



APPENDICES

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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APPENDIX A

Original values, means, and standard deviation for each soil parameter and field.

TOTAL CARBON (%)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	0.212	0.182	0.222	0.164
REF-1-2	0.170	0.111	0.183	0.154
REF-1-3	0.160	0.158	0.280	*0.217
REF-1-4	0.222	0.180	0.173	0.162
REF-1-5	0.234	0.202	0.164	0.156
MEAN	0.200	0.166	0.204	0.159
STDEV	0.033	0.035	0.048	0.005

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	0.151	0.128	0.140	0.149
REF-2-2	0.166	0.141	0.270	0.168
REF-2-3	0.297	0.310	0.178	0.307
REF-2-4	0.329	0.246	0.336	0.241
REF-2-5	0.288	0.197	0.292	0.249
MEAN	0.246	0.204	0.243	0.223
STDEV	0.082	0.076	0.082	0.065

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	0.535	0.220	0.265	0.178
REF-3-2	0.505	0.312	0.394	0.308
REF-3-3	0.380	0.186	0.506	0.301
REF-3-4	0.316	0.173	0.408	0.191
REF-3-5	0.490	0.260	0.455	0.264
MEAN	0.445	0.230	0.406	0.248
STDEV	0.093	0.057	0.090	0.061

* indicates outlier not included in mean or std. deviation

TOTAL CARBON (%)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	0.335	0.297	0.361	0.181
CF4-1-2	0.294	0.249	0.354	0.241
CF4-1-3	0.352	0.231	0.395	0.220
CF4-1-4	0.251	0.179	0.286	0.210
CF4-4-5	0.489	0.308	0.542	0.218
MEAN	0.344	0.253	0.388	0.214
STDEV	0.090	0.052	0.095	0.022

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	0.246	0.351	0.371	0.310
CF4-2-2	0.528	0.278	0.713	0.312
CF4-2-3	0.272	0.185	0.344	0.169
CF4-2-4	0.315	0.260	0.393	0.234
CF4-2-5	0.465	0.262	0.597	0.277
MEAN	0.365	0.267	0.484	0.260
STDEV	0.124	0.059	0.163	0.060

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	0.371	0.208	0.461	0.165
CF4-3-2	0.456	0.291	0.539	0.458
CF4-3-3	0.342	0.217	0.631	0.220
CF4-3-4	0.354	0.198	0.304	0.132
CF4-3-5	0.566	0.214	0.269	0.146
MEAN	0.418	0.226	0.441	0.224
STDEV	0.094	0.037	0.154	0.135

* indicates outlier not included in mean or std. deviation

TOTAL CARBON (%)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	0.263	0.202	0.356	0.237
CF8-1-2	0.295	0.187	0.438	0.202
CF8-1-3	0.353	0.235	0.481	0.261
CF8-1-4	0.403	0.182	0.498	0.228
CF8-1-5	0.303	0.214	0.450	0.321
MEAN	0.323	0.204	0.445	0.250
STDEV	0.055	0.022	0.055	0.045

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	0.518	0.527	0.717	0.245
CF8-2-2	0.427	0.381	0.472	0.355
CF8-2-3	0.572	0.507	0.666	0.520
CF8-2-4	0.595	0.448	0.492	0.439
CF8-2-5	0.747	0.522	0.680	0.469
MEAN	0.572	0.477	0.606	0.406
STDEV	0.118	0.062	0.115	0.108

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	0.978	0.713	0.621	0.684
CF8-3-2	0.605	0.567	0.653	0.493
CF8-3-3	0.775	0.669	0.994	0.575
CF8-3-4	0.928	0.656	0.952	0.538
CF8-3-5	0.513	0.589	0.872	0.555
MEAN	0.760	0.639	0.818	0.569
STDEV	0.201	0.060	0.172	0.071

* indicates outlier not included in mean or std. deviation

ACTIVE CARBON
(mg/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	53.31	84.01	110.46	53.31
REF-1-2	83.35	7.42	89.88	30.44
REF-1-3	41.88	0.00	98.21	65.88
REF-1-4	92.33	114.87	121.56	63.92
REF-1-5	99.19	128.75	42.69	34.85
MEAN	74.01	67.01	92.56	49.68
STDEV	25.09	60.07	30.36	16.34

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	84.17	8.89	98.05	44.65
REF-2-2	61.96	104.25	195.37	100.33
REF-2-3	231.79	185.74	142.47	142.14
REF-2-4	193.90	85.96	186.39	126.79
REF-2-5	92.82	34.04	90.05	79.43
MEAN	132.93	83.78	142.47	98.67
STDEV	75.02	68.74	48.60	38.64

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	264.45	91.84	167.78	52.33
REF-3-2	230.81	128.26	234.07	160.10
REF-3-3	207.95	28.97	339.89	131.36
REF-3-4	187.86	84.01	199.46	17.87
REF-3-5	350.18	65.88	247.30	94.95
MEAN	248.25	79.79	237.70	91.32
STDEV	63.69	36.36	65.00	57.58

* indicates outlier not included in mean or std. deviation

ACTIVE CARBON
(mg/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	167.86	242.70	249.18	74.60
CF4-1-2	105.80	37.93	198.07	86.22
CF4-1-3	166.70	45.73	155.09	51.87
CF4-1-4	83.73	60.50	206.03	109.62
CF4-4-5	224.28	107.63	290.66	97.50
MEAN	149.68	98.90	219.80	83.96
STDEV	55.81	84.82	51.80	22.16

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	97.01	175.00	203.21	97.17
CF4-2-2	381.43	169.52	438.35	211.34
CF4-2-3	141.15	85.89	170.52	73.28
CF4-2-4	189.93	105.97	214.99	137.83
CF4-2-5	284.85	148.61	364.01	127.21
MEAN	218.87	137.00	278.22	129.37
STDEV	114.57	39.41	116.43	52.39

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	153.76	94.52	289.83	122.06
CF4-3-2	225.61	153.92	322.52	*275.56
CF4-3-3	157.58	73.61	277.72	97.84
CF4-3-4	164.05	123.39	376.12	146.96
CF4-3-5	348.24	102.15	288.01	105.80
MEAN	209.85	109.52	310.84	118.16
STDEV	82.73	30.55	40.18	21.68

* indicates outlier not included in mean or std. deviation

ACTIVE CARBON
(mg/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	148.61	15.70	192.92	136.67
CF8-1-2	120.24	81.41	239.72	99.00
CF8-1-3	278.55	64.48	337.62	175.17
CF8-1-4	312.07	124.22	353.55	205.86
CF8-1-5	186.45	93.36	296.97	157.74
MEAN	209.18	75.83	284.16	154.89
STDEV	82.91	40.08	67.34	40.23

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	258.06	230.22	330.71	186.34
CF8-2-2	253.29	287.63	268.41	190.72
CF8-2-3	502.00	372.08	435.98	236.06
CF8-2-4	273.58	206.10	247.59	218.56
CF8-2-5	391.70	275.83	394.22	241.23
MEAN	335.73	274.37	335.38	214.58
STDEV	108.94	63.90	80.31	25.27

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	474.86	369.48	402.51	319.70
CF8-3-2	331.81	241.87	382.43	218.14
CF8-3-3	427.73	262.78	403.83	269.25
CF8-3-4	445.65	295.97	440.84	223.12
CF8-3-5	302.77	228.76	359.20	190.93
MEAN	396.57	279.78	397.76	244.23
STDEV	75.00	56.21	30.16	50.72

* indicates outlier not included in mean or std. deviation

TOTAL NITROGEN (%)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	0.0173	0.0137	0.0168	0.0123
REF-1-2	0.0109	0.0064	0.0129	0.0099
REF-1-3	0.0136	0.0158	0.0222	0.0194
REF-1-4	0.0196	0.0164	0.0135	0.0159
REF-1-5	0.0226	0.0260	0.0141	0.0199
MEAN	0.017	0.016	0.016	0.015
STDEV	0.005	0.007	0.004	0.004

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	0.0190	0.0173	0.0142	0.0180
REF-2-2	0.0156	0.0127	0.0227	0.0182
REF-2-3	0.0316	0.0294	0.0139	0.0265
REF-2-4	0.0326	0.0172	0.0328	0.0168
REF-2-5	0.0143	0.0052	0.0163	0.0068
MEAN	0.023	0.016	0.020	0.017
STDEV	0.009	0.009	0.008	0.007

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	0.0363	0.0082	0.0124	0.0058
REF-3-2	0.0274	0.0191	0.0277	0.0216
REF-3-3	0.0211	0.0085	0.0329	0.0118
REF-3-4	0.0217	0.0054	0.0295	0.0057
REF-3-5	0.0362	0.0115	0.0274	0.0120
MEAN	0.029	0.011	0.026	0.011
STDEV	0.007	0.005	0.008	0.006

* indicates outlier not included in mean or std. deviation

TOTAL NITROGEN (%)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	0.0264	0.0245	0.0306	0.0144
CF4-1-2	0.0214	0.0200	0.0294	0.0162
CF4-1-3	0.0306	0.0188	0.0342	0.0185
CF4-1-4	0.0224	0.0153	0.0259	0.0192
CF4-4-5	0.0448	0.0281	0.0514	0.0170
MEAN	0.029	0.021	0.034	0.017
STDEV	0.009	0.005	0.010	0.002

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	0.0266	0.0333	0.0363	0.0212
CF4-2-2	0.0398	0.0256	0.0612	0.0213
CF4-2-3	0.0227	0.0131	0.0301	0.0157
CF4-2-4	0.0299	0.0239	0.0309	0.0206
CF4-2-5	0.0352	0.0182	0.0443	0.0205
MEAN	0.031	0.023	0.041	0.020
STDEV	0.007	0.008	0.013	0.002

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	0.0330	0.0175	0.0444	0.0111
CF4-3-2	0.0351	0.0317	0.0502	*0.0483
CF4-3-3	0.0253	0.0125	0.0549	0.0147
CF4-3-4	0.0290	0.0157	0.0263	0.0101
CF4-3-5	0.0524	0.0217	0.0216	0.0107
MEAN	0.035	0.020	0.039	0.012
STDEV	0.010	0.007	0.015	0.002

* indicates outlier not included in mean or std. deviation

TOTAL NITROGEN (%)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	0.0161	0.0126	0.0271	0.0150
CF8-1-2	0.0162	0.0087	0.0305	0.0104
CF8-1-3	0.0230	0.0117	0.0363	0.0144
CF8-1-4	0.0276	0.0110	0.0359	0.0162
CF8-1-5	0.0202	0.0111	0.0314	0.0221
MEAN	0.021	0.011	0.032	0.016
STDEV	0.005	0.001	0.004	0.004

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	0.0335	0.0361	0.0494	0.0201
CF8-2-2	0.0254	0.0286	0.0316	0.0301
CF8-2-3	0.0451	0.0366	0.0524	0.0302
CF8-2-4	0.0438	0.0315	0.0343	0.0307
CF8-2-5	0.0563	0.0360	0.0489	0.0357
MEAN	0.041	0.034	0.043	0.029
STDEV	0.012	0.004	0.010	0.006

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	0.0568	0.0593	0.0430	*0.0583
CF8-3-2	0.0399	0.0516	0.0522	0.0476
CF8-3-3	0.0611	0.0596	0.0628	0.0468
CF8-3-4	0.0707	0.0573	0.0738	0.0498
CF8-3-5	0.0396	0.0484	0.0630	0.0469
MEAN	0.054	0.055	0.059	0.048
STDEV	0.014	0.005	0.012	0.001

* indicates outlier not included in mean or std. deviation

PHOSPHOROUS (mg/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	1.38	0.58	1.58	0.73
REF-1-2	2.33	0.88	1.53	1.33
REF-1-3	1.48	0.78	1.28	0.78
REF-1-4	1.08	0.53	1.58	0.53
REF-1-5	1.03	0.33	2.73	0.53
MEAN	1.46	0.62	1.74	0.78
STDEV	0.52	0.22	0.57	0.33

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	1.88	0.78	3.54	1.23
REF-2-2	1.63	1.13	1.28	3.14
REF-2-3	1.23	6.55	1.03	2.73
REF-2-4	5.89	1.48	3.54	1.98
REF-2-5	7.20	3.54	10.31	4.59
MEAN	3.57	2.69	3.94	2.73
STDEV	2.77	2.41	3.76	1.27

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	*10.61	0.73	5.44	1.23
REF-3-2	3.79	1.03	3.39	1.48
REF-3-3	3.99	1.08	7.05	1.23
REF-3-4	2.23	0.53	3.09	0.53
REF-3-5	4.09	0.88	3.94	0.88
MEAN	3.52	0.85	4.58	1.07
STDEV	0.87	0.23	1.65	0.37

* indicates outlier not included in mean or std. deviation

PHOSPHOROUS (mg/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	2.66	1.45	18.46	8.88
CF4-1-2	2.11	1.15	4.51	1.45
CF4-1-3	3.36	1.35	19.21	4.11
CF4-1-4	1.66	1.05	8.88	1.20
CF4-4-5	3.76	1.15	19.51	7.32
MEAN	2.71	1.23	14.12	4.60
STDEV	0.87	0.16	6.96	3.44

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	0.50	1.10	3.81	0.60
CF4-2-2	2.41	1.96	8.28	1.20
CF4-2-3	0.60	0.40	5.07	0.35
CF4-2-4	2.76	0.75	8.23	0.75
CF4-2-5	1.10	0.40	4.46	0.60
MEAN	1.47	0.92	5.97	0.70
STDEV	1.04	0.65	2.13	0.32

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	2.36	0.70	4.21	0.90
CF4-3-2	1.66	0.55	3.81	1.15
CF4-3-3	3.11	0.90	6.85	0.78
CF4-3-4	1.68	0.68	8.25	2.38
CF4-3-5	3.19	0.78	4.04	1.68
MEAN	2.40	0.72	5.43	1.38
STDEV	0.74	0.13	2.00	0.66

* indicates outlier not included in mean or std. deviation

PHOSPHOROUS (mg/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	4.06	0.90	78.01	6.12
CF8-1-2	2.46	1.45	13.54	1.25
CF8-1-3	4.26	2.06	7.88	2.36
CF8-1-4	3.21	0.80	20.82	1.61
CF8-1-5	8.63	0.70	132.14	9.43
MEAN	4.52	1.18	50.48	4.15
STDEV	2.40	0.57	53.58	3.53

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	13.24	3.56	17.16	4.31
CF8-2-2	8.83	2.26	7.88	2.66
CF8-2-3	*105.65	*128.93	67.77	*102.34
CF8-2-4	10.08	2.06	4.82	2.31
CF8-2-5	29.75	7.78	30.60	8.23
MEAN	15.48	3.91	25.64	4.38
STDEV	9.69	2.66	25.60	2.71

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	10.23	1.50	35.07	2.36
CF8-3-2	4.57	1.56	17.06	1.05
CF8-3-3	17.46	2.16	18.06	1.96
CF8-3-4	6.12	1.00	16.60	1.05
CF8-3-5	7.12	1.30	34.16	1.66
MEAN	9.10	1.50	24.19	1.62
STDEV	5.11	0.42	9.54	0.57

* indicates outlier not included in mean or std. deviation

POTASSIUM (Bray analysis) (mg/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	116.38	102.34	117.39	99.33
REF-1-2	77.25	76.25	82.27	111.37
REF-1-3	79.26	98.32	114.38	162.54
REF-1-4	98.32	109.36	121.40	132.44
REF-1-5	120.40	138.46	66.22	159.53
MEAN	98.32	104.95	100.33	133.04
STDEV	20.13	22.45	24.61	28.19

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	124.41	215.71	162.54	243.80
REF-2-2	148.49	137.45	369.22	270.89
REF-2-3	263.87	268.89	218.72	191.63
REF-2-4	206.68	187.62	141.47	134.44
REF-2-5	166.55	109.36	117.39	159.53
MEAN	182.00	183.81	201.87	200.06
STDEV	54.75	63.17	100.78	56.90

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	278.92	168.56	156.52	143.47
REF-3-2	206.68	274.91	188.62	209.69
REF-3-3	220.73	165.55	255.84	167.55
REF-3-4	177.59	111.37	425.40	110.36
REF-3-5	241.80	160.53	275.91	175.58
MEAN	225.14	176.18	260.46	161.33
STDEV	38.05	59.92	104.20	37.07

* indicates outlier not included in mean or std. deviation

POTASSIUM (Bray analysis) (mg/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	89.29	103.34	186.62	43.14
CF4-1-2	105.35	72.24	226.75	94.31
CF4-1-3	119.39	149.49	164.54	74.25
CF4-1-4	58.19	66.22	89.29	47.16
CF4-4-5	116.38	56.19	252.83	72.24
MEAN	97.72	89.50	184.01	66.22
STDEV	25.05	37.88	63.09	21.13

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	139.46	107.35	139.46	144.48
CF4-2-2	197.65	271.90	*338.12	79.26
CF4-2-3	85.28	126.42	127.42	105.35
CF4-2-4	214.71	258.85	185.61	143.47
CF4-2-5	130.43	124.41	161.53	100.33
MEAN	153.51	177.79	153.51	114.58
STDEV	52.63	80.43	25.65	28.57

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	128.42	121.40	185.61	120.40
CF4-3-2	148.49	177.59	248.82	213.71
CF4-3-3	81.27	69.23	242.80	62.21
CF4-3-4	214.71	94.31	224.74	92.30
CF4-3-5	140.46	76.25	155.51	113.37
MEAN	142.67	107.76	211.50	120.40
STDEV	47.96	43.93	39.85	56.86

* indicates outlier not included in mean or std. deviation

POTASSIUM (Bray analysis) (mg/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	141.47	90.30	152.50	99.33
CF8-1-2	165.55	139.46	218.72	130.43
CF8-1-3	213.71	183.61	338.12	207.69
CF8-1-4	171.57	190.63	237.78	241.80
CF8-1-5	184.61	90.30	173.57	85.28
MEAN	175.38	138.86	224.14	152.90
STDEV	26.53	48.47	72.28	68.65

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	241.80	83.27	233.77	126.42
CF8-2-2	52.17	32.11	57.19	30.10
CF8-2-3	151.50	62.21	198.66	95.31
CF8-2-4	64.21	35.12	72.24	29.10
CF8-2-5	128.42	53.18	171.57	54.18
MEAN	127.62	53.18	146.68	67.02
STDEV	76.36	20.96	78.19	42.70

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	89.29	39.13	65.22	37.12
CF8-3-2	45.15	21.07	63.21	23.08
CF8-3-3	148.49	44.15	94.31	51.17
CF8-3-4	53.18	32.11	62.21	33.11
CF8-3-5	76.25	21.07	74.25	30.10
MEAN	82.47	31.50	71.84	34.92
STDEV	40.91	10.44	13.43	10.44

* indicates outlier not included in mean or std. deviation

POTASSIUM (Exchangeable cations) (mmol/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	3.17	3.30	3.50	3.17
REF-1-2	1.99	2.12	2.12	2.76
REF-1-3	1.92	2.63	2.95	4.62
REF-1-4	2.82	3.08	3.21	3.66
REF-1-5	3.14	5.00	1.73	4.43
MEAN	2.61	3.23	2.70	3.73
STDEV	0.61	1.09	0.75	0.80

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	3.27	6.93	4.36	6.99
REF-2-2	4.17	3.59	7.89	11.16
REF-2-3	8.27	8.27	11.16	6.35
REF-2-4	5.71	5.39	3.98	3.66
REF-2-5	4.30	2.95	2.89	3.78
MEAN	5.14	5.43	6.05	6.39
STDEV	1.96	2.23	3.42	3.06

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	7.25	4.81	4.17	3.78
REF-3-2	5.07	8.02	4.87	5.96
REF-3-3	5.71	4.23	6.73	4.17
REF-3-4	4.55	2.95	11.29	2.95
REF-3-5	6.54	4.30	7.57	4.62
MEAN	5.82	4.86	6.93	4.30
STDEV	1.09	1.89	2.80	1.12

* indicates outlier not included in mean or std. deviation

POTASSIUM (Exchangeable cations) (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	2.47	2.75	4.63	1.10
CF4-1-2	2.36	1.90	5.51	2.86
CF4-1-3	3.00	3.92	3.99	2.06
CF4-1-4	1.41	1.66	2.31	1.34
CF4-4-5	3.13	1.45	5.95	1.86
MEAN	2.48	2.34	4.48	1.84
STDEV	0.68	1.01	1.43	0.69

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	3.84	3.20	3.79	4.32
CF4-2-2	5.36	6.54	*7.76	1.97
CF4-2-3	2.66	3.43	3.56	3.30
CF4-2-4	5.87	7.34	4.52	4.14
CF4-2-5	3.56	3.50	4.20	3.11
MEAN	4.26	4.80	4.02	3.37
STDEV	1.32	1.98	0.43	0.94

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	3.43	3.56	5.29	3.50
CF4-3-2	4.14	5.42	7.22	6.83
CF4-3-3	2.41	2.15	6.83	1.96
CF4-3-4	5.93	3.05	6.06	2.73
CF4-3-5	3.69	2.66	4.65	3.17
MEAN	3.92	3.37	6.01	3.64
STDEV	1.29	1.26	1.06	1.88

* indicates outlier not included in mean or std. deviation

POTASSIUM (Exchangeable cations) (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	3.62	2.64	4.12	3.11
CF8-1-2	4.68	3.57	6.09	3.68
CF8-1-3	5.79	4.59	8.24	5.61
CF8-1-4	4.62	5.83	5.93	7.28
CF8-1-5	4.84	2.56	4.86	2.57
MEAN	4.71	3.84	5.85	4.45
STDEV	0.77	1.39	1.56	1.96

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	6.61	2.63	6.09	3.66
CF8-2-2	1.62	1.10	1.65	1.09
CF8-2-3	4.29	1.61	5.51	2.90
CF8-2-4	1.76	1.13	2.09	0.98
CF8-2-5	3.48	1.71	4.54	1.95
MEAN	3.55	1.64	3.97	2.12
STDEV	2.05	0.62	2.01	1.16

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	2.82	1.66	2.17	1.45
CF8-3-2	1.85	0.80	2.50	0.91
CF8-3-3	2.75	1.52	2.93	1.93
CF8-3-4	1.79	1.37	2.16	1.38
CF8-3-5	1.53	1.11	2.56	1.24
MEAN	2.15	1.29	2.47	1.38
STDEV	0.59	0.34	0.32	0.37

* indicates outlier not included in mean or std. deviation

CALCIUM (mmol/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	11.64	19.90	10.76	14.14
REF-1-2	9.14	10.76	9.76	10.01
REF-1-3	11.14	18.65	14.77	23.78
REF-1-4	25.91	40.55	25.03	39.93
REF-1-5	19.90	32.17	7.26	20.03
MEAN	15.55	24.41	13.52	21.58
STDEV	7.11	11.84	6.98	11.54

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	19.65	20.40	22.40	21.90
REF-2-2	21.90	15.90	23.16	28.04
REF-2-3	36.42	51.57	22.90	50.32
REF-2-4	26.03	27.16	21.78	24.41
REF-2-5	13.77	15.14	*14.89	15.27
MEAN	23.56	26.03	22.56	27.99
STDEV	8.45	15.05	0.61	13.32

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	40.80	38.17	32.92	35.30
REF-3-2	34.67	39.93	34.04	35.55
REF-3-3	35.05	32.67	*60.95	38.43
REF-3-4	25.03	20.90	32.17	21.28
REF-3-5	40.30	29.54	35.30	30.41
MEAN	35.17	32.24	33.61	32.19
STDEV	6.35	7.59	1.37	6.75

* indicates outlier not included in mean or std. deviation

CALCIUM (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	24.66	11.01	25.16	10.14
CF4-1-2	8.89	8.51	9.76	7.76
CF4-1-3	17.02	10.01	16.52	10.64
CF4-1-4	5.76	7.01	30.92	16.15
CF4-4-5	19.02	16.77	27.79	16.65
MEAN	15.07	10.66	22.03	12.27
STDEV	7.69	3.74	8.70	3.93

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	24.41	16.90	19.90	28.91
CF4-2-2	43.31	23.91	34.67	*69.34
CF4-2-3	15.51	14.89	19.15	14.77
CF4-2-4	24.03	10.51	34.92	16.77
CF4-2-5	20.78	16.40	25.03	19.40
MEAN	25.61	16.52	26.73	19.96
STDEV	10.52	4.83	7.70	6.26

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	19.28	16.52	51.32	17.77
CF4-3-2	35.55	49.44	50.19	17.77
CF4-3-3	17.02	16.52	*114.52	17.27
CF4-3-4	21.40	17.90	39.18	23.66
CF4-3-5	29.54	15.52	61.33	13.27
MEAN	24.56	23.18	50.50	17.95
STDEV	7.75	14.70	9.06	3.71

* indicates outlier not included in mean or std. deviation

CALCIUM (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	14.77	18.77	37.05	31.17
CF8-1-2	17.90	13.64	30.79	14.64
CF8-1-3	40.80	29.91	50.82	32.04
CF8-1-4	26.28	25.28	45.06	43.43
CF8-1-5	19.15	17.77	44.68	24.78
MEAN	23.78	21.08	41.68	29.21
STDEV	10.41	6.47	7.81	10.56

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	29.91	38.30	35.55	35.05
CF8-2-2	36.42	59.20	41.43	55.32
CF8-2-3	78.98	79.10	50.44	59.70
CF8-2-4	32.29	41.80	32.92	41.55
CF8-2-5	44.93	50.57	34.80	41.05
MEAN	44.51	53.80	39.03	46.54
STDEV	20.10	16.31	7.13	10.46

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	57.57	71.59	111.90	63.21
CF8-3-2	41.18	45.93	122.53	43.31
CF8-3-3	58.08	66.96	*330.05	52.44
CF8-3-4	49.81	56.82	85.99	62.96
CF8-3-5	25.28	46.81	121.16	41.30
MEAN	46.39	57.63	110.39	52.64
STDEV	13.66	11.58	16.94	10.41

* indicates outlier not included in mean or std. deviation

MAGNESIUM (mmol/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	3.61	6.29	3.61	5.06
REF-1-2	3.51	4.33	3.92	4.75
REF-1-3	3.09	7.43	4.95	11.14
REF-1-4	6.19	10.73	6.60	10.94
REF-1-5	7.84	16.71	2.68	10.73
MEAN	4.85	9.10	4.35	8.52
STDEV	2.07	4.85	1.50	3.31

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	8.25	18.98	10.73	17.33
REF-2-2	6.60	11.35	7.63	9.70
REF-2-3	13.21	18.57	7.63	15.47
REF-2-4	9.08	9.90	7.43	8.05
REF-2-5	4.75	6.40	5.16	4.95
MEAN	8.38	13.04	7.72	11.10
STDEV	3.17	5.54	1.98	5.17

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	7.43	7.63	5.36	6.60
REF-3-2	5.98	7.84	6.81	8.67
REF-3-3	6.19	6.81	8.25	6.40
REF-3-4	5.98	7.02	9.28	6.19
REF-3-5	9.49	6.81	8.46	7.02
MEAN	7.02	7.22	7.63	6.97
STDEV	1.51	0.48	1.55	0.99

* indicates outlier not included in mean or std. deviation

MAGNESIUM (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	2.89	6.81	2.48	2.06
CF4-1-2	2.06	3.51	2.89	2.27
CF4-1-3	4.95	5.36	14.65	3.51
CF4-1-4	2.68	3.71	19.19	3.51
CF4-4-5	4.95	4.13	2.48	3.51
MEAN	3.51	4.70	8.34	2.97
STDEV	1.35	1.38	8.00	0.74

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	11.14	6.19	5.57	12.79
CF4-2-2	8.05	10.11	6.40	4.33
CF4-2-3	6.29	7.32	5.26	7.32
CF4-2-4	9.18	6.29	3.40	6.71
CF4-2-5	7.32	7.12	5.67	8.77
MEAN	8.40	7.41	5.26	7.99
STDEV	1.86	1.59	1.12	3.13

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	6.71	7.53	7.53	8.36
CF4-3-2	7.74	11.86	7.53	12.90
CF4-3-3	3.40	4.02	6.50	3.20
CF4-3-4	5.26	4.02	4.64	3.82
CF4-3-5	5.67	5.06	6.71	5.06
MEAN	5.76	6.50	6.58	6.66
STDEV	1.63	3.32	1.18	4.01

* indicates outlier not included in mean or std. deviation

MAGNESIUM (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	2.89	7.22	3.51	8.05
CF8-1-2	8.25	10.32	6.60	10.32
CF8-1-3	8.05	11.35	8.05	10.94
CF8-1-4	7.63	16.30	5.16	16.71
CF8-1-5	5.78	11.35	3.71	7.02
MEAN	6.52	11.31	5.41	10.61
STDEV	2.25	3.26	1.93	3.77

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	9.08	13.41	10.52	13.00
CF8-2-2	5.57	10.11	4.75	8.05
CF8-2-3	15.68	15.06	13.21	15.68
CF8-2-4	6.60	10.52	8.67	11.97
CF8-2-5	12.59	16.92	8.46	11.35
MEAN	9.90	13.21	9.12	12.01
STDEV	4.21	2.92	3.10	2.77

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	13.41	23.52	9.90	22.70
CF8-3-2	14.03	24.35	16.92	25.17
CF8-3-3	13.41	22.49	24.97	39.20
CF8-3-4	16.51	27.44	18.36	30.95
CF8-3-5	8.67	26.82	9.90	18.36
MEAN	13.21	24.92	16.01	27.28
STDEV	2.84	2.13	6.35	8.07

* indicates outlier not included in mean or std. deviation

SODIUM (mmol/kg)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	0.17	0.14	0.15	0.24
REF-1-2	0.23	0.26	0.45	0.33
REF-1-3	0.31	0.31	0.33	0.44
REF-1-4	0.56	0.64	0.32	0.37
REF-1-5	0.49	0.39	0.56	0.34
MEAN	0.35	0.35	0.36	0.34
STDEV	0.16	0.19	0.15	0.07

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	0.27	0.53	0.40	0.50
REF-2-2	0.30	0.52	0.89	0.50
REF-2-3	0.69	0.54	0.37	0.39
REF-2-4	0.38	0.39	0.73	0.58
REF-2-5	0.61	0.45	0.49	0.42
MEAN	0.45	0.49	0.57	0.48
STDEV	0.19	0.06	0.23	0.08

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	0.44	0.42	0.63	0.32
REF-3-2	0.38	0.43	0.59	*1.04
REF-3-3	0.30	0.39	0.39	0.40
REF-3-4	0.30	0.37	0.75	0.43
REF-3-5	0.39	0.47	0.41	0.38
MEAN	0.36	0.42	0.55	0.38
STDEV	0.06	0.04	0.15	0.05

* indicates outlier not included in mean or std. deviation

SODIUM (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	0.59	0.16	0.10	0.08
CF4-1-2	0.11	0.55	0.99	1.39
CF4-1-3	0.39	0.37	0.46	0.50
CF4-1-4	0.25	0.38	0.52	0.44
CF4-4-5	0.35	0.43	0.43	0.65
MEAN	0.34	0.38	0.50	0.61
STDEV	0.18	0.14	0.32	0.48

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	0.64	*1.25	0.35	0.25
CF4-2-2	0.64	0.34	0.29	0.33
CF4-2-3	0.10	0.15	0.10	0.19
CF4-2-4	0.49	0.10	0.12	0.05
CF4-2-5	0.00	0.21	0.05	0.41
MEAN	0.37	0.20	0.18	0.25
STDEV	0.30	0.11	0.13	0.14

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	0.26	0.09	0.33	0.21
CF4-3-2	0.05	0.14	0.09	0.15
CF4-3-3	0.26	0.00	0.20	0.13
CF4-3-4	0.11	0.12	0.13	0.10
CF4-3-5	0.11	0.31	0.31	0.03
MEAN	0.16	0.13	0.21	0.12
STDEV	0.10	0.11	0.11	0.06

* indicates outlier not included in mean or std. deviation

SODIUM (mmol/kg)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	0.76	0.62	0.55	0.57
CF8-1-2	0.58	0.64	0.49	0.61
CF8-1-3	0.76	0.56	0.45	0.54
CF8-1-4	0.51	0.53	0.52	*0.80
CF8-1-5	0.53	0.54	0.56	0.57
MEAN	0.63	0.58	0.51	0.57
STDEV	0.12	0.05	0.05	0.03

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	*0.50	0.58	0.44	0.59
CF8-2-2	0.31	0.55	0.22	0.27
CF8-2-3	0.26	0.23	0.14	0.14
CF8-2-4	0.31	0.32	0.51	0.25
CF8-2-5	0.26	0.31	0.16	0.53
MEAN	0.28	0.40	0.29	0.35
STDEV	0.03	0.16	0.17	0.20

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	0.90	0.76	0.59	0.68
CF8-3-2	1.30	0.57	0.91	0.55
CF8-3-3	0.55	0.66	0.59	0.56
CF8-3-4	0.50	0.73	0.55	0.52
CF8-3-5	0.21	0.88	0.71	0.58
MEAN	0.69	0.72	0.67	0.58
STDEV	0.42	0.11	0.15	0.06

* indicates outlier not included in mean or std. deviation

pH

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	4.53	4.84	4.84	4.57
REF-1-2	4.42	4.25	4.63	4.14
REF-1-3	4.27	4.27	4.73	4.57
REF-1-4	5.07	5.72	5.22	5.81
REF-1-5	5.03	5.13	4.34	4.50
MEAN	4.66	4.84	4.75	4.72
STDEV	0.36	0.62	0.32	0.64

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	6.16	4.15	6.46	6.21
REF-2-2	6.32	4.54	6.30	6.27
REF-2-3	6.66	6.55	6.11	6.29
REF-2-4	6.24	5.90	5.99	5.65
REF-2-5	5.97	5.69	6.29	5.89
MEAN	6.27	5.37	6.23	6.06
STDEV	0.25	0.99	0.18	0.28

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	6.25	6.58	6.65	6.77
REF-3-2	6.28	6.67	6.15	6.35
REF-3-3	6.73	6.67	7.43	7.23
REF-3-4	6.12	6.10	6.83	6.31
REF-3-5	6.23	6.63	6.52	6.61
MEAN	6.32	6.53	6.72	6.65
STDEV	0.24	0.24	0.47	0.37

* indicates outlier not included in mean or std. deviation

pH

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	6.54	6.05	6.20	4.89
CF4-1-2	4.60	4.41	5.34	4.38
CF4-1-3	5.64	4.83	5.02	4.37
CF4-1-4	4.45	4.32	6.48	5.94
CF4-4-5	5.40	4.88	5.90	4.41
MEAN	5.33	4.90	5.79	4.80
STDEV	0.85	0.69	0.60	0.67

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	4.87	4.85	5.07	5.17
CF4-2-2	6.97	*6.2	7.16	6.71
CF4-2-3	4.81	4.82	4.91	4.86
CF4-2-4	6.50	4.60	6.82	5.98
CF4-2-5	4.93	4.51	4.92	4.55
MEAN	5.62	4.70	5.78	5.45
STDEV	1.04	0.17	1.12	0.88

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	5.19	5.27	7.04	6.27
CF4-3-2	5.78	5.78	6.41	6.95
CF4-3-3	4.96	4.66	7.36	4.93
CF4-3-4	5.20	4.63	6.86	6.20
CF4-3-5	5.22	4.47	7.16	5.16
MEAN	5.27	4.96	6.97	5.90
STDEV	0.30	0.55	0.36	0.84

* indicates outlier not included in mean or std. deviation

pH

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	4.50	4.05	5.87	4.54
CF8-1-2	4.18	4.19	5.66	4.27
CF8-1-3	6.52	*6.36	6.83	6.63
CF8-1-4	5.73	4.34	6.74	6.60
CF8-1-5	5.42	4.67	5.77	4.87
MEAN	5.27	4.31	6.17	5.38
STDEV	0.95	0.27	0.56	1.15

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	5.14	5.15	5.62	5.47
CF8-2-2	5.07	6.23	5.45	5.94
CF8-2-3	6.55	7.27	6.15	6.24
CF8-2-4	5.03	5.07	5.21	5.04
CF8-2-5	5.68	6.27	5.14	5.11
MEAN	5.49	6.00	5.51	5.56
STDEV	0.65	0.91	0.40	0.52

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	5.22	5.52	6.61	5.47
CF8-3-2	4.83	5.11	7.16	5.33
CF8-3-3	6.88	5.77	7.49	6.83
CF8-3-4	5.06	5.03	5.65	5.52
CF8-3-5	5.07	4.91	6.66	4.47
MEAN	5.41	5.27	6.71	5.52
STDEV	0.83	0.36	0.70	0.85

* indicates outlier not included in mean or std. deviation

BULK DENSITY (g/cm³)

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-1-1	1.59	1.50	1.63	1.51
REF-1-2	1.54	1.57	1.62	1.71
REF-1-3	1.53	1.61	1.64	1.52
REF-1-4	1.67	1.58	1.61	1.64
REF-1-5	1.55	1.55	1.39	1.64
MEAN	1.58	1.56	1.58	1.60
STDEV	0.06	0.04	0.11	0.09

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-2-1	1.54	1.55	1.60	1.54
REF-2-2	1.61	1.53	1.51	1.55
REF-2-3	1.47	1.55	1.33	1.56
REF-2-4	1.56	1.59	1.60	1.52
REF-2-5	1.53	1.62	1.44	1.55
MEAN	1.54	1.57	1.50	1.54
STDEV	0.05	0.04	0.11	0.02

Field-Sample	Furrow		Ridge	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
REF-3-1	1.57	1.53	1.62	1.57
REF-3-2	1.59	1.44	1.41	1.35
REF-3-3	1.46	1.43	1.35	1.46
REF-3-4	1.51	1.51	1.48	1.54
REF-3-5	1.54	1.45	.	1.49
MEAN	1.53	1.47	1.47	1.48
STDEV	0.05	0.04	0.12	0.09

* indicates outlier not included in mean or std. deviation

BULK DENSITY (g/cm³)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-1-1	1.40	1.48	1.40	1.39
CF4-1-2	1.62	1.53	1.60	1.48
CF4-1-3	1.47	1.52	1.60	1.52
CF4-1-4	1.58	1.52	1.46	1.45
CF4-4-5	1.58	1.51	1.53	1.49
MEAN	1.53	1.51	1.52	1.47
STDEV	0.09	0.02	0.09	0.05

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-2-1	1.60	1.51	1.44	1.51
CF4-2-2	1.43	1.46	1.35	1.39
CF4-2-3	1.69	1.57	1.49	1.56
CF4-2-4	1.58	1.54	1.42	1.59
CF4-2-5	1.55	1.49	1.52	1.39
MEAN	1.57	1.51	1.44	1.49
STDEV	0.09	0.04	0.07	0.09

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF4-3-1	1.43	1.47	1.53	1.53
CF4-3-2	1.46	1.59	1.56	1.50
CF4-3-3	1.59	1.48	1.63	1.55
CF4-3-4	1.61	1.47	1.49	1.49
CF4-3-5	1.57	1.52	1.52	1.55
MEAN	1.53	1.51	1.55	1.52
STDEV	0.08	0.05	0.05	0.03

* indicates outlier not included in mean or std. deviation

BULK DENSITY (g/cm³)

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-1-1	1.64	1.57	1.56	1.50
CF8-1-2	1.60	1.51	1.43	1.46
CF8-1-3	1.60	1.55	1.52	1.48
CF8-1-4	1.53	1.59	1.47	*1.64
CF8-1-5	1.48	1.51	1.41	1.47
MEAN	1.57	1.55	1.48	1.48
STDEV	0.06	0.04	0.06	0.02

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-2-1	1.53	1.40	1.35	1.44
CF8-2-2	1.49	1.36	1.43	1.45
CF8-2-3	1.47	1.28	1.30	1.40
CF8-2-4	1.51	1.39	1.44	1.42
CF8-2-5	1.39	1.39	1.38	1.38
MEAN	1.48	1.36	1.38	1.42
STDEV	0.05	0.05	0.06	0.03

Field-Sample	Outside Station		Inside Station	
	0-15 cm	15-30 cm	0-15 cm	15-30 cm
CF8-3-1	1.43	1.26	1.29	1.38
CF8-3-2	1.32	1.31	1.41	1.33
CF8-3-3	1.38	1.16	1.27	1.31
CF8-3-4	1.40	1.36	1.33	1.31
CF8-3-5	1.38	1.31	1.33	1.21
MEAN	1.38	1.28	1.33	1.31
STDEV	0.04	0.08	0.05	0.06

* indicates outlier not included in mean or std. deviation

INFILTRATION (mm/hr)

Field-Sample	Furrow 0-15 cm	Ridge 0-15 cm
REF-1-1	110.06	119.24
REF-1-2	235.41	244.59
REF-1-3	55.03	97.83
REF-1-4	158.98	204.84
REF-1-5	210.96	284.33
MEAN	154.09	190.17
STDEV	73.52	80.00

Field-Sample	Furrow 0-15 cm	Ridge 0-15 cm
REF-2-1	67.26	281.27
REF-2-2	464.71	406.62
REF-2-3	97.83	314.90
REF-2-4	152.87	376.05
REF-2-5	204.84	645.10
MEAN	197.50	404.79
STDEV	158.39	143.10

Field-Sample	Furrow 0-15 cm	Ridge 0-15 cm
REF-3-1	174.27	146.75
REF-3-2	100.89	48.92
REF-3-3	281.27	100.89
REF-3-4	94.78	259.87
REF-3-5	146.75	214.01
MEAN	159.59	154.09
STDEV	75.55	84.74

* indicates outlier not included in mean or std. deviation

INFILTRATION (mm/hr)

Field-Sample	outside station 0-15 cm	inside station 0-15 cm
CF4-1-1	232.36	553.38
CF4-1-2	663.44	281.27
CF4-1-3	675.67	336.31
CF4-1-4	602.29	684.84
CF4-4-5	296.56	247.64
MEAN	494.06	420.69
STDEV	212.65	189.66

Field-Sample	outside station 0-15 cm	inside station 0-15 cm
CF4-2-1	366.88	262.93
CF4-2-2	223.18	351.59
CF4-2-3	158.98	284.33
CF4-2-4	152.87	290.45
CF4-2-5	229.30	278.22
MEAN	226.24	293.50
STDEV	86.18	34.04

Field-Sample	outside station 0-15 cm	inside station 0-15 cm
CF4-3-1	687.90	718.47
CF4-3-2	544.20	134.52
CF4-3-3	431.08	467.77
CF4-3-4	299.62	538.09
CF4-3-5	516.69	296.56
MEAN	495.90	431.08
STDEV	143.49	224.41

* indicates outlier not included in mean or std. deviation

INFILTRATION (mm/hr)

Field-Sample	outside station 0-15 cm	inside station 0-15 cm
CF8-1-1	345.48	284.33
CF8-1-2	151.34	301.15
CF8-1-3	206.37	223.18
CF8-1-4	152.87	376.05
CF8-1-5	437.20	308.79
MEAN	258.65	298.70
STDEV	127.34	54.77

Field-Sample	outside station 0-15 cm	inside station 0-15 cm
CF8-2-1	152.87	443.31
CF8-2-2	165.10	360.76
CF8-2-3	262.93	308.79
CF8-2-4	431.08	183.44
CF8-2-5	284.33	308.79
MEAN	259.26	321.02
STDEV	112.20	94.55

Field-Sample	outside station 0-15 cm	inside station 0-15 cm
CF8-3-1	247.64	195.67
CF8-3-2	305.73	272.10
CF8-3-3	473.89	415.80
CF8-3-4	265.99	207.90
CF8-3-5	223.18	244.59
MEAN	303.29	267.21
STDEV	100.02	88.39

* indicates outlier not included in mean or std. deviation

APPENDIX B

**Interview Questions for Farmers Participating in Research Project with
Hohenheim University/ Chiang Mai University**

Farmer interviewed: _____ Date: _____

Village: _____ Ward: _____

1. What is your name?
2. Age?
3. Are you the primary farmer in your household?
4. How many people are in your household?
5. How many fields do you have?
6. What are the sizes?
7. What crops do you grow?
8. What system for growing maize do you use?
9. Do you practice CF planting stations?
 - a. If so, how many years have you practiced the basin technology?
 - i. How did you learn about CF?
 - b. What was the history of the field before using CF?
 - i. Ploughed
 - ii. Bush
10. Do you practice ploughing?
11. How many years have you practiced your current method of farming?
12. Can you describe your cropping history?

- a. Maize every year in the same field?
- b. Do you rotate maize with other crops?

13. Can you describe your yield history?

- a. Last season
- b. Two years ago
- c. Three years ago
- d. Four years ago
- e. Five years ago

14. Do you have a record of your yield?

15. How do you record yield?

- a. By wheelbarrow
- b. By sacks of shelled maize
- c. Other method

16. Please describe the following planting season activities for last season?

a. Field preparation

i. Dates for ploughing

1. How long does it take to plough your field?
2. Is it your own plough and animals?
3. Do you pay for ploughing services?

ii. Burning?

iii. Holing out?

1. How long did it take to make all holes start to finish?
2. Hours per day
3. Days to completion

4. Field size
5. How many people worked on the field?
 - b. Amendment used
 - i. Type
 - ii. Rate
 - c. Seeding date
 - d. Crop and cultivar
 - e. How many times did you weed after planting?
 - f. Did you side dress?
 - i. Type
 - ii. Rate
 - g. Harvest information
 - i. Timing
 - ii. Yield
 - iii. Trend
 1. Better than previous year
 2. Worse than previous year
 3. Same as previous year
 - h. Overall how would you describe the overall trend
 - i. Yields change year to year
 - ii. Yields steadily improving
 - iii. Yields stay the same
 - iv. Yields decreasing
 - v. Yields increased for several seasons and then stayed the same

- i. What do you think impacts yields the most
 - i. Having enough rainfall
 - ii. Having enough fertilizer
 - iii. Having the right kind of seed
 - iv. Planting early
 - v. The presence of mulch
- j. What happens to the maize stalks after you harvest?
 - i. Do animals graze
 - 1. If so, are they your animals
 - 2. Do you want the animals to graze

17. What observations do you have from the growing season and over time regarding the following factors?

- a. Flooding
- b. Drought stress symptoms observed
- c. Compaction
- d. Run-off
- e. Do you think soil quality is improving or declining over time? Why?

18. Why do you practice your current method of farming?

19. Please compare ploughing and CF.

- a. If practicing CF, how does it compare with ploughing? If ploughing, how do you compare it to CF?
 - i. Higher yields? Can you quantify how much more?
 - ii. More or less labor? How much more?
 - iii. Cost? How much more

20. Why does your particular method produce different results?

- a. Earlier planting? If so, by how much?
- b. Improved water harvesting?
- c. Better fertilizer placement/use?
- d. Better germination?

21. What challenges or difficulties do you experience with your current method of farming?

- a. Labor demand?
- b. Costs?
- c. Grazing animals?
- d. Environmental related challenges—soil quality, water runoff, erratic rainfall?

Survey questions adapted from an IFPRI/FSRP Farm Survey, 2001-2 of farmers practicing basin technology in Zambia as reported on by Haggblade and Tembo (2003).

CURRICULUM VITAE

Name

Mr. Daniel Philip Blank

Date of Birth

13 March 1971

Education Background

2010-Present

MSc. Sustainable Agriculture and Integrated Watershed Management, joint degree, University of Hohenheim, University of Chiang Mai (July 2012 projected completion)

1998

B.A. Biology with Environmental Emphasis, Intercultural Relations Minor Houghton College, Houghton, New York

Career Experience

2002-Present

Owner-Producer, 12 Seasons Farm, Fort Myers, Florida

1996-2009

Farm Manager and Tropical Fruit Nursery Manager
Educational Concerns for Hunger Organization (ECHO), Fort Myers, Florida

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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Professional Presentations

- 2012 Evaluation of soil fertility in a no-till farming system, Conference on Sustainable Land Use and Rural Development in Mountain Areas, University of Hohenheim, Germany
- 2009 The Importance of Life in the Soil/ Extending the Growing Season ECHO Asia Agricultural Conference, Chiang Mai, Thailand
- 2008 The Importance of Life in the Soil, La Conferencia Agroecológica Regional (CARECA), Suchitoto, El Salvador
- 2007 Extending the Growing Season, Konferans Agrikol, Haiti
- 2007 The Importance of Life in the Soil, ECHO Conference, Florida
- 2006 Agroforestry Options for Small-Scale Farmers, ECHO Conference, Florida
- 2005 Extending the Growing Season, ECHO Conference, Florida
- 2004 Diversifying with Tropical Fruits, Konferans Agrikol, Haiti
- 2004 Diversifying with Tropical Fruits, ECHO Conference, Florida

Publications

- Blank, D. 2007. A Fresh Look at Life Below the Surface. EDN No.96, Eds: Price, M., Berkelaar, D.

Reprinting

Blank, D. 2008. A Fresh Look at Life Below the Surface. In Goddard, T., Zoebisch, M.A., Gan, Y.T., Ellis, W., Watson, A. and Sombatpanit, S., No-Till Farming Systems, Special Publication No. 3, World Association of Soil and Water Conservation, Bangkok, pp. 73-82.

Blank, D. 2008. A fresh look at life below the surface. The Overstory—Agroforestry ejournal, #208 <http://lists.ibiblio.org/pipermail/permaculture/2008-July/031624.html>

Blank, D. 2009. A fresh look at life below the Surface. International Animal Health News, Publication of Christian Veterinary Mission, v. 32, pp. 2-7. <http://www.cvmusa.org/Document.Doc?id=2265>