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IMBIBITION OPPORTUNITIES OF FOREST SEEDS SPECIES TO REDUCE PROFOUND DORMANCY

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Abstract

The fact that the seeds of some forest species after maturation become profoundly dormant, leading to germination and emergence in the second year after planting, requires some investigation undertaken in order to reduce profound dormancy, considering that mechanical degrading of seminal coatings is a difficult operation which can lead to injuring the endosperm. In their turn, mechanical treatments can provide fast germination imbibitions, but done incorrectly, they can reduce germination potency.
This paper presents a mechanical method for reducing profound dormancy by degradation of the per carp and seed coat permeability for rapid penetration of water into the seed, the method to apply the mechanical treatments under various conditions of time, temperature and humidity.

Key words: *Ceratonia siliqua; dormans; forest seed; scarification.*

INTRODUCTION

Ceratonia siliqua (carob) seeds have been studied, which have been harvested from isolated trees which have been grown in the Southern area of Craiova, i.e. in the sandy area on the left side of river Jiu. Multiple qualities of the species: content of simple and complex carbohydrates, mucilage, pectin, starch and vitamins, using powders against diarrhoea, dysentery, gastritis and enterocolitis, as well as the importance of wood for furniture, constructions and fire, and also for harnessing sandy soils by harvesting it, increased requests of seedlings.
Since it is a tree which originates from the Mediterranean basin from the family of Fabaceae, it has adapted very well to geographic conditions and climate of our South-West part of the country in terms of climate and humidity.
Practical difficulties to obtain seedlings of this species have lead to conducting certain studies and research in order to find possibilities of seeds imbibitions until ensuring the necessary level of humidity in order to germinate and undergo attempts to interrupt deep sleep (Dormans) in various conditions of temperature and humidity. Actually the two represent the proposed objectives in order to achieve the paper.

MATERIALS AND METHODS

In terms of material, we used Ceratonia siliqua pods, harvested at full maturity. Harvesting included the following organisational measures:
- the number of seeds was established;
- the source of seeds was established;
- the phonological chart was drawn in order to establish correctly the date of beginning harvesting.

After harvesting: pods were weighted and humidity was determined. Dehiscent dry fruit, glad pods after dry were treated by mechanical crushing with the help of certain equipment which also separated seeds from pods by fanning. MMB was determined by obtaining the value of 206,7 grams.
In order to assess changing humidity under mechanical action (pericarp degradation) the studied mass of seeds was weighted, before the mechanical action of scarification, followed by placing it into water at room temperature of 22-24^{0}C, then they were weighted every 12-24-36-48 hours. Scarification was carried out with the help of a machine of selecting, removing and sensitising seeds pericarp from forest species.

Figure 1. Sample preparation for work

Table 1. Seed rating in processing pods

Sample	Total weight (g)	The Yield (g)		Nr. seeds
		Seeds	Peabody	
P1	15.77	3.94	11.84	20
P2	14.93	3.73	11.20	18
P3	16.15	4.03	12.11	21
P4	19.57	4.89	14.68	24
P5	16.83	4.20	12.62	22
P6	16.61	4.15	12.46	21
P7	17.45	4.36	13.09	22
P8	14.45	3.61	10.84	17

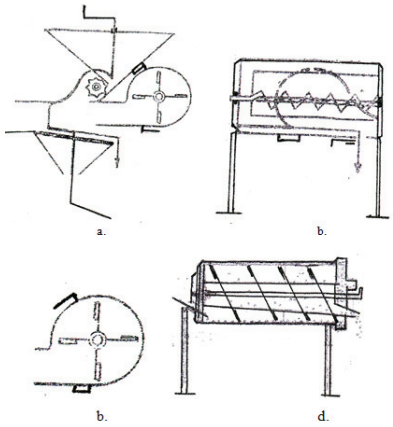

Figure 2. For the selected machine, dezaripat and pericarp of the seeds of sensitized species forestry. a. power supply system and the air flow separation; b. decorticator; c. radial-axial fan; d. conveyor with metal mesh trays for sorting and destruction of seed pericarp

RESULTS AND DISCUSSIONS

After scarification, seeds are under supervision and determination which are meant to establish their influence on seminal coatings and viability. In order to achieve this, 100 grams of seeds were put in small bags and placed in glass cylinders with 200 ml of water at room temperature.

Table 2. Tegument permeability according to the level of humidity after scarification

Initial state %	Humidity % at the time of immersion in water (h)			
	12	24	36	48
10.21 – 13.70	21.64 – 29.04	35.63 – 47.81	57.89- 77.68	67.60 – 90.70

Laboratory determination of the level of imbibitions with scarified seeds established that generally, while germinating, their humidity is 5-6 higher than their humidity while harvesting. Moreover, laboratory determinations performed with seeds in natural state (not scarified seeds) showed the fact that after a long period of time of approximately 120 hours, their initial state did not change, and with certain seeds the process of alteration was observed.

CONCLUSIONS

Degradation of the pericarp and tegument, drop resistance shall be carried out for the purposes of ingress of water into the seed and shortening the period of rest.

Degradation of the pericarp will appreciate after his resistance to mechanical crushing action (compression) measured in the Laboratory for Mechanics and Strength of Materials.

Drop resistance skin will be determined in the laboratory, depending on the degree of humidity of the seeds after a period of immersion in water.

The proposed Car can achieve separation of seeds by setting afloat speed, desariparea, selection and destruction of the pericarp.

REFERENCES

Daia M., 2003. Realizări şi perspective ale protecţiei pădurilor în România. Revista pădurilor, Nr.3

Daia M., 2011. Silvicultură. Curs litografiat, USAMV Bucureşti

Florescu I.I., 1981. Silvicultura. Editura Didactică şi Pedagogică, Bucureşti

Florescu I.I., Nicolescu V.N., 1998. „Silvicultura, Vol II Silvotehnică. Editura Universităţii Transilvania, Braşov.

Georgescu F, Daia M., 2002. „Regenerarea pădurilor în România", Seminarul Internaţional „Împădurirea în contestul managementului durabil al pădurii. ENNIS, Irlanda.

Nicolescu N.V., 1995. „Silvicultura. Îndrumar de lucrări practice. Reprografia Universităţii Transilvania, Braşov.

Petrescu L., şi colab., 1984. Tehnologii îmbunătăţite de îngrijire a arboretelor, de fag, stejar şi de şleau în condiţiile exploatării mecanizate a lemnului. ICAS, Seria II, Bucureşti

***1986, Norme tehnice pentru amenajarea pădurilor, Ministerul Silviculturii, Bucuresti.