شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

PHYSIOLOGICAL STUDIES ON BANANA PLANT USING MODERN BIOTECHNOLOGY

By

Rola Muhammad Said Bayerly

B.Sc. Agric. (Hort.), Fac. of Agric., Damascus University, 1994

D.Sc. Agric. (Hort.), Fac. of Agric., Damascus University, 1995

M.Sc. Agric. (Pom.), Fac. of Agric., Cairo University, 2000

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(Plant Physiology Division)

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achieve this work

Contents

Introduction

Introduction

Bananas and plantains are important staple food crops for people living in tropical and subtropical countries (**Lee *et al.*, 1997**). In Egypt, the overall average of banana reached about 53607 feddans produced about 72899 tones of edible fruits (Ministry of Agric., A.R.E., 1999).

Banana and plantains are herbaceous monocots belonging to the genus *Musa*, most are seedless, sterile and clonally propagated by suckers. The genus *Musa* contains many members and has a complicated taxonomy (**Kshanika and Niranjali, 1997**). Edible cultivars are inter-specific hybrids of the two wild diploid species (2n =2x=22), *Musa accuminata* (AA) and *Musa balbisiana* (BB) (**Simmonds and Shepherd, 1955** and **Rowe, 1984**). The interspecific hybrids (cultivars) have been grouped according to the contribution to the ploidy of the two wild species. *Musa accuminata* providing the "A" genome and *M. balbisiana* providing the "B" genome. The resulting hybrids are designated (AA, AB, BB, AAA, ABB, BBBB and AAAA) (**Stover and Simmonds, 1987**). Williams, however, is belonging to AAA genomic group (2n= 3x=33) (**Okole and Schulz, 1996**). In addition, almost all edible bananas are triploid (**Kshanika and Niranjali, 1997**).

Environmental stress in arid and semi-arid areas, mainly drought and salinity limit growth and productivity of most species (**Shin *et al.*, 2000**).

The excess of salt in the soil or in the irrigation water is one of the biggest problems in agriculture since almost all cultivated plants are sensitive to it (**Jóse *et al.*, 2000**). In addition, a large percentage of the world's crops are exposed to chronic or sporadic period of drought (**Boyer, 1982**) even in the absence of drought the limiting amount of rainfall are primary determinants of crop selection and yield (**Ludlow and Muchow, 1990**). Thus, water deficit is one of the most common environmental

limitation of crop productivity through alternation in metabolism and gene expression, causes a diverse set of physiological, morphological and developmental changes (**Anders *et al.*, 1996**).

Recent advance in biotechnology for crop improvement have had a great impact on banana and plantain cultivation. The micropropagation of shoot tip *in vitro* is the most common application of biotechnology in agriculture (**Dole, 1990**). *In vitro* techniques for clonal micropropagation of *Musa spp.* have been reported by several researchers, using different explant sources, regeneration pathway, media consistency and basal medium components (**Gilmar *et al.*, 2000**). *In vitro* plantation of banana produced 55% more than the conventional plantation. *In vitro* mutation induction has been used to improve vegetatively propagated banana (**El-Agmawy and Afza, 2000**).

Genetic modification of crop plants to improve their salt tolerance is a possible way for increasing production especially for regions of the world were arable lands must be extended to marginal area and sometimes irrigated with saline water (**Dorion *et al.*, 1999**).

Mutants affected in response to environmental stress appeared as a promising way to detect genes involved in normal and stressed-plant behaviour (**Nicole, 1996**).

This investigation was conducted to study the potential of gamma irradiation (as a mutagen) in inducing mutant plants of banana cv. Williams, as well as the potential of tissue culture technique in increasing banana plants (either normals or mutants) tolerance to salinity and drought stresses.

Review of Literature