STUDIES REGARDING THE BEHAVIOR OF CERTAIN VARIETIES OF AUTUMN WHEAT IN THE CURRENT AGROCLIMATIC CONDITIONS OF DOBROGEA

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Abstract: *In the crop structure of Dobrogea, wheat occupies a percentage between 23 and 33%, depending on the economical factors, but also on the climatic ones. In the years with climatic risks, the percentage of wheat in the crop structure decreases. This drop is maintained the following year as well. The production is greatly influenced by the low precipitations fallen that particular year, both throughout the year but especially over the vegetation period of wheat. Temperature is another risk factor that influences wheat culture in Dobrogea. The scorchers occurred during certain vegetation periods of wheat, associated with atmospheric drought and soil dryness, influence negatively the formation of the productivity elements and finally lead to important production decreases. The paper presents the results of researches regarding the behavior of certain wheat types on chernozem soil in the conditions of the Dobrogea Plateau. The paper also makes proposals regarding the choice of a version of cultivation technology in order to control the negative effects of the biotic and abiotic factors on the autumn wheat production in Dobrogea. It also presents the results obtained regarding the harvest structure for the studied wheat types. Knowing that, in Dobrogea's specific climatic conditions, too early or too late sowing causes problems in wheat culture which lead to important harvest losses, the influence of the sowing time on the production of the studied types was researched. Because of the small quantity of precipitations falling in Dobrogea and their non-uniform distribution over the wheat vegetation period, irrigation must be applied as a measure to increase the production. Not respecting certain technological elements such as fitting sowing within the optimum period, cultivating wheat after good previous plants, good soil tilling on time or the use of chemical fertilizers also lead to important production decreases. This paper refers to the fact that the manifestation of the productive potential of one type of wheat is connected to the genetic factor, but also to the other vegetation factors and the applied technology. We attempted to study the behavior of certain Romanian and foreign autumn wheat types which exist in the official catalogue of types and hybrids of cultivated plants in Romania, some older in crops, other newly introduced in the crop structure of Dobrogea.*

Key words*: wheat, agroclimatic condition,productive potential*

INTRODUCTION

In Dobrogea, wheat is an ancient crop, a fact attested by old and new discoveries in Constanta (Tomis), Mangalia (Callatis), Harsova (Carsium) and other ancient places. The coins of the old cities in Dobrogea, dating back to the 4th century BC, were decorated with wheat ears, which proves that the existence of these places was connected especially to the wheat trading, as wheat was also the main merchandise of the local people.

Even though the surface cultivated with wheat has decreased over the past few decades, the production increased. Today, wheat's proportion is over 28% of the international production of cereals. As a whole, the international production of cereals doubled over the past 30 years.

MATERIAL AND METHODS

The experiments were organized in production conditions, in the vicinity of Cogealac, Constanta County. In order to accomplish the paper objectives, six varieties of autumn wheat were chosen (they are listed in the Official Catalogue of plant varieties and hybrids of 2008) and these are Apullum, Ardeal, Alex, Boema, Crina and Dor. These varieties are recommended for cultivation in the experimental zone.

Demonstrative lots were organized with these varieties on typical chernozem soil.

Apullum. The *Apullum* autumn wheat variety was created by SCDA Turda and war recorded in 1992. Within the ecological network of agricultural stations, the average production of Apullum was 570 kg/ha for 3 years (2002-2004) and 3 localities, which represents 93% of the production of Fundulea 4 control variety. The variability coefficient (VC), more reduced in Apullum indicates a better stability of the production. The best production was obtained in Targu Mures in 2004 and it was 9183 kg/ha.

Alex. The *Alex* autumn wheat variety was created by SCDA Lovrin and was homologated in 1994 as a semi-early variety. This variety is approved and cultivated in the European Union. It has a production genetic potential of 7-8 tons/ha. It is resistant to winter, averagely resistant to falling, mildew, brown and yellow blight; it is resistant to ear sprouting.

Ardeal. The *Ardeal* autumn wheat variety was created by ICDA Fundulea and comes from the same precocity group as Fundulea 4 variety. It is resistant to winter, drought, scorchers, and averagely resistant to falling, sensitive to mildew, brown blight, leaf, septoriosis. Its bread-making qualities are superior to Fundulea 4 and inferior to Flamura 85.

Boema. The *Boema* autumn wheat variety was created by ICDA Fundulea, being recorded in 2000. It belongs to the same precocity group as Flamura 85. It is extremely productive, with high quality indexes for bread-making, adapted to the climatic conditions in the plane area in the South of the country and in Moldavia. It is resistant to winter and falling, scorchers and drought, yellow blight. It is averagely resistant to brown blight and mildew. Also, it is more resistant to ear fusariosis and ear sprouting than Fundulea 4 and Flamura 85. It belongs to the group of varieties with superior bread-making qualities. It is recommended for cultivation in the south and west of the country, as well as in conditions on non-irrigation.

Crina. The *Crina* autumn wheat variety was created by ICDA Fundulea, and it belongs to the group of superior varieties in terms of quality. It is a precocious variety, resistant to winter, averagely resistant to scorchers, drought, seed shriveling and falling. It is averagely sensitive to yellow blight, mildew and sensitive to fusariosis, septoriosis, and brown blight. It is recommended for cultivation in area favorable for autumn wheat everywhere in the country.

Dor. The *Dor* autumn wheat variety was created by ICDA Fundulea. It is more precocious to earing, 2-3 days before Fundulea 4. It is averagely resistant to mildew, brown and yellow blight, and it is sensitive to leaf septoriosis, ear blackening, and ear fusariosis. It is recommended for cultivation in the area favorable for autumn wheat in the south and westof the country, in the hilly zone, in Dobrogea, as well as in Transylvania and Moldavia.

RESULTS AND DISCUSSIONS

In order to accomplish the paper objectives, plant samples were taken from the field, on the diagonal, from 5 observation points. Then, 100 plants were chosen and the following were determined: stem height and weight, rachis length, ear length with and without aristae in the conditions of the culture year 2008-2009. The determinations were made in the phytotechny laboratory within the Faculty of Natural and Agricultural Sciences within “Ovidius” University of Constanta.

Table 1

Results obtained regarding the height of wheat stem

Crt. No.	Variety	Stem length (cm)
1.	*Apullum*	84.19
2.	*Alex*	83.69
3.	*Ardeal*	86.13
4.	*Boema*	81.27
5.	*Crina*	86.06
6.	*Dor*	85.11
	Mean	84.41

Table 2

Results obtained regarding the weight of wheat stem

Crt. No.	Variety	Stem weight (g)
1.	*Apullum*	1.10
2.	*Alex*	1.50
3.	*Ardeal*	1.29
4.	*Boema*	1.24
5.	*Crina*	1.22
6.	*Dor*	1.21
	Mean	1.26

Table 3

Results obtained regarding the length of wheat rachis

Crt. No.	Variety	Rachis length (cm)
1.	*Apullum*	6.7
2.	*Alex*	7.38
3.	*Ardeal*	7.7
4.	*Boema*	8.39
5.	*Crina*	8.3
6.	*Dor*	7.5
	Mean	7.66

Table 4

Results obtained regarding the length of wheat ear with aristae

Crt. No.	Variety	Ear length (cm)
1.	*Apullum*	12.65
2.	*Alex*	12.88
3.	*Ardeal*	12.66
4.	*Boema*	12.44
5.	*Crina*	13.7
6.	*Dor*	13.37
	Mean	12.95

Table 5

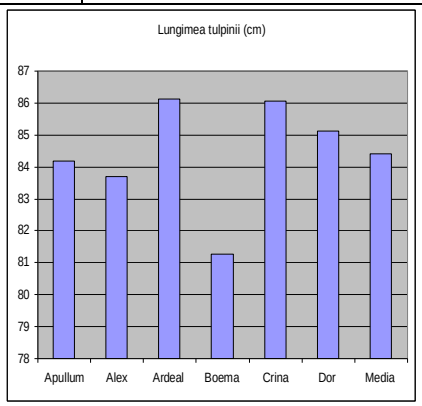
Results obtained regarding the length of wheat ear without aristae

Crt. no.	Variety	Ear length (cm)
1.	*Apullum*	7.76
2.	*Alex*	7.88
3.	*Ardeal*	7.25
4.	*Boema*	7.72
5.	*Crina*	7.31
6.	*Dor*	8.3
	Mean	7.70

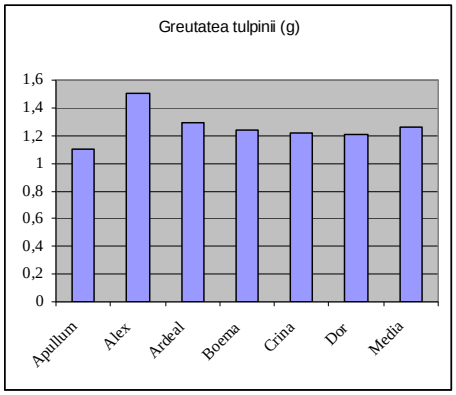
Table 6

Results obtained regarding the mass of 1000 seeds – MMB in wheat

Crt. no.	Variety	MMB (g)
1.	*Apullum*	44.6
2.	*Alex*	49.4
3.	*Ardeal*	50.4
4.	*Boema*	48.6
5.	*Crina*	45.7
6.	*Dor*	49.2
	Mean	47.98



Stem length



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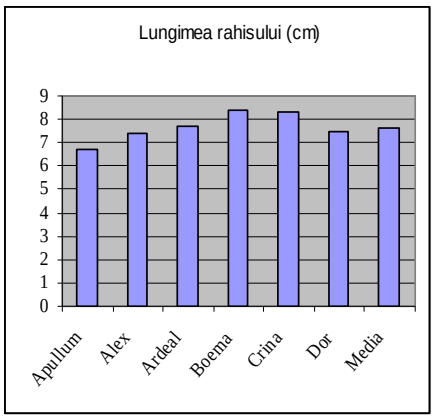
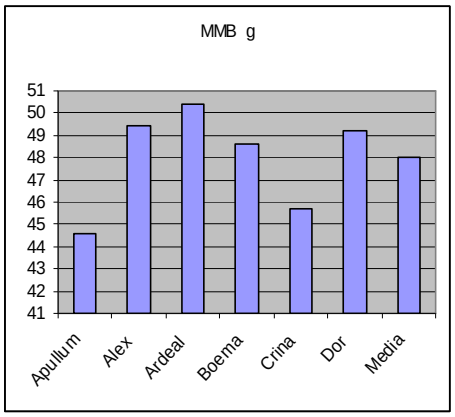
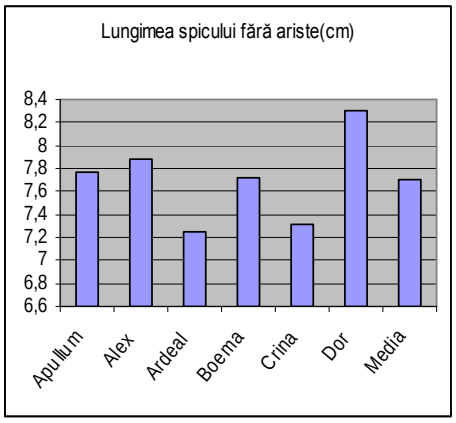


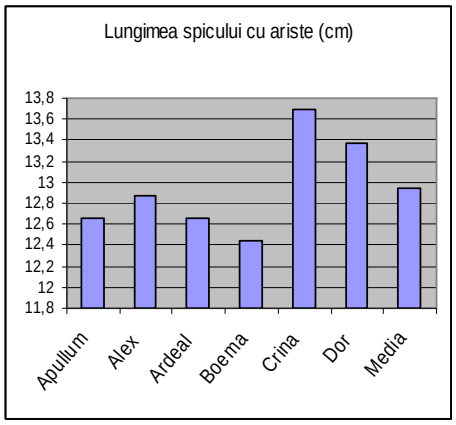
Rachis length



The mass of 1000 seeds



Ear length without aristae



Ear length with aristae

CONCLUSION

Conclusions regarding the behavior of wheat varieties, analyzed in the culture year 2008-2009, in the conditions of the area of Cogealac, the County of Constanta:

- The stem length varied between 81.27 cm and 86.13 cm. The highest value was recorded in the *Ardeal* variety, while the lowest was recorded in the *Boema* variety. The mean height for the studied varieties was 84.41 cm.

- The stem weight varied between 1.1 g and 1.5 g, the mean being 1.26 g. heaviest stem was in the *Alex* variety, while the lightest was in the *Apullum*

- The rachis length varied between 6.7 cm and 8.39 cm, the mean being 7.66 cm. The longest rachis was in the *Boema*, while the shortest was in the *Apullum*.

- The ear length with aristae varied between 12.44 cm in the *Boema* and 13.7 cm in the *Crina*, the mean being 12.95 cm.

- The ear length without aristae varied between 7.25 cm and 8.3 cm, the mean being 7.70 cm.

- The mass of 1000 seeds varied between 44.6 g in *Apulum* and 50.4 in *Ardeal*, the mean being 47.98 g.

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