

Adaptive potential of agricultural production in Russian Federation

A.L.Ivanov, I.B. Uskov, D.V. Nasonov

Russian Academy of Agricultural Sciences

Observed change rate of temperature and moisture condition of Earth and its' biosphere doesn't cause the impression of approaching global catastrophe as a result of rapid biological productivity decrease. Moreover, evident increase of CO₂ content in surface layer makes possible forecasting the increase of primary photosynthesis product. Spatial heterogeneity of those changes allows consideration of agricultural production sustainability problem from a position of interregional compensation of local productivity decrease. Climatically conditioned production heterogeneity is one of the global food safety factors. This is one of Russia's adaptive potential components.

Biosphere per se, as any biological system, is self-regulating on the global scale, as well as on the other hierarchy levels up to cellular. Adaptive possibilities of nature's biological systems are welfare for humanity until environment parameters surpass the boundaries of physiological existence of species. In a certain range of temperature, moisture and photic regime changes vegetable cenosis self-adopts to these changes. Outside the boundaries begins the zone of venturesome agriculture, which demands committed adaptive agricultural measures and special technologies. Study of precipitation and temperature change rate in a vegetation period reveals the fact that these changes yet do not surpass the adaptive potential of the main crops.

Temperature and precipitation in the autumn and winter seasons create favorable conditions for winter crops, and in some grain-producing regions farmers have switched spring crops to winter crops, thus increasing the yield potential sustainability to climatically conditioned spring draughts. Observed increase of dangerous agrometeorologic occurrences frequency is statistically linked to the global climate change by a number of researchers. Low local changes of agrometeorologic parameters do not cause a considerable change of the cultivated cenosis climatic potential. In the same time, analysis of statistical structure of probabilistic yield and productivity factors (temperature and precipitation) distribution indicates the risks growth.

Thus, regional and local agro-climatic risks category moves out to the foreground in process of global food safety problem examination.

We believe that it's time to put in front of the international society the question of international reserve grain and seed fund reasonability, alike interregional Russian reserve funds.