

Annotation

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Ecological assessment of the depth of basic plowing and fertilizer systems on changes in agrophysical soil properties

The studies are devoted to the issue of an ecologic assessment of the depth of autumn plowing and fertilizer systems on the change in agrophysical soil properties. It is determined that when growing sugar beet in crop rotation with prolonged application of fertilizers during the vegetative period there is soil density of the upper layers to a depth of 30 cm. Long-term use of the organic mineral and organic fertilizer system in the crop rotation, as well as autumn plowing by 40 cm reduces the soil density. Plowing up to 40 cm in the organic mineral and organic fertilizer systems increases the number of agronomically valuable units in the soil layer of 0–10 cm by 9 %. At the same time, it increases water resistance of units in this soil layer by 28–37%, respectively, per set of mechanical movement from lower soil layers. Water permeability of heavy loamy podzolized chernozem is quite low. For the third hour of observation it was only 7 mm. Deep autumn plowing by 40 cm has the advantage of passing water through deep layers which is observed even after the sixth hour from the beginning of the observation. With a prolonged application of fertilizers in the crop rotation deep autumn plowing by 40 cm for sugar beets with organic mineral and organic fertilizer systems reduces soil density, improves structural characteristics and water resistance of the soil and increases the soil infiltration which reduces the surface runoff.

Keywords: *heavy loamy podzolized chernozem, soil tillage, fertilizer system, dense soil, soil structure, water resistance of the soil, water permeability of the soil, sugar beet.*