Comparing the growth of the eggplant in different agricultural medium

Done by:

Maladh Al Maimani

Adhari Al Balushi

School:

Umm Kulthum bint Uqba for basic education

Supervisor:

Amira Al-Balushi

Date:

12/12/2019

Table of contents

Topic	Page number
Summary	3
Research Questions - Introduction	3-4
Research methods	4
Results	7
Discuss the results	9
Conclusion – Acknowledgement	10
References	12

Summary:

Our research aims to exploit natural resources in the agricultural production process and find different agricultural mediums that replace the soil due to the presence of the problems that it suffers from, such as salinization of the soil. We have prepared three questions to answer them through experiments and research studies and they are as follows:

How can the regular direct soil be replaced with agricultural mediums? What are the problems that farmers face when planting directly on the soil? And what are the results of using other agricultural mediums as a substitute for soil?

And we used the ground cover protocol to carry out studies on eggplant. which we distributed over five pots containing different agricultural mediums: (pitmos, sawdust, palm fronds, valley soil, and valley soil mixture with pitmos) and we monitored their growth weekly for four Weeks until we concluded that the pitmos are the best agricultural medium for their high porosity, which allows gases to reach the roots, as it contains large proportions of organic materials. We also found that sawdust and palm fronds are the least preferred mediums even though they have been sprinkled with water. and while we were doing this, we faced the problem of the erosion of the leaves and it was solved by boiling neem leaf, and finally we recommend farmers to use pitmos and valley soils, especially in areas where there is a problem of salinization or other problems.

Research questions:

1- How can direct normal soil be replaced with other mediums?

2- What are the problems that farmers face when planting directly on the soil?

3- What are the results of using other agricultural mediums as a substitute for soil?

Introduction:

Agriculture depends on the composition of the agricultural medium and the way it is managed. It includes organic, mineral and microbiological materials. Therefore, in recent years, the problems that regular agriculture faces spread within the greenhouse such as salinization of soil and fungal diseases. so the idea of our research came to exploit the natural resources available in the environment in the agricultural production process.so, we have conducted research studies on the use of sawdust, palm fronds and pitmos as an agricultural medium instead of disposing them by burning or throwing them and instead using them as bedding for poultry raising which pollutes the environment and then compare it with normal soil, where there are many ways. It may be used as an agricultural medium, whether as an improvement or fertilizer for the soil or under the conditions of greenhouses as a substitute for natural soil. Moreover, due to the good quality of the fruits, the low cost, does not bring weeds and reduce insect pests, as it does not need to do many agricultural operations such as tillage and weeding as cultivation in the normal soil, this leads to saving effort and time.

Research methods:

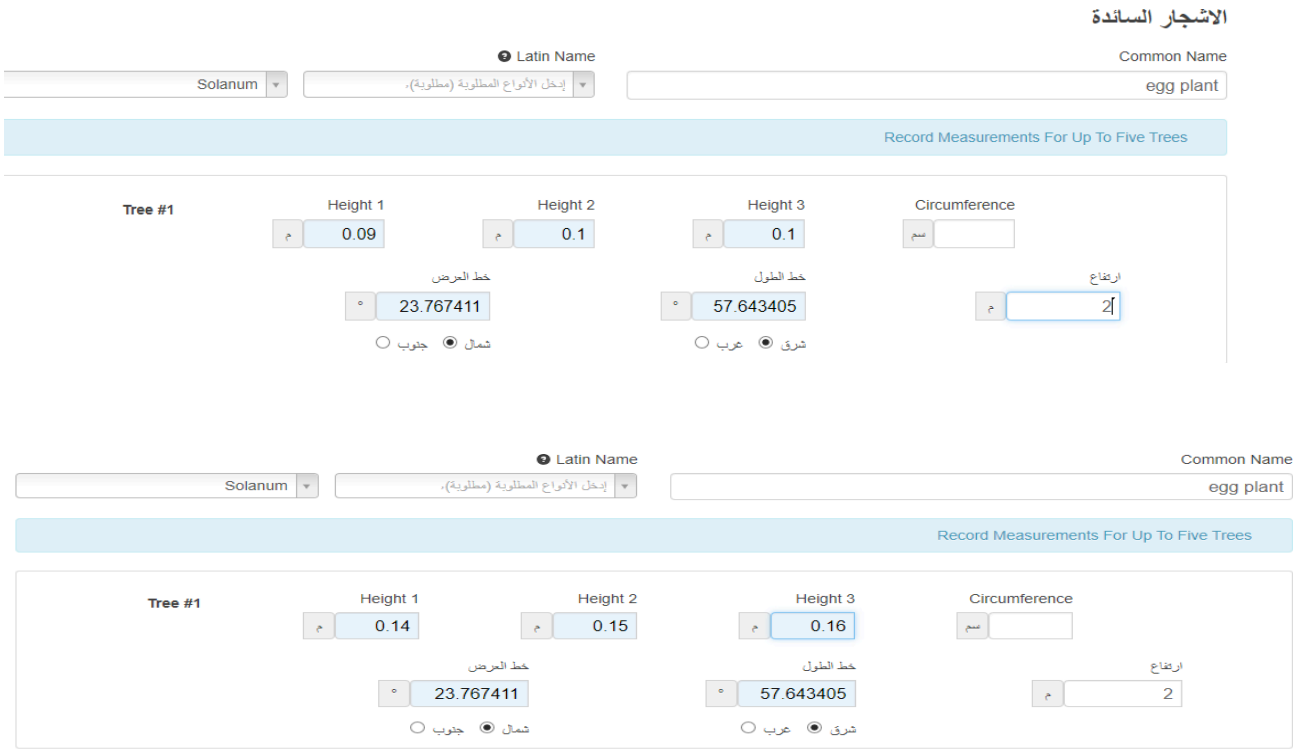
1. Study site: Al-Musanna'a / Al-Shuaiba

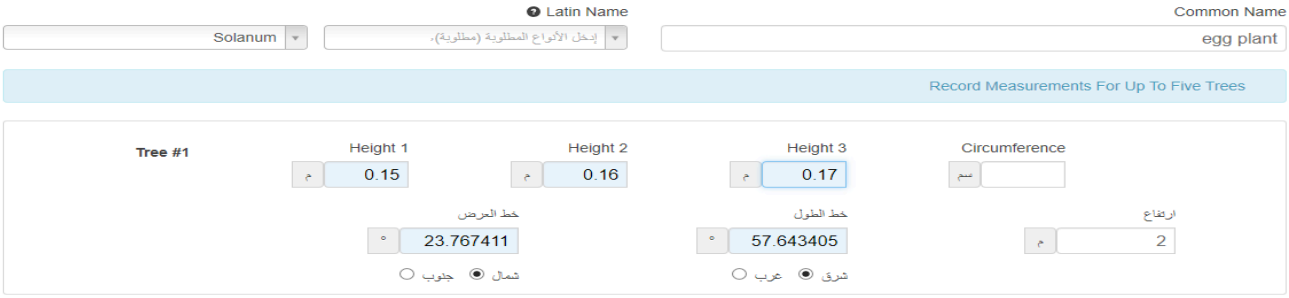
Longitude 57.643405:

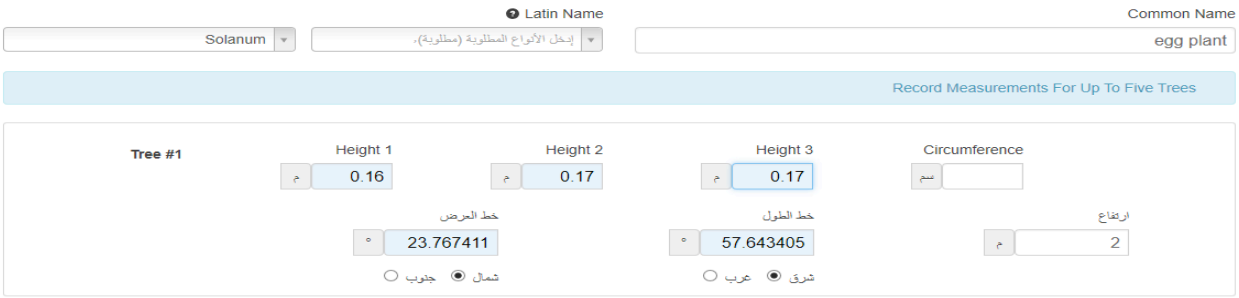
Latitude: 23.767411

2. The protocols used: plant protocol
3. Climatic characteristics: winter
4. Data Collection:

We distributed five agricultural mediums in five pots, where we first brought the soil of the valley from a valley near the school. Then we put it in the pot allocated for it and then we brought two samples for sawdust and palm fronds in cooperation with the Agricultural Research Centre and finally we put the pittmos that were brought from a nursery in the last pot. Then, we mixed all these mediums with water and then we planted the (eggplant) on it for easy handling and rapid growth. It was watered daily with water and implemented the ground cover protocol in the farm by monitoring the length of the plant and the number of leaves per week for a period of time (Four weeks).







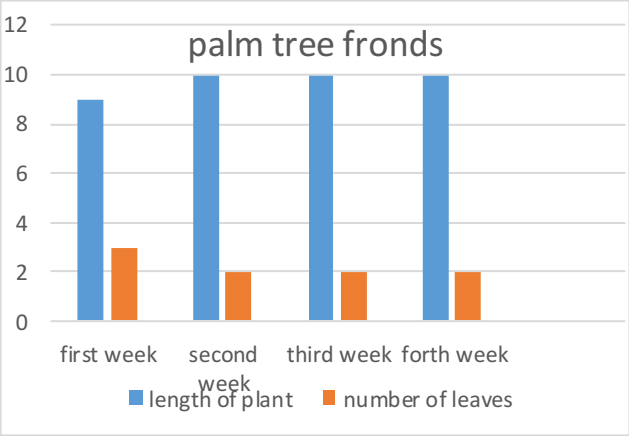
Research Plan:

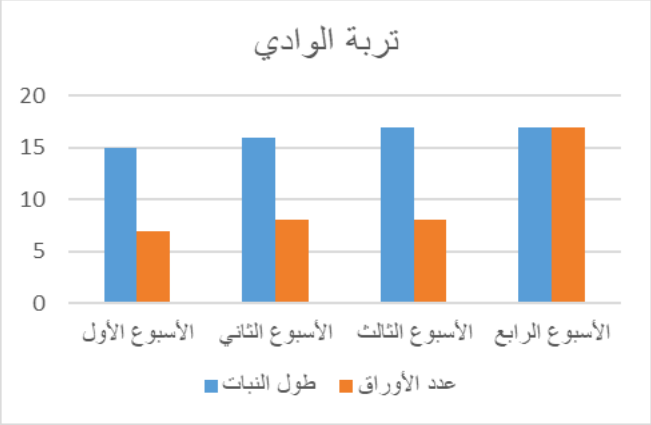
Task	Student
Distribution of roles to the team	Maladh and Adhari
Implementation of the research topic by placing seedlings of eggplant in different mediums: pitmus soil - valley soil - sawdust - ground palm leaves	Maladh and Adhari
Measuring the length and number of leaves of each seedling per week	Maladh

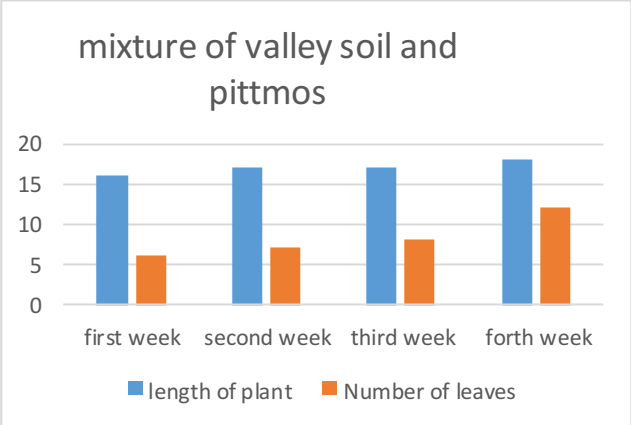
in four weeks	
Record data and periodic notes	Adhari

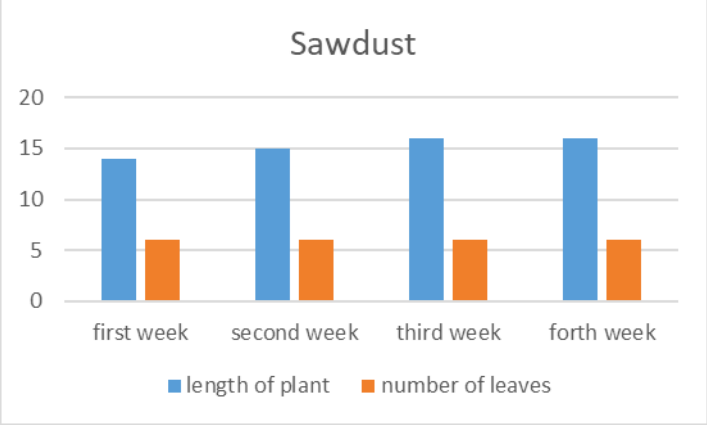
Results:

Weeks	**First week**		**Second week**		**Third week**		**Forth week**	
Mediums/ measurements	Number Of leaves	length of the plant	Number Of leaves	length of the plant	Number Of leaves	length of the plant	Number Of leaves	length of the plant
Palm fronds	3	9	2	10	2	10	2	10
Pitmos	7	16	8	18	9	19	22	37
Valley soil	7	15	8	16	8	17	15	17
Valley soil and pitmos mixture	6	16	7	17	8	17	12	18
Sawdust	6	14	6	15	6	16	6	16


palm tree fronds
12
10
8
6
4
2
0
first week
second week
third week
forth week
length of plant
number of leaves


تربة الوادي
20
15
10
5
0
الأسبوع الأول
الأسبوع الثاني
الأسبوع الثالث
الأسبوع الرابع
طول النبات
عدد الأوراق


mixture of valley soil and pittmos
20
15
10
5
0
first week
second week
third week
forth week
length of plant
Number of leaves


Sawdust
20
15
10
5
0
first week
second week
third week
forth week
length of plant
number of leaves

Discussing the results:

1- We have noticed the natural growth of plants in the valley and pitmus soil is more than in the sawdust and palm fronds, due to their high porosity, which leads to ventilation of roots, non-rot and gases reaching them, as they contain organic materials in high proportions. (second week)

2- We noticed the emergence of erosion in the leaves of the plant and we addressed the problem by spraying the plants with Neem soaked (boiled Neem leaf and water).

3- To answer the first question, we brought five pots in which we put different agricultural medium. Moreover, we brought soil from the valley near the school, and we distributed pitmos, palm fronds, sawdust, and valley soil and mixed with a little water and then put it in the pots, And we planted the eggplant in the pots and watered it with water in a daily basis for a certain amount and monitored them for four weeks.

4- To answer the second question, we concluded that cultivation in these mediums solves the problems of soil salinization and fungal diseases.

5- We answered the third question by noticing the growth of the eggplant, the absence of harmful herbs that affect the plant and therefore we saved cost, effort and time because it does not need a lot of agricultural operations such as tillage and weeding.

Sources of error

Amount of water

Comparing to previous studies:

The Agricultural Research Centre in the South Al Batinah Governorate has done an experiment using the sawdust of palm trees and wood in the production of tomatoes, sweet pepper and cucumber under the conditions of protected houses by the cultivation system without soil. Moreover, the use of palm leaf sawdust in the production of bananas under the conditions of the

South Batinah governorate field. They added to that the organic substance of vital role in solving the problems of agricultural lands, because it is an important part of the absorption compound that keeps the nutrients in plants. At the same time, the organic substance is an important source of energy needed for most of the soil organisms.

The head of the Plant Production Research Centre added that with the decomposition of the organic substance in the soil. Its components are distributed from the nutrients where the plant benefits, explaining that, according to the research studies conducted, palm fronds contain a high percentage of protein and organic materials as well as for sawdust and therefore they can be used as agricultural medium to grow some important crops.

Through this research, we answered the questions that we put before starting studies and experiments, and we realized how important it is. And how beneficial it is for farmers, the local and agricultural community.

Conclusion:

After we measured the number of leaves and the length of the plant on a weekly basis for a period of four weeks, we noticed the growth of pitmos and the valley soil. Moreover, the emergence of a number of leaves and this indicates that these mediums are the best for cultivation. While the growth of sawdust and palm leaves remained constant from the second week. While preparing these experiments and studies, we faced the problem of leaf erosion. And if we wanted to re-examine the mediums, we will adjust the amount of water and temperature. Finally, we recommend farmers to use pitmos and valley soils, especially in areas that suffer from the problem of salinization of the soil and other problems.

Acknowledgment:

We extend our sincere thanks and appreciation to all those who supported and contributed to completing this research and they are:

1- Engineer / Nasser Al-Wahaibi, Senior Soil Specialist, provided us with valuable information on how to grow plants in other mediums.

2- T. Aisha Al Baloushi, a teacher of mathematics, provided us with valuable information that is useful for our research and contributed to providing a farm to conduct the experiment.

3.T. Afrah Al-Khumsiah, Learning Resource Centre Specialist, let us use the information network to search for information related to research.

References:

- Sameh Amin, Al-Watan newspaper (5/4/2018), success in finding agricultural mediums locally and that are eco-friendly, Muhammed bin Suleiman Al-Tai
- alwatan.com/details/253990
- Mechanisms of agriculture without soil
- zr3h.mosw3a.com/arabq3591/
- Agriculture without soil and the importance of the agricultural community used.
- https://kwagri.org/2017/07/11/ Agriculture-without-soil-and the most important circles-farmers /