.10 | 0.039 | 0.484 | 0.026 | 0.913 | 0.026 | 2.84 | 0.099 | 0.918 | 0.201 |
| Soil Total C (Combustion) | % | 27 | 1.08 | 0.038 | 0.490 | 0.020 | 0.915 | 0.045 | 2.87 | 0.061 | 1.34 | 0.063 |
| SOM - Walkley-Black | % | 31 | 1.81 | 0.110 | 0.890 | 0.090 | 1.57 | 0.130 | 4.51 | 0.290 | 1.39 | 0.140 |
| SOM - LOI (% Wt loss) | % | 64 | 2.24 | 0.105 | 1.20 | 0.100 | 1.79 | 0.122 | 4.82 | 0.220 | 1.90 | 0.180 |
| Other | | | | | | | | | | | | |
| CaCO3 Content | % | 17 | 0.100 | 0.010 | 0.370 | 0.037 | 0.370 | 0.037 | 1.30 | 0.130 | 5.00 | 0.525 |
| CEC - Cation Displacement | cmol/kg | 17 | 8.15 | 1.53 | 8.50 | 1.13 | 6.93 | 1.150 | 15.6 | 2.19 | 16.5 | 1.72 |
| CEC - Estimation | cmol/kg | 12 | 7.70 | 0.770 | 9.70 | 1.05 | 6.80 | 0.400 | 14.2 | 0.300 | 30.0 | 3.00 |
| Soil Density (Scoop) | g/cc | 12 | 1.30 | 0.055 | 1.49 | 0.035 | 1.32 | 0.035 | 1.25 | 0.030 | 1.34 | 0.035 |
| Particle Size Analysis-Hydrometer | | | | | | | | | | | | |
| Sand 2000 - 50 um | % | 30 | 38.2 | 3.20 | 76.5 | 3.05 | 73.5 | 5.30 | 56.0 | 2.75 | 43.9 | 4.28 |
| Silt 50 - 2 um | % | 30 | 50.6 | 2.50 | 17.5 | 3.50 | 22.0 | 3.55 | 33.7 | 2.70 | 38.4 | 4.60 |
| Clay 2 - 0 um | % | 30 | 11.6 | 2.50 | 6.13 | 0.613 | 5.00 | 0.50 | 10.0 | 2.50 | 17.0 | 4.25 |
| Particle Size Analysis- Pipette | | | | | | | | | | | | |
| Sand 2000 - 50 um | % | 4 | 37.0 | 3.10 | 82.9 | 1.20 | 78.3 | 0.370 | 54.7 | 0.900 | 50.1 | 3.25 |
| Silt 50 - 2 um | % | 4 | 54.2 | 3.05 | 12.9 | 1.27 | 17.5 | 0.020 | 33.1 | 1.25 | 30.7 | 0.340 |
| Clay 2 - 0 um | % | 4 | 8.65 | 0.210 | 5.60 | 0.770 | 4.21 | 0.490 | 11.8 | 0.380 | 16.2 | 3.00 |

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