

**IMPACT OF CLIMATE CHANGE ON WATER
REQUIREMENTS AND THE PRODUCTIVITY
OF POTATO CROP**

By

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**A Thesis Submitted in Partial Fulfillment
Of
the Requirements for the Degree of**

**MASTER OF SCIENCE
in
Agricultural Sciences
(Agriculture in desert and salt Affected Areas)**

**Arid land Agricultural graduate studies and Research Institute
Faculty of Agriculture
Ain Shams University**

2021

ABSTRACT

Mustafa Mohamed Abdel-Wahab Meligy : Impact of Climate Change on Water Requirements and The Productivity of Potato Crop, Unpublished M. Sc. Thesis, Department of Arid Land Agricultural graduate studies and Research Institute (ALARI), Faculty of Agriculture, Ain Shams University, 2021.

Climate change will affect many activities, but its effects on agricultural production may be severe. Estimates of annual damage in agriculture due to increased temperature or prolonged dry periods will be more costly than damage in other activities. Yield losses are caused by the direct and indirect effects of climate change on crops.

A field experiment was carried during two seasons, 2014/15 and 2015/16, at the experimental farm of Arid Land Agricultural graduate studies and Research Institute (ALARI), Faculty of Agriculture, Ain Shams University, Shubra al-Khaimah, Qalyubiah Governorate. There were nine treatments obtained by a combination of three planting dates (the 18th of Dec., the 7th of Jan. and the 27th of Jan.) and three irrigation levels (60, 80, and 100 % of irrigation water requirements (IR)) to study the effect of climate changes on the potato crop productivity. The obtained results indicated that the highest tuber yield was obtained by the first planting date (the 18th of Dec.) during both seasons. Regarding the irrigation level, the highest plant growth parameter and tuber yield were obtained by the high followed by the medium irrigation level during both seasons. The interactions indicated that the first planting date combined with the high irrigation level gave the highest potato tuber productivity compared to the other treatments. While the first planting date combined with the medium irrigation level gave the best values for water use efficiency (WUE) compared to the other treatments during both tested seasons. Also, under all climatic change scenarios by different percentages compared with the current conditions the lowest irrigation water quantity needed with cubic meter for irrigating one feddan of potato was projected under the RCP3 scenario in 2050; the irrigation water

requirement under climate change increased under RCP4.5, RCP6.0, and RCP 8.5 than RCP3 scenario. The highest seasonal irrigation water requirement was projected under RCP8.5 in 2050 and the 2100s.

Key words: Climate changes, Planting Date, Irrigation level, Potato, Yield, Water requirements, WUE.

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