



## A Study of the Effect of Some Natural and Human Factors on Date Palm Cultivation in the Hilla District, Iraq

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### Article Information

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### Abstract:

The current study aimed to study some of the natural and human factors that affect date palm cultivation in the south of Babil Governorate, as the natural factors included the surface, climate, water and soil, and the human factors included labor force, capital, market, fertilization, transportation and marketing. The study includes several areas in the south of Babil Governorate, such as (Al-Hashimiyyah district, Al-Qasim district, Al-Tali'a district, as well as Al-Hamza Al-Gharbi district and Al-Shomali district) as all these areas contain palm trees. The rate of rainfall and wind speed in the study area were based on previously published information. It showed The results of the study indicate the impact of natural and life factors clearly on the decline in the productivity of palm trees

through the problem of soil salinity. Also, human factors have the greatest impact on the decline in palm productivity through its role in providing water requirements for palm trees, the lack of number of workers in the agricultural sector and the neglect of farmers, and Thus, the productivity of palm trees is deteriorating in quantity and quality.

**Keywords:** *palm trees, climate, soil salinity, composting, Babylon city.*

### Introduction

The importance of the study lies in the fact that palm trees are one of the most important food sources in the Hilla district, and that they are exposed to the phenomenon of desertification, which leads to a decrease in productivity in quantity and quality.

Iraq was ranked first in the production and export of dates globally and in the Arab world, but it has fallen to late ranks due to the exposure of palm trees in Iraq in general and in Babil Governorate in particular, and for more than three decades to neglect and deterioration, as the number of palm trees and the quantity of production decreased significantly as a result of the conditions it went through. Iraq, in addition

to infecting large numbers of them with diseases and their prices falling at levels that are not commensurate with the costs of production, which led to the reluctance of many farmers to pay attention to them. Therefore, this research came as an attempt to study the problems facing palm production in Iraq, so it is necessary to prepare plans for the advancement of palm trees and identify the problems that It faces it because it is an important element for preserving the environment and combating desertification and being one of the basic and important food sources in human life. The study area included several districts and sub-districts in the south of the governorate. These districts and sub-districts are Al-Hashimiyyah district, Al-Qasim district, Al-Tali'a district, as well as Al-Hamza Al-Gharbi

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district and Al-Shomali district. The boundaries of the study area are (south of Babil Governorate) from the south, Al-Qadisiyah Governorate, from the north, the city center, from the south, Al-Kifl district, and from the west, Wasit city.

## Natural Factors Affecting Date Palm Cultivation

### Surface

The surface contributes to determining the type of agricultural production and the necessary agricultural operations, such as the nature of tillage, irrigation and drainage operations.

The lands of Babylon Governorate are considered part of the Iraqi sedimentary plain, which is generally erected with a slight slope from north to south and southeast, passing the contour (18.5 meters) and then declining in the far south of the province to reach (10 meters). Secondary and local variations appear in the surface of the province due to many factors, the most important of which The geothermal sedimentation process and profitability.

We summarize from the foregoing that the surface of the governorate, despite its variation in height, is still not an obstacle to the progress of agricultural operations, except that the lack of slope led to the difficulty of surface drainage of excess irrigation water, and thus the emergence of the problem of salinity.

### The Climate

The climate includes several elements that affect palm cultivation, including the following:

#### Temperature

When we studied the distribution of palm trees in the world, we saw that the expansion of its cultivation area recedes between latitudes (100-350) north and does not exceed latitude (240-440) north, and the topography of the earth's surface also has an effect on the temperature as well, as it was found that the air temperature decreases at a rate Celsius as it rose (184 meters) on the surface of the earth, the date palm bears temperature fluctuations to a large extent, and

the temperature at which growth stops is the degree that was called (zero point) (Al-Ansari, 2021). The date palm needs somewhat high temperatures and continues to grow throughout the months of the year or most of it. The palm tree continues to grow throughout the year if the average daily temperature is more than 9 degrees Celsius during the winter months.

### Rain and Moisture

Dates, as well as a close relationship with rainwater, are not hidden. They are usually washed with river water to remove the dirt and dust attached to them. If I want to press them with plates or wicker, then washing them in this case is important, provided that the washing is accurate and in an appropriate amount so that they do not affect their vitality. Indeed, when the dates are picked and placed on the mats, and rain falls on them, they quickly spoil and turn into poor quality, which the commercial market does not care about, and in that case they are not edible. It gives it vitality and a view (Al-Tafili & Al-Jassani, 2021).

**Table 1. Average Annual and Monthly Rainfall in the Hilla District for the Period (2001-2011)**

Months	Rainfall rate
January	23.3
February	14.7
March	13.2
April	12
May	2.4
June	0.1
July	0
August	0
September	0.1
October	3.7
November	14.2
December	14.2
<b>Average</b>	<b>83.1</b>

Palm groves are found in arid or semi-arid areas, and these areas are characterized by scarcity of rain, especially in the summer. The months of June, July, August, September and October are among the important months in the growth and ripening of date palm fruits. The absence or lack

of rainfall in these months in the study area leads to the ripening of dates on palm trees naturally. It is clear from Table (1) that the annual average rainfall in the study area is 83.1, as the month of January recorded the highest rate, reaching 23.3, while the months of July and August recorded the lowest rate in terms of rainfall.

### Wind

The winds do not have a significant effect on the date palm, for in the desert strong winds blow with dryness and heat, and they may carry with them dirt and sand. Strong storms may cause the fall of the tall, weak palm tree, or the one growing in shallow soil, or the one whose trunk is affected by necrosis of the stem pits. Also, the palm tree that uproots its entire shoot at once is exposed to fall (Neumann & Parpola, 1987). If high winds blow, the healthy young palm tree is not affected by strong winds, because the trunk of the palm tree has flexibility, strength, and fixation in the ground with its dense roots, which helps the palm tree to resist severe hurricanes.

**Table 2. Average Monthly Wind Speed (m/s), Its Direction, and the Number of Days of Dust Storms in Hilla District for the Period (1981-2013)**

Months	Average wind speed m/s	Average number of days of dust storms	Prevailing wind direction
January	1.4	1	North-west
February	8.1	5	North-west
March	2.2	7	North-west
April	1.9	9	North-west
May	2	18	Northern
June	2.4	6	Northern
July	2.6	1	North-west
August	2	1	Northern
September	1.5	1	North-west
October	1.2	1	North-west
November	1.1	3	North-west
December	1.3	1	North-west
<b>Total</b>	<b>1.78</b>	<b>54</b>	<b>North-west</b>

Northwestern winds prevail in the study area, as shown in Table 2, and the wind speed in the

district of Hilla reaches an annual rate of (1.78) m/s. However, this rate rises in the summer, reaching (2.4-2.6) m/s in June. and July respectively.

### Water

There are three sources of water in the study area, which are precipitation, surface water, and groundwater, as the amount of precipitation does not constitute an important source of life in the study area. As for surface water, it includes the main resources represented by the Euphrates River in its course and its branches.

The Euphrates River enters the governorate from its northwestern section at the Jurf al-Nasr area, heading towards the southeast, with a clear and regular course surrounded by a natural dam, and continues its direction until the Hindiyah Dam, where it splits into two large branches: River of al-Hashimiyya, which runs in a southeast direction, and River of al-Hindiya, which runs in a southern direction (Al Khalidy et al., 2012).

### Soil and Its Salinity

The study area is part of the sedimentary plain, so the soil is a type of riverine sedimentary soil that was formed as a result of the accumulation of sediments carried by the rivers. It was added to those river and water sediments brought by the wind from areas located outside the sedimentary plain in the form of air sediments. Therefore, this soil is from the soil transported from Rocks far from stable soil due to the similarity of the characteristics of the rocks of the area above it, and it consists of a mixture of various and numerous rock fragments, and this applies to the soil of the city as a whole. This soil is characterized by the presence of the phenomenon of stratification and the flatness of its surface with the presence of some small terrain in it and it is deep, as its depth reaches several meters and the level of the underground water is high During a period of suitable rise, the water in the Euphrates has a high degree of fertility compared to what can be observed in the fertility of the rest of the soils that are exposed to the desert climate, such as the one that prevails in the study area.

## Human Factors Affecting Date Palm Cultivation

### Manpower

The agricultural labor force is one of the main factors influencing agricultural production, as no agricultural activity can be carried out without it. Hence, the study of the labor force requires knowing the population of the region and revealing its spatial variation and geographical distribution (Chao & Krueger, 2007).

There is no doubt that any progress in the agricultural production of Iraq must depend to a large extent on what is available to it of manpower as a major element of production. its natural resources and its population (Hashim, 2022).

### Capital

Capital has a great impact on agricultural production, as modern agriculture requires a lot of money to be invested in purchasing machines, providing improved seeds, chemical fertilizers, and renting agricultural lands, and all of these require saving capital.

It can be said that modern agriculture is based on and relies on capital to a large extent, different from the old agriculture, which was based on self-agricultural production, which does not require a large amount of capital (Jubrael et al., 2005). We can imagine the role of capital used in agricultural production when we count the machines, plows, tractors, conveyors, and the value of chemical fertilizers and pesticides used in agricultural operations. And if we add to it what is spent on irrigation, drainage and building dams, it becomes clear to us the huge amount of capital used in modern agriculture, and this in itself is an important motive for the establishment of agricultural banks that prepare the agricultural product with the necessary capital for agricultural operations (Sharif et al, 2010).The provision of capital in its various forms for the farmer is considered one of the basic factors affecting agricultural production, and it is necessary for the farmer to have a large capital, especially if he is going to

apply mechanized methods on his farm, or if the agricultural land is high (Ali & Hama, 2016).

### Market

The market is its size or the amount of demand and its organization, and the flexibility of each of supply and demand, prices, profits and competition is one of the important economic factors that affect agricultural production (Abd Rabou & Radwan, 2017). Coexistence agriculture is not related to the market except slightly through the cash crops that it cultivates because it is produced for the purpose of self-sufficiency (Porter, 1993).

As for commercial agriculture, it is closely related to the market, but the subsistence economy is steadily shrinking in the world, and the importance of the percentage is constantly decreasing because the state is trying to develop its agriculture using the commercial formula (Ortiz-Uribe et al., 2019). The markets also have a clear effect in determining the quantity of production, as the markets represent the second aspect of the production aspects (Chabuk et al., 2015). The farm represents the first aspect in which the production process takes place, while the market represents the aspect that represents the consumption of that production.

The markets are divided into two parts: local markets and global markets. One of the characteristics of ancient agricultural production is that it was linked to the local market more than it was linked to the global market. The reason for this is due to the nature of agricultural products. All agricultural production is characterized by being affected by the time factor (Al-Shujairy et al., 2021).

### Composting

There is a misconception among many palm farmers that palm trees can grow and bear fruit under the worst conditions without the need for composting. Recent studies have proved the mistake of this belief, as it became clear that composting has a major role in the growth of palm trees, increasing its productivity, and improving the characteristics of its fruits, and that its needs of basic elements are no less than any other crop, in addition to its tolerance of

neglect and low soil fertility, but it responds very quickly to good service and composting (Hameed et al., 2023).

It is quite intriguing to note that this work supports earlier findings demonstrating the value of applied research in nature (Khierallah et al., 2015; Mohammed & Hadi, 2022; Mohammed et al., 2023).

## Conclusion

The impact of natural and life factors has clearly appeared on the low productivity of palm trees in the study area through the problem of soil salinity, which ranges from the riverside areas to the neighboring low lands, and thus its impact was reflected on the low production and its variation from one place to another and the life factors through the injury of the palm. It is infected with many diseases and pests, such as the donkey, the *Ommatissus binotatus lybicus* insect, the dust spider, and the disease of pollen.

It has been shown that human factors have the greatest impact on the decline in palm productivity through its role in providing water requirements for palm trees, so their production deteriorated in quantity and quality, through the conversion of the sex of the property from orchard to residential land, especially those close to the suburbs and administrative units, the lack of number of workers in the agricultural sector and neglect. The farmer of the orchards because of his ignorance and poor experience, as well as the high production costs compared to the marketing prices of dates, which was one of the important problems that led to the neglect of palm groves.

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## Conflict of interests

No conflict of interest.

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