

Parent material:

The main parent rock/ : pyroclastic, consolidated material over which the soil has been formed (1st entry)

Mode of Accumulation : residual material or deposition of parent material (1st entry)

Texture of parent material (1st entry) : clayey

Weathering status of solid rock (1st entry) : slightly

Resistance against weathering (solid rock) (1st entry) : poor

Depth1 of lithological boundary : 40 cm

The main parent rock/ : pyroclastic, consolidated material over which the soil has been formed (2nd entry)

Mode of Accumulation : residual material or deposition of parent material (2nd entry)

Texture of parent material (2nd entry) : loamy

Weathering status of solid rock (2nd entry) : slightly

Resistance against weathering (solid rock) (2nd entry) : poor

Soil Depth; depth to which roots can easily penetrate throughout the year : cm

Remarks on Parent Materials : Early Pleistocene ignimbrite of the Bacaces Formation

Land use / vegetation:

Current land use at the site : afforestation

Major crops :

Main type of irrigation :

Rotation scheme :

Vegetation Type;The natural vegetation at the site : woodland

Status of vegetation :

Remarks on Land Use : LANDUSE: Formerly grazing land / Vegetation

where the profile is located

Form of the slope : straight surrounding the site

Slope Aspect of the site :

Hydrology and drainage:

Depth of groundwater table : cm

Groundwater Top : cm

Groundwater Bottom : cm

Kind of groundwater : no groundwater table observed table

Top Stagnating Layer : 60 cm

Bottom Stagnating Layer : 120 cm

Runoff : slow

Estimated permeability (class) : slow

of least permeable part of the profile

Drainage Class : imperfect

To Drainage Class : moderately well

Moisture conditions of the profile: dry from -to

Moisture conditions : cm

of the profile: moist from -to

Wet From - To : cm

Erosion and aggradation:

Soil erosion type (1st : sheet entry)

Intensity of the soil erosion type (1st entry) : slight

Occurrence of soil aggradation :

Slope Stability :

Surface characteristics:

Microrelief type: small-scale :
differences in relief in the
direct vicinity of the site
Microrelief Height :
Rockiness : none
Stoniness : none
Average size of stones :
Shape of stones (on average) :
Cracks : no cracks observed
Slaking of aggregates by : surface partly slaked, round smooth aggregates
tillage, rainfall or frost
Evidence of salt : non-saline
Evidence of alkali : non-alkaline

Nearest climate station:

Station : santa rosa
Country : Costa Rica
WMO Code : 9999
Distance : 25 km S (good)
Latitude / Longitude : X 0°0 / X 0°0

Climate data*:

dataType(Station)	: nrecord	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation (mm)(santa rosa)	: 10	4	1	4	7	220	248	158	258	355	275	92	19	1641

*Data are considered representative for site

Profile description:

Ah 0-20 cm : black (10YR 2/1, moist) (10YR 3.5/1, dry), silty clay, strongly coherent porous massive to ME medium subangular blocky, hard friable sticky plastic, many very fine fine pores, clear smooth boundary to,
Bw 20-40 cm : very dark grey (10YR 3/1, moist) grey (10YR 5/1, dry), clay, strong medium and coarse angular blocky, very hard firm sticky plastic, few fine faint mottles (7.5YR 5/6), many very fine pores, clear smooth boundary to,
Bg 40-60 cm : dark grey (10YR 4/1, moist) (light) grey (10YR 6/1, dry), sandy clay loam, moderate very coarse prismatic and strongly coherent porous massive, very hard firm slightly sticky slightly plastic, many medium prominent clear mottles (7.5YR 5/6), many very fine pores, few medium spherical hard ferruginous concretions, abrupt smooth boundary to,
R/C 60-67 cm : (light) grey (10YR 6/1, moist) light grey (10YR 7/1, dry), sandy loam, strongly coherent massive, extremely hard extremely firm, many coarse prominent mottles (7.5YR 6/6), abrupt smooth boundary to,
R 67-120 cm : (light) grey (10YR 6/1, moist) white (10YR 8/1, dry), massive, extremely hard extremely firm,

Physical

Particle size distribution:

Depth (cm)	Gravel (%)	Very Coarse Sand (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Very Fine Sand (%)	Total Sand (%)	Coarse Silt (%)	Fine Silt (%)	Total Silt (%)	Clay (%)
0-20	: 0	0.2	0.8	1.3	3.7	2.7	8.7	13.6	35.0	48.6	42.8
20-40	: 0	0.2	1.6	2.2	4.3	2.5	10.8	10.8	39.9	50.7	38.5
40-60	: 0	5.2	12.7	14.1	8.5	2.7	43.2	6.8	26.9	33.7	23.3
60-67	: 0	8.6	9.4	7.5	5.6	2.1	33.2	11.7	38.1	49.8	17.1
67-120	: 0	16.2	16.7	10.3	7.6	5.0	55.8	13.6	24.0	37.6	6.7

Other physical data

Depth (cm)	Bulk Density (kg/dm³)	Spec. Surf. Area (m²/g)	COLE (cm/cm)	Water Disp. Clay (%)	Clay (%)
0-20	: -	-	-	19.8	42.8
20-40	: -	-	-	22.4	38.5
40-60	: -	-	-	16.4	23.3
60-67	: -	-	-	9.9	17.1
67-120	: -	-	-	4.3	6.7

Chemical characteristics:

Depth (cm)	pH H ₂ O	pH KCl	EC 1 : 2.5 (mS/cm)	CaCO ₃ (%)	Org. C (%)	Org. N (%)	C / N	Exch. Acid (cmol/kg)	Exch. Al (cmol/kg)	Ca (cmol/kg)	Mg (cmol/kg)	K (cmol/kg)	Na (cmol/kg)	Sum Cations (cmol/kg)
0-20	: 5.4	4.4	0.07	-	3.36	0.19	18	0.2	0	11.3	2.4	0.8	0.1	14.6
20-40	: 5.7	4.6	0.04	-	0.71	0.05	14	-	-	8.2	2.4	0.3	0.2	11.1
40-60	: 6.1	4.7	0.03	-	0.21	0.03	7	-	-	4.1	1.3	0.3	0.1	5.8
60-67	: 6.2	4.8	0.04	-	0.13	0.03	4	-	-	4.7	1.7	0.4	0.2	7.0
67-120	: 6.4	4.8	0.03	-	0.04	0	-	-	-	4.0	1.3	0.2	0.1	5.6

Depth (cm)	CEC Soil (cmol/kg)	CEC Clay (cmol/kg)	CEC Org (cmol/kg)	ECEC (cmol/kg)	Base sat. (%)	Al sat. (%)	ESP (%)
0-20	: 21.7	51	11.8	-	67	0	0
20-40	: 13.1	34	2.5	-	85	-	2
40-60	: 7.1	30	0.7	-	82	-	1
60-67	: 8.2	48	0.5	-	85	-	2
67-120	: 6.5	97	0.1	-	86	-	2

Depth (cm)	pH NaF	P Retention (%)	OD OE	Melanic Index	Fe o (wt%)	Al o (wt%)	Si o (wt%)	Fe d (wt%)	Al d (wt%)	Fe p (wt%)	Al p (wt%)	C p (wt%)
0-20	: -	-	-	-	0.34	0.17	0.06	-	-	-	-	-
20-40	: -	-	-	-	0.10	0.09	0.03	-	-	-	-	-
40-60	: -	-	-	-	0.06	0.05	0.03	-	-	-	-	-
60-67	: -	-	-	-	0.08	0.05	0.04	-	-	-	-	-
67-120	: -	-	-	-	0.04	0.01	0.03	-	-	-	-	-

Clay mineralogy:

Depth (cm)	Kaolinite	Mica / illite	Vermiculite	Chlorite	Smectite	Halloysite	Mixed layer	Quartz	Feldspar	Gibbsite	Goethite	Hematite
0-20	: strong	very weak	-	-	very weak	-	-	-	weak	-	-	-
20-40	: strong	weak	-	-	very weak	-	-	-	very weak	-	-	-
40-60	: strong	weak	-	-	weak	-	-	-	very weak	-	-	-
60-67	: strong	very weak	-	-	weak	-	-	-	very weak	-	-	-
67-120	medium to strong	-	-	-	medium to strong	-	-	-	very weak	-	-	-

Source of analyzing procedures:

Laboratory Attribute	Description	Proc. ref
ISRIC Al o	Al; Atomic Absorption Spectrometry	12-2
ISRIC Al sat.	Calculation; Exchangeable Al / (exchangeable bases+Al+H) or Al / CEC	11.1.4-1.4.3
ISRIC Base sat.	Calculation; Sum of Exchangeable Cations (Na, K, Ca, Mg) / CEC soil	labmanual
ISRIC C / N	Calculation; Organic Carbon / Organic Nitrogen	labmanual
ISRIC Ca	Exchangeable bases with 1 M ammonium acetate at pH 7; Ca by atomic absorption spectrometry	9-4 and 9-5.3
ISRIC CEC Clay	Calculation; ((CEC soil - CEC org.m.)/ clay %)*100	9-6.3
ISRIC CEC Org	CEC organic matter; expert estimate for charge per unit C	9-6.3
ISRIC CEC Soil	CEC; with index cation in buffered solution pH7	9-4 and 9-5.3.3
ISRIC Clay; < 0.002 mm	Fraction by Pipette analysis; after removal CaCO ₃ and organic matter, dispersion and sedimentation	3-4.7
ISRIC EC 1 : 2.5	Electro Conductivity of a soil / water (1:2.5) suspension	4-1.4 and 13-4
ISRIC ESP	Calculation; (Exchangeable Na / CEC soil) * 100	9-6.3
ISRIC Exch. Acid	Extraction by 1 M KCl; titration with NaOH	11.1.4-1.4.2
ISRIC Exch. Al	Extraction by 1 M KCl; Al by atomic absorption spectrometry	11.1.4-1.4.3
ISRIC Fe o	Fe; Atomic Absorption Spectrometry	12-2
ISRIC Feldspar	Feldspar; relative abundance scale 0 - 7	16-1
ISRIC Gravel	Fraction from field sample, after drying, crushing, sieving	1-1
ISRIC K	Exchangeable bases with 1 M ammonium acetate at pH 7; K by flame atomic emission spectrometry	9-6.1
ISRIC Kaolinite	Kaolinite; relative abundance scale 0 - 7	16-1
ISRIC Mg	Exchangeable bases with 1 M ammonium acetate at pH 7; Mg by atomic absorption spectrometry	9-4 and 9-5.3
ISRIC Mica / Illite	Mica / illite; relative abundance scale 0 - 7	16-1
ISRIC Na	Exchangeable bases with 1 M ammonium acetate at pH 7; Na by flame atomic emission spectrometry	9-4 and 9-5.3
ISRIC Organic Carbon	Wet combustion of organic matter by potassium dichromate and sulphuric acid at about 125 degrees Celcius. Residual dichromate is back titrated against ferrous sulphate. To compensate for incomplete destruction an empirical correction factor of 1.3 is applied	5
ISRIC Organic Nitrogen	Organic Matter is digested in sulphuric acid (and hydrogen peroxide) with selenium as catalyst. Nitrogen is converted to ammonium sulphate.	6

		The solution is made alkaline and ammonia is distilled off. The evolved ammonia is trapped in boric acid and titrated with standardized acid solution	
ISRIC	pH H2O	pH electrode; in supernatant suspension	4-1
ISRIC	pH KCl	In supernatant suspension; potentiometrically	4-1
ISRIC	Sand; 0.10 - 0.05 mm	Fraction by sieving; after removal CaCO ₃ and organic matter	3-4.6
ISRIC	Sand; 0.25 - 0.10 mm	Fraction by sieving; after removal CaCO ₃ and organic matter	3-4.6
ISRIC	Sand; 0.5 - 0.25 mm	Fraction by sieving; after removal CaCO ₃ and organic matter	3-4.6
ISRIC	Sand; 1.0 - 0.5 mm	Fraction by sieving; after removal CaCO ₃ and organic matter	3-4.6
ISRIC	Sand; 2.0 - 0.05 mm	Total sand fractions by sieving; after removal CaCO ₃ and organic matter	3-5
ISRIC	Sand; 2.0 - 1.0 mm	Fraction by sieving; after removal CaCO ₃ and organic matter	3-4.6
ISRIC	Si o	Si; Atomic Absorption Spectrometry	12-2
ISRIC	Silt; 0.02 - 0.002 mm	Fraction by Pipette analysis ; after removal CaCO ₃ and organic matter, dispersion and sedimentation	3-4.7
ISRIC	Silt; 0.05 - 0.002 mm	Calculation; Sum fractions Silt 0.05 - 0.02 mm	3-4.7
ISRIC	Silt; 0.05 - 0.02 mm	Fraction by Pipette analysis ; after removal CaCO ₃ and organic matter, dispersion and sedimentation	3-4.7
ISRIC	Smectite	Smectite; relative abundance scale 0 - 7	16-1
ISRIC	Sum cations	Sum of Exchangeable Cations (Ca, Mg, Na, K) with 1 M ammonium acetate at pH 7	9-
	Water		
ISRIC	Dispersable Clay	Fraction by Pipette analysis; without any pretreatment	3-8

*ref: no labmanual available, link to presumable used analytical methode

Other classification

USDA-SCS (1975) : Ustropept clayey over loamy kaolinitic isohyperthermic