RESEARCH ON VEGETATIVE PROPAGATION CAPACITY OF THE *Bromus inermis* Leyss. SPECIES

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Abstract

Bromus inermis Leyss. *species is a rustic one, very well adapted to less favorable pedoclimatic conditions. High production capacity and extended vivacity, due to vgegetative multiplication, make this species used for various purposes such as: feed production, degraded permanent meadows improvement, slope soil fixiation, greening of polluted areas and others more. The purpose of the research conducted during the 2022-2025 agricultural period, at the Research and Development Station for Meadows Vaslui, was to select the best Bromus inermis* Leyss. *genotypes in terms of vegetative propagation capacity. Of the 155 transpanted genotypes, 22 did not survive, and a total of 38 did not develop a bush larger than 15 cm, even after 2 years of vegetation. Of the 95 genotypes with vegetative multiplication, were selected a number of 10 clones with bush diameter between 103 and 158 cm, respectively clones with the codes R9P6, R9P7, R9P9, R15P4, R16P10, R20P7, R22P6, R24P2, R3P4 and R15P6, which will be further studied in terms of productive potential.*

Keywords: transplantation, rooting, bush diameter, expandability

INTRODUCTION

Bromus inermis Leyss. species (smooth brome or awnless bromegrass) is a rustic one, very well adapted to less favorable pedoclimatic conditions. High production capacity and extended vivacity, due to vegetative multiplication, make this species used for various purposes.

It can be used to obtain feed, grown alone or mixed with sainfoin (*Onobrychis vicifolia* Scop.) for setting up temporary meadows used by mowing or mixed (this mixture also has an anti-erosional role) (Lazaridou M., 2008; Saeidnia F. et al, 2019; Ahmed A.I. et al, 2020; Ciobanu Cătălina, 2021).

This species has a very important role to improve the composition of vegetation, production capacity and quality of feed on degraded permanent meadows in steppe and forest-steppe areas, in spcial on slopes, being used for overseeding, alone or in mixtures together with other valuable perennial grasses and legumes species (Dumitrescu N. *et al*, 2014; Lardner H.A. *et al*, 2015; Samuil C. *et al*, 2019; Stavarache M. *and* Naie Margareta, 2024).

In the context of the Romanian Order No. 80/2023 can be used to make grassy bands between the rows of trees in

orchards. It can be used for the greening of polluted areas (for example, on areas cleared of waste, from the outskirts of localities, etc.), for the rapid fixing of terraces, dams, banks of irrigation canals or other land improvement works, for the fast and long-term fixing of areas of modelled land, as a result of road or highway construction and in aquaculture, as well it can be used for rapid grassing and creating optimal conditions in fish breeding pools (Maruşca T. *et al*, 2010; Shi W. *et al*, 2017). *Bromus inermis* Leyss. spreads vegetatively primarily through underground stems called rhizomes. This allows it to form dense, spreading sods, especially in disturbed areas. It also reproduces sexually by seeds, but its vegetative spread via rhizomes is the primary way it maintains and expands its populations aggressively. This feature can be improved, and may be created varieties that are recommended for the cultivation of land with erosion problems, in order to fix them. The researches carried out in the 2022-2025 agricultural period, within the Moara Grecilor location of the Research and Development Station for Meadows (RDSM), Vaslui, was represented by the analysis of the influence of *Bromus inermis* Leyss. genotype on the vegetative propagation capacity, under the conditions of Moldavian Forest Steppe.

MATERIAL AND METHOD

The research was carried out in the 2022-2025 agricultural period at the Research and Development Station for Meadows (RDSM), Vaslui, Moara Grecilor location. The purpose of the research was to select the best *Bromus inermis* Leyss. genotypes in terms of vegetative propagation capacity.

A total of 155 genotypes (clones) were selected and studied in the *Bromus inermis* Leyss. species, from the field collection of the RDSM Vaslui. In the spring of 2023 (02.05.2023), genotypes were transplanted, in the form of a monolith measuring L = 10 cm, l = 10 cm and h = 15 cm, in the middle of a plot of 4 m^2 (2 m × 2 m) available surface for vegetative development. After the establishment of the experimental field, the care works consisted only in performing a number of 2 cleaning cuts per year. The diameter of the bush was measured in two perpendicular directions and the average (cm) was made, and the comparison of the provenances between them was carried out (notes from 1 to 5) taking into account the height of the bush (cm), the number of shoots and the shape of the bush.

Tabel 1 shows how the experimental field is organised and the codification of the 155 genotypes. The experimental field of the Vaslui SCDP has an eastern exhibition with a slope of 3-5 %, and the soil is typical cambic chernozem with a content, in the layer of 0-25 cm, of 3.42 humus, 0.16 total N, 37.6 ppm P, 151.7 ppm K and a pH of 6.3.

Table 1.

Experimental field organization and the codification of the genotypes

E	D	C	B	A	
R1P1	R1P3	R1P8	R1P9	R1P10	1
R2P3	R2P4	R2P5	R3P1	R3P4	2
R3P9	R4P3	R4P4	R4P9	R5P9	3
R6P3	R6P4	R7P6	R7P9	R7P10	4
R8P1	R8P2	R8P8	R8P9	R8P10	5
R9P6	R9P7	R9P9	R9P10	R10P4	6
R10P5	R11P1	R11P3	R11P4	R11P9	7
R12P2	R12P3	R12P4	R12P7	R13P10	8
R14P5	R15P2	R15P3	R15P4	R15P10	9
R16P1	R16P3	R16P8	R16P9	R16P10	10
R17P3	R17P4	R18P1	R19P1	R19P8	11
R20R1	R20P3	R20P7	R20P10	R21P8	12
R22P6	R22P8	R23P1	R23P3	R23P9	13
R24P1	R24P2	R24P3	R24P8	R25P1	14
R24P1	R26P3	R26P7	R27P1	R27P2	15
R27P6	R27P7	R27P9	R27P4	R27P7	16
R28P1	R28P2	R29P3	R29P8	R29P9	17
R29P1	R29P2	R29P3	R30P1	R30P2	18
R30P7	R31P8	R32P7	R32P8	R33P9	19
Is	Ms	R1P3	R1P4	R2P9	20
R3P4	R3P5	R3P9	R4P8	R4P9	21
R5P9	R5P10	R6P2	R6P5	R6P6	22
R6P7	R6P9	R7P6	R7P7	R7P8	23
R7P9	R8P6	R8P9	R9P5	R9P10	24
R10P6	R10P9	R11P7	R12P5	R12P6	25
R13P1	R13P6	R13P10	R14P9	MIH.	26
R15P1	R15P2	R15P3	R15P4	R15P6	27
R15P8	R16P9	R17P2	R17P6	R17P9	28
R18P9	R19P7	R20P6	R20P10	R21P2	29
R22P1	R22P4	R23P8	R23P10	R24P10	30
R25P7	R26P9	R27P7	R27P9	DOV.	31

Figure 1 shows the climatic conditions during the research. The variability of climatic conditions may be observed, depending on the year, but also depending on the month of each year. Water stress periods are relevant, the most important being those in the summer and autumn of 2023, but which contributed to a better selection among the 155 genotypes analyzed.

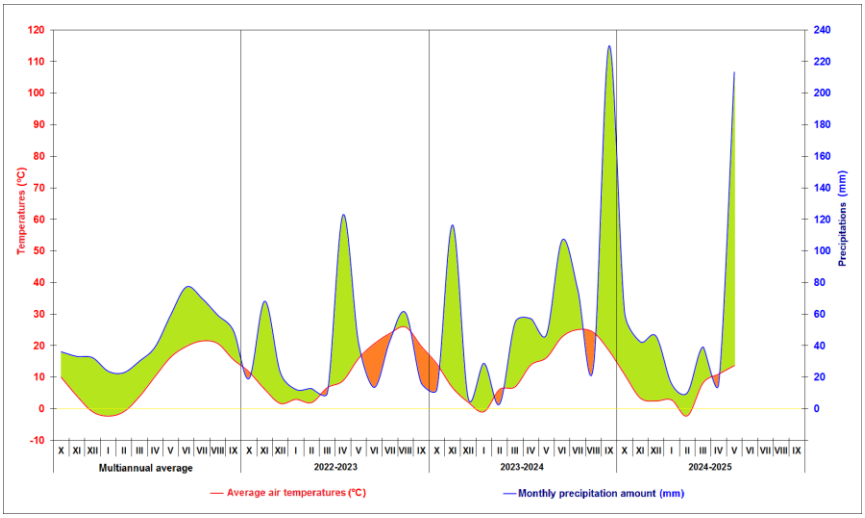

Figure 1. Climate conditions in the 2022-2025 agricultural period (RDSM Valui - Moara Grecilor location)

RESULTS AND DISCUSSIONS

At the time of transplanting, the irrigation work was not carried out, to see also the potential for installation of new clones. For this reason, in the year of establishment of the experience (determination being carried out at the end of 2023 - year 0) a number of 22 genotypes did not survive (R1P9, R6P3, R6P4, R7P6, R7P10, R8P10, R8P1, R8P2, R20P10, R23P3, R23P1, R28P1, R27P7, R30P7, R32P7, R5P9, R7P9, R10P6, R11P7, R12P5, R20P10 and DOV.). In figure 2 are presented the results of measurements regarding the diameter of the bush in the genotypes studied, in the year 1 (2024) and year 2 (2025) of development. The results obtained showed that, in addition to the 22 clones that did not survive, a number of 38 clones almost did not show the vegetative multiplication trend, their diameter being 10 cm in the year 1 and maximum 15 cm in the year 2. The other clones generated bushes with a diameter of up to 82 cm in year 1 and up to 158 cm in year 2. Of the 95 genotypes with obvious vegetative multiplication, in year 2, were selected a number of 10 clones with bush diameter greater than 100 cm (between 103 and 158 cm), respectively clones with the codes R9P6, R9P7, R9P9, R15P4, R16P10, R20P7, R22P6, R24P2, R3P4 and R15P6. They are to be transplanted into a degraded meadow of *Dichanthium ischaemum* (L.) Roberty, where the vegetative propagation capacity will be tested, under conditions different from those in arable land. The ultimate goal is to create a new genotype of *Bromus inermis* Leyss., with a high capacity of fixing degraded soils, including those on which permanent grasslands are installed.

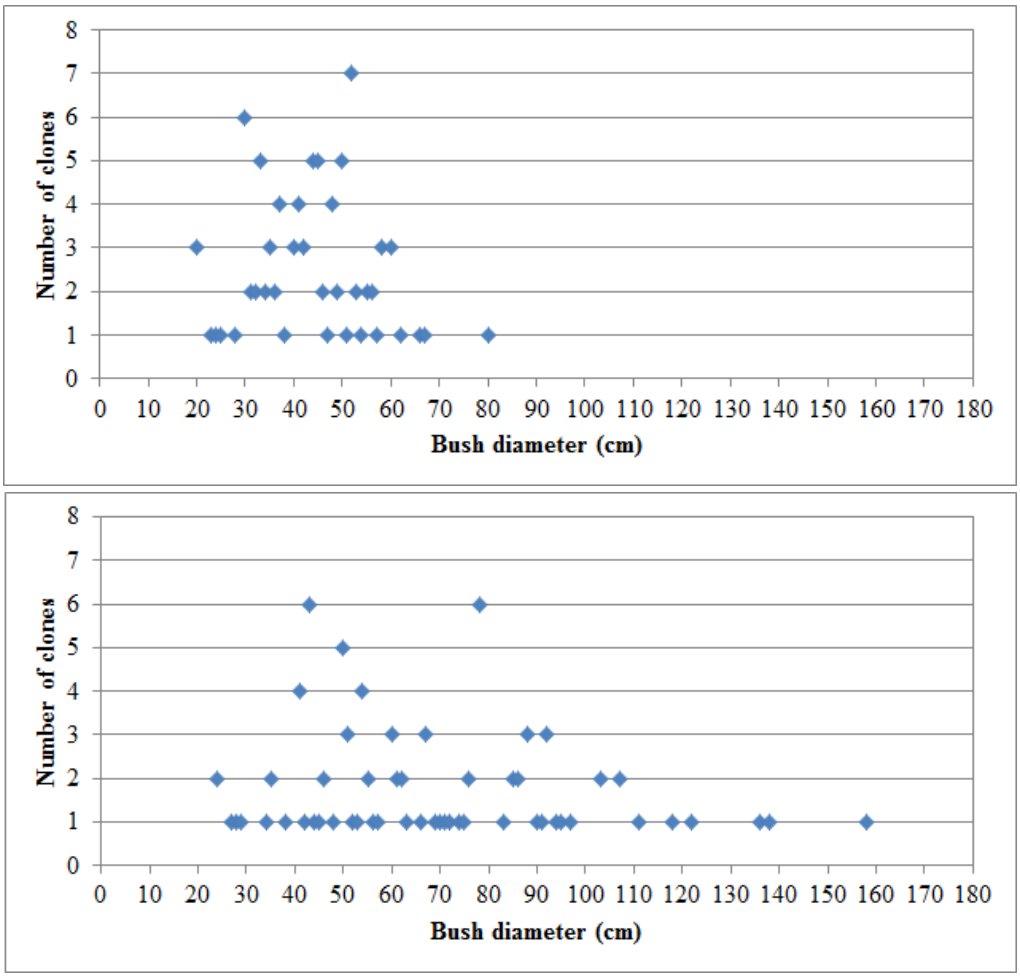

Figure 2. The diameter of the bush (cm) at the ground level, at the 95 genotypes that survived: a - year 1 (2024) and b - year 2 (2025)

The evolution of the bush diameter at the 10 genotypes with a large diameter of 100 cm, selected, is shown in figure 3. General aspects from the installation of the experience and the following years of vegetation are shown in figure 4. Vegetative multiplication capacity and productivity are usually dependent on each other. As a perspective, the research needs to be extended, because the correlation between vegetative propagation capacity and the productive potential in the 10 selected genotypes must be established.

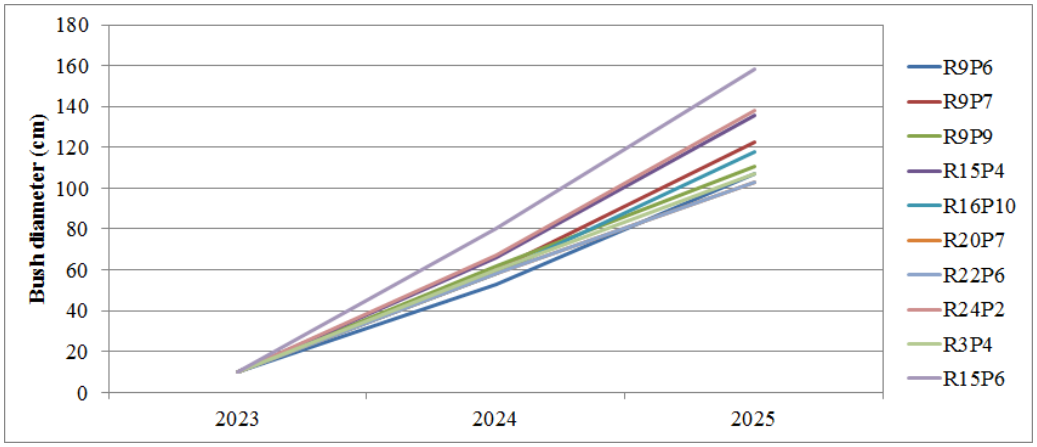

Figure 3. Evolution of the bush diameter at the 10 genotypes selected, with a large diameter of 100 cm

Figure 4. Aspects from the installation of the experience (year 0) and the following years (year 1 and year 2) of vegetation

CONCLUSIONS

Of the 155 transpanted genotypes, 22 did not survive in the first year of vegetation.

A total of 38 genotypes did not develop a bush larger than 15 cm, even after 2 years of vegetation.

Of the 95 genotypes with vegetative multiplication, were selected a number of 10 clones with bush diameter between 103 and 158 cm, respectively clones with the codes R9P6, R9P7, R9P9, R15P4, R16P10, R20P7, R22P6, R24P2, R3P4 and R15P6.

The main recommendation is to continue the research and to determine the correlation between vegetative propagation capacity and the productive potential in the 10 selected genotypes.

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