

ON THE IMPACT OF SOWING TIME AND SOWING DENSITY ON YIELD AND QUALITY IN BARLEY

INFLUENȚA PERIOADEI DE SEMĂNAT ȘI A DENSITĂȚII ASUPRA RECOLTEI ȘI A CALITĂȚII BOABELOR LA SECARĂ

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Abstract. Research was carried out in the hill area of the Meridional Carpathians, in the Horezu Depression, on a typical eutricambosol strongly levigated with a low acid reaction and a humus content of 2.43%.

Results pointed out that the optimal sowing interval is September 10-20. Delaying sowing time until October 10-20 leads to a diminution of the production of over 800 kg/ha.

Optimal sowing density was 550 g.g./m². Protein content depending on the sowing period varied between 12.0 and 13.1%, and starch content varied between 56.1 and 59.1%.

Rezumat: Cercetările s-au desfășurat în zona colinară a Carpaților Meridionali, teritoriul Depresiunea Horezu, pe un eutricambosol tipic levigat puternic, cu o reacție slab acidă și un conținut de humus de 2,43%.

Rezultatele au evidențiat ca optim intervalul de semănat - 10-20.IX. Întârzierea semănatului până în 1-10.X conduce la diminuarea recoltei cu peste 800 kg/ha. Densitatea optimă rezultată a fost de 550 b.g./m². Conținutul de proteină în funcție de perioada de semănat a variat între 12%-13,1%, iar conținutul de amidon între 56,1% și 59,1%.

Key words: barley, sowing technology

Cuvinte cheie: secară, tehnologia semănatului

INTRODUCTION

The micro area in which we carried out our research is characterised by precipitations between 800 and 1,000 mm and by a mean annual temperature of 7-8⁰C.

In this area, among all the cereals cultivated as field crops, barley valorises well soil and climate conditions, yielding economically efficient productions of over 4,000 kg/ha.

Biological features of barley (i.e. ending fall twinning and its good twinning capability) ask the cultivator to well define both the sowing time and the sowing density.

MATERIALS AND METHOD

Trials were of the bi-factorial type with three replications; factor A was the sowing time and factor B was sowing density. The pre-emergent crop was potato.

Fertilisation was done evenly with N₅₀P₆₀K₆₀. The cultivar we used was Rapid, with a yielding capability between 5,000 and 6,000 kg/ha.

RESULTS AND DISCUSSION

Table 1 presents the results obtained in the Horezu Depression in the cultivation of barley. Barley yield results on a eutricambosol in the Horezu Depression

Means of the factor B

Results concerning the sowing period point out as optimal the interval September 10-20, when we can get over 200 kg/ha more than when sowing during the first decade of October. Delaying sowing time until late September diminishes the yield with over 200 kg/ha, while delaying it until the first decade of October leads to a diminution of the yield of over 800 kg/ha.

Table 1

Barley yield results on a eutricambosoil in the Horezu Depression

Factor A – sowing period	Means of factor B (b.g./m ²)			A Factorial averages			
	350	450	550	Crop kg/ha	%	Difference kg/ha	Significance
1-10 IX	4291	4554	4638	4494	100		
10-20 IX	4516	4921	4650	4696	104	202	xx
20-30 IX	4131	4219	4463	4273	95	-221	00
1-10 X	3190	3579	4026	3598	80	-896	000

DL 5 % = 128 kg/ha; DL 1 % = 172 kg/ha; DL 0.1 % = 226 kg/ha

Means of factor B

Specification	350	450	550
Crop (kg/ha)	4032	4318	4444
%	100	107	110
Difference (kg/ha)		286	412
Significance		xx	xxx

DL 5 % = 111 kg/ha; DL 1 % = 149 kg/ha; DL 0.1 % = 390 kg/ha.

Increasing sowing density from 350 g.g./m² to 450 g.g./m² resulted in an increase of the yield with 7%, a variant in which we got a very significant difference of over 280 kg/ha.

Figure 1 shows the evolution of protein content. We can see that, depending on the sowing time, we could record an amplitude of the variation between 11.5 and 13.1%, the highest content being in the variants sowed in the first decade of October, a variant in which both the grains and their ripening occurred during the interval with the least precipitations and sunny days.

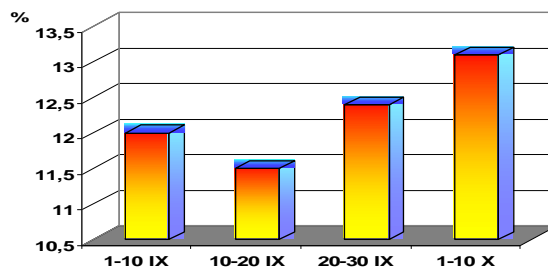


Figure 1. Variation of barley raw protein content (%) depending on the sowing time in the Horezu Depression

Figure 2 shows the evolution of the starch content. In the studied field, amplitude was between 56.1 and 59.1%. The highest starch content was measured in the variant in which protein content was the lowest, i.e. in the variant sowed in the second decade of September.

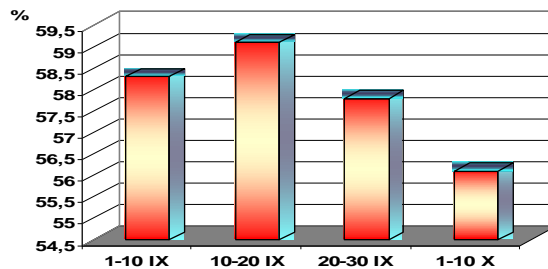


Figure 2 shows the evolution of the starch content

Table 2 shows barley protein yield depending on sowing time. Barley protein yield depending on the sowing time in the Horezu Depression. At the level of the studied factor, protein yield was between 471 and 539 kg/ha. To note that the differences between the variants sowed between September 1 and September 30 are not significant. The lowest protein yield was in the case of the variant sowed in the first decade of October, though in this variant there was also the highest protein content but with a low seed production.

Starch yield is shown in Table 3. Barley starch yield depending on the sowing time in the Horezu Depression. Results point out that in the variants sowed between September 1 and September 20, starch yield was close, the differences in yield ranging within error limits. The lowest starch yield was in the variant sowed in the first decade of October.

Table 2.

Barley protein yield depending on sowing time

Variant	Protein yield (kg/ha)	%	Difference (Kg/ha)	Signification
1-10 IX	539	100		
10-20 IX	540	100	1	
20-30 IX	530	98	-9	
1-10 X	471	87	-68	000

DI 5% = 12.4 kg/ha ; DI 1% = 17.5 kg/ha; DI 0.1% = 23.1 kg/ha.

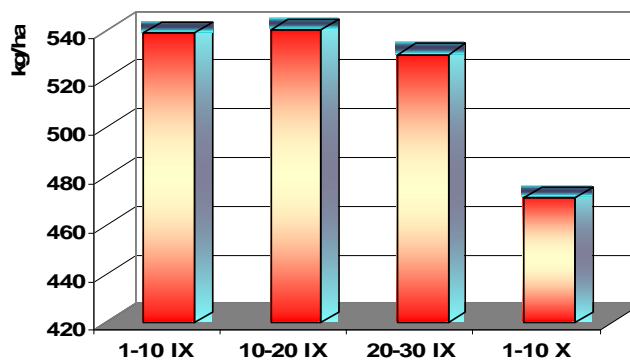


Figure 3. Barley protein yield depending on sowing time

Table 3

Starch yield is shown

Variant	Yield kg/ha	%	Difference (Kg/ha)	Signification
1-10 IX	2620	100		
10-20 IX	2775	106	55	
20-30 IX	2470	94	-150	00
1-10 X	2018	77	-602	000

DI 5% = 75 kg/ha ; DI 1% = 134 kg/ha; DI 0.1% = 244 kg/ha.

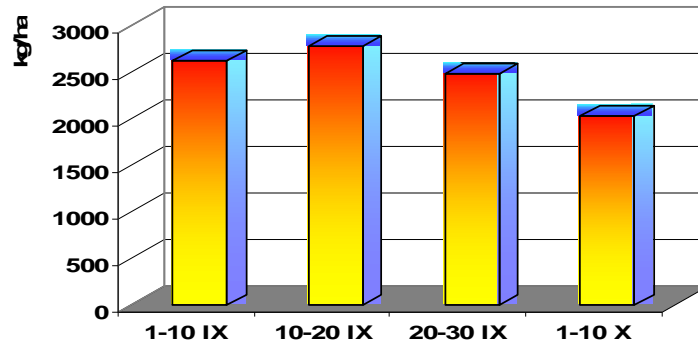


Figure 4. Starch yield

CONCLUSIONS

1. The Rapid barley cultivar proved to be adapted to the hill area of the Meridional Carpathians where, depending on the factors taken into account, it yielded between 3,100 and 4,900 kg/ha.
2. The optimal sowing time is September 10-20, when we got over 4,600 kg/ha on the average per studied sowing densities.
3. Optimal sowing time was 550 g.g./m², a variant in which we got an increase in yield of 10% compared to the variant sowed with 350 g.g./m².
4. Protein content depending on the sowing time varied between 11.5 and 13.1%, and starch content varied between 56.1 and 59.1%.

LITERATURE

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