SULTANATE OF OMAN
MINISTRY OF EDUCATION

Study the causes of wild berries plant (fresaide) growth stopped and Withered stems and leaves in the wilayat of Dhank (Al-Nahda district)

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Sultanate of Oman - Al Dhahirah Governorate – Wilayat Dhank

Summary: -

This research aims to Study the causes of wild berries plant (fresaide) growth stopped and Withered stems and leaves in Al-Nahda district The research questions were as follows:

- What are the causes of growth stopped and Withered stems and leaves of wild berries in the neighborhood of Al-Nahda?
- How does Al Masarat water affect the growth of wild berries plant?
- Does water salinity affect the growth of wild berries plants?

We made a time plan for the work, so we started with a visit to the study site that we took and examined the neighborhood of Al-Nahda and recorded everything surrounding it and the factors affecting it and we took samples of the water and we went to the source of the water that is watered with and we recorded the surroundings. It turned out that the region is higher by a small percentage than AL Dhowihiriya village. Then we took samples of the water and we searched for the source of that water and discovered that it was watered from a well inside the farms. We went back to the school's laboratory and applied the water protocols. We reached the following: (That the plants in Al Dhhaiyriyah region have a longer life cycle than the plants of Al Nahdah neighborhood due to the salinity of Masarat water). Then we did interviews with farmers to find out other reasons that might have an effect. The farmers' opinion agreed that the salinity of Masarat water is one of the reasons for of growth stopped of wild berries in Al-Nahdha district.

Several researches have been used like the research of: a study of the effectiveness of the use of rogue plants in fertilizing the plant, its effect on the water and the soil on which it grows, and looking for reasons for the failure of flowering mango trees in al Qarya area (farms in the Wilayat of Qurayyat)

Key terms: -

interview: a press interview that includes questions to be answered.

Death: the paradox of life, the death, the end of life, the expiration of time, its loss, the loss of life.

Examination: analysis, isolation of elements from which a particular substance is composed and determination of the nature of those elements or the separation of their parts.

The sample: a portion of the material from which a sample of the rest of it is taken.

Wild berry: it is a distinct summer fruit that has lovers from everywhere.

Research questions:

- What are the causes of growth stopped and Withered stems and leaves of wild berries in the neighborhood of Al-Nahda?
- How does Masarat water affect the growth of berries?
- Does water salinity affect the growth of berries?

Through the previous questions, we will start our research and employ all the data, discuss the results and answer every question we asked previously to discover the factors that affected the death of wild berry in the district of Al-Nahda, after comparing it to another region located in the same town.

introduction and literature review:

Cranberries or raspberries are among the trees belonging to the pink family, which are frequently cultivated in the Mediterranean regions, and it is one of the trees on which silkworms are raised. There are many types of berries, such as white, black, and wild, which have a high nutritional value, because they contain plant and chemical nutrients that enhance the health of the body, in addition to containing vitamins and various minerals, such as phosphorous, calcium, iron, copper, manganese, natural sugars, and mineral salts, proteins and fatty acids, and due to its nutritional value, it has many health benefits, and its great role in treating various problems and diseases, and in these references and literature review we will mention some of its general benefits.

Wild berry benefits:

- It revitalizes the skin, protects it from the appearance of premature wrinkles, and eliminates pimples and blackheads, because it contains antioxidants.
- It enhances brain and brain function, stimulates memory and the ability to focus, in addition to playing a great role in raising the life expectancy of neurons.
- It strengthens the immune system against various diseases.
- It maintains normal blood pressure levels.
- It promotes cardiovascular health because it contains antioxidants and flavonoids, in addition to its ability to reduce harmful cholesterol levels in the blood and increase the beneficial cholesterol.
- It treats bladder and urinary tract infections because it contains a substance (Hippuric acid) that reduces the adhesion of bacteria on the walls of the bladder.

Wild berry types:

- Blackberries.
- Raspberry, dark red color, small in size but strong in flavor.

- Salmon berries, characterized by a light orange color, and tastes slightly sweet.
- Thimble berries, similar to red raspberries.
- Swamp berries grow in wet areas and have a sour taste.
- Elderberry, round shape, purple or black color.

search methods:

First: The research plan:

In the beginning, we thought about a region in our town, is there any people in the village suffering from it? So we did some questions for some students, and we discovered that the people of the village suffer from the problem of the death of wild berries in a specific area which is the neighborhood of Al-Nahda, and then we did several interviews with the people of the region to identify the reasons leading to the growth wild berry and why did it stop, and then we divided the team into two groups and we Search for the area in which the berry plant grows, we discovered that al Dhowaihiriya region is the one where the berry plant grows, so a group went to that region to study it and another group went to the neighborhood of Al-Nahdah (the target study site), so we explored the two regions and took the plant specifications for both regions And samples from a Water which is watered by those farm at both locations, we took the samples to the school laboratory, and we have implemented the protocol of water and vegetation protocol to discover the causes that keep the berries from growing basically why did it stop.

And get to know the type of water in both sites and know the reasons that prevent the growth of wild berry plant on the farm and the salinity and acidity of the water. After writing down the data by the team members we went after a period of time to the two sites and we studied the external factors surrounding the site to discover other reasons that may have prevented the plant growth. We searched for the source of water that irrigates the two regions and the amount of water that irrigates the plantations and the height of the two sites above the sea surface, since it could be possible height to have an effect and the sun's rise to sunset, because of the possibility of being affected by the amount of light absorbed

by the crops, then we searched for various references to discover other reasons that could prevent wild berry plant growth.

Schedule (1) to search by the proposed time plan

Months	**Time period**	**Objectives to be implemented**
January	January 2021	Choose a research topic
	January 2021	Collect information related to the research
February	February 2021	Field visits to the research site and other sites
	February2021	Making vegetation and water protocols
	February2021	Results, writing results and recommendations
	February2021	Review the final research and production
March	March 2021	Research poster design
	March 2021	Send the research

Table (2): The distribution of work roles among the research team, represented in preparing tools and field application.

Activity	Done by
Clearly formulating the research problem and defining and equipping the required tools	AlHanouf and Mayar
Collecting and analyzing data through the application of the planned protocols, whether inside or outside the school, and entering data on the site	Mayar, AlHanouf and Razan
Reaching conclusions through the data collected, including drafting the abstract and writing the paper	Mayar and AlHanouf

- Identify and review some sources related to the research topic, such as collecting information from the school's learning resources center
- Such as scientific encyclopedias, and the use of the Internet to obtain and document some articles
- in addition to Protocol notes from GLOBE program.
- choosing different locations for the study and being very precise when selecting the location for the preparation for the application process for data collection.

Table (3) shows the locations of implementing the research plan

Activity	Location
Bring two plants from wild berries and note the effectiveness of water on them	The school
Study the properties of water	the water source for Al-Dhuhairia well and Al Masarat water
Specifying study location	Al-Nahdhah neighborhood

Bring two plants from both regions	Al-Nahdhah neighborhood and AL Dowahriah

* Determine the appropriate activities (protocols) to be applied to collect data

Table (4) Protocols applied in the research

Activity	**Appropriate protocol**
Plant cultivation, water effectiveness and study of plant properties	Plant Cover Protocol
Study of water properties for both sources (Al-Nahdhah District, Dhuhariya)	Water protocol

* Determine the appropriate devices and tools to carry out the work (acidity measuring device - salinity and conductivity measuring device - tape- GPS - Metric - Ruler - Sensitive scale - Distilled water - Cups - Stirring tool - Transparency tube – Thermometer -Paper – Pen).

* Application of research to samples through the application of appropriate protocol activities (ground cover and water)

Table (5) Explaining the mechanism of applying protocols for data collection

Research questions	**The protocol**	**Mechanism of application**
The first question	Vegetation protocol	Know the environment that the wild berry plant adapts to
The second question	Water protocol	Study the properties of Masarat water

The third question	Water protocol	Study the properties of water salinity for both sources and know the source that the wild berry plant adapts to.

* Taking samples from the study sites at the appropriate times and according to the specifications codified by the work team. The worksheets were designed, and the wild berry plant growth data was recorded weekly, in addition to watering it in equal quantities each time.

* Data collection and organization in tables.

* Entering data on the program's website (www.GLOBE.gov).

* Data analysis and graphical representation.

* Coordinate a visit to the Agricultural Development Department in Wilayat of Dank for more scientific explanations on the data.

* Coordinate a visit to Be'ah for more scientific explanations related to the wild berry plant.

* Finding the results and recommendations.

Second: The study site:

The plan of this research was implemented in the Sultanate of Oman - Al Dhahirah Governorate - Dank Province, where the wild berry plant was planted in the school garden and the vegetation protocol and water protocol were applied. Two sites were also visited to implement the water protocol. The maps below show this geographical area.

Pictures (1) and (2) are the geographical area of the research application site

Location of Al-Nahda district: Longitude: 23.31 / Width: 56.32 / Height: 501

Location of Al-Dhowahriyah District: Longitude: 23.3 / Width: 56.29 / Height: 499

Third: Data collection and analysis:

A draw has been used to determine the work of each student. The research team and their roles, which each student will perform through a schedule that defines the actions of each student and the protocols that will be reviewed in the steps:

1. Water protocol: Two samples were taken from (Al-Massarat Water, Al-Dhuhairia Well Water) and examined using the salinity, acidity and conductivity device, then the average was taken.
2. A comparison of the salinity, acidity and conductivity of the water (Masarat and Al-Dhuhairyia well) and knowing of the amount of change in it, through samples taken from the source.
3. Plant Protocol: Compare plant length and width by applying plant protocol.
4. Making a comparison table with all of the above and data charts to know the effect of acidity, water salinity and plant growth (wild berry).
5. Through the study of the site, it became clear that both the (Dhowaiharia and Al-Nahdha neighborhood) distribute water sources, as the Dhowharya water source (Al-Dhowhairiya well) and Al-Nahdha (Masarat water)

6. Then, all the protocol information and study sites were recorded in the program and copied.

Through the data of the water, which turned out to be distinguished in: -

Data of water protocol for Massarat Water

1. Has large salinity which affect the plant (wild berry)
2. the water salts the soil and makes it unsuitable for cultivation, and it is considered a type of desertification
3. PH (8.55), salinity (1161)

Data of Plant cover protocol which waters Massarat Water

1. The effect of the plant was evident from the third week on which it got affected in (plant height, width and number of leaves).

2.The length of plant in the first week (92), last week (86)

3.the width of the plant in the first week (2), last week (1)

4.Number of leaves in the first week (7), last week (1)

Data of water protocol for AL Dhowaihiriya well water

1. salinity Average (639) and conductivity Average (668).
2. PH Average (8.88) and temperature Average (25)

Data of Plant cover protocol which waters AL Dhowaihiriya well water

1. It turned out that the water of Al-DJowahairia well had more effect on the plant because the new leaves had grown
2. Length of plant in the first week (107) and Last week (125)
3. Length of plant in the first week (1) and last week (2)
4. Number of leaves in the first week (7) and Last week (13)

Results:

Through the application of the water and vegetation protocol for the study site (Al-Nahda district) and another site for comparison (Al-Dhowahriya), pictures (1) and (2) were taken of how to collect data as follows:

Application and collection of waster protocol data

Picture 1 and Picture 2

The results that we reached from the study site (AL Dhowiharia area and Al-Nahdha district) were as follows:

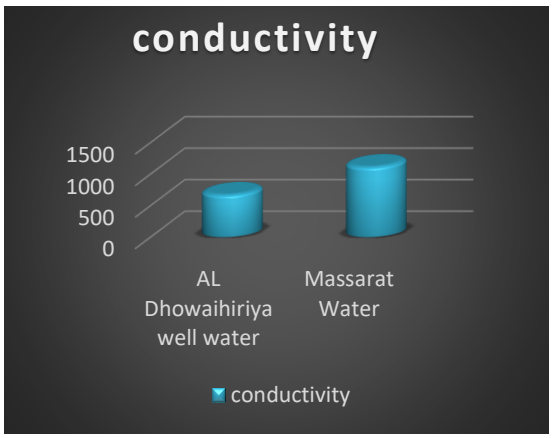
First: A comparison of water characteristics between the two study areas:

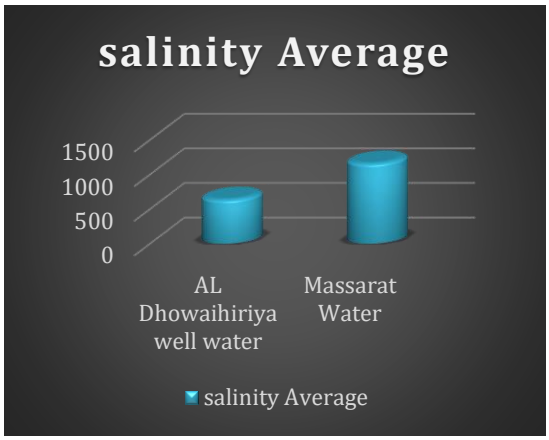
Table (6) comparison between Al Nahda and Al Dhawharia neighborhood water

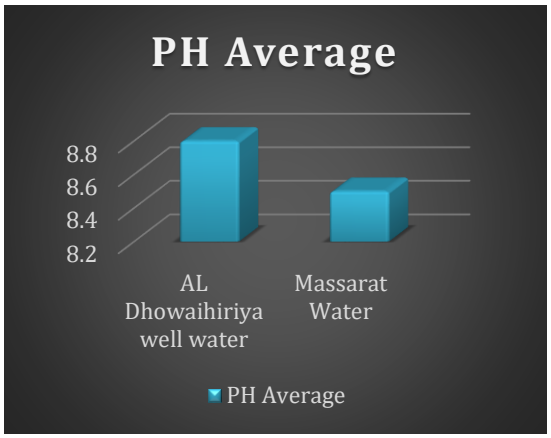
comparison	Salinity Average	Conductivity Average	Ph Average	Temperature Average
Masarat Water	1161	1111	8,55	25
Al-DHuhairia well water	639	668	8,88	25

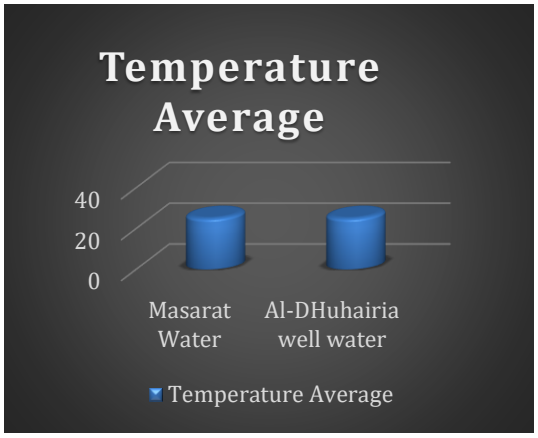
The data (1), (2), (3) and (4) were reached through the salinity and conductivity of the waters of Al-Nahda and Al-Dhuhairia neighborhood as follows:

And acidity and temperature were as follows:









Figures 1,2,3 and 4 are water properties data

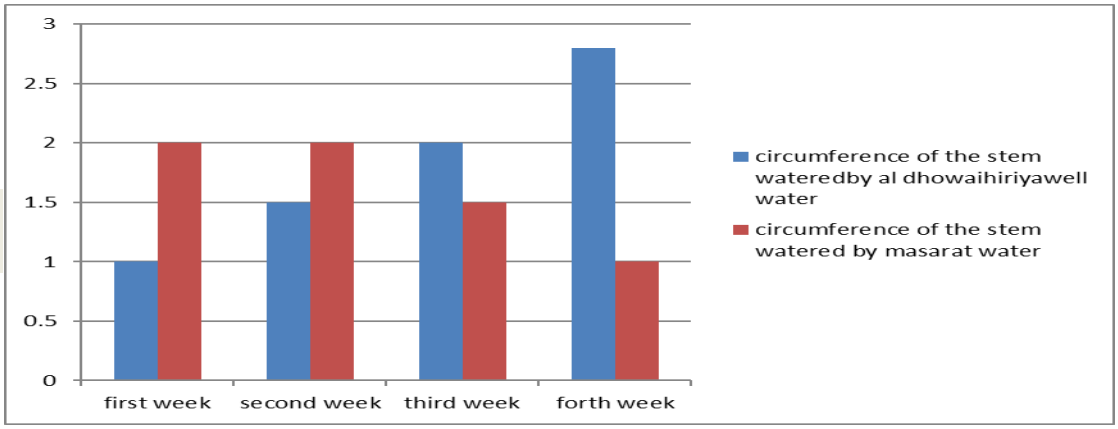
Table (7) a comparison between the number of leaves and the circumference

and length of the stem in the Dhowahairia plant and Hay Al-Nahda plant:

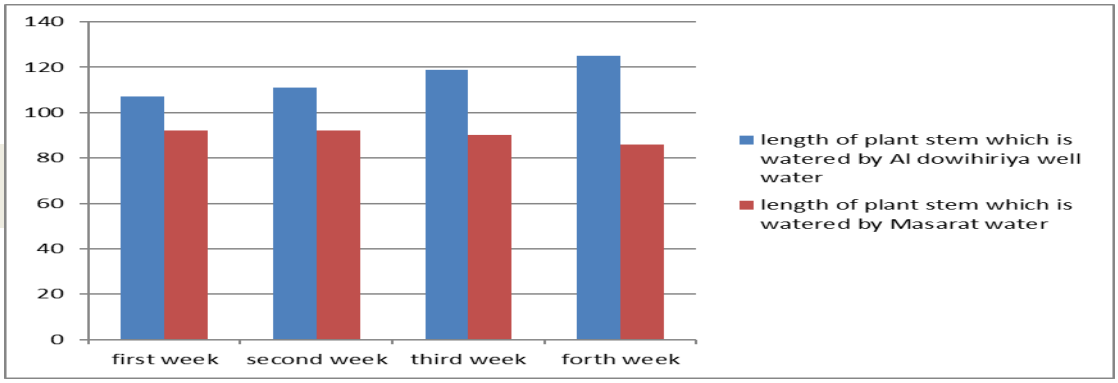
comparison	**Leg circumference**		**Leg length**		**Number of sheets**	
	The plant that is watered by a well water (Al Dhowaihiriya)	The plant watered with Masarat water	The plant that is watered by a well water (Al Dhowaihiriya)	The plant watered with Masarat water	The plant that is watered by a well water (Al Dhowaihiriya)	The plant watered with Masarat water
The first week	1	2	107	92	7	7
second week	1.5	2	111	92	8	6
Third week	2	1,5	119	90	10	4
Forth week	2,8	1	125	86	13	1

We came to (5), (6) and (7) data which is a comparison between the circumference of the stem and its length, and the number of leaves in the plant for Al-Dhowahayriyah (well water) and Hay Al-Nahdha plant (Al-Masarat water).

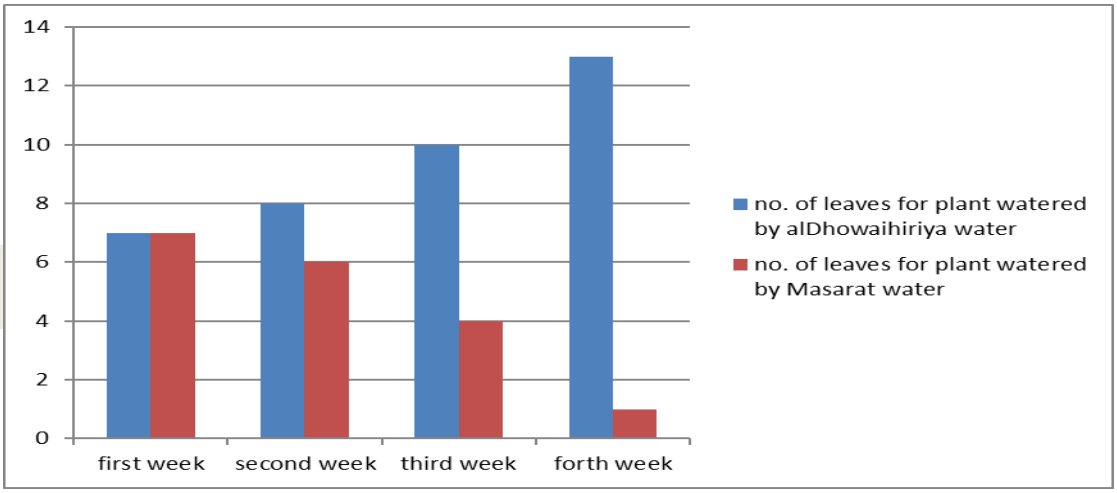
(5)



(6)



(7)

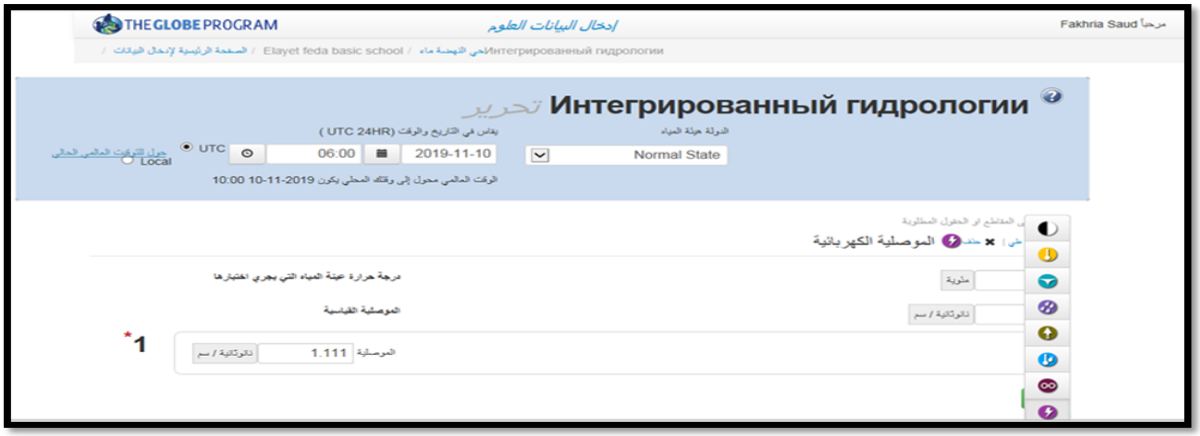


Entering data at the program site where we entered new sites, data and water:

(3)

(4)

(5)


THE GLOBE PROGRAM
إدخال البيانات العلوم
Fakhria Saud مرحباً
Elayet feda basic school
Интегрированный гидрологии
تحرير Интегрированный гидрологии
Normal State
UTC
Local
06:00
2019-11-10
الموصلية الكهربائية
درجة حرارة عينة المياه التي يجري اختبارها
الموصلية القياسية
1.111

(6)


THE GLOBE PROGRAM
إدخال البيانات العلوم
Fakhria Saud مرحباً
Elayet feda basic school
Интегрированный гидрологии
pH
مقياس درجة الحموضة
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8.88
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10

(7)


THE GLOBE PROGRAM
إدخال البيانات العلوم
Fakhria Saud مرحباً
Elayet feda basic school
Интегрированный гидрологии
الموصلية الكهربائية
درجة حرارة عينة المياه التي يجري اختبارها
الموصلية القياسية
0.668
التملح

(8)


THE GLOBE PROGRAM
إدخال البيانات العلوم
Fakhria Saud مرحباً
Elayet feda basic school
Интегрированный гидрологии
Salinity kit
manufacturer
1.384

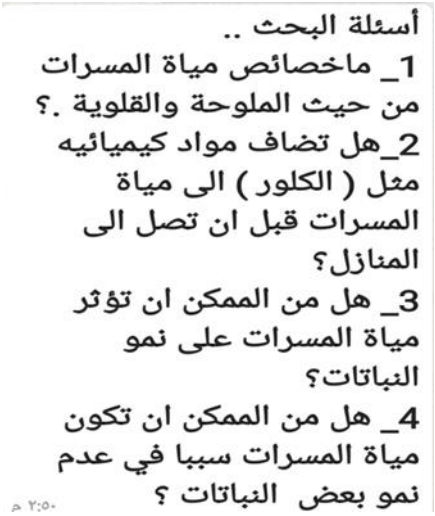
Pictures (3), (4), (5), (6), (7), (8), water protocol data

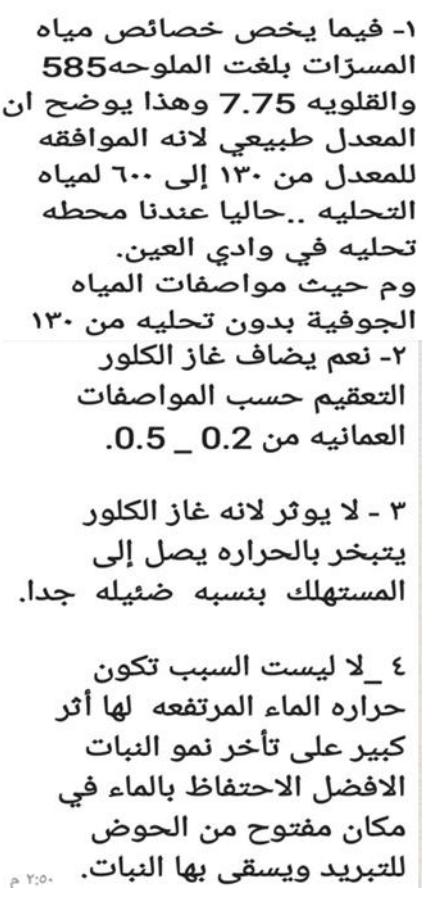
Interviews with people of Hay Al Nahdha: -

We Interview with some farmers to look closely if there are external causes affecting the death and growth stopping of wild berry in the Al-Nahdha district, and record those reasons:

- An Increase in salinity and conductivity in Masarat water
- The area is above sea level.
- The different timing of sunrise between the two places
- The farmers kill the wild berry to provide another area for growing a different plant

Interview with a specialist: - (in Arabic)


أسئلة البحث ..
1_ ماخصائص مياة المسرات من حيث الملوحة والقلوية .؟
2_هل تضاف مواد كيميائيه مثل (الكلور) الى مياة المسرات قبل ان تصل الى المنازل؟
3_ هل من الممكن ان تؤثر مياة المسرات على نمو النباتات؟
4_ هل من الممكن ان تكون مياة المسرات سببا في عدم نمو بعض النباتات ؟


١- فيما يخص خصائص مياه المسرّات بلغت الملوحه585 والقلويه 7.75 وهذا يوضح ان المعدل طبيعي لانه الموافقه للمعدل من ١٣٠ إلى ٦٠٠ لمياه التحليه ..حاليا عندنا محطه تحليه في وادي العين.
وم حيث مواصفات المياه الجوفية بدون تحليه من ١٣٠
٢- نعم يضاف غاز الكلور التعقيم حسب المواصفات العمانيه من 0.2 _ 0.5.

٣ - لا يوثر لانه غاز الكلور يتبخر بالحراره يصل إلى المستهلك بنسبه ضئيله جدا.

٤ _لا ليست السبب تكون حراره الماء المرتفعه لها أثر كبير على تأخر نمو النبات الافضل الاحتفاظ بالماء في مكان مفتوح من الحوض للتبريد ويسقى بها النبات.

Answers:

1. The salinity of Masarat water reached 585 and alkaline no. is 7.75 and it is a normal rate and it corresponds to130 to 600 of desalination water, we have a water desalination in AL Ain valley. And regarding ground water properties with desalination is 130.
2. Yes, chlorine gas is added according to the Omani specifications from 0.2 -0.5
3. No, because the gas evaporates with heat and it reached the consumer with small amounts.
4. No. the high temperature of water might effect on the growth of the plant so better to keep the water in open areas for cooling and then using it to water the plants.

An interview with a specialist

The research questions:

1. What are the properties if Masarat water in terms of salinity and alkaline?
2. Are chemicals such as (chlorine) added to Masarat water before it reaches houses?
3. Is it possible that Masarat water might affect the growth of plants?
4. Is it possible that Masarat water is the reason for nor letting dome plants grow?

Discuss the results:

Result Discussion:

Through our results, it became clear to us that the salinity and conductivity of water in Al-Nahdha farm is high compared to AL Dhowaihirya water. And after research and verification it became clear through studies that the salinity of water affects negatively in soil fertility and its ability to grow.

Then we concluded that the salinity of the neighborhood of Al-Nahda and Al-Dhuhayriya is different. This indicates that the salinity of the water is the highest in Hayy Al-Nahda, despite the similarity of the soil quality in the two sites (Al-Dhuhariya and Al-Nahda).

From the data we can conclude that the type of water affects the growth of wild berry plant, then we identified internal causes that cause the death of plants. We reached the external factors affecting the death of wild berry plant through an interview with one of the farmers and explained to us that the salinity of water is the main reason, and the height above the sea surface affect the ability of plants to live.

Table (8) shows the following answers to research questions and protocols used:

Question	Used protocol	Answers
1	Vegetation protocol	- Because Masarat water has much salinity more than what wild berry plant can bear. - The height of area above the sea surface level
2	Water protocol	Decrease leaves number, circumference, length of the stem which lead to the case of the growth stopped of the plant.
3	Water protocol	Yes, because the wild berry plant does not bear the salinity of Masarat Water

Conclusion:

We have tried in this research to identify the causes of the death of wild berries in the neighborhood of Al-Nahdha, so we as students experimented

with a process (by examining two water samples from Al-Nahda and Al-Dhowaihayriyah) as well as making field visits.

We reach the following:

External factors such as the salinity of Masarat water is high.

And through that we conclude that the water of the Al-Nahdha neighborhood has properties that differ from those of the water in the Al-Dhowihairah region:

Al-Dhowaihairyia water features: high alkalinity and low salinity.

Water characteristics of Al-Nahda: low alkalinity and high salinity.

We can apply the research again so that we can collect a sample from the neighborhood water of Al-Nahda and Al-Dhowihayriyah and grow it in school soils and keep watching the growth and flowering of plants, and apply the water protocol and the vegetation protocol.

Through these results, society must work hard and diligently to find solutions to help this tree grow.

- Suggestions:

We also suggest to agricultural institutions to provide farmers with solutions to reduce the salinity of irrigation water, and we suggest to the people of Al-Nahdha to make a water source so that the salinity of the water is equal to help in the growth of different plants.

- Recommendations:

We also recommend agricultural institutions to create awareness and training workshops for farmers so that they have the appropriate awareness regarding cultivation.

Thanks and appreciation:

We are pleased to extend sincere thanks to everyone who contributed to the completion of this research. We would like to thank:

1) The two supervisors: T. Fakhriya Al-Balushi and T. Jamila Al-Maamari

2) All school staff: to provide support and facilities for the work of this research.

3) The General Authority for Water in (Ibri): -for the valuable information on Masarat water and its effect on plants.

4) T. Fakhriya Al-Balushi: who did not spare an effort to communicate all that is new in science and knowledge regarding research.

5) The headmistress and her assistant: for their role in providing scientific and knowledge advice and guidance in relation to research.

We also thank all those who contributed to help and provide scientific information on the subject of research. We also thank the people of the AL Dhowihayriyah and Al-Nahdha regions for the opportunity to test two samples of water, and for Aisha Bint Abdullah Al-Wahshi, Head of the Quality Department of the Employment Directorate in Al-Dhahirah Governorate.

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