Sultanate of Oman

Governorate of AlDahira

Elayat Fida School (1-10)

Study the Reasons behind Lack of Maturity of Lemon Tree Fruits in AlDwahriya Village

(Wilayat of Dank)

Done by:

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Sultanate of Oman - Governorate of AlDahira – Wilayat of Dank

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Contents

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Summary

This research aims to study the reasons behind lack of maturity of lemon tree fruits. The questions are as below:

- What are the reasons behind lack of maturity of lemon tree fruits in AlKadari village?
- What are the external factors that impact on lack of maturity of lemon tress in AlKadari village?
- Is there any difference in the characteristics of soil between AlDwahriya and AlKadari? Why?
- What is the kind of soil in the two areas?

We started field visits to the research site. We checked the area and we registered all what surround it. We also noted the factors that affect the area and we took samples from AlKadari soil and the water used in irrigation. Then, we went to water source that is used in irrigation in the area and we found a well. After that, we checked up AlDwahriya farm and we noted the factors that surround it. Furthermore, we took

samples from water and soil used in irrigation. We searched for the source of that water and we found that it was well water. Then, we went to the school laboratory and we applied soil and water protocols for the regions. We noticed that salinity clearly affected the two regions. After that, we interviewed farmers to recognize other influential reasons. They agreed that due to lack of water and the source of water is very few, these caused to lack of maturity of lemon tree fruits. In fact, this is the main reason for lack of maturity of plant fruits because in other region, there is a water source and the plant is everyday irrigated with a large amount of water. They got benefit from a research done by Um AlHakam School entitled “Study the Reasons of Lemon Trees not blooming”.

Key Terms

Maturity: growth phase when the fruit is completed and valid for picking. It can continue performing its physiological functions without having to be on the tree andafter taking its normal shape and size.

Field visits: a way to give the participants a chance to move away from monotony, repetition and giving the experience and new ideas for a period of time. The visit can be to a factory, farm, company, governmental institution or any practical experiments which enrich the learning process.

Research Questions

1- What are the reasons behind lack of maturity of lemon tree fruits in AlKadari in wilayat of Dank?
2- What are the external factors that impact on lack of maturity of lemon tress in AlKadari village?
3- Is there any difference in the characteristics of soil between AlDwahriya and AlKadari? Why?
4- What is the kind of soil in the two areas?

Through the last questions, we will start our research and we will use all the data. We are going to discuss the results and we will answer all the questions that we have asked previously. We aim to discover all the factors that impact on lack of maturity of lemon plant in AlKadari village after comparing it with another area that locates in the same area.

Introduction and Literature Review

When AlKadari village parents are cultivating lemon trees, they suffer from the fruits are not being ripe although they grow and bear. Sometimes, the plant is small and dies. “Then let mankind look at his food, How We poured down water in torrents, Then We broke open the earth, splitting [it with sprouts], And caused to grow within it grain, And grapes and herbage, And olive and palm trees, And gardens of dense shrubbery, And fruit and grass, [As] enjoyment for you and your grazing livestock”.

There is gratitude and inference in which the plant life is derived from the earth. There is also inference in reviving the body after the bones were worn and the soil was torn.
These verses indicate the main factors and the mechanisms that based on agricultural system which are

- weather factors How We poured down water in torrents which means “we brought it from sky to earth”
- soil factors “Then We broke open the earth”, which means we put it in it and enters into its borders and defects in the parts of seeds, it planted and grew up and appeared on the earth
- The plant “splitting…” This is the third main factor to identify the success of agricultural process and includes conditions of germination and type of seeds used.

Beginning of this verse, we strived to search for weather factors that affect the maturity of lemon plant in AlKadari farms although they are ripe in all other villages.

From this research, we aim to recognize the reasons behind lack of maturity of lemon trees in AlKadari region. We also aim to acknowledge the characteristics of soil and compare them with the characteristics of other region that featured in maturity of this tree. In

addition, we want to know the soil type (clay or sand) and its relationship to maturity by applying soil and water protocols.

Research Methods

Research plan:

At the beginning, we thought about our region, is there any problem that parents suffer from? We made some questions to some students and we found out that parents suffer from lack of maturity of lemon trees in AlKadari village. Then, we interviewed some parents to list the reasons that cause this problem. After that, we divided the team into two groups and we searched for a village where the lemon trees can be ripe in and we found that it was AlDwahriya village. A group went to study AlDwahriya village and the other group went to Alkadari. We discovered the place and we took soil samples from the two regions and samples from the water that irrigate that farm. We also took samples to school laboratory to apply soil and water protocols. We used protocol to find the reasons of lack of maturity and to know soil type in the two places. This is to know if it was one of the reasons that prevent fruits maturity in the farm. In addition, we checked the salinity and acidity of water and soil. After the team members wrote the data, we went to the site after a period of time. We studied the external factors that surround the place to find out the other reasons which might prevent fruits maturity. We searched for water source that irrigates the two areas and the amount of water that irrigates the crops. Indeed, we identified the areas height. We also noticed the period of sunrise to sunset for possible impact of amount of light which is absorbed by plants. After that, we searched for various references to find other reasons that may prevent lemon trees maturity.

period	Objectives to be implemented
September	Choose a topic
October & November 2018/2019	Collect research information
December & January 2018/2019	Field visit to research site and other sites, soil and water protocols
January 2018/2019	Extract and write results and recommendations
February 2018/2019	Review the research and find output
February 2018/2019	Design research poster
1st/ March 2018/2019	Send the research

Table (1) Suggested time plan in research timetable

Disturbing the roles work to the research team by preparing the tools and field application.

work	student
Writing research issue clearly, and identifying required tools and preparing them.	Qabas &AlHanoof
Reaching the results through collecting the data, drafting the summary and writing the research.	Mayar, Qabas and AlHanoof
Reaching the results through the collected data, drafting the summary and writing the research.	Qabas and Mayar

Table (2) disturbing the roles to research team

Second: Research Site

(Governorate of AlDahra – wilayat of Dank – AlDwahriya village) AlDwahriya village and AlKadari village.

(N 23, 31. 179) (E 056, 32. 644)

Reseach site: AlKadari farm

Reseach site: AlDwahriya farm

Third: Data Collection and Analysis

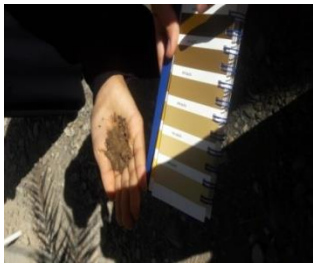
At the beginning, each student in the team was given a specific work and the role that everyone had to do. The students' works and protocols were identified in a table. Then, the following steps were done:

1- Applying water protocol; two samples were taken and checked using the device of acidity, conductivity and salinity then using the average of the two samples.
2- Comparing water acidity in AlDwahriya and AlKadari water and getting to know the amount of change through samples used in each region.
3- Comparing the types of soil by applying soil protocol and its ability to absorb water.

Image (1) (2) (3) application of water protocol in the two villages

4- Making comparison table and charts for all of the above to recognize the extent of effectiveness of water acidity, the ability of soil to absorb water and soil acidity on maturity tree fruits.
5- Through studying the location, it was clear that external factors surround the study area. By this, we will come to recommendations to solve this problem and trying to get rid of it.
6- After that, all protocols data and study sites were registered in program website and were copied as follow:





Picture 5, 6, 7 application of soil protocol in the two villages

Through soil data, it was clear that it featured in:

- Soil protocol data in AlDwahriya

- Granular soil with roots, large amount of carbon, small and many rocks
- Hard granular soil with low alkalinity

After collecting the data of this protocol, we got following data

- Data of water protocol in AlDwahriya

- The pH of water is OK.
- Water source from the well is not far from the farm and provides sufficient water.

Through soil data, it was clear that it featured in:

- Data of soil protocol in AlKadari

- Soil with no roots, small amount of carbon and few small rocks.
- Hard soil with great alkalinity.

After collecting data of this protocol, we got the following data:

- Water protocol data in AlKadari

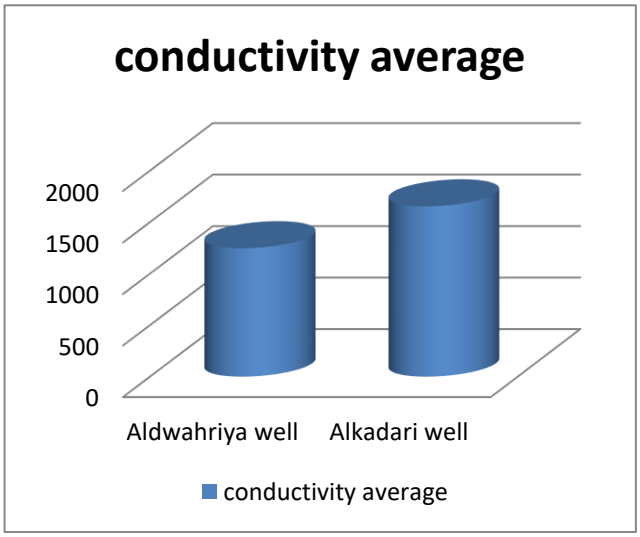
- PH of water is OK
- Water source comes from the well and it is far from the farm so the water cannot be delivered in sufficient quantity.

	Conductivity average	Salinity average	pH average	Temperature average
AlDwahriya farm well	1246	927	8.45	24
AlKadari farm well	1653	994	8.46	18

Table (3) a comparison between water of Aldwahriya well & water of AlKadari well

Results

By applying soil and water protocols to the study site (AlDwahriya) and other site for comparison, photos were taken for how data was collected as the following:



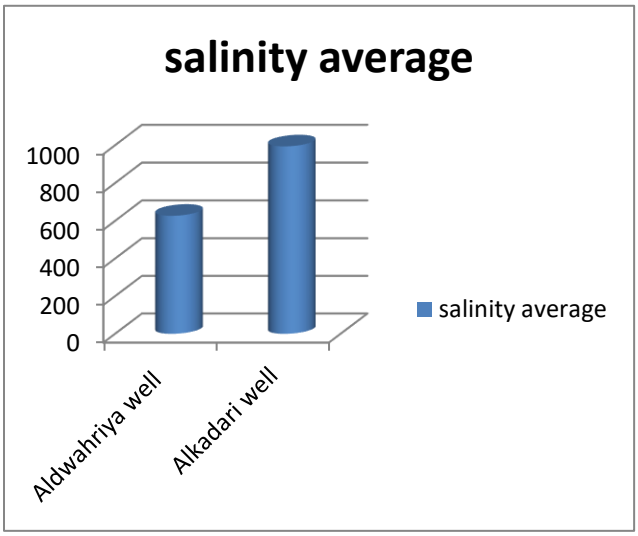
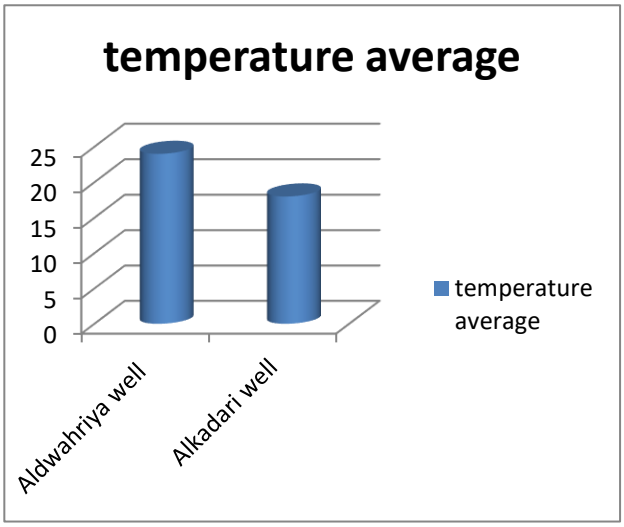


Chart (1): Salinity and conductivity data for water samples (1: AlDwahriya well, 2: Alkadari well)



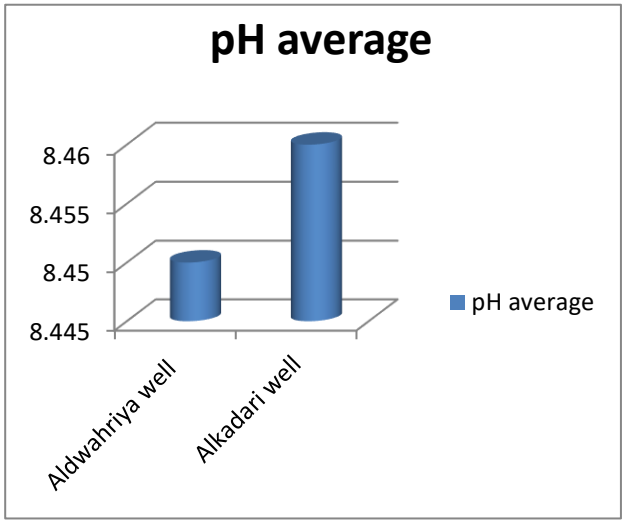


Chart (2): Temperature and pH average data for water samples (1: AlDwahriya well, 2: Alkadari well)

The data was reached through salinity, conductivity and acidity of AlDwahriya's and AlKadari's water.

	Conductivity	Quantity of roots	Quantity of rocks	Quantity of carbon	salinity	pH
AlDwahriya farm soil	945	many	few	few	931	8.35
AlKadari farm soil	652	few	many	Many	642	8.33

Table(4): a comparison between soil of Aldwahriya well & soil of AlKadari well

The data was reached through salinity, conductivity and acidity of AlDwahriya's and AlKadari's soil:

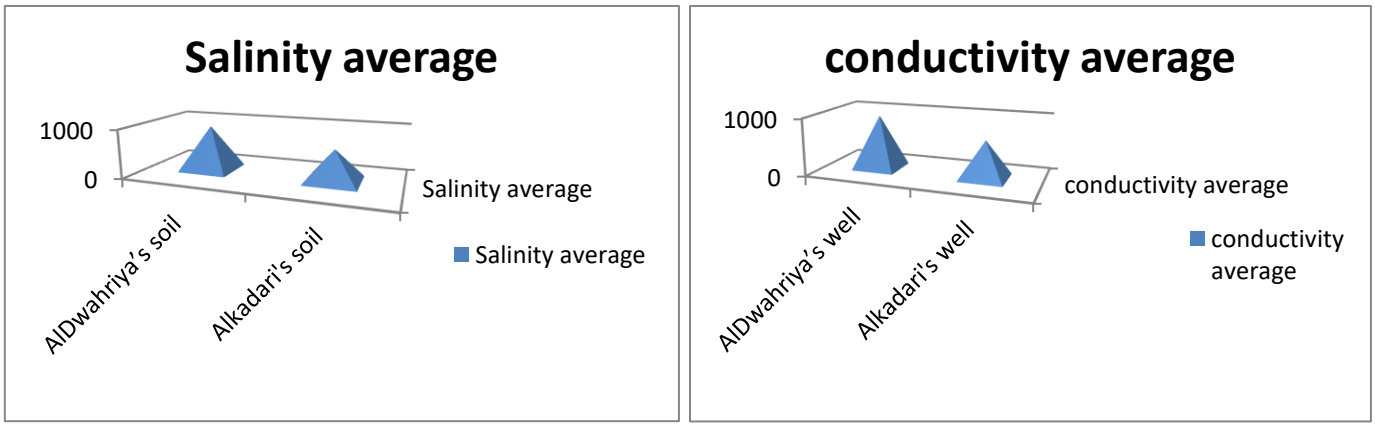


Chart (3): Salinity and conductivity data for soil samples (1: AlDwahriya well, 2: Alkadari well)

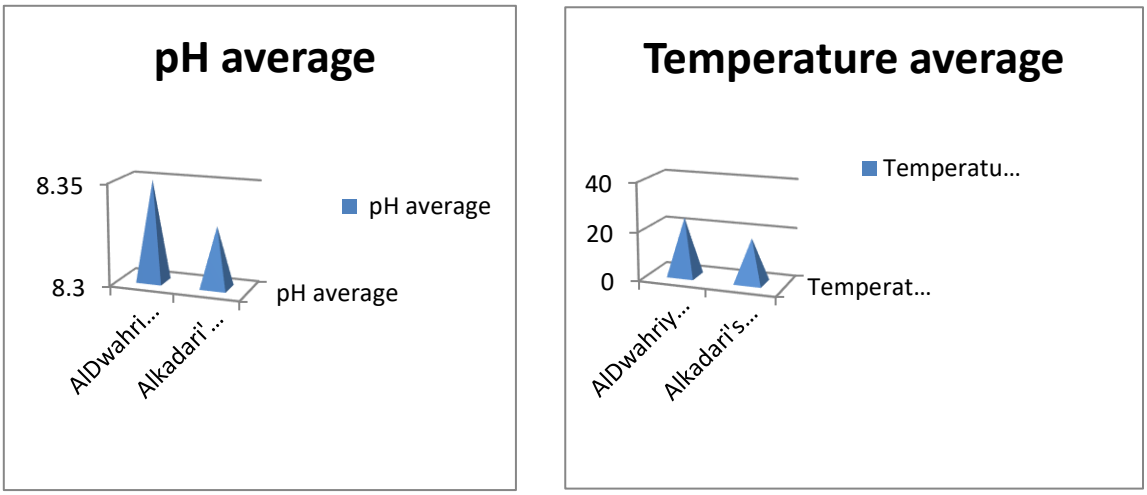
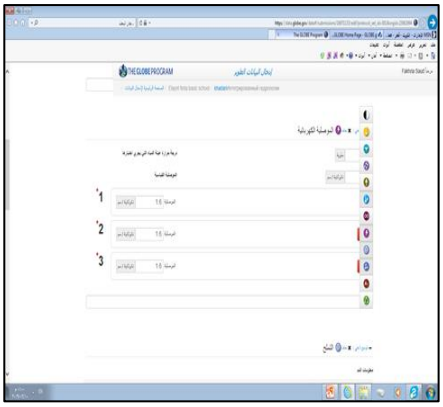
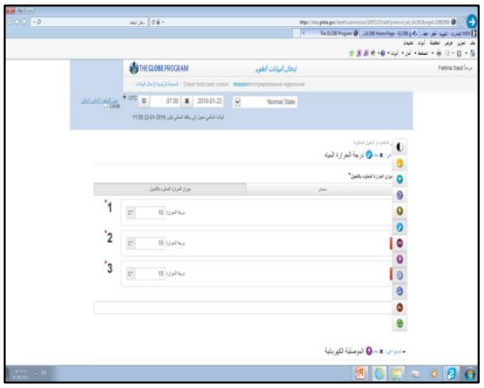
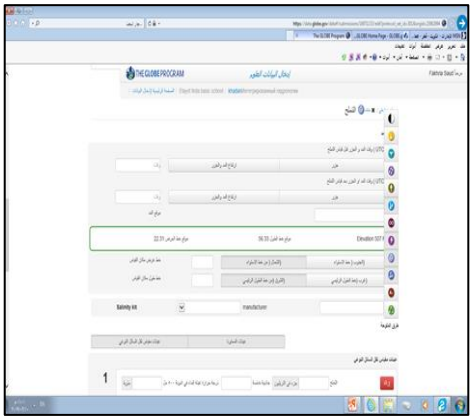


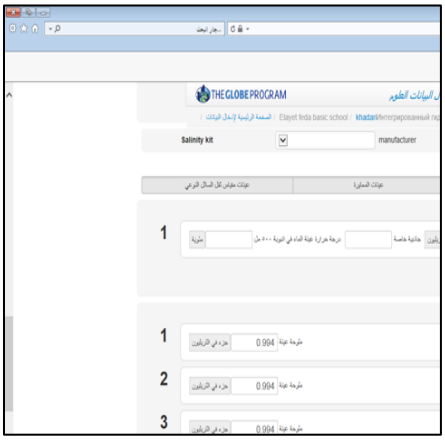
Chart (4): pH and temperature data for soil samples (1: AlDwahriya well, 2: Alkadari well)

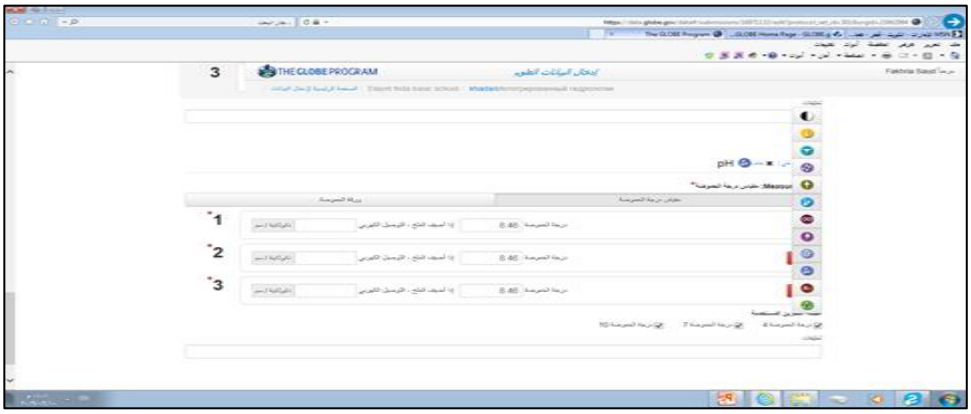
Data entry in program. New website had been entered then soil and water data had been entered.



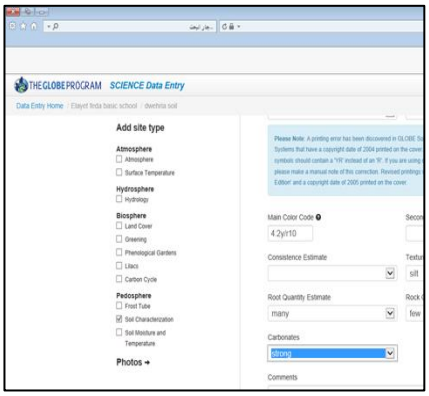


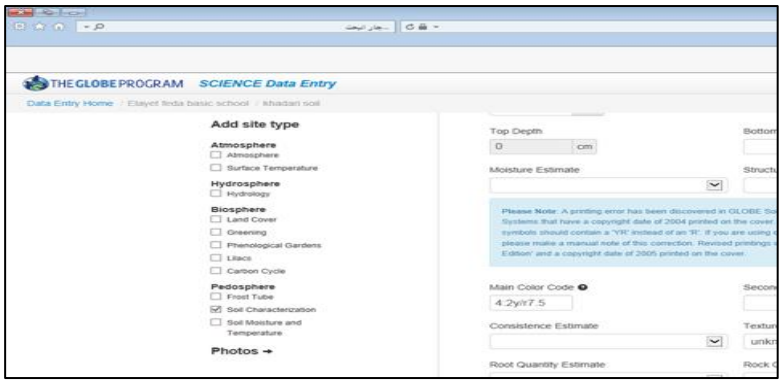






Picture (7), (8), (9), (10), (11) Data for water protocol





Picture (12) & (13) Data for soil protocol

Interview with AlKadari village parents

Some farmers were interviewed to learn closely if there were external causes that impact on maturity of lemon fruits in AlKadari village. The causes were registered as bellow:

- The amount of water that irrigate the crops is very low.
- The farm is far from the water source that irrigates it.
- The area is higher than the sea level.
- Late sunrise and early sunset since the sun goes down at 4:30.

Results discussion

Through the results that we got, it turned out to us that salinity and conductivity of water in AlKadari were very high. The transparency was also high compared to AlDwahriya water. After searching and checking, it was clear from the studies that water salinity affects negatively the soil fertility and its ability to mature. On the contrary, the research results were opposite. We found that AlDwahriya soil is more fertile and muddy depth of two meters. Because of this, it retains water and lemon trees are ripe a lot in it.

Then, we found out that there is slight difference in salinity of AlKadari soil and AlDwahriya soil. This indicates that water salinity is higher in AlKadari village although the diversity of soil type. AlKadari soil is muddy, low waterproof permeability and two meters deep is gravel (Agricultural Development Office in Dank.) It also needs a large amount of water and absorbs a large amount of water.

We draw from the data that soil type affects the maturity of lemon tree fruits. Then, we recognized the external causes that help in maturity of lemon fruits such as amount of water that irrigate crops. Whenever amount of water increases the soil fertility increases. We inferred to the external factors that impact on lemon fruits maturity. We interviewed one of the farmers and he clarified to us that the amount of water is the basic reason. All people agreed to this for a long time ago because of lack of water in region. Lemon trees and their ability to achieve economic crop are affected if the height of the agricultural site is exceeded 600 meters above sea level. In these cases, lemon trees suffer from lack of good maturity and thermal requirements that need to grow. They also suffer from lack of access of large amount of light which is also one of the factors that affects the appearance of the issue we have studied.

Recommendations

In this research, we were trying to recognize the reasons behind lack of maturity of lemon trees in the farms of AlKadari region. We did as students a practical experiment (by examining two samples of water and soil from AlKadari and AlDwahriya). We also made some field visits.

We concluded:

External factors such as amount of water consumed in crops irrigation which is a factor affects more in lack of maturity of lemon plant. Also, the characteristics of water that is irrigated from.

Through this, we found out that AlDwahriya soil's characteristics differ from the charateristics of AlKadari soil.

- Characteristics of AlDwahriya soil: muddy with remarkable alkalinity
- Characteristics of AlDwahriya water: moderate alkalinity and low salinity.
- Characteristics of AlKadari'ssoil: muddy, high salinity and acidity.
- Characteristics of AlKadari'swater: moderate alkalinity and high salinity.

We can apply the research once again by bringing samples from AlDwahriya soil and AlKadari soil. We will plant them in the school and noticing growth and flowering. Then, we will add the study of plant cover protocol.Through these results, all people in society should work hard to find solutions that help this tree to mature.

We also demand the governmental authorities that are responsible for agricultural development to provide the farmers' needs in the area. They also should work hard overcome the problem of lack of irrigation water for plant diversity in the quantity of water that need to grow.

We demand the parents to make other water source to irrigate the plants. They need other source to make more water which helps the plants to absorb their need of water to mature. We also suggest establishing an office referred to Ministry of Agricultural Development so that any farmer who faces a problem can solve it after discussing it with specialists. They should also teach the farmers how to use devices to avoid waste of time in attempt of plant maturity.

Thanks and Acknowledgments

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We also thank all whom contributed in helping us and providing scientific information that is related to research topic.

We also thank AlKadari and AlDwahriya parents for giving us the opportunity to detect and test the soil and water samples.

Thank you also to Hamad SaifAlAlawi for interviewing him as a farmer in AlKadari village.

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