

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth).

Site #	Eco-region	Slope Position	Depth (cm)	Chloride <sup>1</sup> (mg/kg) (0.5) <sup>5</sup>	Aluminum <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Antimony <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Arsenic <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Barium <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Beryllium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Bismuth <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Boron <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Cadmium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Chromium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Cobalt <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Copper <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>
586	PL	U	0-15	11.70	0.91	0.01	0.06	2.87	0.001	0.02	0.185	0.288	0.007	0.060	0.889
586	PL	M	0-15	15.80	0.81	0.01	0.07	1.81	0.001	0.02	0.255	0.298	0.007	0.049	1.260
586	PL	L	0-15	9.80	1.34	0.01	0.07	1.41	0.001	0.03	0.198	0.170	0.006	0.076	1.270
588	PL	U	0-15	19.30	0.02	0.01	0.06	1.51	0.001	0.02	0.244	0.026	0.007	0.040	1.980
588	PL	M	0-15	4.60	0.02	0.01	0.06	1.11	0.001	0.01	0.373	0.052	0.009	0.034	1.520
588	PL	L	0-15	3.90	0.02	0.01	0.04	1.02	0.001	0.03	0.219	0.056	0.008	0.060	4.810
590	PL	U	0-15	2.20	0.02	0.01	0.03	1.11	0.001	0.02	0.341	0.061	0.009	0.041	1.190
590	PL	M	0-15	14.90	4.08	0.01	0.05	3.10	0.001	0.01	0.149	0.094	0.009	0.085	0.604
590	PL	L	0-15	10.10	11.30	0.01	0.06	3.45	0.001	0.01	0.198	0.134	0.009	0.124	0.567
591	PL	U	0-15	4.80	5.66	0.01	0.08	2.42	0.001	0.02	0.175	0.136	0.008	0.147	1.550
591	PL	M	0-15	5.70	0.07	0.01	0.10	3.70	0.001	0.01	0.385	0.411	0.007	0.147	1.510
591	PL	L	0-15	4.60	0.88	0.02	0.07	3.64	0.002	0.06	0.251	0.508	0.008	0.360	2.130
592	PL	U	0-15	22.20	0.02	0.01	0.06	3.23	0.001	0.03	0.200	0.274	0.008	0.045	1.090
592	PL	M	0-15	17.60	0.02	0.01	0.07	3.62	0.001	0.02	0.140	0.269	0.007	0.050	1.210
592	PL	L	0-15	24.60	0.03	0.02	0.08	3.51	0.002	0.04	0.136	0.322	0.011	0.058	1.200
593	PL	U	0-15	11.10	12.40	0.01	0.13	1.65	0.001	0.01	0.160	0.206	0.010	0.232	1.350
593	PL	M	0-15	9.40	1.43	0.01	0.11	2.13	0.001	0.02	0.214	0.116	0.007	0.273	2.130
593	PL	L	0-15	6.20	1.00	0.01	0.13	1.97	0.001	0.01	1.090	0.093	0.009	0.388	2.180
594	PL	U	0-15	27.10	31.90	0.01	0.07	0.95	0.001	0.01	0.547	0.057	0.009	0.162	1.320
594	PL	M	0-15	20.90	25.60	0.01	0.05	1.46	0.001	0.01	0.899	0.071	0.010	0.165	1.070
594	PL	L	0-15	18.70	13.80	0.01	0.06	1.38	0.001	0.01	1.150	0.079	0.009	0.238	1.130
595	PL	U	0-15	7.40	32.80	0.01	0.15	0.99	0.001	0.01	0.920	0.160	0.009	0.205	1.590
595	PL	M	0-15	9.30	41.50	0.01	0.12	1.09	0.001	0.01	1.270	0.168	0.008	0.261	1.030
595	PL	L	0-15	5.60	31.40	0.01	0.09	1.06	0.001	0.01	1.270	0.097	0.008	0.330	1.140
599	PL	U	0-15	11.10	19.70	0.02	0.19	1.48	0.002	0.03	1.570	0.185	0.008	0.364	2.160
599	PL	M	0-15	12.30	18.90	0.01	0.07	0.82	0.001	0.01	1.110	0.106	0.007	0.174	1.240
599	PL	L	0-15	9.50	19.50	0.02	0.16	1.30	0.002	0.03	1.670	0.193	0.009	0.357	2.240
			<b>Mean</b>	<b>11.87</b>	<b>10.19</b>	<b>0.01</b>	<b>0.08</b>	<b>1.99</b>	<b>0.001</b>	<b>0.02</b>	<b>0.57</b>	<b>0.17</b>	<b>0.01</b>	<b>0.17</b>	<b>1.53</b>
			<b>Max</b>	<b>27.10</b>	<b>41.50</b>	<b>0.02</b>	<b>0.19</b>	<b>3.70</b>	<b>0.002</b>	<b>0.06</b>	<b>1.67</b>	<b>0.51</b>	<b>0.01</b>	<b>0.39</b>	<b>4.81</b>
			<b>Min</b>	<b>2.20</b>	<b>0.02</b>	<b>0.01</b>	<b>0.03</b>	<b>0.82</b>	<b>0.001</b>	<b>0.01</b>	<b>0.14</b>	<b>0.03</b>	<b>0.01</b>	<b>0.03</b>	<b>0.57</b>
			<b>SD</b>	<b>6.82</b>	<b>12.87</b>	<b>0.00</b>	<b>0.04</b>	<b>1.00</b>	<b>0.000</b>	<b>0.01</b>	<b>0.50</b>	<b>0.12</b>	<b>0.00</b>	<b>0.12</b>	<b>0.80</b>
			<b>CV (%)</b>	<b>57.51</b>	<b>126.30</b>	<b>31.53</b>	<b>46.06</b>	<b>50.39</b>	<b>31.53</b>	<b>62.65</b>	<b>87.71</b>	<b>69.13</b>	<b>14.08</b>	<b>70.51</b>	<b>52.47</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Chloride <sup>1</sup> (mg/kg) (0.5) <sup>5</sup>	Aluminum <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Antimony <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Arsenic <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Barium <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Beryllium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Bismuth <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Boron <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Cadmium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Chromium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Cobalt <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Copper <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>
615	MB	U	0-15	16.90	0.98	0.01	0.03	1.59	0.001	0.01	1.710	0.154	0.010	0.041	1.260
615	MB	M	0-15	3.50	9.72	0.01	0.04	2.02	0.001	0.01	1.200	0.080	0.008	0.101	0.609
615	MB	L	0-15	9.90	0.35	0.05	0.10	4.09	0.005	0.07	3.450	0.469	0.008	0.372	1.570
			<b>Mean</b>	<b>10.10</b>	<b>3.68</b>	<b>0.02</b>	<b>0.06</b>	<b>2.57</b>	<b>0.002</b>	<b>0.03</b>	<b>2.12</b>	<b>0.23</b>	<b>0.01</b>	<b>0.17</b>	<b>1.15</b>
			<b>Max</b>	<b>16.90</b>	<b>9.72</b>	<b>0.05</b>	<b>0.10</b>	<b>4.09</b>	<b>0.005</b>	<b>0.07</b>	<b>3.45</b>	<b>0.47</b>	<b>0.01</b>	<b>0.37</b>	<b>1.57</b>
			<b>Min</b>	<b>3.50</b>	<b>0.35</b>	<b>0.01</b>	<b>0.03</b>	<b>1.59</b>	<b>0.001</b>	<b>0.01</b>	<b>1.20</b>	<b>0.08</b>	<b>0.01</b>	<b>0.04</b>	<b>0.61</b>
			<b>SD</b>	<b>6.70</b>	<b>5.24</b>	<b>0.02</b>	<b>0.04</b>	<b>1.34</b>	<b>0.002</b>	<b>0.03</b>	<b>1.18</b>	<b>0.21</b>	<b>0.00</b>	<b>0.18</b>	<b>0.49</b>
			<b>CV (%)</b>	<b>66.36</b>	<b>142.19</b>	<b>98.97</b>	<b>66.81</b>	<b>52.08</b>	<b>98.97</b>	<b>115.47</b>	<b>55.65</b>	<b>88.15</b>	<b>13.32</b>	<b>102.93</b>	<b>42.79</b>
678	BT	U	0-15	11.70	24.00	0.01	0.05	1.21	0.001	0.01	1.180	0.081	0.010	0.201	0.713
678	BT	M	0-15	15.20	30.70	0.01	0.06	1.24	0.001	0.01	1.490	0.112	0.010	0.206	0.768
678	BT	L	0-15	12.60	4.88	0.01	0.11	1.40	0.001	0.01	1.630	0.135	0.006	0.106	0.892
680	BT	U	0-15	9.80	4.92	0.01	0.07	1.21	0.001	0.01	1.570	0.031	0.010	0.124	0.472
680	BT	M	0-15	5.50	11.60	0.01	0.08	1.43	0.001	0.01	1.480	0.065	0.009	0.131	0.556
680	BT	L	0-15	8.80	15.50	0.01	0.10	1.47	0.001	0.01	1.250	0.088	0.009	0.130	0.666
681	BT	U	0-15	7.30	2.56	0.01	0.06	1.32	0.001	0.01	1.220	0.054	0.006	0.113	0.516
681	BT	M	0-15	4.80	4.52	0.01	0.06	1.32	0.001	0.01	1.270	0.045	0.008	0.131	0.496
681	BT	L	0-15	6.50	2.43	0.01	0.07	1.15	0.001	0.01	1.320	0.094	0.007	0.104	0.517
684	BT	U	0-15	6.20	1.58	0.01	0.08	3.19	0.001	0.01	1.300	0.039	0.005	0.084	1.180
684	BT	M	0-15	8.20	8.58	0.01	0.07	3.92	0.001	0.01	1.390	0.089	0.008	0.147	0.833
684	BT	L	0-15	13.20	26.50	0.05	0.16	11.70	0.005	0.07	5.270	0.660	0.016	0.401	1.830
687	BT	U	0-15	14.90	20.50	0.02	0.08	2.20	0.002	0.03	2.900	0.062	0.011	0.289	0.759
687	BT	M	0-15	19.50	18.50	0.02	0.04	2.38	0.002	0.03	0.940	0.087	0.013	0.233	0.861
687	BT	L	0-15	21.30	2.53	0.01	0.08	1.97	0.001	0.01	0.708	0.086	0.009	0.168	0.953
688	BT	U	0-15	2.70	48.50	0.02	0.31	6.52	0.002	0.03	2.120	0.347	0.018	0.325	2.910
688	BT	M	0-15	3.70	27.70	0.01	0.14	3.94	0.001	0.01	1.000	0.166	0.009	0.222	1.910
688	BT	L	0-15	2.40	20.30	0.01	0.09	4.59	0.001	0.01	1.200	0.181	0.011	0.276	1.420
692	BT	U	0-15	11.50	11.60	0.02	0.18	3.59	0.002	0.03	1.730	0.061	0.012	0.172	2.820
692	BT	M	0-15	6.50	17.60	0.05	0.13	2.11	0.005	0.07	2.320	0.076	0.010	0.330	1.930
692	BT	L	0-15	4.80	17.20	0.02	0.21	3.08	0.002	0.03	2.200	0.133	0.013	0.775	1.600
703	BT	U	0-15	9.60	2.87	0.01	0.11	3.36	0.001	0.02	0.791	0.031	0.011	0.157	0.610
703	BT	M	0-15	6.80	7.47	0.02	0.08	2.97	0.002	0.03	1.070	0.038	0.011	0.142	0.459
703	BT	L	0-15	16.60	0.34	0.05	0.24	6.36	0.005	0.07	2.440	0.246	0.011	0.847	5.760
			<b>Mean</b>	<b>9.59</b>	<b>13.87</b>	<b>0.02</b>	<b>0.11</b>	<b>3.07</b>	<b>0.002</b>	<b>0.02</b>	<b>1.66</b>	<b>0.13</b>	<b>0.01</b>	<b>0.24</b>	<b>1.31</b>
			<b>Max</b>	<b>21.30</b>	<b>48.50</b>	<b>0.05</b>	<b>0.31</b>	<b>11.70</b>	<b>0.005</b>	<b>0.07</b>	<b>5.27</b>	<b>0.66</b>	<b>0.02</b>	<b>0.85</b>	<b>5.76</b>
			<b>Min</b>	<b>2.40</b>	<b>0.34</b>	<b>0.01</b>	<b>0.04</b>	<b>1.15</b>	<b>0.001</b>	<b>0.01</b>	<b>0.71</b>	<b>0.03</b>	<b>0.01</b>	<b>0.08</b>	<b>0.46</b>
			<b>SD</b>	<b>5.18</b>	<b>11.87</b>	<b>0.01</b>	<b>0.07</b>	<b>2.40</b>	<b>0.001</b>	<b>0.02</b>	<b>0.94</b>	<b>0.14</b>	<b>0.00</b>	<b>0.19</b>	<b>1.18</b>
			<b>CV (%)</b>	<b>54.02</b>	<b>85.58</b>	<b>75.83</b>	<b>59.90</b>	<b>78.34</b>	<b>75.83</b>	<b>87.73</b>	<b>56.85</b>	<b>108.11</b>	<b>29.46</b>	<b>79.99</b>	<b>90.46</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Chloride <sup>1</sup> (mg/kg) (0.5) <sup>5</sup>	Aluminum <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Antimony <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Arsenic <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Barium <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Beryllium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Bismuth <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Boron <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Cadmium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Chromium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Cobalt <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Copper <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>
727	AP	U	0-15	35.40	3.05	0.02	0.11	5.07	0.002	0.03	1.400	0.186	0.012	0.201	1.270
727	AP	M	0-15	15.20	36.30	0.05	0.18	4.60	0.005	0.07	2.560	0.268	0.015	0.397	1.460
727	AP	L	0-15	74.70	22.90	0.02	0.18	2.64	0.002	0.03	2.450	0.285	0.012	0.474	1.530
728	AP	U	0-15	4.60	35.40	0.01	0.08	1.09	0.001	0.04	0.479	0.088	0.011	0.150	0.406
728	AP	M	0-15	11.20	24.80	0.05	0.13	2.13	0.005	0.07	0.772	0.145	0.008	0.219	0.680
728	AP	L	0-15	19.20	16.90	0.08	0.09	1.95	0.001	0.02	0.555	0.193	0.009	0.142	0.880
730	AP	U	0-15	5.80	1.50	0.05	0.10	2.11	0.005	0.07	1.020	0.054	0.008	0.081	1.010
730	AP	M	0-15	6.50	25.30	0.02	0.08	1.91	0.002	0.03	0.757	0.107	0.013	0.156	0.909
730	AP	L	0-15	4.10	1.98	0.02	0.10	1.73	0.002	0.03	0.391	0.179	0.009	0.136	1.130
738	AP	U	0-15	16.10	34.00	0.02	0.10	2.75	0.002	0.03	0.641	0.243	0.013	0.530	1.050
738	AP	M	0-15	12.80	48.00	0.02	0.11	2.29	0.002	0.03	0.571	0.270	0.014	0.596	1.010
738	AP	L	0-15	11.20	22.80	0.02	0.17	2.53	0.002	0.03	0.735	0.292	0.011	0.522	1.190
739	AP	U	0-15	3.50	16.30	0.05	0.11	3.93	0.005	0.07	0.737	0.141	0.008	0.332	0.639
739	AP	M	0-15	4.40	8.77	0.02	0.12	3.66	0.002	0.03	0.832	0.105	0.010	0.230	0.510
739	AP	L	0-15	3.10	24.20	0.05	0.17	3.28	0.005	0.07	0.943	0.148	0.012	0.370	0.534
740	AP	U	0-15	12.10	26.30	0.05	0.20	3.85	0.005	0.07	1.340	0.083	0.008	0.291	0.689
740	AP	M	0-15	18.60	16.50	0.02	0.13	2.89	0.002	0.03	1.050	0.172	0.016	0.410	1.120
740	AP	L	0-15	10.10	0.03	0.02	0.12	0.69	0.002	0.03	0.628	0.192	0.010	0.156	1.580
743	AP	U	0-15	2.80	0.03	0.02	0.07	3.96	0.002	0.03	1.410	0.068	0.007	0.080	1.800
743	AP	M	0-15	4.00	9.90	0.05	0.13	3.61	0.005	0.07	0.599	0.173	0.008	0.315	2.010
743	AP	L	0-15	4.00	30.40	0.02	0.20	3.52	0.002	0.03	0.309	0.231	0.014	0.438	1.490
744	AP	U	0-15	23.20	25.70	0.02	0.12	3.37	0.002	0.03	0.387	0.103	0.010	0.214	0.763
744	AP	M	0-15	15.10	19.10	0.01	0.14	3.37	0.001	0.01	0.720	0.161	0.010	0.243	0.831
744	AP	L	0-15	14.90	18.60	0.02	0.15	3.75	0.002	0.03	1.020	0.201	0.009	0.254	1.160
746	AP	U	0-15	2.50	0.96	0.05	0.10	3.49	0.005	0.07	1.240	0.190	0.012	0.127	0.931
746	AP	M	0-15	4.20	13.60	0.02	0.10	3.25	0.002	0.03	0.923	0.238	0.010	0.148	0.906
746	AP	L	0-15	4.40	21.80	0.02	0.14	3.38	0.002	0.03	0.666	0.258	0.011	0.141	1.020
			<b>Mean</b>	<b>12.73</b>	<b>18.71</b>	<b>0.03</b>	<b>0.13</b>	<b>2.99</b>	<b>0.003</b>	<b>0.04</b>	<b>0.93</b>	<b>0.18</b>	<b>0.01</b>	<b>0.27</b>	<b>1.06</b>
			<b>Max</b>	<b>74.70</b>	<b>48.00</b>	<b>0.08</b>	<b>0.20</b>	<b>5.07</b>	<b>0.005</b>	<b>0.07</b>	<b>2.56</b>	<b>0.29</b>	<b>0.02</b>	<b>0.60</b>	<b>2.01</b>
			<b>Min</b>	<b>2.50</b>	<b>0.03</b>	<b>0.01</b>	<b>0.07</b>	<b>0.69</b>	<b>0.001</b>	<b>0.01</b>	<b>0.31</b>	<b>0.05</b>	<b>0.01</b>	<b>0.08</b>	<b>0.41</b>
			<b>SD</b>	<b>14.61</b>	<b>12.60</b>	<b>0.02</b>	<b>0.04</b>	<b>1.02</b>	<b>0.002</b>	<b>0.02</b>	<b>0.54</b>	<b>0.07</b>	<b>0.00</b>	<b>0.15</b>	<b>0.40</b>
			<b>CV (%)</b>	<b>114.80</b>	<b>67.35</b>	<b>58.10</b>	<b>28.70</b>	<b>34.15</b>	<b>54.08</b>	<b>47.86</b>	<b>58.44</b>	<b>38.97</b>	<b>22.15</b>	<b>54.40</b>	<b>37.49</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3. Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.**

Site #	Eco-region	Slope Position	Depth (cm)	Chloride <sup>1</sup> (mg/kg) (0.5) <sup>5</sup>	Aluminum <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Antimony <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Arsenic <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Barium <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Beryllium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Bismuth <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Boron <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Cadmium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Chromium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Cobalt <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Copper <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>
769	MM	U	0-15	2.80	36.90	0.05	0.15	1.69	0.005	0.07	1.510	0.131	0.009	0.290	0.819
769	MM	M	0-15	3.50	57.40	0.01	0.10	1.69	0.001	0.09	0.545	0.240	0.015	0.333	0.663
769	MM	L	0-15	6.80	73.90	0.05	0.10	1.88	0.005	0.14	0.899	0.281	0.016	0.384	0.629
781	MM	U	0-15	11.40	73.00	0.05	0.10	3.08	0.005	0.07	0.004	0.189	0.017	0.558	1.240
781	MM	M	0-15	11.90	66.00	0.05	0.10	2.72	0.005	0.07	0.004	0.208	0.013	0.527	1.360
781	MM	L	0-15	15.90	63.50	0.05	0.10	1.66	0.005	0.07	1.250	0.168	0.014	0.668	1.420
786	MM	U	0-15	2.50	0.11	0.01	0.12	4.39	0.001	0.01	0.909	0.052	0.009	0.051	0.757
786	MM	M	0-15	3.20	0.17	0.01	0.05	4.60	0.001	0.01	0.600	0.076	0.009	0.041	0.457
786	MM	L	0-15	4.10	44.20	0.05	0.10	2.32	0.005	0.07	0.507	0.093	0.009	0.089	0.331
791	MM	U	0-15	3.00	7.94	0.01	0.09	4.41	0.001	0.01	0.257	0.241	0.009	0.189	1.320
791	MM	M	0-15	4.20	0.02	0.01	0.06	6.11	0.001	0.01	0.430	0.188	0.009	0.099	1.540
791	MM	L	0-15	5.00	1.77	0.01	0.13	5.94	0.001	0.01	0.341	0.466	0.007	0.248	2.910
793	MM	U	0-15	3.30	0.12	0.01	0.09	3.99	0.001	0.01	0.449	0.179	0.009	0.077	0.981
793	MM	M	0-15	3.10	0.13	0.01	0.07	3.94	0.001	0.01	0.473	0.180	0.009	0.125	0.968
793	MM	L	0-15	2.40	2.07	0.01	0.09	3.86	0.001	0.01	0.388	0.223	0.009	0.150	1.180
			<b>Mean</b>	<b>5.54</b>	<b>28.48</b>	<b>0.03</b>	<b>0.10</b>	<b>3.49</b>	<b>0.003</b>	<b>0.04</b>	<b>0.57</b>	<b>0.19</b>	<b>0.01</b>	<b>0.26</b>	<b>1.11</b>
			<b>Max</b>	<b>15.90</b>	<b>73.90</b>	<b>0.05</b>	<b>0.15</b>	<b>6.11</b>	<b>0.005</b>	<b>0.14</b>	<b>1.51</b>	<b>0.47</b>	<b>0.02</b>	<b>0.67</b>	<b>2.91</b>
			<b>Min</b>	<b>2.40</b>	<b>0.02</b>	<b>0.01</b>	<b>0.05</b>	<b>1.66</b>	<b>0.001</b>	<b>0.01</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>0.04</b>	<b>0.33</b>
			<b>SD</b>	<b>4.15</b>	<b>31.27</b>	<b>0.02</b>	<b>0.03</b>	<b>1.49</b>	<b>0.002</b>	<b>0.04</b>	<b>0.42</b>	<b>0.10</b>	<b>0.00</b>	<b>0.20</b>	<b>0.62</b>
			<b>CV (%)</b>	<b>74.98</b>	<b>109.79</b>	<b>78.01</b>	<b>26.13</b>	<b>42.62</b>	<b>78.01</b>	<b>94.02</b>	<b>73.14</b>	<b>50.78</b>	<b>29.28</b>	<b>78.60</b>	<b>55.99</b>
798	FG	U	0-15	19.10	15.10	0.01	0.12	3.37	0.001	0.01	0.558	0.246	0.008	0.146	0.918
798	FG	M	0-15	30.10	1.95	0.01	0.09	3.41	0.001	0.01	0.297	0.221	0.009	0.094	0.766
798	FG	L	0-15	17.80	19.20	0.01	0.12	3.62	0.001	0.01	0.516	0.229	0.007	0.106	0.904
800	FG	U	0-15	3.30	7.12	0.05	0.12	5.46	0.005	0.07	0.601	0.319	0.008	0.318	2.690
800	FG	M	0-15	4.60	9.36	0.05	0.17	5.42	0.005	0.07	0.674	0.329	0.010	0.334	2.770
800	FG	L	0-15	3.20	4.95	0.05	0.10	5.23	0.005	0.07	0.812	0.321	0.008	0.287	2.820
			<b>Mean</b>	<b>13.02</b>	<b>9.61</b>	<b>0.03</b>	<b>0.12</b>	<b>4.42</b>	<b>0.003</b>	<b>0.04</b>	<b>0.58</b>	<b>0.28</b>	<b>0.01</b>	<b>0.21</b>	<b>1.81</b>
			<b>Max</b>	<b>30.10</b>	<b>19.20</b>	<b>0.05</b>	<b>0.17</b>	<b>5.46</b>	<b>0.005</b>	<b>0.07</b>	<b>0.81</b>	<b>0.33</b>	<b>0.01</b>	<b>0.33</b>	<b>2.82</b>
			<b>Min</b>	<b>3.20</b>	<b>1.95</b>	<b>0.01</b>	<b>0.09</b>	<b>3.37</b>	<b>0.001</b>	<b>0.01</b>	<b>0.30</b>	<b>0.22</b>	<b>0.01</b>	<b>0.09</b>	<b>0.77</b>
			<b>SD</b>	<b>11.08</b>	<b>6.46</b>	<b>0.02</b>	<b>0.03</b>	<b>1.05</b>	<b>0.002</b>	<b>0.03</b>	<b>0.17</b>	<b>0.05</b>	<b>0.00</b>	<b>0.11</b>	<b>1.04</b>
			<b>CV (%)</b>	<b>85.09</b>	<b>67.22</b>	<b>73.03</b>	<b>22.97</b>	<b>23.74</b>	<b>73.03</b>	<b>82.16</b>	<b>29.82</b>	<b>18.24</b>	<b>12.39</b>	<b>51.67</b>	<b>57.49</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3. Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.**

Site #	Eco-region	Slope Position	Depth (cm)	Chloride <sup>1</sup> (mg/kg) (0.5) <sup>5</sup>	Aluminum <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Antimony <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Arsenic <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Barium <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Beryllium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Bismuth <sup>2</sup> (mg/kg) (0.01) <sup>5</sup>	Boron <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Cadmium <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Chromium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Cobalt <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Copper <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>
804	MG	U	0-15	3.20	1.51	0.01	0.04	3.51	0.001	0.01	0.541	0.081	0.007	0.124	0.836
804	MG	M	0-15	4.40	0.21	0.01	0.03	3.13	0.001	0.01	0.384	0.054	0.008	0.098	0.739
804	MG	L	0-15	3.60	2.89	0.01	0.08	2.26	0.001	0.01	0.191	0.119	0.009	0.140	0.952
806	MG	U	0-15	9.10	0.04	0.01	0.05	3.32	0.001	0.01	0.579	0.054	0.008	0.076	1.030
806	MG	M	0-15	6.70	1.94	0.01	0.13	2.41	0.001	0.01	0.215	0.082	0.007	0.184	0.937
806	MG	L	0-15	4.80	11.70	0.01	0.11	1.96	0.001	0.01	0.427	0.118	0.008	0.166	0.793
809	MG	U	0-15	4.10	0.02	0.01	0.08	2.92	0.001	0.01	0.612	0.086	0.009	0.073	1.570
809	MG	M	0-15	10.20	0.03	0.02	0.15	3.43	0.002	0.03	0.489	0.078	0.027	0.135	1.680
809	MG	L	0-15	14.20	0.70	0.01	0.16	2.96	0.001	0.01	0.352	0.121	0.008	0.095	0.864
812	MG	U	0-15	10.90	0.02	0.01	0.02	3.80	0.001	0.01	0.676	0.034	0.007	0.106	1.400
812	MG	M	0-15	8.70	0.02	0.01	0.02	2.98	0.001	0.01	0.675	0.033	0.006	0.080	1.260
812	MG	L	0-15	12.60	0.02	0.01	0.03	3.26	0.001	0.01	0.439	0.048	0.008	0.102	1.600
815	MG	U	0-15	4.90	0.02	0.01	0.05	4.61	0.001	0.01	0.691	0.070	0.008	0.070	1.150
815	MG	M	0-15	3.20	0.02	0.01	0.06	4.44	0.001	0.01	0.541	0.065	0.009	0.073	0.956
815	MG	L	0-15	3.60	0.05	0.02	0.18	2.50	0.002	0.03	0.665	0.330	0.008	0.211	2.240
823	MG	U	0-15	14.80	0.02	0.01	0.04	2.51	0.001	0.01	1.940	0.092	0.011	0.133	1.250
823	MG	M	0-15	23.00	0.02	0.01	0.10	2.55	0.001	0.01	1.600	0.148	0.010	0.156	0.864
823	MG	L	0-15	25.20	0.02	0.01	0.12	2.36	0.001	0.01	1.600	0.174	0.011	0.136	0.845
1828	MG	U	0-15	2.70	0.08	0.01	0.03	3.80	0.001	0.01	1.530	0.037	0.008	0.055	0.996
1828	MG	M	0-15	19.20	0.06	0.01	0.11	3.02	0.001	0.01	1.700	0.152	0.009	0.139	0.900
1828	MG	L	0-15	6.50	0.02	0.01	0.10	4.99	0.001	0.01	1.390	0.103	0.009	0.128	1.070
2828	MG	U	0-15	5.50	0.02	0.01	0.13	3.99	0.001	0.01	2.530	0.109	0.008	0.216	1.460
2828	MG	M	0-15	6.00	0.22	0.01	0.12	3.59	0.001	0.01	1.440	0.138	0.009	0.218	1.280
2828	MG	L	0-15	9.90	0.02	0.01	0.13	4.06	0.001	0.01	1.620	0.146	0.008	0.226	1.580
			<b>Mean</b>	<b>9.04</b>	<b>0.82</b>	<b>0.01</b>	<b>0.09</b>	<b>3.27</b>	<b>0.001</b>	<b>0.01</b>	<b>0.95</b>	<b>0.10</b>	<b>0.01</b>	<b>0.13</b>	<b>1.18</b>
			<b>Max</b>	<b>25.20</b>	<b>11.70</b>	<b>0.02</b>	<b>0.18</b>	<b>4.99</b>	<b>0.002</b>	<b>0.03</b>	<b>2.53</b>	<b>0.33</b>	<b>0.03</b>	<b>0.23</b>	<b>2.24</b>
			<b>Min</b>	<b>2.70</b>	<b>0.02</b>	<b>0.01</b>	<b>0.02</b>	<b>1.96</b>	<b>0.001</b>	<b>0.01</b>	<b>0.19</b>	<b>0.03</b>	<b>0.01</b>	<b>0.06</b>	<b>0.74</b>
			<b>SD</b>	<b>6.32</b>	<b>2.43</b>	<b>0.00</b>	<b>0.05</b>	<b>0.79</b>	<b>0.000</b>	<b>0.01</b>	<b>0.64</b>	<b>0.06</b>	<b>0.00</b>	<b>0.05</b>	<b>0.37</b>
			<b>CV (%)</b>	<b>69.94</b>	<b>296.44</b>	<b>26.06</b>	<b>56.06</b>	<b>24.23</b>	<b>26.06</b>	<b>48.40</b>	<b>67.68</b>	<b>61.15</b>	<b>43.36</b>	<b>39.31</b>	<b>31.15</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Iron <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Lead <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Lithium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Magnesium <sup>2</sup> (mg/kg) (0.1) <sup>5</sup>	Manganese <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Molybdenum <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Nickel <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Phosphorus <sup>2</sup> (mg/kg) (0.06) <sup>5</sup>	Selenium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silicon <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silver <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Strontium <sup>2</sup> (mg/kg) (0.0002) <sup>5</sup>
586	PL	U	0-15	120.0	0.540	0.089	177.0	8.38	0.002	1.99	1.64	0.063	7.46	0.002	4.46
586	PL	M	0-15	177.0	0.689	0.184	362.0	5.98	0.002	1.93	1.12	0.084	5.63	0.002	5.44
586	PL	L	0-15	184.0	0.658	0.130	312.0	5.77	0.004	1.74	1.67	0.074	6.85	0.002	4.15
588	PL	U	0-15	72.1	0.769	0.189	435.0	4.65	0.002	0.83	0.70	0.062	7.01	0.002	8.11
588	PL	M	0-15	39.4	0.889	0.213	634.0	5.60	0.002	0.65	0.55	0.049	9.40	0.002	9.10
588	PL	L	0-15	142.0	1.990	0.070	350.0	2.10	0.003	1.04	0.53	0.057	3.55	0.002	4.99
590	PL	U	0-15	57.0	0.921	0.116	394.0	6.24	0.002	0.75	0.73	0.051	9.14	0.002	7.14
590	PL	M	0-15	62.8	0.430	0.012	71.5	28.20	0.002	1.41	1.27	0.060	4.47	0.002	2.44
590	PL	L	0-15	82.6	0.569	0.014	73.8	37.20	0.002	1.87	1.98	0.084	5.39	0.002	2.47
591	PL	U	0-15	126.0	1.490	0.054	230.0	8.66	0.002	2.72	1.42	0.061	6.19	0.002	5.67
591	PL	M	0-15	103.0	0.995	0.132	286.0	5.82	0.002	4.19	1.40	0.065	10.00	0.002	7.57
591	PL	L	0-15	194.0	1.160	0.118	312.0	13.20	0.006	5.83	2.17	0.072	12.50	0.004	8.25
592	PL	U	0-15	73.4	0.912	0.150	326.0	6.84	0.009	1.64	2.38	0.054	22.60	0.002	5.40
592	PL	M	0-15	84.5	0.992	0.144	333.0	8.36	0.009	1.79	2.59	0.054	24.10	0.002	5.58
592	PL	L	0-15	90.7	1.160	0.159	341.0	10.50	0.018	2.13	2.89	0.068	26.80	0.004	6.10
593	PL	U	0-15	135.0	1.210	0.063	330.0	20.90	0.002	2.60	1.82	0.076	8.06	0.002	4.72
593	PL	M	0-15	184.0	1.020	0.138	319.0	20.60	0.002	3.33	1.51	0.089	7.03	0.002	5.07
593	PL	L	0-15	243.0	1.050	0.113	309.0	25.90	0.003	2.36	0.88	0.118	8.31	0.002	4.43
594	PL	U	0-15	103.0	1.160	0.007	221.0	21.40	0.002	1.08	0.92	0.074	4.69	0.002	3.16
594	PL	M	0-15	131.0	0.807	0.021	165.0	30.00	0.002	1.27	1.04	0.094	5.72	0.002	2.81
594	PL	L	0-15	204.0	0.975	0.038	155.0	14.90	0.002	1.41	1.25	0.102	6.64	0.002	2.54
595	PL	U	0-15	175.0	1.690	0.058	433.0	14.90	0.002	2.38	1.20	0.085	11.40	0.002	4.66
595	PL	M	0-15	160.0	1.390	0.030	292.0	26.90	0.002	2.59	1.15	0.091	11.30	0.002	3.78
595	PL	L	0-15	161.0	1.270	0.054	306.0	28.10	0.002	2.41	1.15	0.087	9.70	0.002	3.53
599	PL	U	0-15	244.0	1.630	0.112	453.0	26.30	0.004	3.49	1.38	0.120	14.20	0.004	6.77
599	PL	M	0-15	132.0	0.975	0.056	285.0	13.80	0.002	2.03	0.92	0.086	6.27	0.002	4.30
599	PL	L	0-15	226.0	1.660	0.074	517.0	28.20	0.004	4.04	1.00	0.130	10.20	0.004	6.49
			<b>Mean</b>	<b>137.28</b>	<b>1.07</b>	<b>0.09</b>	<b>311.94</b>	<b>15.90</b>	<b>0.004</b>	<b>2.20</b>	<b>1.38</b>	<b>0.08</b>	<b>9.80</b>	<b>0.0023</b>	<b>5.15</b>
			<b>Max</b>	<b>244.00</b>	<b>1.99</b>	<b>0.21</b>	<b>634.00</b>	<b>37.20</b>	<b>0.018</b>	<b>5.83</b>	<b>2.89</b>	<b>0.13</b>	<b>26.80</b>	<b>0.0040</b>	<b>9.10</b>
			<b>Min</b>	<b>39.40</b>	<b>0.43</b>	<b>0.01</b>	<b>71.50</b>	<b>2.10</b>	<b>0.002</b>	<b>0.65</b>	<b>0.53</b>	<b>0.05</b>	<b>3.55</b>	<b>0.0020</b>	<b>2.44</b>
			<b>SD</b>	<b>57.94</b>	<b>0.38</b>	<b>0.06</b>	<b>124.62</b>	<b>10.04</b>	<b>0.004</b>	<b>1.18</b>	<b>0.61</b>	<b>0.02</b>	<b>5.91</b>	<b>0.0007</b>	<b>1.84</b>
			<b>CV (%)</b>	<b>42.20</b>	<b>35.51</b>	<b>62.14</b>	<b>39.95</b>	<b>63.12</b>	<b>98.46</b>	<b>53.55</b>	<b>43.93</b>	<b>27.55</b>	<b>60.27</b>	<b>31.53</b>	<b>35.74</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Iron <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Lead <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Lithium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Magnesium <sup>2</sup> (mg/kg) (0.1) <sup>5</sup>	Manganese <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Molybdenum <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Nickel <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Phosphorus <sup>2</sup> (mg/kg) (0.06) <sup>5</sup>	Selenium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silicon <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silver <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Strontium <sup>2</sup> (mg/kg) (0.0002) <sup>5</sup>
615	MB	U	0-15	119.0	0.892	0.010	118.0	15.50	0.021	0.51	6.17	0.063	13.10	0.002	3.56
615	MB	M	0-15	177.0	0.832	0.044	136.0	22.50	0.002	1.01	1.75	0.059	5.05	0.002	3.48
615	MB	L	0-15	397.0	1.240	0.111	300.0	22.60	0.012	2.28	3.18	0.190	13.40	0.010	9.66
			<b>Mean</b>	<b>231.00</b>	<b>0.99</b>	<b>0.06</b>	<b>184.67</b>	<b>20.20</b>	<b>0.0117</b>	<b>1.27</b>	<b>3.70</b>	<b>0.10</b>	<b>10.52</b>	<b>0.0047</b>	<b>5.57</b>
			<b>Max</b>	<b>397.00</b>	<b>1.24</b>	<b>0.11</b>	<b>300.00</b>	<b>22.60</b>	<b>0.0210</b>	<b>2.28</b>	<b>6.17</b>	<b>0.19</b>	<b>13.40</b>	<b>0.0100</b>	<b>9.66</b>
			<b>Min</b>	<b>119.00</b>	<b>0.83</b>	<b>0.01</b>	<b>118.00</b>	<b>15.50</b>	<b>0.0020</b>	<b>0.51</b>	<b>1.75</b>	<b>0.06</b>	<b>5.05</b>	<b>0.0020</b>	<b>3.48</b>
			<b>SD</b>	<b>146.66</b>	<b>0.22</b>	<b>0.05</b>	<b>100.29</b>	<b>4.07</b>	<b>0.0095</b>	<b>0.91</b>	<b>2.26</b>	<b>0.07</b>	<b>4.74</b>	<b>0.0046</b>	<b>3.55</b>
			<b>CV (%)</b>	<b>63.49</b>	<b>22.30</b>	<b>93.44</b>	<b>54.31</b>	<b>20.15</b>	<b>81.47</b>	<b>71.88</b>	<b>60.96</b>	<b>71.64</b>	<b>45.04</b>	<b>98.97</b>	<b>63.69</b>
678	BT	U	0-15	82.5	0.794	0.017	218.0	38.70	0.002	0.93	1.21	0.056	5.85	0.002	9.73
678	BT	M	0-15	134.0	1.040	0.046	211.0	28.50	0.002	1.07	1.74	0.083	7.39	0.002	9.19
678	BT	L	0-15	129.0	0.986	0.190	377.0	17.00	0.002	1.85	1.10	0.073	10.50	0.002	13.00
680	BT	U	0-15	49.5	0.508	0.031	244.0	17.90	0.002	0.63	0.78	0.049	3.79	0.002	2.21
680	BT	M	0-15	66.0	0.519	0.032	216.0	22.90	0.002	1.06	1.30	0.058	4.87	0.002	2.44
680	BT	L	0-15	103.0	0.557	0.023	212.0	17.70	0.006	1.42	2.04	0.072	5.55	0.002	2.37
681	BT	U	0-15	64.9	0.445	0.019	86.5	15.20	0.002	0.99	0.87	0.053	5.46	0.002	3.48
681	BT	M	0-15	67.7	0.517	0.007	90.1	13.60	0.002	0.98	1.02	0.061	4.30	0.002	3.21
681	BT	L	0-15	91.6	0.531	0.062	116.0	15.80	0.002	1.38	1.05	0.064	6.54	0.002	3.94
684	BT	U	0-15	43.5	0.589	0.015	160.0	9.73	0.002	0.70	0.57	0.035	3.35	0.002	3.98
684	BT	M	0-15	77.3	0.791	0.016	131.0	20.00	0.002	1.47	1.12	0.062	3.65	0.002	4.32
684	BT	L	0-15	421.0	2.520	0.028	168.0	91.20	0.010	4.75	6.71	0.280	13.80	0.010	9.24
687	BT	U	0-15	78.1	0.756	0.017	46.6	39.80	0.004	1.11	1.20	0.042	4.39	0.004	2.39
687	BT	M	0-15	76.5	0.769	0.011	59.2	36.60	0.004	1.19	1.36	0.079	4.91	0.004	3.04
687	BT	L	0-15	82.4	0.860	0.046	116.0	27.00	0.002	1.33	1.40	0.076	8.71	0.002	5.01
688	BT	U	0-15	278.0	0.706	0.132	624.0	55.70	0.005	5.87	2.91	0.094	24.30	0.004	16.50
688	BT	M	0-15	151.0	0.517	0.068	324.0	30.60	0.004	3.42	1.38	0.065	13.30	0.002	8.67
688	BT	L	0-15	188.0	0.630	0.052	210.0	45.20	0.007	3.77	1.62	0.084	13.00	0.002	7.85
692	BT	U	0-15	127.0	1.730	0.084	550.0	18.20	0.004	2.25	1.00	0.068	8.76	0.004	9.89
692	BT	M	0-15	200.0	1.680	0.114	665.0	41.70	0.010	1.75	1.20	0.140	7.86	0.010	10.50
692	BT	L	0-15	238.0	1.510	0.072	413.0	85.10	0.011	3.33	1.58	0.082	15.70	0.004	8.72
703	BT	U	0-15	52.1	0.546	0.010	156.0	21.50	0.002	0.78	0.88	0.037	3.49	0.002	4.52
703	BT	M	0-15	59.0	0.542	0.005	120.0	22.30	0.004	0.63	0.86	0.035	2.39	0.004	3.42
703	BT	L	0-15	390.0	1.800	0.067	383.0	52.80	0.047	5.00	3.54	0.110	10.60	0.010	8.50
			<b>Mean</b>	<b>135.42</b>	<b>0.91</b>	<b>0.05</b>	<b>245.68</b>	<b>32.70</b>	<b>0.0058</b>	<b>1.99</b>	<b>1.60</b>	<b>0.08</b>	<b>8.02</b>	<b>0.0035</b>	<b>6.51</b>
			<b>Max</b>	<b>421.00</b>	<b>2.52</b>	<b>0.19</b>	<b>665.00</b>	<b>91.20</b>	<b>0.0470</b>	<b>5.87</b>	<b>6.71</b>	<b>0.28</b>	<b>24.30</b>	<b>0.0100</b>	<b>16.50</b>
			<b>Min</b>	<b>43.50</b>	<b>0.45</b>	<b>0.01</b>	<b>46.60</b>	<b>9.73</b>	<b>0.0020</b>	<b>0.63</b>	<b>0.57</b>	<b>0.04</b>	<b>2.39</b>	<b>0.0020</b>	<b>2.21</b>
			<b>SD</b>	<b>103.47</b>	<b>0.54</b>	<b>0.05</b>	<b>173.83</b>	<b>21.23</b>	<b>0.0092</b>	<b>1.52</b>	<b>1.27</b>	<b>0.05</b>	<b>5.11</b>	<b>0.0027</b>	<b>3.87</b>
			<b>CV (%)</b>	<b>76.40</b>	<b>59.32</b>	<b>93.42</b>	<b>70.75</b>	<b>64.94</b>	<b>157.90</b>	<b>76.72</b>	<b>79.54</b>	<b>63.79</b>	<b>63.77</b>	<b>75.83</b>	<b>59.49</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Iron <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Lead <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Lithium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Magnesium <sup>2</sup> (mg/kg) (0.1) <sup>5</sup>	Manganese <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Molybdenum <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Nickel <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Phosphorus <sup>2</sup> (mg/kg) (0.06) <sup>5</sup>	Selenium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silicon <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silver <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Strontium <sup>2</sup> (mg/kg) (0.0002) <sup>5</sup>
727	AP	U	0-15	103.0	2.200	0.105	397.0	27.90	0.009	2.58	2.53	0.042	15.10	0.004	7.50
727	AP	M	0-15	243.0	2.000	0.141	402.0	53.50	0.010	3.93	4.17	0.040	18.30	0.010	7.91
727	AP	L	0-15	321.0	1.820	0.087	263.0	54.60	0.010	5.20	3.32	0.110	16.10	0.004	5.71
728	AP	U	0-15	91.2	0.628	0.034	120.0	25.00	0.012	0.91	0.91	0.076	6.60	0.002	2.30
728	AP	M	0-15	136.0	1.340	0.067	138.0	40.30	0.021	2.03	1.30	0.047	13.10	0.010	4.10
728	AP	L	0-15	140.0	4.440	0.034	95.9	25.00	0.024	1.81	4.62	0.045	15.40	0.002	3.65
730	AP	U	0-15	37.0	0.450	0.018	244.0	11.40	0.010	1.42	0.46	0.040	5.98	0.010	2.63
730	AP	M	0-15	93.0	0.560	0.025	156.0	25.20	0.015	1.34	0.97	0.072	5.45	0.004	2.22
730	AP	L	0-15	133.0	0.758	0.062	339.0	30.00	0.004	2.01	0.61	0.080	9.29	0.004	3.02
738	AP	U	0-15	88.8	0.736	0.024	165.0	75.20	0.009	1.76	0.61	0.094	6.46	0.004	4.23
738	AP	M	0-15	103.0	0.789	0.020	144.0	89.50	0.010	1.65	1.10	0.100	7.75	0.004	4.07
738	AP	L	0-15	98.9	0.784	0.035	151.0	79.40	0.007	2.71	0.82	0.120	6.97	0.004	4.25
739	AP	U	0-15	75.8	0.708	0.027	139.0	44.40	0.010	2.35	0.71	0.046	4.51	0.010	3.38
739	AP	M	0-15	55.9	0.557	0.042	143.0	26.40	0.004	1.79	0.80	0.080	3.90	0.004	3.81
739	AP	L	0-15	74.7	0.714	0.037	113.0	47.70	0.017	1.84	0.64	0.071	5.07	0.010	3.54
740	AP	U	0-15	68.3	1.020	0.060	266.0	29.10	0.010	1.84	0.57	0.040	6.07	0.010	5.30
740	AP	M	0-15	88.0	1.010	0.033	170.0	72.30	0.008	2.19	0.64	0.110	7.68	0.004	4.27
740	AP	L	0-15	83.4	1.750	0.553	508.0	28.80	0.030	1.81	3.70	0.079	25.20	0.004	9.31
743	AP	U	0-15	10.9	0.485	0.072	414.0	9.45	0.004	1.42	0.15	0.048	16.60	0.004	6.51
743	AP	M	0-15	81.7	0.723	0.071	414.0	49.00	0.014	3.45	0.49	0.120	7.43	0.010	5.69
743	AP	L	0-15	97.4	0.816	0.051	312.0	68.30	0.010	2.60	0.61	0.093	10.30	0.004	4.90
744	AP	U	0-15	111.0	1.030	0.026	166.0	26.40	0.004	2.43	1.23	0.037	7.02	0.004	4.42
744	AP	M	0-15	147.0	15.400	0.034	123.0	34.50	0.007	2.91	1.18	0.088	10.30	0.002	4.70
744	AP	L	0-15	224.0	1.110	0.038	123.0	36.10	0.008	4.09	1.79	0.099	11.20	0.004	4.06
746	AP	U	0-15	62.0	0.684	0.037	196.0	26.30	0.010	2.19	0.93	0.040	13.80	0.010	3.17
746	AP	M	0-15	108.0	0.872	0.040	158.0	36.00	0.004	2.31	0.97	0.076	11.70	0.004	2.87
746	AP	L	0-15	144.0	1.130	0.027	154.0	30.70	0.004	2.44	1.10	0.076	14.20	0.004	2.77
			<b>Mean</b>	<b>111.85</b>	<b>1.65</b>	<b>0.07</b>	<b>222.74</b>	<b>40.83</b>	<b>0.0106</b>	<b>2.33</b>	<b>1.37</b>	<b>0.07</b>	<b>10.43</b>	<b>0.0056</b>	<b>4.46</b>
			<b>Max</b>	<b>321.00</b>	<b>15.40</b>	<b>0.55</b>	<b>508.00</b>	<b>89.50</b>	<b>0.0300</b>	<b>5.20</b>	<b>4.62</b>	<b>0.12</b>	<b>25.20</b>	<b>0.0100</b>	<b>9.31</b>
			<b>Min</b>	<b>10.90</b>	<b>0.45</b>	<b>0.02</b>	<b>95.90</b>	<b>9.45</b>	<b>0.0040</b>	<b>0.91</b>	<b>0.15</b>	<b>0.04</b>	<b>3.90</b>	<b>0.0020</b>	<b>2.22</b>
			<b>SD</b>	<b>64.38</b>	<b>2.86</b>	<b>0.10</b>	<b>117.07</b>	<b>20.79</b>	<b>0.0063</b>	<b>0.94</b>	<b>1.20</b>	<b>0.03</b>	<b>5.12</b>	<b>0.0030</b>	<b>1.74</b>
			<b>CV (%)</b>	<b>57.55</b>	<b>173.76</b>	<b>151.84</b>	<b>52.56</b>	<b>50.92</b>	<b>60.11</b>	<b>40.12</b>	<b>88.01</b>	<b>37.28</b>	<b>49.09</b>	<b>54.08</b>	<b>39.06</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)



**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Iron <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Lead <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Lithium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Magnesium <sup>2</sup> (mg/kg) (0.1) <sup>5</sup>	Manganese <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Molybdenum <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Nickel <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Phosphorus <sup>2</sup> (mg/kg) (0.06) <sup>5</sup>	Selenium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silicon <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silver <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Strontium <sup>2</sup> (mg/kg) (0.0002) <sup>5</sup>
769	MM	U	0-15	97.1	0.692	0.108	257.0	50.90	0.010	1.71	1.40	0.040	11.30	0.010	4.77
769	MM	M	0-15	120.0	0.634	0.036	71.0	92.30	0.008	1.43	1.99	0.103	11.20	0.002	2.79
769	MM	L	0-15	154.0	0.828	0.044	80.0	76.70	0.015	1.60	2.50	0.140	12.50	0.010	3.14
781	MM	U	0-15	142.0	1.330	0.064	217.0	66.70	0.010	1.72	1.90	0.081	14.70	0.010	4.23
781	MM	M	0-15	153.0	1.400	0.084	233.0	59.40	0.020	2.48	1.60	0.130	17.00	0.010	4.40
781	MM	L	0-15	183.0	1.490	0.065	261.0	65.80	0.015	2.32	2.00	0.220	15.00	0.010	3.84
786	MM	U	0-15	23.9	0.398	0.035	197.0	7.37	0.002	1.65	0.61	0.020	10.70	0.002	4.19
786	MM	M	0-15	22.8	0.310	0.022	146.0	6.22	0.002	1.18	0.94	0.046	12.10	0.002	4.36
786	MM	L	0-15	133.0	0.663	0.010	57.0	5.53	0.010	0.72	1.20	0.110	2.42	0.010	2.01
791	MM	U	0-15	76.6	0.654	0.037	116.0	41.10	0.003	2.15	0.91	0.092	5.58	0.002	2.72
791	MM	M	0-15	60.8	0.759	0.047	156.0	19.80	0.004	2.02	0.55	0.077	12.00	0.002	4.21
791	MM	L	0-15	414.0	1.700	0.038	105.0	43.70	0.007	3.69	0.83	0.190	6.45	0.002	2.65
793	MM	U	0-15	35.2	0.546	0.050	141.0	17.00	0.004	1.20	0.59	0.074	12.40	0.002	2.32
793	MM	M	0-15	28.7	0.524	0.051	140.0	26.20	0.004	1.22	0.53	0.078	11.70	0.002	2.01
793	MM	L	0-15	54.3	0.706	0.048	122.0	34.50	0.002	1.55	0.68	0.093	7.79	0.002	1.81
			<b>Mean</b>	<b>113.23</b>	<b>0.84</b>	<b>0.05</b>	<b>153.27</b>	<b>40.88</b>	<b>0.0077</b>	<b>1.78</b>	<b>1.22</b>	<b>0.10</b>	<b>10.86</b>	<b>0.0052</b>	<b>3.30</b>
			<b>Max</b>	<b>414.00</b>	<b>1.70</b>	<b>0.11</b>	<b>261.00</b>	<b>92.30</b>	<b>0.0200</b>	<b>3.69</b>	<b>2.50</b>	<b>0.22</b>	<b>17.00</b>	<b>0.0100</b>	<b>4.77</b>
			<b>Min</b>	<b>22.80</b>	<b>0.31</b>	<b>0.01</b>	<b>57.00</b>	<b>5.53</b>	<b>0.0020</b>	<b>0.72</b>	<b>0.53</b>	<b>0.02</b>	<b>2.42</b>	<b>0.0020</b>	<b>1.81</b>
			<b>SD</b>	<b>98.94</b>	<b>0.43</b>	<b>0.02</b>	<b>66.11</b>	<b>27.40</b>	<b>0.0056</b>	<b>0.71</b>	<b>0.64</b>	<b>0.05</b>	<b>3.84</b>	<b>0.0041</b>	<b>1.03</b>
			<b>CV (%)</b>	<b>87.38</b>	<b>50.50</b>	<b>48.83</b>	<b>43.13</b>	<b>67.02</b>	<b>72.07</b>	<b>39.77</b>	<b>52.92</b>	<b>53.79</b>	<b>35.38</b>	<b>78.01</b>	<b>31.21</b>
798	FG	U	0-15	81.3	0.798	0.025	105.0	33.80	0.002	1.93	1.11	0.078	7.80	0.002	2.69
798	FG	M	0-15	52.6	1.780	0.018	134.0	24.10	0.003	1.39	0.72	0.086	9.58	0.002	3.06
798	FG	L	0-15	96.7	0.858	0.009	103.0	22.20	0.003	1.46	0.88	0.076	6.16	0.002	2.52
800	FG	U	0-15	128.0	1.630	0.111	228.0	55.70	0.021	4.28	0.84	0.120	10.80	0.010	3.61
800	FG	M	0-15	126.0	1.560	0.120	284.0	60.30	0.023	4.40	1.00	0.170	11.90	0.010	4.08
800	FG	L	0-15	127.0	1.670	0.122	289.0	50.10	0.021	4.29	0.89	0.150	11.70	0.010	4.48
			<b>Mean</b>	<b>101.93</b>	<b>1.38</b>	<b>0.07</b>	<b>190.50</b>	<b>41.03</b>	<b>0.0122</b>	<b>2.96</b>	<b>0.91</b>	<b>0.11</b>	<b>9.66</b>	<b>0.0060</b>	<b>3.41</b>
			<b>Max</b>	<b>128.00</b>	<b>1.78</b>	<b>0.12</b>	<b>289.00</b>	<b>60.30</b>	<b>0.0230</b>	<b>4.40</b>	<b>1.11</b>	<b>0.17</b>	<b>11.90</b>	<b>0.0100</b>	<b>4.48</b>
			<b>Min</b>	<b>52.60</b>	<b>0.80</b>	<b>0.01</b>	<b>103.00</b>	<b>22.20</b>	<b>0.0020</b>	<b>1.39</b>	<b>0.72</b>	<b>0.08</b>	<b>6.16</b>	<b>0.0020</b>	<b>2.52</b>
			<b>SD</b>	<b>30.90</b>	<b>0.44</b>	<b>0.06</b>	<b>87.19</b>	<b>16.51</b>	<b>0.0104</b>	<b>1.51</b>	<b>0.13</b>	<b>0.04</b>	<b>2.29</b>	<b>0.0044</b>	<b>0.78</b>
			<b>CV (%)</b>	<b>30.31</b>	<b>31.53</b>	<b>81.94</b>	<b>45.77</b>	<b>40.23</b>	<b>85.80</b>	<b>50.95</b>	<b>14.82</b>	<b>35.27</b>	<b>23.70</b>	<b>73.03</b>	<b>22.99</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3. Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.**

Site #	Eco-region	Slope Position	Depth (cm)	Iron <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Lead <sup>2</sup> (mg/kg) (0.004) <sup>5</sup>	Lithium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Magnesium <sup>2</sup> (mg/kg) (0.1) <sup>5</sup>	Manganese <sup>2</sup> (mg/kg) (0.0004) <sup>5</sup>	Molybdenum <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Nickel <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Phosphorus <sup>2</sup> (mg/kg) (0.06) <sup>5</sup>	Selenium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silicon <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Silver <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Strontium <sup>2</sup> (mg/kg) (0.0002) <sup>5</sup>
804	MG	U	0-15	49.6	0.395	0.076	160.0	16.30	0.002	1.80	0.69	0.076	7.10	0.002	4.04
804	MG	M	0-15	32.8	0.336	0.127	209.0	11.60	0.002	1.35	0.60	0.067	10.70	0.002	4.62
804	MG	L	0-15	76.8	0.465	0.168	235.0	17.70	0.005	1.65	0.92	0.083	7.11	0.002	3.98
806	MG	U	0-15	30.7	0.385	0.146	347.0	7.78	0.004	1.59	0.40	0.073	11.20	0.002	5.33
806	MG	M	0-15	61.2	0.409	0.121	238.0	19.50	0.003	1.65	0.48	0.087	4.63	0.002	3.97
806	MG	L	0-15	81.5	0.460	0.058	134.0	23.80	0.002	1.26	0.78	0.065	4.27	0.002	3.15
809	MG	U	0-15	14.6	0.397	0.045	277.0	11.70	0.002	1.12	0.38	0.034	17.50	0.002	2.91
809	MG	M	0-15	28.2	0.528	0.074	369.0	18.40	0.004	1.98	0.42	0.043	9.92	0.004	3.65
809	MG	L	0-15	45.4	0.307	0.049	181.0	18.30	0.002	1.16	0.45	0.047	9.07	0.002	3.06
812	MG	U	0-15	16.4	0.724	0.181	396.0	9.82	0.002	1.23	0.11	0.032	15.00	0.002	10.30
812	MG	M	0-15	24.3	0.738	0.187	420.0	8.31	0.004	1.25	0.19	0.037	15.00	0.002	9.06
812	MG	L	0-15	23.1	0.863	0.214	498.0	11.80	0.004	1.44	0.34	0.042	17.50	0.002	9.01
815	MG	U	0-15	8.9	0.459	0.047	133.0	8.04	0.002	0.87	0.25	0.038	21.00	0.002	3.63
815	MG	M	0-15	10.0	0.429	0.043	119.0	8.67	0.002	0.83	0.32	0.043	21.80	0.002	3.00
815	MG	L	0-15	285.0	1.370	0.044	158.0	50.30	0.016	2.57	1.22	0.140	12.60	0.004	2.86
823	MG	U	0-15	10.5	0.571	0.090	250.0	13.60	0.003	1.38	0.26	0.057	26.60	0.002	4.51
823	MG	M	0-15	19.1	0.469	0.078	253.0	25.50	0.006	1.21	1.00	0.064	23.80	0.002	3.85
823	MG	L	0-15	24.0	0.454	0.059	229.0	27.90	0.003	1.26	0.35	0.067	17.70	0.002	3.51
1828	MG	U	0-15	7.2	0.340	0.039	140.0	6.18	0.002	0.69	0.14	0.050	16.60	0.002	3.45
1828	MG	M	0-15	28.8	0.416	0.046	189.0	27.60	0.004	1.17	0.48	0.076	15.00	0.002	2.83
1828	MG	L	0-15	15.8	0.569	0.060	224.0	19.40	0.002	1.11	0.24	0.064	21.50	0.002	3.26
2828	MG	U	0-15	34.6	0.698	0.077	249.0	27.90	0.002	1.83	0.30	0.068	11.70	0.002	3.25
2828	MG	M	0-15	39.1	0.565	0.055	195.0	35.30	0.002	1.69	0.35	0.075	9.22	0.002	2.67
2828	MG	L	0-15	36.1	0.732	0.064	245.0	30.70	0.002	1.94	0.34	0.069	12.80	0.002	3.23
			<b>Mean</b>	<b>41.82</b>	<b>0.54</b>	<b>0.09</b>	<b>243.67</b>	<b>19.00</b>	<b>0.0034</b>	<b>1.42</b>	<b>0.46</b>	<b>0.06</b>	<b>14.14</b>	<b>0.0022</b>	<b>4.30</b>
			<b>Max</b>	<b>285.00</b>	<b>1.37</b>	<b>0.21</b>	<b>498.00</b>	<b>50.30</b>	<b>0.0160</b>	<b>2.57</b>	<b>1.22</b>	<b>0.14</b>	<b>26.60</b>	<b>0.0040</b>	<b>10.30</b>
			<b>Min</b>	<b>7.15</b>	<b>0.31</b>	<b>0.04</b>	<b>119.00</b>	<b>6.18</b>	<b>0.0020</b>	<b>0.69</b>	<b>0.11</b>	<b>0.03</b>	<b>4.27</b>	<b>0.0020</b>	<b>2.67</b>
			<b>SD</b>	<b>55.51</b>	<b>0.23</b>	<b>0.05</b>	<b>98.41</b>	<b>10.62</b>	<b>0.0029</b>	<b>0.42</b>	<b>0.28</b>	<b>0.02</b>	<b>6.03</b>	<b>0.0006</b>	<b>2.10</b>
			<b>CV (%)</b>	<b>132.75</b>	<b>42.04</b>	<b>59.20</b>	<b>40.39</b>	<b>55.89</b>	<b>85.40</b>	<b>29.77</b>	<b>60.92</b>	<b>37.20</b>	<b>42.67</b>	<b>26.06</b>	<b>48.88</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3. Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.**

Site #	Eco-region	Slope Position	Depth (cm)	Sulphur <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Thallium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Tin <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Titanium <sup>2</sup> (mg/kg) (0.0008) <sup>5</sup>	Vanadium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Zinc <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Antimony <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Arsenic <sup>3</sup> (mg/kg) (0.04) <sup>5</sup>	Boron <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>	Selenium <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Cobalt <sup>3</sup> (mg/kg) (0.003) <sup>5</sup>	Copper <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Lead <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>
586	PL	U	0-15	24.90	0.008	0.041	0.0010	0.002	16.30	0.02	0.07	1.220	0.02	0.005	0.055	0.008
586	PL	M	0-15	27.60	0.008	0.032	0.0015	0.002	10.80	0.02	0.04	1.580	0.02	0.011	0.082	0.008
586	PL	L	0-15	28.30	0.008	0.045	0.0019	0.002	7.98	0.02	0.07	1.260	0.02	0.013	0.080	0.008
588	PL	U	0-15	19.50	0.008	0.036	0.0008	0.002	0.99	0.02	0.05	0.974	0.02	0.017	0.130	0.022
588	PL	M	0-15	19.10	0.008	0.049	0.0012	0.003	1.52	0.02	0.05	1.040	0.02	0.011	0.114	0.008
588	PL	L	0-15	23.20	0.008	0.028	0.0018	0.003	2.55	0.02	0.04	1.120	0.02	0.007	0.138	0.008
590	PL	U	0-15	20.50	0.008	0.047	0.0008	0.002	1.77	0.02	0.07	0.483	0.02	0.006	0.084	0.008
590	PL	M	0-15	14.90	0.008	0.052	0.0031	0.003	3.67	0.02	0.04	0.924	0.02	0.009	0.054	0.008
590	PL	L	0-15	15.70	0.008	0.050	0.0049	0.006	5.48	0.02	0.04	0.935	0.02	0.010	0.063	0.008
591	PL	U	0-15	16.40	0.008	0.042	0.0052	0.002	3.78	0.02	0.04	1.030	0.04	0.017	0.070	0.008
591	PL	M	0-15	22.00	0.008	0.038	0.0015	0.004	10.30	0.02	0.05	1.670	0.05	0.014	0.074	0.008
591	PL	L	0-15	25.50	0.016	0.018	0.0018	0.004	13.50	0.02	0.04	2.040	0.03	0.028	0.094	0.008
592	PL	U	0-15	17.00	0.008	0.035	0.0019	0.007	8.03	0.02	0.08	0.491	0.04	0.005	0.087	0.008
592	PL	M	0-15	17.80	0.008	0.040	0.0011	0.005	8.10	0.02	0.05	0.557	0.04	0.008	0.088	0.008
592	PL	L	0-15	19.60	0.016	0.045	0.0020	0.005	9.10	0.02	0.08	0.678	0.07	0.005	0.084	0.008
593	PL	U	0-15	18.50	0.008	0.045	0.0058	0.004	9.80	0.04	0.08	1.510	0.03	0.016	0.070	0.020
593	PL	M	0-15	14.60	0.008	0.048	0.0022	0.002	8.70	0.02	0.06	1.220	0.03	0.012	0.081	0.008
593	PL	L	0-15	17.50	0.008	0.058	0.0038	0.004	6.63	0.02	0.04	0.874	0.04	0.017	0.070	0.011
594	PL	U	0-15	35.60	0.008	0.049	0.0087	0.002	1.36	0.02	0.04	0.548	0.02	0.013	0.053	0.038
594	PL	M	0-15	34.80	0.008	0.068	0.0067	0.002	2.38	0.02	0.04	0.605	0.07	0.027	0.064	0.008
594	PL	L	0-15	41.90	0.008	0.072	0.0081	0.004	2.33	0.02	0.06	0.542	0.02	0.025	0.047	0.026
595	PL	U	0-15	24.60	0.008	0.046	0.0135	0.004	5.93	0.04	0.08	1.290	0.03	0.013	0.066	0.027
595	PL	M	0-15	27.60	0.008	0.049	0.0234	0.013	12.00	0.02	0.04	1.100	0.04	0.011	0.051	0.025
595	PL	L	0-15	24.50	0.008	0.044	0.0122	0.006	7.03	0.02	0.04	0.880	0.04	0.009	0.046	0.011
599	PL	U	0-15	20.20	0.016	0.058	0.0093	0.004	5.63	0.07	0.08	1.250	0.03	0.015	0.078	0.024
599	PL	M	0-15	14.80	0.008	0.059	0.0059	0.005	2.90	0.10	0.08	1.680	0.05	0.025	0.118	0.016
599	PL	L	0-15	19.70	0.016	0.051	0.0069	0.004	5.18	0.04	0.08	1.460	0.03	0.024	0.095	0.016
			<b>Mean</b>	<b>22.46</b>	<b>0.0092</b>	<b>0.05</b>	<b>0.0051</b>	<b>0.0039</b>	<b>6.43</b>	<b>0.03</b>	<b>0.06</b>	<b>1.07</b>	<b>0.03</b>	<b>0.01</b>	<b>0.08</b>	<b>0.01</b>
			<b>Max</b>	<b>41.90</b>	<b>0.0160</b>	<b>0.07</b>	<b>0.0234</b>	<b>0.0130</b>	<b>16.30</b>	<b>0.10</b>	<b>0.08</b>	<b>2.04</b>	<b>0.07</b>	<b>0.03</b>	<b>0.14</b>	<b>0.04</b>
			<b>Min</b>	<b>14.60</b>	<b>0.0080</b>	<b>0.02</b>	<b>0.0008</b>	<b>0.0020</b>	<b>0.99</b>	<b>0.02</b>	<b>0.04</b>	<b>0.48</b>	<b>0.02</b>	<b>0.01</b>	<b>0.05</b>	<b>0.01</b>
			<b>SD</b>	<b>6.83</b>	<b>0.0029</b>	<b>0.01</b>	<b>0.0051</b>	<b>0.0023</b>	<b>4.04</b>	<b>0.02</b>	<b>0.02</b>	<b>0.41</b>	<b>0.01</b>	<b>0.01</b>	<b>0.02</b>	<b>0.01</b>
			<b>CV (%)</b>	<b>30.39</b>	<b>31.53</b>	<b>24.79</b>	<b>100.74</b>	<b>59.08</b>	<b>62.77</b>	<b>67.90</b>	<b>30.17</b>	<b>38.50</b>	<b>44.70</b>	<b>49.79</b>	<b>30.57</b>	<b>61.80</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Sulphur <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Thallium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Tin <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Titanium <sup>2</sup> (mg/kg) (0.0008) <sup>5</sup>	Vanadium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Zinc <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Antimony <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Arsenic <sup>3</sup> (mg/kg) (0.04) <sup>5</sup>	Boron <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>	Selenium <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Cobalt <sup>3</sup> (mg/kg) (0.003) <sup>5</sup>	Copper <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Lead <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>
615	MB	U	0-15	21.20	0.008	0.070	0.0172	0.026	16.10	0.06	0.04	1.840	0.04	0.024	0.153	0.008
615	MB	M	0-15	19.20	0.008	0.054	0.0081	0.002	3.00	0.04	0.04	0.669	0.02	0.040	0.079	0.008
615	MB	L	0-15	45.80	0.040	0.061	0.0083	0.010	14.70	0.07	0.08	2.120	0.03	0.015	0.098	0.016
			<b>Mean</b>	<b>28.73</b>	<b>0.0187</b>	<b>0.06</b>	<b>0.0112</b>	<b>0.0127</b>	<b>11.27</b>	<b>0.06</b>	<b>0.05</b>	<b>1.54</b>	<b>0.03</b>	<b>0.03</b>	<b>0.11</b>	<b>0.01</b>
			<b>Max</b>	<b>45.80</b>	<b>0.0400</b>	<b>0.07</b>	<b>0.0172</b>	<b>0.0260</b>	<b>16.10</b>	<b>0.07</b>	<b>0.08</b>	<b>2.12</b>	<b>0.04</b>	<b>0.04</b>	<b>0.15</b>	<b>0.02</b>
			<b>Min</b>	<b>19.20</b>	<b>0.0080</b>	<b>0.05</b>	<b>0.0081</b>	<b>0.0020</b>	<b>3.00</b>	<b>0.04</b>	<b>0.04</b>	<b>0.67</b>	<b>0.02</b>	<b>0.02</b>	<b>0.08</b>	<b>0.01</b>
			<b>SD</b>	<b>14.81</b>	<b>0.0185</b>	<b>0.01</b>	<b>0.0052</b>	<b>0.0122</b>	<b>7.19</b>	<b>0.02</b>	<b>0.02</b>	<b>0.77</b>	<b>0.01</b>	<b>0.01</b>	<b>0.04</b>	<b>0.00</b>
			<b>CV (%)</b>	<b>51.56</b>	<b>98.97</b>	<b>13.01</b>	<b>46.40</b>	<b>96.48</b>	<b>63.85</b>	<b>26.96</b>	<b>43.30</b>	<b>49.89</b>	<b>33.33</b>	<b>48.08</b>	<b>34.94</b>	<b>43.30</b>
678	BT	U	0-15	23.80	0.008	0.058	0.0008	0.002	3.24	0.02	0.04	0.793	0.05	0.009	0.033	0.021
678	BT	M	0-15	30.80	0.008	0.067	0.0119	0.003	6.06	0.02	0.04	0.888	0.09	0.022	0.028	0.008
678	BT	L	0-15	28.90	0.008	0.047	0.0033	0.002	8.61	0.02	0.04	1.490	0.03	0.009	0.023	0.014
680	BT	U	0-15	14.10	0.008	0.074	0.0057	0.003	0.85	0.02	0.04	0.448	0.06	0.012	0.029	0.012
680	BT	M	0-15	14.50	0.008	0.073	0.0074	0.005	1.52	0.02	0.04	0.726	0.02	0.010	0.024	0.008
680	BT	L	0-15	15.60	0.008	0.061	0.0100	0.004	2.99	0.02	0.04	0.922	0.02	0.018	0.037	0.008
681	BT	U	0-15	11.40	0.008	0.062	0.0029	0.002	1.41	0.02	0.06	0.816	0.06	0.039	0.054	0.008
681	BT	M	0-15	12.00	0.008	0.077	0.0030	0.002	0.66	0.02	0.04	0.508	0.02	0.010	0.021	0.008
681	BT	L	0-15	12.40	0.008	0.060	0.0025	0.002	2.29	0.03	0.04	0.910	0.03	0.017	0.027	0.008
684	BT	U	0-15	13.40	0.008	0.055	0.0018	0.002	0.61	0.02	0.04	0.294	0.06	0.011	0.050	0.008
684	BT	M	0-15	17.70	0.008	0.065	0.0041	0.002	1.47	0.02	0.04	0.511	0.03	0.034	0.044	0.008
684	BT	L	0-15	49.80	0.040	0.150	0.0190	0.012	17.10	0.02	0.04	0.767	0.02	0.019	0.030	0.008
687	BT	U	0-15	16.90	0.016	0.110	0.0082	0.008	1.10	0.02	0.05	0.368	0.02	0.024	0.056	0.008
687	BT	M	0-15	19.60	0.016	0.059	0.0076	0.008	1.64	0.02	0.07	0.510	0.02	0.015	0.060	0.008
687	BT	L	0-15	24.20	0.008	0.066	0.0033	0.007	2.11	0.02	0.14	1.050	0.02	0.026	0.062	0.031
688	BT	U	0-15	39.30	0.016	0.100	0.0268	0.004	14.90	0.02	0.04	1.240	0.02	0.004	0.050	0.008
688	BT	M	0-15	18.40	0.008	0.063	0.0222	0.003	8.01	0.02	0.12	1.260	0.02	0.012	0.058	0.016
688	BT	L	0-15	18.00	0.008	0.060	0.0204	0.011	10.40	0.02	0.07	1.160	0.02	0.011	0.043	0.008
692	BT	U	0-15	25.20	0.016	0.041	0.0068	0.004	3.83	0.04	0.08	1.230	0.03	0.010	0.103	0.020
692	BT	M	0-15	30.60	0.040	0.044	0.0078	0.010	1.49	0.04	0.08	0.853	0.03	0.011	0.051	0.016
692	BT	L	0-15	27.60	0.035	0.042	0.0196	0.004	3.96	0.04	0.10	0.838	0.03	0.017	0.040	0.020
703	BT	U	0-15	14.70	0.008	0.090	0.0039	0.002	0.35	0.02	0.06	0.371	0.02	0.020	0.050	0.023
703	BT	M	0-15	15.10	0.016	0.099	0.0081	0.004	0.20	0.02	0.08	0.322	0.02	0.023	0.038	0.012
703	BT	L	0-15	67.40	0.040	0.030	0.0210	0.170	15.60	0.04	0.08	0.714	0.03	0.011	0.106	0.020
			<b>Mean</b>	<b>23.39</b>	<b>0.0148</b>	<b>0.07</b>	<b>0.0095</b>	<b>0.0115</b>	<b>4.60</b>	<b>0.02</b>	<b>0.06</b>	<b>0.79</b>	<b>0.03</b>	<b>0.02</b>	<b>0.05</b>	<b>0.01</b>
			<b>Max</b>	<b>67.40</b>	<b>0.0400</b>	<b>0.15</b>	<b>0.0268</b>	<b>0.1700</b>	<b>17.10</b>	<b>0.04</b>	<b>0.14</b>	<b>1.49</b>	<b>0.09</b>	<b>0.04</b>	<b>0.11</b>	<b>0.03</b>
			<b>Min</b>	<b>11.40</b>	<b>0.0080</b>	<b>0.03</b>	<b>0.0008</b>	<b>0.0020</b>	<b>0.20</b>	<b>0.02</b>	<b>0.04</b>	<b>0.29</b>	<b>0.02</b>	<b>0.00</b>	<b>0.02</b>	<b>0.01</b>
			<b>SD</b>	<b>13.28</b>	<b>0.0114</b>	<b>0.03</b>	<b>0.0077</b>	<b>0.0339</b>	<b>5.14</b>	<b>0.01</b>	<b>0.03</b>	<b>0.33</b>	<b>0.02</b>	<b>0.01</b>	<b>0.02</b>	<b>0.01</b>
			<b>CV (%)</b>	<b>56.75</b>	<b>77.39</b>	<b>37.75</b>	<b>80.71</b>	<b>294.78</b>	<b>111.67</b>	<b>32.41</b>	<b>46.01</b>	<b>42.02</b>	<b>57.38</b>	<b>50.99</b>	<b>46.79</b>	<b>50.72</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Sulphur <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Thallium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Tin <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Titanium <sup>2</sup> (mg/kg) (0.0008) <sup>5</sup>	Vanadium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Zinc <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Antimony <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Arsenic <sup>3</sup> (mg/kg) (0.04) <sup>5</sup>	Boron <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>	Selenium <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Cobalt <sup>3</sup> (mg/kg) (0.003) <sup>5</sup>	Copper <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Lead <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>
727	AP	U	0-15	30.40	0.016	0.071	0.0062	0.004	10.20	0.04	0.08	1.320	0.04	0.007	0.066	0.020
727	AP	M	0-15	44.80	0.040	0.030	0.0300	0.034	9.00	0.02	0.04	1.440	0.02	0.007	0.045	0.008
727	AP	L	0-15	44.10	0.016	0.060	0.0241	0.014	11.00	0.04	0.08	1.380	0.03	0.017	0.052	0.020
728	AP	U	0-15	15.60	0.008	0.073	0.0275	0.012	2.31	0.02	0.08	0.959	0.03	0.017	0.045	0.013
728	AP	M	0-15	24.60	0.040	0.080	0.0140	0.014	5.78	0.02	0.05	1.860	0.02	0.008	0.060	0.015
728	AP	L	0-15	30.20	0.008	0.057	0.0555	0.047	22.70	0.02	0.07	2.320	0.03	0.007	0.096	0.015
730	AP	U	0-15	18.10	0.040	0.066	0.0040	0.014	0.53	0.02	0.04	0.287	0.02	0.005	0.125	0.008
730	AP	M	0-15	18.90	0.016	0.059	0.0097	0.008	2.17	0.02	0.15	0.645	0.03	0.019	0.068	0.034
730	AP	L	0-15	16.50	0.016	0.081	0.0038	0.006	4.60	0.02	0.10	1.360	0.03	0.018	0.065	0.023
738	AP	U	0-15	29.00	0.016	0.069	0.0140	0.005	5.31	0.02	0.06	0.801	0.02	0.021	0.077	0.008
738	AP	M	0-15	22.80	0.016	0.070	0.0201	0.011	6.99	0.02	0.09	0.755	0.02	0.020	0.065	0.008
738	AP	L	0-15	19.90	0.016	0.081	0.0082	0.004	5.66	0.02	0.08	0.911	0.02	0.016	0.062	0.008
739	AP	U	0-15	16.40	0.040	0.120	0.0045	0.010	3.92	0.02	0.10	0.482	0.03	0.020	0.044	0.013
739	AP	M	0-15	13.90	0.016	0.092	0.0041	0.005	1.66	0.02	0.06	0.428	0.02	0.010	0.048	0.008
739	AP	L	0-15	16.30	0.040	0.110	0.0075	0.010	3.12	0.02	0.06	0.574	0.02	0.019	0.060	0.019
740	AP	U	0-15	27.80	0.040	0.076	0.0057	0.010	1.25	0.02	0.10	0.670	0.02	0.021	0.073	0.015
740	AP	M	0-15	33.00	0.016	0.053	0.0084	0.004	5.33	0.02	0.06	1.320	0.02	0.011	0.085	0.008
740	AP	L	0-15	711.00	0.016	0.069	0.0072	0.154	7.22	0.02	0.10	1.290	0.03	0.014	0.148	0.008
743	AP	U	0-15	13.00	0.016	0.072	0.0020	0.011	1.06	0.02	0.04	0.463	0.02	0.005	0.115	0.008
743	AP	M	0-15	20.20	0.040	0.049	0.0054	0.010	3.51	0.02	0.07	0.672	0.03	0.010	0.058	0.008
743	AP	L	0-15	20.70	0.016	0.058	0.0110	0.004	3.59	0.02	0.20	0.620	0.04	0.028	0.084	0.068
744	AP	U	0-15	19.80	0.016	0.051	0.0085	0.004	1.49	0.02	0.09	0.817	0.02	0.008	0.040	0.008
744	AP	M	0-15	19.90	0.008	0.048	0.0190	0.011	5.37	0.02	0.05	1.070	0.02	0.007	0.047	0.008
744	AP	L	0-15	24.00	0.016	0.037	0.0174	0.009	7.38	0.02	0.13	1.060	0.02	0.020	0.076	0.040
746	AP	U	0-15	16.90	0.040	0.030	0.0040	0.010	2.09	0.02	0.06	0.843	0.02	0.004	0.117	0.008
746	AP	M	0-15	16.90	0.016	0.061	0.0092	0.004	4.26	0.02	0.15	1.030	0.02	0.010	0.069	0.044
746	AP	L	0-15	20.20	0.016	0.048	0.0188	0.009	5.09	0.02	0.05	1.490	0.02	0.005	0.069	0.008
			<b>Mean</b>	<b>48.33</b>	<b>0.0222</b>	<b>0.07</b>	<b>0.0130</b>	<b>0.0162</b>	<b>5.28</b>	<b>0.02</b>	<b>0.08</b>	<b>1.00</b>	<b>0.02</b>	<b>0.01</b>	<b>0.07</b>	<b>0.02</b>
			<b>Max</b>	<b>711.00</b>	<b>0.0400</b>	<b>0.12</b>	<b>0.0555</b>	<b>0.1540</b>	<b>22.70</b>	<b>0.04</b>	<b>0.20</b>	<b>2.32</b>	<b>0.04</b>	<b>0.03</b>	<b>0.15</b>	<b>0.07</b>
			<b>Min</b>	<b>13.00</b>	<b>0.0080</b>	<b>0.03</b>	<b>0.0020</b>	<b>0.0040</b>	<b>0.53</b>	<b>0.02</b>	<b>0.04</b>	<b>0.29</b>	<b>0.02</b>	<b>0.00</b>	<b>0.04</b>	<b>0.01</b>
			<b>SD</b>	<b>132.69</b>	<b>0.0120</b>	<b>0.02</b>	<b>0.0114</b>	<b>0.0291</b>	<b>4.44</b>	<b>0.01</b>	<b>0.04</b>	<b>0.47</b>	<b>0.01</b>	<b>0.01</b>	<b>0.03</b>	<b>0.01</b>
			<b>CV (%)</b>	<b>274.54</b>	<b>54.08</b>	<b>31.97</b>	<b>88.32</b>	<b>179.23</b>	<b>84.06</b>	<b>24.85</b>	<b>46.06</b>	<b>47.12</b>	<b>26.20</b>	<b>50.43</b>	<b>37.26</b>	<b>86.13</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3. Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.**

Site #	Eco-region	Slope Position	Depth (cm)	Sulphur <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Thallium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Tin <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Titanium <sup>2</sup> (mg/kg) (0.0008) <sup>5</sup>	Vanadium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Zinc <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Antimony <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Arsenic <sup>3</sup> (mg/kg) (0.04) <sup>5</sup>	Boron <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>	Selenium <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Cobalt <sup>3</sup> (mg/kg) (0.003) <sup>5</sup>	Copper <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Lead <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>
769	MM	U	0-15	36.00	0.040	0.030	0.0140	0.010	2.00	0.02	0.10	0.720	0.02	0.028	0.053	0.016
769	MM	M	0-15	28.30	0.008	0.089	0.0924	0.025	4.56	0.02	0.05	0.740	0.02	0.025	0.039	0.008
769	MM	L	0-15	34.20	0.040	0.110	0.1050	0.030	5.43	0.02	0.09	0.837	0.02	0.033	0.046	0.008
781	MM	U	0-15	34.40	0.040	0.074	0.0533	0.034	3.13	0.02	0.07	0.945	0.02	0.029	0.062	0.008
781	MM	M	0-15	37.20	0.050	0.100	0.0482	0.040	2.85	0.02	0.08	1.010	0.03	0.022	0.071	0.008
781	MM	L	0-15	41.00	0.040	0.093	0.0330	0.023	2.87	0.02	0.08	1.030	0.05	0.035	0.061	0.008
786	MM	U	0-15	12.80	0.008	0.079	0.0018	0.003	0.84	0.02	0.07	0.706	0.03	0.007	0.109	0.014
786	MM	M	0-15	9.09	0.008	0.070	0.0019	0.008	0.70	0.02	0.10	0.680	0.03	0.008	0.078	0.016
786	MM	L	0-15	15.70	0.040	0.081	0.0200	0.010	1.35	0.02	0.06	0.380	0.02	0.014	0.055	0.008
791	MM	U	0-15	13.30	0.008	0.081	0.0052	0.004	2.02	0.02	0.09	0.731	0.02	0.015	0.089	0.015
791	MM	M	0-15	11.20	0.008	0.065	0.0015	0.012	1.41	0.02	0.04	0.485	0.02	0.008	0.157	0.008
791	MM	L	0-15	15.90	0.008	0.026	0.0087	0.002	5.38	0.02	0.11	0.818	0.02	0.035	0.099	0.016
793	MM	U	0-15	10.30	0.008	0.069	0.0008	0.017	1.14	0.02	0.09	0.796	0.02	0.018	0.076	0.008
793	MM	M	0-15	8.97	0.008	0.062	0.0009	0.017	0.97	0.02	0.10	0.680	0.02	0.018	0.084	0.012
793	MM	L	0-15	10.90	0.008	0.066	0.0014	0.010	1.30	0.02	0.05	0.873	0.03	0.006	0.086	0.008
			<b>Mean</b>	<b>21.28</b>	<b>0.0215</b>	<b>0.07</b>	<b>0.0259</b>	<b>0.0163</b>	<b>2.40</b>	<b>0.02</b>	<b>0.08</b>	<b>0.76</b>	<b>0.02</b>	<b>0.02</b>	<b>0.08</b>	<b>0.01</b>
			<b>Max</b>	<b>41.00</b>	<b>0.0500</b>	<b>0.11</b>	<b>0.1050</b>	<b>0.0400</b>	<b>5.43</b>	<b>0.02</b>	<b>0.11</b>	<b>1.03</b>	<b>0.05</b>	<b>0.04</b>	<b>0.16</b>	<b>0.02</b>
			<b>Min</b>	<b>8.97</b>	<b>0.0080</b>	<b>0.03</b>	<b>0.0008</b>	<b>0.0020</b>	<b>0.70</b>	<b>0.02</b>	<b>0.04</b>	<b>0.38</b>	<b>0.02</b>	<b>0.01</b>	<b>0.04</b>	<b>0.01</b>
			<b>SD</b>	<b>12.17</b>	<b>0.0172</b>	<b>0.02</b>	<b>0.0343</b>	<b>0.0117</b>	<b>1.61</b>	<b>0.00</b>	<b>0.02</b>	<b>0.18</b>	<b>0.01</b>	<b>0.01</b>	<b>0.03</b>	<b>0.00</b>
			<b>CV (%)</b>	<b>57.17</b>	<b>80.34</b>	<b>31.14</b>	<b>132.63</b>	<b>71.76</b>	<b>67.09</b>	<b>0.00</b>	<b>27.12</b>	<b>23.04</b>	<b>33.80</b>	<b>51.84</b>	<b>37.95</b>	<b>33.49</b>
798	FG	U	0-15	13.80	0.008	0.056	0.0088	0.003	2.66	0.02	0.11	1.520	0.03	0.011	0.067	0.019
798	FG	M	0-15	12.80	0.008	0.068	0.0036	0.007	2.55	0.02	0.06	1.980	0.03	0.003	0.055	0.016
798	FG	L	0-15	14.20	0.008	0.061	0.0139	0.002	3.33	0.02	0.06	1.390	0.04	0.006	0.110	0.010
800	FG	U	0-15	12.40	0.040	0.055	0.0040	0.010	2.26	0.02	0.07	1.060	0.02	0.003	0.087	0.018
800	FG	M	0-15	12.70	0.058	0.059	0.0040	0.010	2.27	0.02	0.16	1.060	0.09	0.015	0.042	0.032
800	FG	L	0-15	13.50	0.040	0.081	0.0040	0.010	2.42	0.02	0.08	1.170	0.04	0.008	0.044	0.008
			<b>Mean</b>	<b>13.23</b>	<b>0.0270</b>	<b>0.06</b>	<b>0.0064</b>	<b>0.0070</b>	<b>2.58</b>	<b>0.02</b>	<b>0.09</b>	<b>1.36</b>	<b>0.04</b>	<b>0.01</b>	<b>0.07</b>	<b>0.02</b>
			<b>Max</b>	<b>14.20</b>	<b>0.0580</b>	<b>0.08</b>	<b>0.0139</b>	<b>0.0100</b>	<b>3.33</b>	<b>0.02</b>	<b>0.16</b>	<b>1.98</b>	<b>0.09</b>	<b>0.02</b>	<b>0.11</b>	<b>0.03</b>
			<b>Min</b>	<b>12.40</b>	<b>0.0080</b>	<b>0.06</b>	<b>0.0036</b>	<b>0.0020</b>	<b>2.26</b>	<b>0.02</b>	<b>0.06</b>	<b>1.06</b>	<b>0.02</b>	<b>0.00</b>	<b>0.04</b>	<b>0.01</b>
			<b>SD</b>	<b>0.71</b>	<b>0.0218</b>	<b>0.01</b>	<b>0.0042</b>	<b>0.0037</b>	<b>0.40</b>	<b>0.00</b>	<b>0.04</b>	<b>0.35</b>	<b>0.02</b>	<b>0.00</b>	<b>0.03</b>	<b>0.01</b>
			<b>CV (%)</b>	<b>5.34</b>	<b>80.84</b>	<b>15.49</b>	<b>65.40</b>	<b>52.68</b>	<b>15.43</b>	<b>0.00</b>	<b>43.32</b>	<b>25.97</b>	<b>59.60</b>	<b>61.55</b>	<b>39.45</b>	<b>49.49</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3. Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.**

Site #	Eco-region	Slope Position	Depth (cm)	Sulphur <sup>2</sup> (mg/kg) (0.02) <sup>5</sup>	Thallium <sup>2</sup> (mg/kg) (0.008) <sup>5</sup>	Tin <sup>2</sup> (mg/kg) (0.006) <sup>5</sup>	Titanium <sup>2</sup> (mg/kg) (0.0008) <sup>5</sup>	Vanadium <sup>2</sup> (mg/kg) (0.002) <sup>5</sup>	Zinc <sup>2</sup> (mg/kg) (0.001) <sup>5</sup>	Antimony <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Arsenic <sup>3</sup> (mg/kg) (0.04) <sup>5</sup>	Boron <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>	Selenium <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Cobalt <sup>3</sup> (mg/kg) (0.003) <sup>5</sup>	Copper <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Lead <sup>3</sup> (mg/kg) (0.008) <sup>5</sup>
804	MG	U	0-15	10.60	0.008	0.063	0.0013	0.002	0.94	0.02	0.08	0.883	0.04	0.010	0.112	0.015
804	MG	M	0-15	10.70	0.008	0.061	0.0008	0.004	0.53	0.02	0.06	0.768	0.02	0.010	0.103	0.010
804	MG	L	0-15	13.80	0.008	0.065	0.0045	0.004	1.74	0.02	0.09	1.070	0.06	0.010	0.083	0.008
806	MG	U	0-15	15.30	0.008	0.051	0.0008	0.004	0.48	0.02	0.10	0.666	0.03	0.006	0.188	0.010
806	MG	M	0-15	12.50	0.008	0.056	0.0018	0.002	1.00	0.02	0.24	0.630	0.04	0.028	0.076	0.041
806	MG	L	0-15	17.40	0.008	0.063	0.0047	0.002	1.66	0.02	0.11	0.715	0.05	0.020	0.061	0.015
809	MG	U	0-15	10.50	0.008	0.064	0.0011	0.042	0.49	0.02	0.07	0.739	0.04	0.003	0.161	0.008
809	MG	M	0-15	10.60	0.016	0.050	0.0020	0.004	0.55	0.02	0.09	0.886	0.04	0.008	0.123	0.022
809	MG	L	0-15	10.90	0.008	0.061	0.0049	0.005	1.06	0.02	0.07	0.706	0.06	0.006	0.080	0.012
812	MG	U	0-15	18.20	0.008	0.051	0.0008	0.002	0.37	0.02	0.04	0.604	0.02	0.007	0.163	0.019
812	MG	M	0-15	17.70	0.008	0.051	0.0008	0.004	0.51	0.02	0.05	0.685	0.02	0.004	0.152	0.016
812	MG	L	0-15	20.10	0.008	0.052	0.0008	0.015	0.61	0.02	0.05	0.754	0.05	0.006	0.224	0.008
815	MG	U	0-15	10.20	0.008	0.060	0.0008	0.034	0.46	0.02	0.06	0.814	0.03	0.005	0.206	0.008
815	MG	M	0-15	9.46	0.008	0.062	0.0008	0.041	0.45	0.02	0.10	0.746	0.06	0.008	0.157	0.012
815	MG	L	0-15	17.60	0.016	0.058	0.0044	0.029	4.02	0.02	0.10	0.948	0.09	0.017	0.151	0.012
823	MG	U	0-15	25.60	0.008	0.058	0.0016	0.046	0.89	0.02	0.07	0.605	0.07	0.012	0.195	0.012
823	MG	M	0-15	21.50	0.008	0.063	0.0038	0.038	1.39	0.02	0.06	0.666	0.06	0.012	0.165	0.008
823	MG	L	0-15	21.00	0.008	0.058	0.0045	0.022	1.53	0.02	0.12	0.721	0.07	0.015	0.140	0.033
1828	MG	U	0-15	7.52	0.008	0.058	0.0015	0.024	0.15	0.02	0.06	0.630	0.04	0.004	0.156	0.016
1828	MG	M	0-15	10.60	0.008	0.062	0.0037	0.015	1.06	0.02	0.08	0.788	0.07	0.007	0.106	0.022
1828	MG	L	0-15	9.14	0.008	0.060	0.0025	0.022	0.49	0.02	0.10	0.863	0.07	0.003	0.135	0.034
2828	MG	U	0-15	15.30	0.008	0.046	0.0035	0.007	0.64	0.02	0.09	0.546	0.06	0.011	0.091	0.025
2828	MG	M	0-15	15.10	0.008	0.056	0.0024	0.009	0.70	0.02	0.07	0.480	0.03	0.003	0.091	0.011
2828	MG	L	0-15	14.80	0.008	0.051	0.0028	0.012	0.72	0.02	0.06	0.547	0.05	0.003	0.123	0.016
			<b>Mean</b>	<b>14.42</b>	<b>0.0087</b>	<b>0.06</b>	<b>0.0024</b>	<b>0.0162</b>	<b>0.93</b>	<b>0.02</b>	<b>0.08</b>	<b>0.73</b>	<b>0.05</b>	<b>0.01</b>	<b>0.14</b>	<b>0.02</b>
			<b>Max</b>	<b>25.60</b>	<b>0.0160</b>	<b>0.07</b>	<b>0.0049</b>	<b>0.0460</b>	<b>4.02</b>	<b>0.02</b>	<b>0.24</b>	<b>1.07</b>	<b>0.09</b>	<b>0.03</b>	<b>0.22</b>	<b>0.04</b>
			<b>Min</b>	<b>7.52</b>	<b>0.0080</b>	<b>0.05</b>	<b>0.0008</b>	<b>0.0020</b>	<b>0.15</b>	<b>0.02</b>	<b>0.04</b>	<b>0.48</b>	<b>0.02</b>	<b>0.00</b>	<b>0.06</b>	<b>0.01</b>
			<b>SD</b>	<b>4.68</b>	<b>0.0023</b>	<b>0.01</b>	<b>0.0015</b>	<b>0.0149</b>	<b>0.78</b>	<b>0.00</b>	<b>0.04</b>	<b>0.14</b>	<b>0.02</b>	<b>0.01</b>	<b>0.04</b>	<b>0.01</b>
			<b>CV (%)</b>	<b>32.47</b>	<b>26.06</b>	<b>9.32</b>	<b>63.84</b>	<b>91.75</b>	<b>83.72</b>	<b>0.00</b>	<b>46.60</b>	<b>18.87</b>	<b>38.41</b>	<b>67.08</b>	<b>32.55</b>	<b>55.21</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Molybdenum <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Nickel <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Silicon <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Zinc <sup>3</sup> (mg/kg) (0.002) <sup>5</sup>	Selenium <sup>4</sup> (mg/kg) (0.1) <sup>5</sup>
586	PL	U	0-15	0.015	0.102	76.6	0.116	0.7
586	PL	M	0-15	0.022	0.142	195.0	0.246	1.0
586	PL	L	0-15	0.012	0.102	86.5	0.118	0.7
588	PL	U	0-15	0.036	0.050	81.2	0.054	0.4
588	PL	M	0-15	0.057	0.072	73.7	0.045	0.4
588	PL	L	0-15	0.012	0.067	72.4	0.056	0.3
590	PL	U	0-15	0.058	0.027	41.0	0.027	0.2
590	PL	M	0-15	0.009	0.070	124.0	0.124	0.2
590	PL	L	0-15	0.004	0.067	88.6	0.080	0.2
591	PL	U	0-15	0.004	0.110	93.9	0.060	0.5
591	PL	M	0-15	0.026	0.138	49.7	0.037	0.8
591	PL	L	0-15	0.020	0.205	149.0	0.108	0.8
592	PL	U	0-15	0.080	0.088	116.0	0.061	0.7
592	PL	M	0-15	0.073	0.091	127.0	0.051	0.8
592	PL	L	0-15	0.081	0.089	139.0	0.045	0.8
593	PL	U	0-15	0.008	0.072	256.0	0.215	1.0
593	PL	M	0-15	0.005	0.101	147.0	0.111	0.8
593	PL	L	0-15	0.008	0.075	115.0	0.061	0.5
594	PL	U	0-15	0.004	0.038	62.2	0.035	0.4
594	PL	M	0-15	0.004	0.035	357.0	0.314	0.3
594	PL	L	0-15	0.004	0.058	71.8	0.039	0.3
595	PL	U	0-15	0.008	0.074	154.0	0.092	1.0
595	PL	M	0-15	0.007	0.058	125.0	0.121	0.8
595	PL	L	0-15	0.004	0.067	115.0	0.089	0.7
599	PL	U	0-15	0.008	0.080	125.0	0.073	1.2
599	PL	M	0-15	0.008	0.055	858.0	0.623	1.4
599	PL	L	0-15	0.008	0.094	357.0	0.303	1.6
			<b>Mean</b>	<b>0.02</b>	<b>0.08</b>	<b>157.65</b>	<b>0.12</b>	<b>0.69</b>
			<b>Max</b>	<b>0.08</b>	<b>0.21</b>	<b>858.00</b>	<b>0.62</b>	<b>1.60</b>
			<b>Min</b>	<b>0.00</b>	<b>0.03</b>	<b>41.00</b>	<b>0.03</b>	<b>0.20</b>
			<b>SD</b>	<b>0.02</b>	<b>0.04</b>	<b>160.95</b>	<b>0.13</b>	<b>0.36</b>
			<b>CV (%)</b>	<b>115.32</b>	<b>44.69</b>	<b>102.09</b>	<b>103.75</b>	<b>53.20</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)



**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Molybdenum <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Nickel <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Silicon <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Zinc <sup>3</sup> (mg/kg) (0.002) <sup>5</sup>	Selenium <sup>4</sup> (mg/kg) (0.1) <sup>5</sup>
615	MB	U	0-15	0.153	0.044	223.0	0.394	0.3
615	MB	M	0-15	0.004	0.040	428.0	0.495	0.4
615	MB	L	0-15	0.044	0.108	52.6	0.099	0.8
			<b>Mean</b>	<b>0.07</b>	<b>0.06</b>	<b>234.53</b>	<b>0.33</b>	<b>0.50</b>
			<b>Max</b>	<b>0.15</b>	<b>0.11</b>	<b>428.00</b>	<b>0.50</b>	<b>0.80</b>
			<b>Min</b>	<b>0.00</b>	<b>0.04</b>	<b>52.60</b>	<b>0.10</b>	<b>0.30</b>
			<b>SD</b>	<b>0.08</b>	<b>0.04</b>	<b>187.97</b>	<b>0.21</b>	<b>0.26</b>
			<b>CV (%)</b>	<b>115.10</b>	<b>59.62</b>	<b>80.14</b>	<b>62.48</b>	<b>52.92</b>
678	BT	U	0-15	0.004	0.042	77.4	0.055	0.5
678	BT	M	0-15	0.004	0.050	76.1	0.090	1.1
678	BT	L	0-15	0.006	0.059	108.0	0.063	0.8
680	BT	U	0-15	0.004	0.040	72.5	0.047	0.3
680	BT	M	0-15	0.004	0.052	69.9	0.042	0.3
680	BT	L	0-15	0.004	0.031	218.0	0.140	0.5
681	BT	U	0-15	0.004	0.022	418.0	0.290	0.2
681	BT	M	0-15	0.004	0.052	53.6	0.037	0.2
681	BT	L	0-15	0.004	0.038	207.0	0.126	0.3
684	BT	U	0-15	0.014	0.055	59.1	0.089	0.2
684	BT	M	0-15	0.004	0.054	246.0	0.216	0.2
684	BT	L	0-15	0.020	0.065	50.5	0.058	0.2
687	BT	U	0-15	0.008	0.071	45.8	0.039	0.1
687	BT	M	0-15	0.012	0.058	47.1	0.054	0.2
687	BT	L	0-15	0.024	0.082	227.0	0.142	0.4
688	BT	U	0-15	0.010	0.042	66.6	0.037	0.4
688	BT	M	0-15	0.010	0.070	202.0	0.159	0.4
688	BT	L	0-15	0.014	0.069	89.2	0.087	0.3
692	BT	U	0-15	0.015	0.105	89.8	0.134	0.3
692	BT	M	0-15	0.011	0.050	73.8	0.093	0.4
692	BT	L	0-15	0.011	0.056	79.5	0.078	0.5
703	BT	U	0-15	0.012	0.069	90.1	0.074	0.3
703	BT	M	0-15	0.014	0.053	110.0	0.079	0.2
703	BT	L	0-15	0.098	0.157	23.2	0.080	1.2
			<b>Mean</b>	<b>0.01</b>	<b>0.06</b>	<b>116.68</b>	<b>0.10</b>	<b>0.40</b>
			<b>Max</b>	<b>0.10</b>	<b>0.16</b>	<b>418.00</b>	<b>0.29</b>	<b>1.20</b>
			<b>Min</b>	<b>0.00</b>	<b>0.02</b>	<b>23.20</b>	<b>0.04</b>	<b>0.10</b>
			<b>SD</b>	<b>0.02</b>	<b>0.03</b>	<b>91.14</b>	<b>0.06</b>	<b>0.28</b>
			<b>CV (%)</b>	<b>144.15</b>	<b>44.72</b>	<b>78.11</b>	<b>63.35</b>	<b>69.68</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Molybdenum <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Nickel <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Silicon <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Zinc <sup>3</sup> (mg/kg) (0.002) <sup>5</sup>	Selenium <sup>4</sup> (mg/kg) (0.1) <sup>5</sup>
727	AP	U	0-15	0.028	0.079	81.8	0.101	0.7
727	AP	M	0-15	0.008	0.051	89.1	0.037	0.8
727	AP	L	0-15	0.013	0.091	82.9	0.069	0.6
728	AP	U	0-15	0.016	0.066	130.0	0.235	0.4
728	AP	M	0-15	0.016	0.054	87.1	0.083	0.5
728	AP	L	0-15	0.029	0.072	86.6	0.213	0.5
730	AP	U	0-15	0.033	0.087	11.7	0.132	0.3
730	AP	M	0-15	0.011	0.086	296.0	0.252	0.4
730	AP	L	0-15	0.034	0.086	182.0	0.169	0.4
738	AP	U	0-15	0.011	0.065	68.4	0.149	0.5
738	AP	M	0-15	0.011	0.056	109.0	0.155	0.5
738	AP	L	0-15	0.011	0.080	85.6	0.082	0.6
739	AP	U	0-15	0.016	0.112	112.0	0.149	0.2
739	AP	M	0-15	0.014	0.072	45.8	0.065	0.2
739	AP	L	0-15	0.011	0.081	66.2	0.103	0.2
740	AP	U	0-15	0.013	0.104	161.0	0.253	0.5
740	AP	M	0-15	0.017	0.068	63.8	0.208	0.4
740	AP	L	0-15	0.144	0.087	68.4	0.036	0.8
743	AP	U	0-15	0.042	0.068	30.2	0.019	0.4
743	AP	M	0-15	0.012	0.079	90.8	0.054	0.6
743	AP	L	0-15	0.015	0.117	408.0	0.381	0.7
744	AP	U	0-15	0.009	0.056	70.1	0.089	0.5
744	AP	M	0-15	0.010	0.052	68.4	0.097	0.5
744	AP	L	0-15	0.014	0.106	291.0	0.295	0.5
746	AP	U	0-15	0.022	0.056	73.3	0.172	0.5
746	AP	M	0-15	0.016	0.076	276.0	0.212	0.5
746	AP	L	0-15	0.011	0.061	112.0	0.049	0.6
			<b>Mean</b>	<b>0.02</b>	<b>0.08</b>	<b>120.27</b>	<b>0.14</b>	<b>0.49</b>
			<b>Max</b>	<b>0.14</b>	<b>0.12</b>	<b>408.00</b>	<b>0.38</b>	<b>0.80</b>
			<b>Min</b>	<b>0.01</b>	<b>0.05</b>	<b>11.70</b>	<b>0.02</b>	<b>0.20</b>
			<b>SD</b>	<b>0.03</b>	<b>0.02</b>	<b>93.11</b>	<b>0.09</b>	<b>0.16</b>
			<b>CV (%)</b>	<b>119.25</b>	<b>24.11</b>	<b>77.42</b>	<b>62.88</b>	<b>32.31</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Molybdenum <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Nickel <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Silicon <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Zinc <sup>3</sup> (mg/kg) (0.002) <sup>5</sup>	Selenium <sup>4</sup> (mg/kg) (0.1) <sup>5</sup>
769	MM	U	0-15	0.008	0.091	165.0	0.122	0.4
769	MM	M	0-15	0.009	0.064	94.9	0.205	0.3
769	MM	L	0-15	0.010	0.068	145.0	0.186	0.3
781	MM	U	0-15	0.007	0.075	107.0	0.145	0.7
781	MM	M	0-15	0.008	0.070	109.0	0.080	1.1
781	MM	L	0-15	0.008	0.086	106.0	0.092	1.4
786	MM	U	0-15	0.029	0.150	78.5	0.063	0.3
786	MM	M	0-15	0.036	0.104	135.0	0.087	0.2
786	MM	L	0-15	0.010	0.043	54.8	0.064	0.2
791	MM	U	0-15	0.012	0.094	183.0	0.125	0.2
791	MM	M	0-15	0.086	0.111	42.6	0.022	0.3
791	MM	L	0-15	0.022	0.134	236.0	0.263	0.2
793	MM	U	0-15	0.057	0.074	135.0	0.090	0.3
793	MM	M	0-15	0.053	0.076	182.0	0.146	0.2
793	MM	L	0-15	0.019	0.059	126.0	0.069	0.3
			<b>Mean</b>	<b>0.02</b>	<b>0.09</b>	<b>126.65</b>	<b>0.12</b>	<b>0.43</b>
			<b>Max</b>	<b>0.09</b>	<b>0.15</b>	<b>236.00</b>	<b>0.26</b>	<b>1.40</b>
			<b>Min</b>	<b>0.01</b>	<b>0.04</b>	<b>42.60</b>	<b>0.02</b>	<b>0.20</b>
			<b>SD</b>	<b>0.02</b>	<b>0.03</b>	<b>51.28</b>	<b>0.06</b>	<b>0.36</b>
			<b>CV (%)</b>	<b>94.53</b>	<b>33.01</b>	<b>40.49</b>	<b>54.03</b>	<b>84.72</b>
798	FG	U	0-15	0.015	0.062	171.0	0.118	0.4
798	FG	M	0-15	0.034	0.048	75.0	0.022	0.5
798	FG	L	0-15	0.016	0.056	98.2	0.079	0.5
800	FG	U	0-15	0.012	0.066	134.0	0.029	0.5
800	FG	M	0-15	0.012	0.093	279.0	0.207	0.5
800	FG	L	0-15	0.017	0.090	138.0	0.057	0.5
			<b>Mean</b>	<b>0.02</b>	<b>0.07</b>	<b>149.20</b>	<b>0.09</b>	<b>0.48</b>
			<b>Max</b>	<b>0.03</b>	<b>0.09</b>	<b>279.00</b>	<b>0.21</b>	<b>0.50</b>
			<b>Min</b>	<b>0.01</b>	<b>0.05</b>	<b>75.00</b>	<b>0.02</b>	<b>0.40</b>
			<b>SD</b>	<b>0.01</b>	<b>0.02</b>	<b>71.81</b>	<b>0.07</b>	<b>0.04</b>
			<b>CV (%)</b>	<b>46.77</b>	<b>26.54</b>	<b>48.13</b>	<b>81.02</b>	<b>8.45</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

**Appendix 3.** Results of micronutrient analysis from 42 benchmark sites across Alberta (0-15 cm depth) continued.

Site #	Eco-region	Slope Position	Depth (cm)	Molybdenum <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Nickel <sup>3</sup> (mg/kg) (0.004) <sup>5</sup>	Silicon <sup>3</sup> (mg/kg) (0.02) <sup>5</sup>	Zinc <sup>3</sup> (mg/kg) (0.002) <sup>5</sup>	Selenium <sup>4</sup> (mg/kg) (0.1) <sup>5</sup>
804	MG	U	0-15	0.015	0.130	122.0	0.088	0.3
804	MG	M	0-15	0.038	0.114	101.0	0.042	0.4
804	MG	L	0-15	0.048	0.184	98.6	0.094	0.5
806	MG	U	0-15	0.079	0.128	39.5	0.051	0.5
806	MG	M	0-15	0.019	0.154	446.0	0.470	0.5
806	MG	L	0-15	0.010	0.070	221.0	0.178	0.5
809	MG	U	0-15	0.073	0.073	63.7	0.018	0.3
809	MG	M	0-15	0.023	0.139	140.0	0.080	0.4
809	MG	L	0-15	0.021	0.070	153.0	0.092	0.3
812	MG	U	0-15	0.109	0.112	39.1	0.012	0.3
812	MG	M	0-15	0.106	0.098	42.0	0.016	0.2
812	MG	L	0-15	0.116	0.135	49.4	0.030	0.4
815	MG	U	0-15	0.050	0.086	79.9	0.034	0.4
815	MG	M	0-15	0.050	0.090	108.0	0.039	0.3
815	MG	L	0-15	0.037	0.181	139.0	0.092	0.4
823	MG	U	0-15	0.074	0.106	86.5	0.008	0.2
823	MG	M	0-15	0.080	0.123	139.0	0.024	0.3
823	MG	L	0-15	0.066	0.136	260.0	0.229	0.3
1828	MG	U	0-15	0.037	0.054	61.2	0.020	0.2
1828	MG	M	0-15	0.052	0.091	173.0	0.116	0.2
1828	MG	L	0-15	0.042	0.094	179.0	0.080	0.3
2828	MG	U	0-15	0.021	0.110	185.0	0.133	0.3
2828	MG	M	0-15	0.021	0.091	113.0	0.036	0.4
2828	MG	L	0-15	0.028	0.103	108.0	0.036	0.4
			<b>Mean</b>	<b>0.05</b>	<b>0.11</b>	<b>131.12</b>	<b>0.08</b>	<b>0.35</b>
			<b>Max</b>	<b>0.12</b>	<b>0.18</b>	<b>446.00</b>	<b>0.47</b>	<b>0.50</b>
			<b>Min</b>	<b>0.01</b>	<b>0.05</b>	<b>39.10</b>	<b>0.01</b>	<b>0.20</b>
			<b>SD</b>	<b>0.03</b>	<b>0.03</b>	<b>88.57</b>	<b>0.10</b>	<b>0.10</b>
			<b>CV (%)</b>	<b>61.29</b>	<b>29.81</b>	<b>67.55</b>	<b>117.65</b>	<b>28.25</b>

<sup>1</sup> 0.01 M Ca(NO<sub>3</sub>)<sub>2</sub> extractable

<sup>2</sup> DTPA extractable

<sup>3</sup> Hot water extractable

<sup>4</sup> Total

<sup>5</sup> Detection limit (mg/kg)

