RESEARCH ON THE INFLUENCE OF FOLIAR FERTILIZATION ON BEER BARLEY AND TWO ROWS BARLEY PRODUCTION IN TWO AREAS OF CULTURE

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Abstract: *Barley is a cereal crop with multiple uses: as fodder, brewing, food. Has long been one of the main crop with wheat and millet. In recent decades the importance of barley decreased and cultivated area declined by 3-4 times. Barley grains contain a percentage of 8-15% cellulose (paddy), 60-70% starch, 11% protein, 10% ballast, lipids, vitamins (especially B) and minerals, gluten. People with gluten intolerance can not drink beer because barley is an important ingredient. The economic importance of barley is lower compared to that of wheat, corn, rice or rye; is used especially winter barley as animal feed. In food people can remember especially malt and brewing coffee, also one can remember the effect of barley extract in cases of high fever, with fever-lowering effect of patient. In addition to the uses already known, barley has therapeutic qualities, recovered by treatment of conditions such as diarrhea, cystitis, rheumatism, cough, hemorrhoids, influenza, infertility, depression, anemia, skin problems etc. Barley is considered the therapeutic properties of herbal and remineralizing, anti-inflammatory, hypotensive, increases sex drive and helps people young and old to recover after a period of convalescence. The research was conducted in two areas with different climatic conditions, Timişoara and Mizieş - Bihor. In both centers, four varieties of spring barley were studied: Aspen, Adonis, Penellope and Hanca and four varieties of winter barley: Laura, Trasko, Plaissant and Clarine. The research aimed to determine the influence of fertilization on yields. Four variants of fertilization were used: $N_{48}P_{48}K_{48}$; $N_{48}P_{48}K_{48}$ + PlantfertU; $N_{48}P_{48}K_{48}$ + MicrofertU and $N_{48}P_{48}K_{48}$ + TerraSorb.The variant $N_{48}P_{48}K_{48}$ was used as control. Foliar fertilizers were applied during vegetation before earing. The experimental results obtained in both areas, highlights the difference of production potential between the studied varieties and the positive influence of foliar fertilizers on grain production both in spring and winter varieties.*

Key words: *barley, two rows barley, fertilizing, foliar tratments.*

INTRODUCTION

Barley and two rows barley are cereals with a large expansion in culture, with particular importance for human feed, used as forage and for malt and brewing industry (BÎLTEANU GH., 1969, 1998; BILAUS I. şi colab., 1983; BORCEAN I., TABĂRĂ V., 1996; BUDE AL., VASILESCU L.,2001).

Areas of use that request large amounts of barley and two rows barley, need higher and higher amounts of raw material, which requires the improvement of cultivation technologies to provide high and qualitative yields.

MATERIAL AND METHOD

Researches were conducted in field in two locations: Timişoara and Mizieş – Bihor and in laboratory. The field determinations were focused on yield and productivity traits. In laboratory were done biometrical measurements, physical attributes and main chemical traits. For production ability testing and research indicators accomplishment, were used bifactorial experiences and the experimental units were:

Unit A–the agrofond, with four graduations:
a_1 - $N_{48}P_{48}K_{48}$ – applied on seedbed preparation
a_2 - $N_{48}P_{48}K_{48}$ + (Plantfert U)
a_3 - $N_{48}P_{48}K_{48}B_{0,0048}$ +(Microfert U)
a_4 - $N_{48}P_{48}K_{48}$ + (Terra Sorb foliar)

Unit B – barley and winter two rows barley with four graduations:
b_1 – Laura – two rows barley
b_2 - Trasko– two rows barley
b_3 - Plaissant - barley
b_4 – Clarine

Excepting the distinctive experimental traits, all other technological traits were those specific for these two crops for brew: barley and two rows barley.

Quantitative and qualitative determinations were done according to experimental technique rules.

RESULTS AND DISCUSSION

The results on productions realized at winter barley varieties are presented in Table 1.

Table 1

The average yields at four varieties of winter barley and two rows barley under the influence of foliar fertilization in conditions of Mizieş - Bihor in 2005-2007

Fertilizer fund	Varieties				Average of fertilizer fund			
	Laura	Trasko	Plaissant	Clarine	Average yield kg/ha	%	Difference ± kg/ha	Signifiance
$a_1N_{48}P_{48}K_{48}$	2403	3061	1814	2061	2335	100		
a_2 Plantfert	3332	3888	3107	2608	3234	139	899	***
a_3 Microfert	3026	3914	3047	2789	3193	137	858	***
a_4 Terra Sorb	3323	4064	3684	3696	3692	158	1357	***

Dl 5% = 422 kg/ha; Dl 1% = 457 kg/ha; Dl 0,1% = 826 kg/ha.

Average yield of B unit – cultivar

Yield kg/ha	3021	3732	2912	2789
%	100	124	96	92
Diff. ± kg/ha		711	-109	-232
Significance		000		0

Dl 5% = 220 kg/ha; Dl 1% = 307 kg/ha; Dl 0,1% =436 kg/ha.

Foliar application increases production with very significant increases in all three foliar fertilizers. The highest production increase is realized in application of the product Terra Sorb foliar - 1357 kg / ha, provided statistically as very significant.

Among the varieties, the best productions are obtained from barley cultivar Trasko - 3732 kg / ha. In this variety, increase the production of 711 kg / ha is provided statistically as very significant.

Varieties of barley Plaissant and two rows barley Clarine, yields are below those achieved in the variety of barley Laura. Note that the difference in production of barley variety Clarine, differential production of 232 kg / ha is provided statistically as significant.

Analysis of production resulting from the interaction variety - foliar fertilizer is found that the highest yield of 4064 kg / ha is obtained at the variety Trasko with foliar fertilizer product Terra Sorb

foliar. The most spectacular production increases are obtained by foliar fertilization of barley variety Trasko.

Summary of the production results in four varieties of spring barley under the influence of foliar fertilization are shown in Table 2.

Table 2

Summary of average productions at four varieties of spring barley and two rows barley under the influence of foliar fertilization in conditions of Mizieş - Bihor

Fertilizer fund	Varieties				Average of fertilizer fund			
	Aspen	Adonis	Penellope	Hanca	Productia medie Average yield kg/ha	%	Diferenta ± Difference ± kg/ha	Semnificatia Signifiance
$a_1N_{48}P_{48}K_{48}$	1842	1895	1855	1748	1835	100		
a_2 Plantfert	2342	2282	2290	2337	2313	126	478	***
a_3 Microfert	2341	2313	2150	2258	2266	123	431	***
a_4 Terra Sorb	2348	2341	2202	2417	2327	127	492	***

Dl 5% = 144 kg/ha; Dl 1% = 147 kg/ha; Dl 0,1% = 213 kg/ha.

Average yield of B unit – cultivar

Yield kg/ha	2218	2208	2124	2190
%	100	100	96	99
Diff. ± kg/ha		-10	-94	-28
Significance			0	

Dl 5% = 90 kg/ha; Dl 1% = 112 kg/ha; Dl 0,1% =179 kg/ha.

Regarding the studied varieties it appears that they have close yields values. The highest yields are obtained at Aspen and Adonis varieties, yields of 2218 kg / ha respectively 2208 kg / ha. At Penellope variety, the realized yield compared to that of the control variety Aspen of 2018 kg / ha, less than 99 kg / ha, a difference that is statistically ensured as significant.

In the case of spring varieties, production is also positively influenced by foliar fertilization with Plantfert, Microfert and Terra Sorb foliar products with production increases of 478 kg / ha, 431 kg / ha and respectively 492 kg / ha, all statistically ensured as very significant.

In the interaction variety - foliar fertilizer the biggest productions are obtained from Aspen and Adonis varieties with Terra Sorb foliar fertilization. In these variants the realized productions are of 2348 kg / ha for Aspen variety and 2341 kg / ha for Adonis variety.

CONCLUSIONS

The results of research undertaken in the two bifactorial experiences from Mizieş - Bihor allow us to formulate some conclusions:

1. The yields of both winter and spring barley varieties are smaller in comparison with the potential of the varieties. This is due to the less favorable climatic conditions for barley.
2. Foliar fertilizers stimulates production causing very significant production increases both in autumn and spring varieties.

3. The differences beetwen the varieties yields are small. It is distinguished, however, as production potential winter barley varieties Laura and Trasko and spring barley varieties Aspen and Adonis.

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