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Book of Abstracts

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Annotation

**In the following we are publishing
the abstracts as submitted by the authors.**

The symposia are in numerical order.

**The posters are ordered according
to the postersessions 1 – 4 during
which they were presented.**

Keys and Abbreviations:

S01 Symposium 01
A Time Block A (see programme)
KL Keynote Lecture
P Poster Presentation

The Editors

periods (several years). In contrast, the indirect way is related to modification of the initial (before irrigation) microclimatic conditions. It is much less studied, realized during relatively long periods (decades), and the prediction of soil quality alteration is rather difficult. Although the mathematical modeling of long-term soil alteration is usually not very reliable, it could be improved using known relationships between regional virgin soil properties and climate. This approach can be based on the geographic law of soil zonality and the establishment of a quantitative relationship between Budyko's radiative index of dryness (I_v) and regional modal values of a virgin soil fertility index (φ_v) inside geomorphologically homogeneous soil groups. The microclimatic index (I_v) is calculated as I_v = Rn/LPr, where (Rn) and (Pr) are mean annual values of net radiation and precipitation, respectively, and (L) is the latent heat of evaporation. It is considered that irrigation with a mean annual amount of water Ir changes the microclimatic index to I_{ir} = Rn/L(Pr+Ir), and will gradually lead to a new soil fertility index (φ_{ir}), which could be better or worse than the initial value (φ_v). Analyzing the curve $\varphi_v(I_v)$, it is possible to identify limits of Ir_s in order to prevent soil degradation. Although these values of Ir_s may not be sufficient to obtain a maximum crop yield, they will conserve or improve soil quality indirectly and allow for a most sustainable use of land and water resources. Some results of this approach and its verification for the case of Mexico are presented.

P609
The physical and mathematical analysis of irrigation water optimization in arid conditions

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In offered work the results of researches of thermal and water modes of various agricultural crops in conditions of Kur-Araz lowland of Republic Azerbaijan are presented. Laws of change of the basic power parameters of system soil-plant-atmosphere and quantitative ratio between them in the form of functional dependences are received.
It is shown that at excess of solar radiation the problems of economy of water and the problems of soil protection from processes of secondary salinization demand the search of new approaches in agricultural production. In this respect the suggested variants of normalization of irrigation water and taking into account the vegetative phases of plants and their energy accumulative properties can be perspective.
On the basis of data about change of radiation, average temperature of air and a surface of soil during the periods of various phenological phases, sizes of energy expenses for total evaporation and its connection with an economic crop of various agricultural crops have been established. The energy accumulated in different part of plant, the rate of irrigation water and the system of application of fertilizers was simultaneously considered.
Possible variants of increase in an economic and biological crop are shown. It is revealed, that almost in all cases, after the certain norm of irrigating water, there is an attenuation of curve dependence between a crop and quantity of the water used for an irrigation. This phenomenon was observed almost in all phenological phases of development of agricultural crops.
On the basis of the received experimental data, models for definition of optimum size of water-need of plants on phenological phases of their development and factor of useful use of energy which are suggested to use at definition of time and norms of irrigation waters separately for each agricultural crop in conditions of arid steppe zones are offered.

P610
Biological activity of water in agriculture problems

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The works of influence of various kind of the information devoted to studying on quality of water and, accordingly, to its influence on the various processes which are taking place in agriculture production, in particular information influence on quantity of grains germination represent theoretical and practical interest.
Results of the researches spend by us have shown, that action of various information fields on water lead to change of its superficial tension.
On depending of size of the energy applied on unit of volume of water, the factor of its superficial tension decreases. It occurs due to increase in intermolecular distances or type of packing of molecules the water leading reduction of forces cohesion. Thus by application of various information fields, we will changed biological activity of water (BAW).
For change of BAW, preliminary processing by its silver was spent, i.e. created various concentration of silver in applied water. Comparing quantity of germination grains, in various variants in unit of time we will defined relative change of (BAW).
It is necessary to note, that if BAW there is more than zero (BAW> 0) process conducts to reduction of factor of a superficial tension of water, in case of BAW <0, factor of a superficial tension of water increases, and if BAW=0, the factor of a superficial tension of water does not change. Experiments were spent on the basis of influence of BAW by various concentration of silver on germination of various grades of wheat.
For change of BAW preliminary processing by its silver was spent, i.e. created various concentration of silver in applied water. Comparing quantity of germination grains, in various variants in unit of time we will defined relative change of BAW.
Results have shown the greatest effect is received at application of active water by differ concentration of silver.

P611
Changes in soil properties due to different soil and water conservation methods in a non-terraced sloping oil palm plantation

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The main objective was to compare the effects of four conservation methods (oil palm frond heap or control, oil palm empty fruit bunches or EFB, EFB mat or Ecomat and silt pitting) on several soil properties over a period of 17 months. The experiment was on a non-terraced sloping land (6 degrees). Treatment applications were done annually for two years. Soil properties measured periodically were: pH, CEC, exchangeable Ca, Mg and K, total N, P, C, bulk density, aggregation, and aggregation stability. Soil water content until 1 m depth was also measured. In all treatments, there were more changes to the soil chemical properties than the soil physical properties. In the first six months, EFB, then Ecomat, gave the highest improvement in almost all the soil chemical properties. After nine months, however, all treatments begun to have comparable soil properties. In the first six months, both EFB and Ecomat were better in conserving water in the 0 - 0.6 m soil depth. EFB concentrated water more in the upper soil layers, whereas Ecomat tended to distribute the water more uniformly throughout the profile. Silt pit plots concentrated water in a shallower depth as compared to Ecomat and EFB. The control plots only conserved water in the upper layers during the wet weather periods. However, as EFB and Ecomat decomposed, they were less effective than the control and silt pit in conserving water. This study showed that EFB, followed by Ecomat, were the best methods to increase soil fertility and conserve water. As EFB and Ecomat fully decomposed after about six months, this study suggested that either higher rates or more frequent application (more than once a year) of EFB and Ecomat are required to sustain their benefits in the soil.