

Book of Abstracts

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Agroclimatic estimation of reference corn crops in the Transcarpathian region

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In Transcarpathian region corn crops during the last ten years do not exceed 42-44 thousand hectares, which makes up about a quarter of all crops area. With use of harmonic weighing analyzed time series of maize yield for the period from 1996 to 2016. For such analysis we are used V. M, Obukhov's idea about the possibility of decomposition of the time series productivity on two components: stationary and random. Then all the diversity of factors affecting the yield of crops can be divided into two large classes: the first will include factors that determine the level of agricultural culture, the second - the meteorological factors.

The principle of the method of harmonic weighing, which is used in agrometeorology, is proposed by A. N. Polevoy, is that the value of the time series is weighed so that later observations have a greater weight, that is, the effect of later observations should be more strongly reflected in yield trends than the effects of the earlier ones. As calculations have shown, from 1996 to 2010, there was a gradual almost straightforward increase in the trend component, indicating an increase in the level of agriculture in this period. From 2010 to the end of the research period, the trend components decreasing.

The average yields during the years of research amounted to 43,5 c / ha. The yield trend is negative and has 0,7 c / ha. A study was also carried out on the climatic component of the variability of crops (according to the V.M. Pasov's method). As a result, we can conclude that the Transcarpathian region can be attributed to the territory of very stable crops.

The agroclimatic assessment of maize crops of various agroecological categories in the Transcarpathian region was also conducted. For this, we used the proposed H. Tooming's standard method yields. This method considers and compares different categories of yields: potential (P), really possible (RP) and in production (IP).

Potential yield is the yield of a variety in ideal meteorological conditions; it is determined by the advent of PHAR and the biological properties of crops and varieties. The really possible yield is the maximum possible yield of a crop or a variety in the existing meteorological conditions. RP differs from P the more, the more meteorological factors differ from the optimal ones.

P is determined by the magnitude of the PHAR, which according to Z.A. Mishchenko was determined by the sum of temperatures during the warm period. Thus, the characteristics of radiation and heat resources of the territory of four Transcarpathian stations - Veliky Berezhnyi, Khust, Uzhhorod and Beregovo - were provided. With the minds of the active air temperatures during the period of active vegetation, they grow in the direction from north to south and range from 2704 °C to 3243 °C. Sum of PHAR also noticeably increase in this direction. Consequently, the potential yield of corn grown in the Transcarpathian region is also increasing in the north-south direction.

Data were also analyzed on the heat supply and moisture content of the corn vegetation period. The best moisture provided in the north-east of the Transcarpathian region (Veliky Berezhny) and in the southern Khust region. In the plain area (Uzhhorod and Beregovo), corn crops are provided with moisture much worse.

As a result of the work it was possible to give a quantitative assessment of reference corn yields. The range of differences between the potential yield between the points located on the plain areas of the region and the points representing its northeastern part does not exceed 6-8 centners per hectare (depending on the efficiency). Thus, due to the PHAR, which comes to the entire territory of the Transcarpathian region, potential yields of corn from 40 to 127 c / ha (depending on the efficiency of crops) can be obtained. RP at stations Khust and Veliky Berezhniy are about 36-108 c / ha. In the vicinity of the station Beregovo RP is 28-84 centners per hectare, depending on the efficiency. Uzhgorod district is characterized by the smallest index of water availability, therefore the value of RP is the smallest and makes 28-69 c / ha.

Comparison of the values of yields in production with potential and actual yields shows that at present, in the Transcarpathian region, when the corn is cultivated, the use of PAR crops is at the order of 1,2-1,6 %. Consequently, there is a huge reserve for obtaining high harvests from the efficiency of using PHAR 2-3% by introducing new zoned corn varieties and rational placement of them.