TWO DEVICES FOR SPEEDING MORPHOLOGICAL ASSESSMENT OF NURSERY STOCK

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During annual nursery stock assessment, fertiliser trials, and other growth studies,.the British Columbia Forest Service measures many hundred seedlings. To facilitate rapid measurement, two pieces of equipment have been designed.

The first device (fig. 1) enables one man to record the root length, shoot length, and

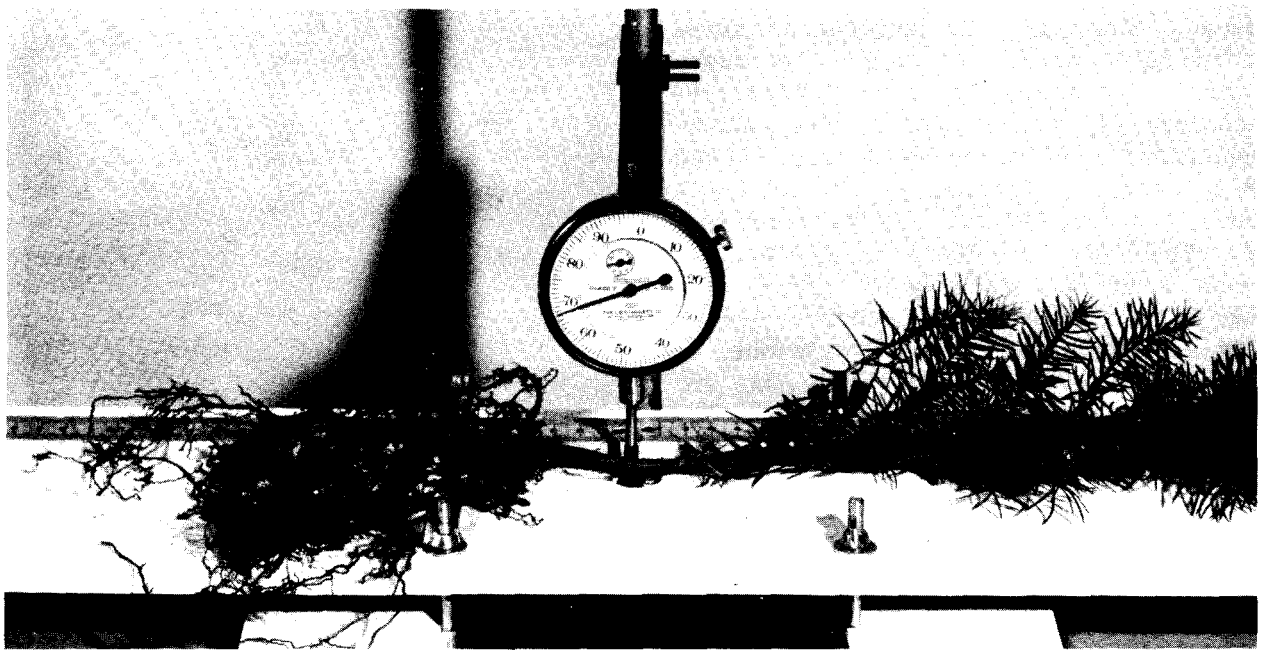

Figure 1.--Dial gage used to record root length, shoot length, and root-collar diameter. Courtesy of British Columbia Forest Service.

root-collar diameter of about 120 seedlings per hour. It consists essentially of a dial gage clamped to a laboratory retort stand, to which is bolted a board 5 feet long with two sections of metre-stick attached. The contact point of the dial gage rests on a metal or hardwood cylinder, one-fourth inch in diameter and one-half inch in height, which is cemented to the retort stand and projects slightly through a one-half-inch hole in the measuring board.

The seedling is put into the dial gage at the root collar. Root length and shoot length are read on the scales, and the root-collar diameter is read from the dial gage. The relatively constant compression of the dial gage gives greater reproducibility and accuracy than vernier calipers, and the dial eliminates faulty vernier readings. These dial gages have a range of 0-1 inch in 0.001 -inch graduations, or of 0-25 mm. with 0.01-mm. graduations.

The second device (figs. 2, 3) is used to measure root volumes. It consists of two Lucite tubes--the first is 3 inches in inside diameter and 14 inches long, and the second is one-half inch in inside diameter and 36 inches long. The smaller tube is cemented to the larger tube and sealed at the other end. It is calibrated in cubic centimerers to 110 ccs. The base of the larger tube is fitted with a collar which has been threaded to take a plastic screwcap. The screwcap has a 1/8inch thick polyurethane liner to make a watertight seal. To calibrate, the device is orientated as in figure 3A. It is completely filled with water, and then 110 ccs. are withdrawn (fig. 3B). Thus, when the device is inverted, the water level reaches a point marked zero (fig. 3C) on the calibrated tube.

In use, the device is filled with water to reference level X (fig. 3B). The roots are placed in the large-diameter tube, the device inverted, and the volume of root read from the calibrated tube (fig. 3D). Approximately 40 root volumes per hour can be measured.

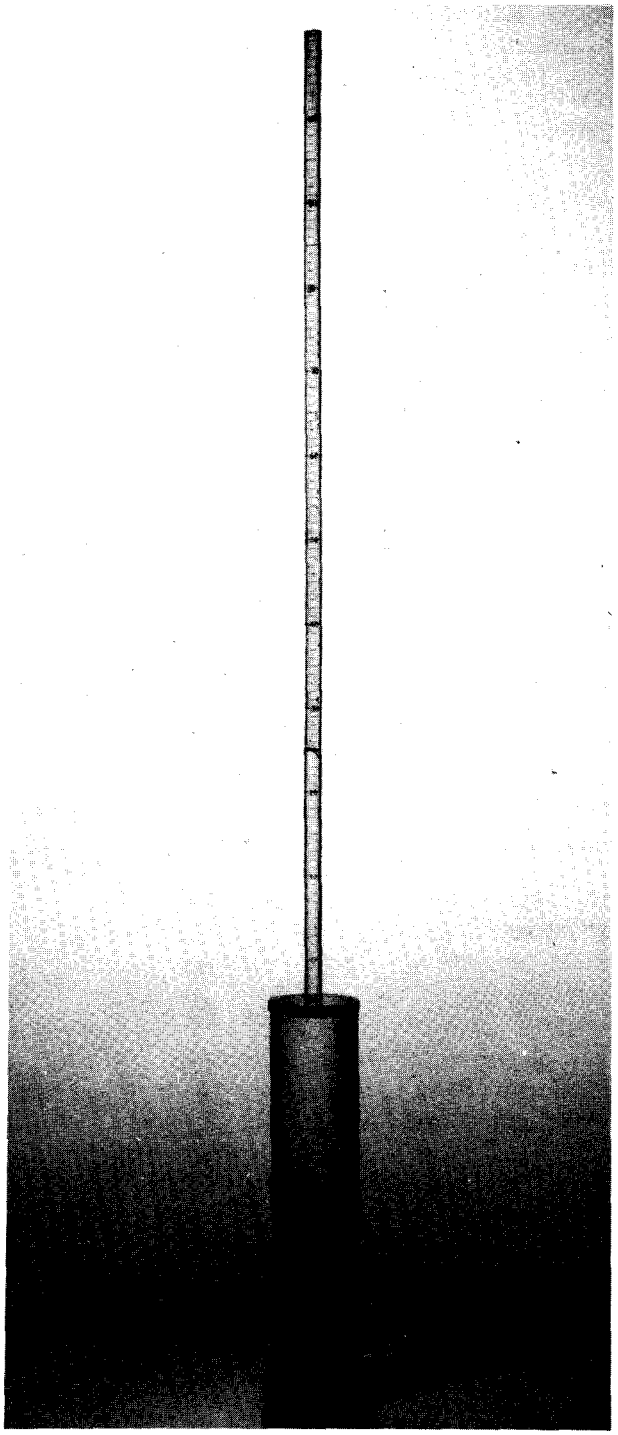

Figure 2.--Instrument used to measure root volume. Courtesy of British Columbia Forest Service.