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STUDIES REGARDING THE BEHAVIOUR OF ORNAMENTAL SPECIES *LAGURUS OVATUS* IN CROPPING CONDITIONS FROM N-E AREA OF ROMANIA

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Abstract

The current paper aimed to analyse some aspects about behaviour and multiplication of Lagurus ovatus species in cropping conditions from Iaşi County, Romania. Research material was represented by Lagurus ovatus. Were established five experimental variants represented by different substrate types utilised for sowing: V1 garden soil, V2 garden soil + leaves soil (1:1), V3 garden soil + leaves soil + peat (1:1:1), V4 leaves soil + peat (1:1) and V5 jiffy pots. Observations and determinations were carried out in the didactic field of Floriculture Discipline from UASVM Iaşi, Romania, during 2015-2016 and had in view aspects regarding seedlings obtaining and also plants behaviour. At the end of the current research we observed that for seedlings production the best results were obtained at variant V3, followed by V2 and V4; and in cropping conditions at variants V3, V2 and V4 the results were quite close as values. In conclusion we can affirm that Lagurus ovatus is an ornamental grass which could be easily multiplied through seeds and for establishing crops the utilisation of seedlings is recommended.

Key words*: capitalization, Lagurus ovatus, ornamental (grass).*

INTRODUCTION

At world level plant species, generally named ornamental grasses, are utilised in floral art and also in vegetal compositions in landscape designs.
In Romania, ornamental grasses are less known and utilised in landscape designs and in floral art. In the last years, interest for those species increased, but due to lack of information regarding cropping technologies and utilisation modalities in pedo-climatic conditions of Romania, their utilisation is not always adequate (Chelariu, 2013).
Lagurus ovatus L. belongs to *Poaceae* botanical family and is cultivated in rustic areas 8-10 (11) (Mills-Hicks, 2007). It is a species with origins in South Europe, Mediterranean area. It's an annual species with a bush aspect, height of 30-50 cm and leaves of a light green colour (Brickell and Cathey, 2004; Şelaru, 2007). Flowers are grouped in small compact spikes, with a green white-yellow colour. Fruits appearance and maturation took place in stages from summer till autumn (Chelariu, 2013).
This species prefers fertile soils, permeable, with a pH between 6.6 and 7.5. Have a well development on sunny exposure fields (Brickell and Cathey, 2004; Chelariu, 2013; Colborn, 2006; Ondoño et al., 2016). Multiplication of this species is realised on a generative way. Seeds germination could be influenced by different parameters of some ecological factors (light, temperature, salinity etc.) (Carreño et al., 2004).
In the current paper are presented the aspects regarding seedlings obtaining and also the behaviour in cropping conditions of *Lagurus ovatus* species in pedo-climatic conditions from Iaşi, Romania.

MATERIALS AND METHODS

Research took place during 2015-2016 in the didactic collection (greenhouse and field) of Floriculture Discipline from UASVM Iaşi,

Romania. Biological material was represented by *Lagurus ovatus* species and the seeds used for establishing the experiments were achieved from Holland. Experiments were organised in five variants, each variant being represented by a substrate type utilised for sowing (Table 1).

Table 1. Experimental design

Studied species	Biological material	Seeds number	Variant	Substrate for sowing
Lagurus ovatus 	Seeds 	100	V_1	garden soil
		100	V_2	garden soil + leaves soil (1:1)
		100	V_3	garden soil + leaves soil + peat (1:1:1)
		100	V_4	leaves soil + peat (1:1)
		100	V_5	jiffy-pots

The experimental variants were established having in view the ecological demands of the studied species and data from literature (Buta and Cantor, 2009; Cantor, 2009; Draghia and Chelariu, 2011; Chelariu, 2013).

In each year sowing was realised on 10th of February and the establishment of field crops was done on 10th of May.

Research aimed the obtaining of seedlings (seed germination percent, necessary period from sowing till ending of plants' emergence), as well as the behaviour in cropping in pedo-climatic conditions from Iaşi, for species.

In field, were studied separately plants obtained in different types of substrate, aiming aspects regarding the growing rhythm, phenology and morphology of plants.

The obtained results were statistically processed and were presented as a mean of two years of study.

RESULTS AND DISCUSSIONS

Seeds' germination at species *Lagurus ovatus* could be influenced by light, temperature, soil salinity (Carreño et al., 2004).

The research highlighted that the percent of germinated seeds at *Lagurus ovatus* varied between 75% and 100% (Figure 1). The best results were recorded at variant V_3 (1 part garden soil + 1 part leaves soil + 1 part peat), followed by variants V_2 (1 part garden soil + 1 part leaves soil) and V_4 (1 part leaves soil + 1 part peat), and the lowest values were obtained at variant V_5 (jiffy-pots) (Figure 1).

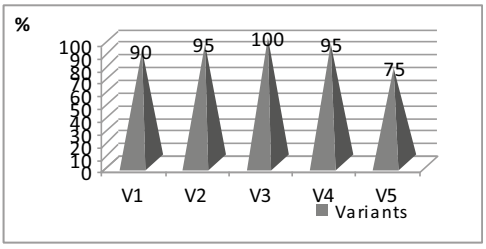

Figure 1. *Lagurus ovatus* seeds germination (%)

From statistic point of view at variants V_2, V_3 and V_4 were observed very significant positive differences comparing with the control variant (V_1). At variant V_5 the negative difference value comparing with the control was very significant (Table 2).

Table 2. Results regarding seed germination

Variant	Number of seeds (pieces)	% face to control	Difference	Signification
V_1	90.0	100.00	0.0	control
V_2	95.0	105.56	5.0	***
V_3	100.0	111.11	10.0	***
V_4	95.0	105.56	5.0	***
V_5	75.0	83.33	-15.0	000
LSD 5% = 1.4 pieces				
LSD 1% = 2.0 pieces				
LSD 0.1%= 3.1 pieces				

Regarding the necessary time period till plants' emergence, were observed differences between experimental variants. So, at variants V_1, V_2, V_3 and V_4 the emergence started after 3 days from sowing and at variant V_5 after 5 days

(Figure 2). Necessary time for a complete emergence of plants, calculated from sowing, was of 10 days at variant V_3, 11 days at variant V_2, 12 days at variants V_1 and V_4, for variant V_5 were necessary 17 days from sowing to end of emergence (Figure 2).

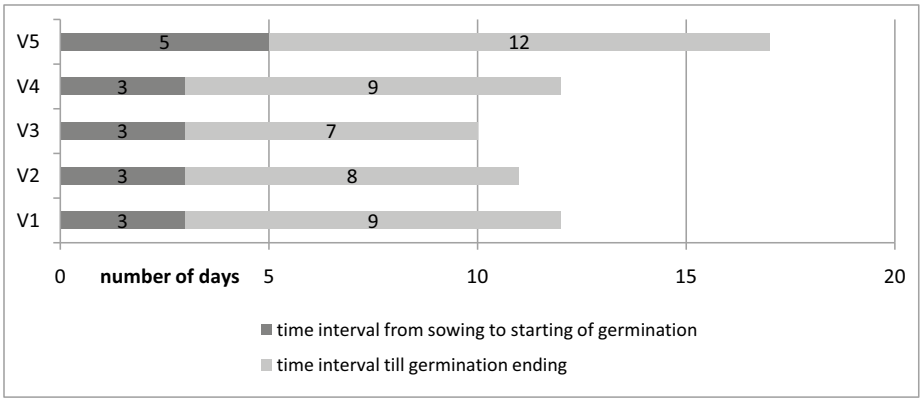

Figure 2. Duration of germination (number of days from sowing)

The utilised seedlings for establishing the field crops had different features function by experimental variant (Table 3).

Table 3. Morphological features of seedlings planted in experimental field

Variant	Mean number of roots per plant	Mean length of seedlings (cm)	Mean height of plant (cm)	Mean number leaves/plant
V_1	6.3	14.2	11.2	14.4
V_2	6.8	14.4	11.6	14.6
V_3	7.2	15.1	12.5	14.8
V_4	6.7	14.3	12.0	14.7
V_5	5.4	9.6	8.1	13.0

Seedlings obtained in greenhouse, on different types of substrates were planted in field on 10th of May. In according with literature (Brickell and Cathey, 2004; Colborn, 2006; Ondoño et al., 2016) plants of *Lagurus ovatus* reach a height between 30 and 50 cm; flowering in summer. During research period, in pedo-climatic conditions from Iaşi, Romania, plants had a normal rhythm of growing. Flowering took place in the second decade of June (V_1, V_2, V_3, V_4) or in the third decade of June (V_5), and fructification in the second decade (V_1, V_2, V_3, V_4) or in the third decade of August (V_5). Vegetation period ended in the first decade of October (Table 4).

In Table 5 is presented the morphological characterization of plants, realised based on field observations made on 1st of October.

Table 4. Phenology of *Lagurus ovatus* specie in cropping conditions from Iaşi County

Variant	Growing rhythm	Flowering (decade/ month)	Fructify (decade/ month)	Ending of vegetation period (decade/month)
V_1	normal	II/06	II/08	I/10
V_2	normal	II/06	II/08	I/10
V_3	normal	II/06	II/08	I/10
V_4	normal	II/06	II/08	I/10
V_5	normal	I/07	III/08	I/10

Table 5. Morphological characterization of *Lagurus ovatus* plants

Variant	Mean height of plant -cm-	Diameter of bush -cm-	Mean length of leaves -cm-	Mean width of leaves -cm-	Mean length of inflorescence -cm-	Mean number inflorescence per plant -pieces-
V_1	38.8	23.3	14.1	1.3	5.3	24.3
V_2	40.1	23.5	14.2	1.3	5.4	24.6
V_3	40.9	24.2	14.5	1.4	5.5	25.1
V_4	40.3	23.9	14.4	1.4	5.5	25.0
V_5	34.9	21.9	14.0	1.3	5.3	23.9

Regarding mean height of plants were observed very significant positive differences comparing with the control (V_1) at variant V_3 and distinct significant positive differences at variants V_2 and V_4. At variant V_5 the negative difference comparing with the control variant is very significant (Table 6).

Regarding flowering capacity at variants V_3 and V_2 differences comparing with the control

(V_1) were positive distinct significant while variant V_5 recorded a significant negative difference (Table 7).

Table 6. Results regarding plants' growing

Variant	Mean height of plant (cm)	% face to control	Difference	Signification
V_1	38.8	100.00	0.0	control
V_2	40.1	103.35	1.3	**
V_3	40.9	105.41	2.1	***
V_4	40.3	103.87	1.5	**
V_5	34.9	89.95	-3.9	000
LSD 5% = 0.8 cm LSD 1% = 1.1 cm LSD 0.1% = 1.7 cm				

Table 7. Mean number of inflorescences/plant

Variant	Number of inflorescences (pieces)	% face to control	Difference	Signification
V_1	24.3	100.00	0.0	control
V_2	24.6	101.23	0.3	-
V_3	25.1	103.29	0.8	**
V_4	25.0	102.88	0.7	**
V_5	23.9	98.35	-0.4	0
LSD 5% = 0.4 pieces LSD 1% = 0.5 pieces LSD 0.1% = 0.8 pieces				

In landscape design, *Lagurus ovatus* assures decoration due to its bush habitus, from spring till autumn, and by inflorescences in period June-September (Chelariu, 2013). Due to fine texture and plants' elegance these species could be utilised in vegetal compositions from different types of landscape designs such as: decorative pots, rounds, flats, stone designs etc. (Brickell and Cathey, 2004; Chelariu, 2013; Colborn, 2006; Şelaru, 2007; Tomaškin et al., 2015), green roofs (Ondoño et al., 2016). Also, floral rods could be utilised in floral art as cut flowers both in fresh state as well as in dry state (Chelariu, 2013; Tomaškin et al., 2015).

CONCLUSIONS

In conclusion we can affirm that *Lagurus ovatus* is an ornamental grass which could be easy multiplied through seeds and for establishing of crops is recommended the utilisation of seedlings.

To obtain a 100% percent of germination and a quality seedling at species *Lagurus ovatus* is recommended as substrate for sowing the mixture between garden soil + leaves soil + peat (1:1:1).

In crop conditions, at plants obtained at variants V_3, V_2, V_1, and V_4, morphological characteristics were quite similar, differences being observed at plants from variant V_5.

Lagurus ovatus is an ornamental grass species which in cropping conditions from North-East area of Romania acts as an annual plant, having a normal growing rhythm and decorates through habitus and inflorescences.

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