ABSTRACTS

METHOD OF SILT FRACTION SEPARATION FROM SOIL SUSPENSION

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The electrophoresis method of soil silt fraction separation is offered. The modified electrophoresis system is described. The method of sedimentation of silt fraction by electrophoresis might be useful in solving problems when it is not necessary to remove the entire amount of silt fraction from soil water suspension and can give good results. The advantages and disadvantages of the method, the limits of its application as well as the comparison with other methods of separation of silt fraction from soil water suspension are presented.

Key words: soil water suspension, sedimentation of silt fraction, methodology, electrokinetics, electrophoresis.

MODERN STAGES OF DEVELOPMENT OF AGRICULTURAL LAND MELIORATION THEORY

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Main directions and stages of the theoretical basis formation for soil melioration are described as a systematic integrating knowledge about control of such complicated systems as agricultural landscapes. By way of illustration an example of water regime control for an individual agricultural landscape is given.

Key words: soil melioration, regime and resource control, agricultural landscapes, mathematical models

THE ESTIMATION OF SPATIO-TEMPORAL VARIABILITY OF THE SOIL-ECOLOGICAL INDEX

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Soil fertility is one of the most important factors of land productivity and crop capacity; it is a complex value that depends not only on agrophysical and agrochemical soil properties, but also on other natural factors, for example, climate. There are different methodical approaches for a quantitative assessment of soil fertility level. The estimation and comparison between V. A. Semenov's and N. L. Blagovidov's methods for the quality of land estimation and I. I. Karmanov's method of an appraisal of soils are given in this paper. I. I. Karmanov's method has climate parameters in the formula of soils class and the soil-ecological index estimation which is important under the changing climate and weather conditions.

Key words: productivity, agroecosystems, soil-ecological indexes, yields.

FUZZY MODELING OF ZONING FOR AGRICULTURAL FIELD

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Fuzzy modeling of zoning for agricultural field is considered. A two-tier model based on the concept of a fuzzy indicator is proposed. General principles are illustrated by an example based on the data of the field experiment conducted in Texas, USA. Using the data sets from the experiment fuzzy indicators are calculated and zoning of agricultural field is executed.

Key words: zoning of the agricultural field, fuzzy modeling, fuzzy indicators.

THE AGROPHYSICAL APPROACH TO THE CREATION OF NEW FORMS OF CULTURAL PLANTS

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The original approach to creation of new forms of cultural plant with predicted economic-valuable properties is offered on the basis of plant genetic features study in controlled conditions. The advantages of this approach are the time-shortening of constant breading forms creation and the reduction of studied material volume.

Key words: new selection technologies, transgressions of the plants, regulable agroecosystem

MODELING OF CHANGES IN CHEMICAL COMPOSITION OF BUCKWHEAT BIOMASS GROWN ON SODDY-PODZOLIC ACID SOIL UNDER INCREASING RATES OF K-FERTILIZERS

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The chemical composition (Ca, Mg, S, Cl, Fe, P, Zn, Cu, Mn) and buckwheat biomass are affected by high rates of K-fertilizers in chloric or sulfate form. It is possible that there is a "critical" rate of K-fertilizers after which significant changes in elements' concentrations in plants take place. Different chemical forms of Ca and Mg were found in plants under effect of K-fertilizers. Abnormal accumulation of S by plants was observed with increasing rates of K-chloric fertilizer. Concentrations of K, Cl, and S increased and concentrations of Ca, Mg and Fe decreased in plants with increasing rates of K-fertilizers. Increase of K, Cl and S concentrations in plants was approximated by logistic function. Decrease of Ca, Mg and Fe concentrations in plants was approximated by sum of two exponential functions.

Key words: K-fertilizers, chemical composition of plants, modeling.