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The V International Conference-Symposium

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Abstract Book





The V International Conference-Symposium ECOLOGICAL CHEMISTRY 2012

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Abstract Book

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Academy of Sciences of Moldova

1 Stefan cel Mare Str. 2001 MD, Chisinau, Republic of Moldova

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CHEMICAL DEGRADATION OF SOILS AND MEASURES TO MINIMIZE THE DEGREE OF ENVIRONMENTAL POLLUTION BY NUTRIENTS

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The factors and forms of chemical degradation of soils through dehumification, depleting soil nutrients, secondary salinization and alkalization to irrigation are presented. The intensity of chemical degradation processes is largely determined by soil erosion. During the last 100-130 years the initial reserves of humus decreased with 40-45% as a result of mineralization. The annual losses of organic matter in soils is of 1100 kg/ha, including 700 kg by mineralization and 400 kg/ha by erosion.

Erosion presents the most serious form of soil degradation and environmental pollution with nutrients. Annual losses amount up to 26 million tons of soil, 700 thousand tons of humus, 50 thousand t of nitrogen, 43 thousand t of phosphorus, and considerable amounts of microelements. The decrease of 60 times in the volume of organic fertilizers and 10 times of the chemicals used in agriculture, led to a negative balance of humus and soil elements. Chemical soil degradation results in decreased ability to produce agricultural land.

Agrochemicals measures and physical-chemical processes of conservation, restoration and enhancement of soil fertility characteristics are proposed. Application of environment friendly practices offer training to a balanced review of humus and elements, minimize the soil erosion processes and environmental pollution with nutrients.

BLACK SOILS DEGRADATION IN THE SOUTH-WESTERN BLACK SEA REGION AT IRRIGATION AND IN THE POST-IRRIGATION PERIOD

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The objective of the paper is to reveal the essence and ecological & soil consequences of the processes of degradation of the black soils in the south-western Black Sea region at irrigation and in the current post-irrigation period of their evolution, development of measures to prevent soil degradation processes in the irrigated massifs and to increase their fertility.

Our many years' (1971-2011) studies of the processes of changes of black soils in the irrigation region have established the increase of carbonates' and humus substances' mobility, decrease of base exchange capacity and content of consumed calcium. Also, the share of consumed magnesium and sodium increase, which are the evidences of the processes of alkalization and salinization of the black soils with irrigation. Their agro-physical characteristics worsen significantly.

The area of irrigated fields in the region sharply decreased (5-8 times) within past 15-17 years; organic and mineral fertilizers, ameliorants, pesticides and herbicides to the irrigated fields decreased significantly. As a result, agrophysical alkalinity of soils increases, processes of humus mineralization (soil dehumification) intensify, indices of ecological and agrochemical soil properties decline. A system of measures has been substantiated and implemented as a pilot-experimental measure to prevent from degradation processes in the black soil irrigated massifs and to increase their fertility.

Presented and analyzed in the report are the results of many years' studies of irrigated black soil massifs' degradation processes in the region, system of ameliorative measures to prevent from chernozem degradation processes and mitigation of their consequences under the conditions of irrigation and in the current period, as well as efficiency of the system.