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ROOTED CUTTINGS OF YELLOW CEDAR

(*Chamaecyparis nootkatensis* (D. Don.)Spach.)

by

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Abstract

Rooting of yellow cedar cuttings was undertaken during three different years at Cowichan Lake Experiment Station. In the last experiment which was done in a heated greenhouse and with hormonal treatment of the cuttings, plantable stock was produced in one growing season.

Introduction

Increased logging activities at high elevations in the Vancouver Forest District have recently focused attention upon the use of minor species in reforestation programs. In response to this interest, the Research Division of the British Columbia Forest Service has obtained collections of wild seedlings from a number of provenances to provide material for physiological research and for a breeding arboretum. Under contract with Research Division, Dr. J.N. Owens (1974) of the University of Victoria studied the reproductive cycle in both yellow cedar and mountain hemlock. He also initiated experiments on flower induction in both species, with considerable success in yellow cedar (Owens and Molder 1974). Dr. G. W. Edwards (1974) is currently studying germination and rooting of cuttings in yellow cedar for the Canadian Forestry Services. At the Mission Tree Farm (1974), development of methods for growing yellow cedar seedlings on a production scale is in progress, both in the greenhouse and in the nursery.

Yellow cedar has not been important for reforestation in the past, but some references to the species can be found in horticultural literature. Bloome and Van Hulle (1967) and Van Elk (1969) in different studies of ornamentals, had little success in rooting cuttings from old yellow cedar trees. Mathews *et al* (1960) obtained the best results in rooting cuttings of Leyland cypress (*Cupressus macrocarpa* x *Chamaecyparis nootkatensis*) in the rooting medium which had the best aeration.

Materials and Methods

Research on the rooting of yellow cedar cuttings started on a small scale in 1971 at the Cowichan Lake Experiment Station. Approximately 30 cuttings were taken from each of one 10-year-old tree, and two trees between 50 and 100 years of age. On the older trees, the cuttings were taken from the lower part of the crowns. The cuttings were set in a wooden flat in a rooting medium of sand and vermiculite and the flat was placed in a rooting bed along with Douglas fir cuttings. No hormone treatment was applied, but otherwise the yellow cedar cuttings received the same treatment as the fir cuttings. Some root formation took place on cuttings from all three trees, but only on cuttings along the sides of the flat. The moisture content was apparently too high in the centre part of the flat and this caused the cambium of the cuttings to rot.

The experiment was repeated in 1972. This time, about 100 cuttings from a number of young trees - under 10 years of age - were used. The rooting medium was a mixture of fresh sphagnum and sand. Hormone treatment was not included. Root formation took place on cuttings along the sides of the flat suggesting a deficiency in aeration.

About 25 percent of the total number of cuttings formed roots. The rooted cuttings from the young trees in these two experiments required attention for two growing seasons in the nursery, and the ones from the old trees for three growing seasons before their root systems were sufficiently developed for planting in the field.

A third rooting experiment was conducted in the greenhouse in 1974 to provide additional plants from 13 provenances for a breeding arboretum. On January 8th, 735 cuttings were collected from three to ten year old trees from these provenances. The cuttings were treated with "Rootone", which contains indolebutyric acid as its main active ingredient. The length of the cuttings varied between five and 12 centimetres. A rooting medium recommended by Brix (1973) was used, which contained equal volumes of peat, coarse sand and perlite. This time, BC/CFS Styro 8 containers were used instead of wooden flats.

The temperature in the greenhouse was kept above freezing until February 25th, when it was raised to 16°C. No bottom heat was supplied. The cuttings were watered only enough to keep the rooting medium from drying out. From April, some fertilizer was added with the water. At this time it was noticed that roots were rapidly developing.

In mid-May the cuttings were extracted and potted into plastic pots, three inches in diameter and four inches deep. The cuttings were difficult to extract from the styro blocks without breaking the new roots, so it was found necessary to push out the plugs from the bottom. The potted cuttings were kept in the greenhouse under the same watering and fertilizer regime as the Douglas fir seedlings until mid-July, when they were moved outside for hardening.

Results and Discussion

Ninety-one percent of the cuttings had formed roots when they were potted in May. In addition to the potted ones, there were some green cuttings which had not yet formed any roots, but these were not followed further. Table 1 shows data of plantable rooted cuttings in September.

As can be seen the difference between cuttings with root formation in May and those plantable in September was only three percent. Root and shoot dry weight were also checked in September on 10 randomly selected cuttings from the Labour Day Lake provenance. The following average values were obtained for those seedlings: Shoot 8.31 g, Root 1.92 g, R/S ratio .23. Judging by the appearance of these cuttings (see Figure 1), it is believed that this R/S ratio is adequate for this type of plant.

It appears from this experiment, that it is quite practical to produce plantable yellow cedar stock in one growing season by using the described greenhouse method without applying specialized rooting techniques. A pre-requisite, of course, is that young cutting material be used. The rooted cuttings may then be a strong alternative to seedlings grown from the seed of this particular species.

Table 1. Number, percent and mean height of plantable rooted cuttings for the different provenances, September 1974.

Provenance	Elevation m.	Cuttings Set No.	Plantable No.	%	Mean Height cm.
Labour Day Lake	760-850	79	76	96	30.2
Elsie Lake	820-850	79	70	87	30.2
Mt. Cain	640-730	52	45	87	30.2
Leech River	700	49	48	98	31.2
Lookout Mountain	1070	60	52	87	22.8
Wauhlawis Creek	700-760	57	48	84	24.6
Sproat Lake	760-820	75	72	96	32.5
Forbidden Plateau	780	79	76	96	35.3
Toiko Lake	980	57	55	96	32.9
Upana River	550	41	29	71	24.8
Meade Creek	670-730	43	37	86	32.1
Harris Creek	700	41	33	80	29.4
Maggie Lake	520	23	12	52	26.2
TOTAL		735	653	89	

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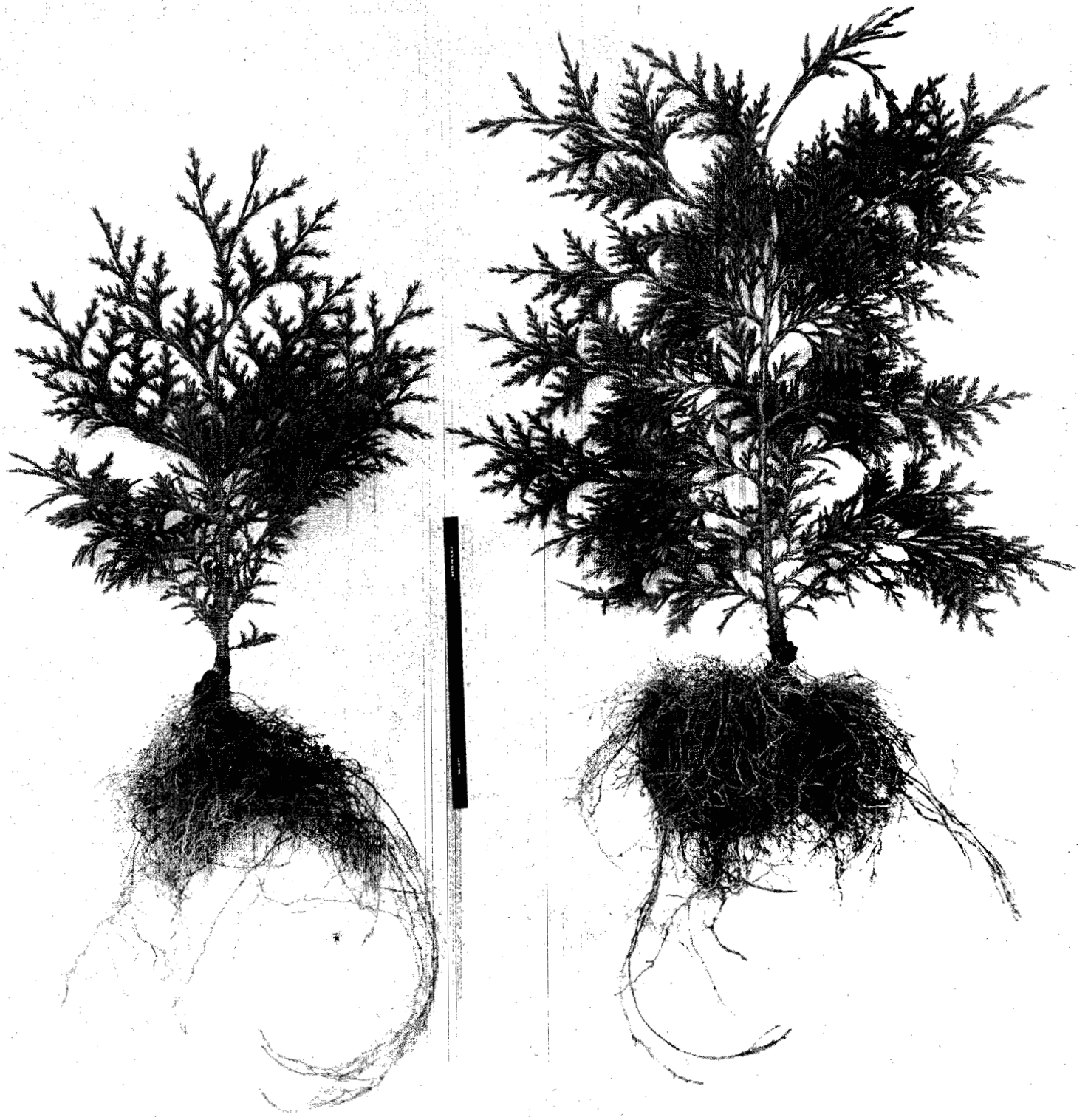

Figure 1. Rooted cuttings from the Labour Day Lake provenance September 1974.