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 الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

STUDIES ON WATER RELATIONS AND DROUGHT RESISTANCE OF SOME GRAPE VARIETIES

By

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B.Sc. (Agric.),Tanta University, 1992

THESIS

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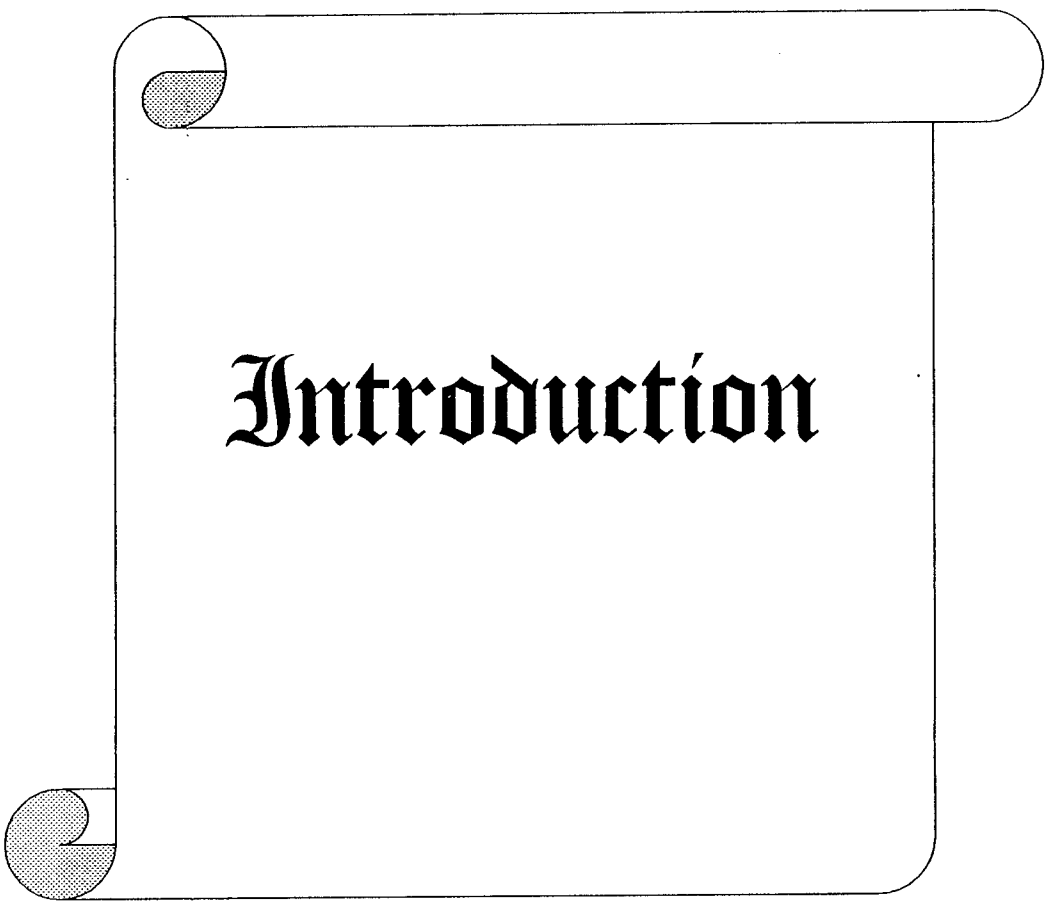


Introduction

INTRODUCTION

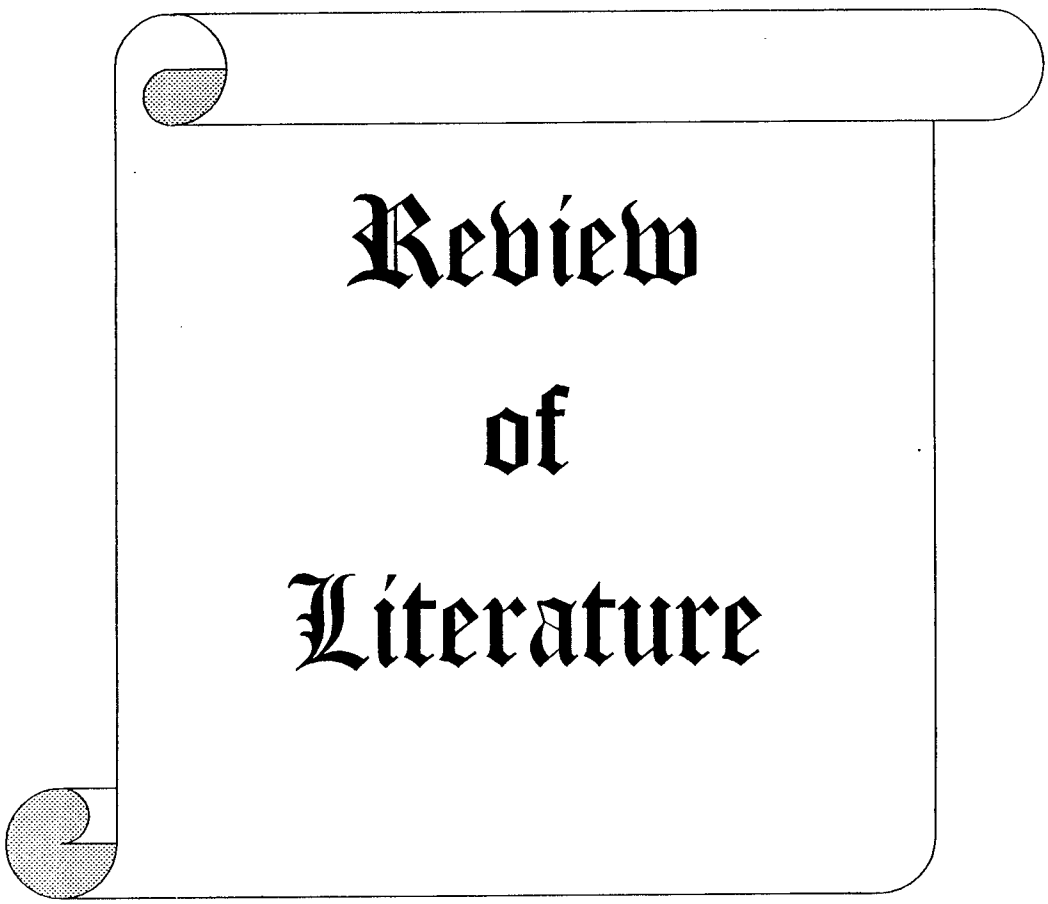
It is of great value to provide fruit growers with the list names, including the evaluated varieties as sensitive and tolerant variety to drought, salinity and cold conditions. This evaluation will be helpful for fruit growers to select the right variety in a given environmental conditions, especially in the new reclaimed arid and semi-arid regions in the world as well as in Egypt.

The adverse effects of osmotic stress resulted under drought and salinity conditions on water relations and physiological changes in several plant species have been widely studied over the years **(Paul, 1962; Levitt, 1980; Lotter *et al.*, 1985 and Ranney *et al.*, 1991)** to define variations in drought resistance among plant species **(Baghdadi, 1977 and Chandel and Chauhan, 1991)**. Moreover, a better understanding of Biotic Stress and physiological responses under different drought conditions can be of value in programmes conducted to breed drought tolerant fruit varieties.

Previous studies reviewed by **Terashima (1992)** have reported that, limitation in photosynthetic CO_2-uptake when plants were subjected to osmotic stress may result from stomatal and non-stomatal effects which in turn are determined largely by the water relations of the leaves **(Kaiser, 1987)**. However, the physiological basis of the differences in Biotic Stress found between drought sensitive and tolerant grape varieties is not well studied. Also, relatively little is known about the close relationship between drought resistance and water relations in sensitive and resistant grape varieties. Therefore, this study aimed to evaluate five of the most important grape varieties in Egypt for their drought resistance.

This evaluation depends on three directions which are associated with each other and with the response to drought conditions. The first was

related with water changes in the plant tissues, by determining water fractions (free, bound and total water contents), in addition to osmotic pressure and water holding capacity. The second was related with some physiological changes, by determining some organic substances in the plant tissues, such as chlorophyll, proline amino acid, total soluble sugars and NPK concentrations in leaves petioles, shoots and roots of the grape plants. The third was conducted to plant growth behaviours, by measuring some vegetative and root growth parameters under drought conditions.


Review
of
Literature

REVIEW OF LITERATURE

Several review articles have been written relating the influence of water level on plant growth and its chemical contents, and it will be reviewed in this study as follows:

1- Effect of soil moisture level on vegetative growth.

2- Effect of soil moisture level on root growth

3- Effect of soil moisture level on some water relations.

4- Effect of soil moisture level on some organic substances.

5- Effect of soil moisture level on some macro nutrients.

1. Effect of soil moisture level on vegetative growth:

Many investigators studied the effects of soil moisture level on growth and production. They reported that with increasing soil moisture stress growth rate had decreased.

Kenworthly (1948) in pot experiment, studied the effect of soil moisture level on growth of apple seedlings. He found that best growth of the shoots was obtained by the plants grown under soil moisture above 60% from the field capacity. Plants grown under soil moisture above 80% from the field capacity recorded the second values and the plants grown under soil moisture level lower than 60% recorded the lowest growth.

Morita and Yoneyama (1949) studied the effects of soil moisture on growth of peach, pear and persimmon seedlings. They found that about 20% soil moisture was the best for the development of branches and 30-40% for the plant as a whole. Soil moisture of 50% upwards were generally injurious. The same investigators pointed out in other work (1950) on the effect of different soil moisture contents on growth of grape cuttings. They found that optimum soil moisture for top growth was from 20 to 40% of soil dry weight.

Morita and Yoneyama (1952) found that cherry seedlings made normal growth when soil moisture was maintained at levels between 20 and 40% of soil dry weight. They noted also that the growth ceased when moisture was kept as 10% of soil dry weight, and the best growth of grape seedlings was at 25-45% of field capacity.

Sadomori and Mordakami (1952) studied the effects of different soil moisture stresses on the growth of several apple seedlings. They noted that the maximum growth rate was at 58-87% of field capacity, while the growth had declined at 87% of field capacity. However, at soil moisture less than 44% of field capacity the seedlings showed a different response in their growth.

Korindine *et al.* (1954) mentioned that shortage of water supply in the first period of growing season decreased growth of apple trees and reduced leaf area/plant.

Gates (1955) reported that cell enlargement was particularly susceptible to water stress. He added that developing tissues appear to enter a rejuvenating phase when water stress was relieved and relative growth rates of such plants become more rapid.

Stanhili (1957) studied the effect of different soil moisture stress on growth of various fruit trees and vines and reported that the plant growth rate was not correlated with soil moisture depression except under severe soil moisture stresses. He added also that growth was reduced greatly by low soil moisture.

Geisler (1960) reported that shoot characters were correlated with drought resistance as he found that vine plants with long shoots were associated with drought resistance.