

Reference soil Brazil 29: Planosol

Description

Classification

WRB 2006:

Umbric Acric Endogleyic Planosol (Albic Ruptic Alomic)
0-35 cm umbric horizon
35-65 cm albic horizon
65-143 cm argic horizon
abrupt textural change
gleyic colour pattern
lithological discontinuity

WRB 1998:

Umbri- Gleyic Planosol (Albic Alomic)
0-35 cm umbric horizon
35-65 cm albic horizon
65-143 cm argic horizon
abrupt textural change
gleyic properties

FAO-UNESCO-ISRIC 1988:

Albi- Umbric Planosol
0-35 cm umbric A horizon
35-65 cm albic E horizon
65-143 cm argic B horizon
abrupt textural change
stagnic properties

FAO-UNESCO 1974:

Humic Planosol
0-35 cm umbric A horizon
35-65 cm albic E horizon
65-143 cm argillic B horizon
abrupt textural change
hydromorphic properties

Site description

General information:

Names of person(s) : Dos Santos HG, AL Lemos, FCS
who described the do Amaro & B Calderano Filho
profile
General description of : Rio de Janeiro, RJ, Itumirim road
location of profile (e.g., no. 654, 50m on the right side and
town, province) 300m from the Magerca Road
Date : August 1986
Latitude / Longitude : ° / °

Physiography:

The altitude of the : 20 m asl
soil profile relative
to mean sea level,
specified in meters
Regional landform : plain
Topography of the : undulating
surrounding country
Physiographic Unit : trench
in the immediate
surrounding of the
site
The slope refers to : 0 %
the inclination of the
land immediately
surrounding the
site. The measured
or estimated slope
angle is specified to
the nearest per cent
The physiographic : flat
position of the site
where the profile is
located
Form of the slope : straight
surrounding the site
Slope Aspect of the :
site

Parent material:

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

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

Texture of parent : sandy material (1st entry)

Weathering status of : partially or moderately solid rock (1st entry)

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

Depth1 of lithological : cm boundary

The main parent rock/ : mixed lithology and composition material over which the soil has been formed (2nd entry)

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

Texture of parent : clayey material (2nd entry)

Weathering status of : partially or moderately solid rock (2nd entry)

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

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

Remarks on Parent : Holocene sediments Materials

Land use / vegetation:

Current land use at : cultivated pasture the site

Major crops :

Main type of irrigation :

Rotation scheme :

Vegetation Type;The : semi-deciduous forest natural vegetation at the site

Status of vegetation :

Remarks on Land Use : LANDUSE: Cleared for pasture / Vegetation

Hydrology and drainage:

Depth of : cm groundwater table

Groundwater Top : cm

Groundwater Bottom : cm

Kind of groundwater : table

Top Stagnating : cm Layer

Bottom Stagnating : cm Layer

Runoff : very slow

Estimated : slow

permeability (class) of least permeable part of the profile

Drainage Class : imperfect

To Drainage Class :

Moisture conditions : 0-10 cm of the profile: dry from -to

Moisture conditions : 10-163 cm of the profile: moist from -to

Wet From - To : cm

Erosion and aggradation:

Soil erosion type (1st : entry)

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) :
Slaking of aggregates by :
tillage, rainfall or frost
Evidence of salt : non-saline
Evidence of alkali : non-alkaline

Nearest climate station:

Station : No representative climate station available for this site

Profile description:

Ap1 0-10 cm : (10YR 5.5/1, dry) (10YR 3/1.5, moist), loamy sand, moderate very fine and fine granular and single grain, soft friable non sticky non plastic, many very fine medium pores, gradual smooth boundary to,
Ap2 10-35 cm : very dark greyish brown (10YR 3/2, moist), sandy loam, weak very fine and fine granular and single grain, soft friable non sticky non plastic, many very fine medium pores, clear smooth boundary to,
Eg 35-65 cm : dark grey (10YR 4/1, moist), sandy loam, massive, slightly hard friable non sticky non plastic, common fine medium pores, abrupt smooth boundary to,
2Btg1 65-88 cm : grey (10YR 5/1, moist), clay, weak fine and medium angular and subangular blocky and weak coarse angular and subangular blocky, very hard firm sticky plastic, common medium distinct mottles (10YR 5/5) and common medium prominent mottles (2.5YR 3/6), few pores, gradual smooth boundary to,
2Btg2 88-118 cm : grey (5Y 5/1, moist), clay, moderate medium and coarse angular and subangular blocky, extremely hard firm sticky plastic, common medium prominent mottles (10YR 4/6) and common medium prominent mottles (10YR 5/6), few pores, gradual smooth boundary to,
2Btg3 118-143 cm : grey (5Y 5/1, moist), clay, moderate medium and coarse angular and subangular blocky, extremely hard firm sticky plastic, common coarse prominent mottles (10R 3/3) and common coarse prominent mottles (10YR 4/6), few pores, gradual smooth boundary to,
2BCg 143-163 cm : grey (5Y 5/1, moist), clay, weak medium and coarse angular and subangular blocky, extremely hard firm sticky slightly plastic, common medium prominent mottles (10R 3/3) and common medium prominent mottles (2.5Y 6/7), few pores,

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 (%)
0-10	-	13.1	37.3	23.3	10.2	3.4	87.3	3.3	5.6	8.9	3.9
10-35	-	17.1	27.3	17.3	13.3	5.4	80.4	6.1	8.2	14.3	5.2
35-65	-	9.9	26.3	21.9	13.7	5.7	77.5	6.2	8.8	15.0	7.6
65-88	-	9.2	14.7	10.4	7.9	3.8	46.0	4.3	6.4	10.7	43.3
88-118	-	7.1	8.8	5.4	5.0	3.3	29.6	5.6	3.8	9.4	61.0
118-143	-	7.5	11.5	7.2	6.2	3.8	36.2	5.2	6.4	11.6	52.1
143-163	-	12.1	18.3	12.8	7.1	3.1	53.4	3.5	4.7	8.2	38.4

Water retention characteristics

Depth (cm)	Bulk Density (kg/dm ³)	pF 0 (% w/v)	pF 1.0 (% w/v)	pF 1.5 (% w/v)	pF 2.0 (% w/v)	pF 2.3 (% w/v)	pF 2.7 (% w/v)	pF 3.4 (% w/v)	pF 4.2 (% w/v)	pF 2.5 (%)
10-35 :	1.585	36.4	30.1	22.9	15.8	13.7	11.0	5.4	4.8	-
35-65 :	1.689	31.4	27.9	19.3	12.5	10.7	8.6	6.2	5.9	-
65-88 :	1.680	37.6	39.8	35.0	32.5	31.6	29.8	27.9	27.2	-
88-118 :	1.509	44.5	42.7	42.5	41.2	40.7	39.8	35.8	34.5	-
118-143 :	1.605	40.1	39.8	38.0	36.3	35.6	34.3	38.2	31.9	-

Other physical data

Depth (cm)	Bulk Density (kg/dm ³)	Spec. Surf. Area (m ² /g)	COLE (cm/cm)	Water Disp. Clay (%)	Clay (%)
0-10 :	-	-	-	2.2	3.9
10-35 :	-	-	-	3.2	5.2
35-65 :	-	-	-	7.3	7.6
65-88 :	-	-	-	29.3	43.3
88-118 :	-	-	-	0.9	61.0
118-143 :	-	-	-	0.5	52.1
143-163 :	-	-	-	0.3	38.4

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)
0-10 :	4.7	4.1	0.18	-	0.54	0.05	11	1.2	0.2	0.6	0.3	0.1	0.2	1.2
10-35 :	4.9	4.1	0.05	-	0.29	-	-	0.4	0.5	0.0	0.0	0.0	0.1	0.1
35-65 :	4.9	4.1	0.03	-	0.07	-	-	0.4	0.5	0.2	0.0	0.0	0.2	0.4
65-88 :	4.8	3.6	0.04	-	0.16	-	-	3.4	3.6	0.8	0.9	0.0	0.1	1.8
88-118 :	4.5	3.5	0.04	-	0.12	-	-	6.2	6.2	0.6	0.9	0.1	0.2	1.8
118-143 :	4.5	3.5	0.04	-	0.07	-	-	6.8	7.1	0.2	0.7	0.1	0.0	1.0
143-163 :	4.4	3.6	0.04	-	0.06	-	-	5.7	5.7	0.2	0.5	0.1	0.0	0.8

Depth (cm)	CEC Soil (cmol/kg)	CEC Clay (cmol/kg)	CEC Org (cmol/kg)	ECEC (cmol/kg)	Base sat. (%)	Al sat. (%)	ESP (%)
0-10 :	1.9	49	1.9	-	63	11	11
10-35 :	0.5	10	1.0	-	20	100	20
35-65 :	0.9	12	0.2	-	44	56	22
65-88 :	4.8	11	0.6	-	38	75	2
88-118 :	9.1	15	0.4	-	20	68	2
118-143 :	7.9	15	0.2	-	13	90	0
143-163 :	5.3	14	0.2	-	15	108	0

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%)
0-10 :	-	-	-	-	0.00	0.00	0.00	0.10	0.00	-	-	-
10-35 :	-	-	-	-	0.00	0.00	0.00	0.10	0.00	-	-	-
35-65 :	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-
65-88 :	-	-	-	-	0.10	0.10	0.00	1.00	0.10	-	-	-
88-118 :	-	-	-	-	0.10	0.10	0.00	1.60	0.20	-	-	-
118-143 :	-	-	-	-	0.10	0.10	0.00	1.50	0.10	-	-	-
143-163 :	-	-	-	-	0.00	0.10	0.00	0.70	0.10	-	-	-

Clay mineralogy:

Depth (cm)	Kaolinite	Mica / illite	Vermiculite	Chlorite	Smect	Halloysite	Mixed layer	Quartz	Feldspar	Gibbsite	Goethite	Hematite
0-10	: medium to strong	weak	-	-	-	-	-	medium to strong	-	-	-	-
10-35	: medium to strong	weak	-	-	-	-	-	medium to strong	-	-	-	-
35-65	: strong	weak	-	-	-	-	-	medium to strong	-	-	-	-
65-88	: very strong	weak	-	-	weak	-	-	very weak	-	-	-	-
88-118	: very strong	weak	-	-	weak	-	-	very weak	-	-	-	-
118-143	: very strong	weak	-	-	-	-	-	very weak	-	-	-	-
143-163	: very strong	weak	-	-	-	-	-	-	-	-	-	-

Source of analyzing procedures:

Laboratory Attribute	Description	Proc. ref
ISRIC Al d	Al; Atomic Absorption Spectrometry	12.1-1.2
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 Bulk Density	Soil density excluding mass liquid, including interparticle space	18-3
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 d	Fe; Atomic Absorption Spectrometry	12-1.2
ISRIC Fe o	Fe; Atomic Absorption Spectrometry	12-2
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. The solution is made	6

		alkaline and ammonia is distilled off. The evolved ammonia is trapped in boric acid and titrated with standardized acid solution	
ISRIC	pF 0	Moisture content of soil in a ring sample at tension of 0.1 kPa head of water	18-3
ISRIC	pF 1.0	Moisture content of soil in a ring sample at tension of 1 kPa head of water	18-3
ISRIC	pF 1.5	Moisture content of soil in a ring sample at tension of 3.2 kPa head of water	18-3
ISRIC	pF 2.0	Moisture content of soil in a ring sample at tension of 10 kPa head of water	18-3
ISRIC	pF 2.3	Moisture content of soil in a ring sample at tension of 20 kPa head of water	18-3
ISRIC	pF 2.7	Moisture content of soil in a ring sample at tension of 50 kPa head of water	18-3
ISRIC	pF 3.4	Moisture content of soil in a ring sample at tension of 250 kPa head of water	18-3
ISRIC	pF 4.2	Moisture content of soil in a ring sample at tension of 1.5 MPa head of water	18-3
ISRIC	pH H2O	pH electrode; in supernatant suspension	4-1
ISRIC	pH KCl	In supernatant suspension; potentiometrically	4-1
ISRIC	Quartz	Quartz; relative abundance scale 0 -7	16-1
ISRIC	Sand; 0.10 - 0.05 mm	Fraction by sieving; after removal CaCO3 and organic matter	3-4.6
ISRIC	Sand; 0.25 - 0.10 mm	Fraction by sieving; after removal CaCO3 and organic matter	3-4.6
ISRIC	Sand; 0.5 - 0.25 mm	Fraction by sieving; after removal CaCO3 and organic matter	3-4.6
ISRIC	Sand; 1.0 - 0.5 mm	Fraction by sieving; after removal CaCO3 and organic matter	3-4.6
ISRIC	Sand; 2.0 - 0.05 mm	Total sand fractions by sieving; after removal CaCO3 and organic matter	3-5
ISRIC	Sand; 2.0 - 1.0 mm	Fraction by sieving; after removal CaCO3 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 CaCO3 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 CaCO3 and organic matter, dispersion and sedimentation	3-4.7
ISRIC	Smectite	Smectite; relative abundance scale 0 - 7	16-1
ISRIC	Sum cations Water	Sum of Exchangeable Cations (Ca, Mg, Na, K) with 1 M ammonium acetate at pH 7	9-
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-NRCS (1999) : Typic Albaquilt mixed isohyperthermic sandy over clayey

USDA-SCS (1975) : Typic Albaquilt sandy over clayey mixed isohyperthermic

Classification (other) :

Planossolo Tb álico a moderado textura média/argilosa fase floresta tropical subcaducifolia relvo plano

Please report suggestions for improvement to the [webmaster](#)

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