STUDIES ON SOME FACTORS AFFECTING EARLY PRODUCTION OF TOMATO

By

MONA MAHMOUD ABD EL-MOUTY ALY

A thesis submitted in partial fulfillment

of

the requirements for the degree of

MASTER OF SCIENCE

in

Agriculture

(Vegetable Crops)

Department of Horticulture

Faculty of Agriculture

Ain Shams University

1989

APPROVAL SHEET

Studies on Some Factors Affecting Early Production of Tomato.

By

Mona Mahmoud Abd El-Mouty Aly

B. Sc.Agric. (Horticulture) Cairo Univ., 1979.

This thesis for M. Sc. Degree has been

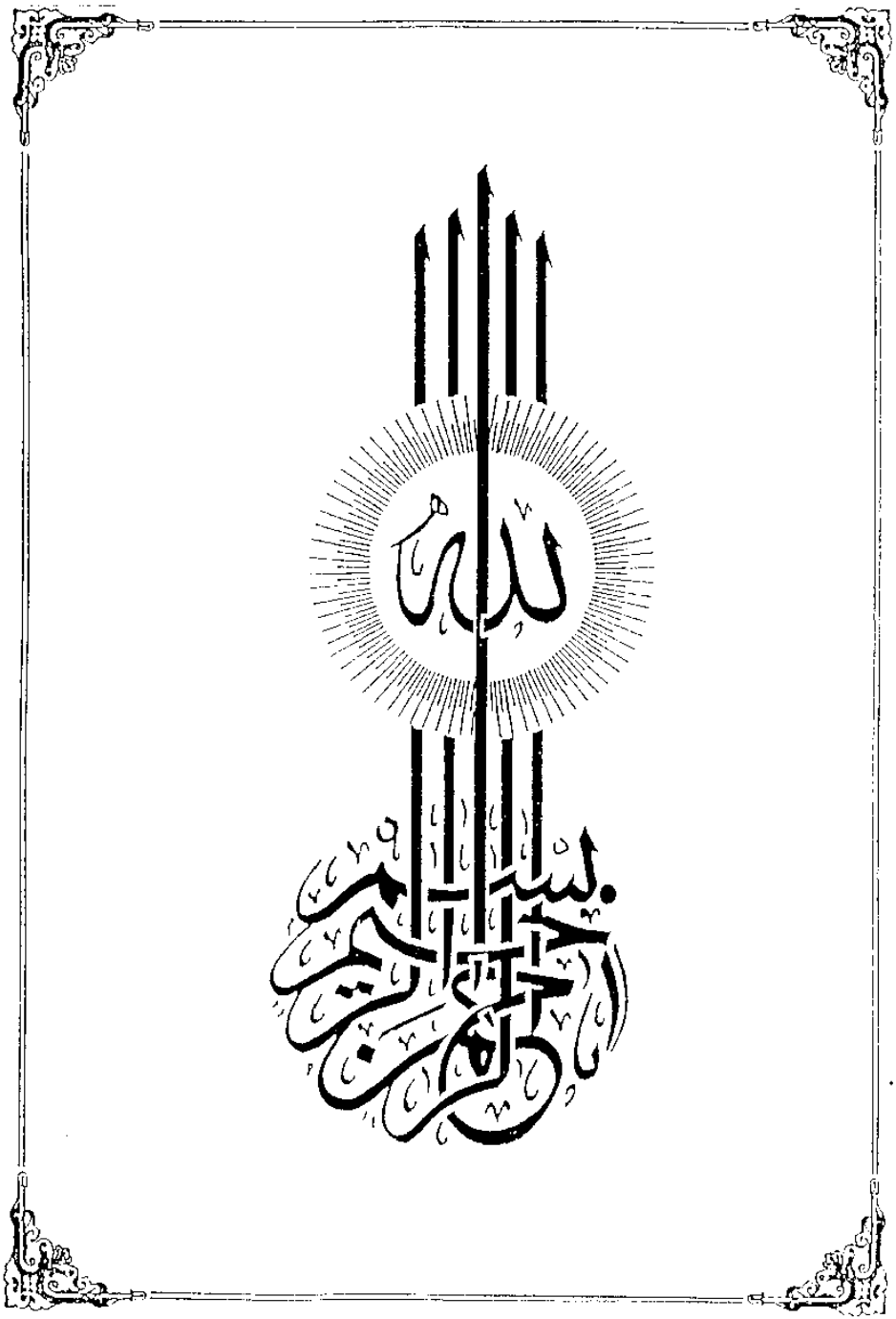
Approved by :

Prof. Dr. Sh.A. Shanan S. A. Shanan .
Prof. of Vegetable Crops, ~~Al-~~Azhar University

Prof. Dr, I. I. El-Oksh I. El-Oksh .....
Prof. of Vegetable Crops, Ain Shams University

Prof. Dr. Hosnia M. Gomaa Hosnia Gomaa
Prof. of Vegetable Crops, Ain Shams University
(Supervisor)

Date of Examination : 8 / 8 /1989



Studies on Some Factors Affecting Early Production of Tomato

By

Mona Mahmoud Abd El-Mouty Aly
B. Sc. Agric. (Horticulture) Cairo Univ., 1979.

Under the Supervision of :

Prof. Dr. Hosnia Mohamed Gomma
Prof. of Vegetable Crops, Ain Shams Univ.

Prof. Dr. Kamal Mohamed El-Habbasha,
Prof. of Vegetable Crops, N.R.C.

Prof. Dr. Abd El-Hameed M. El-Asdoudi
Assoc. Prof. of Vegetable Crops, Ain Shams Univ.

ABSTRACT

Field experiments were conducted to investigate the effect of date of planting and cultivars on the growth and yield of tomato plant. The highest number of the survival of plants was recorded by planting tomato at the middle of December. Also, the highest value of the survival of plants was recorded by the Supermarmand cultivar. However, the highest values of the survival plants were recorded by the Supermarmand cultivar planted on the 1st December.

The highest number and fresh weight of branches and the tallest plants were obtained from the fourth planting, i.e., 15th February planting. On the other hand, the highest number of flowers were obtained by the first date of planting i.e., 1st December.

The highest number, fresh and dry weight of leaves and branches and the tallest plants were obtained by the Supermarmand cultivar. However, the UC 82 cultivar produced the highest number of flowers.

The highest number of leaves and branches as well as highest fresh weight of branches and the tallest plants were obtained from Pritchard cultivar planted on 15th February. Whereas, the highest values of fresh and dry weight of leaves and dry weight of branches resulted from Supermarmand planted on 1st December.

The highest yield of fruits was recorded on the plants planted on the 1st January. Also, the highest values of yield were showed by UC 82 cultivar.

The highest yield was by the UC 82 cultivar planted on the 1st January. On the other hand, the lowest yield was by the Supermarmand planted at the above same time, i.e. 1st January.

The highest values of average fruit weight and diameter were by the plants planted on the 1st December. Also, the highest values of average fruit weight, diameter and volume were by Pritchard cultivar.

The highest values of fruit weight and diameter were by the Pritchard cultivar planted on the 1st December.

The highest value of T.S.S. was by the plants planted on the 1st January. Also, the highest value of T.S.S. was by the Supermarmanc cultivar. However, the highest value of T.S.S. was by the Pritchard cultivar planted on the 1st January.

ACKNOWLEDGEMENT

The author wishes to express her gratitude to Dr. Hosnia Gomaa, Professor of Vegetable Crops, Faculty of Agriculture, Ain Shams University, for her supervision, kind help and continuous encouragement.

Deepest and sincere gratitude and appreciation to Dr. K.M. El-Habbasha, Professor of Vegetable Crops, National Research Centre, Cairo, for his supervision, valuable and constructive discussion throughout the course of this study.

Great thanks are expressed as well as Dr. A.M.El-Asdoudi Assoc. Professor of Vegetable Crops, Department of Horticulture, Ain Shams Univ. for his continuous advice and support throughout my thesis.

Thanks are also due to Dr. M. O. Bakry Associate Professor, National Research Centre, Cairo, for valuable guidance and continuous encouragement during this work.

Sincere thanks is due to may collegues in vegetable groups, National Research Centre, Cairo, for their willing help and co-operation during the course of this investigation.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

1. INTRODUCTION

Tomato (Lycopersicon esculentum Mill.) is one of the most widely grown and economically important vegetable crops in Egypt. It is eaten fresh and cooked and also often processed to make tomato paste, sauce, puree, catsup or juice. Tomatoes are rich in vitamin A, vitamin C and potassium. The total area cultivated with tomatoes in Egypt increased from 255, 656 feddan in 1972 to 394, 320 feddan in 1986. The corresponding production of tomato was 1,665,416 and 4,445,816 tons in 1972 and 1986, respectively.

In the last few years, the Egyptian government recommended the increase of yield of vegetable crops. This could be achieved by growing more area or by increasing the total yield per feddan, mainly through improving the cultural practices. In Egypt, increasing the total yield of tomato crop through increasing the average of yield per feddan is easier than increasing it through expansion of the total area. It could be done through improving the cultural practices, mainly, transplanting the seedlings on suitable dates and selecting high yield varieties. The aim of the present work is to identify the best date of sowing as well as the best variety to produce the early and high tomato yield.

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

2.1. Survival of plants :

Omarah (1970) stated that the survival of plants in the winter and nily seasons exceeded those grown in summer 1968 - 1969 experiment on sweet pepper plants.

2.2. Growth characters :

2.2.1. Effect of date of planting :

Frenz (1968) found that higher temperatures during 18 days after germination resulted in more leaves and fewer double clusters, whereas the opposite occurred with lower temperatures. He also said that in some cases flower initiation occurred 6 to 8 days after germination, and in others after 10 to 12 days. The double cluster values changed according to variety, in some cases and according to date in others.

The same author (1968) found that all varieties formed the least number of leaves between the first and second inflorescences at 24°C and 18°C day and night temperatures respectively. A significant effect of temperature on flower number was observed only in the first inflorescence, but number of double clusters decreased with higher temperatures. In general a larger number of flowers accompanied a higher proportion of double clusters.

Ininov and Murtazov (1973) sowed tomatoes on February 1st, 10th and 20th and March 1st and noticed that the plants from later sowings developed more rapidly but were shorter and more suitable for mechanical transplanting.

Cornillon (1974) stated that, generally, the lower temperatures favoured fruiting and higher temperatures favoured vegetative growth. Flowering and fruit set were optimum at 15 to 18°C.

Shaheen (1979) stated that early direct sowing of tomatoes on 20th April (11.9°C) resulted in a reduction in growth measures, i.e. height of plant, number of leaves, fresh and dry weight per plant, at 45 days after sowing.

Klapwijk (1981) showed that there was a linear increase in the duration of the growing period between 21st September and 21st December, and a linear decrease between 21st December and 21st March. In the third season, from 21st March to 21st September, the growing period remained practically constant.

Gautam et al. (1981) in India reported that trials were carried out with 41 tomato cultivars transplanted