**Genotype x environment interactions affecting flowering time and flowering duration in mungbean.**

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Mungbean (*Vigna radiata L.*) is a high value pulse crop cultivated in the subtropics and the primary summer legume rotation option in Australia. Understanding phenology, particularly flowering, is key to achieving adaptation of mungbean to varying production environments. Despite its importance, the traits that underpin flowering behaviour in mungbean such as days to flowering and flowering duration are not well understood. This includes a lack of knowledge about how these physiological traits interact with each other and the production environment, and the underlying genetic mechanisms. Utilising a diverse mungbean nested association mapping population, key flowering traits (days to flowering and flowering duration) were evaluated across four field experiments conducted in Queensland, Australia in 2022 and 2023. Genotype by Environment interactions (G x E) were observed, and extensive genotypic variation was noted particularly in traits such as days to flowering and flowering duration. Fluctuations in flowering time have been observed, with high yielding varieties typically flowering at ~30-35 days and lower yielding varieties flowering earlier Flowering duration in mungbean was observed to be substantially influenced by the environment with a high degree of genetic variation within the mungbean germplasm studied. To dissect the genetic mechanisms controlling days to flowering and flowering duration, genome wide association studies were conducted. Ten QTL were identified to have significant associations with flowering traits on several chromosomes. This research provides new knowledge of novel flowering traits in mungbean and provides genetic mechanisms which lay the foundation for further investigation.