

MODERATOR MEAHL: I think that the observation of a similarity is correct. Undoubtedly, Mr. Hancock will comment on that when he speaks to us a little bit later.

MR. EVERETT CONKLIN (Rutgers University, New Brunswick, N.J.): How much space was there between the top of the rooting medium and top of the burlap?

MODERATOR MEAHL: As given in the paper, it may be made flexible. It struck me if I used the maximum figures given here, there would be no space left. I would say in such a case it would be necessary to dig the hole deeper or use less material to fill it.

Two years ago Mr. Leslie Hancock of the Woodland Nurseries, Cooksville, Ontario described in detail his method of rooting softwood cuttings in salt and protected by moist burlap. It was an interesting and informative discussion. Today Mr. Hancock has some additional comments and ideas to express about his propagation technique.

MR. LESLIE HANCOCK: Mr. Moderator and Fellow Propagators: Before I speak about my subject, I would like to pay tribute to what we heard this morning. After hearing Dr. Skinner, I wondered why we were standing on the platform beside him. After all, creators of new plants like that make the world progress. We propagators merely multiply them. I think any of you who have ambitions to be producers of new things should take courage like I am going to, even in a small way, to do what Dr. Skinner has done. Such an example of perseverance and endurance, and under such difficult conditions, I have seldom heard of.

## THE BURLAP CLOUD METHOD OF ROOTING SOFTWOOD CUTTINGS IN SOIL

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Since the Burlap-cloud method of rooting summer softwood cuttings in ordinary soil was described here two years ago, and fully reported in the 1953 Proceedings, my remarks this evening will be very brief. Specimen blocks of rooted cuttings from this year's crop are to be seen with the exhibits.

This year we set up an electronic mist control section for comparison with our ordinary burlap covered frames. The only difference from our standard method was that the misting apparatus and full sunshine was substituted for the burlap shade. However, this was not fair to the intermittent mist method. The new bed should have been on higher, more completely drained land, and the recommended wind baffles should have been used. Next year, we will insure perfect drainage and have burlap strips attached to both sides of the frame, which can be fastened up vertically during the hot part of the day.

Our results were not as good with the mist control system as with the burlap cloud method for the reasons above stated. But we used ordinary soil as the medium for both methods and will continue to do so as I am sure you will agree, when you see the results which I will show. It is difficult to understand why more propagators will not use nursery soil as a rooting medium when it can be so thoroughly demonstrated that the results are superior.

At least, they are superior under our conditions. I am not trying to lead you up a rose path. You have to work under your own conditions. As far as we are concerned, they are superior to sand and in making special prepared beds in the orthodox manner.

I believe in the new electronic mist control system wholeheartedly for the propagation of difficult subjects. The costs are too high for easily rooted items. It appears that lilacs, potentillas, flowering almond, *Cornus florida*, azaleas, and some broad-leaved evergreens will root particularly well under mist, provided the drainage is perfect. Even for the mist system we will continue to use our standard frame, nursery soil and flooding technique before sticking, also plant from either side of the frame and raise the burlap wind walls afterwards. These wind walls can be let down at night at the same time we are throwing the burlap off the "Hancock frames," and then raised again the following morning. In this way, we will not have two competing systems but one system, part of which receives mist. The beds in both cases will be of standard width and handling throughout. The log line is at perfect elevation when laid on top of the ten inch high frames. However novel or promising the equipment experimented with, we feel that costs per 100 or 1,000 plants produced will be the final arbiter of the method used.

Before I get the questions, I would just like to break down these two bundles of rooted cuttings just to show the results we get.

(Demonstrating) —This is a sod dug out of the bed just before I came away. That is *Potentilla emesi*, one of the horticultural varieties of potentilla, and I will pass that around so you can see for yourself. It is good soil. See what you have got.

Now while you are looking at those, I would like to explain to those who weren't here two years ago what we do. We mark the whole field carefully. First, we make raised beds of sandy soil, just the same as you would if you were setting out thousands of little plants. We set the frames so that this will be the final elevation of the bed. The frames are exactly twelve feet long with a central bar which is a perfect point of balance. It is built of British Columbia red cedar. It can be carried on or off the field, or anywhere in the field. The frames are set down in long lines and the soil is sifted. Now we have a six-foot,  $\frac{3}{4}$ -inch sieve that will fit exactly on half of the frame. We start at one end of the field and dig out a half bed to a finger depth above the level you originally added and sift the soil systematically from one end. We leave the soil in two piles in these frames and only spread it as we need it, for the simple reason if we spread we may get a heavy rain.

Each frame has its burlap strip of standard 40-inch burlap attached to it. When we are ready with cuttings, we gather the cuttings in the field. We do not take any leaves off. We put them in pails during the cool part of the day we put them in, and we put just a little water—about

an inch. We gather thousands of them without taking the tips off, without taking the leaves off. We spread a pile as we require it and water it thoroughly until it becomes a soup and the water sinks away fairly quickly. As it is sinking away, we put the cuttings in as fast as we can put them in. They are left standing there and that is all the watering they get except rain. They are covered immediately with burlap. Since the frame is twelve feet long, the burlap won't cover it very conveniently, we have ordinary sections made up that we can put on temporarily as we move along.

Many people have criticized our method in that it is expensive keeping the burlap wet. As a matter of fact, two boys put the cuttings on either side of the frame. Every half or three-quarters of an hour if the burlap begins to look dry, they take a hose, which is systematically up, so they can go up two sections and the whole bed of 200,000 cuttings never takes more than 20 minutes to water. Since we usually have three or four waterings daily, (some days none at all, some days six or seven) you can see the total overhead of watering that burlap is very small. It gives the chap a change and he goes back to the sticking cuttings. We gather the cuttings all day long and bring them in at night. If we haven't stuck them, we don't allow water to stay in the pails. You just have to dump the water out and leave the cuttings in a cool place. They are as easily stuck in the morning.

After we have stuck the cuttings they are sprayed. The burlap is kept moist; if it is a cool day and high humidity you can throw the burlap off at 5:30 and leave it off until 9:00 o'clock next morning. So there is almost no overhead at all.

With the Bolivar method, you can't see how the cuttings are getting along. With our system they are uncovered daily and you can go through the frames in the morning and see if there are molds or fungi starting.

One thing I should have said, we do something to the cuttings. We do dip them with Tersane, which is a fungicide. Now I am ashamed to say we don't use hormones because we are so successful growing them this way that we haven't time. When I get to growing rhododendrons, I am going to follow Jim Wells' method to the letter. When we get plenty of stock plants we will get into that. When we get into mist control and with difficult material, I am going to use the hormones. Although you might not hear about this, I am coming right back one of these days with a lot of dope all about the hormones.

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MR. MARTIN VAN HOF (Rhode Island Nursery, Newport, R.I.): You say you screen your sand before you wash them?

MR. HANCOCK: Yes. With our soil, it is better to screen. We throw the lumps aside.

MR. VAN HOF: Do you use a shredder?

MR. HANCOCK: If you had a rather rough soil, I suppose a shredder would be good. All we do is one man throws the soil in and another rakes it in. You would have to wet the frames. You put your shredder there, and if you think that is a better thing for your operation, then it would be better than our screen. I would certainly adopt the shredder if I found it improved the technique.

MR. VAN HOF: I would also like to ask if you ever tried to flush off the top?

MR. HANCOCK: I made a frame once and I was going to have complete humidity in there. It was not a polyethylene cover but a treated cover, and I put my plants in for 24 hours. You have to have the air movement for this method. I know you are referring to Mr. Kepton's method, but he keeps a spray going all the time.

MR. HOOGENDOORN. I think there is one thing you forgot to mention. That is, that you have a hard bottom in order to hold the water.

MR. HANCOCK: I don't want to miss a single thing because it is very important. We found when we rototill the land and just leveled it and put the cuttings in, every time you felt a cutting dying you could push it two more inches down. We found out by having a uniform base so it was only finger depth of soft soil, we even tramped it, as they cleaned up the shovel they tramped on it, so when the next lot came along this sifted soil contacts the capillary moisture and the cuttings moves to the bottom.

MR. ROSCOE FILLMORE. I am inclined to disagree, Leslie. After all, we learn from experience, I suppose. I listened to Leslie two years ago and talked with him many, many times personally about this and was inclined to accept his theory entirely but this year we made several thousand cuttings of heather. They were made extremely soft and they were not more than an inch and a half long. You couldn't get them in the hard top. They rooted one hundred per cent. The same was true of Zawadsky's, which were taken in the field by shearing the soft tips, put right in the Hancock frame, and they didn't go anywhere near down to solid soil and still they rooted.

MR. HANCOCK. My good friend lives on the Atlantic, and heather cuttings probably would live there on top of the ground.

MR. JOHN VERMEULEN (John Vermeulen and Son Nursery, Neshanic Station, N.J.): Mr. Hancock, would you describe the texture of your soil?

MR. HANCOCK. It is a fine dust. It is part of the old lake bed which used to exist before Niagara went out, and has a clay base several feet down. The sand is not a true sand, it is really a granite dust. You might as well be growing plants in glass beads for all the fertility there is in it. You have to put everything in it. It is extremely fine. It is so fine we don't get sufficient aeration ordinarily. When we sift it, of course the year the cuttings are in there it is never trampled, so it doesn't get real tight and the trenches make it real light.

MR. VERMEULEN: If we tried your method in our soil I wouldn't have any cuttings. If we watered our soil like you do, we would have nothing but water standing, and it would stay there for three or four days, and we would have a solid layer of water. It should be brought out that your soil is of fine texture and it draws your water through. It can't be used everywhere else.

MR. HANCOCK: You could use a sand everywhere provided you have some sort of a water table about three feet down. I think you have to have that.

MR. VERMEULEN: When we rototill we have a solid layer of hardpan. Then we have this three inches of soil which you make into mud. The water stays three or four days.

MR. JACK SIEBENTHALER (The Siebenthaler Co., Dayton, O.): In your other presentation and also in this one I have never heard you say what you did with this particular soil after you were through using it and before you put in another crop of cuttings.

MR. HANCOCK: We just turn it back to ordinary crops. We don't fertilize the piece we are going to use the next year, but the previous year it may be heavily fertilized.

MR. SIEBENTHALER: In relation to your trial of the mist system tonight, I thought you inferred that you stuck the cuttings in the same soil but with a mist system.

MR. HANCOCK. I did use the same soil. I merely put the beds on a higher elevation.

MR. VINCENT K. BAILEY (J. V. Bailey Nursery, Co., St. Paul, Minn.) Did I understand you to say you do not remove any leaves?

MR. HANCOCK: None whatever. Furthermore, we make them in June. You can't take long shoots — that won't work. You have to make them from laterals. Just as soon as the laterals of *S. persica* or *Deutzia lemoine* are about 5 or 6 inches, we strip them off as fast as we can and push them into the slimy soil.

MR. HESS: All I want to say is that it is too bad that the nurserymen didn't take the privilege of stopping at your place. The nurserymen are lucky, because if he had in this condition on the American side, we would all be out of business.

MODERATOR MEAHL: We thank you very much, Mr. Hancock. If you have further questions to the question box. The next speaker is Thomas B. Kyle, Bohlender Nurseries, Tipp City, Ohio. Mr. Kyle will discuss grafting varieties of *Juniperus virginiana* without potting the understock.

## GRAFTING JUNIPERUS VIRGINIANA VARIETIES WITHOUT POTTING THE UNDERSTOCK.

Thomas B. Kyle  
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It is not my intent to tell you the details of how to graft junipers, but I thought that some of you, especially those who are primarily growers, might be interested in our method of grafting junipers without potting the rootstock.