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Stability in Phenological, yield and yield attributes of chickpea over environments

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SUMMARY

Fifty-two chickpea genotypes of advance breeding lines of AICRP centres were sown at three different soil temperatures *i.e.* 24.5^{0}C, 21.5^{0}C and 18.5^{0}C in randomized block design with two replications to know the stability in Phenological, yield and yield attributes over different environments in chickpea. In pooled analysis the mean square due to genotypes, environments and G x E interaction were highly significant for all the traits except G x E interaction of biological yield/plant. Six genotypes *viz.*, GNG-1407, IPC-99-47, GL-99016, BG-2002, BG-2003 and H-98-58 were above average yielder and showed their suitability for favorable environmental condition.

Key words : Phenological, Yield attributes, Yield, Chickpea

Pulse crops are major source of protein, minerals and vitamins and form important part of predominantly vegetarian diet of Indian people. Among all the grain legumes, chickpea (*Cicer arietinum* L.) is the most important *rabi* pulse crop covering 48.9 lakh ha/area and 35.22 lakes tones of production per annum in India. Its productivity is 720 kg/ha in India. It occupies 5th position in area and 4th position in production among all food crops *i.e.* cereals and pulses.

The characteristics of growth and development in chickpea are such that a critical examination of these functions is needed to evaluate the extent of variability in the germplasm. The duration of vegetative growth, formation of floral primodia, differential periods of various reproductive phases are under genetic control. Success of yield improvement largely depends upon the magnitude and nature of genetic variability present in the existing material as it is the prerequisite for any crop improvement.

Screening of genotypes for stability under varying environmental conditions is an essential component of breeding programme. Studies on genotypic, environmental and genetypic x environment interaction (G x E) facilitate identification of genotypes with stability of characters. The present investigation was therefore, planned with objectives to know the stability in Phenological, yield and yield attributes over different environments in chickpea.

MATERIALS AND METHODS

The present investigation was carried out during *rabi* season of 2002-2003 at All India Co-ordinated Research Project on chickpea, Rafi Ahmed Kidwai College of Agriculture, Sehore (M.P.).

The soil of experimented area was clay loam vertisol with 52% clay, 41.3% silt and 6.6% sand and having the pH ranging from 7.2 to 7.8. It was low in nitrogen, medium in phosphorus and high in potash content. Fifty-two genotypes of advance breeding lines of AICRP centres were sown at three different soil temperatures *i.e.* 24.5^{0}C, 21.5^{0}C and 18.5^{0}C in randomized block design with two replications. Each replication consisted of 52 row of 2 meter length, sown 30 cm apart with plant to plant spacing of 10 cm. Fertilizer dose of 20 : 50 : 0 : 20 NPKS kg/ha was applied as basal. Plant protection measures were taken as and when required. Five randomly selected competitive plants from each replication were tagged for recording the observations. The mean of these five plants was taken as replication mean. Observations recorded for the present study were growing degree-days of flowering duration (GDD of FD), heliothermal unit of flowering duration (HTU of FD), photothermal index of flowering duration (PTI of FD), growing degree days of podding duration (GDD of PD), heliothermal unit of podding duration (HTU of PD), photothermal index of podding duration (PTI of PD), growing degree days of seed filling duration (GDDof SFD), heliothermal unit of seed filling duration (HTUof SFD), photothermal index of seed filling duration (PTI of SFD), number of pods/ plant, biological yield/plant (g), seed yield/plant (g) and 100 seed weight (g).

RESULTS AND DISCUSSION

Studies on genotypes x environment interaction facilitate identification of genotypes for phenotypic stability. Screening number of genotypes over a range of environment thus becomes an essential part in breeding

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