

INFLUENCE OF TILLAGE ON PRODUCTIVE MOISTURE RESERVES IN AGROCHERNOZEM OF KRASNOYARSK FOREST-STEPPE

E. N. Belousova, A. A. Belousov
Krasnoyarsk State Agrarian University
Russia, Mira Ave., 90, Krasnoyarsk, 660049
E-mail: svoboda57130@mail.ru

The formation of productive moisture reserves in the chernozem soils of the Krasnoyarsk forest-steppe is one of the key tasks of agriculture. The purpose of the work was to study the influence of minimal tillage technology on the dynamics of productive moisture reserves in agrochernozems. The study was carried out in Krasnoyarsk on the land areas of the APC Shilinskoe (56°37', 93°12'). The influence of the soil tillage (surface disking - minimal technology and conventional plowing) on moisture reserves was studied during 2013–2015 in the long-term field experiment established in 2005. Reference plots with an area of 500 m² were allocated within the crop production fields. Soil samples were collected from layers of 0–5 and 5–20 cm by the «snake» method (15 spatially remote points) at the beginning, middle and end of each growing season. It was shown that the estimated tillage treatments did not have a significant compacting effect on the studied soil. However, there was a noticeable change in the soil microaggregation, expressed as an increase in the dispersion coefficient (Cd) from minimal tillage (Cd = 13.1) to convectional plowing (Cd = 31.7). For both tillage treatments, soil moisture reserves corresponded to a «good» level. The advantage of the conventional plowing was accumulation of more productive moisture compared to minimal tillage in conditions of precipitation shortage (in 2015). However, with sufficient precipitation (2013–2014), soil moisture reserves were either almost the same for both studied technologies, or even higher under minimal tillage. The simulation results showed that the greatest degree of influence on moisture reserves was exerted by the air content in the soil.

Keywords: minimal tillage technologies, productive moisture reserves, soil density, air content.