GERMINATION TEST OF SILVER FIR (*ABIES PINDROW*) SEED

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Summary. *Tree size, from 21 to 94 cm dbh, did not appear to influence germinative energy and capacity in silver fir (Abies pindrow). Moist stratification at 4°C for 21 days did not improve germination. Seed source influenced germination significantly: Maximum germination was obtained from Nala and Chanian seed sources and minimum from Kalabagh and Kuzagali.*

Introduction. Natural regeneration under pure stands of silverfir, *Abies pindrow* spach is not satisfactory. The following investigation was conducted to find out the effect of tree size and seed source on the germinative capacity and germinative energy of silver fir seed. An attempt was also made to find if seed germination can be improved by stratification.

Method. Thirty silverfir trees were marked in Shogran, Kaghan Forest Division, in 5 dbh classes (cm): 21 to 34, 36 to 46, 50 to 62, 67 to 79 and 80 to 94, 6 trees in each dbh class. Cones were collected from these trees on 20th October, 1979. Seed was extracted from cones and sieved through 4000 micron mesh sieve, discarding the material which passed through. The seed left on the sieve were floated in Iso-butenol and the empty seed (which did not sink) thrown away. From each tree lot, four representative samples of 50 seed each were taken at random and imbibed in water for 30 hours. The imbibed seed were treated with 0.1% mercuric chloride for 45 seconds and kept in steralized petri dishes on moistened blotting paper in germinator with the following temperature regime:

Hours	*Temperature*
0830 to 1600	30°C
1600 to 0830	20°C

The experiment was started on 15th January, 1980 and observations continued for 40 days after which the ungerminated seeds were cut to find out if they were sound.

Seed from the same dbh classes were soaked in water for 30 hours and kept in air tight polythene bags in cool incubator at 4°C for 21 days. At the end of this period, the seed were treated with 0.1% mercuric chloride solution and kept for germination on 6th February, 1980 under similar conditions of temperature as for the previous experiment and observed for germination for 40 days.

To find out the effect of seed source on germination, seed was collected from ten apparently sound trees at each of seven localities. Equal quantities of seed were taken from

each locality and mixed into a composite sample. Seed were treated as for other experiments: floatation in Iso-butenol to separate empty seed, imbibation in water for 30 hours, and mercuric chloride treatment. The seed were then placed in the germinator under the similar conditions as for the other experiments.

Results. Effect of size of tree on germinative energy[1] and germinative capacity[2]: As indicated by the following data, tree size did not influence germinative capacity. Germinative energy, however, appeared to be higher in the 80 to 94 cm dbh class.

dbh class	Germinative energy after: 15 days (Mean %±1 S.D.)	20 days	Germinative capacity (Mean %±1.S.D)
21 — 34	66±2.6	75±0.7	92±1.0
36 — 46	69±3.5	77±2.5	95±2.7
50 — 62	70±1.2	77±1.9	97±1.4
67 — 79	70±3.1	77±3.2	93±1.2
80 — 94	83±1.5	89±1.8	96±1.0

Effect of stratification on germinative energy and germinative capacity: Stratification for 21 days did not significantly influence seed germination as indicated by the following data:

dbh class (cm)	Germinative energy after: 15 days		20 days		Germinative capacity	
	Stratified	Non-stratified	Stratified	Non-stratified	Stratified	Non-stratified
	(%)					
21 — 34	63	66	69	75	94	92
36 — 46	73	69	78	77	93	95
50 — 62	70	70	78	77	92	97
67 — 79	67	70	74	77	92	93
80 — 94	70	83	77	89	94	96

1. Percentage of seeds that germinate during a specific time interval that is determined by the peak rate of germination.

2. Percentage of seed that genminate during a period of time ending when germination is practically complete. Actully determined by adding to the number of seed which germinated till the end of 40 days, the number of filled seed still left ungerminated in the petri dish.

1974. Seeds of woody plants in the United States. For. Sercice, U.S. Deptt: of Agriculture, Washington D.C.

Effect of seed source on germination: Seed source appeared to significantly influence germination, as is evident from the following data:

Seed source	Germinative energy after: 15 days (Mean %)	20 days	Germinative capacity (Mean %)
Chanian	61	73	95
Nala	50	57	96
Hillan	44	50	77
Kuldana	40	48	75
Kalabagh	35	41	68
Dungagali	35	41	80
Kuzagali	34	37	66

The data were analysed by Chi square test. The localities are arranged below in descending order of germinative energy and germinative capacity.

Germinative energy	Germinative capacity
Chanian	Nala and Chanian
Nala	Dunga gali, Hillan, Kuldana
Hillan, Kuldana	Kalabagh, Kuzagali
Kalabagh, Dungagali, Kuzagali	