

14.9 Appendix A: Soil characteristics of sites sampled in 2007

Table 9: Chemical characteristics of soil samples collected in 2007. Note results shown in bold are outside the recommended ranges for land use.

Site	Soil and land use	pH	Total C mg/cm ³	Total N mg/cm ³	C:N ratio	Olsen P µg/cm ³	NH ₄ -N µg/cm ³	NO ₃ -N µg/cm ³	Mineralisable N µg/cm ³
NRC00_1	Marua clay, drystock	5.43	60.9	5.9	10.4	25	40.9	29.0	144
NRC00_2	Marua clay, drystock	5.69	59.3	5.1	11.7	16	0.5	17.7	157
NRC00_3	Marua clay, drystock	5.32	66.6	5.8	11.5	52	13.6	18.2	162
NRC00_4	Waiotira clay, dairy	6.15	72.2	6.0	12.0	82	51.1	17.5	142
NRC00_5	Waiotira clay, dairy, irrigated	6.19	63.5	5.6	11.3	43	42.8	13.6	141
NRC00_6	Waiotira clay, indigenous forest	5.28	60.6	3.7	16.5	9	44.4	18.2	134
NRC00_7	Waiotira clay loam, drystock	6.49	65.8	5.8	11.4	12	44.0	18.5	138
NRC00_8	Waiotira clay loam, pines	5.07	57.6	3.4	17.2	16	5.0	16.1	47
NRC00_9	Waiotira clay, drystock	5.64	48.9	3.8	12.9	8	25.7	29.3	92
NRC00_10	Red Hill sandy loam, drystock	7.20	50.4	3.8	13.2	40	20.7	21.2	41
NRC00_11	Red Hill sandy loam, pines	6.36	40.6	2.2	18.2	6	0.9	14.5	55
NRC00_12	Red Hill loamy sand, dairy	6.09	50.9	5.0	10.2	56	64.8	24.5	101
NRC00_13	Red Hill loamy sand, drystock	5.77	59.7	5.1	11.6	13	42.2	34.3	108
NRC00_14	Wharekohe silt loam, dairy	4.85	57.2	4.6	12.5	58	107.5	35.9	116
NRC00_15	Wharekohe silt loam, dairy	4.90	51.0	4.3	11.7	56	83.7	27.3	110
NRC00_16	Wharekohe silt loam, pines	4.46	63.2	4.0	15.9	8	0.6	25.8	50
NRC00_17	Marua clay loam, pines	4.97	54.5	3.0	18.2	24	9.3	35.6	66
NRC00_18	Marua clay loam, indigenous forest	4.64	58.0	3.0	19.2	13	1.9	35.6	44
NRC00_19	Awarua clay loam, dairy	5.78	83.0	6.2	13.4	16	38.9	27.4	142
NRC00_20	Awarua clay loam, indigenous forest	4.84	99.5	5.2	19.1	7	12.0	36.7	132
NRC00_21	Awarua clay loam, dairy, irrigated	6.28	73.3	6.1	12.0	35	59.8	33.0	154
NRC00_22	Awarua clay loam, pines	4.98	80.0	3.4	23.7	18	0.0	37.1	90
NRC00_23	Kiripaka bouldery clay loam, drystock	5.53	75.0	6.8	11.1	45	68.0	16.6	164
NRC00_24	Kiripaka bouldery clay loam, indigenous	6.48	84.1	5.7	14.7	7	28.1	12.8	174
NRC00_25	Kiripaka bouldery clay loam, orchard	6.07	61.4	5.2	11.9	74	39.3	18.6	137

Table 10: Physical characteristics of soil samples collected in 2007. Note results shown in bold are outside the recommended ranges for land use.

Site	Soil and land use	Bulk density Mg m ³	Particle density Mg/m ³	Total porosity %v/v	Macro porosity %v/v	Moisture content @ -5 kPa %v/v	Moisture content @ -10 kPa %v/v
NRC00_1	Marua clay, drystock	0.84	2.44	65.7	12.4	53.3	51.6
NRC00_2	Marua clay, drystock	1.00	2.49	59.9	9.2	50.7	48.9
NRC00_3	Marua clay, drystock	1.02	2.51	59.4	8.0	51.4	49.6
NRC00_4	Waiotira clay, dairy	1.05	2.48	57.7	4.2	53.6	52.5
NRC00_5	Waiotira clay, dairy, irrigated	0.89	2.46	63.6	6.2	57.4	55.9
NRC00_6	Waiotira clay, indigenous forest	1.10	2.59	57.5	6.9	50.6	49.3
NRC00_7	Waiotira clay loam, drystock	0.88	2.49	64.6	12.2	52.4	50.9
NRC00_8	Waiotira clay loam, pines	0.94	2.47	62.4	22.9	39.5	38.6
NRC00_9	Waiotira clay, drystock	0.93	2.49	62.8	7.6	55.2	52.9
NRC00_10	Red Hill sandy loam, drystock	1.22	2.60	53.0	5.2	47.8	44.7
NRC00_11	Red Hill sandy loam, pines	0.80	2.56	68.9	30.5	38.4	30.8
NRC00_12	Red Hill loamy sand, dairy	1.04	2.54	59.2	3.1	56.1	53.9
NRC00_13	Red Hill loamy sand, drystock	0.86	2.50	65.7	13.9	51.9	46.1
NRC00_14	Wharekohe silt loam, dairy	0.79	2.40	67.0	10.7	56.3	53.7
NRC00_15	Wharekohe silt loam, dairy	0.73	2.36	69.0	4.5	64.5	61.6
NRC00_16	Wharekohe silt loam, pines	1.00	2.53	60.5	23.8	36.6	35.7
NRC00_17	Marua clay loam, pines	0.96	2.52	62.0	22.0	40.0	38.3
NRC00_18	Marua clay loam, indigenous forest	0.91	2.54	64.2	15.8	48.4	47.2
NRC00_19	Awarua clay loam, dairy	0.78	2.51	68.9	7.7	61.3	59.7
NRC00_20	Awarua clay loam, indigenous forest	0.80	2.62	69.6	12.0	57.6	56.2
NRC00_21	Awarua clay loam, dairy, irrigated	0.88	2.57	65.9	7.7	58.2	56.4
NRC00_22	Awarua clay loam, pines	0.84	2.69	68.8	14.3	54.5	53.4
NRC00_23	Kiripaka bouldery clay loam, drystock	0.94	2.49	62.2	10.1	52.1	50.3
NRC00_24	Kiripaka bouldery clay loam, indigenous	0.68	2.48	72.5	27.7	44.8	42.1
NRC00_25	Kiripaka bouldery clay loam, orchard	1.00	2.62	61.9	10.4	51.5	49.7

Table 11: Heavy metal concentrations in soil samples collected in 2007. * For means and standard deviations, values below detection limit (<0.5) were assumed to be ½ that of detection limit (0.25 mg/kg).

Site	Land use and soil class	As mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/kg	Ni mg/kg	Pb mg/kg	Zn mg/kg
NRC00_4	Dairy, Brown	<0.5	<0.5	29.7	6.1	17.6	10.2	3.0	41.2
NRC00_5	Dairy, Brown	<0.5	<0.5	25.6	4.7	15.6	8.3	3.2	41.0
NRC00_12	Dairy, Allophanic	5.1	<0.5	15.2	4.6	6.1	8.4	3.5	49.9
NRC00_14	Dairy, Ultic	<0.5	<0.5	8.6	0.2	5.4	1.7	3.2	18.3
NRC00_15	Dairy, Ultic	<0.5	<0.5	8.5	1.1	10.6	3.6	21.4	29.4
NRC00_19	Dairy, Granular	<0.5	<0.5	58.8	11.2	30.1	32.7	0.9	43.9
NRC00_21	Dairy, Granular	<0.5	<0.5	47.1	11.2	31.6	27.1	1.7	133
	Mean ± 1SD	0.9±1.8	0.3±0.0	27.6±19.3	5.6±4.4	16.7±10.7	13.1±11.9	5.3±7.2	51.0±37.7
NRC00_1	Drystock, Granular	<0.5	<0.5	13.1	6.4	16.4	12.4	9.3	45.8
NRC00_2	Drystock, Granular	<0.5	<0.5	17.0	7.6	18.3	13.0	12.1	55.1
NRC00_3	Drystock, Brown	<0.5	<0.5	14.0	5.5	8.4	9.9	9.3	28.8
NRC00_7	Drystock, Brown	<0.5	<0.5	35.2	4.5	23.5	16.0	6.6	46.2
NRC00_9	Drystock, Brown	<0.5	<0.5	14.1	2.6	8.1	5.9	5.0	23.5
NRC00_10	Drystock, Allophanic	5.6	<0.5	16.0	5.1	7.9	8.7	3.9	31.2
NRC00_13	Drystock, Allophanic	10.5	<0.5	14.0	4.4	9.5	8.6	3.6	37.7
NRC00_23	Drystock, Allophanic	<0.5	<0.5	69.2	22.4	45.7	50.1	12.1	108
	Mean ± 1SD	2.2±3.8	0.3±0.0	24.1±19.6	7.3±6.3	17.2±12.9	15.6±14.3	7.7±3.5	47.0±26.7
NRC00_8	Plantation Forestry, Brown	<0.5	<0.5	14.2	3.2	9.4	7.4	6.7	30.0
NRC00_11	Plantation Forestry, Allophanic	5.7	<0.5	13.0	5.8	17.1	11.0	8.0	53.5
NRC00_16	Plantation Forestry, Ultic	<0.5	<0.5	5.7	1.6	5.3	3.6	3.6	9.2
NRC00_17	Plantation Forestry, Brown	12	<0.5	15.4	3.9	5.7	8.9	9.8	24.5
NRC00_22	Plantation Forestry, Granular	<0.5	<0.5	144.0	13.4	27.6	37.5	2.7	49.7
	Mean ± 1SD	3.6±5.1	0.3±0.0	38.5±59.1	5.6±4.6	13.0±9.4	13.7±13.6	6.2±3.0	33.4±18.4
NRC00_6	Indigenous, Brown	<0.5	<0.5	17.5	9.2	21.2	11.5	8.4	58.6
NRC00_18	Indigenous, Brown	<0.5	<0.5	11.8	5.0	11.3	9.5	9.5	29.5
NRC00_20	Indigenous, Granular	<0.5	<0.5	61.1	25.5	45.0	43.7	0.1	59.7
NRC00_24	Indigenous, Allophanic	<0.5	<0.5	73.2	27.3	41.9	46.0	11.1	91.2
	Mean ± 1SD	0.3±0.0	0.3±0.0	40.9±30.8	16.7±11.3	29.8±16.3	27.7±19.9	7.3±4.9	59.8±25.2
NRC00_25	Crop/Hort, Allophanic	<0.5	<0.5	67.8	27.9	102	40.3	11.9	80.5