1. INTRODUCTION

Persimmon (*Diospyros kaki*, L.) is one of the most important species of genus *Diospyros* and family *Ebonaceae* from the commercial standpoint. Persimmon acreage is about 1228 feddans, out of which 1164 feddans are fruiting area, produce about 7955 metric ton fruits with the average of 6.83 ton fruits per feddan, according to the latest statistics of the Ministry of Agriculture, Egypt (2002). Table (1) shows the development of persimmon cultivation in Egypt, since (1997) up to (2002) including the cultivated area, productive area, the total fruit production and the average yield per feddan. The most productive Egyptian Governorates are: Dakhlia (721 feddans), Nobaria (274 feddans), Behera (147 feddans), Gharbia (80 feddans), Kalubia (70 feddans) and Alexandria (51 feddans).

Persimmon trees are deciduous and growing well with good production under native temperate and subtropical areas, where soils are well drained, with suitable cultural practices especially fertilization.

Table (1): The cultivated area, fruiting area, total fruit production and average yield/feddan of persimmon orchards in Egypt (1997-2002).

Year	Cultivated area (feddan)	Fruiting area (feddan)	Total fruit production (metric ton)	Average yield ton/feddan
(1997)	1257	1029	4271	4.15
(1998)	1210	1006	4291	4.27
(1999)	1268	1132	6125	5.41
(2000)	1368	1147	6761	5.89
(2001)	1431	1152	6618	5.74
(2002)	1428	1164	7955	6.83

Statistics of the Ministry of Agriculture, Egypt (2002)

Undoubtedly, the nutritional status of the tree is the major factor affecting tree production. Besides, more than 40% of the

production costs is devoted to nutritional practices. Consequently, it is important to understand the nutritional status of persimmon tree and its fertilization program i.e. source, rate and fertilizer application method. Moreover, the need for fertilizers particularly nitrogen fertilizers is in a gradual increment to compensate the reduction of soil fertility that resulted from intensive cultivation over the years and the depletion of loamy colloids after the building of High Dam.

On the other side, the heavy use of chemical fertilizers have resulted in serious problems in the soil. It is not only the salinity, but also and more importantly the pollution of the underground waters and the accumulation of the chemical residues in plant tissue that is a major components of animal fodder human diet. This misuse of chemical fertilizers resulted in the disturbance of natural biological balance in the soil.

It is well known that organic manure fertilizers are the best alternatives for chemical fertilizers. Organic manures are composed mainly of wastes and residues from plant and animal life. They contain much carbon and relatively small percentages of plant foods usually that come from plants that fix the carbon. Organic manures have many advantages as: (a) they supply some nutrients for plants and the carbon containing compounds are food for small animals and microorganisms, (b) they often improve the structure of soil; they may do this directly through their action as bulky diluents in compacted soils or indirectly when the waste products of animals or microorganisms cement soil particles together, (c) these structural improvements due to organic manure increase the amount of water useful to crops that soil can hold and (d) they also improve aeration and drainage and encourage good root growth by providing enough pores of the right sizes and preventing the soil from becoming too rigid when dry or completely over logged and devoid of air when wet. There are several sources of organic manure, but the most used everywhere are cattle, poultry, rabbit and sheep manure.

On the other hand, the application method of organic manure materially affect the utilization and efficiency of organic manure. In this respect, **Moustafa (2002)** on Washington navel orange and **Salama (2002)** on Balady mandarin mentioned that the application of organic manure (cattle, rabbit, sheep and poultry) in trenches increased the utilization and efficiency of organic manure which reflected in better growth, higher leaf mineral content, higher tree yield and better fruit quality rather than superficial application.

Furthermore, biofertilizers are biological preparations containing primarily potent strains of microorganisms in sufficient numbers. These micro-organisms 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. It is worthy to state that biofertilizers do not replace mineral fertilizers, but significantly reduce their rate of application (**Ishac, 1989 and Saber, 1993**). Rhizobacterien and Nitrobien are a multi-strain biofertilizers constituting a set of micro-organisms having a definite beneficial role in soil fertility. Four main functions are carried out by symbiotic and a symbiotic bacteria: (1) nitrogen fixation, (2) mobilizing certain macro and micro-nutrients in a form available for plant absorption, (3) controlling some soil born diseases and (4) secreting a set of growth promoters. Rhizobacterien and Nitrobien could be used as a source for fixing nitrogen in the soil. The use of biofertilizers along with organic fertilizers results in encouraging yield and helps to keep the environment clean for coming generations.

Consequently, this investigation is a trial to replace organic manure and biofertilizers instead of mineral nitrogen fertilization for Costata persimmon trees and the evaluation of this process through studying the affects of organic manure and biofertilizers on some parameters of tree growth, leaf mineral content, tree fruiting and fruit quality. Thereupon, the main

target of this study is to compare between the affects of three organic manure sources i.e. cattle, poultry and rabbit manure; two organic manure application methods namely superficial and trench application and two biofertilizers namely Nitrobien and Rhizobacterien as well as their combination on some parameters of Costata persimmon tree growth, leaf mineral content, fruiting and fruit quality.