EXPERIMENTAL DESIGN FOR STUDY OF SYNERGISM

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Experimental design has many advantages in combined effect studies due to planning of experimental scheme. It allows to obtain data with optimal statistical characteristics. However, need for planning of experimental design reduces applicability of the method and makes impossible to use data obtained in previous experiments. In many cases regression surfaces based on incomplete polynomials are not flexible to describe complicated changes of test parameter. We developed new experimental design technique which free from this restrictions and allows to merge data from experiments with different experimental designs. This approach was tested in studies of cadmium and acetochlor combined effect upon maize seedlings. Plant growth rates and secondary metabolites content were used as test parameters. For each parameter response surfaces were built based on nonlinear multiple regression models. Special function is used to determine the type of combined effect across all the area of factor space. Data obtained confirmed existence of factors interaction effects. Introduced approach demonstrated its flexibility and applicability to different experimental designs. It allows to use data from previous experiments for example for more accurate determination of experimental control point. This method thought to be useful in study of stress factors combined effects on different organisms.