INTRODUCTION

1- INTRODUCTION

The grape is considered the first major fruit crop allover the world. Botanically, grapes belong to the genus Vitis under the Vitaceae Family, which includes more than 60 genera, most of them are used in ornamental purposes and the little produces edible fruits. Grape fruits are characterized by high nutritional value and could be consumed fresh as table grapes and pasteurized fresh juice or used as raisin or as wine.

In Egypt, grape is the second fruit crop since it is preceded only by citrus crop. According to the statistics of Ministry of Agriculture, Egypt (2003), grape cultivated area recorded 160241 feddans.

Thompson seedless grape cultivar among the cultivated grapes is considered the most important and popular cultivar. It has been received a lot of attention and its acreage represents about 45.7% of the total grapevine acreage.

In the last decades, an important change has taken place in agricultural practices to increase production and thus the economic yield of fruit crops. This increase has been supported mainly by new irrigable areas and the wider use of fertilizers, especially nitrogenous ones. The efficiency of nitrogenous fertilization is highly variable. A great part of the nitrogen applied to the soil is lost by leaching, causing problems in the environment due to water pollution by nitrates. Slow release fertilizers can be alternatives to increase efficiency and can

reduce the polluting action of the fertilizers, especially in intensive agricultural areas.

Fertilization is one of the most important practices needed to grow fruit trees. It represents approximately 20% of the total production costs, of which more than 80% is nitrogenous fertilization. In the mediterranean coastal area, there is intensive agriculture characterized by high use of nitrogenus fertilizer and irrigation systems, mostly traditionl with low yields. Various factors such as soil reaction, the influence of small amounts of other elements, physiological peculiarities of the crop and the different nitrogenous material (time, type and composition, rate and method of application) are involved in the efficiency of nitrogen utilization.

It was observed that the increase in the dose of N did not correspond with an increase of N in different parts of the tree or crop, but did notice an increase in the amount of leached N. These results showed that N losses can be very high and have important repercussions on the economy of crop production, apart from harming the environment, since a great of the non-absorbed nitrogen may pollute the soil water with nitrates.

Therefore, it is important to improve the efficiency of nitrogenous fertilization by introducing other techniques and alternative systems to the traditional ones. The utilization of slow release fertilizers with traditional irrigation systems as well as in high frequency systems is another solution to this problem. The efficiency of nitrogenous fertilizers can be increased through the use of slow-release nitrogen sources, which potentially reduce N

leaching and improve the efficiency of plant recovery. These fertilizers have clear advantages compared with conventional ones in a great variety of horticultural crops in different soil types, climates and growing techniques (**Abbes *et al.*, 1994**).

Furthermore, biofertilizers are biological preparation containing primarily potent strains of microorganisms in sufficient numbers. These microorganisms have definite beneficial roles in the fertility of soil rhizosphere and the growth of the plant. Biofertilizers proved to eliminate the use of pesticides sometimes and rebalance the ratio between plant nutrients in soil. Handle with field applications improved their efficiency in increasing crop yields and decreasing the costs of some agricultural practices. It is worthy to state that biofertilizers do not replace mineral fertilizers, but significantly reduce their rate of application . *Azotobacter* is a multi-strain biofertilizer constituting a set of microorganisms having a definite beneficial role in soil fertility. Four main functions are carried out by symbiotic and a symbiotic: nitrogen fixation, mobilizing certain macro and micro nutrients in a form available for plant absorption, controlling some soil born diseases and secreting a set of growth promoters. *Azotobacter* could be used as a source for fixing nitrogen in the soil. The use of bacteria in combination with slow release N-fertilizers results in encouraging yield and helps to keep the environment clean for coming generations(**Ishac, 1989**).

Consequently, this study was initiated to evaluate and compare the effect of nitrogen fertilizers forms i.e., fast release

nitrogen fertilizers (ammonium sulphate and urea) and slow release nitrogen fertilizers [phosphorus coated urea (PCU) and sulphur coated urea (SCU)] and rate of nitrogen fertilizers (40, 60, 80 and 100 g actual N/vine/year) and biofertilizeration with *Azotobacter* as well as their interaction on growth, leaf minerals content, blooming, fruiting and fruit quality of Thompson seedless grapevines.