PRODUCTION OF ASTER MONTE CASSINO UNDER PROTECTED AGRICULTURAL CONDITIONS USING LOCALLY PROPAGATED CUTTING OR *IN VITRO* EXPLANTS

By

FAWZY FAWZY ARAFA ALI LASHEEN

B. Sc. Agric. Sc. (Horticulture), Ain Shams University, 1996

M. Sc. Agric. (Ornamental Horticulture), Ain Shams University, 2001

A thesis submitted in partial fulfillment

of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Agricultural Science

(Ornamental Horticulture)

Department of Horticulture

Faculty of Agriculture

Ain Shams University

2010

Approval Sheet

PRODUCTION OF ASTER MONTE CASSINO UNDER PROTECTED AGRICULTURAL CONDITIONS USING LOCALLY PROPAGATED CUTTING OR *IN VITRO* EXPLANTS

By

FAWZY FAWZY ARAFA ALI LASHEEN

B. Sc. Agric. Sc. (Horticulture), Ain Shams University, 1996

M. Sc. Agric. (Ornamental Horticulture), Ain Shams University, 2001

This Thesis for Ph.D. degree has been approved by:

Dr. Emam Mohamed Saber Nofal **……**

Prof. Emeritus of Ornamental Plants, Faculty of Agriculture, Tanta University

Dr. Sohair El-Sayed Mohamed Hassan **……**

Prof. Emeritus of Ornamental Plants, Faculty of Agriculture, Ain Shams University

Dr. Shafik Ahmed El-Gendy **……**

Prof. Emeritus of Ornamental Plants, Faculty of Agriculture, Ain Shams University

Date of Examination: 16 / 3 / 2010

PRODUCTION OF ASTER MONTE CASSINO UNDER PROTECTED AGRICULTURAL CONDITIONS USING LOCALLY PROPAGATED CUTTING OR *IN VITRO* EXPLANTS

By

FAWZY FAWZY ARAFA ALI LASHEEN

B. Sc. Agric. Sc. (Horticulture), Ain Shams University, 1996

M. Sc. Agric. (Ornamental Horticulture), Ain Shams University, 2001

Under the supervision of:

Dr. Shfik Ahmed El-Gendy

Prof. Emeritus of Ornamental Horticulture, Department of Horticulture, Faculty of Agriculture, Ain Shams University (Principal Supervisor)

Dr. Mahmoud El-Said Hashem

Prof. Emeritus of Ornamental Horticulture, Department of Horticulture, Faculty of Agriculture, Ain Shams University

Dr. Abdelaziz Mohamed Hosni

Prof. of Ornamental Horticulture, Department of Horticulture, Faculty of Agriculture, Ain Shams University

ABSTRACT

Fawzy Fawzy Arafa Ali Lasheen: Production of Aster Monte Cassino Under Protected Agricultural Conditions Using Locally Propagated Cuttings or *In Vitro* Explants. Unpublished Ph.D. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2010

This study was carried out through two successive years (2006/2007 and 2007/2008). The main purpose of this study was to propagate *Aster ericoides* cv. Monte Casino using tissue culture technique. Also, to produce the plant under greenhouse using locally propagated cuttings or tissue culture plants. For tissue culture protocol, it was better to use either apical or lateral buds and surface sterilized by 30% clorox for 20 minutes. A moderate compromise for improved number and length of shoots and leaf number during the multiplication stage it was better to use MS medium supplemented with 1 ppm BA. In rooting stage, the best root number and length were obtained with 0.4 ppm NAA. The highest survival percentage was obtained after acclimatization stage when media with sand or sand plus peat moss were used. For the production under greenhouse, the highest values of number of branches, main stem diameter, number of internodes, fresh and dry weights of plant, C %, N %, C/N ratio and chlorophyll reading were all obtained when using control treatments for either GA_3 or light. Although the highest flower diameter and number of ray flowers were obtained with either GA_3 at 200 ppm or intermittent light. Control light or GA_3 at 200 ppm gave the highest flower number. The earliest flowering time was with GA_3 at 200 ppm and continuous light. Also, GA_3 at 200 ppm or continuous light gave the tallest plants height for the two seasons of study.

Key words: Aster, *Aster ericoides* cv. Monte Casino, tissue culture, cuttings, greenhouse, light.

ACKNOWLEDGMENT

Tribute and praise are due, first of all, to **Allah** the All-Merciful the Companionate.

I am deeply indebted thankful to **Prof. Dr. Shafik Ahmed El-Gendy** for his supervision, everlasting encouragement and his kind help that enabled me to accomplish this work.

Also, my thanks are owed to the late **Prof. Dr. Mohamed El-Said Hashem** for his supervision, keen interest and useful advice.

Hearty thanks and credit are due to **Dr. Abdelaziz Mohamed Hosni** for his supervision, step by step follow up of the experiments, and valuable assistance during the preparation and writing up of this thesis.

Many thanks to the late **Prof. Dr. Nagla Abou-Talib** for her assistance in the preparation of this thesis.

I am grateful to **Prof. Dr. Abdel Azim El-Hammady** for providing me with the lab facilities to work on.

I would like to thank all the staff members and fellow colleagues of the Dept. of Horticulture, Faculty of Agriculture, Ain Shams University for their cooperation and support.

I am particularly appreciative to all members of my family for their moral support, understanding and repeated continuous prayers.

CONTENTS

LIST OF TABLES

Page

Page

LIST OF PLATES

Table (6a): Effect of GA_3 and light treatments on plant length of *Aster ericoides* cv. "*Monte casino*", in the two seasons from cuttings (2006/2007 and 2007/2008)

Treatment	First Season			Second season		
	G_1	G_2	Mean	G_1	G_2	Mean
L_1	62.72	70	66.36	62.67	70.42	66.54
L_2	69	73.92	71.46	68.75	73.83	71.29
L_3	72.08	78.17	75.13	72	77.67	74.83
Mean	67.93	74.03		67.81	73.97	

L_1:L_3 = Light G_1:G_2 = GA_3

LSD: GA_3 = 0.4373 GA_3 = 0.3773

Light = 0.5356 Light =0.4621

GA_3 * Light = 0.7575 GA_3 * Light = 0.6534

Table (6b): Effect of GA_3 and light treatments on plant height of A*ster ericoides* cv. "Monte casino" cultivar *in vitro*, in the two seasons from tissue culture (2006/2007 and 2007/2008)

Treatment	First Season			Second season		
	G_1	G_2	Mean	G_1	G_2	Mean
L_1	61.42	68.33	64.88	63.58	70.58	66.08
L_2	68.08	72.33	70.21	70.17	75.42	72.79
L_3	71	77.58	74.38	72.42	79.33	75.88
Mean	66.83	72.75		68.72	75.11	

L_1:L_3 = Light G_1:G_2 = GA_3

LSD: GA_3 = 0.04986 GA_3 = 0.6724

Light = 0.6106 Light = 0.8235

GA_3 * Light = 0.8636 GA_3 * Light = 1.1647