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Abstract

Genotypic Variation in Biomass Produced Is Linked to Differences in Radiation Acquisition in Mungbean †

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Abstract: Mungbean has become an important cash and legume rotation crop in the Australian Northern Grains region. Thus, it is necessary to narrow the gap between potential productivity and actual production by understanding the crop physiological attributes contributing to the acquisition of radiation, and it's conversion into total biomass. A field experiment was conducted at Gatton, during 2018-19 summer season, growing two commercial varieties of mungbean; Jade-AU and Satin II under irrigated conditions. The varieties were planted at 0.5m and 1.0m row spacing and different plant densities. Weekly biomass cuts were taken from a square meter and separated into its components. The area of a green leaf sub-sample was used to compute the leaf area of the canopy. Weekly Ceptometer measurements were taken above and below the canopy at noon on clear, sunny days to obtain a measure of Fraction of radiation interception (F_i). Total shoot dry matter (TDM), pod dry mater (PDM) and leaf area index (LAI) was investigated. There was a significant effect of canopy density on F_i. There was no significant difference in total dry matter between the two varieties, however, there was a highly significant effect of canopy density on TDM. A highly significant variation in LAI amongst the two varieties and across canopy densities, with Satin II having a higher mean LAI compared to Jade-AU. There was significant effect of canopy density on PDM. Our data indicate variation in dry matter production across canopy densities and there is a need to examine varietal differences in radiation use efficiency which may provide better understanding of hot the captured radiation is utilized in biomass production in mungbean.

Keywords: mung bean; radiation interception; row spacing; biomass; leaf area index

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