

**SIMULATION AND COMPARATIVE ANALYSIS
OF SURGE, CONTINUOUS AND CUTBACK
IRRIGATION ON DIFFERENT SOIL TYPES**

By

Eng. Nadia Rasmy Mohamed Attia

**A Thesis Submitted To The
Faculty of Engineering at Cairo University
In partial Fulfillment of the
Requirements for the degree of
DOCTOR OF PHILOSOPHY
In
Irrigation and Hydraulics**

FACULTY OF ENGINEERING- CAIRO UNIVERSITY

GIZA- EGYPT

2014

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Under the supervision of

Prof. Dr. Kamal El-deen Milad Soliman

Dr. Mostafa Ahmed Ghaith

Professor of Irrigation & Drainage
Faculty of Engineering
Cairo University

Assistant Professor
Faculty of Engineering
Cairo University

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Approved by the examining committee:

Prof. Dr. Kamal El-Deen Milad Soliman, Thesis Main Advisor

Prof. Dr. Mohamed El Sherbini kiwan, Member

Prof. Dr. Mohamed Mohamed Nour EL-Din, Member
Professor of Irrigation and Drainage Engineering & Irrigation and
Hydraulics Department-Faculty of Engineering, Ain-Shams university

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2014

Engineer: Nadia Rasmay Mohamed Attia
Date of Birth: 30/10/1958
Nationality: Egyptian
E-mail: nadiaramv@yahoo.com
Phone: 01091721404
Address: 1 Murad Street, Giza
Registration Date: 19/6/2007
Awarding Date: //
Degree: Doctor of philosophy
Department: Irrigation and Hydraulics



Supervisors: Prof. Dr. Kamal El-deen Milad Soliman
Dr. Mostafa Ahmed Ghaith

Examiners: Prof. Dr. Kamal El-deen Milad Soliman
Prof. Dr. Mohamed El Sherbini Kiwan, Member
Prof. Dr. Mohamed Mohamed Nour EL-Din, Member
Professor of Irrigation and Drainage Engineering & Irrigation
and Hydraulics Department - Faculty of Engineering, Ain-
Shams University

Title of Thesis:
**Simulation and Comparative Analysis of Surge, Continuous and Cutback
Irrigation on Different Soil Types.**

Keywords: Continuous flow, surge flow, cutback irrigation, performance indicators,
overall efficiency.

Summary:

The main objective of this study is to characterize the behavior of the advance of water front in furrow into soil profile using surge irrigation and is to determine the application efficiency and distribution uniformity. This were done by adopting different furrow lengths at single and two field slopes in surge flow irrigation under different types of soil with high and low infiltration. Data were collected from field experiments at Sakha Agricultural Research Station, Kafer El Sheikh; Egypt. Maize crop was cultivated by using new surge flow irrigation technique and compared it with continuous flow irrigation. Different water inflow alternatives with different furrow lengths and field slopes have been evaluated for different scenarios to achieve the improved ones. SIRMOD Model was applied to simulate water advance for surge flow irrigation with fixed and variable cycle time, continuous irrigation, and continuous irrigation with cutback systems.

Acknowledgement

My great thanks to God, who knows all the best, the merciful; who gave me health, thoughts, and enabled me to reach the goal.

I wish to express my sincere appreciation, gratitude and deepest thanks to prof.Dr.Kamal EL-deen Milad Soliman, professor of Irrigation and Drainage Engineering, Cairo University, for giving me the valuable suggestions and constructive criticism throughout the whole work.

I am greatly indebted to Dr.Mostafa Ahmad Ghaith, Assistant Professor, Irrigation and Hydraulics Department, Cairo University for giving me the valuable help, guidance and instructions during the preparation of this thesis, and above all his continuous encouragement, kind attention and precious advice.

Finally, I offer my sincerest thanks to my parents who remembered me in their prayers and for their encouragements without which the present study would have been a mere dream.

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