

CONSEQUENCES OF ORCHARD ROW-SPACING LONG-TERM KEEPING UNDER A BARE FALLOW ON SOUTHERN CHERNOZEM.

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Plough up a virgin soils led to decreasing of its humus content. It connects with considerable decreasing of plant residues quantity going to soil and intensification of organic matter mineralization due to soil cultivation. In this case loss of humus from chernozems in condition of low doses of organic fertilizes may reach more then 25 % from initial stock (Yegorov, 1978). Planting of orchards and keeping of its row spacing under a bare fallow for water conservation and weed plant control further increasing the loss of organic substances from soils.

Long-term monitoring of changes in southern chernozem properties in apple orchard have been carried out in the Steppe Department of Nikita Botanical gardens. We have established that 40 years planting of orchards in this soil led to losing of humus stock on 67,3 t/ha in 1 meter layer. For a first 20 years, when planted wide-row orchards and use of mineral and organic fertilizes, losses of humus from the soil have been 1,3 t/ha a year. From 1981 to present intensive apple orchard has been cultivated on this plot. For last 10 years organic manures have not been bring in soil. For last 5 years – mineral fertilizes have not been used. Moreover the losses of humus from the soil intensified and reached 2,1 t/ha a year.

A virgin analog of this soil consists 4,6 % of humus in an arable layer (Polovitskiy, Husev, 1987). Results of large-scale soil observation in 1959 show that at the moment of the orchard establishing humus content was 3,43 % in that layer. Our analytical test of 1999 shows that 2,5 % humus is in upper layer of this soil. Monoculture, often alley of hard machines in row-spacing promoted to packing of soil and a soil structure worse.

To increase an effective fertility of soil under orchards and stop of humus loss from one it has to plant a winter green manure crops. Legumes, grass family plants and its mixes and its interchange with bare fallow which use a winter rainfalls water may give a significant biomass, keep a water in soil, enrich the soil with nitrogen by nitrogen fixing, stable of humus content in soil. Long-term green manure of orchard led to it yields increasing up to 10-50 % and was profitable.

Key words: Ukraine, fertility, humus evolution, green manure, apple orchard.

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