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EFFECT OF SOME ENVIRONMENTAL FACTORS ON TOMATO SEEDLINGS

By

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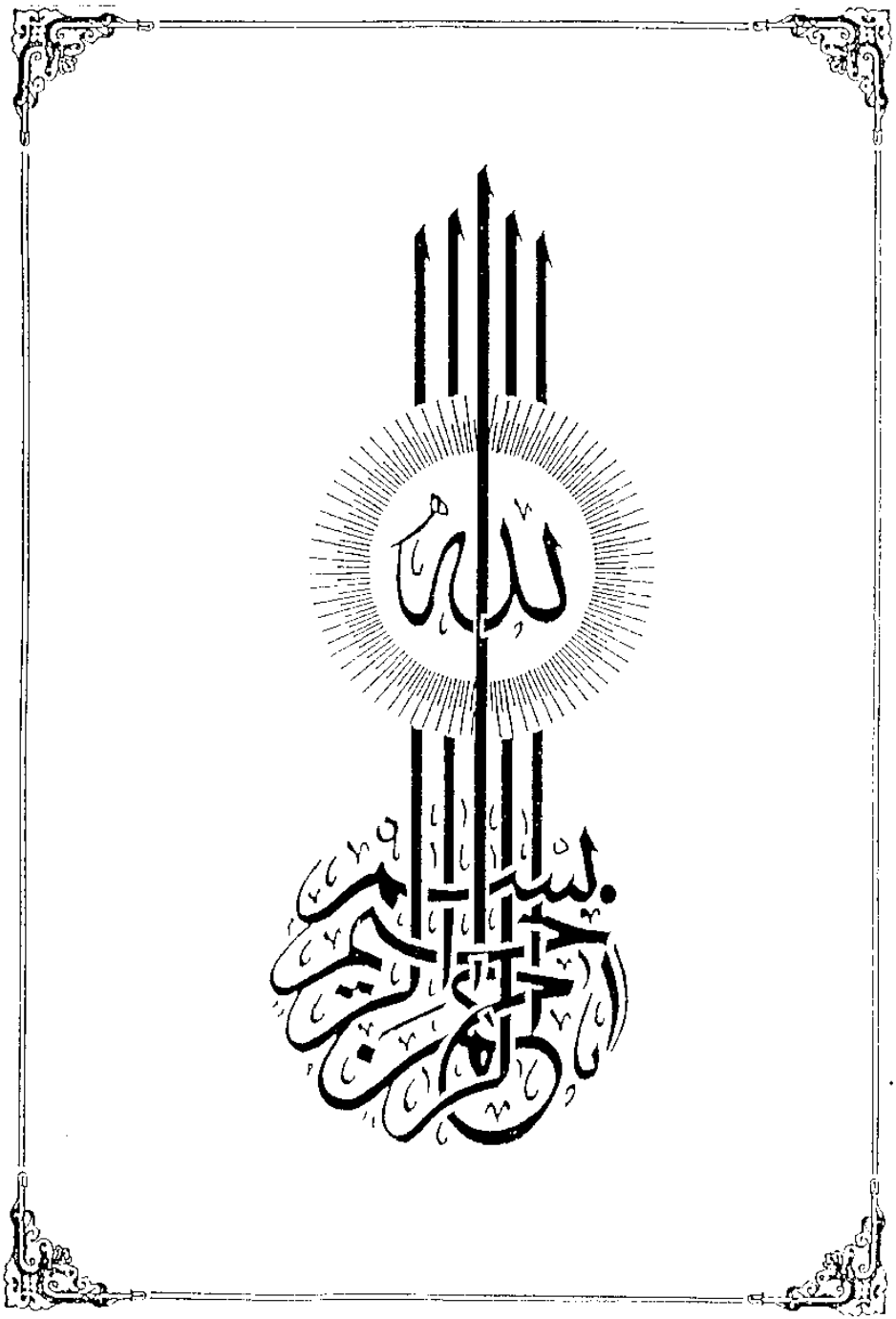

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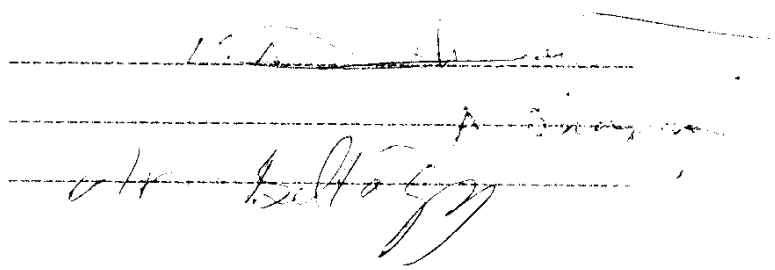

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CONTENTS

		Page
1)	Introduction.....	1
2)	Review of Literature.....	4
2.1	Effect of different chemical treatments for cold resistance and slight frost condition on tomato seedlings.....	4
2.1.1	The effect of CCC	4
2.1.2	The effect of sodium carbonate.....	6
2.1.3	The effect of Zinc sulphate.....	7
2.1.4	The effect of Ethephon.....	8
2.1.5	The effect of Antitranspirant material.....	9
2.2.	The freezing injury.....	10
2.2.1	Development of method for determining frost killing temperature (FKT) of tomato leaves...	11
2.2.2	Determining supercooling point of tomato leaves.....	13
2.3	Hardening of tomato plants at different low temperatures.....	15
3)	Material and Methods.....	21
3.1.1	Effect of different chemical treatments for cold resistance and slight frost condition on tomato seedlings.....	21

Central Library - Ain Shams University

Page

3.2.1 Development of method for determining frost killing temperature (FKT) of tomato leaves. 25

3.2.2 The description ofthermogradient plate..... 27

3.2.3 Freezing and conductance technique..... 27

3.2.4 Visual score observation of damage..... 30

3.2.5 Effect of recovery time on electrolyte leakage after freezing at different temperature 31

3.2.6 Apparatus for determining supercooling points..... 31

3.2.7 Supercooling of dry and wet leaves of four tomato varieties..... 33

3.3.1 Effects of hardening of tomato plants at different low temperatures..... 34

3.3.2 Stomatal behaviour during hardening at low temperature..... 35

4) Results.....

4.1. Initial number of leaflets for seedlings of different tomato varieties grown in pots and field..... 36

4.2. Effect of different chemical treatments on percentage of dead leaflets of some tomato varieties after first frost night exposure 36

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		Page
4.3	Effect of different chemical treatments on percentage of dead leaflets of some tomato varieties after second frost night exposure	39
4.4	Effect of different chemical treatments on general vigour score and healthy tops score of some tomato varieties after first and second frost night exposure.....	41
4.5	The effect of different freezing temperatures on electrolyte leakage percentage of leaves of different tomato varieties.....	46
4.6	The effect of different freezing temperatures on electrolyte leakage percentage of leaves of different tomato species.....	46
4.7	Visual socre observation water soaked area	49
4.8	Effect of recovery time on electrolyte leakage after freezing at different temperatures.....	51
4.9	Supercooling points for dry/wet leaf discs...	51
4.10	Supercording points for leaves at different stages for growth.....	55
4.11	Effect of hardening of tomato plants var "Delisa" at different temperatures.....	57

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Page

4.12 Supercooling of hardened and non hardened of tomato leaves (Delisa var.)..... 65

4.13 Stomatal behaviour during hardening at low temperature..... 65

5. Discussion.....

5.1 Effect of different chemical treatments for cold resistance and slight frost condition of some tomato varieties..... 75

5.2 Freezing injury and determining frost killing temperature and supercooling point of tomato leaves..... 79

5.3 Effects of different temperature on hardening of tomato plants..... 83

5.4 Stomatal behaviour during hardening at low temperature..... 84

6) Summary..... 85

7) References..... 89

8) Arabic Summary

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INTRODUCTION

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1- INTRODUCTION

A serious shortage in tomato production occurs in spring every year in Egypt. It seems that this drop in productivity is a resultant of low-night temperature prevailing during December, January and February which may induce poor fruit-set. Besides, frost waves occur almost annually causing, in some cases, severe damage to vegetative growth of tomato (Abou-Hadid et al, 1985). Frost-sensitive plants, including herbaccous annuals, flowers of deciduous fruit trees, and fruits of many plant species, cannot tolerate ice formation within their tissues. Ice forming in or on frost-sensitive plants spreads rapidly both intercellarly and Interacellularly mechanically disrupting the tissues. This disruption is usually manifested as flaccidity and/or discoloration, when the plant is warm again (Burke, et al., 1976; Mayland and Cary, 1970). In general herbaceaus plants cannot withstand temperature below -20°C, and a hardiness mechanism may be quite different from that in

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woody perennials. An adapted plant species has internal mechanism that permit it to survive and reproduce in its ecological niche. It has been well documented that long days and warm temperatures encourage plants to grow without hardening (Irving, and Lanphear, 1967a). Short days and warm temperatures cause growth cessation and enhance hardiness in deciduous woody perennials (Oslund and Li, 1972) but not in certain evergreens (Gusta and Weiser, 1972), or winter cereals (Paulsen, 1968). Some species can be hardened by low temperatures with a sufficient amount of light, regardless of the photoperiod (Kohn and Levilt, 1965). Potato varieties of the species Solanum tuberosum will not acclimate to low temperatures (Chen and Li, 1976). Other solanum species can be hardened by short days and low temperatures. CCC enhanced frost hardiness by 1°C in S.commersoni, but had no effect on S.tuberosum (Shen and Li, 1983). Tomato is growing at all times, no rest period, and therefore probably little change in hardiness. Experiments on tomato hardening at

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low temperature shows increase in hardiness from -1.5°t -3.0°C (Extracellular freezing) for 30 min. (Shen and Li, 1983). Very little is known about frost hardiness in tomatoes. Therefore, more information is needed about, Frost Killing Temperature of different varieties and species.

The aim of the present work is to identify the best means for tomato seedlings hardening under cold and frost conditions in order to increase the ability of tomato plants to indure cold injury and slight frost. Also to investigate the effect of some chemical hardening treatments on some differrent tomato variaties.

The hardening effect of these treatments aimed to be tested under open field condition in the Norwegain late summer - early autumn season where climatic condition is comparative to the climatic condition of winter in Egypt (Peresson and Abou-Hadid, 1985). Meanwhile, a variety testing trail was intended to introduce suitable varieties which could be useful for open field cultivation in winter season in Egypt.

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