The Importance of Selecting Maize Hybrids and Tillage Systems Under Climate Change

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Abstract

The modern world is changing and Ukraine is no exception. Fertile soils are used exhaustively for maximum profit. But agriculture directly depends on the weather and climatic conditions of a particular year and the elements of crop technologies. For example, there was an insufficient amount of rainfall during the growing season in the northeast of the chernozem zone of Ukraine in 2018-2020, it was 67-162.1 mm down compare with the long-term average. Rainfall is unevenly distributed over the months, often with torrential and devastating character. Moreover, the sum of temperatures was up to 257-475^{0}C warmer than average for May-September months. In order to adapt to such conditions, it is necessary to adjust some elements of the crop technology. We studied four methods of tillage, three corn hybrids corn with FAO 190, 260, 310 at the research sites of the Institute of Agriculture of the North-East of Ukraine (Sumy region). Since yield data for 2018,2019 have already been published, we present data for 2020. In 2020, long-term average temperature was up to 257 degrees higher with a precipitation of 236.9 mm during the five months. In the plots without fertilizers, the factor of tillage was insignificant, all hybrids yields are similar. There is also no difference in the yield of hybrids with FAO 190 and 260 (5.71-6.0 t/ha). But a significant difference was obtained between hybrids FAO 190 and 310. The efficiency of the factors is as follows: hybrids (factor A) -45.9%; tillage (factor B) -1.8%. On the average for three years the degree of influence of the factor A is- 70,7%; B -5.6%. Thus, nowadays, the degree of influence of factor hybrids is more significant than tillage.

Keywords: climate, maize variety, tillage systems, Ukraine