

PRECISION EXPERIMENTS AS A TOOL TO IMPROVE THE REGULATORY FRAMEWORK OF FERTILIZER APPLICATION IN THE CONDITIONS OF SPATIAL FIELD VARIABILITY

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Effective use of precision farming technologies is impossible without accurate and adapted to the specific field conditions rates of fertilizer application. Such fertiliser applications are only possible with accurate and well-organized information data sets. Modern technologies offer a great potential for field trials methodology improvements and for conducting multy-factor field experiments under conditions of soil heterogeneity. At all stages of precision experiments the latest achievements of agricultural technology can be utilized. They include geographic information systems, monitoring systems of agricultural landscapes and can lead to an intensification of the experimental work and to an increase in the effectiveness of specific experiments. The paper presents some information on the hardware and software to be used for precision farming and to ensure the process of the precision experiment planning and establishment. Stages of an active precision experiment and the main technical means used to carry it out are described. The aspects of the experimental field selection and preparation, separation of homogeneous areas, the planning scheme for musty-factor precision experiment and its implementation in the agricultural field with the use of technical means of precision agriculture are also described. Examples of monitoring tools used in the experiments corresponding to the automatic or automated operation requirements, description of the fast delivery of the monitored parameters and the accuracy of the measuring devices used are given. As a result of the precision experiment a set of thematic data layers is being formed. This set numerically describes the spatial and temporal heterogeneity of some fertility factors. The paper discusses the aspects of the experiment data processing, including spatial interpolation layers of the geographic information database. As a result of the precision experiment and the processing of the data by means of geographic information systems a single information data base is being generated with the most appropriate fertilizer rates in terms of spatial heterogeneity of the experimental field.

Key words: precision agriculture, precise experiment, agrochemical soil properties, spatial field variability, GIS.