Some features of primary seed production of large-grained rice genotypes on the example of variety Anait

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• The article presents the results of studying the characteristics of rice grain of variety Anait. It was previously noted that in this variety in the primary seed production nurseries there is a different quality of grain on the panicle and in the plant community. This can be explained by the different quality of technological indicators of grain and milled rice. The variety of grain quality of Anait is due to the interaction of its three forms: matrix (maternal), environmental and genetic.

• The accumulation of heterogeneity traits in the process of reproduction destabilizes the variety as a homogeneous system. It is difficult to definitely establish the timing of the physical aging of a variety, i.e. deterioration of its quality compared to the source material. Varietal, sowing and yielding qualities of seeds of crops, including rice, do not depend on reproduction, but are determined by the level of seed production.

• In seed production practice, there are three categories of different quality: environmental, matrix, and genetic. The most attention of seed producers is attracted by the matrix quality of seeds, due to the nature of fruit formation in plants and their varietal characteristics.
The material in the work was 25 families of large-grained, early-ripening rice variety Anait. The studies were carried out for three years: 2016-2018. Families were sown in primary seed production nurseries according to the methods of “Federal Scientific Rice Centre” with plots of 0.5 m² (P-1) and 6.5 m² (P-2) by seeders: central seeding Wintersteinger “Rowseed” and cassette version Wintersteinger “Plotseed”. The sowing rate of 7 million germinating grains per 1 hectare at the experimental plot of FSBSI "Federal Scientific Rice Centre" (Belozerny, Krasnodar).

Mineral fertilizers in the experiment: N₄₂+⁹₂P₄₂K₄₂.

The work was carried out at Federal Scientific Rice Centre during 2016-2018 in accordance with GOST 15.101.80 - “Procedure for conducting research work” and methods developed at the institute.

The technological characteristics of grain and milled rice were determined in accordance with GOST 55289-2012, GOST 10843-76, GOST 10987-76 and "Guidelines for assessing the quality of rice grain". The mass of 1000 grains was determined by the method of conversion from the mass of grain on a panicle and the number of filled spikelets. The linear dimensions (length and width) of each grain were determined using a Vin Sit image scanner and a GOST 577-684 micrometer (thickness).

All data obtained are statistically processed, and the coefficient of variation (CV, %) and the degree of correlation (r) of the studied traits by classes are revealed.
Conclusions

Anait families, distinguished in the second and third classes, can be used as source material for breeding work.

In the process of primary seed production of a large-grain variety, a number of indicators can be improved, and the variety can be grown for a long time without significant changes in characteristics.

- In the large-grain variety Anait, there is a different quality in the grain thickness for families from 1.8 to 2.1 mm.
- The variability of the main technological quality traits of grain and milled rice by classes amounted to: I class - filminess - 0.3-5.7%, grain thickness - 0.7-2.0%, weight of 1000 grains - 2.1-3.8% ; II class - 0.9-8.4%, 0.3-3.2% and 0.5-3.6%, respectively; III class - 8.2-9.3%, 5.5-7.3% and 6.2-10.4%, respectively. Specific correlation relationships in each class are established, which determine their peculiarity in the subsequent seed production.
- The weight of 1000 grains of the first class of Anait families is directly dependent on their thickness (r = 0.87) and is 39.8-42.5 g. These families are the basis for the selection of original plants for primary seed production.
- For this variety, the thickness of the grain and the weight of 1000 grains are important indicators for the rejection of families in primary seed production.
- Since the large-grain variety Anait has shown different quality in terms of the technological characteristics of grain and milled rice, we recommend that appropriate assessments should be made for this type of variety in the primary seed production system.
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