1. INTRODUCTION

Olive (Olea europaea, L.), belongs to family Oleaceae, comparatively resists drought and salinity conditions to a great extent. Therefore, it is widely distributed tree and grown successfully under the prevailing conditions of the northern west region, of Alexandria, North Saini Governorate and in most of Egyptian oases, where soil is poor and available water is limited with relatively high salinity. In the meantime, the greatest part of Egypt is covered by wide arid deserts and the cultivated area represents about 3% of the total area. In addition, olive offers a great economic potential compared with other fruits grown under the same conditions. Olives, also have good nutritional and medical uses as picked fruits or for the production of oil. Olive production plays an important role in the economy of many Mediterranean countries.

In Egypt, olive cultivation increased considerably during the last two decades due to the horizontal extension in new reclaimed soils, the introduction of new cultivars and the wide scale propagation of olive cultivars by leafy stem cuttings under mist. Olive acreage reached 103933 feddans and fruiting area recorded 69783 feddans with total fruit production of 287080 metric tons, according to statistics of the Ministry of Agriculture, Egypt (1999).
Olives production is adversely affected by the alternate bearing habit. This habit is characterized by a heavy crop in one season ("On" year), followed by a light crop in the following one ("Off" year).

Alternate bearing habit in olives is governed by several factors particularly genetical, hormonal, nutritional and environmental factors (Halevy, 1990). This habit causes severe loss for olive growers income expressed in disturbances in yearly income of the orchard and poor fruit quality in the "On" years. Besides, in the Mediterranean region, where a substantial amount of the world’s olives are grown, the chief producer countries are also the leading consumers. In the meantime, table olive producer is also the top importer. All producing countries are characterized by high and low production years, leading to a large coefficient of variation which can be ascribed to alternate bearing (Nuvoli and Pulina, 1993).

Regular cropping is desired, but rarely obtained and would occur when a very delicate balance between fully vegetative and reproductive branches is attained. Thereupon, as a point of view, earlier fruit thinning of the alternate bearing tree, which is going to an expected "On" year through the inhibition of flower bud induction may be beneficial in minimizing alternate bearing and stabilizing tree cropping. In this concern, gibberellin has been reported as one of the growth regulators that adversely affect flower
induction (Hassan, 1987 and El-Sharkawy, 1999). Beside, Urea (NH₂-CO-NH₂) could be used as fruit thinning agent in “On” years when sprayed at high concentration resulted in reducing alternation of bearing (Baratta, et al., 1992).

In addition, perfect flowers are responsible for the yield of olive fruits, but there are many factors may cause pistil abortion and change of perfect flowers into staminate ones. Among these factors are: immaturity of tree, too high temperature during flower bud differentiation, low carbohydrate reserves, deficiency of micronutrients and insufficient moisture during flower bud differentiation (Spiegel-Roy, 1965). Girdling has been reported to enhance the percentage of perfect flowers through increasing carbohydrate reserves (Agusti et al., 1992).

On the other hand, gibberellin (GA₃) and Naphthalene Acetic Acid (NAA) have been reported to enhance fruit setting when they applied at low concentration at full bloom.

Thereupon, this study was initiated to investigate the factors that may reduce the degree of alternate bearing of olive trees through the application of some chemical substances i.e., gibberellin, naphthalene acetic acid and urea besides, the effect of girdling on flowering and fruiting of two olive cultivars namely Piecual (Spain) and Koroneiki (Greece) was also studied.