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доктора технічних наук, професора,
віцепрезидента УАСГН

КРАМАРОВА

Володимира Савовича

(1906-1987)

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В збірнику представлені тези доповідей науково-педагогічних працівників, наукових співробітників, аспірантів та студентів НУБіП України, провідних вітчизняних і закордонних вищих навчальних закладів та наукових установ, в яких розглядаються завершені етапи розробок.

The Proceedings presents abstracts of reports of scientific and pedagogical workers, research staff, graduate students and students of the NULES of Ukraine, leading domestic and foreign higher educational institutions and scientific institutions, in which completed stages of development are considered.

REINFORCEMENT OF WORKING BODIES OF TILLAGE MACHINES BY SURFACING

A. KUTS, Master's student,
Y. REVENKO, Candidate of Technical Sciences, Associate Professor
National University of Life and Environmental Sciences of Ukraine

Soil cultivation is accompanied by high intensity of wear of parts of working parts of soil tillage machines. Working time until failure of plow shares at primary soil tillage (plowing) due to the presence of abrasive medium is from 3 to 21 hectare depending on its type. Therefore, a number of technological processes that increase the durability of plowshares are not sufficiently adapted to specific types of soils and are not always effective. In this regard, there is a need to conduct research aimed at optimizing the methods of increasing the resource of parts in relation to specific types of soils.

Among the ways to increase the durability of plowshares, cladding reinforcement has recently become widespread. Due to its simplicity the method of reinforcement allows to develop a number of technological options. At the same time, there is no reliable information on the use of plowshares reinforced by such technological options on heavy soils (heavy loam and all forms of loamy soils).

The greatest efficiency is achieved by application of cladding reinforcement of reconditioned plowshares, which consists in application of reinforcing rollers in the form of semi-ellipses in the area of the most probable wear. The service life of standard plowshares hardened in this way exceeds the service life of unhardened ones by 30%. It is possible to use other technological solutions of reinforcement based on agro technical and agrophysical conditions of plow operation.

When studying the hardness of the working surface of the plowshare toe, it was found that the hardness of factory-made plowshares reaches its maximum value of 198HB. It is connected with a greater degree of riveting in comparison with the degree of recrystallization due to the increased volume of metal. The minimum 178HB corresponds to the area of the field cut and the lower part of the toe, where

maximum wear occurs, due to the presence of collecting recrystallization due to the small volume of metal.

Studies of hardness of the hardened area have shown the following: hardness of "traces" of rollers exceeds the hardness of the plowshaft metal and is associated with the formation of hard structures in the transition zone, which allows to obtain a composite surface; the increased value of hardness is associated with an increased rate of cooling of the metal after surfacing; hardness of the interseam zone is comparable to the hardness of the plowshaft surface.

Exposure to abrasive medium, as experiments show, does not significantly affect the change in hardness of the working surface.

The lower value of hardness of reconditioned plowshares is due to the complexity of the process of reconditioning and hardening: patching of radial wear, pulling, cooling at a speed higher than critical, surfacing of reinforcing rollers. Therefore, factory hardened plowshares are more wear-resistant, which determines their longer service life. Reinforcement of factory-made plowshares increases the operating time before failure by 30% on average. Restoration with subsequent hardening by cladding reinforcement provides working time not less than 85% of the working time of the plowshares in the state of delivery.

The process of wear by mass and geometrical parameters for hardened plowshares in the factory version and reconditioned ones has a rectilinear character.

Wear intensity and wear resistance are not constant values. They become constant after a certain operating time, depending on the mechanical properties of the share material, soil properties and operating characteristics of the machine. Decrease / occurs with increasing operating time, which is associated with self-organization of the contact process and creation of a composite surface with "traces" of rollers of increased hardness.

Wear resistance tends to stabilize after a certain operating time. The presence of reinforcing rollers significantly inhibits abrasive wear of the plowshare, associated with the creation of riffles conditions for contact of a smaller number of abrasive particles with the working surface of the part and with less pressure, prevents the formation of radial wear.