

## ***INCEPTISOLS***

### **Soil Profile Description (ID 1)**

#### **Information on the site :**

Soil Classification: USDA (1990): Fine, mixed, thermic Family of Vertic Xerochrepts (JDEF)  
 ACSAD: CCX v 4 b: Vertic Xerochrept  
 FAO/UNESCO: CMv : Vertic Cambisol

Location: W of side sample area 1/6

Coordinates: Geographical : 35.91973 E/ 32.40582 N  
 JTM: 398387 E/ 586704 N

Elevation: 735 m asl

Landform: Position: Lower slope  
 Land System : 18/2(Undulating to rolling dissected limestone plateau on Ajlun/Balqa group)--8.10.0[GIS]  
 Land Facet: 5 (Vally floor on dissected limestone terrains )

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

Slope: Sloping (9%) , concave to ESE

Land Use : 1.1 Cereals

Plant /Crop: Cereals

Climate:Mean annual precipitation:  
 Mean annual temperature: Air : 16.4° C / Soil (50cm): 19.3° C  
 Soil moisture regime: Xeric  
 Precipitation zone: 350-400 mm p.a.

#### **GENERAL INFORMATON ON THE SOIL:**

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

Parent Material: Alluvium

Drainage: Surface Runoff: Medium  
 Soil Drainage Class: Well

Surface Cover: Stones (15 %)

Surface Feature: Litter (5 %)

Soil Surface Conditions: Dry / Loose

Erosion: Slight gully erosion

Soil Depth: 200 cm +

Diagnostic Horizon or Property: Vertic at 25 cm

#### **PROFILE DESCRIPTION:**

0-5	cm	Brown (7.5 YR 4/4) dry and yellowish red (5 YR 4/6) moist; silty clayloam; moderate medium crumb; dry slightly hard; moist very friable; moderately sticky; slightly plastic; common very fine (< 0.5 mm) tubular pores; common very fine (<1 mm) fibrous root; 5 % irregular hard limestone fine gravel (2-5 mm); moderate reaction to HCl; abrupt wavy boundary to:
5-25	cm	Reddish brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; silty clayloam; strong very coarse angular blocky; dry very hard; moist friable; moderately sticky; moderately plastic; few very fine (< 0.5 mm) tubular pores; common fine (1-5 mm) vertical cracks; common very fine (<1 mm) fibrous root; 2 % irregular hard limestone fine gravel (2-5 mm); weak thin clay coating; moderate reaction to HCl; diffuse smooth boundary to:
25-80	cm	Reddish brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; silty clayloam; strong coarse angular blocky breaking to strong coarse platy; dry very hard; moist friable; slightly sticky; moderately plastic; common very fine (< 0.5 mm) tubular pores; common fine (1-5 mm) vertical cracks; common very fine (<1 mm) fibrous root; 4 % irregular hard limestone fine gravel (2-5 mm); moderately thin clay coating; moderate reaction to HCl; diffuse smooth boundary to:
80-165	cm	Reddish brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; silty clay; very strong coarse prismatic; dry very hard; moist friable; moderately sticky; moderately plastic; many fine (1-5 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 10 % irregular hard limestone fine gravel (2-5 mm); strong thick clay coating; strong reaction to HCl; clear wavy boundary to:
165-200+	cm	brown (7.5 YR 4/4 ) moist; extremely stony clay; moderate medium subangular blocky; dry very

hard; moist friable; moderately sticky; very plastic; common very fine (<1 mm) irregular cracks; few medium (2-5 mm) fibrous and woody roots; 60 % irregular hard limestone stones (75-250mm); moderate thin CaCO<sub>3</sub> coating; violent reaction to HCl.

## Soil Profile Description (ID 2)

### Information on the site :

Soil Classification: USDA (1990): Very fine, Mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (JDEO)  
 ACSAD: CCX k x m 5 b: Calcixerollic Xerochrept  
 FAO/UNESCO: CMc : Calcaric Cambisol

Location: S of end of sample area 1/6

Coordinates: Geographical : 35.88701 E/ 32.35473 N  
 JTM: 395251 E/ 581071 N

Elevation: 925 m asl

Landform: Position: Lower slope  
 Land System : 18/2(Undulating to rolling dissected limestone plateau on Ajlun/Balqa group)--18.2.2[GIS]  
 Land Facet: 3 (Moderately steep colluvial upper slopes of main wadis)

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

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

Land Use : 1.4 Tree crops, orchards

Plant /Crop: olives

Climate: Mean annual precipitation:  
 Mean annual temperature: Air : 15.1° C / Soil (50cm): 18.1° C  
 Soil moisture regime: Xeric  
 Precipitation zone: 400-450 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Geology: Unconsolidated colluvium: Limestone [c2 Chalky/sandy LSt (Sir, Fuh (Bender 1968))]  
 Parent Material: Colluvium  
 Drainage: Surface Runoff: Slow  
 Soil Drainage Class:

Surface Cover: Stones (20 %)

Surface Feature:

Soil Surface Conditions: Dry / Loose

Erosion: Nil

Soil Depth: 205 cm +

Diagnostic Horizon or Property: Calcic at 55 cm

### PROFILE DESCRIPTION:

Ap	0-14	cm	Brown (7.5 YR 5/4) dry and dark reddish brown (5 YR 3/4) moist; gravelly sandy clay; very weak fine subangular blocky; dry slightly hard; moist very friable; very sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; common medium (2-5 mm) fibrous and woody roots; 25 % irregular hard limestone gravel (5-20 mm); strong reaction to HCl; clear smooth boundary to:
	14-27	cm	Brown (7.5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; gravelly sandy clay; weak coarse subangular blocky breaking to weak medium subangular blocky; dry slightly hard; moist very friable; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; common medium (2-5 mm) fibrous and woody roots; 20 % irregular hard limestone fine gravel (2-5 mm); strong reaction to HCl; gradual smooth boundary to:
Bt	27-55	cm	Reddish Brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; sandy clay; strong fine 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; common medium (2-5 mm) fibrous and woody roots; 15 % irregular hard limestone fine gravel (2-5 mm); 2% small (<5 mm) soft calcareous concretions; weak thin clay coating; strong reaction to HCl; gradual smooth boundary to :
Bt	55-110	cm	Reddish Brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; gravelly clay; strong medium subangular blocky; dry hard; moist friable; moderately sticky; moderately plastic; few very fine (<1 mm) irregular cracks; common fine (1-2 mm) fibrous and woody roots; 25 % irregular hard limestone gravel (5-20 mm); 10% small (<5 mm) soft calcareous concretions; weak thin CaCO <sub>3</sub> coating; strong reaction to HCl; gradual smooth boundary to :
Bk	110-153	cm	Reddish Brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; clay; moderate coarse subangular blocky breaking to moderate medium subangular blocky; dry very hard; moist friable; moderately sticky; moderately plastic; common fine (1-2 mm) fibrous and woody roots; 15 %

irregular hard limestone fine gravel (2-5 mm); 10% small (<5 mm) soft calcareous concretions; weak thin clay coating; strong reaction to HCl; gradual smooth boundary to :

Bk 153-205+ cm Reddish Brown (5 YR 4/4) dry and dark reddish brown (5 YR 3/4) moist; clay; moderate coarse subangular blocky breaking to moderate medium subangular blocky; dry very hard; moist friable; moderately sticky; very plastic; few fine (1-2 mm) fibrous and woody roots; 10 % irregular hard limestone fine gravel (2-5 mm); 15 % small (<5 mm) soft calcareous concretions; weak thin CaCO<sub>3</sub> coating; strong reaction to HCl.

## Soil Profile Description (ID 3)

### Information on the site :

Soil Classification: USDA (1990): Fine, carbonate, calcareous, thermic Family of calcixerollic Xerochrepts (JDEO)  
ACSAD: CCX k x m 4 a: calcixerollic Xerochrept  
FAO/UNESCO: CMc : Calcaric Cambisol

Location: 5.5 km ESE Tech.Univ.  
Coordinates: Geographical : 35.98884 E/ 32.44724 N  
JTM: 404932 E/ 591233 N  
Elevation: 632 m asl  
Landform: Position: Crest  
Land System : 8/9(Undulating to rolling hills on Tertiary limestone and chalks)--8.9.0[GIS]  
Land Facet: 1 (Rounded limestone hills )  
Microrelief: Class: Even (<25 cm)  
Type: other  
Slope: Almost flat (1%) , convex to N  
Land Use : 1.8 Fallow  
Plant /Crop: Cereal  
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 aeolian: Limestone [q5 Fluv.deposits, sand, loess (Bender 1968)]  
Parent Material: Aeolian  
Drainage: Surface Runoff: None  
Soil Drainage Class: Well  
Surface Cover: Stones (1 %)  
Surface Feature: Litter (1 %)  
Soil Surface Conditions:  
Erosion: Nil  
Soil Depth: 201 cm +  
Diagnostic Horizon or Property: Calcic at 88 cm

### PROFILE DESCRIPTION:

0-4	cm	Light yellowish brown (10 YR 6/4) dry and dark yellowish brown (10 YR 4/6) moist; silty clayloam; weak medium subangular blocky breaking to moderate fine subangular blocky; dry slightly hard; moist very friable; very sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; common very fine (<1 mm) fibrous roots; 1 % angular chert fine gravel (2-5 mm); strong reaction to HCl; abrupt wavy boundary to:
4-20	cm	Light yellowish brown (10 YR 6/4) dry and dark yellowish brown (10 YR 4/6) moist; silty clayloam; moderate coarse angular blocky; dry hard; moist friable; very sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 1 % angular chert fine gravel (2-5 mm); strong reaction to HCl; gradual smooth boundary to:
20-62	cm	Light brown (7.5 YR 6/4) dry and brown (7.5 YR 4/4) moist; silty clay; moderate coarse subangular blocky breaking to moderate medium subangular blocky; dry hard; moist friable; very sticky; slightly plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; fibrous roots; 2 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating; strong reaction to HCl; gradual smooth boundary to:
62-88	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4/6) moist; clay; strong medium subangular blocky; dry hard; moist friable; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 3 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating; strong reaction to HCl; gradual smooth boundary to:
88-140	cm	Light brown (7.5 YR 6/4) dry and brown (7.5 YR 4/4) moist; clay; strong medium subangular blocky breaking to strong fine subangular blocky; dry moderately hard; moist very friable;

very sticky; slightly plastic; few very fine (<0.5 mm) tubular pores; 15 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating; violent reaction to HCl; gradual smooth boundary to:

140-201+ cm Pink (7.5 YR 7/4) dry and strong brown (7.5 YR 4/6) moist; clay; weak coarse subangular blocky breaking to strong medium subangular blocky; dry very hard; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 20 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating; violent reaction to HCl.

## Soil Profile Description (ID 4)

### Information on the site :

Soil Classification: USDA (1990): Fine-silty, mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (JDEO)  
 ACSAD: CCX k x m <sup>3</sup>/<sub>4</sub> a: Calcixerollic Xerochrepts  
 FAO/UNESCO: CMc : Calcaric Cambisol

Location: 3.5 km N of Rujim Sabi

Coordinates: Geographical : 36.14016 E/ 32.38578 N  
 JTM: 419104 E/ 584294 N

Elevation: 732 m asl

Landform: Position: Lower slope  
 Land System : 8/9 (Undulating to rolling hills on Tertiary Limestone and chalks)--8.9.0[GIS]  
 Land Facet: 6 (Pediment and alluvial fan zone)

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

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

Land Use : 1.1 Cereals

Plant /Crop: Cereal, shnan (20): 5 % groundcover

Climate: Mean annual precipitation:  
 Mean annual temperature: Air : 16.6° C / Soil (50cm): 19.6° C  
 Soil moisture regime: Xeric  
 Precipitation zone: 200-250 mm p.a.

### GENERAL INFORMATON ON THE SOIL:

Geology: Limestone [c5 chalky/sandy LSt(Sir, Fuh (Bender 1968))]  
 Parent Material: Alluvium  
 Drainage: Surface Runoff: Slow  
 Soil Drainage Class: Well

Surface Cover: Gravel (5 %)  
 Surface Feature: Capping (10 %)  
 Soil Surface Conditions: Dry / soft  
 Erosion: Moderately gully erosion  
 Soil Depth: 120 cm (paralithic contact)  
 Diagnostic Horizon or Property: Calcic at 102 cm

### PROFILE DESCRIPTION:

0-18	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4.5/6) moist; silt loam; weak coarse platy breaking to weak coarse angular blocky; dry slightly hard; moist very friable; slightly sticky; slightly plastic; common fine (0.5-2 mm) tubular pores; common reaction to HCl; gradual smooth boundary to:
18-50	cm	Rrddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; weak coarse prismatic breaking to moderate medium subangular blocky; dry moderately hard; moist very friable; few fine (0.5-2 mm) tubular pores; common fine (1-5 mm) vertical cracks; common fine (1-2 mm) fibrous and woody roots; 5 % irregular hard limestone gravel (5-20 mm); 2 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating of peds; strong reaction to HCl; gradual smooth boundary to:
50-102	cm	Rrddish yellow (7.5 YR 6/5) dry and strong brown (7.5 YR 5/6) moist; silty clayloam; weak medium subangular blocky breaking to strong fine subangular blocky; dry hard; moist firm; moderately sticky; moderately plastic; few fine (0.5-2 mm) tubular pores; common fine (1-5 mm) vertical cracks; common medium (2-5 mm) fibrous and woody roots; 10 % irregular hard limestone gravel (5-20 mm); weak thin clay coating of peds; strong reaction to HCl; clear smooth boundary to:
102-120	cm	Pink (7.5 YR 8/4) dry and reddish yellow (7.5 YR 6/6) moist; silty clayloam; massive breaking to moderate medium subangular blocky; dry very hard; moist friable; moderately sticky; very plastic; few fine (0.5-2 mm) tubular pores; few fine (1-2 mm) fibrous and woody roots; 15 % irregular soft limestone gravel (5-20 mm); 35 % medium (5-15 mm) moderately hard calcareous concretions; violent reaction to HCl.
120+	cm	Paralithic contact to limestone

## Soil Profile Description (ID 5)

### Information on the site :

Soil Classification: USDA (1990): Fine, Mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (JDEO)  
 ACSAD: CCX k x m 4 b : Calcixerollic Xerochrept  
 FAO/UNESCO: CMc : Calcaric Cambisol

Location: SW of edge Madaba

Coordinates: Geographical : 35.78310 E/ 31.71273 N  
 JTM: 348668 E/ 509993 N

Elevation: 794 m asl

Landform: Position: Crest of plain  
 Land System : 8/15 ( Gently undulating loessic / depositional plains with limestone outcrops )  
 Land Facet: 1 (Undulating, convex plain with deep fill on colluvium/loess)

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

Slope: Gently sloping ( 4 % ) , convex to NNE

Land Use : 4.2 Urban

Plant /Crop:

Climate: Mean annual precipitation:  
 Mean annual temperature: Air : 16.7° C / Soil (50cm): 19.7° C  
 Soil moisture regime: Xeric  
 Precipitation zone: 300-350 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 (80 %)  
 Soil Surface Conditions: Dry / very Hard  
 Erosion : Slight sheet erosion  
 Soil Depth : 260 cm +  
 Diagnostic Horizon or Property: Cambic at 16 cm and calcic at 70 cm

### PROFILE DESCRIPTION :

0-16	cm	Light brown (7.5 YR 6/4) dry and strong brown (7.5 YR 4/6) moist; silty clayloam; very strong medium angular blocky; dry extremely hard; moist firm; slightly sticky; moderately plastic; common medium (5-10 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 1 % angular chert gravel (5-20 mm); weak thin Si coating of peds; strong reaction to HCl; clear smooth boundary to:	
16-70	cm	Yellowish red (5 YR 5/6) moist; silty clayloam; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist friable; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; few fine (1-5 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 1 % sub-rounded chert gravel (5-20 mm); 2 % small (<5 mm) soft calcareous concretions; strong reaction to HCl; gradual wavy boundary to:	
Bk	70-90	cm	Yellowish red (5 YR 4.5/6) moist; silty clayloam; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist very firm; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 3 % sub-rounded soft limestone fine gravel (2-5 mm); 12 % medium (5-15 mm) soft calcareous concretions; weak thin clay coating of beds; strong reaction to HCl; gradual wavy boundary to :
Bk2	90-180	cm	Yellowish red (5 YR 4/6) moist; silty clay; strong medium angular blocky breaking to moderate fine angular blocky; moist friable; slightly sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 2 % sub-rounded soft limestone fine gravel (2-5 mm); 25 % medium (5-15 mm) soft calcareous concretions; moderate moderately thick clay coating of beds; strong reaction to HCl; diffuse boundary to:
C	180-260+	cm	Yellowish red (5 YR 5/6) moist; silty clay; moderate medium angular blocky breaking to moderate

fine angular blocky; moist friable; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 10 % small (<5 mm) soft manganese nodules; moderate moderately thick clay coating of peds; strong reaction to HCl.

## Soil Profile Description (ID 6)

### Information on the site :

Soil Classification: USDA (1990): Loamy, calcareous, thermic Family of Lithic Xerochrepts (JDED)  
 ACSAD: CCX 1 2 b : Lithic Xerochrept  
 FAO/UNESCO: Lpd : Dystric Leptosol

Location: 7km SSW Sahhaqb

Coordinates: Geographical : 35.98260 E/ 31.81084 N  
 JTM: 403679 E/ 520677 N

Elevation: 873 m asl

Landform: Position: Upper slope  
 Land System : 8/12 ( Undulating to rolling lands at margin of escarpment on Balqa group)--8.17.0[GIS]  
 Land Facet: 1 (Irregular crests and rolling slopes)

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

Slope: Sloping ( 6 % ) , convex to SW

Land Use : 3.3 Nat.grazing

Plant /Crop: Grasses, Sunfl. This : 25% groundcover

Climate: Mean annual precipitation:  
 Mean annual temperature: Air : 16.2° C / Soil (50cm): 19.2° C  
 Soil moisture regime: Xeric  
 Precipitation zone: 250-300 mm p.a.

### GENERAL INFORMATON ON THE SOIL:

Geology:

Sedimentary chemic. / organ. : Limestone/ chert [c2 LSt,marls,cherts,phospor ( Bender 1981 )]  
 Parent Material: Colluvium / Bedrock  
 Drainage: Surface Runoff: Medium  
 Soil Drainage Class: Well  
 Surface Cover : Stones (30%)  
 Surface Feature :  
 Soil Surface Conditions: Dry / Moderately hard  
 Erosion : Nill erosion  
 Soil Depth : 42 cm (Lithic contact)  
 Diagnostic Horizon or Property: Cambic at 14 cm and calcic at 32 cm

### PROFILE DESCRIPTION :

0-14	cm	Very pale brown (9 YR 7/4) dry and yellowish brown (9 YR 5/6) moist; silty clayloam; strong fine subangular blocky; dry moderately hard; moist firm; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; many very fine (<1 mm) fibrous and woody roots; 5 % sub-rounded hard limestone gravel (5-20 mm); strong reaction to HCl; gradual smooth boundary to:
14-32	cm	Reddish yellow (7.5 YR 6/6) dry and strong brown (7.5 YR 5/6) moist; silty clayloam; moderate medium subangular blocky breaking to moderate fine angular blocky; dry moderately hard; moist friable; slightly sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; common very fine (<1 mm) fibrous roots; 15 % sub-rounded hard limestone coarse gravel (20-75 mm); 8 % medium (5-15 mm) soft calcareous concretions; strong reaction to HCl; clear wavy boundary to:
42+	cm	Lithic contact to limestone / chert
32-52	cm	Strong brown (7.5 YR 5/6) moist; silty clayloam; weak medium angular blocky breaking to moderate fine angular blocky; moist friable; moderately sticky; moderately plastic; common very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 8 % sub-rounded hard limestone coarse gravel (20-75 mm); 25 % large (>15 mm) soft calcareous concretions; weak thin clay coating of peds; strong reaction to HCl; abrupt irregular boundary to:

## Soil Profile Description (ID 7)

### Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (EAAB)  
ACSAD: DDX k x m 4 a: Calcixerollic Xerochrept  
FAO/UNESCO: CMc : Calcaric Cambisol

Location: 5km E of Hawwara

Coordinates: Geographical : 35.96029 E/ 32.54123 N  
JTM: 402349 E/ 601681 N

Elevation: 525 m asl

Landform: Position: Middle slope  
Land System : 8/8 ( Undulating piedmont alluvial and colluvial plains )-- 8.8.11 [GIS]  
Land Facet: 2 (Undulating, piedmont plain)

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

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

Land Use : 1.9 Tilled

Plant /Crop:

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 17.7° C / Soil (50cm): 20.6° C  
Soil moisture regime: Xeric  
Precipitation zone: 300-350 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Sedimentary chem. / organ. : Chalk [q5 Fluv. deposits, sand, loess ( Bender 1968 )]  
Parent Material: Colluvium (gravelly texture)  
Drainage: Surface Runoff: Medium  
Soil Drainage Class: Well

Surface Cover : Stones (1%)  
Surface Feature : Cracks (5%)  
Soil Surface Conditions: Dry / Slightly Hard  
Erosion : Nil  
Soil Depth : 170 cm +  
Diagnostic Horizon or Property: Cambic at 14 cm and calcic at 96 cm

Geology:

### PROFILE DESCRIPTION :

0-14 cm Strong brown (7.5YR 4/6) dry and yellowish red (5YR 4/6) moist; silty clay; strong medium subangular blocky; dry extremely hard; moist friable; moderately sticky; moderately plastic; common very fine (<1 mm) fibrous roots; 1 % angular chert fine gravel (2-5 mm); strong reaction to HCl; abrupt smooth boundary to:

14-33 cm Brown (7.5YR 4/4) dry and reddish brown (5YR 4/4) moist; clay; moderate coarse prismatic breaking to wedges; dry very hard; moist friable; non-sticky; very plastic; common medium (5-10 mm) vertical cracks; common very fine (<1 mm) fibrous roots; 5 % sub-rounded chert gravel (5-20 mm); 2 % small (<5 mm) moderately hard calcareous concretions; moderate moderately thick clay coating of peds; strong reaction to HCl; abrupt wavy boundary to:

33-69 cm Reddish brown (5YR 4/4) moist; clay; weak coarse angular blocky breaking to wedges; moist friable; non-sticky; very plastic; common fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 1 % sub-rounded chert gravel (5-20 mm); 3 % medium (5-15 mm) soft calcareous concretions; moderate moderately thick clay coating of peds; strong reaction to HCl; gradual smooth boundary to:

69-117 cm Brown (7.5YR 4/4) moist; clay; moderate coarse angular blocky breaking to wedges; moist firm; slightly sticky; very plastic; common fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 1 % angular chert fine gravel (2-5 mm); 10 % medium (5-15 mm) soft calcareous concretions; moderate thin clay slickensides; strong reaction to HCl; clear wavy boundary to:

117-170+ cm Dark reddish brown (5YR 3/4) moist; clay; very strong coarse angular blocky breaking to moderate very fine angular blocky; moist friable; slightly sticky; very plastic; few very fine (<1 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 35 % medium (5-15 mm) moderately hard calcareous

concretions; strong thick clay coating of peds; strong reaction to HCl.

## Soil Profile Description (ID 8)

### Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (FBFW)  
ACSAD: CCX k x m 4 b: Calcixerollic Xerochrept  
FAO/UNESCO: CMc : Calcaric Cambisol

Location: 1.9km E of Jalul

Coordinates: Geographical : 35.87547 E/ 31.71639 N  
JTM: 393427 E/ 510305 N

Elevation: 749 m asl

Landform: Position: Lower slope  
Land System : 8/14 (Undulating to rolling terrain with deep, colluvial fill )--8.14.0 [GIS]  
Land Facet: 2 (Colluvial loessic mantles of valley sides)

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

Slope: Gently sloping (4 % ) , rectilinear to ESE

Land Use : 1.1 Cereals

Plant /Crop: Wheat/barl (500): 25 % groundcover

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 17.1° C / Soil (50cm): 20.0° C  
Soil moisture regime: Xeric  
Precipitation zone: 300-350 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic. /organ. :Limestone [q5 Fluv. Deposits,sand,loess ( Bender 1968 )]  
Parent Material: Colluvium ( fine-loamy texture)  
Drainage: Surface Runoff: Rapid  
Soil Drainage Class: Well  
Surface Cover : Gravel (2 %)  
Surface Feature :  
Soil Surface Conditions: Dry / Slightly hard  
Erosion : Nil  
Soil Depth : 174 cm +  
Diagnostic Horizon or Property: Calcic at 85 cm

### PROFILE DESCRIPTION :

0-21	cm	Brown (7.5YR 4/4) moist; silty clay; moderate medium subangular blocky breaking to moderate fine crumb; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) spherical pores; common fine (1-2 mm) fibrous roots; strong reaction to HCl; gradual smooth boundary to:
21-46	cm	Strong brown (7.5YR 4/5) moist; silty clay; moderate coarse subangular blocky breaking to strong fine crumb; moist friable; very sticky; moderately plastic; common fine (0.5-2 mm) tubular pores; common fine (1-2 mm) fibrous roots; 2 % small (<5 mm) soft calcareous concretions; moderate thin clay coating of peds; violent reaction to HCl; diffuse smooth boundary to:
46-85	cm	Strong brown (7.5YR 4/6) moist; silty clay; moderate coarse subangular blocky breaking to moderate fine crumb; moist friable; very sticky; moderately plastic; few very fine (<1 mm) fibrous roots; 1 % sub-rounded hard limestone gravel (5-20 mm); 5 % medium (5-15 mm) soft calcareous concretions; moderate thin clay coating of peds; strong reaction to HCl; gradual smooth boundary to:
85-132	cm	Strong brown (7.5YR 4/6) moist; silty clay; moderate medium angular blocky breaking to weak fine crumb; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; 20 % large (>15 mm) soft calcareous concretions; moderate moderately thick clay coating of peds; strong reaction to HCl; gradual smooth boundary to:
132-174+	cm	Strong brown (7.5YR 5/6) moist; silty clay; weak medium angular blocky breaking to weak fine crumb; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) spherical pores; 5 % rounded hard limestone gravel (5-20 mm); 15 % medium (5-15 mm) soft calcareous concretions; moderate moderately thick clay coating of peds; strong reaction to HCl.

## Soil Profile Description (ID 9)

### Information on the site :

Soil Classification: USDA (1990): Fine-silty, mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (JDEO)  
ACSAD: CCX k x m 3/4 b: Calcixerollic Xerochrept  
FAO/UNESCO: CMc : Calcaric Cambisol

Location: 1.5km NE of Bir Khidad

Coordinates: Geographical : 35.55346 E/ 30.45275 N  
JTM: 361081 E/ 370568 N

Elevation: 1470 m asl

Landform: Position: Middle slope  
Land System : 10/1 (Dissected plateau with colluvial slopes and wadis on Balqa group)--10.1.0 [GIS]  
Land Facet: 3 (Valleys with deep colluvial mantles)

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

Slope: Sloping (10 % ) , convex to NW

Land Use : 1.1 Cereals

Plant /Crop: Barley (999), Kheiss (99), Balak (50): 50 % groundcover

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 13.4° C / Soil (50cm): 16.5° C  
Soil moisture regime: Xeric  
Precipitation zone: 250-300 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

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

Surface Cover : Stones (2 %)

Surface Feature :

Soil Surface Conditions: Dry / Slightly hard

Erosion : Nil

Soil Depth : 96 cm (Gravel / stones)

Diagnostic Horizon or Property: Cambic at 12 cm and calcic at 38 cm

### PROFILE DESCRIPTION :

0-12	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 4/4) moist; very gravelly fine sandy clayloam; very weak fine subangular blocky breaking to single grain; dry loose; moist very friable; non-sticky; slightly plastic; common fine (1-2 mm) fibrous and woody roots; 35 % angular hard limestone gravel (5-20 mm); violent reaction to HCl; abrupt wavy boundary to:
12-38	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 4/6) moist; gravelly silty clayloam; moderate fine subangular blocky; dry very hard; moist friable; moderately sticky; slightly plastic; few fine (0.5-2 mm) spherical pores; common very fine (<1 mm) fibrous roots; 30 % sub-rounded hard limestone coarse gravel (20-75 mm); weak thin CaCO <sub>3</sub> coating; strong reaction to HCl; gradual smooth boundary to:
38-96	cm	Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/4) moist; gravelly silty clay; moderate medium subangular blocky breaking to moderate fine angular blocky; dry very hard; moist friable; moderately sticky; moderately plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 30 % sub-rounded hard limestone gravel (5-20 mm); 8 % medium (5-15 mm) moderately hard calcareous concretions; violent reaction to HCl.
96+	cm	Gravel / stones

## Soil Profile Description (ID 10)

### Information on the site :

Soil Classification: USDA (1990): Fine, mixed, thermic Family of Typic Xerochrepts (JDEP)  
ACSAD: CCX t 4 b: TypicXerochrept  
FAO/UNESCO: CMx : Chromic Cambisol

Location: 9.8km S of Bir Khidad  
Coordinates: Geographical : 35.53791 E/ 30.35474 N  
JTM: 359447 E/ 359722 N

Elevation: 1550 m asl  
Landform: Position: Upper slope  
Land System : 10/1 (Dissected plateau with colluvial slopes and wadis on Balqa group)--10.1.0 [GIS]  
Land Facet: 3 (Valleys with deep colluvial mantles)

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

Slope: Gently sloping (5 % ) , concave to ENE  
Land Use : 1.8 Fallow  
Plant /Crop: Barley (300), Thistle (20), Grasses (99): 35 % groundcover

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 13.0° C / Soil (50cm): 16.1° C  
Soil moisture regime: Xeric  
Precipitation zone: 150-200 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic. /organ. :Limestone [c2 Chalky/sandy Lst(Sir,Fuh ( Bender 1968 )]  
Parent Material: Colluvium ( fine-loamy texture)  
Drainage: Surface Runoff: Medium  
Soil Drainage Class: Well  
Surface Cover : Gravel (30 %)  
Surface Feature :  
Soil Surface Conditions: Dry / Slightly hard  
Erosion : Nil  
Soil Depth : 145 cm +  
Diagnostic Horizon or Property: Cambic at 7 cm and calcic at 93 cm

### PROFILE DESCRIPTION :

- 0-7 cm Strong brown (7.5YR 4/60 dry and brown (7.5YR 4/4) moist; gravelly silt loam; weak fine angular blocky breaking to weak very fine crumb; dry slightly hard; moist very friable; very sticky; slightly plastic; common fine (1-2 mm) fibrous and woody roots; 30 % angular chert coarse gravel (20-75 mm); moderate reaction to HCl; abrupt wavy boundary to :
- 7-25 cm Brown (7.5YR 4/4) moist; silty clay; weak coarse columnar breaking to moderate medium angular blocky; moist friable; very sticky; moderately plastic; few very fine (<0.5 mm) irregular pores; few very fine (<1 mm) vertical cracks; common fine (1-2 mm) fibrous and woody roots; 10 % angular chert fine gravel (2-5 mm); moderate reaction to HCl; gradual smooth boundary to :
- 25-56 cm Brown (7.5YR 4/4) moist; silty clay; moderate medium subangular blocky breaking to strong fine crumb; moist friable; very sticky; moderately plastic; common fine (0.5-2 mm) irregular pores; few very fine (<1 mm) irregular cracks; common fine (1-2 mm) fibrous roots; 1 % angular chert gravel (5-20 mm); weak thin CaCO<sub>3</sub> coating of peds; strong reaction to HCl; gradual smooth boundary to:
- 56-93 cm Brown (7.5YR 4/4) moist; silty clay; moderate medium subangular blocky breaking to moderate fine subangular blocky; moist friable; very sticky; very plastic; few very fine (<0.5 mm) tubular pores; few fine (1-5 mm) irregular cracks; few fine (1-2 mm) fibrous roots; 5 % angular chert coarse gravel (20-75 mm); 1 % medium (5-15 mm) moderately hard calcareous concretions; strong reaction to HCl; gradual smooth boundary to:
- 93-154+ cm Strong brown (7.5YR 4/6) moist; clay; moderate medium subangular blocky breaking to weak fine crumb; moist friable; slightly sticky; very plastic; few fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 5 % angular chert coarse gravel (20-75 mm); 5 % medium (5-15 mm)

moderately hard calcareous concretions; moderate reaction to HCl.

## Soil Profile Description (ID 11)

### Information on the site :

Soil Classification: USDA (1990): Fine-loamy, mixed, calcareous, thermic, Family of Typic Xerochrepts (FBEL)  
ACSAD: CCX t 2/4 b: Typic Xerochreptic  
FAO/UNESCO: CMx : Chromic Cambisol

Location: 4.3km SW of Main

Coordinates: Geographical : 35.70085 E/ 31.65304 N  
JTM: 376794 E/ 503465 N

Elevation: 640 m asl

Landform: Position: Lower slope  
Land System : 4/2 (Escarpment on calcareous rocks)--4.2.0 [GIS]  
Land Facet: 2 (Narrow, sloping convex interfluvial crests)

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

Slope: Sloping (9 % ) , rectilinear to SE

Land Use : 1.8 Fallow

Plant /Crop: Rehan (100), Grasses (90): 15 % groundcover

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 17.8° C / Soil (50cm): 20.7° C  
Soil moisture regime: Xeric  
Precipitation zone: 200-250 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Geology: Sedimentary chemic. /organ. :Limestone [c2 Chalky/sandy LSt(Sir,Fuh( Bender 1968 )]

Parent Material: Colluvium ( fine-loamy texture)

Drainage: Surface Runoff: Slow  
Soil Drainage Class: Well

Surface Cover : Stones (35 %)

Surface Feature :

Soil Surface Conditions: Dry / Loose

Erosion : Nil

Soil Depth : 100 cm (Lithic contact)

Diagnostic Horizon or Property: Cambic at 15 cm

### PROFILE DESCRIPTION :

0-15	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 3/4) moist; silty clayloam; weak coarse angular blocky breaking to medium angular blocky ; dry moderately hard; moist firm; moderately sticky; moderately plastic; common very fine ( <0.5 mm) tubular pores; few very fine (<1 mm) irregular cracks; many fine (1-2 mm) fibrous roots; 15% sub-rounded hard limestone gravel (5-20 mm); violent reaction to HCL; gradual smooth boundary to:
15-42	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 4/4) moist; clayloam; weak medium angular blocky breaking to fine subangular blocky ; dry moderately hard; moist firm; moderately sticky; slightly plastic; many fine ( 0.5-2 mm) tubular pores; few very fine (<1 mm) irregular cracks; common fine (1-2 mm) fibrous roots; 20 % angular chert coarse gravel (20-75 mm) ; violent reaction to HCL; gradual smooth boundary to:
42-77	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 3/4) moist; gravelly clayloam; weak medium angular blocky breaking to fine angular blocky ; dry slightly hard; moist friable; moderately sticky; slightly plastic; common very fine ( <0.5 mm) tubular pores; few very fine (<1 mm)irregular cracks; few very fine (<1 mm) fibrous roots; 30 % angular hard limestone coarse gravel (20-75 mm); violent reaction to HCL; clear irregular boundary to:
77-100	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 4/4) moist; very gravelly clayloam; weak coarse angular blocky breaking to medium angular blocky ; dry moderately hard; moist friable; moderately sticky; slightly plastic; common very fine ( 0.5-2 mm) tubular pores; few very fine (<1 mm)irregular cracks; few very fine (<1 mm) fibrous roots; 45 % sub-rounded hard limestone stones (75-250 mm); 2 % small (<5 mm) soft calcareous concretions; violent reaction to HCL.
100+	cm	Lithic contact to Limestone

## Soil Profile Description (ID 12)

### Information on the site :

Soil Classification: USDA (1990): Fine, mixed, thermic Family of Typic Xerochrepts (JDEP)  
ACSAD: CCX t 4 c: Typic Xerochrept  
FAO/UNESCO: CMx : Chromic Cambisol

Location: 1.3km E of Center Ausara

Coordinates: Geographical : 35.70512 E/ 32.38198 N  
JTM: 378167 E/ 584258 N

Elevation: 518 m asl

Landform: Position: Terraces  
Land System : 18/1 (Dissected plateau on Ajlun and Balqa groups)--18.1.2 [GIS]  
Land Facet: 4 (Steep slopes on limestone bedrock with colluvial benches)

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

Slope: Moderately steep (22 % ) , rectilinear to N

Land Use : 1.3 Mixed cropping

Plant /Crop: Olives (4) ,Gray (5) ,Saro (3): 80% groundcover

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 17.7° C / Soil (50cm): 20.6° C  
Soil moisture regime: Xeric  
Precipitation zone: 550-600 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

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

Parent Material: Bedrock-fresh

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

Surface Cover : Stones (70 %)

Surface Feature : Litter (20 %)

Soil Surface Conditions: Dry /Moderately hard

Erosion : Slight sheet erosion

Soil Depth : 72 cm (Lithic contact )

Diagnostic Horizon or Property: Cambic at 16 cm

### PROFILE DESCRIPTION :

- 0-16 cm Dark reddish brown (5YR 3/3) dry and dark reddish brown (5YR 3/4) moist; silty clay; moderate medium subangular blocky; dry moderately hard; moist friable; moderately sticky; moderately plastic; many very fine (<0.5 mm) spherical pores; many fine (1-2 mm) fibrous roots; 20 % irregular hard limestone gravel (5-20 mm); no reaction to HCL; clear wavy boundary to:
- 16-52 cm Dark reddish brown (5YR 3/3) dry and dark reddish brown (5YR 3/4) moist; silty clay; moderate medium subangular blocky; dry moderately hard; moist friable; moderately sticky; moderately plastic; many very fine (<0.5 mm) tubular pores; few very fine (<1 mm) vertical cracks; many fine (1-2 mm) woody roots; 15 % irregular hard limestone gravel (5-20 mm); no reaction to HCL; clear smooth boundary to:
- 52-72 cm Reddish brown (5YR 4/4) dry and yellowish red (5YR 4/6) moist; extremely gravelly silty clay; massive breaking to weak very fine subangular blocky; dry moderately hard; moist friable; very sticky; moderately plastic; many very fine (<0.5 mm) tubular pores; many very fine (<1 mm) fibrous roots; 75 % irregular hard limestone coarse gravel (20-75 mm); slight reaction to HCL; abrupt irregular boundary to:
- 72+ cm Lithic contact to Chert / Limestone.

## Soil Profile Description (ID 13)

### Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, hyperthermic Family of Vertic Ustochrepts (JDDC)  
ACSAD: CCI v 4/2 a: Vertic Ustochrept  
FAO/UNESCO: VR : Vertisol

Location: 4.2km N of Shuna

Coordinates: Geographical : 35.61391 E/ 32.64495 N  
JTM: 369964 E/ 613553 N

Elevation: -200 m asl

Landform: Position: Lower slope of plain  
Land System : 1/3 (Alluvial fans and terraces, piedmont fans)--1.3.2 [GIS]  
Land Facet: 2 (Gently sloping to flat alluvial fan)

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

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

Land Use : 1.9 Tilled

Plant /Crop:

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 22.2° C / Soil (50cm): 25.0° C  
Soil moisture regime: Ustic  
Precipitation zone: 350-400 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Geology: Unconsolidated alluvium [q5 Fluv.deposits,sand,loess( Bender 1968 )]  
Parent Material: Alluvium  
Drainage: Surface Runoff: None  
Soil Drainage Class: Imperfect  
Surface Cover : Gravel (10 %)  
Surface Feature : Litter (5 %)  
Soil Surface Conditions: Wet / Moderately hard  
Erosion : Nil  
Soil Depth : 180 cm +  
Diagnostic Horizon or Property: Cambic at 25 cm and Vertic at 50 cm

### PROFILE DESCRIPTION :

0-25	cm	Dark brown (7.5YR 3/4) moist; silty clay; moderate medium subangular blocky; dry moderately hard; moist friable; very sticky; very plastic; common very fine (<0.5 mm) tubular pores; common fine (1-2 mm) fibrous roots; 3 % irregular hard limestone coarse gravel (20-75 mm); strong reaction to HCL; clear smooth boundary to:
25-50	cm	Dark brown (7.5YR 3/4) moist; silty clay; moderate medium subangular blocky; dry moderately hard; moist friable; very sticky; very plastic; few (<2 %) small (<5 mm) distinct mottles (10YR 3/4) ; many very fine (<0.5 mm) tubular pores; common medium (2-5 mm) fibrous and woody roots; 2 % irregular hard limestone fine gravel (2-5 mm); weak thin organic matter coating of peds; strong reaction to HCL; clear smooth boundary to:
50-93	cm	Dark brown (7.5YR 3/4) moist; silty clayloam; moderate medium subangular blocky breaking to wedges; dry moderately hard; moist friable; very sticky; very plastic; common (2-20 %) medium (5-15 mm) distinct mottles (10YR 3/4); many very fine (<0.5 mm) tubular pores; common large (>5 mm) fibrous and woody roots; 2 % fragments; 1 % small (<5 mm) soft calcareous concretions; slickensides; strong reaction to HCL; clear smooth boundary to:
93-126	cm	Dark brown (7.5YR 3/4) moist; silty clay; moderate medium subangular blocky breaking to fine wedges; dry moderately hard; moist friable; very sticky; very plastic; common (2-20 %) medium (5-15 mm) distinct mottles (10YR 3/3); many very fine (<0.5 mm) tubular pores; 1 % sub-rounded hard limestone fine gravel (2-5 mm); 1 % small (<5 mm) soft calcareous concretions; slickensides; violent reaction to HCL; clear smooth boundary to:
126-180+	cm	Dark brown (7.5YR 3/4) moist; silty clay; moderate medium subangular blocky breaking to weak fine wedges; dry moderately hard; moist friable; very sticky; very plastic; common (2-20 %) small

(<5 mm) distinct mottles (10YR 3/3); many very fine (<0.5 mm) tubular pores; 1 % sub-rounded hard limestone fine gravel (2-5 mm); 1 % small (<5 mm) soft calcareous concretions; slickensides; violent reaction to HCL.

## Soil Profile Description (ID 14)

### Information on the site :

Soil Classification: USDA (1990): Fine, thermic Family of Calcixerollic Xerochrepts (JDEO)  
ACSAD: CCX k x m 4 b: Calcixerollic Xerochrept  
FAO/UNESCO: CMc : Calcaric Cambisol

Location: In Adir

Coordinates: Geographical : 35.75494 E/ 31.20415 N  
JTM: 381360 E/ 453637 N

Elevation: 970 m asl

Landform: Position: Middle slope  
Land System : 9/3 (Rolling and rounded limestone hills with basalt outcrops)-- 9.3.0[GIS]  
Land Facet: 3 (Colluvial slopes from limestone and marl extending to valley floor)

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

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

Land Use : 1.1 Cereals

Plant /Crop: Wheat, Olives (5), Figs (3) : 80 % groundcover

Climate: Mean annual precipitation:  
Mean annual temperature: Air : 16.1° C / Soil (50cm): 19.1° C  
Soil moisture regime: Xeric  
Precipitation zone: 300-350 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

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

Surface Cover : Stones (5 %)  
Surface Feature : Cracks (2 %)  
Soil Surface Conditions: Dry / Soft  
Erosion : Moderate rill erosion  
Soil Depth : 162 cm +  
Diagnostic Horizon or Property: Calcic at 52 cm

### PROFILE DESCRIPTION :

0-6	cm	Yellow (10YR 7/6) dry and yellowish brown (10YR 5/6) moist; silt loam; strong medium platy breaking to strong medium subangular blocky; dry slightly hard; moist very friable; common fine (0.5-2 mm) tubular pores; few very fine (<1 mm) vertical cracks; common fine (1-2 mm) fibrous roots; 2 % sub-rounded hard limestone coarse gravel (20-75 mm); moderate reaction to HCL; clear smooth boundary to:
6-25	cm	Reddish yellow (7.5YR 7/6) dry and strong brown (7.5YR 4/6) moist; silty clayloam; moderate medium subangular blocky breaking to moderate fine subangular blocky; dry moderately hard; moist very friable; common very fine (<0.5 mm) tubular pores; common fine (1-2 mm) fibrous roots; 7 % sub-rounded hard limestone coarse gravel (20-75 mm); moderate reaction to HCL; clear smooth boundary to:
25-52	cm	Strong brown (7.5YR 4/6) dry and strong brown (7.5YR 4/6) moist; silty clay; moderate medium subangular blocky breaking to moderate fine subangular blocky; dry moderately hard; moist friable; few (<2 %) mottles; few very fine (<0.5 mm) tubular pores; common fine (1-2 mm) fibrous roots; 10 % sub-rounded chert gravel (5-20 mm); 1 % medium (5-15 mm) soft calcareous concretions; slickensides; moderate reaction to HCL; clear smooth boundary to:
52-125	cm	Strong brown (7.5YR 4/6) dry and strong brown (7.5YR 4/6) moist; silty clay; weak medium subangular blocky breaking to weak fine subangular blocky; dry moderately hard; moist friable; few (<2 %) small (<5 mm) mottles; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 2 % hard limestone gravel (5-20 mm); 5 % medium (5-15 mm) moderately hard calcareous concretions; slickensides; moderate reaction to HCL; abrupt smooth boundary to:
125-162+	cm	Strong brown (7.5YR 5/6) dry and strong brown (7.5YR 4/6) moist; silty clay; weak medium subangular blocky; dry hard; moist firm; few (<2 %) small (<5 mm) mottles; 1 % sub-rounded

chert gravel (5-20 mm); 10 % medium (5-15 mm) moderately hard calcareous concretions;  
slickensides; strong reaction to HCL.

## Soil Profile Description (ID 15)

### Information on the site :

Soil Classification: USDA (1990): Fine, mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (JDEO)  
 ACSAD: CCX k x m 4 b: Calcixerollic Xerochrept  
 FAO/UNESCO: CMc : Calcaric Cambisol

Location: 2.7km SW of El Aluk

Coordinates: Geographical : 35.90426 E/ 32.15462 N  
 JTM: 396648 E/ 558866 N

Elevation: 698 m asl

Landform: Position: Bottom of valley floor  
 Land System : 8/4 (Dissected limestone plateau with steep slopes and colluvial mantles)--8.4.0[GIS]  
 Land Facet: 5 (Narrow wadis with steep slopes)

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

Slope: Gently sloping (5 %), convexoconcave to N

Land Use : 1.5 Mixed tree/annuals

Plant /Crop: Olives

Climate: Mean annual precipitation:  
 Mean annual temperature: Air : 16.9° C / Soil (50cm): 19.9° C  
 Soil moisture regime: Xeric  
 Precipitation zone: 350-400 mm p.a.

### GENERAL INFORMATION ON THE SOIL:

Geology: [ c2 Chalky/sandy LSt( Sir , Fuh (Bender 1968)]

Parent Material: Colluvium

Drainage: Surface Runoff: Medium  
 Soil Drainage Class: Well

Surface Cover : Stones (10 %)

Surface Feature :

Soil Surface Conditions: Dry

Erosion : Nil

Soil Depth : 180 cm +

Diagnostic Horizon or Property: Cambic at 32 cm

### PROFILE DESCRIPTION :

Ap	0-32	cm	Brown (7.5YR 4/4) dry and dark brown (7.5YR 3/2) moist; gravelly clayloam; moderate medium subangular blocky; dry slightly hard; moist firm; moderately plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 25 % sub-rounded hard limestone gravel (5-20 mm); violent reaction to HCL; gradual wavy boundary to:
Bw2	32-72	cm	Reddish brown (5YR 4/4) dry and dark reddish brown (5YR 3/4) moist; gravelly clayloam; moderate medium subangular blocky; dry slightly hard; moist firm; moderately plastic; few very fine (<0.5 mm) tubular pores; few very fine (<1 mm) fibrous roots; 25 % sub-rounded hard limestone gravel (5-20 mm) ; violent reaction to HCL; abrupt smooth boundary to:
Bt	72-102	cm	Reddish brown (5YR 4/4) dry and reddish brown (5YR 4/4) moist; clay; strong medium prismatic; very plastic; many fine (0.5-2 mm) tubular pores; few very fine (<1 mm) fibrous roots; 3 % rounded fine gravel (5-20 mm); 3% soft calcareous concretions ; weak clay coating; violent reaction to HCL; gradual smooth boundary to:
Bt2	102-142	cm	Reddish brown (5YR 4/4) dry and reddish brown (5YR 4/4) moist; clay; moderate medium subangular blocky; dry hard ; very plastic; few very fine (<0.5 mm) tubular pores; few fine (1-2 mm) woody roots; 5 % rounded fine gravel (2-5 mm) ; 2% medium (5-15 mm) soft calcareous concretions ; weak clay coating ; violent reaction to HCL; gradual smooth boundary to:
	142- 180+	cm	Reddish brown (5YR 4/4) dry and reddish brown (5YR 4/4) moist; clay; moderate medium subangular blocky; dry hard; moist firm; moderately plastic; few very fine (<0.5 mm) tubular pores; 5% fragments; 2% soft calcareous concretions ; weak clay coating.

## Soil Profile Description (ID 16)

### Information on the site :

Soil Classification: USDA (1990): Loamy-skeletal,mixed, calcareous, thermic Family of Calcixerollic Xerochrepts (JDEO)  
ACSAD: CCX k x m 2 d: Calcixerollic Xerochrept  
FAO/UNESCO: CMc : Calcaric Cambisol

Location: 6.3km NW of Ail

Coordinates: Geographical : 35.47202 E/ 30.23671 N  
JTM: 352936 E/ 346721 N

Elevation: 1550 m asl

Landform: Position: Upper slope (top)  
Land System : 3/3 (Escarpment on calcareous rocks in Wadi Arabah)--3.3.0[GIS]  
Land Facet: 2 (Steep slopes and scarps on kurnub sandstone )

Microrelief: Class: Extremely uneven (>200 cm)  
Type: other

Slope: Steep (32 %), convexoconcave to SW

Land Use : 3.4 Nat.browse+ grazing

Plant /Crop: Gaisum (60)

Climate:Mean annual precipitation:  
Mean annual temperature: Air : 13.1° C / Soil (50cm): 16.1° C  
Soil moisture regime: Xeric  
Precipitation zone: 200-250 mm p.a.

### GENERAL INFORMATON ON THE SOIL:

Geology: Sedimentary chemic./organ . [ c2 Chalky/sandy LSt( Sir , Fuh (Bender 1968)]

Parent Material: Colluvium

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

Surface Cover : Stones (70 %)

Surface Feature :

Soil Surface Conditions: Dry / soft

Erosion : Nil

Soil Depth : 190 cm +

Diagnostic Horizon or Property: Calcic at 20 cm

### PROFILE DESCRIPTION :

0-20	cm	Yellowish brown (10YR 5/4) dry and dark yellowish brown (10YR 4/4 ) moist; very gravelly silty clayloam; moderate very coarse subangular blocky; dry slightly hard; moist very friable; slightly sticky; slightly plastic; common fine (0.5-2 mm) tubular pores; many medium (2-5 mm) fibrous roots; 40 % sub-rounded hard limestone fine gravel ( 2-5 mm); violent reaction to HCL; clear irregular boundary to :
20-55	cm	Light yellowish brown (10YR 6/4) dry and yellowish brown (10YR 5/6 ) moist; very gravelly silty clayloam; moderate coarse subangular blocky; dry moderatly hard; moist friable; slightly sticky; slightly plastic; many medium (2-5 mm) spherical pores; many fine (1-2 mm) fibrous roots; 70 % sub-rounded hard limestone gravel ( 5-20 mm); 5% medium (5-15 mm) soft calcareous concretions; violent reaction to HCL; abrupt irregular boundary to :
55-190+	cm	Light yellowish brown (10YR 6/4) dry and brownish yellow (10YR 6/6 ) moist; extremely gravelly silty clayloam; strong medium subangular blocky; dry hard; moist friable; slightly sticky; slightly plastic; common fine (0.5-2 mm) tubular pores; common very fine (<1 mm) fibrous roots; 60 % sub-rounded hard limestone coarse gravel ( 20-75 mm); 5% medium (5-15 mm) hard calcareous concretions; violent reaction to HCL.

## Soil Profile Description (ID 17)

### Information on the site :

Soil Classification: USDA (1990): Fine-loamy,mixed, thermic Family of Vertic Xerochrepts (JDEF)  
ACSAD: CCX V 2/4 c: Vertic Xerochrept  
FAO/UNESCO: CMv : Vertic Cambisol

Location: .6km SE of Aidun

Coordinates: Geographical : 35.86725 E/ 32.50237 N  
JTM: 393564 E/ 597461 N

Elevation: 690 m asl

Landform: Position: Middle slope  
Land System : 8/8 (Undulating piedmont alluvial and colluvial plains)--8.8.1 [GIS]  
Land Facet: 6 ( Undulating to steep rocky slopes on edge of plain )

Microrelief: Class: Extremely uneven (>200 cm)  
Type: Other

Slope: Steep (25 %), concave to NE

Land Use : 3.3 Nat.grazing

Plant /Crop: Shoke (40) : 30 % groundcover

Climate:Mean annual precipitation:  
Mean annual temperature: Air : 16.5° C / Soil (50cm): 19.5° C  
Soil moisture regime: Xeric  
Precipitation zone: 400-450 mm p.a.

### GENERAL INFORMATON ON THE SOIL:

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

Parent Material: Alluvium ( fine-loamy texture )

Drainage: Surface Runoff: Very rapid  
Soil Drainage Class: Well

Surface Cover : Stones (60 %)

Surface Feature :

Soil Surface Conditions: Dry / Moderately hard

Erosion : Nil

Soil Depth : 200 cm +

Diagnostic Horizon or Property: --

### PROFILE DESCRIPTION :

0-10	cm	Strong brown (7.5YR 4/6) dry and brown (7.5YR 4/4 ) moist; gravelly clayloam; strong coarse angular blocky breaking to strong medium angular blocky; dry hard; moist friable; moderately sticky; moderately plastic; common fine (0.5-2 mm) spherical pores; common medium (5-10 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 20 % rounded hard limestone gravel ( 5-20 mm); strong reaction to HCL; clear irregular boundary to :
10-35	cm	Brown (7.5YR 4/4) dry and brown (7.5YR 4/4 ) moist; clayloam; very strong very coarse subangular blocky breaking to very strong coarse subangular blocky; dry extremely hard; moist extremely firm; moderately sticky; moderately plastic; common fine (0.5-2 mm) spherical pores; common medium (5-10 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 10 % irregular hard limestone fine gravel ( 2-5 mm); slight reaction to HCL; abrupt smooth boundary to :
35-95	cm	Brown (7.5YR 4/4) dry and dark brown (7.5YR 3/4 ) moist; clay; very strong very coarse subangular blocky breaking to very strong coarse subangular blocky; dry very hard; moist extremely firm; very sticky; very plastic; common medium (2-5 mm) spherical pores; common medium (5-10 mm) vertical cracks; few very fine (<1 mm) fibrous roots; 15 % sub-rounded hard limestone fine gravel ( 2-5 mm); slight reaction to HCL; abrupt smooth boundary to :
95-170	cm	Reddish brown (5YR 4/4) dry and dark reddish brown (5YR 3/4 ) moist; clay; very strong very coarse subangular blocky breaking to very strong coarse subangular blocky; dry very hard; moist very firm; very sticky; very plastic; common medium (2-5 mm) spherical pores; many fine (1-5 mm) irregular cracks; few very fine (<1 mm) fibrous roots; 10 % sub-rounded hard limestone fine gravel ( 2-5 mm); slight reaction to HCL; abrupt smooth boundary to :
170-200+	cm	Strong brown (7.5YR 4/6) dry and brown (7.5YR 4/4 ) moist; clay; strong coarse subangular

blocky; dry extremely hard; moist compact; very sticky; very plastic; few fine (0.5-2 mm) spherical pores; few very fine (<1 mm) irregular cracks; slight reaction to HCL.