

Growth and thermal unit of chickpea(*Cicer arietinum* L.) genotypes under variable weather conditions of Eastern Uttar Pradesh

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SUMMARY

A field experiment was conducted during winter season of 2004-05 and 2005-06 at Faizabad to study the growth and thermal unit requirement of chickpea (*Cicer arietinum* L.) genotype under variable weather conditions. Results revealed that November 5 produced significantly higher growth due to fulfillment of optimum thermal requirement for various plant processes. Delay in sowing (November 20) with temperature 20.7°C. reduced the crop duration by 20 days over sowing done on October 20 and 10 days over sowing done on November 5 with 23.1°C. temperature. "K850" was found more conducive for growth and higher thermal unit. Heliothermal unit 16751 (degree days hr) and photothermal unit 22267 from sowing to maturity produced the higher yield of chickpea under agroclimatic conditions of eastern Uttar Pradesh.

Key words :

Growing degree days, Thermal unit, Chickpea, *Cicer arietinum*, Genotypes, Yield.

Chickpea (*Cicer arietinum* L.) is grown in India during post-monsoon and winter season as it requires cool and dry weather conditions for optimum growth. In India, it is grown in area of 6.76 million hectare with annual production of 5.56 million tones and average productivity 8.41 q/ha. Crop is predominantly grown under rain fed conditions and is raised mainly on conserved soil moisture. Sowing dates/sowing temperature has been proved to be one of the most non-monetary inputs affecting the yield of chickpea. Sub-optimal photo thermal requirement during crop growing season are known to have profound effect on productivity. Selection of sowing time is important to exploit the environmental conditions during the growth of chickpea for maximum production. Higher temperature about 30-35°C has a detrimental effect on growth of chickpea.

Solar radiation is the ultimate source of energy that sustains the crop productivity and governs the distribution of photosynthates among different organs of plants. The dry matter accumulation and distribution during different growth stages ultimately affect the yield of crop. Delay in sowing causes early maturity resulting drastic reduction in yield. The yield of chickpea fluctuates as it responds differently due to the variation in the environment and thermal requirements of a given genotypes in a particular agro-climatic

condition. The productivity of chickpea in eastern U.P. is quite below which needs to be improved by climatic and resource management (Shendge *et al.*, 2002). Keeping this in view, attempts have been made to assess growth, development and thermal indices under varying sowing dates.

MATERIALS AND METHODS

The field experiment was conducted during winter season of 2004-05 and 2005-06 in sandy loam soil at the experimental farm of N.D. University of Agricultural Technology, Kumarganj, Faizabad (U.P.) India. To study the growth and thermal unit of chickpea genotypes under variable weather conditions. Geographically the experimental site was situated at 26° 47' N latitude, 82° 12' E longitude and at an elevation of 113 m in the north indo-gangetic plain. The experiment was laid out in factorial RBD design, consisting 12 treatment combinations comprised of three sowing dates (sowing on October 20 with temperature 25.7°C, November 5 with temperature 23.1°C and November 20 with temperature 20.7°C) and four genotypes of chickpea (K-850, Awarodhi, Uday and Radhey) with three replications. Soil of the site was medium in fertility and saline in reaction having pH 8.38, Electrical conductivity-0.51, organic carbon(0.45%) with available N, 132.5 kg/ha, available P₂O₅, 16.4 kg/ha and available K₂O,

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