

13.6 12.11.01
EVAPOTRANSPIRATION OF SOME CROPS

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B. Sc. Agriculture (Soils)

11

Thesis

**Submitted in Partial Fulfilment
of the Requirments For the Degree of
Master of Science
IN SOILS**



7185

**Soil Science Department
Faculty of Agriculture,
University of Ain Shams**



621.4
11.11.01
**A Contribution from
Bahim Agricultural Research Station,
Agricultural Research Center
A. R. E.**

1975

APPROVAL SHEET

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Title : Evapotranspiration of Some Crops

Thesis Submitted for the Degree of
Master of Science
in
Soil Science

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ACKNOWLEDGEMENTS

The investigation forming the subject of this Dissertation was carried out in the Agricultural Soils Department, Faculty of Agriculture, Ain-Shams University, under the supervision of Professor Dr. Hassan Hamdi, Professor of Soil Science and Dr. Mahmoud Talha, Associate Prof., Soils Department.

The author wishes to express his deepest gratitude and sincere thanks to them for their guidance, willing assistance and helpful kind advice throughout the course of this investigation.

C O N T E N T S

	Page
1. INTRODUCTION	1
2. REVIEW OF LITERATURE	3
2.1 Evapotranspiration	3
2.1.1 Measuring of evapotranspiration	3
2.1.1.1 Water balance method	4
2.1.1.2 The energy balance method	5
2.1.1.3 Aerodynamic method	6
2.1.1.4 Empirical formulae	7
2.1.1.4.1 Penman formula	8
2.1.1.4.2 Englemann formula	9
2.1.1.4.3 Manney & Griddle formula	10
2.1.1.4.4 Thornthwaite formula	11
2.1.2 Evapotranspiration of different crops	12
2.1.2.1 Sugar beet (<u>beta vulgaris</u> L.)	12
2.1.2.2 Onion (<u>Allium Cepa</u> L.)	14
2.1.2.3 Field beans (<u>Vicia faba</u> L.)	15
2.2 Influence of water on yield	17
2.2.1 Sugar beet	18
2.2.2 Onion	19
2.2.3 Field beans	20
2.3 Water economy	21

	Page
3. Materials and Methods	23
4. Results and Discussion	39
4.1 Measuring evapotranspiration	39
4.2 Influence on yield	71
4.2.1 Sugar beet	71
4.2.2 Onion	76
4.2.3 Field beans	80
4.3 The water economy	85
5. Summary and Conclusions	92
6. References	96

LINE OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
1	Chemical properties of the investigated soils	25
2	Physical properties of the investigated soils	25
3	Meteorological data at Bahthim during the growing season of sugar beet, onion and field beans	30
4	Adjusted pan evaporation data (E_A) using Hagleman equation during the growth season of sugar beet at Bahthim Experimental Station	31
5	Adjusted pan evaporation data (E_A) using Hagleman equation during the growth season of onion at Bahthim Experimental Station	32
6	Adjusted pan evaporation data (E_A) using Hagleman equation during the growth season of field beans at Bahthim Experimental Station	33
7	Calculation of consumptive use factor "r" using Blaney & Criddle equation during the growth season of sugar beet at Bahthim Experimental Station	36
8	Calculation of consumptive use factor "r" using Blaney & Criddle equation during the growth season of onion at Bahthim Experimental Station	37
9	Calculation of consumptive use factor "r" using Blaney & Criddle equation during the growth season of field beans at Bahthim Experimental Station	38

<u>Table</u>	<u>Title</u>	<u>Page</u>
10	Average monthly evapotranspiration rate (mm/day) for sugar beet cultivated in calcareous sandy loam, and clay soils	44
11	Average monthly evapotranspiration rate (mm/day) for onion cultivated in calcareous sandy loam, clay and sand soils	45
12	Average monthly evapotranspiration rate (mm/day) for field beans cultivated in calcareous sandy loam, clay and sand soils	46
13	Monthly and seasonal evapotranspiration (cm) of sugar beet cultivated in calcareous sandy loam, and clay soils	48
14	Monthly and seasonal evapotranspiration (cm) of onion cultivated in calcareous sandy loam, clay and sand soils	50
15	Monthly and seasonal evapotranspiration (cm) of field beans cultivated in calcareous sandy loam, clay and sand soils	52
16	Values of "c" factor for each month of the growth season for sugar beet cultivated in calcareous sandy loam and clay soils	62
17	Values of "k" coefficient for each month of the growth season for sugar beet cultivated in calcareous sandy loam, and clay soils	63

Table	Title	Page
18	Values of "c" factor for each month of the growth season for onion cultivated in calcareous sandy loam, clay and sand soils	64
19	Values of "k" coefficient for each month of the growth season for onion cultivated in calcareous sandy loam, clay and sand soils	65
20	Values of "c" factor for each month of the growth season for field beans cultivated in calcareous sandy loam, clay and sand soils	66
21	Values of "k" coefficient for each month of the growth season for field beans cultivated in calcareous sandy loam, clay and sand soils	67
22	The average seasonal values of "C" factor and "K" coefficient for sugar beet, onion and field beans cultivated in calcareous sandy loam, clay and sand soils	70
23	Yield characteristics of sugar beet cultivated in calcareous sandy loam and clay soils as affected by varying available soil moisture depletion level in the root zone	72
24	Yield characteristics of onion cultivated in calcareous sandy loam, clay and sand soils as affected by varying available soil moisture depletion level in the root zone	77

Table	Title	Page
25	Yield characteristics of field beans cultivated in calcareous sandy loam, clay and sand soils as affected by varying available soil moisture depletion in the root zone	81
26	Water economy for the production of sugar beet cultivated in calcareous sandy loam and clay soils as affected by varying available soil moisture depletion in the root zone	86
27	Water economy for the production of onion cultivated in calcareous sandy loam, clay and sand soils as affected by varying available soil moisture depletion level in the root zone	88
28	Water economy for the production of field beans cultivated in calcareous sandy loam, clay and sand soils as affected by varying available soil moisture depletion in the root zone	90

LIST OF FIGURES

<u>Figure</u> <u>No.</u>	<u>Title</u>	<u>Page</u>
1	Evapotranspiration rate throughout the growth season of sugar beet cultivated in calcareous sandy loam and clay soils under different levels of available soil moisture depletion in the root zone	40
2	Evapotranspiration rate throughout the growth season of onion cultivated in calcareous sandy loam, clay and sand soils under different levels of available soil moisture depletion in the root zone	41
3	Evapotranspiration rate throughout the growth season of field beans cultivated in calcareous sandy loam, clay and sand soil under different levels of available soil moisture depletion in the root zone	42
4	The relationship between average monthly air temperature, average height of plants and average monthly evapotranspiration for sugar beet	49
5	The relationship between average monthly air temperature, average height of plants and average monthly evapotranspiration for onion	51

<u>Fig.No.</u>	<u>Title</u>	<u>Page</u>
6	The relationship between average monthly air temperature, average height of plants and average monthly evapotranspiration for field beans	53
7	Average height and number of leaves throughout the growth season of sugar beet plants cultivated in calcareous sandy loam and clay soils under different available soil moisture depletion levels in the root zone	57
8	Average height and number of leaves throughout the growth season of onion plants cultivated in calcareous sandy loam, clay and sand soils under different available soil moisture depletion levels in the root zone	58
9	Average height throughout the growth season of field beans plants cultivated in calcareous sandy loam, clay and sand soils under different available soil moisture depletion levels in the root zone	59
10	Adjusted pan evaporation (E_A) (Eaglesman), consumptive use factor (f) (Blaney & Criddle) and (E_0) class (A) pan evaporation	61

<u>Fig.No.</u>	<u>Title</u>	<u>Page</u>
11	Fresh of roots, sucrose concentration (per cent) and sucrose content (gram per plant) for sugar beet cultivated in calcareous sandy loam and clay soils as affected by different available soil moisture depletion levels in the root zone	74
12	Fresh weight of bulbs and total soluble solids (T.S.S.) for onion cultivated in calcareous sandy loam, clay and sand soils as affected by different available soil moisture depletion levels in the root zone	78
13	Weight of seeds and crude protein content for field beans cultivated in calcareous sandy loam, clay and sand soils as affected by different available soil moisture depletion levels in the root zone	82

I- INTRODUCTION

In all countries, all over the world, water is considered a limiting factor in agricultural expansion. The various phases of water consumption, are direct use by human beings, animals, industry and irrigation. As population increases, greater competition among the various phases makes conservation of water imperative.

Agriculture is, by no means, the major competitor for water consumption. Adding too much or too little water may cause a serious damage for crops. Consequently, water requirements must be carefully determined.

In order to achieve this goal, the evapotranspiration (consumptive use of water) for each crop growing in various soil types under different climatological conditions, must be calculated so as to evaluate the water regimes. This could be aided by the determination of the periodical evapotranspiration rates for each crop and define the most critical periods in which a crop either requires maximum or minimum amounts of water.

Measuring or calculating evapotranspiration rate could be achieved by many ways such as soil moisture depletion method and using the meteorological data throughout the growth season. The latter method leads

to evaluate an imperial constant, for specific vegetation grown in particular location, which can be used afterwards as an index for direct calculation of evapotranspiration.

In the current study, three of most important crops grown in Egypt were chosen; namely sugar beet, onion and field beans. They were cultivated in three different soil types; calcareous sandy loam, clay and sand soils under different levels of soil moisture depletion in the root zone, to evaluate their interrelations on the evapotranspiration rate and the values of the imperial constants for both Hargreaves and Blaney and Criddle formulae.

Since agricultural development should be based on irrigation economy, water economy (efficiency of water utilization) was calculated for every crop and some of its components in order to evaluate the most economic one.