PRESOWING, STRATIFYING SPRUCE AND PINE SEED IN PLASTIC CONTAINERS PROVES BEST IN ALBERTA, CANADA, TEST

J. C. CHEDZOY, *Superintendent,*
Provincial Tree Nursery,
Edmonton, Alberta, Canada

The Provincial Tree Nursery, Edmonton, Alberta, Canada, recently tested two methods of handling white spruce and lodgepole pine seed to obtain highest germination and survival when sown in cardboard and plastic containers.

The trial consisted of the following treatments with 50 plastic and 50 cardboard containers each, replicated three times for each species for a total of 4,800 individual seed tests:

(a) A check with untreated seed.

(b) Seed presown in containers and stratified for 90, 60, and 30 days at 34°F.

(c) Seed cold-soaked for 30, 20, and 10 days, and sown in containers.

(d) Pregerminated seed, sown after 4 days in blotters at greenhouse temperature.

Cardboard and plastic containers, both 21/2 inches long and 3/ inch in diameter, were used; One seed was sown in each. The soil mix was one part sand to two parts loam. Seed was from the Hinton area. Seed was germinated under mist in the greenhouse-the mist was on 2 seconds every 10 minutes in daylight hours only. Greenhouse temperature was held at 65°F., and good air circulation was provided. A gallo drench was applied to the soil after germination.

Treatments were started as follows:

	Date
Check	Feb. 17
90-day Stratification	Nov. 17
60-day Stratification	Dec. 17
30-day Stratification	Jan. 17
30-day Cold Soak	Jan. 17
20-day Cold Soak	Jan. 29
10-day Cold Soak	Feb. 7
4-day Pregerminated	Feb. 13
Starting date all treatments	Feb. 17

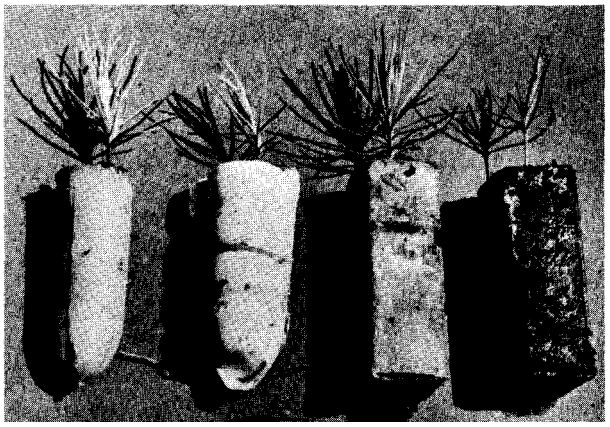
Notes were taken every 4 days after the test began; the test lasted 21 days. All visible germination and damping-off in the seedlings, if there was any, were recorded.

Results

Presowing and stratifying seed in plastic containers appears to be the best technique for producing both lodgepole pine and white spruce seedlings at this time. The 60-day stratification periods allow the highest germination. This together with the fact that the seed germinates within 10 to 12 days is a great advantage to nurserymen producing 12-week-old seedlings. Seed also germinated better in plastic containers than in cardboard, mainly because the drainage was poorer in the cardboard.

Since seed collected from various parts of the Province germinates differently, germination tests must be conducted on each lot before a method of germination is chosen. At the Provincial Tree Nursery germination tests are conducted twice; one with untreated seed and again with seed stratified at 34°F. Interestingly, germination of some seed lots deteriorated after stratification when the untreated seed showed a high percentage of germination.

Figure 1.-Numbers 1 and 4 were the types of containers used in this seed germination project. (1) Plastic type container



developed by Dr. Walters of the Forestry Department, University of British Columbia. (2) Two-section container, plastic held together with elastic band, developed in Edmonton for the Alberta Forest Service. (3) Waxed cardboard container, developed in Edmonton. (4) Black cardboard container, developed in Edmonton.

Figure 2.—Typical trays of *Pinus contorta latifolia* and *Picea glauca,* growing in trays at the Provincial Tree Nursery, Edmonton, Alberta.

TABLE 1—*Percent germination of white spruce* (Picea glauca) *after 21 days in plastic containers*

Treatment	Replications			Average Percent	Remarks
	A	B	C		
Check	38	48	48	44.06	--
90-day stratification	42	40	80	54.00	--
60-day stratification	94	98	96	96.00	All seed germinated after 10 days.
30-day stratification	80	80	78	86.00	--
30-day cold soaked	44	36	24	34.66	--
20-day cold soaked	36	34	32	34.00	--
10-day cold soaked	44	40	30	36.00	--
4-day pregerminated seed	54	50	50	51.03	--

TABLE 2—*Percent germination of white spruce* (Picea glauca) *after 21 days in cardboard containers*

Treatment	Replications			Average Percent	Remarks
	A	B	C		
Check	34	56	30	40.00	--
90-day stratification	34	56	66	5 .00	--
60-day stratification	71	80	90	80.66	All seed germinated after 10 days.
30-day stratification	9	94	78	88.00	--
30-day cold soaked	41	56	48	48.66	--
20-day cold soaked	31	34	28	31.03	--
10-day cold soaked	36	34	48	36.00	--
4-day pregerminated seed	36	56	36	42.00	--

TABLE 3—*Percent germination of lodgepole pine* (Pinus contorta *var.* latifolia) *after 21 days in plastic containers*

Treatment	Replications			Average Percent	Remarks
	A	B	C		
Check	31	46	56	44.6	--
[illegible]-day stratification	No test	No test	No test	--	--
[illegible]-day stratification	100	98	88	95.3	All seed in this lot germinated in 12 days.
30-day stratification	80	88	71	80.00	--
30-day cold soaked	36	4	34	37.3	--
20-day cold soaked	18	30	30	29.3	--
10-day cold soaked	60	54	41	51.0	--
4-day pregerminated seed	66	54	60	60.0	--

TABLE 4—*Percent germination of lodgepole pine* (Pinus contorta *var.* latifolia) *after 21 days in cardboard containers*

Treatment	Replications			Average Percent	Remarks
	A	B	C		
Check	0	40	44	34.66	--
90-day stratification	No test	No test	No test	--	--
60-day stratification	80	66	7	72.66	All seed germinated after 1 days.
30-day stratification	74	60	64	66.00	--
30-day cold soaked	18	32	52	37.3	--
20-day cold soaked	24	38	24	36.66	--
10-day cold soaked	61	46	56	54.60	--
4-day pregerminated seed	71	66	74	70.66	--