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RESEARCHES REGARDING THE DETERMINATION OF THE GENETIC PRODUCTION POTENTIAL AND PRODUCTION STABILITY TO THE WHEAT SORT : DOR AND DEBORAH

CERCETARI PRIVIND DETERMINAREA POTENTIALULUI GENETIC DE PRODUCTIE SI A STABILITATII PRODUCTIEI LA SOIURILE DE GRAU: DOR SI DEBORAH

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On the present territory of Romania, the wheat had been cultivated from the old times. There were found vestiges that were estimated to have 7000 year. The local sorts had been cultivated until 1925, when the experiments with new sorts showed their inferiority as concerns their resistence to fall, to precocity, the disease resistance, productivity and even quality. The experiment purpose was to determine the genotypes production genetic potential and the production stability.
Key words: genotype, fuzarioze, hydric, epidermis

Introduction

The wheat grow on the territory of our country last over two thousand years, while the natural selection retained the biotypes adapted to the local conditions.

The resistance to bad weather of these old Romanian grains, owed to some morphological and anatomical particularities favorable, that helped them maintain in the local grow for centuries. Thus, until the winter arrival, these wheat sorts had the airy part just a little developed, but they had a powerful and profound radicular system, their leaves were narrow and hairy and the epidermis was covered with a cerous coat. These were particularities that helped the plants to be resistant to frost and drought.

Materials and Methods

The biological material was represented by a number of 25 genotypes, including the sorts already existent in the cultivation, new registered sorts and the perspective ones.

The experiments were realized in different medium conditions: in

conditions with of irrigation with azote fertilization, at different dates of sowing (three epochs) in different localities. The position was settled on the squared balancing grating method with the base scheme repeating, with three repetitions on medium conditions. Those 25 genotypes were sowed on plots of land of 5 square meter ingathering at 12,5cm distance between the lines.

The genetic production potential was determined through production weighing realized on the ingathering plot of land and converting it in yield production (kg/ha).

The production stability consisted of determinations and observations in the testing field concerning the resistence to winter, to fall, to disease, to drought, the full of ears| date, biological maturity date, as well in the laboratory: MMB, MH.

The resulted dates were set and processed on the computer in Quatro pro and Paradox programs.

The relation between some characters that were studied was made on the correlation method base.

Results and Discussions

Because of the great number of genotypes that were tested in the experiment, it will be made an emphasized reference about the new sorts Dor and Deborah, comparatively with the sorts extended in cultivation Fundulea 4 and Flamura 85.

The production stability is influenced by many limiting factors like: winter resistence (frost), the main leaves and ear disease, drought, intense heat, germination in the ear, factors that are changed in combination and intensity from one year to another. This situation makes the activity of improvement and creation of new performant sorts to become more difficult from all points of view.

The Dor sort is precocious, with the full of ears date earlier than the other two sorts already existent in the cultivation, with superior genetic production potential, resistent to mealy and brown rust and with a good panification quality.

The Deborah sort is semitardily as precociousness, similar to the Fundulea 4, resistent to fuzarioze and with high quality potential.

In the next table is presented the frost behavior of the main sorts when crossing the hardening process comparatively with the not crossing at atmospherical processes of -19^{o}C.

Table 1

The main autumn common wheat sorts behaviour at frost in full and partial hardening conditions.

Sort	Hardening	Not hardening
Fundulea 4	6	8
Flamura 85	3	5
Boema	4	8
Crina	4	8.5
Dor	2	3
Deborah	2	3
Gruia	2	4

The note was made on the 1-9 scale, where: 1-2 is very resistent, 3-4 resistent, 5-6 middle resistent, 7-8 sensitive, 9 very sensitive.

From the dates presented in the table, can be noticed that the two sorts Dor and Deborah have a superior behavior to those two already existent in the cultivation, Fundulea 4 and Flamura 85, in both testing conditions. It is obvious the role of wheat plants heardening until the frost arrival, resistent sorts as Boema and Crina become vulnerable to frost in the absence of heardening.

Further there are presented the correlations between the production in stress conditions, comparatively with different features of plants.

Table 2

Correlations between the production in hydric stress conditions and different features

Station	The medium production reduction to unirrigation than irrigation (%)	The correlation coefficients between the production in stress conditions and:					
		The plants height in stress conditions	The plants height without stress	The full of ears date	The number of ears/m^2	The number of grains in the ear	MMB
Caracal	37.2	0.29	-0.31	-0.12	0.20	0.11	-0.30
Mărculeşti	37.4	0.29	-0.23	-0.16	0.06	0.31	0.18
Teleorman	38.8	0.35	0.31	-0.85	0.58		
V.Traian	45.5	0.33	0.20	-0.40	0.42	0.40	0.22
Fudulea	52.7	0.46	-0.31	-0.31	0.52	0.30	-0.17
Simnic	95.4	0.41	-0.62	0.16	0.40	0.50	0.15

Significant threshold 5% 0.40

The most frequent feature positive correlated significant with the production, in the drought conditions, was the capacity to form a great number of ears. These correlations where settled to Teleorman and Traian's Wave, with powerful deficit at the end of the vegetation period, and at Fundulea and Simnic with hydric deficit all over the vegetation period.

The number of grains in the ear was also correlated in the stations with the most acute stress (Simnic and Traian's Wave), while differences between the grains size (MMB), weren't determined for the production differences between genotypes.

Extremely interesting are the correlations between the genotypes productions in drought conditions and the plants height on the one side and the full of ears date on the other side.

Significant positive correlations between the production in drought conditions and the plants height were settled only in the stations where were registered the great production reductions because of the drought (Şimnic and

Fundulea). Thus, at Simnic, as it was expected, the production in drought conditions at high build wheat would have a better behavior. If it is considered the normal high of the plants measured in conditions of sufficient water supply, the correlation is negative, it suggests that the wheat whit semi-midget build isn't disadvantaged in drought conditions.

The main objective that was considered at Dor sort creation was the production capacity. Although is earlier than the Fundulea 4 sort, which had the greatest production capacity, the Dor sort proved to be superior, surpassing the Fundulea 4 with 7% and that of Flamura 85 with 9%. The Dor sort, also, present a better production stability having a variation coefficient (S%) inferior to the other two sorts.

The Deborah sort has a good production potential, surpassing with 3% the Fundulea 4 sort production, but with 5% the Flamura 85 sort production (table 3).

Table 3

Productions realized by the Dor and Deborah sorts comparatively with the witness sorts.

Sort	Production Kg/ha	Relative production F4(%)	Relative poduction FL85(%)	S%
Fundulea 4	5715	100	100	22.7
Flamura 85	5602	100	100	21.6
Dor	6124	107	109	21.1
Deborah	5884	103	105	23.2

As conerns the prodution stability, this is smaller, having values of the variation coefficient bigger than the other two sorts: Fundulea 4 and Flamura 85. This fluctuation of the Deborah sort production owns to its sensitivity to intense heat that manifests especially in the southern side of the country.

As concerns the intense heat resistence, Flamura 85 and Dropia have the best behaviour. Those two studied sorts Deborah and Dor don't have their level to tolerate the intense heat, even more the Deborah sort presents sensitivity.

Conclusions

- The new analyzed sorts, Dor and Deborah have proved to be superior to Fundulea 4 and Flamura 85 sorts.
- The Dor sort presents the best level of resistence to mealy and bown rust.
- The Deborah sort, although has lower productive potential than the Dor sort, has the best qualitative potential from the entire assortment existent in the country and a very good behavior to drought in the 2004 year conditions.
- Although both sorts present sensibility to intense heat, the Deborah sort is more sensitive than the Dor sort, which is why the Deborah sort had been recommended for the west and the centre of the Ardeal.

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