

Effect of Bioregulators on Growth and Yield of Chickpea (*Cicerarietinum* L.) to under Late Sown High Temperature Stress Condition

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Abstract: Chickpea yield is constraint by several environmental factors. Amongst them temperature is one of the most important determinants of crop growth and may limit chickpea yield. In chickpea, large part of reproductive phase is exposed to high temperature effecting grain yield up to 50%. Bioregulators are known for their role in plant growth and development and improvement of grain yield. Therefore, in order to explore the potential foliar application of some bioregulators (viz. abscisic acid (ABA), benzyladenine, (BA) and salicylic acid (SA)) on improving growth, dry matter partitioning and yield under high temperature condition, present investigation was undertaken using kabuli type chickpea variety (Pusa-1108). High temperature stress was imposed by delaying the sowing dates (i.e. normal sowing and late sowing) to expose the terminal phase of crop to high temperature. Observations were recorded on various growth parameters (viz. shoot length, leaf area, total dry matter, leaf area index, specific leaf area, specific leaf weight, leaf area ratio, crop growth rate, leaf area duration), phenological stages, stem anatomy, pollen viability, yield and its attributes, harvest index and heat tolerance efficiency. Under high temperature stress interestingly, application of bioregulators (ABA, BA, SA) in general, maintained the higher value of all aforementioned parameters. Moreover, ABA treatment improved the development of xylem vessels while BA and SA enhanced the development of secondary phloem under high temperature late sown condition. Present findings showed the possibility of foliar application of ABA, BA and SA in improving growth biomass partitioning and yield under late sown high temperature condition and thus enhanced the chickpea grain yield.

Keywords: Chickpea, growth, pollen viability, dry matter partitioning, abscisic acid, benzyladenine, salicylic acid, high temperature, yield