INTRODUCTION

mainly citrus called the attention of research

workers and citrus growers and it became in the last few decades a good alternative to chemical fertilization. In the meantime, it is cheaper and causes no polution to the environment. In this respect, there are many systems of bio-fertilization such as bacteria azoto-bacter which fix atmospheric nitrogen into the soil and biomyces which live with legume plants in symbiotic life. Besides, Azoola is considered as bio-fertilizer and biomyces live with rice plants under water. Such organism takes the source of energy from the plant and in the same time the organism provides plants with nitrogen.

Supplying the soil with suitable mycorrhizal fungi is considered also as Bio-fertilization where biomyces live between plant roots. In fact, myco-rrhizal fungi are beneficial micro-organisms since they live near the feeder roots of plants and consequently play a vital role in stimulating various physiological processes in the plant such as vegetative and root growth, absorption of minerals especially phosphorus, and enhances chlorophyll and vitamins content. In addition, such organisms are very important in the Juvenile stage of fruit plants mainly before transplanting to the permanent

place. Nowadays, modern planting of seedling root-stocks takes place in fumigated soils for producing fruit trees free from diseases. Under these conditions, soil inoculation with suitable mycorrhizae became very promising. In this sphere, many investigators indicated that mycorrhizae plays a vital role in producing healthy seedlings in the fumigated soil.

In this respect, two types of mycorrhizae are important namely, vesicular arbuscular mycorrhizae and ectotrophic mycorrhizae. The vesicular arbuscular mycorrhizae is caused by an aseptate fungus, which in most cases has been demonstrated to belong to one of several species of Endogone. This produces a loose weft of hyphae ramifying in the immediate enviroms of the roots. The hyphae penetrate the root tissue mainly the cortex cells, forming therein much branched haustoria called arbuscules (big spores) and vesicles (small spores). Conversely, the ectotrophic mycorrhizae is characterized particularly by the dense, usually basidiomycetous, hyphal mental which encloses the root, and hyphae which penetrate the root cortex between the external cells to from what is called the harting net.

On this basis, this study was conducted to

investigate the effect of two species of the vesicular arbuscular mycorrhizae (Glomus macrocarpus and Glomus austrele fungi) beside two phosphorus levels on the nursery performance of two local citrus species used as rootstocks i.e. sour orange and Cleopatra mandarin seedlings. Such effect involved seedling growth as well as plant chemical constituents.

From this stand point, it may prove feasible to improve the growth of citrus seedlings mainly of Cleopatra mandarin which is characterized by slow growth rate during the Juvenile stage and requires longer time in the nursery to attain the size suitable for budding. Moreover, this study may improve and add new information in the field of bio-fertilization of citrus plants.