INTRODUCTION

Tomato is one of the most important vegetable crops all over the world as well as in Egypt. It is produced in Egypt for local consumption, export, and industrialization. During the period from 1990 to 1995, the total tomato production increased from 4.36 to 5.01 million tons; (A.O.A.D, 1995). The productivity reached 5.9 million tons in 1997.* This increasing in tomato yield was achieved through producing new cultivars of high-yielding capacity and good mangement of pest control.

Root-knot nematode *Meloidogyne species*, constitute a major group of plant-pathogenic nematode affecting crop production throughout the world. These species have wide host ranges and cause damage to many important economic crops in the tropical, subtropical and Mediterranean climates (Sasser, 1977; Lamberti, 1979). In Egypt, the most important and widely spread in different soil types and locations are the root knot nematodes which are in some instances the limiting factors of tomato production (Houssny and Oteifa, 1956).

Plant resistance is considered as an extremely feasible method for controlling root knot nematodes. It is an effective, economical, and environmental safe mean of reducing yield losses caused by these nematodes. The genetic resistance has gained further significance

* Department of Agriculture Economic and Statistics, Ministry of Agriculture; Egypt. 1998.

since the discovery of the bad effects of pesticides on the environment, and human health.

Successful employment of root knot nematode resistance requires the manipulation of genetic systems to transfer resistance genes from resistant germplasm to susceptible and will adabted ones. Significant accomplishments have been made over the recent years in this respect. Number of tomato cultivars reported as resistant to root knot nematodes till 1990 were 75 cultivars (Netscher and Sikora 1990).

The objectives of the present study were to obtain the genetic parameters required to design a successful breeding programs for root knot nematode resistance in tomato through genetic analysis of non-reciprocal set of diallel crosses among certain tomato germplasm, to evaluate the performance of the inoculated and uninoculated plants of the different parental genotypes and related F_1 hybrids, and to study the nature of tomato resistance to root knot nematode. Finding a quite, efficient and dependable bioassay which can be used by the tomato breeder in breeding programs for root-knot nematode resistnce was also one of these objectives.