

## Effect of planting method on agricultural characteristics of kidney beans (*Phaseolus vulgaris* L) in Khuzestan

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**ABSTRACT:**

To evaluate the effects of plant density and planting pattern on the process of growth of kidney bean varieties, an experiment was conducted by using factorial split plot in a completely randomized block design with three replications during the agricultural year of 2014-2015 in Sardasht in Khuzestan. In this experiment, the distances between row at three levels of 30, 45 and 60 cm were used as the main factor and two varieties (Naz and Derakhshan) and three distances between the rows at the levels of 5, 10 and 15 cm were used as the secondary factors. The Dry Matter (DM), Crop Growth Rate (CGR) and Relative Growth Rate (RGR) were used to evaluate the growth indices that the process of changes in growth indices were obtained based on growing degree days by sampling the farm with one-week intervals. According to the results of this experiment, it was observed that the process of changes in the shoot dry matter in all treatments were sigmoidal. The highest dry matter produced was obtained in 1029 growing degree days in Derakhshan variety and in 1200 growing degree days in Naz variety. It was also found that by increasing plant density, the dry matter content was significantly increased and the highest dry matter in Naz and Derakhshan variety was obtained in the planting pattern of 5 × 30 cm and plant density 66.67 plants per square meter. In the varieties studied, by decreasing the distances between rows and between two plants in the row, the crop growth rate increased and the maximum amounts of crop growth rate were obtained in Naz and Derakhshan varieties with the amounts of 3.67 and 3.12 g per growing degree days, respectively. The results also showed that in the varieties studied by decreasing the distances between rows and between two plants in the row, the bean seed yield increased and the planting patterns of 5 × 30 cm in Naz variety and 10 × 30 cm in Derakhshan variety led to produce the maximum seed yield.

**Keywords:**

Plant density, planting pattern, growth indices, total dry matter, crop growth rate and relative growth rate, seed yield