THE RESEARCHES CONCERNING THE BEHAVIOUR IN PRODUCTION OF SOME BARLEY SPRING CULTIVARS AND LINES IN THE NORTH-WEST OF MOLDAVIA

E. ZAMĂ[1]

[1]Agricultural Research and Development Station of Suceava; *tel. 02306523837*

The spring barley represents the main source in the beer producing and, in the same time, a valuable fodder for animals growing. These traits and the favourable climatic conditions from the north part of Moldavia, determined, in the last years, the cultivation of the spring barley on larger surfaces.

In this context in the Agricultural Research and Development Station of Suceava were developed researches for creating and identifying new cultivars, more productive and more adapted to the climatic conditions from this ecological area.

Thus, during period 1988-2004 the following cultivars were created: Prima, Farmec, Maria, Avânt, Succes, Suceava 3, Stindard and Narcisa. These cultivars were considered more productive and more adapted in the ecological and crop conditions from this area, during 16 years, emphasizing an average yield from 3562 kg/ha to 4016 kg/ha. In the same time these cultivars registered a good resistance to the foliar diseases and lodging and were earlier with 3-4 days in comparison with standard cultivar.

In the verified germplasm fund, there are the spring barley cultivars very valuable from morphological traits and yield capacity point of views. This germplasm will be used in future, like the genitors in the barley breeding programs.

This paper comprises the experimentation of 20 spring barley genitors during 5 years (2003-2007).

Key words: *researchs, barley spring cultivars, lines.*

The spring barley represents the main source of raw material in beer fabrication and in the same time represents a valuable fodder in animal growing. These traits and the climatic conditions from north part of Moldavia determined in the last years, the surfaces covered with spring barley grew considerably.

Taking into consideration the necessity to continuous increase of the barley yield, in ARDS of Suceava, were developed the researches for creating and identification of new more productive cultivars and better adapted to the ecological and crop conditions in this area. So, in year 1988, the first Romanian barley cultivar was homologated, and in year 1996, the second cultivar, Farmec was

homologated with a big yield capacity, early, resistant to lodging and attack diseases.

After that, the barley cultivars Maria, Avânt, Succes, Suceava 3, Stindard an Narcisa were homologated. These cultivars are more productive and better adaptability to the ecological land crop conditions from this area. During 7-16 years the middle yield from 3562 kg/ha to 4016 kg/ha, were obtained.

In the same time these cultivars are very resistant to diseases foliar attack, to lodging and are earlier with 2-3 days then standard cultivar.

MATERIAL AND METHOD

During period 2003-2007, at ARDS of Suceava a lot of spring barley cultivars and lines were experimented, from about 20 are presented in this paper.

The experiments were placed after the comparative crops, in Latin rectangle, in three replications, with a plot surface on 5 m^2.

In all years, the experiments were placed after potato, on a chernozem soil with clay texture.

During spring period we fertilized with 100 kg/ha ammonium nitrate.

The sowing was made in the optimum epoch, the assured density being on emerged grains/m square.

The climatic conditions – Generally in the experimental years were favorable for barley crop, excepting the years 2003 and 2007, when because of the excessively drought the yields were smaller.

In majority of experiments years the rich precipitations during period May and June favored the plants growing and developing of the cryptogrammic diseases attack. (*tab .1*).

Table 1

The precipitation regimes during barley vegetation period in Suceava (2003-2007)

Period	Precipitations/years :mm.					Multiyear average x)
	2003	2004	2005	2006	2007	
January - March	57.0	75.1	95.9	97.7	97.1	86.0
April	10.8	19.0	100.6	73.0	32.9	48.2
May-June	46.4	61.6	225.4	235.4	84.6	173.8
July	252.5	160.7	45.3	119.6	105.8	88.6
TOTAL	366.7	316.4	467.2	525.7	320.4	396.6

x) – the calculated average on 62 years (1945 – 2007)

RESULTS AND DISCUSSIONS

The yield capacity – From productivity aspect point of view the barley cultivars and lines which were experimented presented large limits from 619 kg/ha in year 2003 at Succes cultivar to 5058 kg/ha in year 2005 at Sv. DH. 73-23 line (*tab. 2*).

Table 2

The experimental results concerning the productivity of some barley spring cultivars and lines

Cultivar or line	Yield/years , kg/ha					Average			Signif.
	2003	2004	2005	2006	2007	kg/ha	%	Difference kg/ha	
Maria st..	1000	2062	4718	3568	3608	2991	100	-	
Avânt	762	2033	4906	3077	2756	2707	90	-*284	ooo
Succes	619	2119	4815	2848	2559	2592	87	-399	ooo
Suceava 3	857	2350	4853	2911	2488	2692	90	-299	***
Stindard	809	2345	5042	3092	2759	2809	94	-182	o
Narcisa	1857	2787	4243	3263	3645	3159	106	168	*
Aura	714	1939	4703	2990	3313	2732	91	-259	ooo
Daciana	857	1421	4685	3052	3553	2704	90	-287	*
Sv.DH.73-10	1000	2518	4939	3027	3293	2955	99	-36	
Sv.DH.69-8	905	2477	5048	3492	3147	3014	101	23	
Sv.DH.73-27	1048	2281	4664	2402	3049	2689	90	-302	ooo
Sv.10-98	1143	2449	4848	2817	3149	2881	96	-110	
Sv.1100-98	1048	2784	4871	3350	3896	3190	107	199	oo
Sv.DH.73-18	1095	2764	4340	3124	3453	2955	99	-36	
Sv.588-98	1000	2778	4371	2451	2905	2701	90	-290	ooo
Sv.916-97	1667	1638	4558	2837	2902	2760	92	-231	oo
Sv.DH.73-8	1667	1921	4576	3171	3276	2992	100	1	
Sv.DH.73-21	1857	2654	4749	3259	2779	3060	102	69	
Sv.DH.73-23	2149	2515	5058	2923	3877	3303	110	312	***
Sv.DH.73-28	1381	1888	4665	2949	3980	2973	99	-18	

DL 5 % = 14,7 ; Dl 1 % = 19,5 ; DL 0,1 % = 25,3

If we analyze the middle production/ surface unit for whole experiment period we observe that it registered values from 2592 kg/ha at Succes cultivar, to 3303 kg/ha at Sv. D.H.73-23 line.

The other experimented genotypes realized the smaller production that standard, from 284 kg/ha to 287 kg/ha at Avânt and Daciana cultivars .

The diseases resistance . All cultivars and lines had a different behavior to the foliar diseases attack.

So, to powdery mildew attack (*Erysiphe graminis f.sp.hordei* March.), in all years manifested with different intensity in early developing fazes. It noticed like resistant following genotypes : Maria, Avânt, Stindard, Narcisa, Sv. DH.69-8 and Sv 588-98 (*tab. 3*).

The, stripe leaf (*Pyrenophora teres Drechs*.) attacked with a bigger intensity especially in the last three years . Al genotypes had a similarly behavior.

Majority of experimented cultivars and lines were resistant to the stem rust attack.

Table 3

Some traits of the experimented barley spring cultivars and lines

Cultivar or line	Resistance to:				Precocity ± days against to standard	One thousand kernel weight	% from d.s.	
	Powdery mildew	Stripe leaf	Stem rust	Lodging			protein content	starch content
Maria st.	5	6	5	5	0	51.8	15.0	61.9
Avânt	5	6	4	3	-1	48.1	15.1	62.5
Succes	6	7	3	6	-1	50.9	15.2	60.4
Suceava 3	6	6	3	6	-1	47.4	15.4	61.2
Stindard	5	6	3	6	-2	51.4	15.1	60.6
Narcisa	5	5	3	3	-2	52.1	14.9	60.9
Aura	6	7	4	5	-1	48.1	15.2	60.3
Daciana	6	7	5	5	-2	50.6	15.4	62.5
Sv.DH.73-10	6	6	3	6	-2	50.7	15.1	61.9
Sv.DH.69-8	5	7	4	7	0	50.7	15.3	61.4
Sv.DH.73-27	7	7	3	7	-1	53.7	15.9	60.6
Sv.10-98	6	7	3	7	-2	52.9	15.4	60.9
Sv.1100-98	6	6	4	7	-1	5o.3	15.5	60.3
Sv.DH.73-18	6	7	3	7	-1	51.3	15.0	61.4
Sv.588-98	5	7	4	7	-2	50.3	15.1	62.5
Sv.916-97	6	7	3	7	-1	48.0	14.9	62.8
Sv.DH.73-8	7	7	3	6	-5	48.9	15.2	61.1
Sv.DH.73-21	7	7	3	7	-1	48.6	15.4	60.6
Sv.DH.73-23	6	6	4	7	0	51.3	15.1	60.3
Sv.DH.73-28	7	7	3	7	-1	51.4	15.2	60.9

[x)] – FAO scale : 1 = very good …….9 = very bad

The lodging stems resistance. The abundant precipitations failed during the active vegetation determined in all years the accentuated plants lodging.

All cultivars and lines were very sensitive to the lodging (note 5-7), excepting the Avânt and Narcisa cultivars which were resistant to the lodging (note 3).

Precocity. The genotypes Avânt, Narcisa, Aura, Daciana, Sv.10-98, Sv. 916-97 and Sv.DH.73-28 were earlier with 1-2 days than Maria cultivar standard. Sv. DH. 73-8 lines, was the earliest, the harvesting made with five days earlier than standard.

The other genotypes had a similar vegetation period with standard, the harvesting made with two days earlier or later than standard.

The quality yield: One thousand kernel weight registered values comprises between 47. 4 g at Suceava 3 cultivar and 52.1g at Narcisa cultivar.

Concerning the chemical traits we observed that the experimented cultivars and lines have a high protein content comprises between 14,9 % at Narcisa cultivar and Sv.916-97 line and 15.9 % at Sv.DH. 73-27 line, and high starch content from 60.3 % at Aura cultivar , to 62,8 % at Sv.916-97 line.

CONCLUSIONS

In the verified germplasm fond there are the barley spring genotypes very valuable from morpho -physiological and yield capacity point of view. These cultivars will be used in the future like genitors in the breeding process. From about the experimented cultivars for north part of Moldavia the cultivar Maria, Avânt and Narcisa were remarked. These cultivars are very resistant to diseases and lodging and have a high level of productivity.The Sv. DH. 73-23 line is very valuable because of it's high level of productivity and stability. This genotype will be multiplied in the future in order to use in the crop.

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