

The Germplasm Collection of ARDS Turda, a Source of Variability for Maize Breeding

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Maize is one of the most important crops, so preserving the diversity of the biological material used in the breeding programs is very important. The Agricultural Research and Development Station (ARDS) Turda, Romania, germplasm collection includes both its own genotypes as well as inbred lines obtained as a result of exchanges with other research institutions. In the present study, 575 lines created at Turda were analysed regarding several traits of the plant (plant height, ear height, total number of leaves, number of tassel branches) and the ear (ear length and weight, number of kernel rows and number of kernels/row). Most inbred lines studied are semi-early (44.9%) or early (33.2%). The biological material used in this study shows a great diversity: a medium or high variability coefficient was identified for several of the traits analysed (number of tassel branches, ear height, ear height). Frequency histograms were made for the studied lines, for plant and ear traits. The plant height ranged between 78 and 236 cm, most of them (56.5%) have heights between 158 and 197 cm, and 35.1% between 118 and 157 cm. For the ear height a coefficient of variation of 22.48 was calculated, and values range between 23 and 102 cm, most of the inbred lines (59.5%) had the main ear insertion at between 42 and 61 cm. the total number of leaves varied between 9 and 17 leaves/plant. The number of tassel branches had the highest coefficient of variation, 55.05, with values ranging between 1 and 37. Regarding the ear traits, for the ear length an average variation coefficient was calculated, with value ranging between 8 and 22 cm, most of them being included in the 12-15 cm group. For the ear weight, the values calculated were between 14 and 291 g, while the coefficient of variation of 27.73 indicate a high variability of the trait. The number of kernels/row varied between 11 and 41, most of them being included in the group of 24-34 kernels/row genotypes, while the kernel row number ranged between 8 and 24 rows. A great variability also was observed in the colours of the anther and silk, but also for kernel type and colour and cob colour. 54% of the inbred lines have greenish-yellow silk and half of them have greenish yellow anthers, while the other half have purple anthers. 23.8% of the inbred lines have pink silk and the rest have red silk. Regarding the kernel type, the dent group and the groups including combinations of dent and flint dominate. Taking into consideration the kernel type, colour and colour of the cob, 59 groups were identified, the largest one consisting of inbred lines with dent x flint, dark yellow kernels and red cobs (13.5%) and dent, dark yellow kernels and red cobs (12.3%). The inbred lines collection from ARDS Turda shows a high diversity for most traits, this being of great importance for the breeding programs and the creation of new maize hybrids.

Reference

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