1. INTRODUCTION

Broad bean *Vicia faba* is considered as one of the most important winter Legume crops for human consumption in Egypt as protein source. Broad bean represents a highly nutritious source of food for man and animals. Broad bean contain up to 25% of protein in dry seeds. Broad bean plant has a short growing season. Green pod seeds of broad bean in Egypt are eaten fresh or cooked, also dry seeds are used as cooking seeds. With these advantages, broad bean is considered to be among the promising cash crops in Egypt.

The area planted with broad bean in Egypt has been increased from 3318 feddan in 1977 to 29176 feddan in 2003. The total yield in the same period of time increased from 26,446 to 165,744 tons.

To assure adequate supplies of food to its growing population, Egypt is intensifying its efforts to increase crop production in the newly reclaimed areas. Most of the desert soils in North Sinai are sandy soils, very poor in organic matter and nutrients. Moreover, irrigation in this area depends on the underground water, which in most cases is saline. Therefore, the use of such water under conditions of North Sinai led to a decrease in broad bean productivity.

The objective of this work is verified through two experiments. The first one was to study the effect of an alternative irrigation system (between saline and tap water) on growth, yield and its components, seeds chemical composition of some broad
bean cultivars under El Sheakh Zowid conditions, North Sinai Governorate, to know the best cultivar that can be grew under these conditions and the best water treatment to save tap water and give the favourable results for growth, yield and chemical composition of green seed.

The second was to investigate the effect of some micronutrients as individual or mixed foliar addition on growth, yield and seeds chemical compositions of broad bean under El Sheakh Zowid conditions.

Mineral elements play an essential role in plant growth and development; Iron, Zinc, Copper and Molybdenum have a number of important functions in the overall metabolism of the plant. Molybdenum stimulates plant respiration, nitrate reduction and catalase activities, also, molybdenum-increased growth of root nodules and N fixation in broad bean. Molybdenum has long been implicated in gaseous nitrogen fixation and nitrate assimilation and involved in the phosphorus metabolism of the plant. Molybdenum deficiency always leads to a drop in the concentration of ascorbic acid in the plant.

Zinc plays a major role in protein synthesis. Zinc application lead to a significant increase in the IAA content. Zinc deficient reduces the activity of enzyme tryptophan synthetase in plant; also, Zinc participates in the metabolism of plants as an activator of several enzymes.

Iron an essential nutrient, contributes to the structure of proteins, which are critical in oxidation–reduction reactions of
photosynthesis, respiration, nitrate reduction and protein metabolism.

Copper acts as a component of phenolases, ascorbic acid oxidase and its role as a part of these enzymes probably represent an important function in plants.

Recently, using micro-nutrients through foliar fertilization is preferable to avoid not only nutrients fixation in the soil, but also leaching during irrigation such as iron, zinc, copper and molybdenum which have a number of important functions. Hence, providing plants with suitable amounts of these elements is necessary for obtaining high yield with a good quality.