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Effect of Plant Density and Spring Planting Dates on Yield and Morpho-Physiological Traits of Garlic (*Allium sativum* L.)

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Abstract

In order to investigate the effect of different planting dates and plant density on yield as well as on some morpho-physiological traits of garlic, a split plot experiment was conducted with three replications. The experimental treatments were three planting dates (March 5, March 25 and April 14) and four planting densities (20, 40, 60 and 80 plants m^{-2}). The results showed a significant interaction between planting date and planting density for: garlic yield, leaf weight, plant height, total chlorophyll and carotenoids, whereas for harvest index, number of produced cloves in plant, chlorophyll a and relative water content only the effects of planting date and plant density were significant. The highest garlic yield (921 g. m^{-2}) was observed for planting date of March 5 with a density of 80 plants m^{-2}, but the lowest yield (317 g m^{-2}) was obtained for the last planting date with the lowest plant density. Similar results were observed for leaf weight. The highest amount of chlorophyll (2.52 mg g FW^{-1}) was observed for planting date of March 25 with the density of 20 plants m^{-2} but the planting density of 80 plants m^{-2} in the last planting date resulted in the lowest amount of total chlorophyll (2.07 mg g FW^{-1}). The highest harvest index was related to the first planning date and with delay in planting date, this index was reduced significantly. The lowest number of cloves per plant (3.64) was related to the last planting date. Increasing plant density also decreased the number of produced cloves by 14 percent. In terms of garlic yield, the best planting date in the studied region (with Mediterranean climate) was March 5^{th}. Although increasing plant density resulted in higher yield, because of smaller size of produced bulbs the marketable yield decreased.

Keywords: Agronomic practices, harvest index, medicinal plants, relative water content

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