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Agromeliorative efficiency of phosphogypsum application on irrigation saline soils in the northern steppe of Ukraine

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Abstract

The present research represents the influence of chemical reclamation on the saline regime of the soil. Irrigation with limited water suitable for irrigation increased exchangeable sodium in the soil exchange complex to 5% and in the aqueous soil extract by 30%. Phosphogypsum was used as a chemical ameliorant in stock for three years under irrigation conditions and without it. It was applied at rates of 1.4, 3 (in spring) and 6 (in autumn) t/ha. The application of ameliorant in the spring at the rates of 1.4 and 3 t ha⁻¹ under irrigation caused to reducing the ratio of Na/Ca on average from 3 years to 2.53 and 1.51. It was sulfate type of salinity for all period of the time. Sodium exchange was decreased by application rates of phosphogypsum to 2.3% total amount of the exchangeable cations without irrigation (application of ameliorant in autumn) as compared to the control variant. Sodium exchange was decreased to 3.7% with a total amount of the exchangeable

cations with irrigation (application of ameliorant in spring). In the first year after the second application of phosphogypsum there were the lowest rates of the density had the variants without irrigation. The density in this period was 1.17–1.2 g cm⁻³, that was less on 0.04–0.96 g cm⁻³ as compared with the results the first year after first application.

Top Keywords : Saline composition of soil, Chemical reclamation, Irrigation, Phosphogypsum.