RESEARCH ON THE IMPROVEMENT OF THE BIOLOGICAL VALUE OF THE *Bromus inermis* Leyss. SPECIES SEED MATERIAL

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Abstract

The research conducted during the 2021-2022 agricultural year, at the Research and Development Station for Meadows, Vaslui (46°40'-36°10' north latitude and 27°44'-20°40' east longitude) followed the analysis of the influence of the distance between the rows and of the fertilization on the quality of the Bromus inermis Leyss. *species seed material, in seed crop, in the second year of vegetation. As a methodology, 2 factors were experienced: factor A representing the dintance between rows with three graduations and factor B fertilization with 5 graduations. The research showed that sowing at longer distances between rows and fertilization with higher doses of complex mineral fertilizers significantly contributed to obtaining the seed material with a higher 1000 grains mass.*

Keywords: fertilization, distance between rows, 1000 grains mass.

INTRODUCTION

Meadows contribute to the management of feed resources, storage of atmospheric carbon, biodiversity conservation, beautifies the landscape and provides spaces for recreational activities (Marușca T. *et al*, 2010).

Perennial grass species play a very important role in the composition of mixtures intended for the production of feed (Samuil C. *et al*, 2012).

Perennial fodder grasses have a unique physiology and morphology that have the role of contributing to the conservation of the agricultural landscape. The integration of perennials into agriculture could restore a healthy and functional agricultural system (Porter P.A. *et al*, 2015).

Production of seed material for the species *Bromus inermis* Leyss. is made in separate cultures, according to a specific technology (Vacarciuc Elena-Manuela *et al*, 2022).

All technological steps must be fulfilled for the production of seeds. Mazis A. *et al*, 2023 showed that fertilizing smooth brome cops improves the biomass quality and quantity but also the quality of seeds.

Also, sowing at a longer distance between rows offers an optimal yield of seeds.

The research sought the answer to the question, how the two technological elements, respectively the distance between the rows and the fertilization, contributed to the improvement of the 1000 grains mass value in the harvested seeds.

MATERIAL AND METHOD

The research was conducted during the period of March 2021 to October 2022, at the Research and Development Station for Meadows, Vaslui (46°40'-36°10' north latitude and 27°44'-20°40' east longitude).

The researches analyzed the influence of distance between rows and fertilization on 1000 grains mass value of *Bromus inermis* Leyss. species seed material, in seed crop, in the second year of vegetation.

To achieve the proposed goal, a bifactorial experience was organized, 3 x 5 type and placed according to the method of subdivided plots, with the plot harvestable area of 13.5 m^2 (1.5 m x 9 m), in three replications. The studied factors were: A- the distance between rows with three graduations (a_1 - 25 cm, a_2 - 37.5 cm and a_3 - 50 cm) and B - fertilization with five graduations (b_1 - unfertilized, b_2 - $N_{50}P_{50}$, b_3 - $N_{50}P_{50}K_{50}$, b_4 - $N_{75}P_{75}K_{75}$ and b_5 - $N_{100}P_{100}K_{100}$).

The 1000 grains mass (g) of the fruit obtained was determined for each experimental plot by weighing 100 seeds (cariops) in eight repetitions, then the average value was multiplied by 10.

The biological material used was represented by the *Mihaela* variety, created at the Research and Development Station for Meadows, Vaslui in 2009 (Silistru Doina, 2010).

The fertilizers were applied in spring, when the plants vegetation started.

In the area where the researches were carried out, even though the agricultural year 2021-2022 was dry, smooth brome cop behaved well.

The results were statistically interpreted by analyzing the variance and calculating the least significant differences.

RESULTS AND DISCUSSION

The 1000 grains mass is one of the most important quality indicators of the seed material. Seeds with an above average value of this indicator will store more energy. From a practical point of view, in the smooth brome cop technology, the use of seeds with higher 1000 grains mass, under normal soil climatic conditions will cause a faster and more uniform emergence of plants, and in the conditions of a water deficit in the soil, at the time of sowing, the seeds may sow deeper into the soil.

By improving the cultivation technology of the *Bromus inertis* Leyss. species for seeds, the aim is also to create better sowing material, with higher 1000 grains mass.

In the case of the interaction between distance between rows and fertilization, the highest value of 1000 grains mass was obtained in the variant a_3b_5, sown at 50 cm

between rows fertilized with $N_{100}P_{100}K_{100}$ and was 4.48 g, with 0.78 g higher than the lowest value obtained which was at the a_1b_3 variant, sown at 50 cm between rows fertilized with $N_{50}P_{50}K_{50}$. In the case of sowing at 37.5 and 50 cm between rows in the fertilized variants, where distinct significant and very significant differences were obtained (table 1).

The distance between the rows factor contributed significantly to the production of seed material with a higher 1000 grains mass (table 2).

Table 1

The influence of the interaction between distance between rows and fertilization on the 1000 grains mass to smooth brome culture for seed, in the second year of vegetation, at the first cut

Variant		1000 grains mass (g)	Differences		Significance
			g	%	
a_1 - 25 cm (control)	b_1 - unfertilized (control)	3.72	control	100	control
	b_2 - $N_{50}P_{50}$	3.81	0.09	102.3	
	b_3 - $N_{50}P_{50}K_{50}$	3.71	-0.01	99.8	
	b_4 - $N_{75}P_{75}K_{75}$	3.82	0.10	102.6	
	b_5 - $N_{100}P_{100}K_{100}$	3.91	0.19	105.2	
a_2 – 37.5 cm	b_1 - unfertilized	3.79	0.06	101.7	
	b_2 - $N_{50}P_{50}$	4.15	0.43	111.6	**
	b_3 - $N_{50}P_{50}K_{50}$	4.17	0.45	112.0	**
	b_4 - $N_{75}P_{75}K_{75}$	4.43	0.71	119.0	**
	b_5 - $N_{100}P_{100}K_{100}$	4.34	0.62	116.7	**
a_3 - 50 cm	b_1 - unfertilized	4.03	0.31	108.3	*
	b_2 - $N_{50}P_{50}$	4.28	0.56	115.0	**
	b_3 - $N_{50}P_{50}K_{50}$	4.27	0.55	114.8	**
	b_4 - $N_{75}P_{75}K_{75}$	4.25	0.53	114.2	**
	b_5 - $N_{100}P_{100}K_{100}$	4.48	0.76	120.3	**
LSD 0.5 = 0.19 g; LSD 0.1 = 0.23 g; LSD 0.01 =0.51 g.					

Table 2

The separate influence of distance between rows and fertilization on the 1000 grains mass to smooth brome culture for seed, in the second year of vegetation, at the first cut

Variant	1000 grains mass (g)	Differences		Significance
		g	%	
a_1 - 25 cm (control)	3.79	control	100	control
a_2 - 37.5 cm	4.17	0.38	110,0	**
a_3 - 50 cm	4.26	0.47	112,3	**
LSD 0.5 = 0.19 g; LSD 0.1 = 0.23 g; LSD 0.01 =0.51 g.				
b_1 - unfertilized (control)	3,84	control	100	control
b_2 - $N_{50}P_{50}$	4,08	0,23	106,1	*
b_3 - $N_{50}P_{50}K_{50}$	4,05	0,21	105,3	*
b_4 - $N_{75}P_{75}K_{75}$	4,16	0,32	108,3	**
b_5 - $N_{100}P_{100}K_{100}$	4,24	0,40	110,4	**
LSD 0.5 = 0.21 g; LSD 0.1 = 0.30 g; LSD 0.01 =0.46 g.				

Thus, compared to the variant sown at the distance between rows 25 cm to the variants a_2 and a_3 sown at 37.5 and 50 cm the seeds were with 0.38 g and 0.47 g larger (the differences being distinct significant).

The fertilization factor determined the obtaining of seeds with a higher 1000 grains mass, significantly and distinctly significant. In the fertilized variants, the differences in seed size were between 0.23 g and 0.40 g.

CONCLUSIONS

Even though the agricultural year 2021-2022 was extremely dry, the smooth brome crop for the seed behaved very well.

The distance between the rows factor contributed significantly to obtaining the seed material with a larger 1000 grains mass, compared to the variant sown at 25 cm, for the variants sown at 37.5 cm and 50 cm between rows, the seeds were 10-12.3 % larger.

The fertilization factor determined the production of seeds with a mass of 100 grains significantly larger, the differences in seed size were between 5.3-10.4% for fertilized variants.

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