GROUP COMPOSITION OF SOIL ORGANIC MATTER IN AGROCENOSES OF NORTH KAZAKHSTAN

K. K. Kunanbayev, L. D. Zhloba, G. N. Churkina, Zh. A. Kaskarbayev, A. A. Kijas
LTD «Scientific production center of grain farming named after A. I. Barayev»
15 Barayeva str., Nauchniy, Shortadinsky distr., Akmolinskaya reg., 021601, Kazakhstan
E-mail: npcecolab@mail.ru

Intensive use of chernozems in Northern Kazakhstan since 1954 leads to a decrease in the content of the soil organic matter and changes in the organic matter group composition. According to some studies, the total loss of the soil humus since the beginning of virgin soil cultivation amounted to 1.2 billion tons of organic matter. The study was carried out at the Institute's long-term field experiment at the southern carbonate chernozems of Northern Kazakhstan. The total soil organic carbon content was measured by Tyurin method in the modification of CINAO, and the soil organic matter group composition was measured by the pyrophosphate method of Kononova and Belchikova. The measurements were conducted for three years in three crop rotations: “wheat-fallow”, “permanent wheat” and “wheat after sweet clover”. The lowest content of soil humus was measured in the treatment “wheat-fallow” (2.47–2.71%). Application of nitrogen-phosphorus fertilizers and the incorporation of plant residues into the soil make it possible to maintain the humus content of the soil at a stable level (3.21–3.26%). According to the ratio of humic and fulvic acids, the organic matter of the studied chernozem belongs to the humate-fulvate type. The ratio of humic and fulvic acids was more than one for all the studied crop rotations. It indicates the predominance of humus accumulation processes in the studied soil. The content of the labile humus for 3 years of the study was 0.52% in the “wheat-fallow” treatment, 0.59% in the “permanent wheat” treatment and 0.52% in the “wheat after sweet clover” treatment. The dynamic of changes in the content of humic and fulvic acids reflects a slight variability within the experiment. The highest content of humic acids was measured in the “permanent wheat” (0.37%) and “wheat after sweet clover” (0,34%) treatments while the lowest in the “wheat-fallow” treatment (0.31%).

***Key words*:** humus, labile humus, fulvic acids, humic acids, Northern Kazakhstan, chernozem.