Morphological characters variation of A.50-15 new wheat line in present climate conditions

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Abstract

The morphological characteristics expressed in different climatic conditions, and especially those of drought, could be used in the progress of the improvement of the new lines and varieties of winter wheat. The wide genetic dowry and growing conditions of wheat usually lead to the characteristic expression of plant morphology in close connection with periods of drought. In the last three years, the A.50-15 line has encountered different situations, namely from the most favorable to the drought. Thus, the year 2019 was more favorable from a climatic point of view, the year 2020 was the most favorable environment, and the year 2021 the least favorable. Against this diverse background of ensuring the amounts of precipitation, morphological characteristics of the plants of this new line were manifested specifically. Thus, the dimensions of the straw were expressed relatively evenly in the three years, the dominant ones being those at 60-65 cm. The thickness of the straw at the base was 3 mm in the second year (2020), compared to the other two years, by 3.5-4 mm. The length of the ear had a dominant value of 8.5 cm in the favorable conditions and 8 cm in the two less favorable years. The weight of the ear expressed the modal value at 4 g in the first year, while in the other two years it stood at 2-2.5 g. The number of grains in the ear had the modal value at 75 in the first year, being 30 grains higher, much more than the other two years. The weight of the grains in one of their ears was dominant at 3 g in the first year and at 2 g in recent years. The number of spikelets dominated at 19 in the years with drought effect and 21 in the favorable year. The awns had dominant lengths of 7-8 cm in all three years. The grain length was 7 mm in the dry years and 6.5 in the more favorable condition. The thickness of the grain was similar to 3 mm, with a slight tendency to increase in the favorable year. The mass of a thousand grains dominated by 38 g in 2020 and 42 g in the other two years. The correlations obtained between all the determined morphological characters demonstrated specific variability both by very significant positive and by negative values in all three degrees of significance. However, very close positive links show a relatively high level of adaptability of this new wheat line to the changing climate. The statistical indices of the studied morphological characters demonstrated, especially those with productive justification, at average values of the coefficients of variation, namely between 10% and 20%. These aspects in fact demonstrate the good adaptability to these climatic conditions with more and more obvious accents of drought.

Keywords: grains, spike/ear, spikelets, variability, wheat A.50-15 line