THE INTEGRATED CONTROL OF POST HARVEST DISEASES OF SOME VEGETABLES AND FRUITS

By

MARWA ABD-ALLA MAHMOUD ATWA

B.Sc. Agric. (Plant Pathology), Ain Shams Univ., (1994)

A thesis submitted in partial fulfillment

Of

the requirements for the degree of

MASTER OF SCIENCE

In

Agriculture

(Plant Pathology)

Department of Plant Pathology

Faculty of Agriculture

Ain Shams University

1999

APPROVAL SHEET

THE INTEGRATED CONTROL OF POST HARVEST DISEASES OF SOME VEGETABLES AND FRUITS

By

MARWA ABD-ALLA MAHMOUD ATWA

B.Sc. Agric. (Plant Pathology), Ain Shams Univ., (1994)

This thesis for M. Sc. degree has been approved by:

Prof. Dr. A. M. Abdel-Hafez .....A.Hafez.....

Professor of Microbiolgy,

Fac. of Agriculture, Ain Shams Univ.

Prof. Dr. A. M. Abdel-Monem .....A.Mon.....

Director of Plant Pathol. Instit.,

Agriculture Research Center.

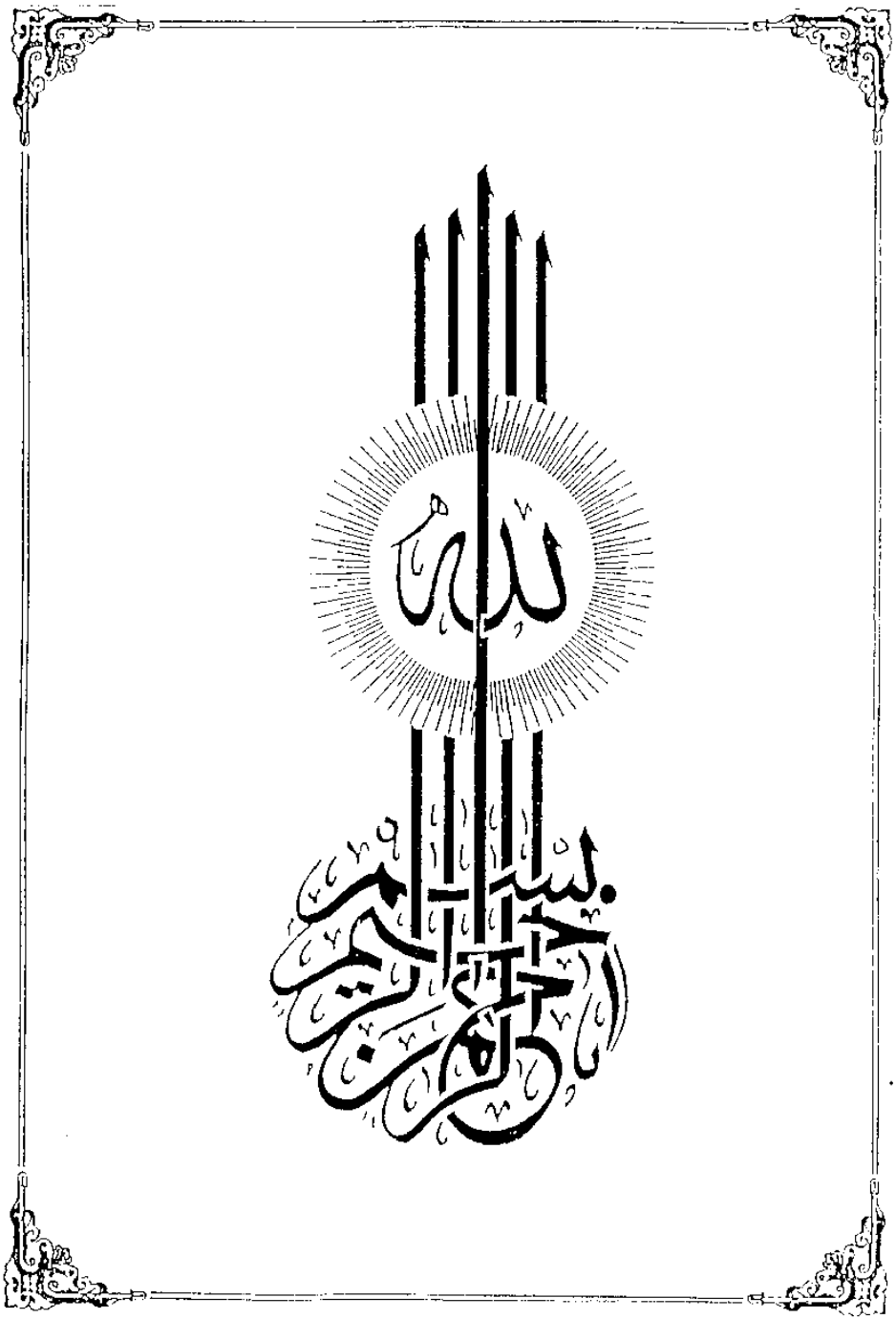
Prof. Dr. M. F. Hegazi .....M.F.Hegazi.....

Professor of Plant Pathology,

Fac. of Agric., Ain Shams Univ.

(Supervisor).

Date of Examination: **/ / *1999*.**



THE INTEGRATED CONTROL OF POST HARVEST DISEASES OF SOME VEGETABLES AND FRUITS

By

MARWA ABD-ALLA MAHMOUD ATWA

B.Sc. Agric. (Plant Pathology), Ain Shams Univ., (1994)

Under the supervision of:

Prof. Dr. M. F. Hegazi

Professor of Plant Pathology,
Fac. of Agric., Ain Shams Univ.

Dr . S. T. Shehata

Lecturer of Plant Pathology,
Fac. of Agric., Ain Shams Univ.

Dr. Azza A. M. Shahin

Lecturer of Plant Pathology,
National Center for Radiation Research
and Technology (NCRRT).

Abstract

Marwa Abd-Alla M. Atwa: The integrated control of post harvest diseases of some vegetables and fruits. Un published Master of Science, Faculty of Agriculture, Department of Plant Pathology, Ain Shams University (1999).

The principle objectives of this work aimed to determine the losses of postharvest diseases of tomato and grapes with reference to their causal organisms Possibilities to control these diseases by safe methods such as irradiation, fumigation by sulfur dioxide, ethanol, as well as biological control were studied.

The main causal organisms of postharvest fruit rots of tomato were *Alternaria alternata, A. solani, Penicillium expansum, P. cyclopium, Stemphylium herbarum, Pleospora herbarum, Botrytis cinerea, Rhizopus oryzae* and *Aspergillus niger*. Losses ranged from 10.8 % to 37.5 % under normal storage condition However, for grapes the main pathogens were *A. alternata, B. cinerea, P. curstosum, P. expansum, P. viridicatum, P. cyclopium* and *Cladosporium herbarum*. The total wastage ranged from 19.6% to 31.6% in the control treatment.

Gamma irradiation treatments of tomato at 0.25 KGy decreased the total losses to 2.3 % as compared with 17.6 % for the control, while 2 KGy inhibited the ripening of tomato fruits. For grapes, doses from 0.25 KGy to 4 KGy decreased the total wastage to 4.86 % compared with 22.1% for control.

Fumigation treatments of grapes with sulfur dioxide reduced the total wastage to 4.8 % as compared with 15.7 % for control. Fumigation with ethanol vapor (30%) decreased the total losses of

tomato to 0.0 % compared with 41.6 % for the control up to 23 days, and delayed the ripening of tomato fruits up to 30 days.

Seventy five different isolates of yeast, which were isolated from surface of apple, grapes and tomato fruits were evaluated *in vivo* (primary screening) for bio-control potential of *Alternaria* mould of tomato. On the base of primary screening 12 isolates were selected to continue secondary screening with different concentrations of antagonisms at 21± 0.5ºC against *Alternaria* mould of tomato. In the secondary screening at 13±1ºC, using washed cells of *Arthroascus* sp (isolate Ap638) at $1x10^9$ produced absolute protection for 18 days to wounds inoculated with spore suspension of *A. alternata* ($1x10^5$ conidia/ ml).

***Key Words*:** Tomato fruits; Grape; Cold storage; Ethanol; Irradiation; Sulfur dioxide; Biological control.

ACKNOLEDGMENT

The author wishes to express her gratitude and deep thanks to Prof Dr M F H Hegazi, Prof of Pl Path and Dr S T Shehata, Lecturer of Pl. Path., Plant Pathology Dept., Faculty of Agric., Ain Shams Univ. for their keen supervision, interest, stimulating encouragement, valuable criticisms and concrete discussion and to Dr. Azza A.M.Shahin, Lecturer of Pl. Path., Microbiology Dept. National Center for Radiation Research and Technology (NCRRT) for her continuous help during the development of the work.

Thanks are also expressed to Prof. Dr. Dorria I. Harfoush, Professor of Plant Pathology, Pl. Path. Dept., Faculty of Agric., Ain Shams Univ. for her help during the start of this investigation .

Thanks are also to "Regional Councils for Agricultural Research and Extension " for financial support of this work.

TABLE OF CONTENTS

LIST OF TABLES