1. INTRODUCTION

Wheat is a member of the tribe *Triticeae*, a festucoid tribe of the family Poaceae (*Gromineae*) that is of great economic importance to humankind. The tribe contain three major cereals barley (*Hordeum*), rye (*Secale*) and wheat (*Triticum*) that have been used since prehistoric times. Wheat is the second most important food crop in India after rice, both in terms of area and production, with an area of around 11% under wheat in the world, India contributes 12% to the world wheat basket. The wheat growing regions lie between 11°N to 35°N latitude and 72°E and 92°E longitude. They represent diverse agro-climatic conditions and a great diversity and range of soil and climatic conditions. India is probably one of the few countries in the world where three wheat types are grown on commercial scale are bread wheat (*T.aestivum* L. em Thell), durum/macaroni wheat (*T.turgidum* var. durum) and dicoccum/emmer wheat (*T. turgidum* var. dicoccum).

In India, durum wheat occupies about 12% of total area and mainly grown under rainfed conditions. Recently, with the development of high yielding fertilizer responsive, rust resistance dwarf varieties, cultivation has spread to the different parts of the country mainly M.P., Maharastra and Gujarat.

Seed size in wheat, as in many other crops, has been reported to be an important component affecting grain yield and its attributes (Waldron 1941; Kaufmann and MC Fadden, 1963; Tandon and Gulati, 1966; Joshi, 1997). Seed formed on late tillers, top/bottom spikelets as well as central florets of wheat are usually smaller in size than those on the main shoot, central spikelets and lateral florets, respectively (Kirby, 1974; Stam and Geisler, 1976).

Bigger seeds produced taller plants with higher number of tillers and more photosynthetic area pre plant than those from the smaller seeds of the same genotype. Tiller development in wheat starts about 25 days after sowing, almost at the same time, the mother shoot also differentiates. As both of these processes are dependent on photosynthate availability, tiller development was much faster in the seedlings from the bold seeds. Although small seeds germinated normally, the initial setback in growth could not be mitigated in the entire plant life. These effects are likely to be more pronounced when such plants have competition with the neighbouring vigorous plants in a population produced from the bold seeds. A very little work has been done on this aspect (Kaufmann and Mc Fadden, 1963, Tandon and Gulati, 1966; Pande *et al.*, 1992; Gan and Stobbe, 1995; Joshi, 1997; Podolska and Sulek, 2002; Royo *et al.*, 2006).

The production and productivity of any crop including wheat can be increased by many ways, such as (i) by developing new varieties with high yield potential, higher stability (by controlling biotic and abiotic stresses), and greater production efficiency to achieve more yield than from the existing ones, (ii) by using appropriate agronomic practices, such as improved management of crop can be realized to its fullest extent, (iii) by increasing the area under cultivation of a crop, and (iv) by making farmer's friendly public policies so as to attract them to produce more and more food. The first one of these measures has a reference to make improvement in the genetic yield potential of the plant, and hence is of immense concern to the plant breeder.

To meet the objective of developing varieties with high yield potential a wide collection of germplasm must be available so that the evaluation for desirable traits for yield can be exercised and a breeding programme for an ideal plant type concept can be made accordingly. Since the germplasm contains a large number of different genotypes/cultivars which in turn constitutes the genetic diversity, that is, of cource, fundamental to any breeding/crop improvement programme. It has already been an established fact that yields of a crop including wheat is not an independent character rather it is a result of action and interaction of various other agronomic characters. Furthermore, these characters show association among themselves and with grain yield and affect the yield both directly and indirectly. Therefore, the knowledge of such relationship among these characters as also with grain yield enables the plant breeder to emphasize on the breeding of those particular characters (plant type concept) which are more important for increasing grain yield and ultimately the productivity of plant. Such a nature of relationship among different characters including plant height, biological yield, harvest index and with grain yield in wheat has been studied at a wide scale using correlation and path coefficient analysis in wheat (Balyan and Singh, 1987; Balyan and Singh, 1997; Dhonde *et al.*, 2000; Singh and Singh, 2001 and Bergale *et al.*, 2001). Keeping the above in view, the present study has been designed with the following objectives:

(i) To study the effect of seed size on growth characters.

(ii) To study the influence of seed size on grain yield and its component characters.

(iii) To study the genetic parameters in a collection of 40 genotypes.

(iv) To study the characters associations among grain yield and other component characters in varying environments.

(v) To study the genetic divergence in forty elite genotypes of durum wheat.

(vi) To study the clustering pattern of different genotypes.