DOI: 10.25695/ AGRPH.2019.03.03

EFFECT OF IRRIGATION METHODS AND HILLING POTATOES ON THE STRUCTURAL CONDITION OF THE SOIL

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The paper presents the results of the two-factor field study to assess the impact of irrigation methods and potato hilling on the structure of southern Chernozem in Rostov region. Three methods of irrigation (sprinkling, surface furrowing and drip irrigation) and two methods of potato hilling in the germination phase (with formation of beds or ridges) were studied. It was established that with all the methods of irrigation there was a decrease in the agronomically valuable fraction of soil aggregates (10–0.25 mm) and an increase in the less agronomically valuable soil fraction <0.25 mm, but the soil structure coefficient remained above 1.5, which indicated stability of southern chernozems to irrigation. A decrease (1–4%) of the most valuable water-stable aggregates larger than 0.25 mm was found, however, their quantity remained higher than 75 %, which characterized the soil in terms of water resistance as good and excessively high. The analysis of soil bulk density dynamics allowed to establish that the lowest values of the soil bulk density (1.09-1.16 g cm^{-3}) in all the treatments were created after potato hilling with the formation of beds or ridges, but later the soil bulk density was increasing more with drip irrigation: in the flowering phase of potato development the soil bulk density increased from 1.22 to 1.23 g cm^{-3} on the ridges, and in the maturation phase from 1.25 to 1.26 g cm^{-3}, against 1.25 g cm^{-3} in the soil with control treatment. The soil remained looser with the bulk density of 1.21 g cm^{-3} by the end of the growing season when furrow irrigation treatment was used.

Keywords: potatoes, irrigation methods, methods of hilling, hydro-physical soil properties.