

VERTISOLS

Soil Profile Description

Information on the site :

Soil Classification: USDA (1990): Very fine, montmorillonitic, thermic Family of Entic Chromoxererts(EAAB)
ACSAD: VXC en 5 a: Entic Chromoxererts
FAO/UNESCO: VR : Vertisol

Location: 1.5 km EN Aidun

Coordinates: Geographical : 35.87661 E/ 32.51207 N
JTM: 394455 E/ 598528 N

Elevation: 610 m asl

Landform: Position: Lower slope
Land System : 8/8 (Undulating piedmont alluvial and colluvial plains)--8.8.1[GIS]
Land Facet: 7 (Concave to flat lower slopes of alluvial plain)

Microrelief: Class: Even (<25 cm)
Type: other

Slope: Gently sloping (2%) , rectilinear to NE

Land Use : 1.5 Mixed tree /annuals

Plant /Crop: olives, Toot

Climate:Mean annual precipitation:
Mean annual temperature: Air : 17.1° C / Soil (50cm): 20.0° C
Soil moisture regime: Xeric
Precipitation zone: 400-450 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Chalk / Limestone [q5 Fluv.deposits, sand, loess (Bender 1968)]

Parent Material: Alluvium

Drainage: Surface Runoff: None
Soil Drainage Class: Well

Surface Cover: Stones (15 %)
Surface Feature: Cracks (10 %)

Soil Surface Conditions: Dry / Extremely hard

Erosion: Nil

Soil Depth: 210 cm +

Diagnostic Horizon or Property: Vertic at 0 cm and Calcic at 83 cm

PROFILE DESCRIPTION:

Ap	0-20	cm	Brown (10 YR 4/3) dry and dark yellowish brown (10 YR 3/4) moist; clay; very strong coarse angular blocky breaking to strong medium angular blocky; dry extremely hard; moist very friable; moderately sticky; moderately plastic; many medium (5-10 mm) vertical cracks; common fine (1-2 mm) fibrous and woody roots; 10 % angular chert fine gravel (2-5 mm); 1 % small (<5 mm) soft calcareous concretions; weak thin clay coating; slight reaction to HCl; gradual wavy boundary to
	20-45	cm	Brown (10 YR 4/3) dry and dark yellowish brown (10 YR 3/4) moist; clay; moderate coarse angular blocky breaking to strong coarse platy; dry very hard; moderately sticky; moderately plastic; common medium (5-10 mm) vertical cracks; many fine (1-2 mm) fibrous and woody roots; 5 % angular chert fine gravel (2-5 mm); 2 % small (<5 mm) moderately hard calcareous concretions; moderately thin clay coating; slight reaction to HCl; clear wavy boundary to:
	45-83	cm	Brown (10 YR 4/3) moist; clay; strong coarse prismatic breaking to strong medium prismatic; dry extremely hard; moist very friable; moderately sticky; very plastic; many fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 5 % irregular chert fine gravel (2-5 mm); 3 % small (<5 mm) moderately hard calcareous concretions; moderate thick clay coating; slight reaction to HCl; gradual smooth boundary to:
	83-210+	cm	Dark yellowish brown (10 YR 4/4) moist; clay; very strong coarse prismatic breaking to strong medium subangular blocky; dry extremely hard; moist friable; moderately sticky; moderately plastic; common fine (1-5mm) irregular cracks; few very fine (<1 mm) fibrous roots; 5 % irregular chert fine gravel (2-5 mm); 5 % medium (5-15 mm) hard calcareous concretions; strong thick clay coating; moderate reaction to HCl.

Soil Profile Description (ID 2)

Information on the site :

Soil Classification: USDA (1990): Very fine, montmorillonitic, calcareous, thermic Family of typic Chromoxererts(EAAD)
ACSAD: VXC t 5 b: Typic Chromoxerets
FAO/UNESCO: VR : Vertisol

Location: Middle sample area 1/6
Coordinates: Geographical : 35.92186 E/ 32.39788 N
JTM: 398579 E/ 585822 N
Elevation: 815 m asl
Landform: Position: Upper slope
Land System : 8/10(Dissected limestone plateau with deep colluvial mantles)--8.10.0[GIS]
Land Facet: 3 (Deep colluvial mantles on mid/lower slopes)
Microrelief: Class: Even (<25 cm)
Type:
Slope: Sloping (7%) , rectilinear to NE
Land Use : 1.4 Tree crops,orchards
Plant /Crop: olives
Climate:Mean annual precipitation:
Mean annual temperature: Air : 15.8° C / Soil (50cm): 18.8° C
Soil moisture regime: Xeric
Precipitation zone: 350-400 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Limestone/chert [c2 Chalky/sandy LSt (Sir, Fuh (Bender 1968))]
Parent Material: Colluvium
Drainage: Surface Runoff: None
Soil Drainage Class: Well
Surface Cover: Stones (5 %)
Surface Feature: Cracks (10 %)
Soil Surface Conditions: Dry / Very hard
Erosion: Nil
Soil Depth: 200 cm +
Diagnostic Horizon or Property: Calcic at 86 cm

PROFILE DESCRIPTION:

Ap	0-20	cm	Reddish brown (5 YR 5/4) dry and dark reddish brown (5 YR 4/4) moist; silty clayloam; moderate coarse subangular blocky breaking to moderate medium subangular blocky; dry hard; moist very friable; very sticky; slightly plastic; common fine (0.5-2 mm) tubular pores; common medium (5-10 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 5 % angular chert coarse gravel (20-75 mm); strong reaction to HCl; clear smooth boundary to:
	20-43	cm	Reddish brown (5 YR 5/4) dry and reddish brown (5 YR 4/4) moist; clay; strong very coarse angular blocky; moist very friable; slightly sticky; very plastic; few fine (0.5-2 mm) tubular pores; common fine (1-5 mm) vertical cracks; common fine (1-2 mm) fibrous roots; 5 % angular chert fine gravel (2-5 mm); weak thin clay coating; strong reaction to HCl; diffuse smooth boundary to:
	43-86	cm	Reddish brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; clay; strong coarse prismatic breaking to medium subangular blocky; dry very hard; moist friable; slightly sticky; very plastic; few very fine (0.5 mm) tubular pores; common very fine (<1 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 5 % irregular hard limestone fine gravel (2-5 mm); moderate thick clay coating; strong reaction to HCl; diffuse smooth boundary to :
	86-122	cm	Dark reddish brown (5YR 3/4) moist; strong coarse prismatic breaking to strong medium prismatic; dry very hard; moist friable; slightly sticky; very plastic; few very fine (0.5 mm) tubular pores; common fine (<1-5 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 1 % irregular hard limestone fine gravel (2-5 mm); 10 % large (>15 mm) moderately hard calcareous concretions; strong thick clay coating; strong reaction to HCl; diffuse smooth boundary to :
	122-200+	cm	Yellowish red (5 YR 4/6) moist; clay; strong coarse prismatic breaking to strong medium prismatic; dry very hard; few very fine (0.5 mm) tubular pores; common fine (<1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 1 % irregular hard limestone fine gravel (2-5 mm); 15 % large

(>15 mm) moderately hard calcareous concretions; strong thick clay coating; violent reaction to HCl.

Soil Profile Description (ID 3)

Information on the site :

Soil Classification: USDA (1990): Fine, montmorillontic, thermic Family of Typic Chromoxererts(EAAB)
ACSAD: VXC t 4 b: Typic Chromoxererts
FAO/UNESCO: VR : Vertisol

Location: 1.5 km NW Hawara
Coordinates: Geographical : 35.89408 E/ 32.54278 N
JTM: 396132 E/ 601916 N
Elevation: 565 m asl
Landform: Position: Middle slope
Land System : 8/8 (Undulating piedmont alluvial and colluvial plains)--8.8.8[GIS]
Land Facet: 2 (Undulating piedmont plain)
Microrelief: Class: Even (<25 cm)
Type: other
Slope: Gently sloping (4%) , convex to ESE
Land Use : 1.8 Fallow
Plant /Crop: Shrubs
Climate:Mean annual precipitation:
Mean annual temperature: Air : 17.3° C / Soil (50cm): 20.3° C
Soil moisture regime: Xeric
Precipitation zone: 350-400 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Basalt [q5 Fluv.deposits, sand, loess (Bender 1968)]
Parent Material: Bedrock-fresh
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well
Surface Cover: Boulders (2 %)
Surface Feature: Cracks (10 %)
Soil Surface Conditions: Dry / hard
Erosion: Nil
Soil Depth: 145 cm (Gravel / stones)
Diagnostic Horizon or Property: Vertic at 0 cm

PROFILE DESCRIPTION:

0-23	cm	Reddish Brown (5 YR 5/4) dry and yellowish red (5 YR 4/6) moist; silty clay; strong coarse angular blocky breaking to moderate medium angular blocky; dry very hard; moist friable; moderately sticky; moderately plastic; many medium (5-10 mm) vertical cracks; few fine (1-2 mm) fibrous and woody roots; 1 % sub-rounded basalt fine gravel (2-5 mm); weak thin clay coating; slight reaction to HCl; clear wavy boundary to:
23-52	cm	Reddish Brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; silty clay; strong coarse angular blocky breaking to strong medium platy; dry very hard; moist friable; moderately sticky; moderately plastic; common fine (1-5 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 1 % sub-rounded basalt fine gravel (2-5 mm); moderate thick clay coating; moderate reaction to HCl; clear smooth boundary to:
52-104	cm	Reddish Brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; clay; moderate coarse prismatic breaking to medium platy; dry very hard; moist friable; slightly sticky; very plastic; few fine (1-5 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 1 % sub-rounded basalt fine gravel (2-5 mm); strong thick clay coating; slight reaction to HCl; gradual smooth boundary to :
104-145	cm	Reddish Brown (5 YR 4/4) moist; clay; strong medium prismatic; moist very firm; moderately sticky; moderately plastic; few very fine (<1 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 10 % sub-rounded basalt fragments; 5 % medium (5-15 mm) soft calcareous concretions; strong thick clay coating; moderate reaction to HCl; clear irregular boundary to:
145+	cm	Gravel / stones

Soil Profile Description (ID 4)

Information on the site :

Soil Classification: USDA (1990): Very fine, montmorillonitic, calcareous, thermic Family of Entic Chromoxererts (EAAB)
ACSAD: VXC en 5 a: Entic Chromoxererts
FAO/UNESCO: VR : Vertisol

Location: 5km NE of Esh Shajam
Coordinates: Geographical : 35.92395 E/ 32.69197 N
JTM: 399105 E/ 618430 N
Elevation: 421 m asl
Landform: Position: Upper slope
Land System : 8/8 (Undulating piedmont alluvial and colluvial plains)-- 8.8.11 [GIS]
Land Facet: 11 (Undulating, high level plains on limestone)
Microrelief: Class: Slightly uneven (25-50 cm)
Type: Mounds
Slope: Almost flat (1 %), convex to SE
Land Use : 1.9 Tilled
Plant /Crop: Herb (5): 1% groundcover
Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.2° C / Soil (50cm): 21.1° C
Soil moisture regime: Xeric
Precipitation zone: 400-450 mm p.a.

GENERAL INFORMATION ON THE SOIL:

sedimentary chem. / organ. : Limestone [q5 Fluv.deposits,sand,loess (Bender 1968)]
Parent Material: Colluvium (gravelly texture)
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well
Surface Cover : Stones (1%)
Surface Feature : Cracks (5 %)
Soil Surface Conditions: Dry / Slightly Hard
Erosion : Nil
Soil Depth : 163 cm +
Diagnostic Horizon or Property: Vertic at 34 cm and calcic at 95 cm

Geology:

PROFILE DESCRIPTION :

Ap	0-14	cm	Dark yellowish brown (10YR 4/4) dry and dark yellowish brown (10YR 4/4) moist; silty clay; strong medium subangular blocky; dry extremely hard; moist very friable; moderately sticky; moderately plastic; few fine (1-2 mm) fibrous roots; 1 % angular hard limestone gravel (5-20 mm); violent reaction to HCl; abrupt wavy boundary to:
	14-34	cm	Dark yellowish brown (10YR 4/4) dry and dark yellowish brown (10YR 4/4) moist; clay; strong very coarse prismatic breaking to moderate fine angular blocky; dry very hard; moist friable; moderately sticky; very plastic; few large (>10 mm) vertical cracks; common fine (1-2 mm) fibrous roots; 1 % small (<5 mm) very hard calcareous concretions; moderately thin clay coating of peds; violent reaction to HCl; gradual wavy boundary to:
	34-60		Dark brown (7.5YR 3/4) moist; clay; moderate coarse angular blocky breaking to wedges; moist firm; non-sticky; very plastic; common fine (1-5 mm) irregular cracks; common very fine (<1 mm) fibrous roots; 2 % small (<5 mm) hard calcareous concretions; moderate moderately thin clay coating of peds; strong HCl; gradual wavy boundary to:
	60-95	cm	Dark yellowish brown (10YR 4/4) moist; clay; moderate coarse angular blocky breaking to wedges; moist firm; non-sticky; very plastic; common fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 2 % medium (5-15 mm) moderately hard calcareous concretions; strong thick clay coating of peds; strong reaction to HCl; gradual wavy boundary to:
	95-126	cm	Dark yellowish brown (10YR 4/4) moist; clay; strong very coarse angular blocky breaking to wedges; moist firm; non-sticky; very plastic; few fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 5 % medium (5-15 mm) moderately hard calcareous concretions; strong thick slickensides; strong reaction to HCl; diffuse smooth boundary to:
	126-163+	cm	Dark yellowish brown (10YR 4/4) moist; clay; moderate coarse columnar breaking strong medium

angular blocky; moist firm; non-sticky; very plastic; few fine (1-5 mm) vertical cracks; few very fine (<1 mm) fibrous
% medium (5-15 mm) moderately hard calcareous concretions; moderate
moderately thick slickensides ; moderate reaction to HCl.

Soil Profile Description (ID 5)

Information on the site :

Soil Classification: USDA (1990): Fine, montmorillonitic, calcareous, thermic Family of Entic Chromoxererts (EAAB)
ACSAD: VXC en 4 b: Entic Chromoxerert
FAO/UNESCO: VR : Vertisol

Location: 3km W of Mubis

Coordinates: Geographical : 35.85841 E/ 32.10315 N
JTM: 392262 E/ 553204 N

Elevation: 605 m asl

Landform: Position: Upper slope valley floor
Land System : 8/7 (Enclosed depression in eroded anticline of limestone and sandstone)--8.7.1[GIS]
Land Facet: 1 (Deep colluvial mantle in valley)

Microrelief: Class: Even (25-50 cm)
Type:

Slope: Sloping (7 %), convexconcave to NW

Land Use : 2.2 Other field crops(irr.)

Plant /Crop: Cabbage, Cucumber

Climate:Mean annual precipitation:
Mean annual temperature: Air : 17.6° C / Soil (50cm): 20.5° C
Soil moisture regime: Xeric
Precipitation zone: 400-450 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Limestone [c1 Arg. SSt, sandy dolom (Krn) (Bender 1968)]

Parent Material: Bedrock-fresh

Drainage: Surface Runoff: Medium
Soil Drainage Class: Well

Surface Cover :

Surface Feature : Cracks

Soil Surface Conditions: Moist

Erosion : Nil

Soil Depth : 185 cm +

Diagnostic Horizon or Property: Vertic at 0 cm

PROFILE DESCRIPTION :

Ap 0-30 cm Strong brown (7.5YR 4/6) dry and brown (7.5YR 4/4) moist; clay; moderate coarse subangular blocky; dry slightly hard; moist firm; very plastic; few very fine (<0.5 mm) tubular pores; many large (>10 mm) cracks; many very fine (<1 mm) fibrous roots; 1 % moderately hard calcareous concretions; violent reaction to HCL; gradual smooth boundary to:

Ac 30-70 cm Reddish brown (5YR 4/4) dry and reddish brown (5YR 4/4) moist; clay; moderate medium prismatic; moist very firm; very plastic; few very fine (<0.5 mm) tubular pores; many large (>10 mm) cracks; common very fine (<1 mm) fibrous roots; 2 % sub-rounded quartz fragments; strong reaction to HCL; gradual smooth boundary to:

Ac2 70-125 cm Yellowish red (5YR 5/6) dry and reddish brown (5YR 4/4) moist; clay; moderate coarse subangular blocky; moist very firm; very plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) woody roots; 2 % irregular chert fragments; weak coating; violent reaction to HCL; diffuse smooth boundary to:

Ac3 125-185+ cm Yellowish red (5YR 5/6) dry and reddish brown (5YR 4/4) moist; clay; moderate medium prismatic breaking to moderate medium subangular blocky; moist very firm; very plastic; few very fine (<0.5 mm) tubular pores; many fine (1-5 mm) irregular cracks; large (>15 mm) soft calcareous concretions; weak coatong; violent reaction to HCL.

Soil Profile Description (ID 6)

Information on the site :

Soil Classification: USDA (1990): Fine, montmorillonitic, thermic Family of Typic Chromoxererts (EAAD)
ACSAD: VXC t 4 b: Typic Chromoxerert
FAO/UNESCO: VR : Vertisol

Location: .6km S of Ibd
Coordinates: Geographical : 35.78797 E/ 32.65653 N
JTM: 386309 E/ 614638 N

Elevation: 505 m asl

Landform: Position: Terrace
Land System : 8/3 (Deeply dissected valleys on Ajlun group and Umm Rijam limestone)--8.2.0[GIS]
Land Facet: 6 (Terraces)

Microrelief: Class: Moderately uneven (50-100 cm)
Type: Undulating

Slope: Gently sloping (4 %), convexoconcave to NE

Land Use : 1.4 Tree crops, orchards

Plant /Crop: Olives (4) : 40 % groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 17.5° C / Soil (50cm): 20.5° C
Soil moisture regime: Xeric
Precipitation zone: 500-550 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic./organ.: Limestone [tt LSt, marls, cherts (Shalla) (Bender 1968)]
Parent Material: Colluvium (clayey texture)
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well

Surface Cover : Stones (40 %)
Surface Feature : Cracks (20%)
Soil Surface Conditions: Dry / Moderately hard
Erosion : Nil
Soil Depth : 135 cm (Gravel / stones)
Diagnostic Horizon or Property: Vertic at 45 cm

PROFILE DESCRIPTION :

0-15	cm	Brown (7.5YR 4/4) dry and dark brown (7.5YR 3/4) moist; clay; very strong very coarse subangular blocky; dry hard; moist very firm; very sticky; very plastic; common medium (2-5 mm) spherical pores; many large (>10 mm) vertical cracks; common fine (1-2 mm) fibrous and woody roots; 5 % hard limestone gravel (5-20 mm); moderate reaction to HCL; abrupt smooth boundary to :
15-45	cm	Brown (7.5YR 4/4) dry and dark brown (7.5YR 3/4) moist; clay; very strong very coarse subangular blocky breaking to very strong coarse subangular blocky; dry very hard; moist extremely firm; very sticky; very plastic; many medium (2-5 mm) spherical pores; many large (>10 mm) irregular cracks; common fine (1-2 mm) fibrous and woody roots; strong reaction to HCL; abrupt smooth boundary to :
45-75	cm	Reddish brown (5YR 4/4) dry and dark reddish brown (5YR 3/4) moist; clay; very strong very coarse prismatic breaking to wedges; dry extremely hard; moist compact; very sticky; very plastic; common medium (2-5 mm) spherical pores; many large (>10 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 10 % irregular hard limestone stones (75-250 mm); moderate reaction to HCL; clear smooth boundary to :
75-135	cm	Reddish brown (5YR 4/4) dry and dark reddish brown (5YR 3/4) moist; very bouldary clay; very strong very coarse angular blocky breaking to very strong very coarse subangular blocky; dry extremely hard; moist compact; very sticky; very plastic; common medium (2-5 mm) spherical pores; many large (>10 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 40 % irregular hard limestone boulders (>250 mm); slight reaction to HCL.
135+	cm	Gravel / stones