

RESULTS OBTAINED IN FIELD TRIALS FOR WHEAT CULTIVARS IN 3 DIFFERENT REGION OF ROMANIA

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Abstract

The aim of the research was undertaken to obtain information on the production capacity of wheat cultivars offered by the Romanian company Saaten Union Romania (Genius E, Mulan B, Petur, Katarina and Joker) in comparison with Romanian cultivars Dropia and Glosa. Observations were made in the agricultural years 2012-2013, 2013-2014 and 2014-2015, at Lugoj, Secuieni and Dragna (only in the agricultural years 2012-2013 and 2014-2015, due to unexpected mice attack in the agricultural year 2013-2014), the behaviour of tested wheat cultivars. Are presented the main cultural characteristics of cultivars. In case registered in the agricultural year 2012-2013 at Secuieni, witness cultivar Glosa, was superior to witness cultivar Dropia and average yield obtained in the experiment. On the whole experiment of this year, cultivar Joker was superior to cultivar Glosa (with 5.5%, Mulan B and Genius cultivars are under the control cultivar Glosa without exceed difference of 11.2% respectively 5.4%. Katarina cultivar proved to be inferior to other cultivars taken into considerations. In agricultural year 2013-2014 (exceptional year for wheat crops due to increased humidity) witness Glosa was superior to cultivar Dropia, but lower than cultivars Petur and Katarina. The Joker cultivar ranked first followed by Mulan B cultivar and Genius E. In this year cultivar Joker was on the first place at Secuieni and Lugoj, but on the last place was Dropia (at Lugoj) and Glosa (at Secuieni). In the agricultural year 2013-2014, the situation keeps classification of witnesses (but at Lugoj cultivar Glosa was superior to Dropia, instead at Secuieni Dropia was superior to Glosa, productions of cultivars Joker, Genius E and Mulan B are superior to witness Glosa followed, with no significant differences by Petur and Katarina cultivars, cultivar Dropia is the least competitive in the experiment. In case registered in the agricultural year 2014-2015 at Secuieni, witness cultivar Izvor, was superior to witness cultivar Dropia and average yield obtained in the experiment. On the whole experiment of this year, cultivar Izvor (the newest cultivar registered was superior to cultivar Dropia (average relative yield trial by location %) with 16.1%, Genius cultivars are under the control cultivar Dropia with a difference of 0.2%. Katarina and Petur cultivars proved to be superior to average relative yield trial by location % and Mulan B and Joker were inferior to this average taken into considerations. It is also discussed cultural behaviour of the tested cultivars and to pest and disease attack. In general, from the data obtained in considered test fields, the cultivars proposed by Union Romania Saaten company have a great ecological plasticity and were in average yield, above witnesses, in the years studied.

Key words: testing wheat cultivars, production.

Wheat is considered, after maize, the main crop plant in Romania. Romania was, last year, one of the first among the EU member states in terms of wheat, according to provisional data on crop production for main crops in 2014, published by the National Statistics Institute. (Press release no. 75/03.31.2015). Area cultivated, 2,104,000 ha./2013, 2,071,000 ha./2014; production, 7,296,000 t./2013, 7,458,000 t./2014. Wheat cultivated area in 2014 was 39.0% of the area cultivated with cereals for grains, wheat production increased by + 3.8% compared to 2013 due mainly to increasing production / ha. Wheat, Romania ranked fifth in the EU, but is among the countries with low production/ha. Grains, in various forms (bread, bread "Lebanon", pasta, breakfast cereals, pastries etc.) a important raw material for food (Gómez-Plana

AG, Devadoss S., 2004). Wheat quality, regardless of destination, is a key factor determining its market value (Ceapoiu et al., 1984; Tabără V., Pușcă I., 2002). Bakery qualities of winter wheat varieties grown depend on the variety (Tabără V., 2003), quality characteristics values are heavily influenced by technology applied (Tabără V., 2005). Wheat quality is not constant from one year to another, from one field to another, due to variety of varieties (genetic potential) and climate change yearly, so the characterization and classification of wheat varieties to be done every year, especially in conditions in which quality of the flour and baking qualities depend on these factors. Year 2015 was an important moment for Saaten-Union Romania marking the entry into a new period of activity, besides the fulfillment of 22 years on the

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market in Romania, 2015 has meant a number of factors that determine the benefit of company's partners, company situated in extensive human and material investment programs (Zaharia D., Danciu I., 2012). The aim of the research was to obtain information about production capacity of wheat provided by the Romanian company Saaten Union Romania varieties: GK Petur [breeder: A.R.I. Szeged (GK)], Katarina [breeder: Agricultural Institute Osijek (OSK)] Genius E [breeder: Nordsaat Saatzzucht GmbH (NS)] Mulan B [breeder: CHT Saatzu- Nordsaat GmbH (NS)], and Joker [breeder: Deutsche Saatveredelung AG (DSV)], compared to roumanian varieties Dropia and Glosa replaced in 2014-2015 with Izvor, NARDI-Fundulea creations. Are presented the main cultural characteristics of varieties.

MATERIAL AND METHOD

Results were obtained in comparative lots of competition (20 m² plot area) with repetition randomized in the test system and selection of varieties. Results were obtained in comparative lots of competition, in the test system and selection of varieties/hybrids adapted to the specific climatic conditions of Romania, applied technology is the classical for comparative fields, normal fertilization without excesses. The observations were made in crop years 2012-13, 2013-2014 and 2014-2015 at Lugoj, Secuieni and Dragna (only crop years 2012-2013 and 2014-2015 agricultural year 2013-2014, because an unexpected mice attack was registered) on the behavior of wheat varieties tested. Was registered production (moisture contents 14%) and was compared the production of each variety with average production of the 7 varieties considered to be 100%, comparing the production of each variety and getting the relative productive. It was compiled a classification of positions of each experimental year marking with note 7 variety with the highest production and with note 1 variety with the lowest production, drawing up an average over all 3 years, on this average being based on final position of varieties.

RESULTS AND DISCUSSION

In the agricultural year 2012-2013, at Secuieni, witness the variety Glosa was superior to witness the variety Dropia as to average production get in experiment. At Lugoj, variety Joker has registered highest yield (8,449 kg/ha) and the variety Dropia the lowest production, while at Secuieni, variety Joker had an output of 8,743 kg/ha, on the last place was the variety Katarina (5,244 kg/ha) and at Dragna, first came variety Katarina (7,692 kg/ha and last variety Genius E (5,943 kg). The variety Joker was superior to variety Glosa (average production expressed in % by location), with 3.9%,

remaining varieties of company Saaten Union Romania were classified under Glosa variety, but Mulan B and Petur varieties were ranked above average relative production from the 3 localities taken consideration, remaining firm varieties but also witness, were below this average (*table 1*). In situation of agricultural year 2012-2013 registered at Secuieni, witness the variety Glosa, was superior to witness the variety Dropia as to average production get in experiment. At Lugoj, variety Joker has registered highest production (6,545 kg/ha) and the variety Dropia lowest production (4,028 kg/ha), in while, at Secuieni, variety Joker had an output of 9,322 kg/ha, on the last place was the variety Glosa (6,006 kg/ha). Variety Joker was superior to variety Glosa (average production expressed in % depending on location), with 38.5%, remaining varieties of company Saaten Union Romania were classified over Glosa variety, but varieties Mulan B and Genius E were classified above average relative production from the 2 localities taken account, the remaining company's varieties (Petur and Katarina) and also witnesses Glosa and Dropia were below this average (*table 2*). The attack of mice at Dragna determined, in crop year 2013-2014, inconclusive results. In situation of agricultural year 2014-2015 registered at Secuieni, witness variety Izvor, was superior to witness variety Dropia as also to average production get in experiment. At Lugoj, variety Izvor has registered highest yield (7,026 kg/ha) and the variety Joker lowest production (3,670 kg/ha), while at Secuieni, variety Joker had an output of 8,232 kg/ha on the last place was the variety Petur (6,480 kg/ha) and at Dragna on the first place was classified variety Joker (9,984 kg/ha) and on last place variety Dropia (7,928 kg/ha). The new witness variety (Izvor) was superior to variety Genius E (average production expressed in %, depending on location), with 16.3%, remaining company's Saaten Union Romania varieties were classified under variety Izvor but Katarina and Petur varieties were classified above average relative production of the 3 local taken in consideration, the rest of company's varieties but also witnesses Dropia were below this average (*table 3*). As regards the classification of positions from each experimental year, in each year of the three taken in consideration [on a scale with marks from the highest production (7) at the lowest production (1)] (*table 4*). Taking in consideration the average from all three years, considering on this its final position, is noted that the first is variety Joker (average positions obtained during of experiment, 5.5), on the second place stands variety Mulan B

(average positions during of experiment 5.125), on the third place stands varieties taken as second witness Glosa in 2012-2014, Izvor in 2014-2015 (average positions during prosecuted 4.375), on the fourth place was variety Petur (average positions during of experiment, 3.625), on the fifth place was variety Katarina (average positions during of experiment, 4.125), on the sixth place was variety Genius E (average positions during of experiment, 3.125), on the last place was variety Drobia, considered the first witness (average positions during of experiment, 2.125) (table 5). Also, the cultural behavior of the tested varieties to pests and diseases did not differ significantly.

In general, the data obtained in the test areas considered, varieties proposed by the company Saaten Union Romania have a high ecological plasticity and have a higher production to witnesses had in consideration, during of experiment. The varieties offered by the company Saaten Union Romania are intensive, have good qualities of bread and a large tillering capacity adapted to all growing areas from Romania, adapted to all have good resistance to frost and winter, are compatible to most type of soils, they have constant productions even in heat stress possess resistance to powdery mildew, *Septoria* blotch and *Fusarium* spp..

Table 1

Crop yields obtained – winter wheat (2012 – 2013)

Variety	Lugoj		Secuieni		Drajna		Relatively production in 3 places
	kg/ha	Relatively %	kg/ha	Relatively %	kg/ha	Relatively %	
PETUR	6730	98.1	7503	101.5	6857	105.1	101.6
KATARINA	6403	93.3	5244	71.0	7692	117.9	94.0
GENIUS E	6519	95.0	7940	107.4	5943	91.1	97.8
MULAN B	7340	107.0	8121	109.9	6314	96.8	104.5
JOKER	8449	123.1	8743	118.3	5750	88.1	109.8
DROPIA	5701	83.1	5844	79.1	6300	96.5	86.2
GLOSA	6892	100.4	8337	112.8	6826	104.6	105.9
Average	6862	100.0	7390	100.0	6526	100.0	100.0

Table 2

Crop yields obtained – winter wheat (2013- 2014)

Variety	Lugoj		Secuieni		Relatively production in 2 places
	kg/ha	Relatively %	kg/ha	Relatively %	
PETUR	5630	100.1	6846	92.6	96.3
KATARINA	5388	95.8	6829	92.3	94.1
GENIUS E	6509	115.8	7191	97.2	106.5
MULAN B	6523	116.0	8759	118.4	117.2
JOKER	6545	116.4	9322	126.0	121.2
DROPIA	4028	71.6	6825	92.3	82.0
GLOSA	4733	84.2	6006	81.2	82.7
Medie	5622	100.0	7397	100.0	100.0

Table 3

Crop yields obtained – winter wheat (2014- 2015)

Variety	Lugoj		Secuieni		Drajna		Relatively production in 3 places
	kg/ha	Relatively %	kg/ha	Relatively %	kg/ha	Relatively %	
PETUR	6711	122.7	6480	87.8	8472	99.3	103.3
KATARINA	5683	103.9	8076	109.4	8283	97.1	103.5
GENIUS E	4822	88.2	6959	94.3	8220	96.4	92.9
MULAN B	5362	98.0	7425	100.6	8535	100.1	99.6
JOKER	3670	67.1	8232	111.5	9984	117.0	98.6
DROPIA	5017	91.7	6986	94.6	7928	92.9	93.1
IZVOR	7026	128.4	7517	101.8	8291	97.2	109.2
Medie	5470	100.0	7382	100.0	8530	100.0	100.0

Table 4

Place obtained by tested varieties in localities and years of experiment

Variety breeder	Variety	2012-2013			2013-2014		2014-2015		
		Drajna	Secuieni	Lugoj	Secuieni	Lugoj	Drajna	Secuieni	Lugoj
GK	PETUR	6	3	4	4	4	5	1	6
OSK	KATARINA	7	1	2	2	3	3	6	5
Nord	GENIUS E	2	4	3	5	5	2	2	2
Nord	MULAN B	4	5	6	6	6	6	4	4
DSV	JOKER	1	7	7	7	7	7	7	1
INCDA-F	DROPIA	3	2	1	3	1	1	3	3
INCDA-F	GLOSA/IZVOR	5	6	5	1	2	4	5	7

Table 5

Final place obtained by tested varieties in localities and years of experiment

Variety breeder	Variety	Average of position during the monitored years	Final position after 3 years
DSV	JOKER	5.5	I
Nord	MULAN B	5.125	II
INCDA-F	GLOSA/IZVOR	4.375	III
GK	PETUR	4.125	IV
OSK	KATARINA	3.625	V
Nord	GENIUS E	3.125	VI
INCDA-F	DROPIA	2.125	VII

CONCLUSIONS

In general, the data obtained in the test areas considered, varieties proposed by the company Saaten Union Romania have a high ecological plasticity and production compared with witnesses taken into consideration, during the study.

Considering average, in final position of the variety, it is noted that the first place is the Joker variety, on 2nd place Mulan B variety, on 3rd place Glosa, (2012-2014) Izvor (2014-2015), taken as second witness, on 4th place Petur variety, on 5th place Katarina variety, on 6th place Genius E variety, last was Dropia variety took as the first witness.

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