Remote monitoring of fertility and ecological condition of regular and southern chernozems of the northern Kazakhstan

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Northern Kazakhstan is the main agricultural region, where commodity grain production is concentrated. The soil cover of the region is represented by chernozems and dark-chestnut soils. Reception of operative and reliable information about the soil cover and soil dynamics is a basis for acceptance of differentiated economic and agro technical measures and for ecological estimation of the researched soils as a whole. The existing methods for studying of these problems are very toilful and require much expense. In this connection the use of the soil cover space sounding for these purposes is very perspective, actual and encouraging as the experiences of the advanced countries testify. Realization of the soil cover space sounding is necessary for determination of the correlation level with the data of ground researches that will give an opportunity to develop a method for determination of the main soil parameters and to predict the soil cover condition, its field humidity, soil compactness, elements of fertility, condition of winter crops. As a result, it will predict an expected yielding ability of agricultural production. The researches will be carried out by key methods. A large-scale soil survey will be performed on the chosen key sites. Typical sites will be chosen by the soil survey results and the characteristics of the sites will be realized by the following indices: mechanical and micro aggregate composition, humus level and its composition, level of water-soluble salts, total nitrogen, calcareousness, exchange capacity of the absorbed bases, pH etc. The list of soil indices, characterizing the dynamics of their physical and chemical properties includes volume mass, humidity, mobile forms of nitrogen, phosphorus and potassium. The establishment of high reliability of space information by the sounding of the soil cover, dynamics of the main soil parameters will permit to develop a method for its widespread use in soil-geographical, physico-chemical researches on the territory of the northern Kazakhstan. As a final result it will permit: compilation of prognoses maps on the future condition of soil fertility, resources of moisture and calculation of the future yielding capacity of the agricultural crops.