

Contribution to the Enrichment of Wheat Germplasm in Romania

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The main objective of ARDS Turda wheat breeding program is creating varieties that ensure significant genetic progress for production capacity, resistance to adverse environmental conditions, resistance to the most important diseases, appropriate quality indices for the milling and baking industries, in order to increase the profitability of agricultural holdings. The creation of varieties with superior production potential is largely determined by the genetic value of the germplasm sources used in wheat breeding programs. The most productive wheat breeding programs owe their success to both the large number of hybrid combinations achieved and the size of the hybrid populations subjected to selection. Genetic progress for wheat production capacity was estimated based on the results of multiannual comparative trials carried out during 2013-2024 at SCDA Turda at a value of 54 kg·ha⁻¹·year⁻¹, with no ceiling trend. The genetic progress made in improving wheat for bread quality must be associated with other agronomic traits important for production capacity and crop stability, and it is recommended that in creating the initial selection material, high-performing parents for quality, well adapted to local conditions, be used, and the use of the progress made in previous breeding cycles was a safer way to obtain the expected performances. The need to create a large number of hybrid combinations is imposed by the fact that the value of recombination cannot be predicted with certainty only based on knowing the value of the parental forms used in crossing. Experience has shown that a smaller number of well-planned hybrid combinations can provide more valuable hybrid material than a large number of random crosses. Since 1971, when the first variety was launched, until 2025, twenty wheat varieties have been created and launched into production, of which 17 winter varieties and three spring varieties, with an average success rate of one variety every 2,7 years, with the mention that in the last decade has been more accelerated, namely one variety every 1,6 years. The lifetime of varieties created at ARDS Turda are between 10 and 20 years, with the mention that the Arieșan variety (registered in 1985), due to its appreciation by farmers from Transylvanian Plain area, especially for its quality indicators, is approaching 40 years. Of the twenty registered wheat varieties, ten are found in the Official Catalogue of Varieties: Arieșan, Dumbrava, Andrada, Codru, Taisa, Dumitra, Cezara, Luminița, Georgiana and Feleacu. In recent years, in the context of climate change, earliness has been a priority objective in the wheat breeding program at ARDS Turda, the advantage of these genotypes being that by heading earlier avoid the effects of drought that often occurs at the end of May-beginning of June in the conditions of the Transylvanian Plain. We have imposed that the varieties that will be homologated in the future be earlier or closer to Arieșan, and Georgiana variety that was homologated in this year corresponds to this objective, being earlier by 5 days, but the production was 2120 kg·ha⁻¹ higher under the same technological conditions.

Keywords: wheat varieties, genetic progress, breeding, earliness, lifetime

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