

SALT COMPOSITION DYNAMICS OF DARK CHESTNUT SOIL IRRIGATED WITH MINERALIZED ARTESIAN WATERS IN STEPPE CRIMEA

O. E. Klimenko, S. V. Podovalova, A. M. Dzhaparova

*FSBSI «Research Institute of Agriculture of Crimea»,
150, Kievskaya str., Simferopol, 295043, Russia, e-mail: olga.gnbs@mail.ru*

The underground artesian waters are used in Crimea when there is a shortage of fresh irrigation water. These waters are often mineralized. Irrigation with such waters can cause suppression of agricultural crops, as well as development of different negative processes in soils. The aim of the study was to investigate the dynamics of the salt composition of the irrigation waters and their effect on the salt content of dark chestnut soils in the Steppe Crimea. The studies were carried out in the Pervomaysky district on irrigated areas planted with vegetables. Non-irrigated soil served as a control. The composition of salts in the irrigation waters and the soils was determined by standard methods. The assessment of water and soil salinity was carried out according to existing recommendations. It was found that weak soil salinization occurred annually at the end of the irrigation season. The chemistry and distribution of salinization along the soil profile depended on the water mineralization. If the water contained more than 2 g dm^{-3} of readily soluble salts (the chemistry of water salinization was sulfate-chloride magnesium-calcium), salinization was observed in the 0–100 cm layer (chloride sodium-magnesium in the 0–20 cm layer, lower down the profile – sulfate-chloride magnesium-sodium). Soil salinization after the irrigation season was manifested in individual layers within the 100 cm thickness, and alkalization was observed in the 0–40 cm layer if the concentration of salts in irrigation water was in the range of $1.0\text{--}1.3 \text{ g dm}^{-3}$. The layer 0–100 cm was completely desalinated or had a weak salinization of individual layers of this thickness in the inter-irrigation period. Such quality of irrigation water and the resulting soil salinization can cause a decrease in the soil productivity of weakly and moderately resistant crops by 20–50 %.

Keywords: irrigation, salt composition, soil, mineralized waters, Steppe Crimea.