I- INTRODUCTION

The total world acreage of grain sorghum (*Sorghum bicolor* (L.) Moench) approximately reached 52 million hectares (130 million acres) in 1966. This crop ranks fifth in acreage of all world crops, being exceeded only by wheat, rice, maize and barley. The highest producing countries are USA, China, India, Nigeria, Mexico, Argentina, Sudan and Egypt. The highest average yield comes from ARE, USA, France and Mixico (Walls and Ross, 1970).

In Egypt, the area devoted to grain sorghum production in 1973 was about 486, 640 Faddan (one Faddan = 0.42 Hectare = 4200 m^2) with an average yield of 12.52 Ardab / Faddan (1 Ardab = 140 Kg). More than 50 % of this area is concentrated concentrated in Assiut and Sohag Provinces with an average of 14.90 and 11.95 Ardab (Faddan, respectively. In 1976, the total area decreased to 474, 643 Faddans with an average of 10.87 Ardab / F ddan (Annual Report of Agric. Economic and Statistics Res. Ins. 1978*). In 1981, the total area decreased to 410.000 Faddans with an average of 11.30 Ardab /Faddan (Annual Report of Agric. Economic and Statistic Res. Ins.1981) This decrease in sorghum acreage is due to overlaping of maize and soybean acreage in Upper Egypt governorates.

Sorghum kernels are used directly in bread making in Upper and Middle Egypt, while the whole plant, Fresh leaves and stalks are used for pasture, hay and silage. Production

of new varieties to suit the local conditions demands knowledge about the genetic behaviour of different economic characters.

The main objectives of this work were to determine the inheritance of some economic characters, namely; plant height, head length, head width, head index, head weight and seed weight per plant. Besides, relationship between some of the characters studied were deduced which is useful for breeder.