PROPAGATION OF RHODODENDRON CAROLINIANUM FROM STEM CUTTINGS

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Commercial producers of *Rhododendron carolinianum* have been limited to propagation by seed or "cutbacks" (collected plants with the above-ground parts and the majority of the root system removed), since the literature indicates that most previous attempts to root stem cuttings have met with poor success.

The time required to produce "landscape-size" plants from seed is longer than would be required for the production of plants from either "cutbacks" or stem cuttings. The use of "cutbacks" has been extensive in North Carolina, but several disadvantages of this procedure will preclude its use in the future. Available plants of good quality for "cutbacks" are becoming limited and landowners hesitate to allow further exploitation. Since the preparation for planting results in large wounds on these plant parts, microorganisms frequently damage or destroy a large number of "cutbacks" and lower the efficiency of the procedure.

Propagation by stem cuttings would insure the producer of plants with less variation in flowering and growth patterns. This report deals with the effect of timing, media for propagation and hormone treatment on rooting of stem cuttings of *R. carolinianum*.

Procedure: Terminal stem cuttings were obtained from unfertilized, partially shaded, natural stands of *Rhododendron carolinianum* in Avery County, N.C. All cuttings, except those taken in November, were gathered at random from a large number of plants with a minimum age of five years. November cuttings were taken from plants in a nursery row which had been planted with "cutbacks" in the previous planting season. All cuttings were secured near the fourteenth of each month for ten consecutive months beginning in July, 1961.

The cuttings, three to five inches long, were wounded by removing a strip of bark about ¾ inch long from one side of the basal end of the stem. The basal ends of the cuttings then were dipped, for 10 seconds, in a 50% ethanol solution containing 5000 ppm of indolebutyric acid. All cuttings were stuck under intermittent mist in a propagation bench with bottom heat controlled to 70° F. Air temperature in the greenhouse was maintained at 60° F. during the winter and as low as possible at other times during the year.

Media consisted of equal volumes of (1) German peat moss and sharp sand, (2) German peat moss and perlite (horticultural grade) and (3) German peat moss and Weblite, a sintered clay-shale (-10 +14 grade).

Following twelve weeks in the propagation bench, cuttings

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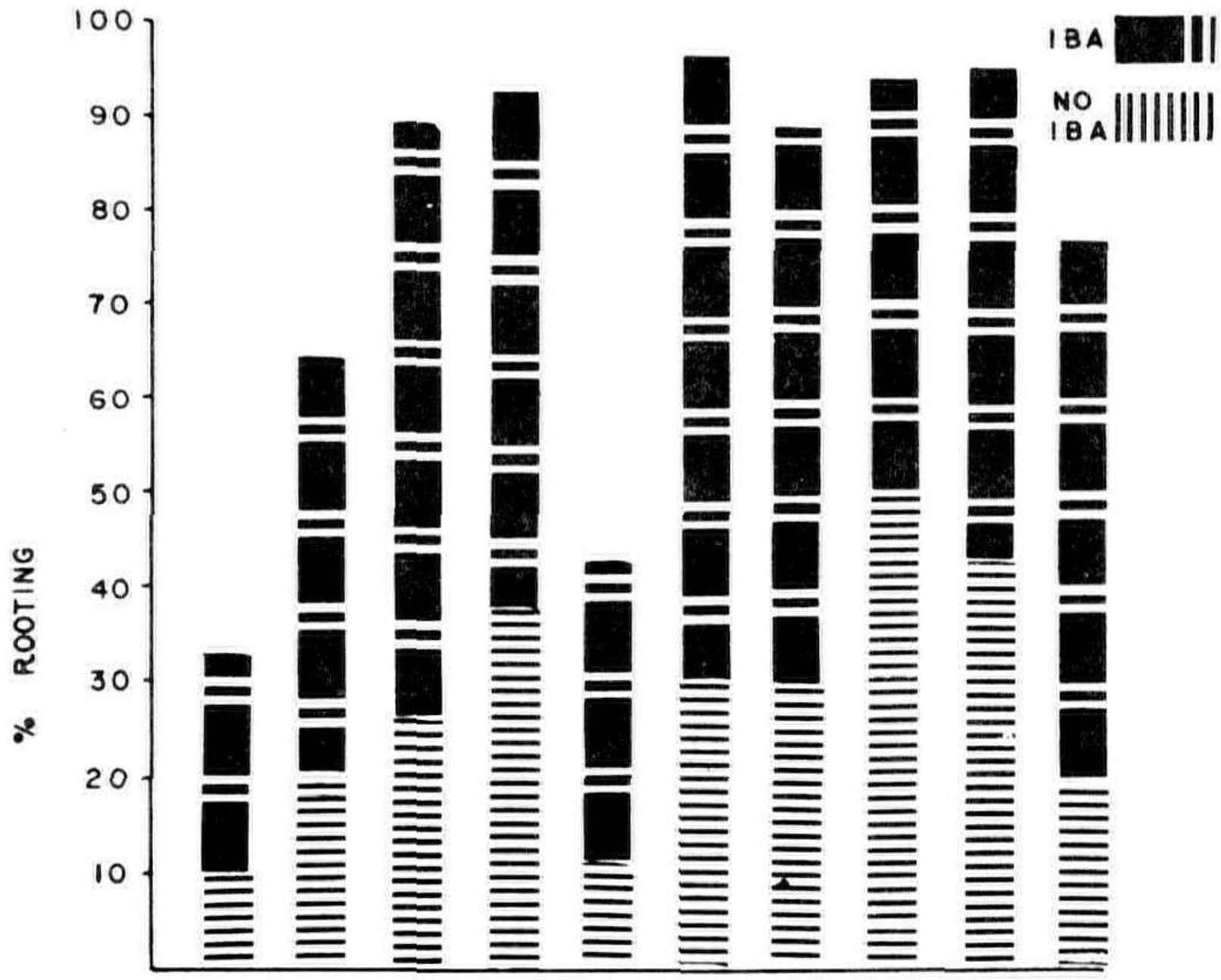
were removed and graded according to the root ball diameter: up to ½ inch, ½ to 1½ inches, and more than 1½ inches.

A split-plot design was used and all data were statistically analyzed. Four hormone treatments were replicated three times in each of the three media.

Results: Rooting percentages were low in July and August, higher values were recorded throughout the fall and winter months, and a decrease was noted in April (Chart 1). At least 90% of the IBA treated cuttings rooted if they were made in the months of September and October or the period December through March. Rooting percentages for July, August and April were 36, 66 and 79, respectively. Less than 50% of the November cuttings rooted, a result probably related to the vigor of the stock plants from which they were taken. These plants were one year from "cutbacks," in full sun and fertilized, in contrast to the unfertilized, shade grown stock plants used in other months.

If IBA was not used to treat the cuttings, less than 50% of the cuttings were rooted, except in the month of February when 51% were rooted.

Data presented in Chart 2 indicate that the peat-weblite combination produced the highest rooting percentage in most months. In contrast, the peat-perlite combination appeared to



		JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL
						%					
IBA-5000	ppm	33	65	90	94	43	98	90	95	96	77
No IBA		10	20	26	38	11	30	30	51	43	20

Chart 1. The effect of month of taking cuttings and IBA treatment on rooting of stem cuttings of *Rhododendron carolinianum*. Values are expressed as percentage of cuttings rooted after twelve weeks in the propagation bench.

be the least desirable in many months. Statistical analysis indicated that these were not significant differences each month during the sampling period.

How well these various media would perform under different misting cycles is not known, since one time clock controlled the mist in all plots used in this study.

The peat-weblite medium usually resulted in a larger number of cuttings with root balls in excess of 1½ inches in diameter. In contrast, the peat-perlite combination resulted in a larger number of cuttings with rootballs under ½ inch in diameter. Such differences are shown for December, January and February in Chart 3. A large number of cuttings in the larger grade probably indicates faster rooting and the possibility of earlier transplanting of these cuttings.

Conclusions: Commercial propagation, by stem cuttings, of *Rhododendron carolinianum* is feasible. Data indicated that most success would be obtained by taking cuttings in the late fall and winter months.

The results indicated that the use of IBA, at 5000 ppm in 50% ethanol, as a 10-second dip was highly beneficial. The use of the hormone could change an unsuccessful operation to a successful one.

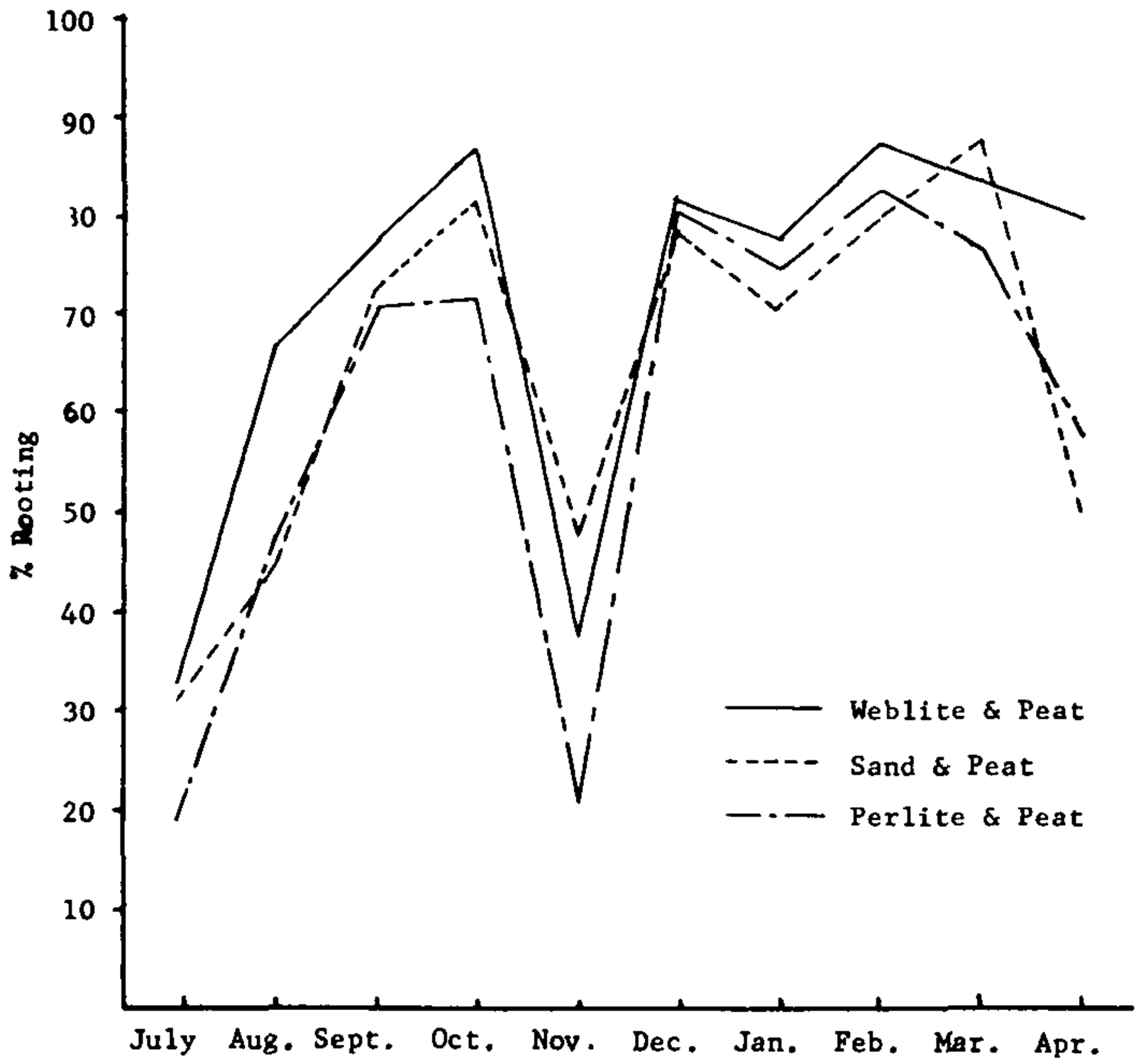


Chart 2. The effect of rooting media on rooting of stem cuttings of *Rhododendron carolinianum* taken in various months of the year. Values are expressed as percentage of cuttings rooted after twelve weeks in the propagation bench.

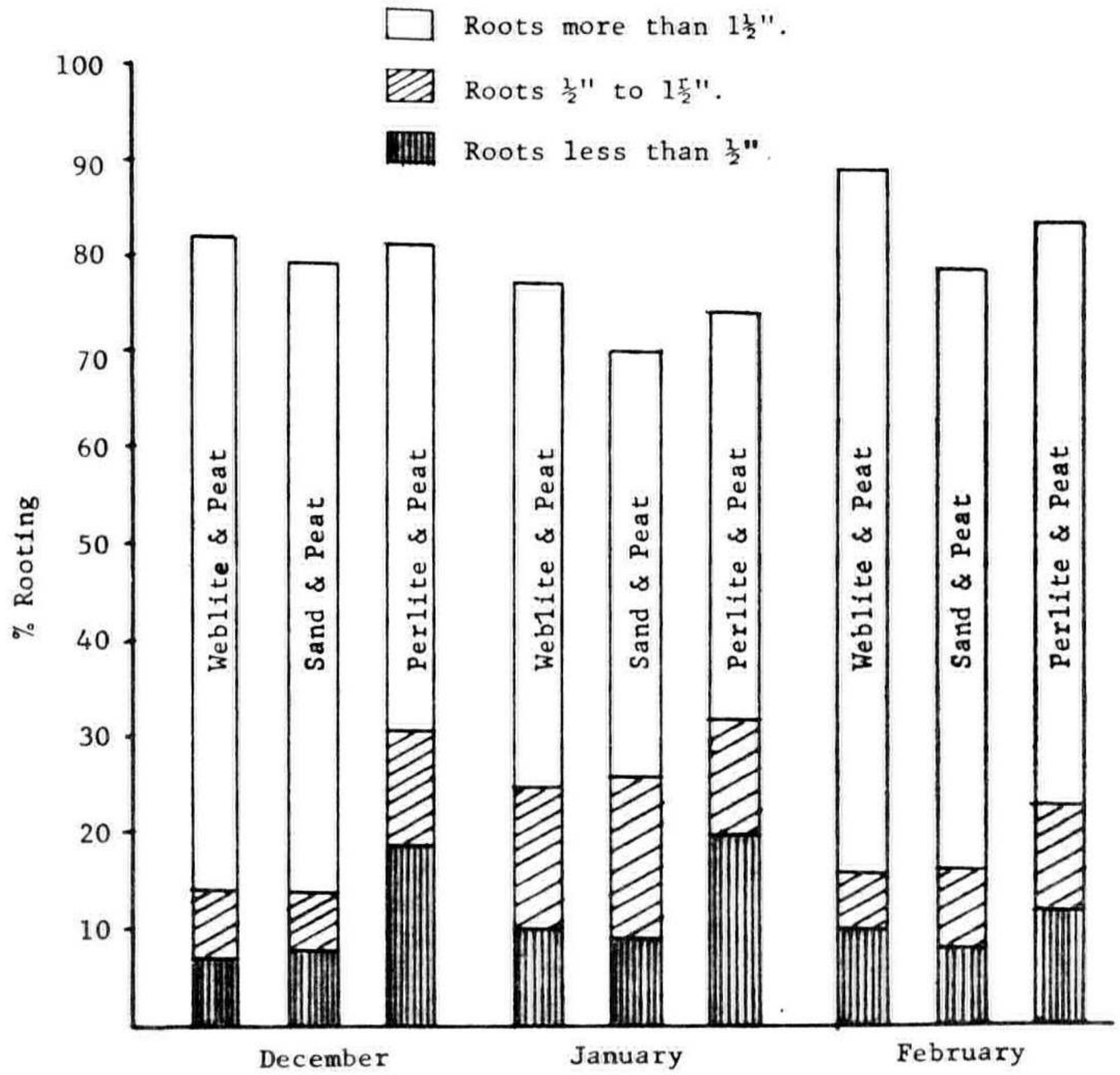


Chart 3. The effect of rooting medium on rooting and root length of stem cuttings of *Rhododendron carolinianum* in three different months. Values are expressed as percentage of cuttings rooted after twelve weeks in the propagation bench.

The propagation medium used was of less importance than timing or hormone treatment; however, the data indicated that cuttings may root faster and be transplanted earlier when the peat-weblite combination is used.

MARTIN VAN HOF: I would like to ask Dr. Cannon if those rhododendrons are all of one clone.

DR. CANNON: I cannot say that they were all of one clone; they were seedlings. All had fairly uniform flowering and growth characteristics. But they were seedlings. They were from a natural stand.

CASE HOOGENDOORN: I didn't hear you mention percentages of rooting. What were the percentages?

DR. CANNON: We had, during the winter months at least 90% rooting when we used hormone. If we did not use hormone we had generally under 50%.

JIM WELLS: Dr. Cannon, have you tried any cuttings without wounding? I harp back to a presentation at this Society, three years ago I think Dr. Chadwick said that wounding was of no value. Do you agree?

DR. CANNON: No, I do not. We have tried cuttings without wounding and they met without success. In addition to that we have found that most of the roots that arise on these cuttings

will arise from the wounded area. We have very few roots from the back side of the cuttings, for example.

DR. HESS: Tom, what is weblite and secondly what do you attribute that big drop in rooting in November to?

DR. CANNON: Weblite is a sintered clay shade. This is the description that was given me. Actually it is a clay-shade combination that has been ground and then heated. It is through the heating process that it is expanded to some extent. It provides very excellent aeration and moisture control in the medium. In other words the particles will hold a considerable amount of water but yet provide the aeration that is necessary. We feel that aeration was the cause of the difference we got between the media.

The drop in November we felt was primarily the vigor of the cuttings. These November cuttings were quite large as compared to the thin cuttings that we had taken in the other months. We think it was the vigor of the stock plants. The November cuttings were from fertilized plants in the nursery row. As it happened the man who cut the cuttings couldn't get up the mountain to get the cuttings in November so he took them from nursery rows.

HANS HESS: The next topic is a new misting nozzle with self contained, adjustable timer. Our speaker is Mr. Werner Rexer.

NEW MISTING NOZZLE WITH SELF CONTAINED ADJUSTABLE TIMER

WERNER REXER
Rexer Forest Nursery
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A few years ago, it got into my mind, that all the intermittent-misting units are operated by a solenoid and some kind of a device. The solenoid-value itself, the way it is designed, needs little power, the water supply line, thinking in the way of hydraulics, can be boosted to create power, a thousand times stronger than needed.

From the day this idea entered my mind, I had only one thought, to design and build a valve, powered by the supply of water, and operated by the evaporation of water, fully adjustable, for misting, light and heavy field irrigation. I was fully aware of the difference between theory and practice, and such a valve may have to be rebuilt a hundred times before being practical for production. I decided then, that just to prove my point that such a valve could be built, and to stay within my budget, to design a small valve for one nozzle only, with adjustable timing, all in one unit.

This type of nozzle, would be impractical for the use in large scale propagation, however, it would be handy for experimental purposes, and for isolated patches of cuttings, since each