

ARIDISOLS

Soil Profile Description (ID 1)

Information on the site:

Soil Classification: USDA (1990): Fine, mixed, calcareous, hyperthermic Family of Typic Camborthids (FBFW)
ACSAD: RHH t 4 a : Typic Camborthid
FAO/UNESCO: CMy : Yermic Cambisol

Location:

Coordinates: Geographical : 35.69792 E/ 29.52468 N
JTM: 373787 E/ 267525 N
Elevation: 820 m asl
Landform: Position: Edge of Qa'
Land System : 6/7 (Alluvial fans, terraces and plays systems) – 6.7.3 [GIS]
Land Facet: 4 (Toeslope playas – Qa')
Microrelief: Class: Even (< 25 cm)
Type:
Slope: Almost flat (1 %), rectilinear to sw
Land Use : 2.1 Cereals (irrig.)
Plant /Crop: Wheat
Climate: Mean annual precipitation:
Mean annual temperature: Air : 19.1° C / Soil (50cm): 22.0° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Unconsolidated alluvium [q5 Fluv.deposits, sand, loess (Bender 1968)]
Parent Material: Alluvium
Drainage: Surface Runoff: Rapid
Soil Drainage Class: Well
Surface Cover : Nil
Surface Feature : Capping (90 %)
Soil Surface Conditions: Dry / Hard
Erosion : Nil
Soil Depth : 165 cm +
Diagnostic Horizon or Property: Cambic at 45 cm

PROFILE DESCRIPTION :

0-45	cm	Pink (7.5 YR 7/4) dry and brown (7.5 YR 5/4) moist; silty clay; moderate medium subangular blocky; dry hard; moist firm; very sticky; non-plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; violent reaction to HCl; clear wavy boundary to:
45-80	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4/5) moist; silty clay; strong coarse platy; dry moderately hard; many very fine (<0.5 mm) tubular pores; many fine (1-5 mm) horizontal cracks; common very fine (<1 mm) fibrous roots; weak coating; violent reaction to HCl; clear wavy boundary to:
80-120	cm	light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 5/5) moist; silty clay; strong coarse platy; dry hard; moist friable; slightly sticky; many fine (<0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; weak coating; violent reaction to HCl; abrupt smooth boundary to:
120-137	cm	brown (7.5 YR 5/4) dry and strong brown (7.5 YR 4/6) moist; clayloam; strong fine subangular blocky; dry slightly hard; moist very friable; small (< 5 mm) faint mottles (7.5 YR 5/6); 5 % chert fine gravel (2-5 mm); 5 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; abrupt smooth boundary to:
137-165+	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; strong fine subangular blocky; dry hard; moist firm; very sticky; 5 % small (<5 mm) moderately hard gypsum crystals; violent reaction to HCl.

Soil Profile Description (ID 2)

Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Typic Camborthids (FBFW)
ACSAD: RHH t 4 a : Typic Camborthid
FAO/UNESCO: CMy : Yermic Cambisol

Location:
Coordinates: Geographical : 36.23141 E/ 30.20012 N
JTM: 426001 E/ 341928 N
Elevation: 854 m asl
Landform: Position: Qa
Land System : 12/8 (Flat depositional plain, seasonally flooded playa)—12.8.0 [GIS]
Land Facet: 4 (seasonally flooded playa, mudflat)
Microrelief: Class: Even (< 25 cm)
Type: other
Slope: flat (0 %)
Land Use : 4.4 Unvegetated, bare
Plant /Crop: Sabkha
Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.5° C / Soil (50cm): 21.4° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Unconsolidated alluvium [q4 Qa (clay) (Bender 1968)]
Parent Material: Alluvium
Drainage: Surface Runoff: None
Soil Drainage Class:
Surface Cover : Nil
Surface Feature : Capping (90 %)
Soil Surface Conditions: Dry / very Hard
Erosion : Nil
Soil Depth : 140 cm (Compaction)
Diagnostic Horizon or Property: Cambic at 18 cm

PROFILE DESCRIPTION :

0-18	cm	Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 5/6) moist; silty clay; strong fine subangular blocky; dry hard; moist friable; very sticky; non-plastic; common fine (<0.5-2 mm) spherical pores; common very fine (< 1 mm) irregular cracks; 4 % small (< 5 % mm) soft calcareous concretion; violent reaction to HCl; clear smooth boundary to:
18-35	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 5/6) moist; silty clay; strong fine subangular blocky; dry very hard; moist friable; very sticky; non-plastic; few very fine(<0.5 mm) tubular pores; few very fine (< 1 mm) irregular cracks; violent reaction to HCl; diffuse smooth boundary to :
35-75	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 5/6) moist; silty clay; weak medium subangular blocky breaking to moderate fine subangular blocky; dry very hard; moist friable; very sticky; slightly plastic; few very fine(<0.5 mm) tubular pores; few very fine (< 1 mm) irregular cracks; violent reaction to HCl; diffuse smooth boundary to:
75-140	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 5/6) moist; silty clay; weak coarse subangular blocky breaking to moderate fine subangular blocky; dry very hard; moist friable; very sticky; non-plastic; few very fine(<0.5 mm) tubular pores; violent reaction to HCl.
140+	cm	Compaction

Soil Profile Description (ID 3)

Information on the site :

Soil Classification: USDA (1990): Loamy-skeletal, mixed, calcareous, thermic Family of Typic Calciorthids (FBEO)
ACSAD: RHK t 2 a : Typic Calciorthid
FAO/UNESCO: CLhy : Yermic-Halpic Calcisol

Location: 2km W of sample area 3/11
Map sheet: 1:25000: 3250-III-SE – 1:100000: 3250 – 1:250000: Bayir

Coordinates: Geographical : 36.18955 E/ 30.04681 N
JTM: 421850 E/ 324963 N

Elevation: 882 m asl

Landform: Position: Upper plain
Land System : 12/10 (Low relief gravel lain gravel of pleistocene alluvium)—12.10.0 [GIS]
Land Facet: 4 (Gravel plain)

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

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

Land Use : 4.4 Unvegetated, bare

Plant /Crop: Desert pavement

Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.4° C / Soil (50cm): 21.4° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Unconsolidated alluvium [q2 Fluv.gravels (Lisan) (Bender 1968)]
Parent Material: Alluvium (stony texture)
Drainage: Surface Runoff: Slow
Soil Drainage Class:
Surface Cover : Gravel (90 %)
Surface Feature : Polygons (80 %)
Soil Surface Conditions: Dry / Hard
Erosion : Nil
Soil Depth : 60 cm (Compaction)
Diagnostic Horizon or Property: Calcic at 35 cm

PROFILE DESCRIPTION :

0-8	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 5/5) moist; silty clayloam; weak coarse platy breaking to weak coarse subangular blocky; dry moderately hard; moist friable; moderately sticky; moderately plastic; many fine (0.5-2 mm) spherical pores; few fine (1-5mm) vertical cracks; few very fine (< 1 mm) fibrous roots; 1 % irregular chert fine gravel (2-5 mm); violent reaction to HCl; clear smooth boundary to:
8-35	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4/6) moist; fine sandy clayloam; moderate medium subangular blocky; dry soft; moist very friable; very sticky; slightly plastic; many very fine (0.5 mm) tubular pores; few fine (1-5mm) vertical cracks; few very fine (< 1 mm) fibrous roots; 2 % irregular chert fine gravel (2-5 mm); 2 % small (<5 mm) soft calcareous concretions; violent reaction to HCl; clear wavy boundary to:
35-60	cm	Strong brown (7.5 YR 5/6) dry and strong brown (7.5 YR 4/6) moist; stony sandy clayloam; weak medium subangular blocky; dry slightly hard; moist very friable; moderately sticky; slightly plastic; common very fine (0.5 mm) tubular pores; 30 % sub-rounded chert stones (75-250 mm); 15 % small (<5 mm) soft calcareous concretions; moderate thick CaCO ₃ coating; violent reaction to HCl; gradual wavy boundary to:
60+	cm	Gravel/stones
60-105	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4/6) moist; extremely stony sandy clayloam; massive; moderately sticky; moderately plastic; few very fine (0.5 mm) tubular pores; 85 % rounded chert stones (75-250 mm); 15 % medium (5-15 mm) soft calcareous concretions;

strong moderately thick CaCO_3 coating; violent reaction to HCL.

Soil Profile Description (ID 4)

Information on the site :

Soil Classification: USDA (1990): fine, Mixed, calcareous, thermic Family of Xerochreptic Calciorthids (FBEL)
ACSAD: RHK x c e 4 b: Xerochreptic Calciorthid
FAO/UNESCO: CLH : Haplic Calcisol

Location: 6km E of University
Map sheet: 1:25000: 3254-IV-NW – 1:100000: 3254 – 1:250000: Soueida

Coordinates: Geographical : 36.01682 E/ 32.43656 N
JTM: 407552 E/ 590025 N

Elevation: 635 m asl

Landform: Position: Lower slope
Land System : 8/9(Undulating to rolling hills on Tertiary limestone and chalks)--18.2.2[GIS]
Land Facet: 6 (Pediment and alluvial fan zone)

Microrelief: Class: very uneven (100-200 cm)
Type: Gullies

Slope: Gently sloping (5%) , irregular to NW

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Halox sal (20)

Climate:Mean annual precipitation:
Mean annual temperature: Air : 17.1° C / Soil (50cm): 20.0° C
Soil moisture regime: Xeric
Precipitation zone: 250-300 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Unconsolidated alluvium: Limestone [c2 LSt, marls, cherts, phospor (Bender 1968)]
Parent Material: Alluvium
Drainage: Surface Runoff: Rapid
Soil Drainage Class:

Surface Cover: Stones (2 %)
Surface Feature: Cracks (10%)
Soil Surface Conditions: Dry / very hard
Erosion: Moderate gully erosion
Soil Depth: 155 cm +
Diagnostic Horizon or Property: Calcic at 96 cm

PROFILE DESCRIPTION:

0-19	cm	Strong brown (7.5 YR 5/6) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; weak coarse subangular blocky breaking to strong medium subangular blocky; dry hard; moist friable; moderately sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; many fine (1-5 mm) irregular cracks; common very fine (<1 mm) fibrous roots; strong reaction to HCl; clear smooth boundary to:
19-47	cm	Strong brown (7.5 YR 4/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; weak very coarse prismatic breaking to strong coarse subangular blocky; dry very hard; moist friable; moderately sticky; moderately plastic; few very fine (0.5-2 mm) tubular pores; common fine (1-5 mm) vertical cracks; many fine (1-2 mm) fibrous and woody roots; strong reaction to HCl; gradual smooth boundary to:
47-96	cm	Strong brown (7.5 YR 5/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; strong very coarse angular blocky breaking to strong coarse subangular blocky; dry hard; moist friable; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) irregular cracks; few fine (1-2 mm) fibrous and woody roots; 1 % small (<5 mm) soft calcareous concretions; weak thin clay coating; strong reaction to HCl; gradual smooth boundary to:
96-155+	cm	Strong brown (7.5 YR 5/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; strong coarse subangular blocky; dry hard; moist very friable; very sticky; moderately plastic; few very fine (<1 mm) irregular cracks; few fine (1-2 mm) fibrous and woody roots; 15 % small (<5 mm) soft calcareous concretions; weak thin clay coating; strong reaction to HCl.

Soil Profile Description (ID 5)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy, mixed, calcareous, thermic Family of Cambic Gypsiorthids (FBDC)
ACSAD: RHY h 2 a: Cambic Gypsiorthid
FAO/UNESCO: Cljy: Yermic-Gypsic Calcisol

Location: 1.5 km E of jebel Arfa
Coordinates: Geographical : 36.86570 E/ 30.18379 N
JTM: 487068 E/ 339876 N
Elevation: 895 m asl
Landform: Position: Upper pediment slope
Land System : 12/16 (Coalesced pediment and low domes on Muwaqqar chalk)--12.6.0[GIS]
Land Facet: 2 (low domes and pediments on pedrock)
Microrelief: Class: Even (<25 cm)
Type: Undulating
Slope: Gently sloping (2 %), rectilinear to N
Land Use : 4.4 Unvegetated, bare
Plant /Crop: Desert pavement
Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.7° C / Soil (50cm): 21.6° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chem./org. : Limestone [q5 Fluv. Deposits, sand, loess (Bender 1968)]
Parent Material: Bedrock-fresh
Drainage: Surface Runoff: Slow
Soil Drainage Class:
Surface Cover: gravel (80 %)
Surface Feature: Polygons (80 %)
Soil Surface Conditions:
Erosion: Nil
Soil Depth: 74 cm (Lithic contact)
Diagnostic Horizon or Property: Gypsic at 9 cm and calcic at 41 cm

PROFILE DESCRIPTION:

0-9	cm	Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 4/6) moist; very fine sandy clayloam; weak coarse platy breaking to moderate medium subangular blocky; dry slightly hard; moist friable; slightly sticky; slightly plastic; many fine (0.5-2 mm) spherical pores; few fine (1-5 mm) vertical cracks; 1 % irregular chert fine gravel (2-5 mm); 1 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear smooth boundary to:
9-28	cm	Reddish yellow(7.5 YR 6/6) dry and strong brown (7.5 YR 5/6) moist; silty clayloam; weak medium platy breaking to moderate fine subangular blocky; dry soft; moist very friable; moderately sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; 1 % sub-rounded chert fine gravel (2-5 mm); 10 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear smooth boundary to:
28-41	cm	Reddish yellow(7.5 YR 6/6) dry and yellowish red (5 YR 4/6) moist; fine sandy clayloam; very weak fine subangular blocky; dry loose; moist loose; slightly sticky; slightly plastic; many very fine (<0.5 mm) tubular pores; 1 % irregular chert fine gravel (2-5 mm); 15 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear wavy boundary to:
41-74	cm	Reddish yellow(5 YR 6/6) dry and yellowish red (5 YR 5/6) moist; fine sandy clayloam; moderate medium subangular blocky; dry moderately hard; moist very friable; moderately sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; 5 % platy hard limestone reaction to HCl; gradual smooth boundary to:
74+	cm	Lithic contact to Limestone

Soil Profile Description (ID 6)

Information on the site :

Soil Classification: USDA (1990): Fine-silty, mixed, calcareous, thermic Family of Typic Calciorthids (FBEO)
ACSAD: RHK t 3 a: Typic Calciorthid
FAO/UNESCO: CLhy: Yermic-Haplic Calcisol

Location: 5 km S of jabal A'naza

Coordinates: Geographical : 37.07323 E/ 32.33586 N
JTM: 506893 E/ 578436 N

Elevation: 875 m asl

Landform: Position: Minor basin
Land System : 16/1 (Undulating basalt flows with parallel drainage network)-- 15.7.0[GIS]
Land Facet: 4 (Depositional basins, Qa')

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

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

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Naytoon (1), Hamd (1): 1 % groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 16.4° C / Soil (50cm): 19.4° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Unconsolidated allunium : Basalt [B5 Basalt (middle) (Bender 1968)]

Parent Material: Alluvium

Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover: Stones (15 %)

Surface Feature: Capping (60 %)

Soil Surface Conditions: Dry / Moderately Hard

Erosion: Nil

Soil Depth: 70 cm (Lithic contact)

Diagnostic Horizon or Property: Calcic at 55 cm

PROFILE DESCRIPTION:

0-11	cm	Reddish yellow (7.5 YR 6/5) dry and brown (7.5 YR 4/4) moist; silty clayloam; moderate coarse platy; dry slightly hard; moist very friable; moderately sticky; moderately plastic; common fine (0.5-2 mm) spherical pores; common fine (1-5 mm) irregular cracks; 1 % sub-rounded basalt gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to:
11-43	cm	Reddish yellow (7.5 YR 6/5) dry and brown (7.5 YR 4/4) moist; silty clayloam; moderate coarse subangular blocky breaking to moderate medium platy; dry hard; moist very friable; very sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few fine (1-2 mm) woody roots; 2 % sub-rounded basalt fine gravel (2-5 mm); 1 % small (<5 mm) soft calcareous concretions; strong reaction to HCl; diffuse smooth boundary to:
43-55	cm	strong brown (7.5 YR 5/6) dry and brown (7.5 YR 4/4) moist; silty clayloam; moderate medium subangular blocky; dry hard; moist very friable; moderately sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few fine (1-2 mm) woody roots; 2 % sub-rounded basalt fine gravel (5-20 mm); 1 % small (<5 mm) soft calcareous concretions; strong reaction to HCl; gradual smooth boundary to:
55-70	cm	strong brown (7.5 YR 5/5) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; strong fine subangular blocky; dry moderately hard; moist very friable; slightly sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few fine (1-2 mm) woody roots; 10 % sub-rounded basalt gravel (5-20 mm); 10 % small (<5 mm) soft calcareous concretions; strong reaction to HCl; abrupt irregular boundary to:
70+	cm	Lithic contact to Basalt

Soil Profile Description (ID 7)

Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Xerochreptic Calciorthids (FBEL)
ACSAD: RHK x c e 4 a: Xerochreptic Calciorthid
FAO/UNESCO: CLh: Haplic Calcisol

Location: 3 km SW of jabal A'naza
Coordinates: Geographical : 37.05743 E/ 32.35433 N
JTM: 505405 E/ 580483 N
Elevation: 925 m asl
Landform: Position: Minor wadi line
Land System : 15/5 (Gently sloping, dissected lava plain with parallel drainage)--15.5.0[GIS]
Land Facet: 10 (Ephemeral wadis)
Microrelief: Class: Even (<25 cm)
Type: other
Slope: Gently sloping (3 %), concave to S
Land Use : 3.4 Nat.browse + grazing
Plant /Crop: Shia (60), Ad AL Nees (10), Hamd (5): 20 % groundcover
Climate: Mean annual precipitation:
Mean annual temperature: Air : 16.1° C / Soil (50cm): 19.0° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Unconsolidated alluvium : Basalt [B5 Basalt (middle) (Bender 1968)]
Parent Material: Alluvium / Bedrock
Drainage: Surface Runoff: Rapid
Soil Drainage Class: Well
Surface Cover: Stones (40 %)
Surface Feature: Capping (10 %)
Soil Surface Conditions: Dry / Moderately Hard
Erosion: Slight sheet erosion
Soil Depth: 65 cm (Paralithic contact)
Diagnostic Horizon or Property: Cambic at 13 cm and Calcic at 34 cm

PROFILE DESCRIPTION:

0-13	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4.5/6) moist; Gravelly fine sandy clayloam; weak coarse platy breaking to moderate fine subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; common very fine (<1 mm) irregular cracks; common very fine (<1 mm) fibrous roots; 20 % sub-rounded basalt gravel (5-20mm); strong reaction to HCl; clear wavy boundary to:
13-34	cm	yellowish red (5 YR 5/5) dry and yellowish red (5 YR 4/6) moist silty clayloam; moderate medium subangular blocky; dry moderately hard; moist very friable; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; common fine (1-2 mm) woody roots; 15 % angular basalt stones (75-250 mm); 2 % medium (5-15 mm) soft calcareous concretions; strong reaction to HCl; clear wavy boundary to:
34-65	cm	Reddish brown (5 YR 5/4) dry and yellowish red (5 YR 4/6) moist; gravelly silty clay loam; strong fine subangular blocky; dry hard; moist very friable; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few very fine (<1 mm) irregular cracks; common fine (1-2 mm) woody roots; 25 % sub-rounded basalt gravel (5-20mm); 15 % medium (5-15 mm) moderately hard calcareous concretions; weak thin clay coating of peds; strong reaction to HCl; Gradual smooth boundary to :
65+	cm	Paralithic contact to Basalt.

Soil Profile Description (ID 8)

Information on the site :

Soil Classification: USDA (1990): Loamy, mixed, calcareous, thermic, Shaloo Family of (Lithic Xerochreptic Calciorthid)s (FBEP)
ACSAD: RHK (l x c e 2 a: (Lithic Xerochreptic Calciorthid)
FAO/UNESCO: LPy : Yermic Leptosol

Location: 4 km SW of jabal A'naza
Coordinates: Geographical : 37.06156 E/ 32.34741 N
JTM: 505794 E/ 579716 N
Elevation: 906 m asl
Landform: Position: Eroded middle slope
Land System : 15/5 (Gently sloping, dissected lava plain with parallel drainage)--15.5.0[GIS]
Land Facet: 4 (Bare, erosional areas)
Microrelief: Class: Even (<25 cm)
Type: other
Slope: Almost flat (1 %), rectilinear to S
Land Use : 3.4 Nat.browse + grazing
Plant /Crop: Shia (10), Ad AL Ness (6), Hamd (2): 1 % groundcover
Climate: Mean annual precipitation:
Mean annual temperature: Air : 16.2° C / Soil (50cm): 19.2° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Igneous basic : Basalt [B5 Basalt (middle) (Bender 1968)]
Parent Material: Bedrock- weathered
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well
Surface Cover: Stones (25 %)
Surface Feature: Capping (20 %)
Soil Surface Conditions: Dry / Hard
Erosion: Slight sheet erosion
Soil Depth: 33 cm (Paralithic contact) / 33 cm (Lithic contact)
Diagnostic Horizon or Property: Calcic at 18 cm

PROFILE DESCRIPTION:

0-5	cm	Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 4/6) moist; gravelly sandy clayloam; weak medium platy breaking to moderate fine subangular blocky; dry soft; moist very friable; non-sticky; slight plastic; common fine (0.5-2 mm) tubular pores; few very fine (<1 mm) irregular cracks; few fine (1-2 mm) woody roots; 25 % sub-rounded basalt gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to:
5-18	cm	Reddish yellow (7.5 YR 6/6) dry and yellowish red (5 YR 4/6) moist; fine sandy clayloam; moderate fine subangular blocky; dry slightly hard; moist very friable; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few fine (1-2 mm) woody roots; 20 % sub-rounded basalt gravel (5-20 mm); 10 % medium (5-15 mm) moderately hard calcareous concretions; strong reaction to HCl ; clear wavy boundary to:
18-33	cm	Brown (7.5 YR 5/4) dry and strong brown (7.5 YR 4/6) moist; extremely gravelly sandy clayloam; moderate fine subangular blocky; dry slightly hard; moist very friable; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few fine (1-2 mm) woody roots; 80 % sub-rounded basalt gravel(5-20 mm); 20 % medium (5-15 mm) hard calcareous concretions; moderate thick CaCO ₃ coating of gravel; strong reaction to HCl; clear broken boundary to:
33+	cm	Lithic contact to Basalt

Soil Profile Description (ID 9)

Information on the site :

Soil Classification: USDA (1990): Fine-Loamy, mixed, calcareous, thermic, Family of Xerochreptic Calciorthid (FBEP)
ACSAD: RHK x c e 2 a: Xerochreptic Calciorthid
FAO/UNESCO: LCh : Halpic Calcisol

Location: 3 km W of jabal A'naza

Coordinates: Geographical : 37.03418 E/ 32.37314 N
JTM: 503216 E/ 582568 N

Elevation: 1003 m asl

Landform: Position: Upper slope
Land System : 15/5 (Gently sloping, dissected lava plain with parallel drainage)--15.5.0[GIS]
Land Facet: 4 (Vally side slopes with dendritic drainage pattern)

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

Slope: Almost flat (1 %), rectilinear to NW

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Ad AL Nees (10), Hamd (5): 5 % groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 15.5° C / Soil (50cm): 18.5° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 150-200 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Igneous basic : Basalt [B5 Basalt (middle) (Bender 1968)]
Parent Material: Bedrock- weathered
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover: Stones (10 %)
Surface Feature: Capping (5 %)

Soil Surface Conditions: Dry / Hard

Erosion: Nil

Soil Depth: 160 cm +

Diagnostic Horizon or Property: Calcic at 70 cm

PROFILE DESCRIPTION:

0-5	cm	Reddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 4/6) moist; fine sandy clayloam; moderate fine subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 10 % tabular basalt gravel (5-20 mm); strong reaction to HCl; gradual smooth boundary to:
5-26	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; moderate medium subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 5 % sub-rounded basalt gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to:
26-47	cm	Strong brown (7.5 YR 5/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; weak medium subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 10 % sub-rounded basalt gravel (5-20 mm); 1 % small (<5 mm) soft calcareous concretions; strong reaction to HCl; gradual smooth boundary to:
47-70	cm	Reddish brown (5 YR 5/4) dry and yellowish red (5 YR 4/6) moist; gravelly siltyfine clayloam; moderate fine subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; 30 % sub-rounded basalt gravel (5-20 mm); 5 % medium (5-15 mm) soft calcareous concretions; strong reaction to HCl; gradual smooth boundary to:
70-125	cm	Reddish brown (5 YR 5/4) dry and reddish brown (5 YR 4/4) moist; gravelly clayloam; moderate fine subangular blocky; dry moderately hard; moist very friable; moderately sticky; very plastic; few very fine (<0.5 mm) tubular pores; 30 % sub-rounded basalt fine gravel (2-5 mm); 50 % medium (5-15 mm) soft calcareous concretions; violent reaction to HCl; gradual smooth boundary

to:

125-160+ cm Brown (10 YR 5/3) dry and brown (10 YR 4/3) moist; gravelly sandy clayloam; moderately sticky; moderately plastic; 25 % irregular basalt gravel (5-20 mm); 10 % small (<5 mm) soft gypsum crystals; violent reaction to HCl.

Soil Profile Description (ID 10)

Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Cambic Gypsiorthids (FBDC)
ACSAD: RHY h 4 a: Cambic Gypsiorthid
FAO/UNESCO: CLjy : Yermic-Gypsic Calcisol

Location: S of Qa shubeika

Coordinates: Geographical : 37.23531 E/ 32.38649 N
JTM: 522138 E/ 584072 N

Elevation: 737 m asl

Landform: Position: Lower middle slope
Land System : 16/1 (Undulating basalt flows with parallel drainage network)--16.4.0[GIS]
Land Facet: 2 (Uneven rocky land and weathered mantle)

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

Slope: Gently sloping (3%), convexoconcave to N

Land Use : 4.4 Unvegetated, bare

Plant /Crop:

Climate: Mean annual precipitation:
Mean annual temperature: Air : 17.4° C / Soil (50cm): 20.4° C
Soil moisture regime: Aridic
Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Igneous basic : Basalt [q5 Fluv. Deposits, sand, loess (Bender 1968)]
Parent Material: Bedrock- weathered
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well

Surface Cover: Gravel (50 %)
Surface Feature: Capping (20 %)

Soil Surface Conditions:

Erosion: Slight rill erosion

Soil Depth: 190 cm +

Diagnostic Horizon or Property: Gypsic at 8 cm

PROFILE DESCRIPTION:

0-8	cm	Light brown (7.5 YR 6/4) dry and brown (7.5 YR 3.5/4) moist; silty clayloam; very weak coarse subangular blocky breaking to moderate medium subangular blocky; dry slightly hard; moist very friable; very sticky; very plastic; common fine (0.5-2 mm) tubular pores; 2 % irregular basalt gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to:
8-28	cm	Strong brown (7.5 YR 5/5) dry and brown (7.5 YR 3.5/4) moist; silty clayloam; very weak coarse subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few very fine (<1 mm) irregular cracks; 1 % sub-rounded basalt gravel (5-20 mm); 10 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; gradual smooth boundary to:
28-55	cm	Strong brown (7.5 YR 5/5) dry and brown (7.5 YR 4/4) moist; silty clayloam; weak coarse subangular blocky breaking to moderate medium subangular blocky; dry moderately hard; moist very friable; very sticky; very plastic; few fine (0.5-2 mm) tubular pores; fine (1-5 mm) vertical cracks; 2 % irregular basalt gravel (5-20 mm); 5 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; clear smooth boundary to:
55-190+	cm	Strong brown (7.5 YR 5/5) dry and brown (7.5 YR 4/4) moist; silty clayloam; massive; dry very hard; moist friable; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few fine (1-5 mm) vertical cracks; 5 % tubular basalt stones (75-250 mm); 10 % medium (5-15 mm) soft gypsum crystals; strong reaction to HCl.

Soil Profile Description (ID 11)

Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Cambic Gypsiorthids (FBDC)
ACSAD: RHY h 4/3 a: Cambic Gypsiorthid
FAO/UNESCO: CLjy : Yermic-Gypsic Calcisol

Location: 11 km NE of Safaw

Coordinates: Geographical : 37.22689 E/ 32.24116 N
JTM: 521388 E/ 567957 N

Elevation: 698 m asl

Landform: Position: Basin
Land System : 16/4 (basalt flows with many enclosed drainage basins)--16.4.0[GIS]
Land Facet: 3 (Depositional basins)

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

Slope: Flat (0%)

Land Use : 4.4 Unvegetated, bare

Plant /Crop:

Climate: Mean annual precipitation:
Mean annual temperature: Air : 17.9° C / Soil (50cm): 20.8° C
Soil moisture regime: Aridic
Precipitation zone: 50-100 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Unconsolidated alluvium : Basalt [q5 Qa (clay) (Bender 1968)]

Parent Material: Alluvium

Drainage: Surface Runoff: None
Soil Drainage Class: Well

Surface Cover: Stones (2 %)
Surface Feature: Polygons (20 %)

Soil Surface Conditions:

Erosion: Nil

Soil Depth: 154 cm +

Diagnostic Horizon or Property: Gypsic at 23 cm

PROFILE DESCRIPTION:

0-8	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 5/6) moist; silty clay; strong very coarse platy; dry moderately hard; moist friable; very sticky; moderately plastic; many medium (2-5 mm) spherical pores; common medium (5-10 mm) vertical cracks; strong reaction to HCl; clear wavy boundary to:
8-23	cm	Reddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 4/6) moist; silty clay; strong medium subangular blocky; dry very hard; moist friable; very sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; common fine (5-10 mm) irregular cracks; strong reaction to HCl; clear wavy boundary to:
23-58	cm	Strong brown (7.5 YR 5/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; weak coarse sugangular blocky breaking to weak fine subangular blocky; dry soft; moist loose; moderately sticky; slightly plastic; common fine (0.5-2 mm) tubular pores; 30 % medium (5-15 mm) soft gypsum crystals; strong reaction to HCl; clear smooth boundary to:
58-123	cm	Reddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; very weak coarse sugangular blocky; dry slightly hard; moist loose; moderately sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; 15 % medium (5-15 mm) soft gypsum crystals; strong reaction to HCl; diffuse smooth boundary to:
123-154+	cm	Reddish yellow (7.5 YR 6/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; weak medium sugangular blocky breaking to moderate very fine subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; 15 % medium (5-15 mm) soft gypsum crystals; strong reaction to HCl.

Soil Profile Description (ID 12)

Information on the site :

Soil Classification: USDA (1990): Fine, carbonate, calcareous, thermic Family of Xerochreptic Calciorthis (FBEL)
ACSAD: RHK x c e 4 a: Xerochreptic Calciorthis
FAO/UNESCO: CLh : Halpic Calcisol

Location: 2 km WN ed Dafyana

Coordinates: Geographical : 36.55400 E/ 32.32867 N
JTM: 458013 E/ 577724 N

Elevation: 895 m asl

Landform: Position: Crest
Land System : 15/1 (Flat to undulating Lava plateau with angulate/parallel drainage)--15.1.8[GIS]
Land Facet: 5 (Flat plain with low ridges – residual plateau surface)

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

Slope: Almost flat (1%), rectilinear to WNW

Land Use : 1.1 Cereals

Plant /Crop: Cereal, shoke (2): 1% groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 15.9° C / Soil (50cm): 18.9° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 200-250 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Basalt / limestone [B5 Basalt (middle) (Bender 1968)]
Parent Material: Bedrock-weathered
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover: Stones (10 %)
Surface Feature: Polygons (10 %)
Soil Surface Conditions: Dry / Loose
Erosion: Nil
Soil Depth: 140 cm +
Diagnostic Horizon or Property: Cambic at 20 cm and calcic at 47 cm

PROFILE DESCRIPTION:

0-7	cm	Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; weak fine subangular blocky; dry soft; moist very friable; moderately sticky; moderately plastic; many fine (0.5-2 mm) tubular pores; many fine (1-2 mm) fibrous roots; 2 % sub-rounded basalt fine gravel (2-5 mm); strong reaction to HCl; clear smooth boundary to:
7-20	cm	Reddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; moderate medium subangular blocky; dry slightly hard; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 2 % sub-rounded basalt gravel (5-20 mm); strong reaction to HCl; gradual smooth boundary to:
20-47	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; strong medium subangular blocky; dry moderately hard; moist very friable; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 2 % irregular basalt fine gravel (2-5 mm); strong reaction to HCl; gradual smooth boundary to:
47-86	cm	Pink (7.5 YR 7/4) dry and reddish yellow (7.5 YR 6/6) moist; gravelly silty clay; massive breaking to moderately medium subangular blocky; dry hard; moist very friable; very sticky; very plastic; few fine (0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; 35 % irregular gravel (5-20 mm); 40 % medium (5-15 mm) moderately hard calcareous concretions; violent reaction to HCl; diffuse smooth boundary to:
86-140+	cm	Pink (7.5 YR 8/4) dry and reddish yellow (7.5 YR 7/6) moist; gravelly silty clay; massive breaking to weak medium subangular blocky; dry hard; moist very friable; very sticky; very plastic; few fine (0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; 20 % irregular gravel (5-20 mm); 50 % medium (5-15 mm) moderately hard calcareous concretions; violent reaction to HCl.

Soil Profile Description (ID 13)

Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Xerochreptic Calciorthids (FBEL)
ACSAD: RHK x c e 4 a: Xerochreptic Calciorthid
FAO/UNESCO: CLh : Halpic Calcisol

Location: 6 km ES Mafraq

Coordinates: Geographical : 36.25382 E/ 32.29904 N
JTM: 429731 E/ 574596 N

Elevation: 663 m asl

Landform: Position: Upper fan slope
Land System : 8/18 (Alluvial fans derived from calcareous rocks (Balqa group))--8.19.0[GIS]
Land Facet: 2 (Lower slopes of alluvial fans/loessic fill)

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

Slope: Almost flat (1%), rectilinear to S

Land Use : 1.1 Cereals

Plant /Crop: Cereal

Climate: Mean annual precipitation:
Mean annual temperature: Air : 17.3° C / Soil (50cm): 20.2° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 150-200 mm p.a.

GENERAL INFORMATION ON THE SOIL:

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

Parent Material: Alluvium (clayey texture)

Drainage: Surface Runoff: None
Soil Drainage Class: Well

Surface Cover:

Surface Feature: Litter (2 %)

Soil Surface Conditions: Dry / Loose

Erosion: Nil

Soil Depth: 150 cm +

Diagnostic Horizon or Property: Cambic at 36 cm and Calcic at 85 cm

PROFILE DESCRIPTION:

Ap	0-12	cm	Reddish yellow (7.5 YR 6/5) dry and brown (7.5 YR 4/4) moist; silty clayloam; weak fine subangular blocky; dry soft; moist very friable; moderately sticky; moderately plastic; Common fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 5 % sub-rounded hard limestone fine gravel (2-5 mm); strong reaction to HCl; gradual smooth boundary to :
	12-36	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; moderate coarse subangular blocky breaking to moderate medium subangular blocky; dry hard; moist friable; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few very fine (<1 mm) irregular cracks; common fine (1-2 mm) fibrous roots; 2 % sub-rounded hard limestone gravel (5-20 mm); 2 % medium (5-15 mm) soft calcareous concretions; strong reaction to HCl; gradual smooth boundary to :
Bw	36-85	cm	Strong brown(7.5 YR 4.5/6) dry and strong brown (7.5 YR 4/6) moist; silty clay; strong medium subangular blocky; dry hard; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) irregular cracks; few medium (2-5 mm) fibrous and woody roots; 5 % sub-rounded hard limestone gravel (5-20 mm); 5 % medium (5-15 mm) moderately hard calcareous concretions; strong reaction to HCl; gradual smooth boundary to :
Bk	85-150+	cm	Reddish yellow (7.5 YR 7/6) dry and reddish yellow (7.5 YR 6/6) moist; clay; strong medium subangular blocky; dry very hard; moist friable; very sticky; very plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) irregular cracks; few medium (2-5 mm) fibrous and woody roots; 15 % irregular hard limestone gravel (5-20 mm); 40 % medium (5-15 mm) moderately hard calcareous concretions; strong reaction to HCl.

Soil Profile Description (ID 14)

Information on the site :

Soil Classification: USDA (1990): Sandy-skeletal, gypsic, calcareous, hyperthermic Family of Typic Gypsiorthids (FBEO)
ACSAD: RHY t 1/2 a : Typic Gypsiorthids
FAO/UNESCO: CLjy : Yermic-Gypsic Calcisol

Location: 1km E of Jafr Aumary road

Coordinates: Geographical : 36.86727 E/ 31.65659 N
JTM: 487413 E/ 503133 N

Elevation: 542 m asl

Landform: Position: Lower slope gravel plain
Land System : 13/12 (Dessected plateau and gravel terraces)--13.12.0 [GIS]
Land Facet: 1 (Gently undulating gravel plain with pedrock)

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

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

Land Use : 4.4 Unvegetated, bare

Plant /Crop:

Climate: Mean annual precipitation:
Mean annual temperature: Air : 19.4° C / Soil (50cm): 22.4° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Limestone [q2 Fluv.gravels (Lisan) (Bender 1968)]
Parent Material: Alluvium (gravelly texture)
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover : Gravel (60 %)
Surface Feature : Patina
Soil Surface Conditions: Dry / Moderately Hard
Erosion : Nil
Soil Depth : 265 cm +
Diagnostic Horizon or Property: Gypsic at 75 cm

PROFILE DESCRIPTION :

0-5	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4.5/6) moist; clayloam; weak medium platy breaking to moderate medium subangular blocky; dry slightly hard; moist loose; moderately sticky; moderately plastic; many fine (0.5-2 mm) irregular pores; 10 % angular chert coarse gravel (20-75 mm); strong reaction to HCl; gradual smooth boundary to:
5-17	cm	yellowish red (5 YR 5/6) dry and red (2.5 YR 4.5/6) moist; very gravelly fine sandy clayloam; very weak fine subangular blocky; dry loose; moist loose; non-sticky; slightly plastic; common fine (0.5-2 mm) tubular pores; 45 % platy chert coarse gravel (20-75 mm); 2 % medium (5-15 mm) soft gypsum crystals; violent reaction to HCl; clear wavy boundary to:
17-75	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 5/6) moist; extremely gravelly sand; massive; dry very hard; moist loose; non-sticky; non-plastic; many fine (0.5-2 mm) tubular pores; 70 % rounded chert coarse gravel (20-75 mm); 25 % small (<5 mm) moderately hard gypsum crystals; strong thick gypsum coating of gravel; strong reaction to HCl; abrupt smooth boundary to:
75-95	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 5/6) moist; sandy loam; massive; dry very hard; moist very firm; non-sticky; non-plastic; many fine (0.5-2 mm) irregular pores; 5 % irregular chert gravel (5-20 mm); 60 % large (>15 mm) hard gypsum crystals; strong reaction to HCl; clear smooth boundary to:
95-165	cm	Reddish yellow (7.5 YR 7/5) dry and strong brown (7.5 YR 5/6) moist; silty clayloam; weak coarse subangular blocky breaking to moderate fine subangular blocky; dry hard; moist very friable; slightly sticky; slightly plastic; common fine (0.5-2 mm) irregular pores; 5 % irregular chert gravel (5-20 mm); 10 % medium (5-15 mm) moderately hard gypsum crystals; violent reaction to HCl; abrupt smooth boundary to:

165-265+ cm Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 5/6) moist; very gravelly silty clayloam; weak coarse platy breaking to moderate medium subangular blocky; dry slightly hard; moist very friable; moderately sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; 50 % sub-rounded chert coarse gravel (20-75 mm); weak thin CaCO₃ coating of gravel; violent reaction to HCl.

Soil Profile Description (ID 15)

Information on the site :

Soil Classification: USDA (1990): loamy-skeletal, mixed, calcareous, thermic Family of Cambic Gypsiorthids (FBDC)
ACSAD: RHY h 2 a : Cambic Gypsiorthids
FAO/UNESCO: CLjy : Yermic-Gypsic Calcisol

Location: Between Makhrug & Jebel Waqf

Coordinates: Geographical : 36.85082 E/ 31.17692 N
JTM: 485781 E/ 449960 N

Elevation: 694 m asl

Landform: Position: Upper slope pediment
Land System : 13/22 (Undulating pediment and colluvial fans from Muwqqar formation)--13.22.0[GIS]
Land Facet: 1 (pediments)

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

Slope: Almost flat (1 %) , rectilinear to NNE

Land Use : 3.4 Nat . brows + grazing

Plant /Crop: Hamd (2) , Ajram (1) : 1 % groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.9° C / Soil (50cm): 21.8° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: sedimentary chemic. / organ. : chalk/ limestone [q2 fluv . gravels (Lisan)(Bender 1981)]

Parent Material: Badrock – weathered

Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover : Gravel (90 %)

Surface Feature : Patina

Soil Surface Conditions: Dry / Slightly Hard

Erosion : Nil

Soil Depth : 96 cm (Paralithic contact) 120 cm (Lithic contact)

Diagnostic Horizon or Property: Gypsic at 49 cm

PROFILE DESCRIPTION :

0-8	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4.5/6) moist; silty clayloam; moderate coarse platy ; dry moderate hard; moist friable; modrately sticky; moderately plastic; many medium (2-5 mm) irregular pores; 15 % irregular chert fine gravel(2-5 mm); strong reaction to HCl; clear smooth boundary to:
8-30	cm	Rrddish yellow (7.5 YR 5.5/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; weak fine subangular blocky; dry soft; moist loose; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; 5 % angular chert gravel (5-20 mm); 2 % small (<5 mm) soft gypsum crystals; violent reaction to HCl; gradual smooth boundary to:
30-49	cm	Yellowish red (5 YR 5/6) dry and red (2.5 YR 4/6) moist; silty clayloam; weak fine subangular blocky; dry soft; moist loose; slightly sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 5 % angular chert gravel (5-20 mm); 5 % small (<5 mm) soft gypsum crystals; moderate moderately thick gypsum coating of gravel; violent reaction to HCl; clear wavy boundary to:
49-96	cm	Rrddish yellow (7.5 YR 7/5) dry and strong brown (7.5 YR 5/6) moist; very gravelly sandy clayloam; massive; dry hard; moist very friable; slightly sticky; slightly plastic; many fine (0.5-2 mm) irregular pores; 40 % irregular soft limestone coarse gravel (20-75 mm); 20 % medium (5-15 mm) moderately hard gypsum crystals; violent reaction to HCl; gradual irregular boundary to:

Soil Profile Description (ID 16)

Information on the site :

Soil Classification: USDA (1990): Fine, gypsic, calcareous, Hyperthermic Family of Cambic Gypsiorthids(FBDC)
ACSAD: RHY h 4/2 a : Cambic Gypsiorthids
FAO/UNESCO: CLjy : Yermic-Gypsic Calcisol

Location: 1 km N of wadi Bayir

Coordinates: Geographical : 37.17780 E/ 30.98870 N
JTM: 516980 E/ 429100 N

Elevation: 659 m asl

Landform: Position: Crest
Land System : 13/17 (Gravel plains derived from Shallala formation)--13.17.0[GIS]
Land Facet: 1 (Gravel plain middle terrace)

Microrelief: Class:
Type:

Slope: Almost flat (1 %) , convex to NE

Land Use : 4.4 Unvegetated, bare

Plant /Crop:

Climate:Mean annual precipitation:
Mean annual temperature: Air : 19.6° C / Soil (50cm): 22.5° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: sedimentary chemic. / organ. : chalk / limestone [q2 fluv . gravels (Lisan)(Bender 1981)]

Parent Material: Aeolian/ Bedrock

Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover : Gravel (90 %)

Surface Feature : Vesiculs (100 %)

Soil Surface Conditions: Dry / moderately Hard

Erosion : Nil

Soil Depth : 93 cm (Lithic contact)

Diagnostic Horizon or Property: Cambic at 18 cm gypsic at 45 cm

PROFILE DESCRIPTION :

0-7	cm	Rreddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4.5/6) moist; clayloam; moderate medium platy; dry moderately hard; moist very friable; very sticky; moderately plastic; many fine (0.5-2 mm) spherical pores; common fine (1-5 mm) horizontal cracks; 15 % irregular; chert gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to :
Bk	7-18	cm Rreddish yellow (7.5 YR 6/6) dry and yellowish red (5 YR 5/6) moist; silty clayloam; weak fine subangular blocky; dry soft; moist loose; moderately sticky; moderately plastic; many very fine (<0.5 mm) tubular pores; few fine (1-5 mm) vertical cracks; 5 % irregular chert fine gravel (2-5 mm); 2 % small (<5 mm) soft gypsum crystals; strong reaction to HCl; gradual smooth boundary to:
Bk	18-45	cm Yellowish red (5 YR 4/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; very weak fine subangular blocky; dry loose; moist loose; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; 10 % irregular chert gravel (5-20 mm); 10 % medium (5-15 mm) soft gypsum crystals; weak moderately thick CaCO ₃ coating of gravel; strong reaction to HCl; abrupt wavy boundary to:
By	45-93	cm Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4.5/6) moist; sandy clayloam; massive; dry very hard; moist friable; moderately sticky; moderately plastic; many medium (2-5 mm) irregular pores; 15 % irregular chert coarse gravel (20-75 mm); 50 % medium (5-15 mm) moderately hard gypsum crystals; strong reaction to HCl; gradual irregular boundary to:
93+	cm	Lithic contact to Chalk / limestone

Soil Profile Description (ID 17)

Information on the site :

Soil Classification: USDA (1990): Fine, Mixed, calcareous, Hyperthermic Family of Typic Calciorthis (FBDC)
ACSAD: RHK t 4 a : Typic Calciorthis
FAO/UNESCO: CLhy : Yermic-Haplic Calcisol

Location: 1.5 km N of wadi Bayir

Coordinates: Geographical : 37.17565 E/ 30.99183 N
JTM: 516774 E/ 429446 N

Elevation: 656 m asl

Landform: Position: Old wadi channel
Land System : 13/17 (Gravel plains derived from Shallala formation)--13.17.0[GIS]
Land Facet: 4 (Old linear channels)

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

Slope: Almost flat (1 %) , convexoconcave to ENE

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Fires (30): 5 % grouncover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 19.6° C / Soil (50cm): 22.5° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology:

sedimentary chemic. / organ. : chalk/ limestone [q4 Qa (clay) (Bender 1981)]
Parent Material: Alluvium
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well
Surface Cover : Gravel (50 %)
Surface Feature : Capping (100 %)
Soil Surface Conditions: Dry / moderately Hard
Erosion : Nil
Soil Depth : 135 cm +
Diagnostic Horizon or Property: Cambic at 13 cm and calcic at 29 cm

PROFILE DESCRIPTION

0-5	cm	Reddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 4/6) moist; clayloam; weak coarse platy; dry slightly hard; moist very friable; moderately sticky; moderately plastic; many medium (2-5 mm) spherical pores; 10 % irregular chert gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to:
5-13	cm	Reddish yellow (7.5 YR 6/6) dry and yellowish red (5 YR 4/6) moist; silty clayloam; very weak fine subangular blocky; dry loose; moist loose; slightly sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; 5 % irregular chert gravel (5-20 mm); 2 % small (<5 mm) soft gypsum crystals; violent reaction to HCl; clear smooth boundary to:
13-29	cm	Yellowish red (5 YR 4/6) dry and red (2.5 YR 4/6) moist; clayloam; moderate coarse subangular blocky breaking to strong fine subangular blocky; dry moderately hard; moist very friable; moderately sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; 10 % irregular chert fine gravel (2-5 mm); 10 % medium (5-15 mm) moderately hard calcareous concretions; strong reaction to HCl; gradual smooth boundary to:
29-110	cm	Yellowish red (5 YR 4/6) dry and red (2.5 YR 4/6) moist; clayloam; strong medium subangular blocky; dry hard; moist friable; very sticky; very plastic; common fine (0.5-2 mm) tubular pores; 5 % irregular chert fine gravel (2-5 mm); 15 % medium (5-15 mm) moderately hard calcareous concretions; moderate moderately thick clay coating of beds; strong reaction to HCl.
110-135+	cm	Reddish brown (5 YR 5/4) dry and red (2.5 YR 4/6) moist; clayloam; massive; dry hard; moist friable; moderately sticky; very plastic; 2 % irregular chert fine gravel (2-5mm); 5 % small (<5 mm) moderately hard gypsum crystals; strong reaction to HCl.

Soil Profile Description (ID 18)

Information on the site :

Soil Classification: USDA (1990): Fine, Mixed, calcareous, thermic Family of Xerochreptic Camborthids (FBFU)
ACSAD: RHH x c e 4/2 a : Xerochreptic Camborthid
FAO/UNESCO: CMy : Yermic Cambisol

Location: 8km E of UM El Amad

Coordinates: Geographical : 35.98601 E/ 31.61034 N
JTM: 403795 E/ 498444 N

Elevation: 745 m asl

Landform: Position: Middle slope in concavity
Land System : 8/17 (Gently undulating plain with mod.well developed drainage)--11.11.0[GIS]
Land Facet: 1 (Undulating, plain of deep colluvial/loessic fill)

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

Slope: Gently sloping (3 %) , rectilinear to SSW

Land Use : 1.1 Cereals and 1.8 Fallow

Plant /Crop: Ado (5): 1 % groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 17.3° C / Soil (50cm): 20.3° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 200-250 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology:

sedimentary chemic. / organ. : Limestone [c2 LSt,marls,chert,phospor (Bender 1981)]
Parent Material: Colluvium
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover :

Surface Feature : Mulching (50 %)

Soil Surface Conditions: Dry / slightly hard

Erosion : Slight rill erosion

Soil Depth : 150 cm +

Diagnostic Horizon or Property: Cambic at 26 cm and calcic at 95 cm

PROFILE DESCRIPTION :

0-9	cm	Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 4/6) moist; silt loam; moderate fine subangular blocky; dry soft; moist friable; slightly sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 1 % sub-rounded hard limestone fine gravel (2-5 mm); strong reaction to HCl; clear smooth boundary to:
9-26	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; moderate medium subangular blocky breaking to moderate fine subangular blocky; dry slightly hard; moist friable; moderately sticky; moderately plastic; many very fine (<1 mm) fibrous roots; strong reaction to HCl; clear wavy boundary to:
26-48	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; moderate medium subangular blocky breaking to moderate fine subangular blocky; dry slightly hard; moist friable; moderately sticky; moderately plastic; many very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 1 % sub-rounded hard limestone fine gravel (2-5 mm); 2 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating of peds; strong reaction to HCl; gradual wavy boundary to:
48-95	cm	Strong brown (7.5 YR 4/6) moist; silty clayloam; moderate medium subangular blocky breaking to strong fine angular blocky; moist firm; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous and woody roots; 7 % sub-rounded hard limestone fine gravel (2-5 mm); 4 % medium (5-15 mm) soft calcareous concretions; moderate thin clay coating of peds; strong reaction to HCl; gradual smooth boundary to:
95-150+	cm	Strong brown (7.5 YR 4/6) moist; silty clayloam; massive breaking to strong very fine angular blocky; moist very firm; slightly sticky; moderately plastic; many (>20%) medium (5-15 mm) faint mottles (black); common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 2 %

sub-rounded hard limestone fine gravel (2-5 mm); 12 % medium (5-15 mm) moderately hard calcareous concretions; weak thin clay coating of peds; strong reaction to HCl.

Soil Profile Description (ID 19)

Information on the site :

Soil Classification: USDA (1990): Clayey-skeletal mixed, calcareous, thermic Family of Cambic Gypsiorthids (FBDC)
ACSAD: RHY h 4 a: Cambic Gypsiorthid
FAO/UNESCO: CLjy : Yermic-Gypsic Calcisol

Location: Far E of Jafr

Coordinates: Geographical : 37.04688 E/ 30.02648 N
JTM: 504521 E/ 322433 N

Elevation: 999 m asl

Landform: Position: Crest
Land System : 12/7(High level gravel plateau on bedrock with derived alluvial fan deposit)--13.18.0 [GIS]
Land Facet:

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

Slope: Almost flat (1 %), convex to N

Land Use : 4.4 Unvegetated, bare

Plant /Crop:

Climate:Mean annual precipitation:
Mean annual temperature: Air : 18.4° C / Soil (50cm): 21.3° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology:

Sedimentary chem. / organ. : Limestone [c2 Lst,marls,cherts,phospor (Bender 1968)]
Parent Material: Bedrock-weathered
Drainage: Surface Runoff: Medium
Soil Drainage Class: Somewhat excessive
Surface Cover : Gravel (60%)
Surface Feature : Aeolian sand (40 %)
Soil Surface Conditions: Dry / loose
Erosion : Nil
Soil Depth : 60 cm (Lithic contact)
Diagnostic Horizon or Property: Gypsic at 16 cm

PROFILE DESCRIPTION :

- | | | |
|-------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0-16 | cm | Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 4/6) moist; fine sandy clay; very weak medium angular blocky breaking to single grain; dry moderately hard; moist very friable; slightly sticky; slightly plastic; few very fine (<1 mm) vertical cracks; 2 % chert gravel (5-20 mm); violent reaction to HCl; clear wavy boundary to: |
| 16-38 | cm | Strong brown (7.5YR 5/6) dry and strong brown (7.5YR 4/6) moist; fine sandy clay; moderate fine subangular blocky breaking to weak very fine subangular blocky; dry hard; moist very friable; slightly sticky; slightly plastic; 2 % angular chert gravel (5-20 mm); 20 % small (<5 mm) moderately hard gypsum crystals; violent reaction to HCl; abrupt wavy boundary to: |
| 38-60 | cm | Strong brown (7.5YR 5/6) dry and yellowish red (5YR 4/6) moist; extremely gravely fine sandy clay; moderate medium subangular blocky breaking to weak very fine angular blocky; dry hard; moist friable; slightly sticky; slightly plastic; few very fine (<0.5 mm) spherical pores; 60 % angular hard limestone stones (75-250 mm); violent reaction to HCl; abrupt wavy boundary to: |
| 60+ | cm | Lithic contact to Limestone. |

Soil Profile Description (ID 20)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy, mixed, hyperthermic Family of Typic Camborthids (FBFW)
ACSAD: RHH t 2 a : Typic Camborthid
FAO/UNESCO: CMy : Yermic Cambisol

Location: Far E of Jafr

Coordinates: Geographical : 37.18919 E/ 30.01160 N
JTM: 518249 E/ 320798 N

Elevation: 865 m asl

Landform: Position: Wadi / fan
Land System : 13/4 (Alluvial fans on lying plains)--13.4.0 [GIS]
Land Facet: 2 (Ancient alluvial fan)

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

Slope: Almost flat (1 %) , convex to E

Land Use : 4.4 Unvegetated , bare

Plant /Crop:

Climate: Mean annual precipitation:
Mean annual temperature: Air : 19.4° C / Soil (50cm): 22.3° C
Soil moisture regime: Aridic
Precipitation zone: 0-50 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology:

Unconsolidated alluvium [c1+2 Varical / silic. SSt(Krnb) (Bender 1968)]
Parent Material: Alluvium (gravelly texture)
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well
Surface Cover : Gravel (50%)
Surface Feature : Aeolian sand (50 %)
Soil Surface Conditions: Dry / Loose
Erosion : Nil
Soil Depth : 105 cm (Gravel / stones)
Diagnostic Horizon or Property: Cambic at 35 cm

PROFILE DESCRIPTION :

0-10	cm	Strong brown (7.5YR 5/6) dry and strong brown (7.5YR 4/6) moist; very fine sandy clayloam; weak fine platy breaking to weak fine angular blocky; dry hard; moist friable; slightly sticky; slightly plastic; common very fine (<0.5 mm) spherical pores; few very fine (<1 mm) vertical cracks; moderate reaction to HCl; gradual wavy boundary to:
10-35	cm	Reddish yellow (7.5YR 7/6) dry and strong brown (7.5YR 4/6) moist; very fine sandy clayloam; weak medium angular blocky breaking to weak fine angular blocky; dry hard; slightly sticky; moderately plastic; few very fine (<0.5 mm) spherical pores; violent reaction to HCl; gradual smooth boundary to:
35-67	cm	Yellowish red (5YR 5/6) dry and yellowish red (5YR 4/6) moist; fine sandy clayloam; weak medium angular blocky; dry hard; moist friable; slightly sticky; slightly plastic; common very fine (<0.5 mm) spherical pores; 1 % angular chert fine gravel (2-5 mm); violent reaction to HCl; abrupt smooth boundary to:
67-80	cm	Yellowish red (5YR 4/6) dry and yellowish red (5YR 4/6) moist; fine sandy clayloam; moderate fine platy breaking to moderate fine angular blocky; dry hard; moist firm; slightly sticky; slightly plastic; 3 % medium (5-15 mm) hard gypsum crystals; moderate moderately thick gypsum coating of peds; slightly reaction to HCl; abrupt smooth boundary to:
80-105	cm	Yellowish red (5YR 5/6) dry and yellowish red (5YR 4/6) moist; fine sandy clayloam; weak medium angular blocky breaking to weak fine angular blocky; dry hard; moist friable; slightly sticky; slightly plastic; 10 % angular chert gravel (5-20 mm); strong reaction to HCl; gradual smooth boundary to:
105+	cm	Gravel / stones

Soil Profile Description (ID 21)

Information on the site :

Soil Classification: USDA (1990): Clayey, mixed, calcareous, thermic, shallow Family of (Lithic Xerochreptic Camborthids) (FBFX)
ACSAD: RHH (1 x c e 4 b: (Lithic Xerochreptic Camborthid)
FAO/UNESCO: LPy : Yermic Leptosol

Location: 9km SSE Bir Khidad

Coordinates: Geographical : 35.58505 E/ 30.36779 N
JTM: 363998 E/ 361111 N

Elevation: 1330 m asl

Landform: Position: Lower middle slope
Land System : 11/16 (Rolling, dissected hills on Balqa group)--11.16.0 [GIS]
Land Facet: 4 (Mid / lower slope colluvial mantles)

Microrelief: Class: Slightly uneven (25-50 cm)
Type: Undulating

Slope: Sloping (7 %) , convex to E

Land Use : 1.9 Tilled and 4.4 Unvegetated, bare

Plant /Crop:

Climate: Mean annual precipitation:
Mean annual temperature: Air : 14.5° C / Soil (50cm): 17.5° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 150-200 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic. /organ. :Limestone [c2 LSt,marls,cherts,phospor (Bender 1968)]
Parent Material: Colluvium/Bedrock (gravelly texture)
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well

Surface Cover : Stones (20 %)

Surface Feature :

Soil Surface Conditions: Dry / Soft

Erosion : Nil

Soil Depth : 40 cm (Lithic contact)

Diagnostic Horizon or Property: Cambic at 24 cm

PROFILE DESCRIPTION :

- | | | |
|-------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0-11 | cm | Light yellowish brown (10YR 6/4) dry and dark yellowish brown (10YR 4/6) moist; fine sandy clayloam; weak medium subangular blocky breaking to single grain; dry slightly hard; moist very friable; slightly sticky; moderately plastic; few fine (1-2 mm) fibrous roots; 10 % angular chert stones (75-250 mm); strong reaction to HCl; abrupt smooth boundary to : |
| 11-24 | cm | Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/4) moist; silty clay; moderate coarse subangular blocky breaking to moderate fine angular blocky; dry very hard; moist friable; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; 5 % sub-rounded hard limestone fine gravel (2-5 mm); strong reaction to HCl; clear wavy boundary to : |
| 24-40 | cm | Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/4) moist; stony fine sandy clay; moderate medium subangular blocky breaking to weak very fine angular blocky; dry hard; moist friable; non-sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; 20 % tubular hard limestone stones (75-250 mm); 2 % medium (5-15 mm) soft calcareous concretions; violent reaction to HCl; abrupt wavy boundary to : |
| 40+ | cm | Lithic contact to Limestone |

Soil Profile Description (ID 22)

Information on the site :

Soil Classification: USDA (1990): Fine-silty, mixed, calcareous, thermic, Family of Xerochreptic Calciorthis (FBEL)
ACSAD: RHK x c e 3/4 a: Xerochreptic Calciorthis
FAO/UNESCO: CLh : Haplic Calcisol

Location: 8km SW of Jebel Mudeisisat

Coordinates: Geographical : 36.15554 E/ 31.61610 N
JTM: 419885 E/ 498946 N

Elevation: 735 m asl

Landform: Position: Middle in shallow wadi
Land System : 11/9 (Gently undulating alluvial/loessic plains)--11.9.0 [GIS]
Land Facet: 6 (Wadi / ephemeral stream course)

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

Slope: Almost flat (1 %) , irregular to W

Land Use : 3.3 Nat.grazing

Plant /Crop: Granes (30), Natoon (6), Gaisum (5): 5 % groundcover

Climate: Mean annual precipitation:
Mean annual temperature: Air : 17.5° C / Soil (50cm): 20.5° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 150-200 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic. /organ. :Limestone [q5 Fluv.deposits,sand,loess (Bender 1968)]
Parent Material: Alluvium (clayey texture)
Drainage: Surface Runoff: Medium
Soil Drainage Class: Well
Surface Cover : Nil
Surface Feature : Capping (70 %)
Soil Surface Conditions: Dry / Slightly hard
Erosion : Moderate gully erosion
Soil Depth : 150 cm (Compaction)
Diagnostic Horizon or Property: Cambic at 15 cm and calcic at 40 cm

PROFILE DESCRIPTION :

0-15	cm	Yellow (10YR 7/6) dry and hard yellowish brown (10YR 5/6) moist; silty clayloam; moderate medium subangular blocky breaking to fine angular blocky ; dry hard; moist friable; very sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) irregular cracks; common very fine (<1 mm) fibrous roots; moderate reaction to HCL; clear smooth boundary to:
15-40	cm	Brownish yellow (10YR 6/6) dry and dark yellowish brown (10YR 4/6) moist; silty clayloam; weak medium angular blocky breaking to fine angular blocky ; dry hard; moist friable; few very fine (<1 mm) fibrous roots; 1% small (<5 mm) soft calcareous concretions; strong thin CaCO ₃ coating of peds; strong reaction to HCL; clear smooth boundary to:
40-75	cm	Brownish yellow (10YR 6/6) dry and dark yellowish brown (10YR 4/6) moist; silty clayloam; weak coarse angular blocky breaking to fine subangular blocky ; dry hard; moist friable; very stickly; moderately plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) irregular cracks; common very fine (<1 mm) fibrous roots;5% small (<5 mm) soft calcareous concretions; weak thin CaCO ₃ coating of peds; violent reaction to HCL; clear smooth boundary to:
75-115	cm	Yellowish brown (10YR 5/6) dry and dark yellowish brown (10YR 4/6) moist; silty clayloam;very weak coarse angular blocky breaking to medium angular blocky ; dry moderately hard; moist friable; very stickly; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 2% small (<5 mm) soft calcareous concretions; weak thin CaCO ₃ coating of peds; strong reaction to HCL; clear smooth boundary to:
115-150	cm	Very pale brown (10YR 7/6) dry and light yellowish brown (10YR 6/4) moist; silty clay;massive; dry hard; moist friable; very stickly; slightly plastic; few (<2%) small (<5 mm) distinct mottles

(black); few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 40% medium (5-15 mm) very hard calcareous concretions; violent reaction to HCL.

150+ cm Compaction

Soil Profile Description (ID 23)

Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Xerochreptic Paleorthids (FBBE)
ACSAD: RHZ x c e 4 a: Xerochreptic Paleorthid
FAO/UNESCO: CMy : Yermic Cambisol
Location: 2.5km SW of ed Dafyana
Coordinates: Geographical : 36.54889 E/ 32.29159 N
JTM: 457515 E/ 573615 N
Elevation: 862 m asl
Landform: Position: Crest
Land System : 15/2 (Gently undulating lava plain with subparallel/dendritic drainage)--15.3.0 [GIS]
Land Facet: 1 (Moderately broad convex interfluves, outcrops, depressions)
Microrelief: Class: Even (<25 cm)
Type: Other
Slope: Almost flat (1 %) , convex to SW
Land Use : 1.1 Cereals
Plant /Crop:
Climate: Mean annual precipitation:
Mean annual temperature: Air : 16.2° C / Soil (50cm): 19.1° C
Soil moisture regime: Transition aridic-xeric
Precipitation zone: 150-200 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Igneous basic : Basalt / Limestone [B5 Basalt (middle) (Bender 1968)]
Parent Material: Calcrete
Drainage: Surface Runoff: Slow
Soil Drainage Class: Well
Surface Cover : Stones (30 %)
Surface Feature :
Soil Surface Conditions: Dry / Soft
Erosion : Nil
Soil Depth : 56 cm (Paralithic contact) / 85 cm (Petrocalcic layer)
Diagnostic Horizon or Property: Calcic at 18 cm and petrocalcic at 85 cm

PROFILE DESCRIPTION :

0-18	cm	Reddish yellow (7.5YR 7/6) dry and strong brown (7.5YR 5/6) moist; silty clay; moderate coarse subangular blocky; dry slightly hard; moist friable; moderately sticky; very plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 2 % sub-rounded basalt fine gravel (2-5 mm); strong reaction to HCL; clear smooth boundary to:
18-39	cm	Strong brown (7.5YR 4.5/6) dry and yellowish red (5YR 5/6) moist; silty clay; strong coarse subangular blocky; dry hard; moist firm; very sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; many very fine (<1 mm) fibrous roots; 5 % irregular basalt fine gravel (2-5 mm); 5 % small (<5 mm) soft calcareous concretions; weak thin clay coating of peds; strong reaction to HCL; clear irregular boundary to:
39-56	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; clayloam; massive breaking to weak medium subangular blocky; dry moderately hard; moist friable; very sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 4 % small (<5 mm) soft calcareous concretions; strong reaction to HCL; clear irregular boundary to:
56+	cm	Paralithic contact to Basalt / Limestone
56-85	cm	
85+	cm	Petrocalcic layer

Soil Profile Description (ID 24)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy, mixed, calcareous, hyperthermic Family of Typic Calciorthis (FBEO)
ACSAD: RHK t 2 a: Typic Calciorthis
FAO/UNESCO: Clhy : Yermic-Haplic Calcisol

Location: 9.6km E of Jebel Hamrat fidar

Coordinates: Geographical : 35.46036 E/ 30.62118 N
JTM: 352394 E/ 389358 N

Elevation: 197 m asl

Landform: Position: Middle slope on alluv.terr.
Land System : 2/2 (Piedmont alluvial fans in wadi Arabah floor)--2.2.0 [GIS]
Land Facet: 5 (Low angle incised paleofan)

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

Slope: Almost flat (1 %), rectilinear to SW

Land Use : 3.3 Nat.grazing

Plant /Crop: Grasses, Ajram (7) : 3 % groundcover

Climate:Mean annual precipitation:
Mean annual temperature: Air : 21.8° C / Soil (50cm): 24.7° C
Soil moisture regime: Aridic
Precipitation zone: 150-200 mm p.a.

GENERAL INFORMATON ON THE SOIL:

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

Parent Material: Alluvium

Drainage: Surface Runoff: Slow
Soil Drainage Class: Moderately well

Surface Cover : Stones (35 %)

Surface Feature : Capping (5 %)

Soil Surface Conditions: Dry / Moderately hard

Erosion : Slight undifferentiated erosion

Soil Depth : 102 cm (undifferentiated)

Diagnostic Horizon or Property: Calcic at 54 cm

PROFILE DESCRIPTION :

- 0-4 cm Very pale brown (10YR 7/4) dry and yellowish brown (10YR 5/6) moist; silty clayloam; weak medium subangular blocky; dry moderately hard; moist friable; slightly sticky; non-plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; strong reaction to HCL; clear smooth boundary to:
- 4-19 cm Yellow (10YR 7/6) dry and yellowish brown (10YR 5/4) moist; silty clayloam ; weak medium subangular blocky; dry slightly hard; moist friable; slightly sticky; non-plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 10 % irregular basalt gravel (5-20 mm); weak thin CaCo3 coating of gravel ; strong reaction to HCL; clear smooth boundary to:
- 19-32 cm Light yellowish brown (10YR 6/4) dry and dark yellowish brown (10YR 4/4) moist; silty clayloam ; moderate medium subangular blocky; dry slightly hard; moist friable; moderately sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; many fine (1-2 mm) fibrous roots; 2 % small (<5 mm) soft calcareous concretions; weak thin CaCo3 coating of gravel ; strong reaction to HCL; clear smooth boundary to:
- 32-54 cm Brownish yellow (10YR 6/6) dry and yellowish brown (10YR 5/6) moist; silty clayloam ; moderate medium subangular blocky; dry moderately hard; moist friable; moderately sticky; slightly plastic; many very fine (<0.5 mm) tubular pores; many very fine (<1 mm) fibrous roots; 15 % irregular hard limestone gravel (5-20 mm); 5% small (<5 mm) moderately hard calcareous concretions ; moderate moderately thick CaCo3 coating of gravel ; clear smooth boundary to:
- 54-90 cm Reddish yellow (7.5YR 6/7) dry and strong brown (7.5YR 5/6) moist; silty clayloam ; moderate medium subangular blocky; dry moderately hard; moist friable; moderately sticky; slightly plastic;

many very fine (<0.5 mm) tubular pores; 5 % irregular hard limestone fine gravel (2-5 mm); 20% medium (5-15 mm) moderately hard calcareous concretions ; weak moderately thick CaCo₃ coating of gravel ; strong reaction to HCL :clear smooth boundary to:

- 90-102 cm Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; very gravelly silty clayloam moderate medium subangular blocky; dry moderately hard; moist friable; moderately sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; 35 % irregular basalt coarse gravel (20-75 mm) 20% medium (5-15 mm) moderately hard calcareous concretions ; moderate moderately thick CaCo₃ coating of gravel ; strong reaction to HCL :clear irregular boundary to:
- 102+ cm Undifferentiated

Soil Profile Description (ID 25)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy; mixed, calcareous, thermic Family of Typic Calciorthids (FBED)
ACSAD: RHK t 2/1 b: Typic Calciorthid
FAO/UNESCO: CLhy: Yermic-Haplic Calcisol

Location: 2.5 Km NE of Titin

Coordinates: Geographical : 35.22539 E/ 29.44952 N
JTM: 327850 E/ 259800 N

Elevation: 820 m asl

Landform: Position: Middle slope Fan
Land System : 5/2 (Outwash fans and wadis derived from Basement and sandstone rocks)—5.2.5[GIS]
Land Facet: 5 (Older fill - alluvial fan)

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

Slope: Sloping (7 %) , rectilinear to NW

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Halox sal

Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.8° C / Soil (50cm): 21.7° C
Soil moisture regime: Aridic
Precipitation zone: 50-100 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Igneous acid : Granite [q5 Fluv.deposits ,sand,loess (Bender 1968)]

Parent Material: Colluvium (gravelly texture)

Drainage: Surface Runoff: Medium
Soil Drainage Class: Somewhat excessive

Surface Cover : Stones (50 %)

Surface Feature : Capping

Soil Surface Conditions: Soft

Erosion : Slight rill erosion

Soil Depth : 180 cm +

Diagnostic Horizon or Property: Calcic at 45 cm

PROFILE DESCRIPTION :

0-12	cm	Brownish yellow (10YR 6/6) dry and yellowish brown (10YR 5/6) moist; fine sandy clayloam ; weak medium subangular blocky; dry soft; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 10% sub-rounded granite fine gravel (2-5 mm); violent reaction to HCL; clear smooth boundary to:
12-45	cm	Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/6) moist; very gravelly very fine sandy clayloam ; very weak medium subangular blocky; dry slightly hard; 50% sub-rounded granite fine gravel (2-5 mm); 10% small (<5 mm) soft calcareous concretions; violent reaction to HCL; clear smooth boundary to:
45-75	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; clayloam; very weak massive; dry slightly hard; 5% angular granite coarse gravel (20-75 mm); 35% medium (5-15 mm) soft calcareous concretions ; strong CaCO ₃ coating ; violent reaction to HCL; clear smooth boundary to:
75-105	cm	Light yellowish brown (10YR 6/4) dry and dark yellowish brown (10YR 4/4) moist; very gravelly loamy coarse sand; very weak massive; dry moderately hard; 40% sub-rounded granite coarse gravel (20-75 mm); 10% medium (5-15 mm) soft calcareous concretions; strong CaCO ₃ coating; violent reaction to HCL; clear wavy boundary to:
105-125	cm	Light yellowish brown (10YR 6/4) dry and dark yellowish brown (10YR 4/4) moist; gravelly coarse sand; moderate coarse subangular blocky; dry soft; common very fine (<0.5 mm) tubular pores; 40 % sub-rounded granite coarse gravel (20-75 mm); 2 % small (<5 mm) soft calcareous concretions; moderate gypsum coating; violent reaction to HCL; clear wavy boundary to:

125-180+ cm White (10YR 8/2) dry and dark yellowish brown (10YR 4/4) moist; gravelly sandy clayloam; dry moderately hard; common very fine (<0.5 mm) tubular pores; 20 % sub-rounded granite coarse gravel (20-75 mm) ; moderate coating; violent reaction to HCL.

Soil Profile Description (ID 26)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy; mixed, calcareous, hyperthermic Family of Typic Calciorthis (FBEO)
ACSAD: RHK t 2 b: Typic Calciorthis
FAO/UNESCO: CLhy: Yermic-Haplic Calcisol

Location: 6.5 Km NNE Titin

Coordinates: Geographical : 35.23091 E/ 29.48748 N
JTM: 328450 E/ 264000 N

Elevation: 770 m asl

Landform: Position: Colluvial fan
Land System : 5/4 (Dissected sandstone mesas, cliffs and fans overlying Basement)--5.2.1[GIS]
Land Facet: 5 (Old fill, alluvial fan system)

Microrelief: Class: Slightly uneven (25-50 cm)
Type: Undulating

Slope: Sloping (9 %) , rectilinear to SE

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Halox sal

Climate: Mean annual precipitation:
Mean annual temperature: Air : 19.1° C / Soil (50cm): 22.0° C
Soil moisture regime: Aridic
Precipitation zone: 50-100 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary detritus : Sandstone [q5 Fluv.deposits ,sand,loess (Bender 1968)]

Parent Material: Colluvium

Drainage: Surface Runoff: Medium
Soil Drainage Class: Well

Surface Cover : Stones (30 %)

Surface Feature : Capping

Soil Surface Conditions: Soft

Erosion : Moderate rill erosion

Soil Depth : 200 cm +

Diagnostic Horizon or Property: Calcic at 60 cm

PROFILE DESCRIPTION :

0-17	cm	Light brown (7.5YR 6/4) dry and strong brown (7.5YR 5/6) moist; sandy clayloam; weak medium platy; dry soft; few very fine (<1 mm) fibrous roots; 2 % sub-rounded sandstone fine gravel (2-5 mm); 2 % small (<5 mm) soft calcareous concretions; violent reaction to HCL; clear smooth boundary to:
17-60	cm	Light brown (7.5YR 6/4) dry and strong brown (7.5YR 5/6) moist; sandy loam; weak medium subangular blocky; dry slightly hard; 2 % sub-rounded sandstone fine gravel (2-5 mm); 5 % medium (5-15 mm) hard calcareous concretions; moderate CaCO ₃ coating; violent reaction to HCL; clear smooth boundary to:
60-95	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; coarse sandy clayloam; moderate medium subangular blocky; dry slightly hard; 10 % angular sandstone coarse gravel (20-75 mm); 15 % medium (5-15 mm) hard calcareous concretions; moderate CaCO ₃ coating; violent reaction to HCL; clear wavy boundary to:
95-140	cm	Light brown (7.5YR 6/4) dry and strong brown (7.5YR 5/6) moist; coarse sandy clayloam; moderate medium subangular blocky; dry moderately hard; 2 % sub-rounded sandstone fine gravel (2-5 mm); 25 % medium (5-15 mm) hard calcareous concretions; moderate CaCO ₃ coating; violent reaction to HCL; clear smooth boundary to:
140-200+	cm	Light brown (7.5YR 6/4) dry and strong brown (7.5YR 5/6) moist; sandy loam; moderate medium subangular blocky; dry moderately hard; 2 % medium (5-15 mm) hard calcareous concretions; violent reaction to HCL.

Soil Profile Description (ID 27)

Information on the site :

Soil Classification: USDA (1990): Loamy-skeletal , mixed, calcareous, thermic Family of Typic Calciorthis (FBEO)
ACSAD: RHK t 2/1 b: Typic Calciorthis
FAO/UNESCO: CLhy : Yermic-Haplic Calcisol

Location: W.Sadr Mulghan

Coordinates: Geographical : 35.19400 E/ 29.67868 N
JTM: 325200 E/ 285250 N

Elevation: 830 m asl

Landform: Position: Old fan middle slope
Land System : 5/2 (Outwash fans and wadis derived from Basement and sandstone rocks)--5.2.5 [GIS]
Land Facet: 5 (Older fill – alluvial fan)

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

Slope: Sloping (10 %) , rectilinear to SSW

Land Use : 3.4 Nat.brows + grazing

Plant /Crop: Halox sal

Climate: Mean annual precipitation:
Mean annual temperature: Air : 18.4° C / Soil (50cm): 21.4° C
Soil moisture regime: Aridic
Precipitation zone: 50-100 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Igneous acid : Granite [q5 Fluv. deposits, sand, loess (Bender 1968)]

Parent Material: Alluvium

Drainage: Surface Runoff: Medium
Soil Drainage Class: Somewhat excessive

Surface Cover : Stones (70 %)

Surface Feature : Capping

Soil Surface Conditions: Soft

Erosion : Slight sheet erosion

Soil Depth : 280 cm +

Diagnostic Horizon or Property: Calcic at 20 cm

PROFILE DESCRIPTION :

0-10	cm	Brownish yellow (10YR 6/6) dry and yellowish brown (10YR 5/6) moist; fine sandy loam; weak fine platy; dry soft; common very fine (<0.5 mm) spherical pores; few very fine (<1 mm) fibrous roots; 15 % sub-rounded granite coarse gravel (20-75 mm); weak CaCO ₃ coating; violent reaction to HCL; abrupt smooth boundary to:
10-20	cm	Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/6) moist; gravelly fine sandy clayloam; moderate fine subangular blocky; dry slightly hard; common very fine (<1 mm) fibrous roots; 25 % sub-rounded granite coarse gravel (20-75 mm); 2 % small (<5 mm) soft calcareous concretions; weak CaCO ₃ coating; violent reaction to HCL; clear wavy boundary to:
20-70	cm	Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/4) moist; extremely gravelly coarse sandy loam; weak fine subangular blocky; dry slightly hard; few very fine (<0.5 mm) tubular pores; 70 % fine gravel (2-5 mm); 50 % medium (5-15 mm) soft calcareous concretions; strong CaCO ₃ coating; violent reaction to HCL; clear smooth boundary to:
70-150	cm	Yellowish brown (10YR 5/6) dry and dark yellowish brown (10YR 4/4) moist; very gravelly sand; weak fine subangular blocky; dry slightly hard; common very fine (<0.5 mm) tubular pores; 40 % coarse gravel (20-75 mm); 25 % medium (5-15 mm) moderately hard calcareous concretions; moderate CaCO ₃ coating; moderate reaction to HCL; abrupt smooth boundary to:
150-230	cm	Light yellowish brown (10YR 6/4) dry and brown (10YR 5/3) moist; very gravelly sand; weak massive; dry soft; few medium (2-5 mm) woody roots; 40 % gravel (5-20 mm); 5 % large (<15 mm) soft calcareous concretions; moderate CaCO ₃ coating; strong reaction to HCL; abrupt smooth boundary to:

230-280+ cm Yellowish brown (10YR 5/6) moist; gravelly loamy sand; very weak massive; dry soft;
30 % sub-rounded granite fine gravel (2-5 mm); moderate CaCO₃ coating; strong reaction to HCL.

Soil Profile Description (ID 28)

Information on the site :

Soil Classification: USDA (1990): Fine-silty , mixed, calcareous, thermic Family of Typic Calciorthiss (FBEO)
ACSAD: RHK t 3 a: Typic Calciorthiss
FAO/UNESCO: CLhy : Yermic-Haplic Calcisol

Location: 5.3km SW of Qasr El Hallabat

Coordinates: Geographical : 36.35691 E/ 32.01991 N
JTM: 439254 E/ 543585 N

Elevation: 635 m asl

Landform: Position: Middle slope colluvial fan
Land System : 11/2 (Undulating dissected limestone plateau with rounded crests and basins)--11.2.0[GIS]
Land Facet: 3 (Colluvial fans of middle slopes)

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

Slope: Gently sloping (3 %) , concave to SSW

Land Use : 3.4 Nat.brows + grazing

Plant /Crop:

Climate:Mean annual precipitation:
Mean annual temperature: Air : 17.9° C / Soil (50cm): 20.8° C
Soil moisture regime: Aridic
Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic./organ. [c2 LSt, marls, cherts, phosphor (Bender 1968)]

Parent Material: Colluvium

Drainage: Surface Runoff: Rapid
Soil Drainage Class: Well

Surface Cover : Gravel (50 %)

Surface Feature : Capping

Soil Surface Conditions: Dry / Very hard

Erosion : Slight sheet erosion

Soil Depth : 230 cm +

Diagnostic Horizon or Property: Calcic at 25 cm

PROFILE DESCRIPTION :

0-10	cm	Very pale brown (10YR 7/4) dry and brown (7.5YR 5/4) moist; fine sandy clay loam; moderate fine subangular blocky; dry soft; moist friable; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; many very fine (<1 mm) fibrous roots; 10 % angular chert fine gravel (2-5 mm); violent reaction to HCL; clear smooth boundary to :
10-25	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; drifty clayloam; weak fine subangular blocky; dry soft; moist friable; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 20 % sub-rounded chert gravel (5-20 mm); 5 % small (<5 mm) soft calcareous concretions; violent reaction to HCL; gradual smooth boundary to :
25-60	cm	Reddish brown (5YR 5/4) dry and yellowish red (5YR 4/6) moist; silty clayloam; weak fine prismatic breaking to moderate fine crumb; dry slightly hard; moist firm; very sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; 5 % sub-rounded chert fine gravel (2-5mm); 15 % small (<5 mm) moderately hard calcareous concretions; violent reaction to HCL; gradual smooth boundary to :
60-100	cm	Yellowish red (5YR 4/6) dry and yellowish red (5YR 4/6) moist; silty clayloam; moderate fine subangular blocky breaking to strong fine granular; dry moderately hard; moist firm; very sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 4 % sub-rounded chert fine gravel (2-5 mm); 15 % medium (5-15 mm) moderately hard calcareous concretions; violent reaction to HCL; gradual smooth boundary to :
100-125	cm	Strong brown (7.5YR 5/6) dry and strong brown (7.5YR 5/8) moist; clayloam; massive; dry moderately hard; moist friable; very sticky; moderately plastic; 1 % sub-rounded chert

fine gravel (2-5 mm); 25 % small (<5 mm) hard gypsum crystals; violent reaction to HCL;
gradual irregular boundary to :

125-140	cm	Yellowish red (5YR 5/6) dry and yellowish red (5YR 5/8) moist; clayloam; massive; dry soft; moist very friable; 25 % small (<5 mm) soft calcareous concretions;
140-155	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; clayloam; 10 % medium (5-15 mm) soft calcareous concretions; violent reaction to HCL;
155-210	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; silty clay; 20 % small (<5 mm) soft calcareous concretions; violent reaction to HCL;
210-230+	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; silty clay; 20 % medium (5-15 mm) soft calcareous concretions; violent reaction to HCL.

Soil Profile Description (ID 29)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy , mixed, calcareous, thermic Family of Xerochreptic Calciorthis (FBEL)
 ACSAD: RHK x c e 2 a: Xerochreptic Calciorthis
 FAO/UNESCO: CLh : Haplic Calcisol

Location: 7.6km SW of Qasr El Hallabat

Coordinates: Geographical : 36.33720 E/ 32.00597 N
 JTM: 437383 E/ 542051 N

Elevation: 645 m asl

Landform: Position: Middle slope undul. fan
 Land System : 11/2 (Undulating dissected limestone plateau with rounded crests and basins)--11.2.0[GIS]
 Land Facet: 4 (Coalesced alluvial fans of lower slopes)

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

Slope: Gently sloping (2 %) , concave to N

Land Use : 3.3 Nat.grazing

Plant /Crop:

Climate: Mean annual precipitation:
 Mean annual temperature: Air : 17.8° C / Soil (50cm): 20.7° C
 Soil moisture regime: Transition aridic-xeric
 Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Sedimentary chemic./organ. : Chalk [tt1 LSt w/chert beds (Rijam) (Bender 1968)]

Parent Material: Alluvium

Drainage: Surface Runoff: Rapid
 Soil Drainage Class: Well

Surface Cover : Gravel (55 %)

Surface Feature : Capping

Soil Surface Conditions: Dry / Very hard

Erosion : Slight sheet erosion

Soil Depth : 170 cm +

Diagnostic Horizon or Property: Calcic at 22 cm

PROFILE DESCRIPTION :

0-8	cm	Light yellowish brown (10YR 6/4) dry and yellowish red (5YR 5/6) moist; silty clayloam; moderate fine platy; dry moderately hard; moist firm; slightly sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 5 % sub-rounded chert fine gravel (2-5 mm); violent reaction to HCL; clear smooth boundary to:
8-22	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; silty clayloam; weak fine subangular blocky; dry moderately hard; moist firm; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 15 % sub-rounded chert fragments; 5 % small (<5 mm) soft calcareous concretions; weak CaCO ₃ coating; violent reaction to HCL; gradual boundary to:
22-80	cm	Light brown (7.5YR 6/4) dry and strong brown (7.5YR 5/6) moist; clayloam; strong fine subangular blocky; dry moderately hard; moist firm; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; 5 % sub-rounded chert gravel (5-20 mm); 25 % small (<5 mm) soft calcareous concretions; weak CaCO ₃ coating; violent reaction to HCL; gradual boundary to:
80-122	cm	Reddish yellow (7.5YR 6/6) dry and strong brown (7.5YR 5/6) moist; clayloam; moderate fine subangular blocky breaking to strong fine crumb; dry moderately hard; moist firm; moderately sticky; moderately plastic; small (<5 mm) distinct mottles (7.5YR 4/6); common very fine (<0.5 mm) tubular pores; 5 % sub-rounded chert gravel (5-20 mm); 30 % small (<5 mm) soft calcareous concretions; weak CaCO ₃ coating; violent reaction to HCL; clear wavy boundary to:
122-152	cm	Reddish brown (5YR 5/4) dry and yellowish red (5YR 5/6) moist; very stony clay; moderate fine

subangular blocky; 50 % sub-rounded chert stones(75-250 mm); 15 % small (<5 mm) soft calcareous concretions; weak CaCO₃ coating; violent reaction to HCL; clear wavy boundary to:

152-170+ cm Yellow (10YR 8/6) dry and very pale brown (10YR 8/3) moist; silty clay; massive; dry very hard; moist friable; very sticky; very plastic; 20 % angular chert fragments; violent reaction to HCL.

Soil Profile Description (ID 30)

Information on the site :

Soil Classification: USDA (1990): Fine-silty , mixed, hyperthermic Family of Ustochreptic Camporthids (FBFV)
ACSAD: RHH i c e 3/4 a: Ustochreptic Camporthid
FAO/UNESCO: CMy : Yermic Cambisol

Location: 2.8km W of el Masri road

Coordinates: Geographical : 35.56649 E/ 32.10039 N
JTM: 364706 E/ 553227 N

Elevation: -285 m asl

Landform: Position: Flat plain
Land System : 1/2 (Plain and badlands on Lisan lacustrine deposits)--1.2.1[GIS]
Land Facet: 6 (Cultivated plain on Lisan formation)

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

Slope: Flat (0 %)

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Grasses

Climate:Mean annual precipitation:
Mean annual temperature: Air : 23.4° C / Soil (50cm): 26.2° C
Soil moisture regime: Aridic
Precipitation zone: 200-250 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Unconsolidated alluvium : Marl/limestone [q2 Lac.LSt,sandy marls(Lis)(Bender 1968)]

Parent Material: Alluvium

Drainage: Surface Runoff: Medium
Soil Drainage Class: Imperfect

Surface Cover :

Surface Feature : Capping (30%)

Soil Surface Conditions: Moist / Slightly hard

Erosion : Nil

Soil Depth : 150 cm +

Diagnostic Horizon or Property: Cambic at 20 cm

PROFILE DESCRIPTION :

0-20	cm	Brown (10YR 5/3) moist ; silty clay; moderate medium subangular blocky breaking to moderate fine crumb; moist firm; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; many fine (1-2 mm) fibrous roots; strong reaction to HCL; clear smooth boundary to:
20-42	cm	Brown (10YR 5/3) moist ; silty clay; moderate medium subangular blocky breaking to moderate very fine subangular blocky; moist very firm; very sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; few fine (1-2 mm) fibrous roots; strong reaction to HCL; abrupt smooth boundary to
42-82	cm	Pale brown (10YR 6/3) moist ; silty clayloam; weak medium subangular blocky; moist firm; moderately sticky; moderately plastic; few (<2 %) small (<5 mm) faint mottles (10YR 4/3); common fine (0.5-2 mm) tubular pores; 2 % medium (5-15 mm) moderately hard gypsum crystals; strong reaction to HCL; clear smooth boundary to:
82-108	cm	Pale brown (10YR 6/3) moist ; silty clay; strong medium angular blocky breaking to strong fine angular blocky; common (2-20 %) medium (5-15 mm) distinct mottles (10YR 5/4); few fine (0.5-2 mm) tubular pores; 10 % angular soft limestone gravel (5-20 mm); moderate reaction to HCL; abrupt smooth boundary to:
108-150+	cm	Pale brown (10YR 6/3) moist ; silty clayloam; moderate medium subangular blocky; moist firm; moderately sticky; moderately plastic; common (2-20 %) medium (5-15 mm) prominent mottles (2.5YR 6/4); few fine (0.5-2 mm) tubular pores; strong reaction to HCL.

Soil Profile Description (ID 31)

Information on the site :

Soil Classification: USDA (1990): Fine-silty ,mixed,calcareous,hyperthermic Family of Ustochreptic Calciorrhids (FBEM)
ACSAD: RHK i c e 3 d: Ustochreptic Calciorrhid
FAO/UNESCO: CLh : Haplic Calcisol

Location: 3.75km SE of Mu'addi

Coordinates: Geographical : 35.64710 E/ 32.14066 N
JTM: 372371 E/ 557594 N

Elevation: 110 m asl

Landform: Position: Colluvial upper slope
Land System : 4/7 (Steeply dissected escarpment with ridges, scarps and colluvial fans)--4.2.0[GIS]
Land Facet: 4 (Steep clayey/stony colluvial upper slope)

Microrelief: Class:
Type: Terraces

Slope: Steep (46 %), concave to N

Land Use : 3.4 Nat.browse + grazing and 3.5 Planted forest

Plant /Crop: Cassia : 70 % groundcover

Climate:Mean annual precipitation:
Mean annual temperature: Air : 20.7° C / Soil (50cm): 23.6° C
Soil moisture regime: Transition aridic-ustic
Precipitation zone: 400-450 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Sedimentary chemic./organ. : Limestone / shale [j Calc. SSt, LSt (Bender 1968)]

Parent Material: Colluvium / Bedrock

Drainage: Surface Runoff: Rapid
Soil Drainage Class: Moderately well

Surface Cover :

Surface Feature :

Soil Surface Conditions: Moist / Slightly hard

Erosion : Moderate sheet erosion

Soil Depth : 170 cm (Paralithic contact)

Diagnostic Horizon or Property: Cambic at 30 cm and calcic at 60 cm

PROFILE DESCRIPTION :

0-30	cm	Dark yellowish brown (10YR 4/4) moist ; clayloam ; strong medium subangular blocky breaking to strong fine crumb; moist friable; moderately sticky; moderately plastic; many fine (0.5-2 mm) irregular pores; many fine (1-2 mm) fibrous roots; 5 % sub-rounded hard limestone coarse gravel (20-75 mm); violent reaction to HCL; clear smooth boundary to:
30-60	cm	Yellowish brown (10YR 5/4) moist ; clayloam ; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist friable; moderately sticky; moderately plastic; many fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 15 % sub-rounded hard limestone coarse gravel (20-75 mm); strong reaction to HCL; clear wavy boundary to:
60-110	cm	Brownish yellow (10YR 6/6) moist ; silty clayloam ; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist firm; common fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 5 % hard limestone fragments; 10 % medium (5-15 mm) soft calcareous concretions; strong reaction to HCL; clear wavy boundary to:
110-170	cm	Yellowish brown (10YR 5/6) moist ; silty clayloam ; weak medium subangular blocky breaking to weak fine subangular blocky; moist firm; common fine (0.5-2 mm) tubular pores; common fine (1-2 mm) woody roots; 15 % angular hard limestone stones (75-250 mm); 2 % medium (5-15 mm) soft calcareous concretions; strong reaction to HCL; clear smooth boundary to:
170+	cm	Paralithic contact to limestone / shale
170-200	cm	Light yellowish brown (10YR 6/4) moist; silty clayloam; weak medium platy; moist very firm; few fine (0.5-2 mm) tubular pores; common cracks; common fine (1-2 mm) woody roots;

10 % platy coarse gravel (20-75 mm); moderate reaction to HCL.

Soil Profile Description (ID 32)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy ,mixed,calcareous,hyperthermic Family of Ustollic Camborthids (FBFT)
ACSAD: RHH i m 2 d: Ustollic Camborthid
FAO/UNESCO: CMy : Yermic Cambisol

Location: 4.5km SE of Mu'addi

Coordinates: Geographical : 35.65442 E/ 32.13735 N
JTM: 373057 E/ 557218 N

Elevation: 280 m asl

Landform: Position: Colluvial upper slope
Land System : 4/3 (Escarpment on mesozoic/Paleozoic rocks)--4.2.0[GIS]
Land Facet: 3 (Colluvial slopes derived from sandstone)

Microrelief: Class: Slightly uneven (25-50 cm)
Type: Benches

Slope: Steep (50 %), concave to N

Land Use : 3.4 Nat.browse + grazing and 3.5 Planted forest

Plant /Crop: Cassia, Retama, Grasses : 70 % groundcover

Climate:Mean annual precipitation:
Mean annual temperature: Air : 19.6° C / Soil (50cm): 22.5° C
Soil moisture regime: Transition aridic-ustic
Precipitation zone: 400-450 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Sedimentary detritus : Sandstone [j Calc. SSt, LSt (Bender 1968)]
Parent Material: Colluvium / Bedrock (fine-loamy texture)
Drainage: Surface Runoff: Rapid
Soil Drainage Class: Moderately well

Surface Cover : Stones (5 %)

Surface Feature :

Soil Surface Conditions: Moist / Soft

Erosion : Moderate sheet erosion

Soil Depth : 270 cm (Lithic contact)

Diagnostic Horizon or Property: Cambic at 33 cm and calcic at 170 cm

PROFILE DESCRIPTION :

0-33	cm	Dark brown (10YR 3/3) moist ; sandy clayloam ; strong medium subangular blocky breaking to strong fine crumb; moist friable; moderately sticky; moderately plastic; many fine (0.5-2 mm) irregular pores; many fine (1-2 mm) fibrous roots; 5 % sub-rounded sandstone coarse gravel (20-75 mm); strong reaction to HCL; gradual smooth boundary to:
33-70	cm	Dark yellowish brown (10YR 4/4) moist ; sandy clayloam ; moderate fine subangular blocky breaking to moderate fine crumb; moist friable; moderately sticky; moderately plastic; many fine (0.5-2 mm) tubular pores; many fine (1-2 mm) fibrous roots; 10 % sub-rounded sandstone stones (75-250 mm); strong reaction to HCL; clear wavy boundary to:
70-145	cm	Strong brown (7.5YR 5/6) moist ; sandy clayloam ; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist firm; very sticky; very plastic; many fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 2 % sub-rounded sandstone stones (75-250 mm); 1 % medium (5-15 mm) soft calcareous concretions; moderate thick CaCO ₃ coating of gravel; strong reaction to HCL; clear wavy boundary to:
145-170	cm	Strong brown (7.5YR 5/6) moist ; sandy clayloam ; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist firm; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 2 % sub-rounded sandstone stones (75-250 mm); 5 % medium (5-15 mm) soft calcareous concretions; moderate thick CaCO ₃ coating of gravel; violent reaction to HCL; clear boundary to:
170-270	cm	Brown (7.5YR 5/4) moist ; sandy clayloam ; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist firm; moderately sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; few medium (2-5 mm) woody roots; 2 % sub-rounded sandstone

stones (75-250 mm); 30 % medium (5-15 mm) hard calcareous concretions; strong moderately thick CaCO₃ coating of gravel; violent reaction to HCL; clear wavy boundary to:

270+ cm Lithic contact to Sandstone.

Soil Profile Description (ID 33)

Information on the site :

Soil Classification: USDA (1990): Fine-loamy ,mixed,calcareous, thermic Family of Xerochreptic Calciorrhids (FBEL)
ACSAD: RHK x c e 2/1 b: Xerochreptic Calciorrhid
FAO/UNESCO: CLh : Haplic Calcisol

Location: 3km W of Dabit Hanot

Coordinates: Geographical : 35.42910 E/ 29.97125 N
JTM: 348400 E/ 317350 N

Elevation: 1085 m asl

Landform: Position: Middle slope
Land System : 6/6 (Rolling hills and depositional plains on Disi sandstone)--6.6.4[GIS]
Land Facet: 4 (Undulating, old fill of aeolian-alluvial plains)

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

Slope: Gently sloping (5 %), concave to NW

Land Use : 3.4 Nat.browse + grazing

Plant /Crop: Qada (20), Zilla (10)

Climate:Mean annual precipitation:
Mean annual temperature: Air : 16.5° C / Soil (50cm): 19.5° C
Soil moisture regime: Aridic
Precipitation zone: 100-150 mm p.a.

GENERAL INFORMATON ON THE SOIL:

Geology: Sedimentary detritus [q5 Fluv. Deposits, sand, loess (Bender 1968)]

Parent Material: Aeolian

Drainage: Surface Runoff: Slow
Soil Drainage Class: Well

Surface Cover : Gravel (15 %)

Surface Feature : Capping (10 %)

Soil Surface Conditions: Dry / Hard

Erosion : Slight rill erosion

Soil Depth : 200 cm +

Diagnostic Horizon or Property: Calcic at 18 cm

PROFILE DESCRIPTION :

0-18	cm	Yellow (10YR 8/6) dry and brownish yellow (10YR 6/6) moist; fine sandy clayloam; moderate coarse subangular blocky breaking to moderate fine subangular blocky; dry hard; moist friable; slightly sticky; non-plastic; few fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 1 % irregular sandstone fine gravel (2-5 mm); 7 % medium (5-15 mm) moderately hard calcareous concretions; moderate moderately thick CaCO ₃ coating; violent reaction to HCL;
18-87	cm	Yellow (10YR 7/6) dry and brownish yellow (10YR 6/6) moist; sandy clayloam; moderate medium subangular blocky breaking to weak fine subangular blocky; dry hard; moist friable; slightly sticky; non-plastic; few very fine (<1 mm) vertical cracks; few fine (1-2 mm) fibrous roots; 3 % sandstone gravel (5-20 mm); 20 % medium (5-15 mm) very hard calcareous concretions; strong thick CaCO ₃ coating; violent reaction to HCL;
87-148	cm	Yellow (10YR 8/6) dry and brownish yellow (10YR 6/6) moist; sand; moderate medium subangular blocky; dry slightly hard; moist very friable; slightly sticky; non-plastic; few very fine (<1 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 2 % irregular sandstone gravel (5-20 mm); 3 % small (<5 mm) soft calcareous concretions; weak moderately thick CaCO ₃ coating; violent reaction to HCL;
148-176	cm	Yellow (10YR 7/6) dry and brownish yellow (10YR 6/6) moist; sandy loam; moderate medium subangular blocky breaking to weak fine subangular blocky; dry hard; moist friable; slightly sticky; non-plastic; 2 % irregular sandstone coarse gravel (20-75 mm); 2 % small (<5 mm) soft calcareous concretions; weak thin CaCO ₃ coating; violent reaction to HCL;
176-200+	cm	Yellow (10YR 7/8) dry and brownish yellow (10YR 6/8) moist; fine sand; weak fine subangular blocky; dry soft; moist loose; non-sticky; few very fine (<1 mm) fibrous roots; 1 % small

(<5 mm) soft calcareous concretions; weak moderately thick CaCO₃ coating; violent reaction to HCL;