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Supplementary Material

Tab. S1 - The background history of the studied areas.

Site	Area (ha)	Geographical coordinates	Altitude (m)	Land use history	Current land use and soil management
PNV	20	07° 25’ 36” S; 40° 25' 50" W	837	• There are no reports of land use since 1970.	• Not managed
DNV	02	07° 27' 52" S; 40° 25' 3" W	830	• Vegetation with low natural regeneration since 1970 due to the exploitation of wood to supply the industries producing calcined gypsum and flour houses. • Cashew planting in the remote past.	• Not managed • The presence of crusts of ~ 0.5 cm was observed in situ, caused by runoff and the presence of animal runners.
CCC	30	07° 27' 40" S; 40° 25' 21" W	828	• The native vegetation of caatinga was deforested and burned and the soil used for cassava cultivation from 1970.	• Soil preparation for planting is always carried out with plowing followed by harrowing. • No reports of soil acidity correction. • The soil was fertilized with N-P-K, but the last application occurred in 2009. • The management of the crop is done with weeding and manual cutting every 18 months, with the plant material spread over the soil and incorporated near the planting.
EAC	04	07° 27' 40" S; 40° 24' 39" W	828	• The native vegetation of caatinga was deforested and burned and the soil used for cassava cultivation from 1970 to 2005. • Eucalyptus cultivation was introduced from 2005.	• The planting is carried out after correction of the soil with limestone, plowing and harrowing. Fertilization is performed with N-P-K (6-24-12). The last fertilization was carried out in 2009. • The management of the crop is done with manual and mechanical weeding, and crowning, with plant material kept on soil.

Tab. S2 - Particle size distribution in the studied areas.

Vegetation Type	Depth (cm)	Particles size distribution (g kg^{-1})		
		Sand (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (< 0.002 mm)
Preserved native vegetation - PNV	0-10	758	40	202
	10-20	722	60	218
Degraded native vegetation - DNV	0-10	690	92	218
	10-20	712	91	197
Cassava conventional cultivation - CCC	0-10	759	30	211
	10-20	716	56	228
Eucalyptus agro-energy cultivation - EAC	0-10	656	101	243
	10-20	664	105	231

Appendix 1 – Description of soil profiles.

Profile P1: Preserved native vegetation – PNV

SOIL CLASS (SiBCS 2018): Latossolo Amarelo Distrófico, A moderado, textura franco-arenosa, caatinga hipoxerófila com trechos de floresta caducifólia, relevo plano.
SOIL TAXONOMY (2014): Oxisol. A moderate, sandy-loam texture, hypoxerophilic Caatinga, with stretches of deciduous forest, flat relief.
LOCALIZATION: Private property; Area under preserved native vegetation, Araripina Municipality, Pernambuco State, Brazil. Coordinates: 7° 25' 36" S e 40° 25' 50" W.
SLOPE AND VEGETATION: Top plateau plan, slope 0-2%, native vegetation – Caatinga Biome.
ALTITUDE: 837 m.
LITHOLOGY: Sandstone from Exú Formation.
STONY: Absent
RELIEF: Flat
EROSION: Not apparent.
DRAINAGE: Markedly drained.
CURRENT USE: Unused.
CLIMATE: Bshw' (Koppen Classification) (Alvarez et al., 2013).

MORPHOLOGICAL DESCRIPTION

A – (0-17 cm), dark-brown (7.5 YR 4/3, wet) and brown (7.5 YR 5/3, dry); sandy-loam; weak to moderate structure/small to medium. Sub-angular blocks. Granular and single grain; slightly hard; very friable; slightly plastic and slightly sticky; flat and clear transition.
AB – (17-39 cm), light-brown (7.5 YR 5/6, wet) and yellowish-brown (7.5 YR 6/4, dry); Sandy-loam; weak to moderate structure/small to medium. Sub-angular blocks; slightly hard; very friable; slightly plastic and slightly sticky; flat and gradual transition.
BA – (39-63 cm), light-brown (7.5 YR 5/6, wet); Sandy-loam; weak/small to medium structure. Sub angular blocks, strong, very small; slightly hard; very friable; plastic and slightly sticky; flat and diffuse transition.
BW1 – (63-100 cm), light-brown (7.5 YR 5/8, wet); sandy-clay-loam; weak/small to medium structure. Sub angular blocks, Strong, very small granular; slightly hard; very friable; plastic and slightly sticky; flat and diffuse transition.
BW2 – (100-180^{+} cm), reddish yellow (7.5 YR 6/8, wet); Sandy-clay-loam; weak/small to medium structure. Sub angular blocks, strong, very small granular; slightly hard; very friable; plastic and slightly sticky; flat and diffuse transition.
ROOTS: Many thin, common medium and few thick in horizons A and AB; common thin and few medium on BA; common thin and rare medium on BW1; few thin on BW2.
OBSERVATIONS: Soil slightly moist along the profile, some dry parts in horizons A and AB; Presence of roots throughout the profile; Area under Caatinga native vegetation, called "carrasco"; Presence of small amount of ferromagnetic minerals.

Profile P2: Degraded native vegetation - DNV

SOIL CLASS (SiBCS, 2018): Latossolo Amarelo Distrófico, A moderado, textura franco-arenosa, caatinga hipoxerófila com trechos de floresta caducifólia, relevo plano.

SOIL TAXONOMY (2014): Oxisol. A moderate, sandy-loam texture, hypoxerophilic Caatinga, with stretches of deciduous forest, flat relief.

LOCALIZATION: Experimental area in Agronomic Institute of Pernambuco – IPA; Area under degraded native vegetation, Araripina Municipality, Pernambuco State, Brazil. Coordinates: 7° 27' 52" S e 40° 25' 3" W.

SLOPE AND VEGETATION: Top plateau plan, slope 0-2%, area under degradation.

ALTITUDE: 830 m.

LITHOLOGY: Sandstone from Exú Formation.

STONY: Absent

RELIEF: Flat

EROSION: Not apparent.

DRAINAGE: Markedly drained.

CURRENT USE: Unused.

CLIMATE: Bshw' (Koppen Classification) (Alvarez et al., 2013).

MORPHOLOGICAL DESCRIPTION

AP – (0-14 cm), dark-brown (7.5 YR 4/4, wet) and yellowish-brown (7.5 YR 6/4, dry); sandy-loam; weak/small to medium structure. Sub-angular blocks and single grain; slightly hard to hard and soft; very friable; slightly plastic and slightly sticky; flat and clear transition.

AB – (14-45 cm), brown (7.5 YR 5/4, wet) and yellowish-brown (7.5 YR 6/4, dry); sandy-loam; weak to moderate/small to medium. Sub-angular blocks and single grain; slightly hard to soft; very friable; slightly plastic and slightly sticky; flat and clear transition.

BA – (45-75 cm), light-brown (7.5 YR 5/6, wet) and reddish yellow (7.5 YR 6/6, dry); sandy-loam^{+}; weak/small to medium structure. Sub-angular blocks and strong very small granular; slightly hard to soft; very friable; plastic and slightly sticky; flat and diffuse transition.

BW1 – (75-110 cm), reddish yellow (7.5 YR 6/6, wet) and reddish yellow (7.5 YR 7/6, dry); sandy-clay-loam; weak/small to medium structure. Sub-angular blocks and strong very small granular; slightly hard to soft; very friable; plastic and slightly sticky; flat and diffuse transition.

BW2 – (110-180^{+} cm), light-brown (7.5 YR 5/8, wet) and reddish yellow (7.5 YR 6/8, dry); sandy-clay-loam; weak/small to medium structure. Sub-angular blocks and strong very small granular; slightly hard to soft; very friable; plastic and slightly sticky; flat and diffuse transition.

ROOTS: Common thin, rare thick and medium in horizons AP and AB; few thin rare medium on BA; rare thin and medium in horizons BW1 and BW2.

OBSERVATIONS: Area under visible degradation by the presence of clearings without vegetation for decades; Presence of small amount of ferromagnetic minerals; Presence of few, big and diffuse mottles; Presence of crust of approximately 1 cm causing impediment of water infiltration in the soil. The rain has caused separation of sand and clay around the profile location. The soil is completely dry in the profile.

Profile P3: Cassava conventional cultivation - CCC

SOIL CLASS (SiBCS, 2018): Latossolo Amarelo Distrófico, A moderado, textura franco-arenosa, Caatinga hipoxerófila com trechos de floresta caducifólia, relevo plano.
SOIL TAXONOMY (2014): Oxisol. A moderate, sandy-loam texture, hypoxerophilic Caatinga, with stretches of deciduous forest, flat relief.
LOCALIZATION: Experimental area in Agronomic Institute of Pernambuco – IPA; Area under monoculture (Cassava conventional cultivation), Araripina Municipality, Pernambuco State, Brazil. Coordinates: 7° 27' 40" S e 40° 25' 21" W.
SLOPE AND VEGETATION: Top plateau plan, slope 0-2%, area under Cassava cultivation.
ALTITUDE: 828 m.
LITHOLOGY: Sandstone from Exú Formation.
STONY: Absent.
RELIEF: Flat.
EROSION: Not apparent.
DRAINAGE: Markedly drained.
CURRENT USE: Cassava monoculture.
CLIMATE: Bshw' (Koppen Classification) (Alvarez et al., 2013).

MORPHOLOGICAL DESCRIPTION

AP – (0-17 cm), dark-brown (7.5 YR 4/3, wet); sandy-loam; weak/small to medium structure. Sub-angular blocks and granular; very friable; slightly plastic and slightly sticky; flat and clear transition.
AB – (17-38 cm), dark-brown (7.5 YR 4/4, wet); sandy-loam; weak to moderate/small to medium structure. Sub-angular blocks; very friable; slightly plastic and slightly sticky; flat and gradual transition.
BA – (38-65 cm), light-brown (7.5 YR 5/6, wet); sandy-loam^{+}; weak/small to medium structure. Sub-angular blocks; very friable; plastic and slightly sticky; flat and diffuse transition.
BW1 – (65-110 cm), light-brown (7.5 YR 5/8, wet); sandy-clay-loam; weak/small to medium structure. Sub-angular blocks; plastic and slightly sticky; flat and diffuse transition.
BW2 – (110-180^{+} cm), reddish-yellow (7.5 YR 6/6, wet); sandy-clay-loam; weak/small to medium. Sub-angular blocks, strong, very small granular; very friable; plastic and slightly sticky; flat and diffuse transition.
ROOTS: Common thin in horizon AP; few thin on AB, BA and BW1; rare thin on BW2.
OBSERVATIONS: Only described in the wet state.

Profile P4: Eucalyptus agro-energy cultivation - EAC

SOIL CLASS (SiBCS, 2018): Latossolo Amarelo Distrófico, A moderado, textura franco-arenosa, Caatinga hipoxerófila com trechos de floresta caducifólia, relevo plano.

SOIL TAXONOMY (2014): Oxisol. A moderate, sandy-loam texture, hypoxerophilic Caatinga, with stretches of deciduous forest, flat relief.

LOCALIZATION: Experimental area in Agronomic Institute of Pernambuco – IPA; Area under eucalyptus cultivation, Araripina Municipality, Pernambuco State, Brazil. Coordinates: 7° 27' 40" S e 40° 24' 39" W.

SLOPE AND VEGETATION: Top plateau plan, slope 0-2%, area under eucalyptus cultivation.

ALTITUDE: 828 m.

LITHOLOGY: Sandstone from Exú Formation.

STONY: Absent.

RELIEF: Flat.

EROSION: Not apparent.

DRAINAGE: Markedly drained.

CURRENT USE: Eucalyptus cultivation.

CLIMATE: Bshw' (Koppen Classification) (Alvarez et al., 2013).

MORPHOLOGICAL DESCRIPTION

AP – (0-17 cm), dark-brown (7.5 YR 4/3, wet) and brown (7.5 YR 5/4, dry); sandy-loam; weak/small to medium structure. Sub-angular blocks and granular; slightly hard; very friable; slightly plastic and slightly sticky; flat and clear transition.

AB – (17-40 cm), dark-brown (7.5 YR 4/6, wet) and brown (7.5 YR 5/4, dry); sandy-loam; weak to moderate/small to medium structure. Sub-angular blocks; slightly hard; very friable; slightly plastic and slightly sticky; flat and gradual transition.

BA – (40-69 cm), light-brown (7.5 YR 5/6, wet); sandy-loam^{+}; weak/small to medium structure. Sub-angular blocks; slightly hard; very friable; plastic and slightly sticky; flat and diffuse transition.

BW1 – (69-115 cm), light-brown (7.5 YR 5/8, wet); sandy-clay-loam; weak/small to medium structure. Sub-angular blocks, strong, very small granular; slightly hard to soft; plastic and slightly sticky; flat and diffuse transition.

BW2 – (115-190^{+} cm), reddish-yellow (7.5 YR 6/8, wet); sandy-clay-loam; weak/small to medium structure. Sub-angular blocks, strong, very small granular; slightly hard to soft; very friable; plastic and slightly sticky; flat and diffuse transition.

ROOTS: Common thin in horizon AP; few thin and medium, rare thick on AB; few thin, medium and thick on BA; rare thin and medium on BW1; rare thin on BW2.

OBSERVATIONS: Slightly moist soil up to 1 m deep; soil under eucalyptus cultivation; significant presence of eucalyptus roots up to 1 m deep; Presence of small amount of ferromagnetic minerals; presence of organic layer that characterizes O horizon.