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Land Evaluation of Some Soils at Al-Azhar University Farm, Assiut, Egypt

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ABSTRACT

This study was initiated to assess land suitability of Al-Azhar university farm, Assiut, Egypt which is considered alluvial soils and is located about 4 km northwest of Assiut city, between Nile River and El-Ibrahimya canal. Eleven soil profiles were selected and dug down to 150 cm depth to represent the study area as a semi-detailed soil survey. The studied soils had clay, silty clay and sandy clay textures. The soil organic matter content was relatively low (0.2 to 3.9 %) and decreased with soil depth. These soils showed non-saline EC_e values (1.23 to 1.52 dS/m) and non-sodic ESP values (1.6 to 5.1). They had moderately alkaline to strongly alkaline soil pH. The soils also were considered non-calcareous as the $CaCO_3$ content varied from 1.08 to 2.93 %. High values of the cation exchange capacity (26.1- 68.3 cmol+/kg) were recorded for these soils reflecting their finer texture. The land suitability was achieved using both the microLIES (Almagra model) program and the applied system of land evaluation (ASLE) program for arid and semi-arid regions. The rating of the studied soil profiles according to microLIES (Almagra model) was suitable to marginally suitable for alfalfa, cotton, sugar beet, maize, wheat, melon, potatoes, olive, soya bean, sunflower, citrus and peach, most of these soils are suitable (S2) for these crops, while, some these soils are marginally suitable (S4) for olive, citrus and peach. However, according to ASLE program, the soil profiles class varied from highly suitable to marginally suitable for cotton, sunflower, sugar beet wheat, faba bean, maize, soya bean, peanut, alfalfa, watermelon, pepper, tomato, cabbage, onion, potato, fig, olive, grape, apple, citrus and banana, most of these soils are suitable (S2) for these crops. In addition, all of them are marginally suitable (S4), for peanut, potato, fig, grape and citrus. In conclusion, the studied area is mostly suitable for growing a wide crop variation. The main limitations for these soils were the soil texture, low drainage and low organic matter.

Keywords: land Evaluation, land suitability, alluvial soils.

INTRODUCTION

Alluvial soils are rich in most of the nutrients that are necessary for plant growth. These soils have been cultivated for a long time without a proper scientific approach. Therefore, the objective of this study is to scientifically assess the land suitability of the alluvial soils crops of Al-Azhar university farm for growing different.

The area understudy formed from the sedimentation of the suspended matter, which was carried by the annual Nile flood during the most recent geological period. This suspended matter is the product of physical and chemical weathering of the igneous and metamorphic rocks forming the Ethiopian plateau (Kishk, 1972).

Land evaluation is a part of the land use planning process. It provides information about the opportunities and constraints for the use of lands as a basis for making decisions on its use and management (FAO, 1983).

Land suitability is the fitness of a given type of lands for a defined use. The land considered in its present condition or may be after improvements. The process of land suitability classification is the appraisal and grouping of specific areas of lands with respect of their convenience for specific uses (FAO, 1983).

MATERIALS AND METHODS

The study area is located at the Al-Azhar university farm, Assiut, Egypt. It is bounded by longitudes 31° 09′ 00″ and 31° 11′ 00″ E and latitudes 27° 10′ 00″ and 27° 13′ 00″ N. It is lies 4 km northwest of Assiut city, between Nile river and El-Ibrahimya canal (Figure 1). The area under study is characterized by a hot dry summer with scanty winter rainfall and bright sunshine throughout the year. The average annual temperature is 22° C; the average annual rainfall is about 0.37 mm and the daily evaporation is about 6.75 mm/day.

Eleven soil profiles were chosen to represent the investigated area (Figure 2) to assess land suitability of Al-Azhar university farm, Assiut, Egypt. Sites of soil profiles were located in the field with GPS guidance. All soil profiles were dug to 1.5 m depth. Morphological description for these soil profiles was done according to Soil Survey Staff (1993) and FAO (2006).

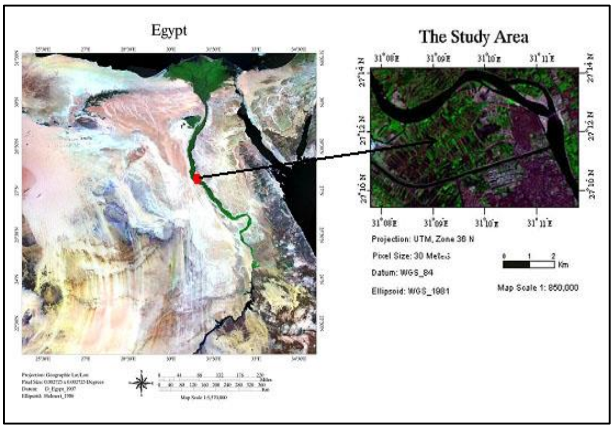

Figure 1. The study area in the Al-Azhar university farm at Assiut.

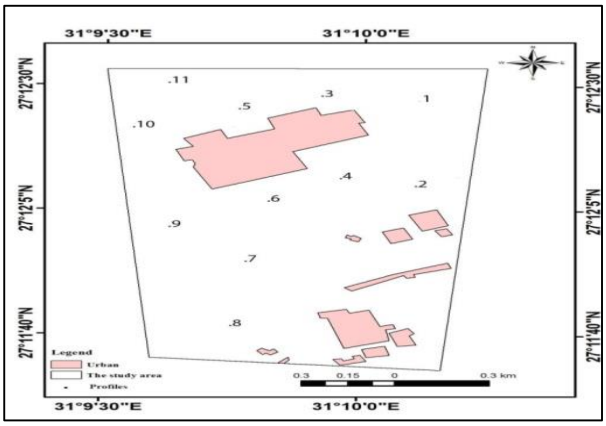

Figure 2. Soil profile locations in the Al-Azhar university farm at Assiut.

Particle-size distribution was determined using the pipette method (Piper, 1950). The soil organic matter (SOM) content was estimated according to Wakley and Black method (Jackson, 1973). Soil calcium carbonate ($CaCO_3$) was measured by the calcimeter method according to Nelson (1982). Soil pH was measured in a 1:1 soil to water suspension using a glass electrode (Mclean, 1982). The electrical conductivity of the saturated soil paste extract (EC_e) was determined according to Jackson (1973). The gypsum content of the soil samples was estimated using the acetone method (Hesse, 1998). Cation exchange capacity (CEC) of the soil samples was determined using sodium acetate for saturation, ethanol for leaching and ammonium acetate for replacing the exchangeable sodium (Jackson, 1973). The exchangeable sodium percentage (ESP) was calculated using the values of CEC and exchangeable sodium.

Geographic information system (GIS) was used for drawing of maps and geostatistical analysis (ArcGIS 10.2.2 software, ESRI, 2014).

The land suitability of these soils was achieved using the microLIES (Almagra model) and the applied system of land evaluation (ASLE) program introduced by De la Roza *et al* (2004) for growing specific types of crops (Table 1), such as alfalfa, cotton, sugar beet, maize, wheat, melon, potatoes, olive, soya bean, sunflower, citrus and peach.

On the other hand, the applied system of land evaluation (ASLE) program by Ismail and Morsi (2001) for arid and semi-arid regions was used to predict the suitability of some crops, such as cotton, sunflower, sugar beet wheat, faba bean, maize, soya bean, peanut, alfalfa, watermelon, pepper, tomato, cabbage, onion, potato, fig, olive, grape, apple, citrus and banana to be grown on these soils (Table 1).

These program calculations were based on matching crop requirements with land qualities according to (FAO, 1976).

Table 1. Land suitability classes of MicroLEIS (Almagra model) and Applied System of Land Evaluation (ASLE) program.

MicroLEIS (Almagra model)						Applied System of Land Evaluation (ASLE) program		
Suitability class		Limitation		Soil factor				
Symbol	Definition	Symbol	Definition	Symbol	Definition	Class	%	Description
S1	High suitable	1	None	a	Sodium saturation	S1	> 80	High suitable
S2	Suitable	2	Slight	c	Carbonate	S2	60-80	Suitable
S3	Moderately suitable	3	Moderate	d	Drainage	S3	30-60	Moderately suitable
S4	Marginally suitable	4	Severe			S4	20-30	Marginally suitable
S5	Not suitable	5	Very severe	g	Profile development	NS1	10-20	Currently suitable
				t	Texture	NS2	< 10	Permanently suitable

RESULTS AND DISCUSSION

1- Physical Properties

Some physical properties of the studied soils are present in Table (2). The elevation of the studied soils is between 54 to 61 m above sea level. The texture class of the investigated soil profiles includes clay, silt clay and sandy clay.

Table 2. Some physical properties of the investigated soil profiles of Al-Azhar university farm at Assiut.

Profile No.	Depth (cm)	Location	Elevation (m)	Particle-size distribution: Coarse sand (%)	Fine sand (%)	Silt (%)	Clay (%)	Texture grade	SP (%)	Db (Mg/m^3)	HC (cm/h)
1	0-20	31° 10′ 06.3″ E	61	3.8	11.2	42.0	43.0	Silt clay	65	1.48	0.51
	20-70			3.3	13.7	37.0	46.0	Clay	74	1.50	0.46
	70-150	27° 12′ 28.9″ N		4.4	7.6	47.0	41.0	Silt clay	53	1.52	0.50
2	0-20	31° 10′ 13.7″ E	60	3.4	11.6	44.0	41.0	Silt clay	65	1.50	0.48
	20-50			2.4	18.6	37.0	42.0	Clay	61	1.47	0.49
	50-100	27° 12′ 09.1″ N		1.3	15.7	38.0	45.0	Clay	68	1.41	0.45
	100-150			4.9	10.1	38.0	47.0	Clay	50	1.55	0.37
3	0-20	31° 09′ 59.6″ E	59	3.7	11.3	42.0	43.0	Silt clay	66	1.52	0.58
	20-70			4.0	13.0	37.0	46.0	Clay	65	1.53	0.43
	70-150	27° 12′ 13.2″ N		2.6	15.4	33.0	49.0	Clay	50	1.47	0.45
4	0-20	31° 09′ 56.6″	57	4.0	8.0	46.0	42.0	Silt clay	71	1.53	0.59
	20-90			3.3	14.7	38.0	44.0	Clay	76	1.50	0.39
	90-120	27° 12′ 25.6″ N		1.1	19.9	29.0	50.0	Clay	83	1.41	0.29
	120-150			3.5	13.5	36.0	47.0	Clay	56	1.50	0.47
5	0-20	31° 09′ 45.8″ E	55	2.7	10.3	44.0	43.0	Silt clay	68	1.48	0.50
	20-70			1.1	19.9	33.0	46.0	Clay	70	1.44	0.45
	70-150	27° 12′ 22.2″ N		2.5	12.5	37.0	48.0	Clay	63	1.46	0.33
6	0-20	31° 09′ 51.3″	56	0.8	11.2	42.0	46.0	Silt clay	63	1.43	0.45
	20-100			3.8	18.2	36.0	42.0	Clay	66	1.52	0.55
	100-150	27° 12′ 10.9″ N		2.1	16.9	37.0	44.0	Clay	56	1.46	0.47
7	0-20	31° 09′ 53.6″ E	57	2.5	13.5	42.0	42.0	Silt clay	62	1.48	0.53
	20-70			2.7	20.3	33.0	44.0	Clay	59	1.49	0.41
	70-150	27° 11′ 51.4″ N		3.5	13.5	42.0	41.0	Silt clay	65	1.52	0.56
8	0-20	31° 09′ 56.4″ E	57	2.3	12.7	43.0	42.0	Silt clay	71	1.47	0.49
	20-70			1.9	12.1	42.0	44.0	Silt clay	66	1.46	0.47
	70-150	27° 11′ 39.0″ N		2.6	5.4	44.0	48.0	Clay	63	1.48	0.44
9	0-20	31° 09′ 40.7″ E	54	1.3	9.7	47.0	42.0	Silt clay	58	1.47	0.47
	20-100			3.6	17.4	36.0	43.0	Clay	56	1.47	0.46
	100-150	27° 11′ 58.6″ N		3.9	11.1	44.0	41.0	Silt clay	50	1.52	0.54
10	0-20	31° 09′ 37.8″ E	60	1.0	7.0	46.0	46.0	Silt clay	61	1.44	0.41
	20-70			2.6	13.4	35.0	49.0	Clay	65	1.48	0.31
	70-150	27° 12′ 15.3″ N		0.4	17.6	37.0	45.0	Clay	71	1.52	0.46
11	0-20	31° 09′ 34.8″ E	61	8.0	56.2	12.8	23.0	Sand clay loam	46	1.63	0.71
	20-70			7.5	52.4	20.1	20.0	Sand clay loam	50	1.63	0.70
	70-90	27° 12′ 27.2″ N		8.4	59.0	12.6	20.0	Sand clay loam	45	1.66	0.89
	90-150			7.3	50.7	16.0	26.0	Sand clay loam	47	1.60	0.50

Tg= Texture grade SP= Saturation percentage Db= Bulk density HC= Hydraulic conductivity

The saturation percentage (SP) of the studied soil samples varied from 45.0 to 83.0 %. The highest values of saturation percentage are dominated and well coincide with the common fine texture of these samples. Bulk density (Db) values of the studied soil profiles range between 1.41 to 1.66 Mg/m^3. According to the Soil Survey Staff (1993), hydraulic conductivity (HC) values of these soil profiles have low to moderate permeability classes which vary between 0.29 and 0.89 cm/h. These results coincide with those of Abou-El-Ezz and Heggy (1985) and Abdel-Mawgoud and Faragallah (2004).

2- Chemical Properties

Some chemical properties of the studied soil profiles are shown in Table 3. These soils are non-calcareous which the calcium carbonate ($CaCO_3$) content ranges from 1.08 to 2.93 %. Also, the gypsum content of these soils is low (0.01-0.45%). Moreover, the soil organic matter (SOM) content is relatively low (0.2 to 3.9 %) and decreases with depth. All soil profiles are non-slain according to Sys and verheye, 1978. Where the EC_e varies from 1.23 to 1.52 dS/m. Soil reaction (pH) of these soils is considered moderately alkaline to strongly alkaline as the soil pH ranges from 7.92 to 8.89. These soils exhibit high values of the cation exchange capacity (CEC) (26.1- 68.3 cmol+/kg) which reflect their finer texture. All samples of the studied soils are non-sodic, with an ESP value ranging from 1.6 to 5.1 %. On the other hand, the available phosphorus of these soil samples varies from 10 to 19 mg/kg which is considered adequate (Abdel-Mawgoud and Faragallah, 2004). However, available potassium differs from 305 to 599 mg/kg which is also adequate (Abdel-Mawgoud and Faragallah, 2004). Generally, both the available phosphors and potassium show higher levels in the upper layers and decrease downwards. These results are in an agreement with those of Kishk (1972), Faragallah (1995) and Al-Sayed (2016).

Table 3. Some chemical properties of the studied soil profiles of Al-Azhar university farm at Assiut.

Profile No.	Depth (cm)	$CaCO_3$ (%)	(SOM) (%)	Gypsum (%)	pH (1:1)	EC_e (dS/m)	CEC (cmol(+)/kg)	ESP (%)	Available P (mg/kg)	Available K (mg/kg)
1	0-20	2.89	1.9	0.13	8.24	1.48	42.0	3.8	16	494
	20-70	2.56	1.7	0.15	8.52	1.42	46.1	4.0	18	499
	70-150	2.77	0.4	0.19	8.89	1.52	39.9	4.6	15	409
2	0-20	1.88	1.4	0.16	8.18	1.35	52.6	4.9	18	506
	20-50	1.79	0.3	0.30	8.21	1.42	55.0	4.3	14	573
	50-100	1.82	0.5	0.03	8.16	1.43	54.1	4.6	17	452
	100-150	1.77	0.2	0.11	8.18	1.50	36.9	1.8	12	427
3	0-20	1.33	2.4	0.13	8.31	1.43	62.7	3.3	19	441
	20-70	1.78	1.4	0.10	8.30	1.40	55.8	3.8	19	498
	70-150	1.72	0.4	0.10	8.39	1.41	43.2	3.4	15	512
4	0-20	2.14	1.5	0.12	8.02	1.23	56.2	3.9	17	492
	20-90	1.30	1.4	0.13	8.13	1.50	65.6	4.4	18	488
	90-120	2.92	0.9	0.11	8.05	1.40	59.3	5.1	15	565
	120-150	2.17	0.8	0.04	8.29	1.35	41.6	2.5	14	562
5	0-20	2.17	3.3	0.17	8.23	1.49	56.9	5.0	18	561
	20-70	1.17	1.3	0.11	8.20	1.32	62.1	4.7	17	452
	70-150	2.44	1.8	0.10	8.25	1.37	55.3	4.9	16	474
6	0-20	1.17	0.5	0.13	8.27	1.45	43.8	4.4	17	531
	20-100	1.64	1.0	0.04	8.34	1.42	57.3	3.8	14	478
	100-150	1.08	0.8	0.01	8.35	1.43	53.7	4.3	13	423
7	0-20	2.11	2.4	0.09	8.31	1.43	61.2	5.1	16	482
	20-70	2.02	1.2	0.17	8.17	1.47	46.8	4.8	19	596
	70-150	1.89	1.1	0.07	8.10	1.37	48.4	4.2	19	417
8	0-20	1.85	1.9	0.12	8.14	1.45	65.1	4.8	17	490
	20-70	2.93	1.1	0.19	8.23	1.38	62.8	4.0	15	561
	70-150	2.11	0.4	0.18	8.07	1.40	53.9	3.1	18	489
9	0-20	1.73	3.9	0.17	7.92	1.50	68.3	3.7	19	599
	20-100	2.31	2.1	0.22	8.09	1.40	60.3	3.4	16	564
	100-150	2.11	0.8	0.23	8.34	1.32	57.0	3.3	14	487
10	0-20	1.50	2.3	0.14	8.25	1.42	65.5	4.0	17	453
	20-70	2.23	1.4	0.22	8.27	1.40	26.1	3.4	17	589
	70-150	2.74	1.2	0.02	8.23	1.50	62.6	3.9	15	422
11	0-20	2.25	1.7	0.22	8.41	1.37	41.6	2.9	11	362
	20-70	2.29	1.7	0.34	8.39	1.47	35.8	1.6	10	321
	70-90	2.10	0.4	0.45	8.27	1.43	31.1	2.3	10	305
	90-150	2.06	0.9	0.33	8.02	1.35	36.6	2.1	11	311

SOM= Soil organic matter EC_e= Saturation percentage CEC= Cation exchange capacity ESP= exchangeable sodium percentage

3- Land Suitability

In this study, two programs, the microLIES (Almagra model) program introduced by De la Roza et al., (2004) and the applied system of land evaluation (ASLE) for arid and semi-arid regions under the surface irrigation system (Ismail and Morsi, 2001), are used to assess the land suitability of the studied soils.

a. The microLIES (Almagra model) program

According to the microLIES (Almagra model) program, the land suitability of these soils is considered suitable to marginally suitable for alfalfa, cotton, sugar beet, maize, wheat, melon, potatoes, olive, soya bean, sunflower, citrus and peach (Table 4) and illustrated in Figure 3.

Most of the investigated soil profiles are suitable (S2) for the selected crops. Soil profiles 4, 5, 8 and 11 are moderately suitable (S3) for alfalfa, sugar beet, wheat, soya bean and sunflower while; they are marginally suitable for olive, citrus and peach. However, soil profiles 1, 2, 3, 7 and 10 are marginally suitable (S4) for olive, citrus and peach. Soil profile 9 is only moderately suitable for alfalfa, cotton, sugar beet, maize, wheat, melon, potatoes, soya bean and sunflower.

Table 4. Suitability classes of the study soils using the microLIES (Almagra model) program.

Profile	Fodder crops					Vegetables		Oil crops			Fruit	
No.	Alfalfa	Cotton	Sugar beet	Maize	Wheat	Melon	Potatoes	Olive	Soya bean	Sunflower	Citrus	Peach
1	S_2tc	S_2ta	S_2tca	S_2t	S_2tc	S_2t	S_2t	S_4t	S_2tc	S_2tc	S_4t	S_4t
2	S_2tc	S_2ta	S_2tca	S_2t	S_2tc	S_2t	S_2t	S_4t	S_2tc	S_2tc	S_4t	S_4t
3	S_2tc	S_2ta	S_2tca	S_2t	S_2tc	S_2t	S_2t	S_4t	S_2tc	S_2tc	S_4t	S_4t
4	S_3c	S_2tca	S_3c	S_2tc	S_3c	S_2tc	S_2tc	S_4t	S_3c	S_3c	S_4t	S_4t
5	S_3c	S_2tca	S_3c	S_2tc	S_3c	S_2tc	S_2tc	S_4t	S_3c	S_3c	S_4t	S_4t
6	S_2c	S_2ta	S_2ca	S_2ptd	S_2c	S_2t	S_2t	S_2tc	S_2c	S_2c	S_2tg	S_2tg
7	S_2tc	S_2ta	S_2tca	S_2t	S_2tc	S_2t	S_2t	S_4t	S_2tc	S_2tc	S_4t	S_4t
8	S_3c	S_2tca	S_3c	S_2tc	S_3c	S_2tc	S_2tc	S_4t	S_3c	S_3c	S_4t	S_4t
9	S_3t	S_3t	S_3t	S_3t	S_3t	S_3t	S_3t	S_2tc	S_3t	S_3t	S_2tg	S_2tg
10	S_2tc	S_2ta	S_2tca	S_2t	S_2tc	S_2t	S_2t	S_4t	S_2tc	S_2tc	S_4t	S_4t
11	S_3c	S_2tca	S_3c	S_2tc	S_3c	S_2tc	S_2tc	S_4t	S_3c	S_3c	S_4t	S_4t

S_2= Suitable **S_3= Moderately suitable** **S_4= Marginally suitable**

a= sodium saturation **c= calcium carbonate** **d= drainage** **g= profile development** **t=texture**

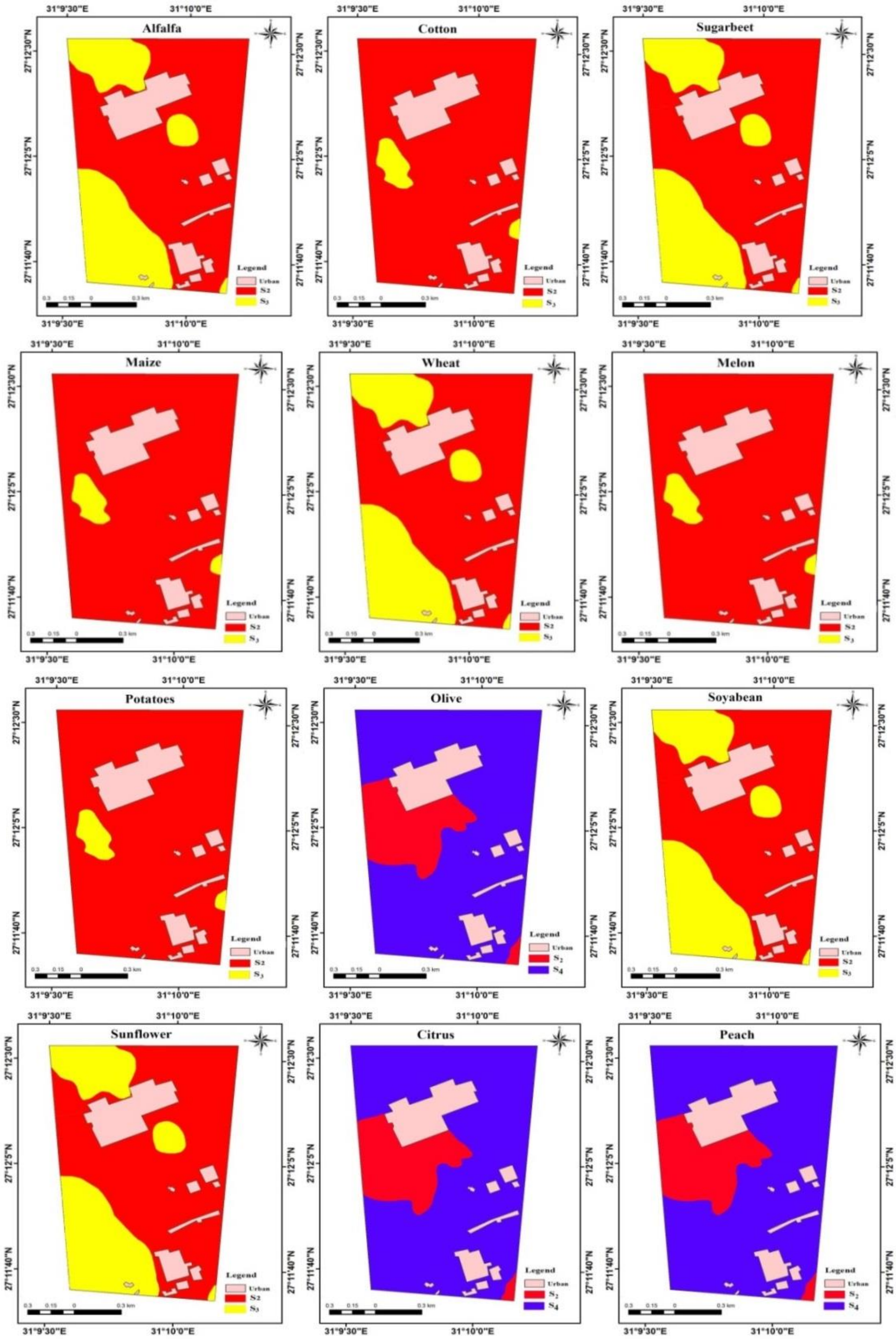

Figure 3. Some maps for selecting crops using the microLIES (Almagra model) program.

b- The applied system of land evaluation (ASLE) program.

The results in Table 5 and illustrated in Figure 4 show that using the applied system of land evaluation (ASLE) program, these soils are highly suitable (S1) and marginally suitable (S4) for the selected crops: cotton, sunflower, sugar beet wheat, faba bean, maize, soya bean, peanut, alfalfa, watermelon, pepper, tomato, cabbage, onion, potato, fig, olive, grape, apple, citrus and banana. Most of the soil profiles are suitable for these crops. On the other hand, all soils profiles are marginally suitable for peanut, potato, fig, grape and citrus. Soil profiles 2, 3 and 8 are highly suitable for sunflower and cabbage. However, soil profile 9 is highly suitable for watermelon, pepper, tomato and olive.

Table 5. Suitability classes of the study soils using the applied system of land evaluation (ASLE) program.

	Field Crops									Vegetables						Fruit Crops					
Profile No.	Cotton	Sunflower	Sugar beet	Wheat	Faba bean	Maize	Soya bean	Peanut	Alfalfa	Water melon	Pepper	Tomato	Cabbage	Onion	Potato	Fig	Olive	Grape	Apple	Citrus	Banana
1	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
2	S_2	S_1	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_1	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
3	S_2	S_1	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_1	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
4	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
5	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
6	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
7	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
8	S_2	S_1	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_1	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
9	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_1	S_1	S_1	S_2	S_2	S_4	S_4	S_1	S_4	S_2	S_4	S_2
10	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2
11	S_2	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_2	S_2	S_2	S_2	S_2	S_2	S_4	S_4	S_2	S_4	S_2	S_4	S_2

S_1= Highly suitable **S_2= Suitable** **S_3= Moderately suitable** **S_4= Marginally suitable**

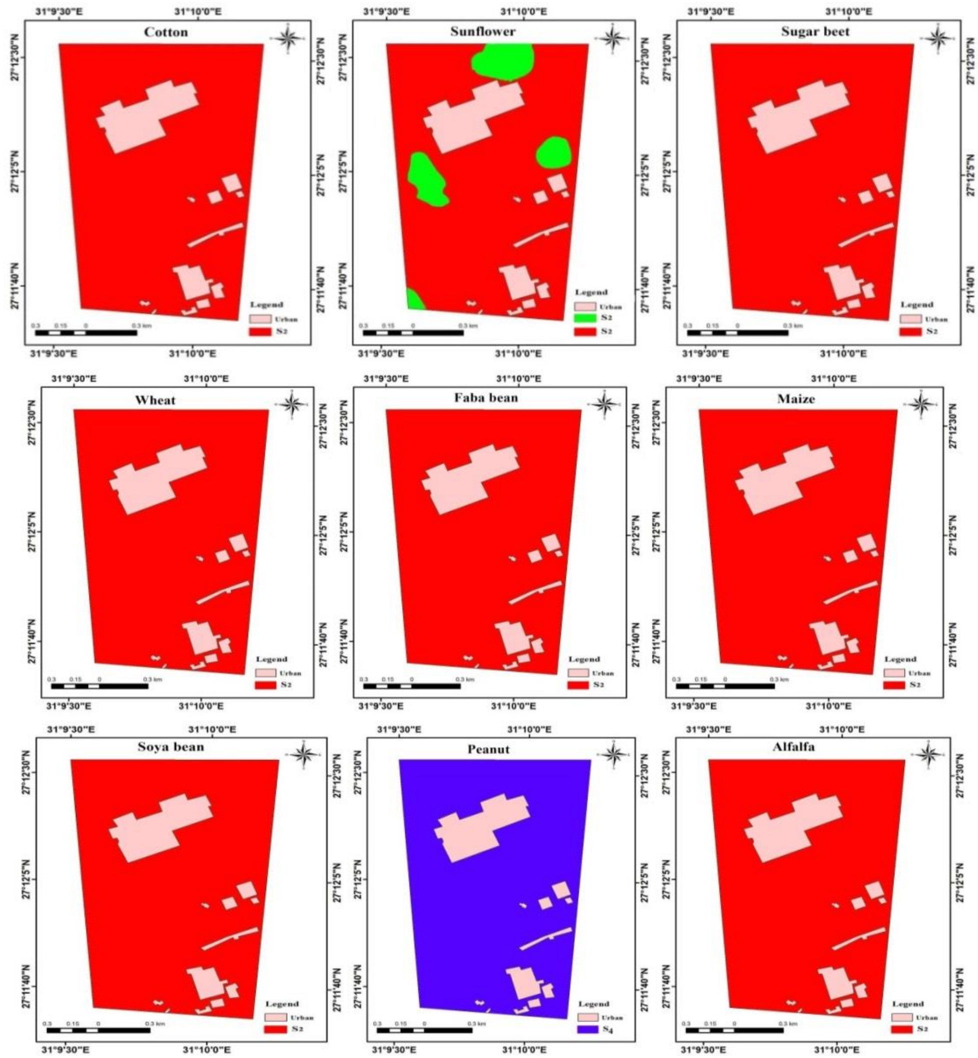

Figure 4. Some maps for selecting crops using the applied system of land evaluation (ASLE) program.

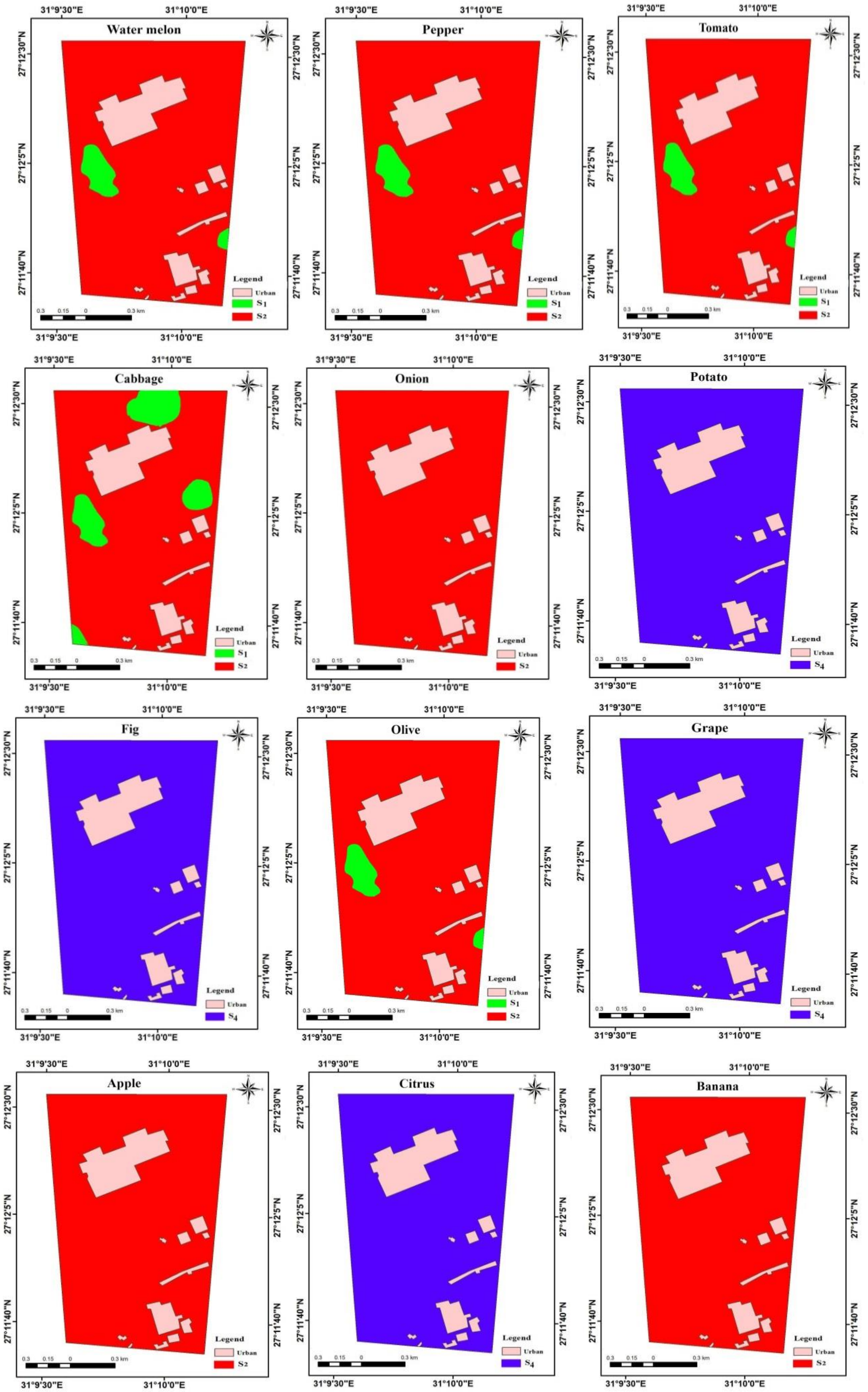

Figure 4. countiue Some maps for selecting crops using the applied system of land evaluation (ASLE) program.

The land suitability of these soils using the ASLE program is more sensitive in detecting lands for growing crops due to considering the climate, soil fertility and soil characteristics in the program input. On the other hand, the microLIES (Almagra model) does not consider climate, soil fertility or any soil property in the soil assessment. Therefore, it can be concluded that the results of both applied systems, ASLE program and microLIES (Almagra model), vary in evaluating of these studied soils for land suitability, and the ASLE program is suitable for arid and semi-arid regions, such as these investigated soils. The main limitations for these soils are the low drainage and low organic matter. So, a continuous supply of organic matter and create of drainage condition to improving their soil properties.

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تقييم بعض الأراضى بمزرعة جامعة الأزهر بأسيوط ، مصر

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تمثل المنطقة المدروسة بعض الأراضى النهرية الرسوبية والتى تقع غرب نهر النيل وتمتد من ترعة الابراهيمية إلى نهر النيل شمال غرب مدينة أسيوط بمزرعة جامعة الأزهر بأسيوط. وتهدف هذا الدراسة إلى تقييم مدى ملائمة هذا الأراضى لزراعة المحاصيل المختلفة على أساس علمى سليم. من النتائج الهامة المتحصل عليها من هذه الدراسة أنه يسود فى هذه الأراضى القوام الناعم (الطينى, الطينى السلتي , الطينى الرملى). كما أن محتوى هذه الأراضى من المادة العضوية منخفض (من ٠,٢- ٣,٩ %) وأما ملوحة التربة فأظهرت انها أراضى غير ملحية (١,٢٣ - ١,٥٢ ديسيمنز/ م) وغير صودية (١,٦ - ٥,١ %) وغير جيرية (% ٢,٩٣ - ١,٠٨ $CaCO_3$). على الجانب الأخر كانت السعة التبادلية الكاتيونية لهذه الأراضى مرتفعة وذلك لسيادة قوام التربة الناعم. تم إجراء تقييم مدى ملائمة بعض الأراضى الرسوبية لزراعة المحاصيل المختلفة وذلك بإستخدام نظامين من نظم التقييم وهما نظام MicroLEIS (Almagra model) حيث تم اختار ١٢ محصولاً وتشمل محاصيل حقلية وهى (البرسيم الحجازى, القطن, بنجر السكر, الذرة الشامية, القمح) والخضروات (البطيخ, البطاطس) والمحاصيل الزيتية (الزيتون, فول الصويا, دوار الشمس) والفواكه (الليمون, الخوخ) حيث أظهرت النتائج أن أراضى منطقة الدراسة كانت أراضى ملائمة إلى أراضى هامشية الملائمة للمحاصيل المختارة فكانت معظم هذه الاراضى ملائمة لتلك المحاصيل وقليل منها هامشية الملائمة لمحاصيل الزيتون والموالح والخوخ. أما بإستخدام النظام الثانى Applied System of Land Evaluation (ASLE) تم إختيار ٢٠ محصولاً تحت نظام الرى السطحى وتشمل محاصيل حقلية (القطن, دوار الشمس, بنجر السكر, القمح, الفول البلدى, الذرة الشامية, فول الصويا, الفول السودانى, والبرسيم الحجازى) والخضروات (البطيخ, الفلفل, الطماطم, الكرنب, البصل والبطاطس) والفواكه (التين, الزيتون, العنب, الموالح, والموز) حيث أظهرت النتائج بإستخدام هذا النظام أن أراضى منطقة الدراسة كانت أراضى عالية الملائمة إلى أراضى هامشية الملائمة لهذا المحاصيل, حيث كانت معظم هذه الاراضى ملائمة للمحاصيل المختارة وهامشية الملائمة لمحصول الفول السودانى والبطاطس والتين والعنب والموالح. كما كانت أهم العوامل المحددة لزراعة المنطقة المدروسة هى قوام التربة وإنخفاض محتواها من المادة العضوية ودرجة الصرف. لذا ينصح بإضافة المادة العضوية بصفة شبه مستمرة وانشاء صرف جيد لتحسين صفات وخواص هذه الأراضى.