

عنوان مقاله:

Agro-physiological responses of Tepary bean to planting patterns and plant densities

محل انتشار:

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خلاصه مقاله:

Planting pattern and plant density are efficient management tools for maximizing crop yield by reducing soil surface evaporation and optimizing resource utilization such as light, nutrients, and water. A two-year (۲۰۱۷-۱۸) field trial was conducted to determine the effects of plant density and planting pattern on some agro-physiological and biochemical traits of Tepary bean (*Phaseolus acutifolius* L.) at the Research Station of Islamic Azad University, Arak Branch, Iran. The experiment was performed as a split-plot arranged in a randomized complete block design with three replications. The treatments were two planting patterns (one-row and two-row plantations) and three plant densities (۳۰، ۴۰، and ۵۰ plants per m²). The results showed that that one-row planting pattern and ۴۰ plants per m² improved seed yield by ۷۵% and ۶۵% compared to ۳۰ and ۵۰ plants per m² in one-row planting pattern in the second year, respectively. The plant chlorophyll content increased by ۲۰% with two-row plantation and medium plant density compared to high and low plant density in the first year. The highest accumulation of seed carbohydrates (۳۸.۲۶ mg. g⁻¹ FW) was obtained with two-row cultivation and medium plant density in the second year. The relative seed water content significantly decreased with one-row plantation and low plant density compared to a two-row plantation and medium plant density. The least malondialdehyde and proline aggregation (۳.۲ and ۲۲۵ μ mol. g⁻¹ FW, respectively) was achieved with two-row plantation and medium plant density. Finally, a two-row planting pattern with medium-density cultivation is recommended to obtain optimal Tepary bean seed yield in the region.

کلمات کلیدی:

Carbohydrate, Photosynthetic pigments, Proline, Seed yield

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