THE YIELD OF VARIETIES WINTER WHEAT GROWN UNDER ENVIROMENTAL CONDITIONS OF MOLDAVIAN PLAIN

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Abstract

In the environmental conditions of the SCDA Podu Iloaiei, have experienced 12 varieties of winter wheat in 2005-2008 in order to find the most productive for area. The research results for crop years 2005-2006 and 2007-2008 are presented, 2006-2007 crop year was very dry, the results can not be taken into account.
In the crop year 2005-2006, the highest production was obtained to Beti variety of 8842 kg/ha followed by variety Iaşi 2, with 8239 kg / ha. The two varieties have obtained very significant differences against the experience average**.**
In the crop year 2007-2008 the highest production was obtained to Faur variety ,with 9990 kg / ha followed by Flamura 85 variety with 9879 kg / ha and Izvor variety with 9585 kg / ha, differences being very significant against the experience average.

Key words: wheat, variety, production, caryopsis.

The selection for improvement of wheat for bread, in Romania has always focused on the quality and a good level of resistance to disease, to the plant limit treatment (Anghel Ionela et al., 1990; Moldovan V., 1988).

To reduce the production losses caused by drought and other adverse environmental factors, biotic and abiotic (low or high temperatures, sprouting in the ear, etc..), the scientific research recommends Romanian cultivated varieties, which ensures high yields circumstances and higher quality (Ittu Gh., 2009).

The contribution of improved variety and quality in wheat production increase is indisputable, the new varieties are more productive, more resistant to climatic stress factors, of pathogens and pests (Fossati,1990; Kleijer G., 2002; Pârşan et al., 2007; Perenzin M. et al., 2003).

From the middle period of the 60s and following, the introduction of cultivars in several countries in Asia and Latin America, the phrase "Green Revolution" has induced various efforts undertaken to increase agricultural production in developing countries in these high-yield varieties (Sasson A., 1986; Borlaug N.F., 1983).

The quality of wheat should be a major goal in research production and for the procurement of wheat bread. Romania benefits for remarkable climatic conditions for obtaining a superior baking quality wheat (Rusanovschi Gabriela et al., 1982)

MATERIAL AND METHOD

The research were developed at SCDA Podu Iloaiei, in a chernozem soil, with cambic subtype, containing 3.56% humus, pH 6.8, 0.16% total nitrogen, 12 ppm P_2O_5.and 169 ppm K_2O. The temperatures were higher than the annual average in all years: with 0.2°C more in 2005-2006, with 3.4 °C more in 2007-2008. Recorded rainfall exceeded the annual average in 2005-2006 to 132 mm and 242.8 mm in 2007-2008. In these two years of experience the climatic conditions for wheat culture were favorable. The 12 wheat varieties were introduced in an ordered experience in six randomized blocks with harvested area of 20 m^2. The varieties were: Fundulea 85, Eliana, Iaşi 2, Beti, Gabriela, Boema, Dropia, Faur, Crina, Moldova 83, Gruia and Izvor.

RESULTS AND DISCUSSIONS

The number of the ears per unit area is an important indicator on achieving the wheat production to fall. In the 2005-2006 crop year, the number of ears at m^2 ranged between 549 at Izvor variety and 431 at Flamura 85 and Gabriela varieties (*table 1*). In the 2007-2008 crop year, the number of ears at m^2 was higher than in the 2005-2006 crop year. So that the greatest number of ears was performed on Iaşi 2 variety with 728 ears/m^2 and the lowest number of ears, to the Gabriela variety with 580 ears/m^2. The higher number of ears at m2 determined a higher production in 2007-2008.

On average, from those two years (Table 1) the number of ears varied from 580/m^2 at Gabriela variety to 728/m^2 at Iaşi 2 variety. In the 2005-2006 crop year the number of ears/m^2 was lower than in 2007-2008 crop year.

In the 2007-2008 crop year, the number of the cariopsys in ear was higher than in 2005-2006 crop year. On average from those two years, Flamura 85 variety had the highest number, 39.4 cariopsys in the ear. On average from those two years the plant height ranged between 79.7cm at Crina variety and 97.4 cm at Beti variety (*table 1*).

Beti variety, which has achieved the highest average production of cariopsys had the highest plant height by 97.4 cm, with a vigor worthy of attention.

Table 1

The influence of variety on the biometric measurements to wheat

Variety	Ear/m^2			Grains / ear			Plant height		
	2006	2008	Average	2006	2008	Average	2006	2008	Average
Gabriela	431	580	505.5	34.5	31.3	32.9	87.0	98.3	92.6
Beti	518	671	594.5	33.9	34.0	33.9	94.5	100.3	97.4
Iaşi 2	513	728	620.5	29.2	34.3	31.7	86.3	99.3	92.8
Flamura 85	431	725	578.0	43.8	35.0	39.4	76.0	103.3	89.6
Dropia	447	660	553.5	33.8	31.0	32.4	74.8	103.0	88.9
Eliana	531	683	607.0	34.3	32.0	33.1	76.5	98.0	87.2
Izvor	549	623	586.0	30.2	37.0	33.6	81.8	96.7	89.2
Gruia	446	600	523.0	38.1	36.0	37.0	74.5	93.0	83.7
Faur	518	705	611.5	35.9	34.3	35.1	74.5	88.3	81.4
Boema	433	619	526.0	39.0	36.3	37.6	74.5	94.3	84.4
Crina	532	631	581.5	33.1	35.9	34.5	74.3	85.2	79.7
Moldova 83	494	682	588.0	36.2	34.8	35.5	75.4	88.3	81.8
DL 5%	19.8	21.3	23.7	10.1	9.2	9.8	4.4	5.4	4.9
Dl 1%	32.9	35.3	38.4	13.4	12.8	14.2	5.9	7.0	6.2
DL 0.1%	40.8	44.2	51.2	17.5	15.1	17.1	7.7	8.1	7.3

Table 2

The influence of variety on some quality traits to wheat

Variety	Grain weight/ear (g)			MMB (g)			MH (kg/hl)		
	2006	2008	Average	2006	2008	Average	2006	2008	Average
Gabriela	1.6	1.5	1.55	44.3	47.9	46.1	72.8	73.9	73.3
Beti	1.9	1.5	1.70	42.7	44.1	43.4	76.5	77.3	76.9
Iaşi 2	1.8	1.7	1.75	41.0	49.5	45.2	75.0	76.9	75.9
Flamura 85	1.6	1.5	1.55	44.0	42.8	43.4	72.2	71.2	71.7
Dropia	1.6	1.4	1.50	44.0	45.2	44.6	74.6	76.3	75.4
Eliana	1.6	1.5	1.55	39.5	46.8	43.1	73.6	77.2	75.4
Izvor	1.4	1.7	1.55	44.3	45.9	45.1	74.8	75.9	75.3
Gruia	1.7	1.6	1.65	41.3	44.4	42.8	73.0	76.2	74.6
Faur	1.5	1.7	1.60	45.3	49.5	47.4	73.6	77.3	75.4
Boema	1.8	1.5	1.65	44.0	41.3	42.6	74.2	73.1	73.6
Crina	1.6	1.5	1.55	41.8	43.1	42.4	74.5	75.6	75.0
Moldova 83	1.4	1.6	1.50	43.5	41.7	42.6	73.4	72.9	73.1
DL 5%	0.3	0.32	0.34	2.2	2.4	2.3	1.8	1.6	1.7
Dl 1%	0.4	0.41	0.43	3.0	3.5	3.2	2.5	2.2	2.3
DL 0.1%	0.5	0.49	0.50	4.3	4.1	3.9	3.6	3.1	3,2

The weight of the cariopsys in ear (*table 2*) varied in 2006 between 1.4 g at Dropia and Crina varieties, up to 1.9 g for Beti variety. In 2008 the weight of cariopsys in ear was 1.4 g at Dropia variety and 1.7 g at Iaşi 2, Izvor and Faur varieties. On average, from those two years the highest weight of the cariopsys in ear was 1.75 g at Iasi 2 variety, and the lowest was 1.50 g at Dropia and Crina varieties.

The weight of 1000 grains was high in both years, highest in 2007-2008. The weight of 1000 grains in 2006 was obtained at Faur variety, by 45.3 g, and in 2008 at Iaşi 2 and Faur varieties by 49.5 g. On average from those two years, the varieties ranged from 42.6 g at Crina and Boema varieties to 47.4 at Faur variety. The hectoliter mass (Table 2) ranged from 72.2 kg/hl at Flamura 85 variety to 76.5 kg/hl at Beti variety in 2005-2006 and in 2007-2008 from 71.2 kg/hl for the Flamura 85 variety, to 77.3 kg/hl at Faur and Beti varieties.

On average from those two years there have been 71.7 kg/hl to Flamura 85 variety and higher, 76.9 kg/hl for Betu variety. Analyzing the quality criteria of wheat bread were framed as the value of MH, Beti, Iaşi 2, Dropia, Eliana, Izvor, Faur, Moldova 83, with values over 75 kg/hl.

Other varieties – Gabriela, Flamura 85, Gruia, Boema, and Crina, were classified as satisfactory, with MH between 70 and 75 kg/hl.

Table 3

The influence of variety on some quality traits to wheat

Variety	Years		2006-2008 average kg/ha	Comparisons with Control 1			Comparisons with Control 2		
	2006	2008		%	Dif. kg/ha	Signif.	%	Dif. kg/ha	Signif.
Gabriela	5900	7700	6800	100,00	Control 1	-	85,9	-1114	ooo
Beti	8842	9060	8951	131,6	2151	***	113,1	1037	***
Iaşi 2	8239	9376	8807	129,5	2007	***	111,2	893	***
Flamura 85	5900	9879	7889	116,0	1089	***	99,6	-25	-
Dropia	6156	8240	7198	105,8	398	**	90,9	-716	ooo
Eliana	7500	9240	8370	123,0	1570	***	105,7	456	**
Izvor	6690	9585	8137	119,6	1337	***	102,8	223	*
Gruia	6593	8600	7596	111,7	796	***	95,9	-31	-
Faur	6780	9990	8385	123,3	1585	***	105,9	417	**
Boema	6806	8280	7543	110,9	743	***	95,3	-371	oo
Crina	6448	8320	7384	108,5	584	***	93,3	-530	ooo
Moldova 83	6915	8920	7917	116,4	1117	***	100,1	3	-
Media Exp.	6897	8932	7914	-	-	-	100,00	Control 2	-
DL 5%	130	202	188						
Dl 1%	240	334	301						
DL 0,1%	410	624	517						

The production of wheat cariopsys was raised in the two years of experimentation, higher in 2007-2008 (*table 3*).We must remember that in 2006-2007 we could not take into account the results of the drought.

In 2005-2006 the production of cariopsys ranged from 7500 kg/ha at Eliana variety, and 8842 kg/ha for Beti variety while in 2007-2008, between 8240 kg/ha at Dropia variety to 9990 kg at Faur variety.

On average from those two years the highest yield was obtained for Beti variety with 8951 kg/ha by 31.6% higher than the control variety Gabriela (with 6800 kg/ha) or 13.1% higher than average experience (with 7914 kg/ha).

The higher production increases were achieved by 29.5% at Iasi 2 variety, Eliana variety 23%, and 23.3% at Faur variety.

The Beti and Iasi 2 varieties proved more consistent in production, achieving high yields in both years.

CONCLUSIONS

The Romanian wheat varieties studied have proved productive, a good and very good quality.

The parameters were obtained at very high number of ears in m^2, the number of cariopsys in the ear, the ear weight cariopsys, MMB and MH.

The productions obtained in the two years were high, average all varieties, from 6897 kg/ha

in 2006 and 8932 kg/ha in 2008, the difference being 2035 kg/ha for the year 2007-2008.

Beti variety with 8951 kg/ha to 8807 kg at Iaşi 2 have proved the most productive and most consistent production.

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