SOIL TEXTURE PROPERTY AND ITS IMPACT ON AGRICULTURAL PRODUCTION (EAST OF WASIT GOVERNORATE)

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Abstract
The study aims to analyze the relationship and effect of physical properties the task represented py (soil texture) in soil east of Wasit Governorate on agricultural productivity using the analysis of soil samples analysis for the research area and explaining the reasons for their discrepancy between soil samples in the study area and their impact on agricultural production the study showed that there is a close relationship between physical charactristics and productivity of the crops grown in the region.

Introduction

Soil in the upper disintegrated layer of the earth in soil and stones in agricultural land. As for the concept of soil, according to the geographer, it is the outer, incoherent layer of the earth's crust formed from the mixture of materials resulting from the dissolution of rocks and the dissolutionof minerals and the remains of living organisms through which the roots of plants are established and from which they derive their food. This layer is different in its thickness and in its natural, chemical and biological properties from the original materials from which it was formed or on which the soil is based, is a major source of natural wealth and an important element that cannot be ignored in agricultural production processes, both plant and animal, as its importance lies in the fact it is the medium that supplies the plant extends its roots from. His presence during it in order to obtain the necessary materials necessary for its growth and reproduction if other conditions suitable for the movement of air in it, that its fertility and thickness in the agricultural areas creates a kind of discrepancy in the agricultural activity from one place to another, and then thisdiscrepancy determines the agricultural capabilities in the region and the extente the quality of agricultural production and the type of crop is most of the soils of the study area from movable flood soils, as it is located within the sedimentary plain range It is a newly formed soil , resulting from the sediments that it transported follow rivers during times of floods, as well as sedimentation and the weathering anderosion processes there fore it is considered from transferredSolis and not from emerging soils, whereits composition is a mixture of clay sanday gravel and limestone these factors are among other factors that contributed to the formation of these soils as well as human activity and its impact on the formation of soils .

1. Theoretical framework

1.2 Research problem: The problem of searching, its selecting and identification represents the first step of the steps of scientific research, as it is the basic nucleus in Any geographical research, it represents the researcher's launch for the purpose of answers it and explanation its appearance. A major problem of the research can be identified by asking the following: What is the nature of the relationship between the soil properties of the prevented by the soil texture) and the amount of agricultural production in the soils of wasit?

1.3 Research hypothesis: The research hypothesis means the answer to the question that arises in the research problem, temporarily or as a temporary solution, and the main research hypothesis can be formulated in the following form: variation (soil texture) affects the diversity of agricultural production and its quantity in the research area.

Journal of New Zealand Studies NS34 (2022), https://doi.org/ 10.5281/zenodo.7426366

1.4 Importance research: Iraq is located within the arid and semi- arid regions to which large areas of it belong, including the study area.and because its soil is highly sensitive it receives any change that may occur in soil moisture which is a reflection of climate conditions and irrigation processes especially in agricultural areas the importance Search to show the relationship between Important soil properties and the productivity of agricultural crops prevailing in it in order to identify the most important treatments.

1.5 Research methodology: the research relied on the experimental and inductive methods, as well as the adoption of the descriptive and analytical methods and the field study, the soil science methodology was adopted based on the analysis of soil properties represented by (soil texture) and its impact on (20) A sample of two depths are (0-30) and work (30-60), which were distributed randomly distributed symmetrically in the soils of the research area, as shown in the map (2) and picture (1).

)picture (1

Field study 20/1/2022.

1.6 Spatial and temporal boundaries of the study:

The study area is geographically located within the Wasit Governorate, represented by the administrative of badra district and part of the Sheikh Saad district in the northeastern and southeastern part of the governorate.it represents the border separating the province and the Islamic republic iran from the east and from north diyala governorate and from the south Maysan Governorate, in the northwest, Aziziyah district, and from the west, numaniyah district and Al-Kut districts, which covers the research area about (5,438 km2), out of the total area of Wasit Governorate (1,7153 km2).the region lies astronomically between the(46.15-45.57)east, and width (33.30- 33.5) north, see map (1).

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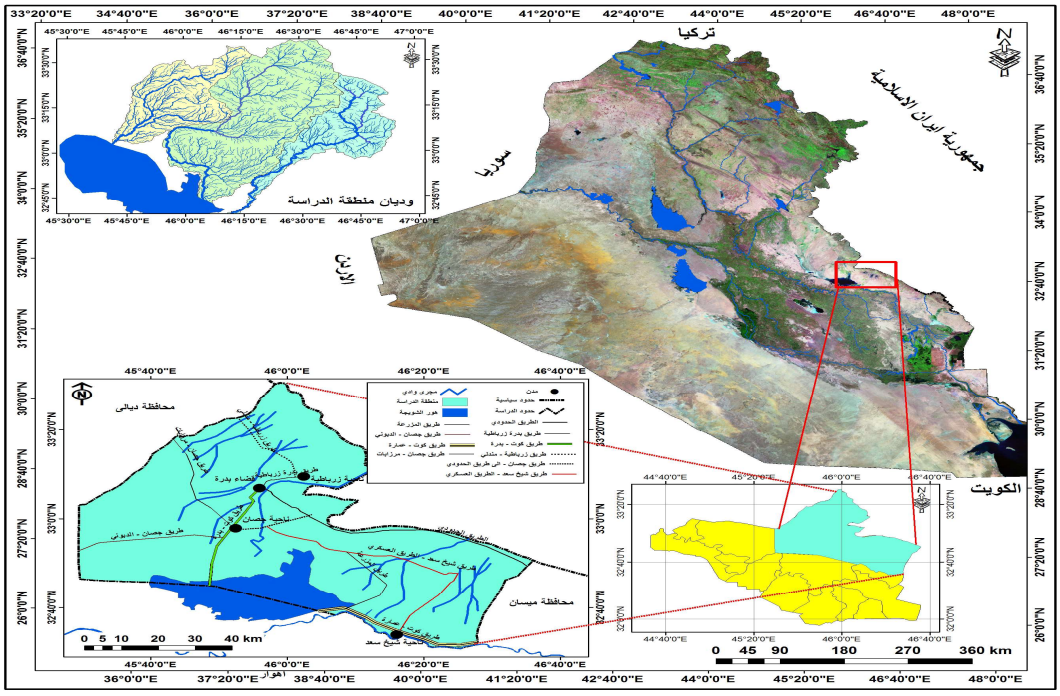
Map (1)

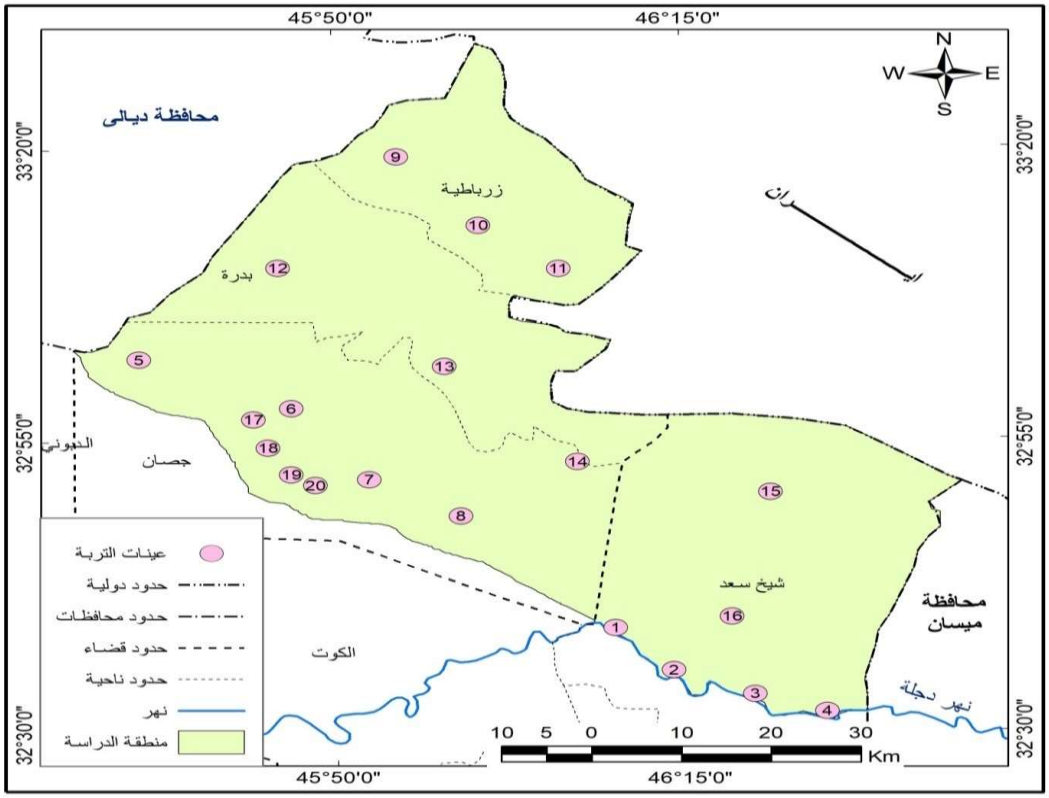
The geographical location of the study area and its location in relation Iraq



Source: is the researcher based on the GIS program using the program ARCLNFO10.4 ARC MAP0

Map (2)

Places of distribution of soil samples in the study area



Journal of New Zealand Studies NS34 (2022), https://doi.org/ 10.5281/zenodo.7426366

Source: is the researcher based on the GIS program using the program ARCLNFO10.4 ARC MAP0

2 Soil types in the study area:

1.2 **Rivers shoulder Soil**: they are the soils located on the banks of the rivers and occupying the high areas near the river. This include soils includes narrow strips adjacent to the riverbeds, and it is considered one of the most fertile and suitable lands for agriculture; This is due to the lack of salt, the suitability of its physical and chemical composition, its thickness of more than (2 m), and its good porosity, which facilitated the process of internal exchange, which was reflected in the increase in agricultural production, especially vegetable crops.this soil is characterized by its mediumto coarse textures in the surface and sub layers and different textures in in the deep substratum. As for the texture of the soil in the wet state it will be brittle to loose in the coarse texture layers and cohesive in the not coarse.in the wet case its texture ranges from non – viscous to viscous,this soil appears in the from of narrow bands adjacent to riverbeds (al-rubaie, 2011, p. 76), the surface of which undulates a little or a lot, According to its location in the rivers this village occupies a small area of the total soils of the study area, amounting to (66 km2), i.e., it constitutes a percentage of (1.5%) of the total types of village in the study area. See Table. (1), Figure. (1), and Map. (3).

Table (1)

Areas of soil types in the study area and their percentages

PERCENTAG E (%)	AREA(KM2)	SOIL TYPES	T
1.5	**66**	**River shoulder soil**	**1**
18.1	**791**	**Depression soil**	**2**
78.7	**3438**	**Flood fan soil**	**3**
1.6	**71**	**Sand dune soil**	**4**
99.9	**4366**	**The total**	

Arc mab 10.5 **researcher** based on the program Source:

The area of soil types in the study area 1)(Figure

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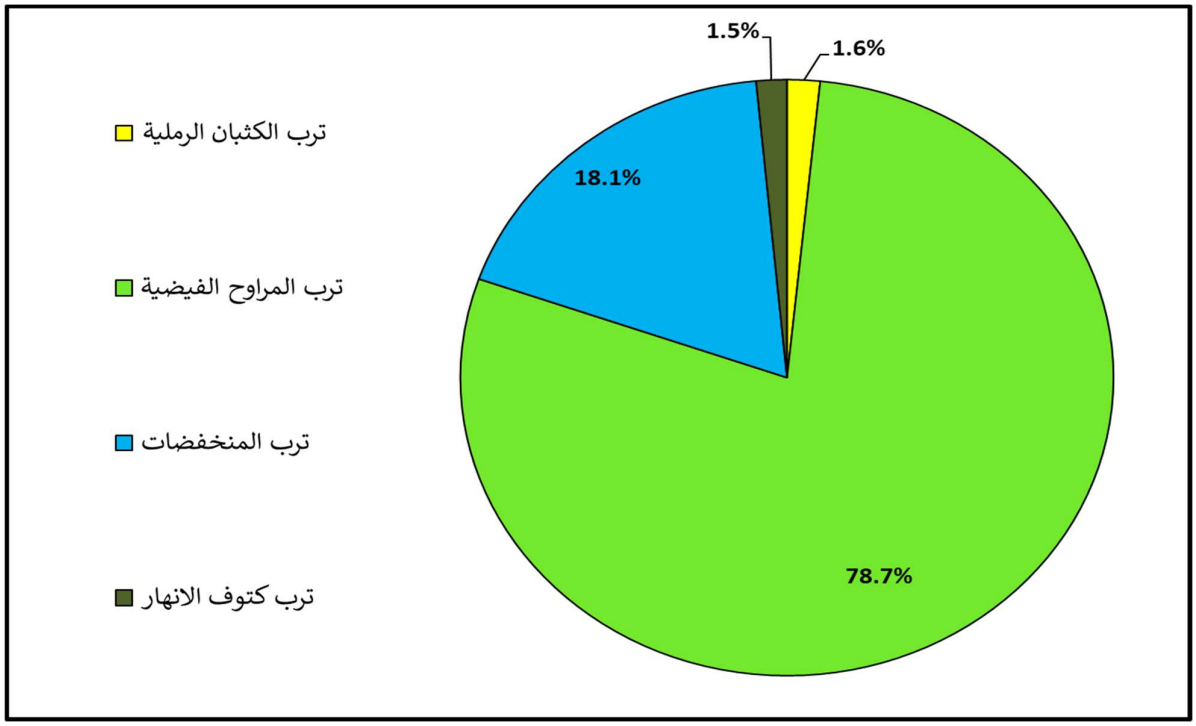
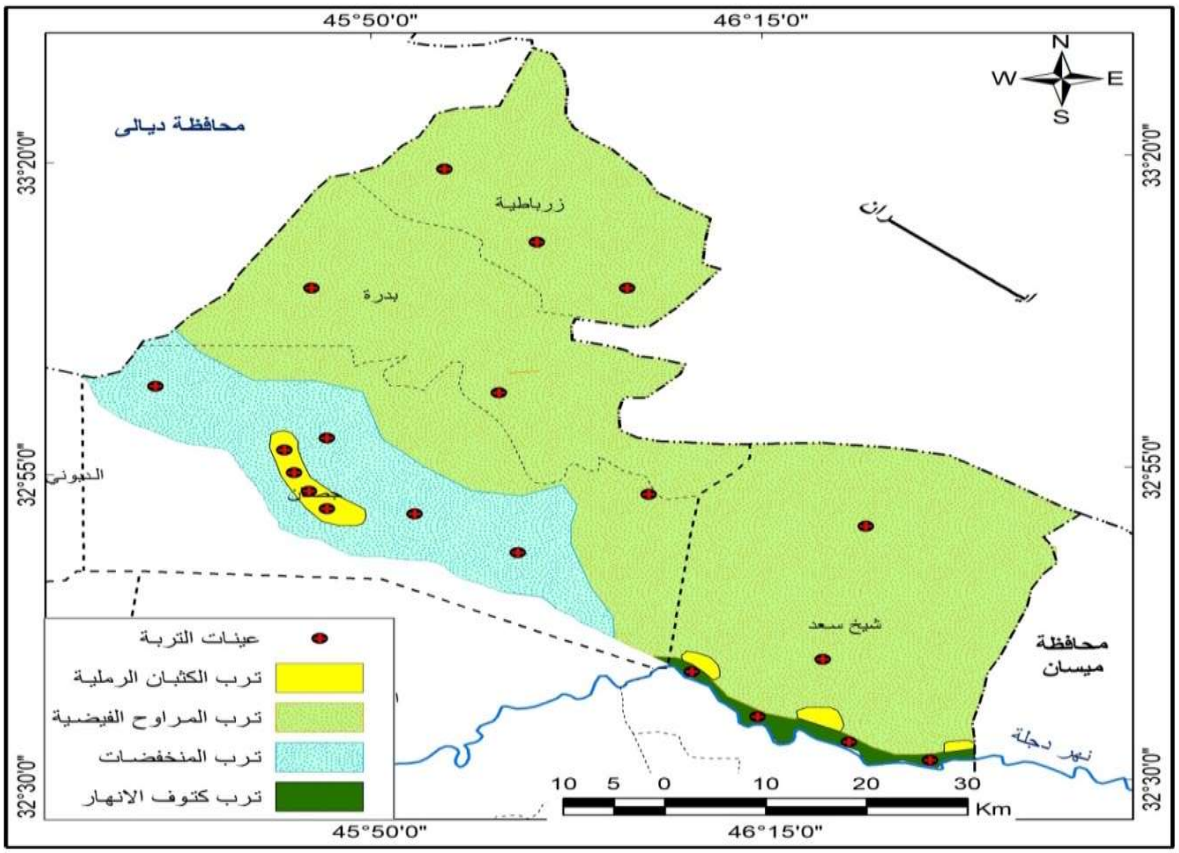


) Table (1 researcher based on th:, Source

Map (3) types of soils in the study area and location of samples



Buring p. map soil and soils condition in Iraq, 1960**:** Source

The soil of the rivers aregeographiclly distributed in the east of the Tigris River fromon the hand Sheikh Saad district along the Tigris River in the study area, and it is suitable for the cultivation of all kinds of agricultural crops, the soil of the rivers comes in terms of importance in the first place in terms of agricultural productivity. because thes soil is fertile because of its good qualities , look Due to the presence of pebbles and stones that follow shoulders of the rivers, the internal drainage below the shoulders to the rivers or drains , and Beuret showed the general characteristics of the soil follows: (Buringh, 1960, pp. 118-119) as

1- It have a coarsetexture to medium version that contains a proportion of fine sand and a mixture Alluvial clay.

2- It has a weak to medium physical structure.

3- Low ground water level; Because it is deep under natural conditions.

4 –the drainage of water is towards the adjacent basins or the river is a natural drainage.

5- good permeability under normal conditions.

6- It rises by about (2-3 m) above the level of adjacent basins.

7- It is characterized by its depth for several meters, there is no problem with the depth.

8 –shoulder soil is often unsalted, so it was invested for agricultural purposes by (6000-4000) years ago.

2.2 depression soil:

This type of soil occupies an area of about (km791), and a percentage of (%18.1) of the area of the study area (Table 1). It spreads in the western, central and southwestern parts of the study area, see a map (3) and Figure (1), and it is is highly saline soil because it is filled with permanent and sometimes seasonal water that flows to it from the high areas adjacent to it or because of the height of the ground water in it, which made it saline glandular soil (majeed, 2008, p. 224) and this type of soil is the result of the novel that you quoted The torrential waters coming from the eastern highlands during the flood season,as the water prevails in this area as the scientific water in this area deposits large quantities of alluvial sediments, and the soil particles differ in their size as a result of the quantity of water and the ability to carry sediments, when the waters of the valleys overflow above its banks and through its branches over. Its speed decreases it moves away From the highlands areas towards the plaine areas, which leads to the deposition of materials with large grains of gravel and sand that are deposited near the course of the valley,as for the fine grains of silt and clay,they are deposited away from it (hussein, 2007, p. 16), This type of soil is often found around shallow swamps and made up of silt, it is of high density and poor drainage, so they are often flooded with water.

2-3 Flood fan soil:

This soil occupies an area extending with the western flank Hamrin hills, formed by seasonal water sediments of rivers (wadis) descended from the Iranian highlands towards this plain that drains into the region, this led to the formation ofhelicopter deltas and this soil is described by a clay texture, (alsammak, 1985, p. 43) and its color is similar to reddish brown,this is due to the effect of its color on the clay rocks belonging to the formation of anjana, (ali, 2010, p. 50) and it contains aggregates of lime and gypsum, as it is of medium salinity and of low depth due to severe wwater erosion, large parts of the lands of this type of soil were exploited in permaculture because they are highly productive, do not need fertilizers, and are free from competing weeds, so they are widely used in the cultivation of strategic like, t wheat and barley widely,this clearly includes

the soil in the center of the district Badra and Zurbatiya district, looking
Map (3), and it comes in third place in terms of the area in which it spreads, with an area of (3438 km2), and at a rate of (78.7%) of the total area of the study area, which is the widest among the rest of the types of soil, it is noted in Table (1) and Fig( ). This soil is considered one of the arable lands due to the low percentage of salinity in it and this is due to the large number of torrential waters coming from the Iranian highlands in the winter and the accumulation of layers of silt rich in minerals and organic matter transported by torrents over the number of years,it keeps rising every time there is a flood season,and since the soil of this plain was inundated by water in the flood season there was a dry season in which the soil was exposed to weaken its cohesion, and then it is easy to transport by wind.

2.4 Sand Dunes Soil:

prepare this type of soil, it is the least widespread type of soil in the study area in terms of area and distribution, as it is limited to an area of about (71 km2), and by (%1.6) of the area of the study area, it is noted Table (1)soils of this type are found in found near this type in the southwestern part in the east of Sheikh Saad district near the Cote Maysan highway, and in small areas in the center jassan hand, see map (3), which is represented by gatherings of accumulated sand formed by wind erosion, and the origin of this Sand is the sand of the floods that were brought during the rainy period in the Pleistocene period and deposited in the floodplains, then the winds scattered them and deposited them in the form of sand dunes in their current locations. The prevailing climate in the study area is a dry climate with high temperatures in summer, (shaker, 1989, p. 233) evaporation has intensified in this soil and made it disjointed and easy to transport by wind and the possibility of arousing dusty weather manifestations, in addition, the flatness and flatness of the area, especially in the areas targeted by the sand, increases the impact of the transfers of liters of sand particles by wind, (qureshi, 2015, p. 52) and this soil is generally characterized by the scarcity of its vegetation, which led to its poverty in organic matter, as well as its high porosity due to the large size of the atoms that make up it as a result of the drought conditions that it went through for a long time and the lack of the clay component in it,therefore these areas and soils are not suitable for cultivation, It is used only to graze animals, especially camels.

Soil texture and its impact on agricultural production: 3.

Soil Texturn ratio and its impact on agricultural production The village tissue means the relative distribution (alani, 1980, p. 59) of the totals of different sizes of soils for in the relative distribution of sand, clay and silt in the soil. The texture determines the fineness or coarseness of the soil, (shalash, 1981, p. 54)and the texture of of the soil does not include the very coarse materials that size is more than (2mm),What is expressed by (stones), soil texture is of great importance asit determines a lot the physical, chemical and biological in the soil,the soil texture is also graded on the basis of Breeding fabric is shaken on the basis of the size of its component atoms from a very coarse sandy texture to a coarse sandy texture to a medium coarse sandy texture to sandy to very fine sandy and then to a clay mixture and then to a clay texture and the size of the atoms that make up for this tissue (samour, 2005, p. 256), as shown in table(2).

Table (2)

types of fabric according to the size of the soil particles

Size of the atoms(mm)	Fabric type
1-2	Very coarse sand

1-0.5	**Coarse sand**
0.5-0.25	**Medium sandy**
0.25- 0.1	**Fine sandy**
0.05 – 0.1	**Very Fine sandy**
0.002 – 0.05	**Mixed or alluvial**
Less than 0.002	**muddy**

Source: Ibrahim: Ibrahim sheriff, ali Hussein al shalash, soil geography, Baghdad universesity press,1985, p116-117:

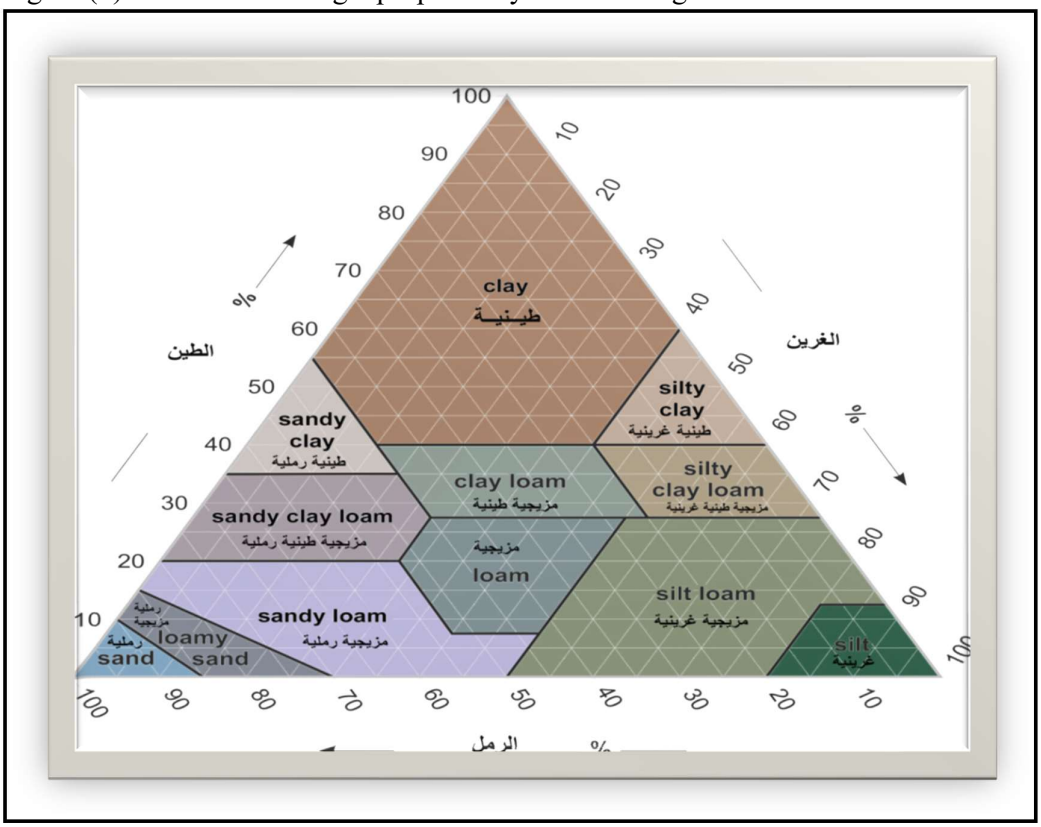
Soil texture is an important and influential factor in the geological history of the region and the geomorphological processes that were affected by it (atti, 1988, p. 73), The different methods of its formation, the size of the soil particles (sand, clay and silt) result from the initial weathering processes and the fragmentation of the mother rocks, and the size of the atoms gets smaller becomes Continuously and continuously weathering processes, although some of it is transported from other sources by running water and winds, (mashhadani, 2006, p. 63) soil texture is a fixed property, unlike some other properties, such as the chemical, they cannot be relied upon, as stable properties of soil,here topography plays a kay role in its composition, this is clearly seen in the variation of soil texture in the study areas, and soil texture has a direct impact on the passage of Air and water movement, and plant roots penetration. Soil with a coarse sandy texture usually has little effect on the movement of water, air and roots in it, unlike soil with muddy runoff that slows and sometimes prevents the movement of water and air and the begging of bridges in it. Just as the weave has an effect on the nitrogen of the soil thesofter the soil the more There was an increase in the availability of nitrogen and vice versa in the soil whith poor drainage and drainage. The soil texture in the study area varies from one region to another and affects the amount of agricultural production in the study area.

3.1 River shoulder soil:

to soil the shoulders of river is soil in a highly arable soil because this type of tissue has characteristics that enable the plant to grow easily and to reach great depths, as well as good ventilation and proper drainage and its containment of organic matter (issawy, 1989, p. 126), the advantages that this proximity enjoys enabled it to diversify in the cultivation of different crops, especially horticultural trees that need soil through which they can reach from their roots to far depths, especially near the riverbed, where large and heavier in size and weight particles are deposited, which contribute to increasing the porosity of the breeding, while The smaller and lighter the farther away from the water course, which flourishes the cultivation of vegetables and field crops, as the demand for field crops is grown in such soils, it turns out Table (3) and Map (6.5.4), the relative distribution of soil separations and the nature of its of the distribution between the tow depths, this distribution is attributed to the topographic situation and the geomorphological structure that formed this typeof soil, that small size The area in which this type of soil prevails, which extends along the Tigris River and is confined to the eastern side of the river within the administrative boundaries of Sheikh Saad only, , and this is a small homogeneous area that reflects the state of variation in the soil texture in it, as the discrepancy is observed in the separation of sand, silty and clay in this soil The overly rate sand separations was (29.9 %), while the rate of separation silt and clay respectively (37.5%,

31%),and the high content of this soil from the silt separated compared to the separted sand and clay is due to the sedimentation soutce that helped that sand deposition of the messengers in large quantities, because it is close to the Tigris River, and it was formed due to the frequent floods that the river passed through during the previous periods and through the data of Table (3), the riversshoulders in the study area is characterized as (silty and alluvial mixture) according to the triangle of soil texture proposed by the American Department of Agriculture Fig(2), the proportions of the soil separations are distributed according to the depths, The results of the laboratory analyzes shown indicate the depth of(0-03),in table(3) there is a slight spatial discrepancy in the percentages of the separation of the river shoulders soil for this depth,there was a discrepancy in the proportion of separators(sand,silt and clay),the averge sand content was(1.36%)to soil the area,as for the average silt percentage the values ranged between(7.33%),while the clay ratios ranged between(1.30%)to soil the study area,it turns out the soil texture to the depth(0-30cm)for the study area according to the above details(clay alluvial mixture) according to the soil texture triangle, Whith regard to the results of laboratory analyzes of the depth (30-60) set out in the table (3), there is a spatil discrepancy percentages by the soil of the shoulders of the rivers for this depth, , the average percentage of sand has reached (36.2%), to soil the area As forThe average silt percentageit ranged between (32.3%), while the clay ratios ranged between (31.4%) rivers shoulders soils for the study area, , according to the soil texture triangle proposed by the American Department of Agriculture Fig(2) it turns out that the soil texture is depth (30-60 cm) for the study area, as details above (clayey alluvial mixture).

Figure (2) Soil texture triangle proposed by American agriculture



Source: U.S. Environmental Protection Agency, Soil Screening Guidance, Second Edition, United States Office of Solid Waste and Publication, Washington, July, 1996, P19.

Table (3)

Thephysical properties of the (soil texture) of the soils shoulders of the rivers in the study area

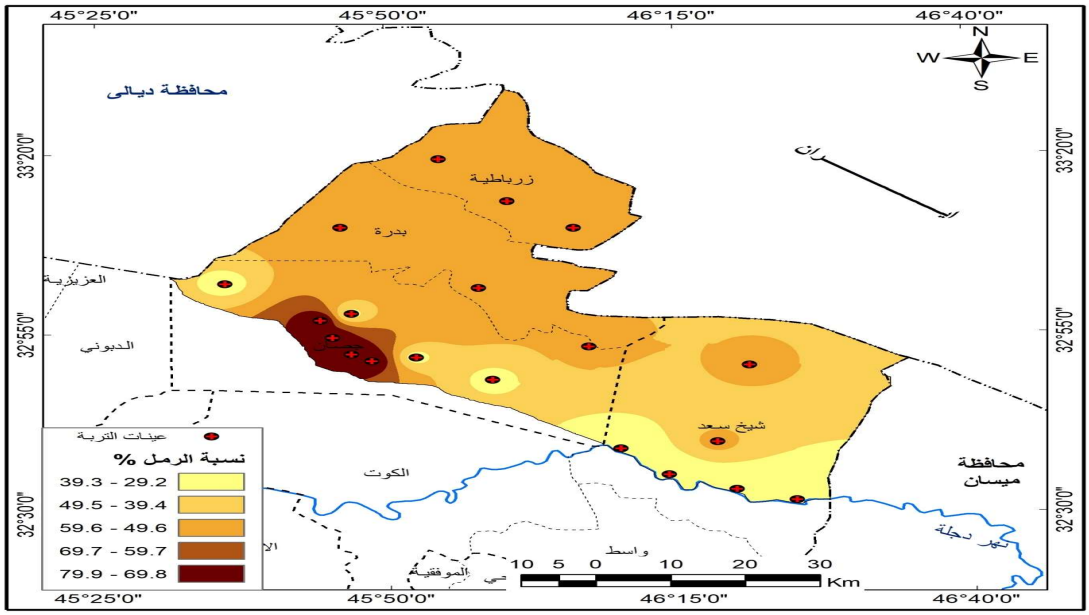
Tissue class	Soil separators%			Depth(cm)	Sample number	Region
	mud	silt	sand			
Alluviai clay mixture	35.2	36	28.8	0.30	S 1	East of sheikh saad district
Alluviai clay mixture	36.1	35.8	28.1	30.60		
Alluviai clay mixture	35.6	35.9	28.4	average		
Alluviai clay mixture	33.5	35.9	30.6	0.30	S 2	
Alluviai clay mixture	35.3	35.3	29.4	30.60		
Alluviai clay mixture	34.4	35.6	30	average		
Alluviai clay mixture	34.5	40.5	25	0.30	S 3	
Alluviai clay mixture	35.6	37.9	26.5	30.60		
Alluviai clay mixture	35.0	39.2	25.7	average		
mixture	17.3	22.7	60	0.30	S 4	
mixture	18.7	20.4	60.9	30.60		
mixture	18	21.5	60.4	average		
Alluviai clay mixture	30.1	33.7	36.1	Depth rate 0.30	average	
Alluviai clay mixture	31.4	32.3	36.2	Depth rate 30.60		
Alluviai clay mixture	31	37.5	29.9	General average		

Source: the researcher is based on the ministry of agriculture,wasit agriculture directorate2020.2021.

Journal of New Zealand Studies NS34 (2022), https://doi.org/ 10.5281/zenodo.7426366

Map (4)

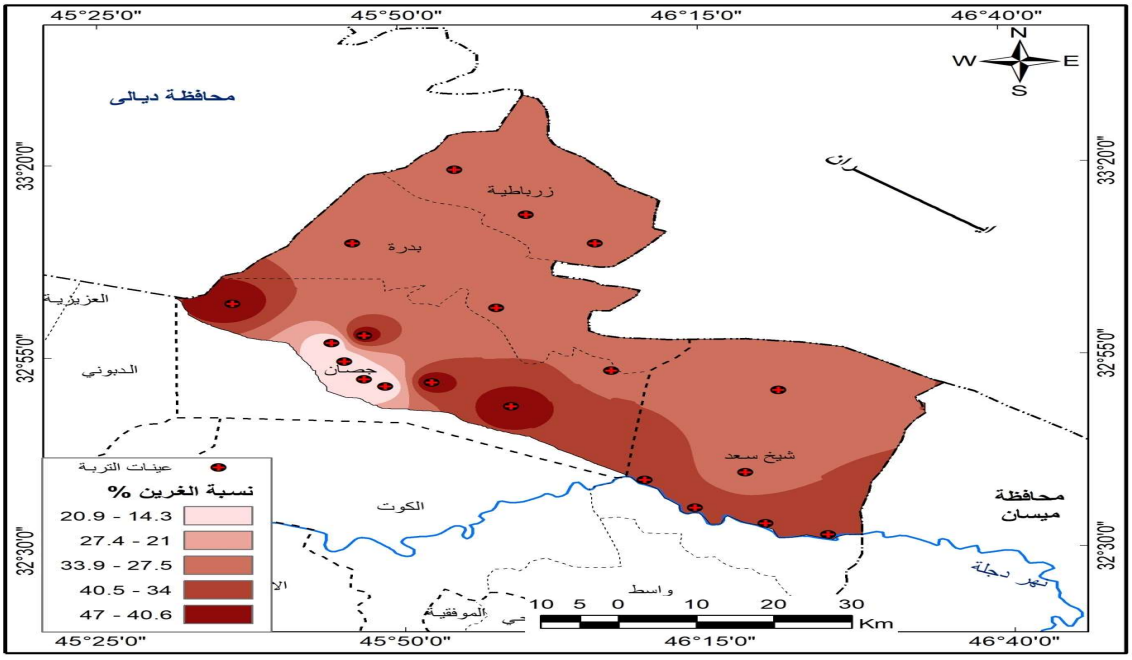
Soil texture spatial variance map(sand%)in the study area



Source: researcher based on the program Erdas mab.9.3, and table (3,4,5,6)

Map (5)

Soil texture spatial variance map (silt%)in the study area



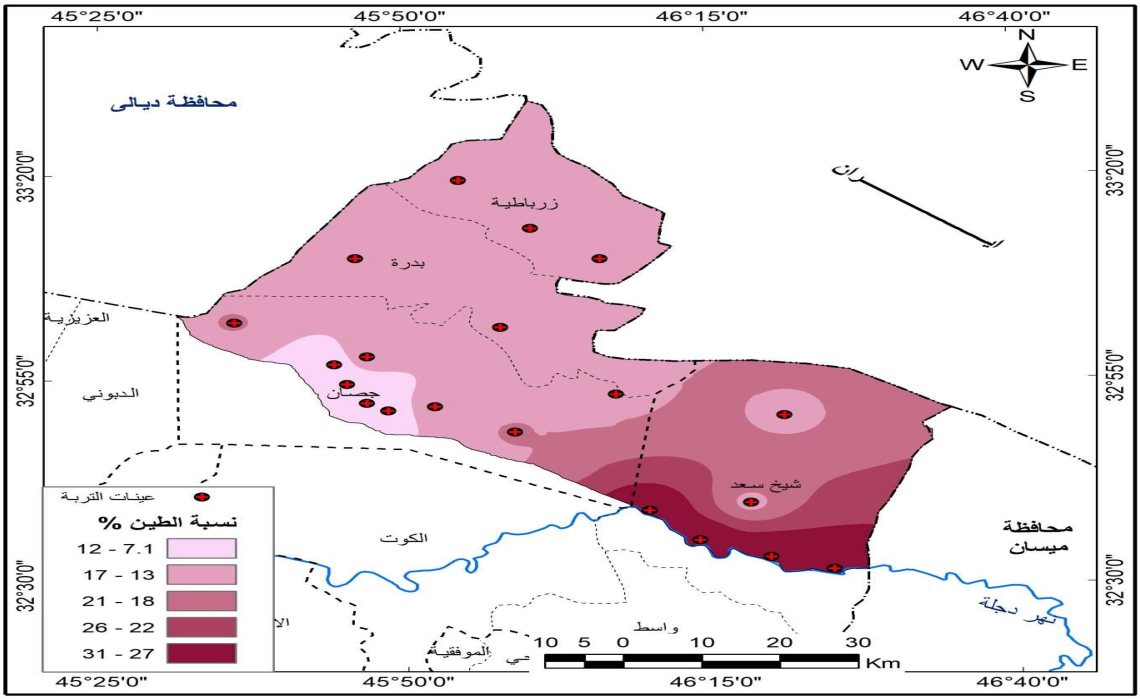
Source: researcher based on the program Erdas mab.9.3, and table (3,4,5,6)

Soil texture spatial variance map (mud%)in the study area) Map (6)

3.1.2 Soil of the depressions:

According to the triangle of the soil texture and Table (2) Map (4.5.6), it isturns out that the soils of

the depressions varies by a small percentage from one place to another according to the samples and places where they were taken, They are alluvial clay soils, where the general rate of sand reached (35%), The rate of silt separation was (47%), and the rate of clay separation was (17%) The reason for the high proportion of the silt separated from that of clay and sand in these soil locations can be attributed to the nature of the effect of the sedimentation and waterlogging process in some areas and within the same area, As there is a variation in the type of transported materials and their quantity of flood waters, especially the river of important valleys in the region, the most important of which is Kalal Badra, and during the different time period related to the speed of the current and the source of the transported materials and what they were exposed to during transport, and that the process of sedimentation continuous in every flood season In this confined area west and southwest of the study area. (jubeir, 2012, p. 44)



) Source: researcher based on the program Erdas mab.9.3,and table (3,4,5,6

) Table (4

study area Thephysical properties of the (soil texture)of the soils depressions in the

Tissue class	Soil separators%			Depth(cm)	Sample number	Region
	mud	silt	sand			
alluvial	16.8	54.0	29.2	0.30	S 5	West of the study area
alluvial	18.8	53.0	28.2	30.60		
alluvial	17.8	53.5	28.7	average		
alluvial	16.2	53.9	29.9	0.30	S 6	
alluvial	18.0	53.0	29.0	30.60		
alluvial	17.1	53.45	29.45	average		
alluvial	12.8	35.0	52.2	0.30	S 7	
alluvial	11.6	44.0	44.4	30.60		

alluvial	**12.2**	**39.5**	**48.3**	**average**		
alluvial	**21.6**	**46.0**	**32.4**	**0.30**	**S 8**	
alluvial	**19.8**	**40.0**	**40.2**	**30.60**		
alluvial	**20.7**	**43**	**36.3**	**average**		
alluvial	**16.5**	**47.2**	**35.9**	**Depth rate 0.30**	**average**	
alluvial	**18.4**	**47.5**	**35.4**	**Depth rate 30.60**		
alluvial	**17**	**47**	**35**	**General average**		

Source: the researcher is based on the ministry of agriculture, wasit agriculture directorate2020.2021.

appears from Table (4) there is a discrepancy in the rates of soil separations for the two targeted depths, The sand percentage ranged from (35.9%) to soils the area to a depth of (0-30 cm), the rates of siltratios are followed by the highest, which reached (47.2%) to soil the area and to the same depth, as for the clay percentage ratio, they reached (16.5%), and according to the soil texture triangle proposed by the American Department of Agriculture in Figure (2), it turns out that the soil texture to the depth of (0-30 cm) for the study area and according to the details of the soil of the depressions is are alluvial clay,to Table also shows (4), there is a slight variation in the rates of soil separations to debth(60-30 cm), the sand levels have reached (35.4%), it followes the rates of the silt ratios which are the highest among the ratios reached (47.5 %), to soil area the region and to the same depth, As for the clay percentage rates they reached (18.4%), and according to the soil texture triangle proposed by the American Department of Agriculture in Figure (2), it turns out that the soil texture for the depth (60-30 cm) of the study area, according to the detail of the soil of the depressions is alluvialclay.

3.1.3 Flood Fans Soil:

It can be seen from theTable (5) and map (4,5,6) show the relative distribution of the separations of flood fans soil in the study area, which infers from this distribution the existencee of a state of discrepancy in the content of soil separations and their distribution between the two depths, and this discrepancy is attributed to The topographical situation, the geomorphological structure and the nature of the prevailing climate that formed this type of soil, the size of the area in which this type of soil prevails which extends along the Iraqi-Iranian borders, the eastern sideof the administrative borders of the eastern region of Wasit Governorate, the contrast is observed in the separation of sand,silt and clay in this soil,the overall rate of sand separation was (52.7%), while the rate of segregated silt and clay respectively (31.5% and 15.4%), and the high content of this soil of sand separation compared to the separation of silt and clay is due to the source of sedimentation (alnabulsi, 1977, p. 23) that helped this is because it is close to the mountainous high areas and because of the recurring slope and floods that this area has experiwnced, and through the table data (5), thesoil of flood fans in the stady area is alluvial mixtureaccording to the general average, and according to thesoil texture triangle proposed by the American Department of Agriculture, Figure (2), the proportions of the soil separators are distributed according to the depths The results of the laboratory analyzes indicate thedepth of the soil (0-30cm), there is a slight spatial discrepancy in the percentages of soil separation for this depth, there was a discrepancy in the proportion of the separators (sand,silt and clay) the average

propottion of sand reached (53.9%) to soil the area, for the proximity of the area, as for the location of the percentage of the den,as for the average silt ratio the values were (33%), while the rates of clay ratios ranged (13.1%), for the soilof the study area, and it is turns that the soil texture for the depth of (0- 30 cm)of the study area and according to the above detail (alluvial mixture), according to the triangle of soil texture, and with regard to the results of the laboratory analyzes of the depth (30-60 cm) shown in Table (5), that there is a spatial in the percentagesof soil separation for this depth, the average percentage of sand (49.7%) for the soil of the region,as for the average silt ratio the values were (35%), while the rates of clay ratios were (15.2%)to soil the study area, according to the soil texture triangle proposed by the American Department of Agriculture Figure (2), it turns out that the soil texture for the depth (30-60 cm) of the study area according to the above detail is (alluvial mixture).

Thephysical properties of the (soil texture) of the soils flood fans in the study area)Table(5

Tissue class	Soil separators%			Depth(cm)	Sample number	Region
	mud	silt	sand			
Alluvial mixture	21.6	46.0	32.4	0.30	S 9	East and north east study area
Alluvial mixture	19.8	40.0	40.2	30.60		
Alluvial mixture	20.7	43	36.3	average		
Alluvial mixture	11.6	14.0	74.4	0.30	S 10	
Alluvial mixture	12.5	25.0	62.2	30.60		
Alluvial mixture	12.05	19.5	68.3	average		
Alluvial mixture	30.2	20.0	49.8	0.30	S 11	
Alluvial mixture	20.8	25.0	54.2	30.60		
Alluvial mixture	25.5	22.5	52	average		
Alluvial mixture	10.8	14.0	75.2	0.30	S 12	
Alluvial mixture	15.6	20.0	64.4	30.60		
Alluvial mixture	13.2	17	69.8	average		
Alluvial mixture	17.8	53.0	29.2	0.30	S 13	
Alluvial mixture	15.8	57.0	27.2	30.60		

Journal of New Zealand Studies NS34 (2022), https://doi.org/ 10.5281/zenodo.7426366

Alluvial mixture	**16.8**	**55**	**28.2**	**average**		
Alluvial mixture	**10.8**	**40.0**	**49.2**	**0.30**	**S 14**	
Alluvial mixture	**14.8**	**38.0**	**47.2**	**30.60**		
Alluvial mixture	**12.8**	**39**	**48.2**	**average**		
Alluvial mixture	**12.8**	**25.0**	**62.2**	**0.30**	**S 15**	
Alluvial mixture	**14.8**	**25.0**	**60.2**	**30.60**		
Alluvial mixture	**13.8**	**25**	**61.2**	**average**		
Alluvial mixture	**10.8**	**14.0**	**75.2**	**0.30**	**S 16**	
Alluvial mixture	**15.6**	**20.0**	**64.4**	**30.60**		
Alluvial mixture	**13.2**	**17**	**70.1**	**average**		
Alluvial mixture	**13.1**	**33**	**53.9**	**Depth rate 0.30**	**average**	
Alluvial mixture	**15.25**	**35**	**49.75**	**Depth rate 30.60**		
Alluvial mixture	**15.4**	**31.5**	**52.7**	**General average**		

Source: the researcher is based on the ministry of agriculture, wasit agriculture directorate2020.2021.

3.1.4 Sand dune soil:

According to the soil texture triangle and Table (6) Map (4,5,6) it turns out that sand dune soils vary slightly from one place to another ,and according to the samples and places they were taken, it is sandy soils where the general rate of sand reached(79.9%), The rate of silt separation was (14.3%), and the rate of clay separation was (7.1%), The reason for the high percentages of sand separated from the clay and silt in these soil location can be attributed to the nature of the effect of the of sedimentation, erosion and transportation process what is done by the prevailing winds and the nature of the soilcomposition in some areas and Within the same region (alzamili, 2014, p. 123), as there is variation in the type, quantity and movement of transported materials, especially in the dry season, and during the different time periods related to the prevailing climate in the region, the nature of winds and drought in particular, and the transport process, they produce, and that the sedimentation process is still continuous and repeated in evrey season in this confined area east of Sheikh Saad district, along Kout – Misan Street.

Table(6) Thephysical properties of the (soil texture)of the soils sand dunes in the study area

Tissue class	Soil separators%			Depth(cm)	Sample number	Region
	mud	silt	sand			
sandy	5.6	10	84.4	0.30	S 17	Jassan district
sandy	7.5	20.0	72.2	30.60		
sandy	6.55	15	78.3	average		
sandy	6.8	10.0	85.2	0.30	S 18	
sandy	5.6	20.0	84.4	30.60		
sandy	6.2	15	79.8	average		
sandy	7.8	13	79.2	0.30	S 19	
sandy	2	11	87.2	30.60		
sandy	4.9	12	83.2	average		
sandy	9.8	15.0	75.2	0.30	S 20	
sandy	11.8	16.1	72.1	30.60		
sandy	10.8	15.5	73.6	average		
sandy	7.5	12	81	Depth rate 0.30	average	
sandy	6.7	16.7	78.9	Depth rate 30.60		
sandy	7.1	14.3	79.9	General average		

. Source: the researcher is based on the ministry of agriculture, wasit agriculture directorate2020.2021

Conclusions:

1 - The study area was divided into four types (river shoulder soil, depression soil, flood fan soil and sand dune soil).

2 – There is a direct effect of village tissue on agricultural production, positively and graciously, as it is noticed that in the vicinity of depressions, the breeding tissue is unsuitable. It has a financial ratio that leads to poor agricultural production, while the soils of the shoulders of rivers and flood fans are very suitable for raising agricultural productivity, and sand dunes soils with a coarse ratio and large pores due to the increase in sand are observed free from agriculture and cannot be cultivated and benefited from due to the normal cost, as well as the scarcity of water.

3 - This is the effect of salinity education on agricultural production, negatively and positively, as it is noticed in the western depressions that the salinity rate is high, and agricultural production decreases, while the shoulders of rivers and flood fans are drained.

4- This area depends on these two factors, according to the field study and the interviews that anchored with farmers and residents.

Suggestions:

1 - There is a great neglect by not maintaining soil fertility and increase its productivity, setting up a good management system, holding educational courses for farmers and activating the work of agricultural extension.

2- there is an urgent and urgent need for government support, it is the basis of the agricultural process because of the tools and capabilities it can provide, such as agricultural supplies such as seeds, fertilize pesticides agricultural equipment and others at reasonable and subsidized prices.

3- theFinancial benefits must be paid to farmers and not be delayed, and soft loans should be granted to establish small or large agricultural projects to encourage farmers to increase and diversify production.

4- The study area requires reclamation Integrated reclamation processes and an effective irrigation anddrainage system for the purpose of reducing soil salinity and increasing land productivity, through the establishment of irrigation projects especially dams on the strwams of valleys that carry iarge amounts of water in the winter season.

5 – use of suitable land for agriculture, and not to waste water by lining rivers and projects to reduce water losses through evaporation and leakage, the installation of lifting pomps and theconstruction of channels that transfer water from the tigris river to the lands of the region since the soil is fertile and has distinctive characteristics.

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