

IDENTIFICATION OF SOME VALUABLE GERMPLASM SOURCES IN SILVER FIR (*ABIES ALBA*) ON THE BASIS OF SEED GERMINATION CAPACITY

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Abstract: The Silver Fir genetic resources conservation is a very important activity (including in our country) considered through the viewpoint of a drastic diminution of natural arboreta. The elite (*plus*) silver fir trees are the most important purveyors of high quality biological material for the creation of populations (orchards) for seed or cutting production in the process of forest genetic improvement and afforestation too. The experiments were fulfilled in order to establish the biological answer of Silver Fir seeds concerning the germinative potential in a mixture arboretum (Silver Fir and European Beech). Related to the main physiological indicators of Silver Fir seeds, the value of the germinative energy/germinative vigour, respectively 26,75%, is normal in natural conditions. The germinative capacity (technical germination) registered 32%, value corresponding to second category of seed quality.

INTRODUCTION

Silver Fir is one of the most exacting forest species concerning the stational conditions with optimum vegetation status in medium warmther climate and rainfull (4). The Silver Fir genetic resources conservation is a very important activity (including in our country) considered through the viewpoint of a drastic diminution of natural arboreta (from10-15% in XIX century to 5-6% in present) (1).

On the other hand, the elite (*plus*) silver fir trees are the most important purveyors of high quality biological material (seeds, cuttings and grafts) for the creation of populations (orchards) for seed or cutting production in the process of forest genetic improvement and afforestation too (2,5).

The germinative energy represents a germination vigour indicator in correlation with a rapid germinations of seeds and mass rise in a short time (3).

In this respect, the present paper aims to study the seeds germination to evaluate and identify the most valuable genetic resources in natural Silver Fir arboreta.

MATERIAL AND METHODS

There were used Silver fir seeds (6,04 g/1000 seeds) harvested in 2011 in March, after the snow melting, from more biotypes of the Moldovița forest ward.

After the pre-refrigeration treatment (21 days to 4°C), the seeds were sown, in four replicates of 100 each, in Petri dishes on filter paper moistened periodically with distilled water.

The germination was carried out, according to the valid standards [SR 1634: June 1999], in a CONVIRON 4030 – G30 growth chamber, at 21°C, 95% humidity and photoperiod regime (16 hours day/8 hours night alternation). It was measured the germinative energy at 10 days and germinative capacity (technical/total germination) at 28 days.

RESULTS

The experiments were fulfilled in order to establish the biological answer of Silver Fir seeds concerning the germinative potential in a mixture arboretum, including 9 Silver Fir to 1 European Beech.

Table 1. Analysis of germination capacity

Germination	Repetition				Total	Average
	1	2	3	4		
Total germinate	36	29	33	30	128	32
Abnormal germinated	0	0	0	0	0	0

seeds						
Ungerminated seeds	15	18	20	14	67	16,75
Damaged seeds	6	1	0	3	10	1,5
Empty seeds	37	41	39	43	160	40
Parasited seeds	16	11	8	10	45	9,75
Total	100	100	100	100	400	100

Table 2. Main germinative indicators

	Repetition				Average
	1	2	3	4	
Technical germination %	36	29	33	30	32
Germinative energy (germination vigour) %	30	24	28	25	26,75

Number of germinated seeds

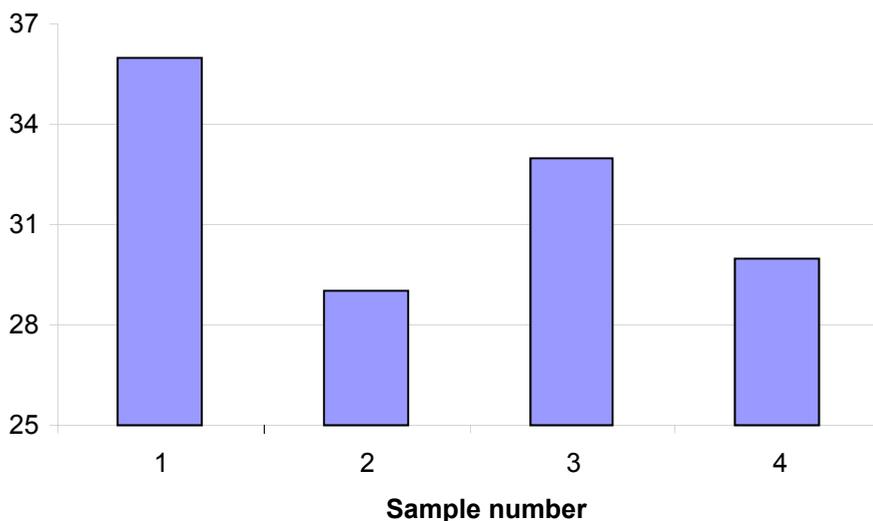


Figure 1. Number and percentage of germinated seeds

DISCUSSIONS AND CONCLUSIONS

Related to the main physiological indicators of Silver Fir seeds, in table 2 are shown values for the germinative energy/germinative vigour, respectively 26,75% which is normal in natural conditions. The geminative energy represents an indicator in correlation with a rapid germination and mass rise of Silver Fir seedlings in short time.

The germinative capacity (technical germination) registered 32%, value corresponding to second category of seed quality (fig.1). The germination capacity of Silver Fir seeds is related to the resin bags which often spoil the biological integrity of seeds and

decrease the final germination percentage. On the other hand, a fruitful year produce many seeds of a high quality.

The Silver Fir quality seed is also influenced by humidity level from previous year. For example, a droughty year increase the empty seeds number. Table 1 contain data related to the proportion between different categories of biological reproductive material after the germination experiment. In this respect we registered a high percentage of empty seeds – 40% and about 10% parasited seeds, other categories of seeds (ungerminated seeds, damaged seeds, abnormal germinated seeds) framing in normal bounds.

REFERENCES

1. **Enescu V. et al., 1997** – *Conservarea biodiversității și a resurselor genetice forestiere (Conservation of biodiversity and forest genetic resources)*. S.C. Agris, Red. Rev. Agric., București
2. **Fărtăiș L., 2007** – *Conservarea și utilizarea durabilă a resurselor genetice forestiere (Sustainable usage and conservation of forest genetic resources)*. Edit.Univ."Ștefan cel Mare" Suceava
3. **Fărtăiș L., 2002** – *Genetică și ameliorarea speciilor forestiere (Genetics and improvement of forest species)*. Edit."Univ.Șt.cel Mare" Suceava
4. **Giurgiu, V., 1979** - *Dendrometrie și Auxologie Forestieră*. Editura Ceres București
5. **Nanson A., 2004** – *Génétique et amélioration des arbres forestiers*. Les Press Agron. Gembloux

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