

Characteristic—land use	Forest	Jungle rubber	Rubber plantation	Oil palm plantation
Loam Acrisol soil				
Bulk density (g cm <sup>-3</sup> )	1.0 (0.04) <sup>ab</sup>	0.9 (0.03) <sup>bA</sup>	1.1 (0.1) <sup>a</sup>	1.1 (0.1) <sup>a</sup>
pH (1 : 4 H <sup>2</sup> O)	4.3 (0.04) <sup>b†</sup>	4.3 (0.03) <sup>b†B</sup>	4.5 (0.1) <sup>ab†</sup>	4.5 (0.1) <sup>a†</sup>
Soil organic C (kg C m <sup>-2</sup> )	2.6 (0.2)	2.7 (0.3) <sup>B</sup>	2.0 (0.3)	1.8 (0.2)
Total N (g N m <sup>-2</sup> )	182.9 (10.8)	186.1 (11.0) <sup>B</sup>	172.6 (23.8)	145.0 (13.5)
C : N ratio	14.3 (0.2) <sup>a</sup>	13.7 (0.8) <sup>a</sup>	11.7 (0.7) <sup>b</sup>	12.5 (0.5) <sup>ab</sup>
Effective cation exchange capacity (mmolc kg <sup>-1</sup> )	44.8 (5.0)	40.6 (7.6) <sup>B</sup>	46.0 (5.4)	39.5 (7.9)
Base saturation (%)	10.6 (0.5) <sup>b†B</sup>	16.0 (2.2) <sup>ab†</sup>	21.1 (7.5) <sup>ab†</sup>	27.9 (5.4) <sup>a†</sup>
Potassium (g K m <sup>-2</sup> )	3.3 (0.3)	2.6 (0.2) <sup>B</sup>	3.4 (0.8)	2.1 (0.8)
Sodium (g Na m <sup>-2</sup> )	0.5 (0.1) <sup>cB</sup>	1.5 (0.2) <sup>bB</sup>	1.4 (0.1) <sup>b</sup>	3.9 (1.1) <sup>a</sup>
Calcium (g Ca m <sup>-2</sup> )	5.5 (2.0)	6.9 (0.8) <sup>B†</sup>	14.5 (7.1)	18.5 (7.4)
Magnesium (g Mg m <sup>-2</sup> )	1.8 (0.1)	2.0 (0.3) <sup>B</sup>	3.4 (1.4)	1.7 (0.9)
Aluminum (g Al m <sup>-2</sup> )	33.1 (3.5)	29.6 (6.6) <sup>B</sup>	30.7 (4.3)	23.5 (2.7)
Iron (g Fe m <sup>-2</sup> )	0.8 (0.1) <sup>aB</sup>	0.3 (0.02) <sup>bcB</sup>	0.3 (0.1) <sup>c</sup>	0.5 (0.02) <sup>ab</sup>
Manganese (g Mn m <sup>-2</sup> )	0.3 (0.1)	0.4 (0.2) <sup>B</sup>	0.8 (0.3)	0.5 (0.2)
Bray-extractable phosphorus (g P m <sup>-2</sup> )	0.5 (0.1) <sup>B</sup>	0.7 (0.1)	0.5 (0.1)	0.8 (0.1)
Clay at 1.0–1.5 m (%)	33.3 (7.6)	42.4 (9.9)	46.1 (9.9)	43.3 (2.8)
Clay at 1.5–2.0 m (%)	37.3 (8.7)	44.5 (10.0)	43.4 (6.5)	47.6 (4.5)
Clay Acrisol soil				
Bulk density (g cm <sup>-3</sup> )	1.0 (0.1)	0.8 (0.1) <sup>B</sup>	0.9 (0.1)	0.9 (0.1)
pH (1 : 4 H <sub>2</sub> O)	4.2 (0.04) <sup>b</sup>	4.5 (0.04) <sup>aA</sup>	4.5 (0.1) <sup>a</sup>	4.4 (0.04) <sup>a</sup>
Soil organic C (kg C m <sup>-2</sup> )	3.3 (0.5)	4.3 (0.4) <sup>A</sup>	2.8 (0.4)	3.5 (0.2)
Total N (g N m <sup>-2</sup> )	263.4 (67.1)	331.4 (34.1) <sup>A</sup>	198.9 (32.5)	260.2 (22.6)
C : N ratio	13.1 (1.3)	13.0 (0.3)	14.3 (0.6)	13.5 (0.2)
Effective cation exchange capacity (mmolc kg <sup>-1</sup> )	94.3 (40.8)	124.5 (25.5) <sup>A</sup>	71.3 (22.3)	78.1 (8.4)
Base saturation (%)	22.9 (5.6) <sup>A</sup>	23.2 (5.8)	20.1 (2.6)	37.5 (7.1)
Potassium (g K m <sup>-2</sup> )	9.4 (3.9)	9.6 (2.6) <sup>A</sup>	4.2 (1.1)	4.8 (0.9)
Sodium (g Na m <sup>-2</sup> )	3.6 (0.8) <sup>A</sup>	4.2 (0.2) <sup>A</sup>	3.7 (1.3)	1.9 (1.3)
Calcium (g Ca m <sup>-2</sup> )	32.3(21.2)	33.3 (10.9) <sup>A†</sup>	14.7 (2.8)	59.1 (19.5)
Magnesium (g Mg m <sup>-2</sup> )	7.3 (3.9)	12.0 (4.1) <sup>A</sup>	4.0 (0.9)	3.5 (0.8)
Aluminum (g Al m <sup>-2</sup> )	50.9 (22.7)	76.6 (15.6) <sup>A</sup>	47.2 (17.6)	34.4 (2.0)
Iron (g Fe m <sup>-2</sup> )	3.7 (1.1) <sup>aA</sup>	3.0 (0.4) <sup>aA</sup>	2.3 (0.6) <sup>a</sup>	0.7 (0.3) <sup>b</sup>
Manganese (g Mn m <sup>-2</sup> )	4.5 (3.1)	2.5 (0.7) <sup>A</sup>	1.5 (0.4)	3.4 (1.3)
Bray-extractable phosphorus (g P m <sup>-2</sup> )	1.4 (0.1) <sup>abA</sup>	0.8 (0.1) <sup>bc</sup>	0.4 (0.04) <sup>c</sup>	4.7 (1.5) <sup>a</sup>
Clay at 1.0–1.5 m (%)	39.0 (13.0)	62.8 (12.6)	40.8 (10.3)	62.8 (3.7)
Clay at 1.5–2.0 m (%)	41.3 (11.2)	46.6 (16.2)	36.5 (10.8)	63.3 (6.1)