

Kalmia, *Amelanchier*, *Photinia*, *Sequoia*, and *Hypericum*.

Different subjects again are microcultured by Microplant Nurseries of Gervais, Oregon; for example, *Malus* 'Royalty', *Betula* 'Dalecarlica', and 'Newport' plum. The laboratory is a sophisticated one, on the site of one of Oregon Rootstock's nurseries, and is funded by them, in partnership with McGill and Son of Fairview, Oregon, among others. Some material from Microplant is sent to McGills for growing on under glass and then in the field. McGills have found that plum plantlets grow away better after a cold period of about 3 weeks. They have tried tissue culture of Norway maple but, at the moment, have problems with rooting.

I got the impression that setting up the Microplant Laboratory has been costly, and that there was spare production capacity not being fully used. Gayle Suttle, the manager, said that they were looking hard for sales to recover funds to meeting running costs. I felt that this experience at Microplant backed up Dr. Anderson's advice to be very careful about costing a tissue culture unit before investing.

The British nursery stock trade can, therefore, learn this lesson from the American experience: Technically, tissue culture has great potential to become a major tool for our industry, but caution is needed. Before embarking on a microcultural program it must be proved to be competitive as investment of capital and time are considerable. For many plant subjects there are still problems to be overcome before they can be produced successfully in vitro, but there is a good prospect that solutions will be found, and found in the foreseeable future, say five or ten years.

SOME IMPRESSIONS OF CURRENT PROPAGATION AND PRODUCTION TECHNIQUES IN THE U.S.A.

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I hope by the time I finish I will have frightened you a little, because during my tours abroad in recent months I have become scared. I could begin with the story of a French micro-propagation concern who propagated 500,000 M27 apple rootstocks, and when they were out in the field it was realized that there had been a swapping of flasks in the laboratory and they had 500,000 MM 106!

In the U.S.A. they have reached a stage of very considerable over-production. I could tell you about the American

nursery stock industry in deep trouble, partly because of economics but partly because of over-production. In some cases the latter is due to micropropagation. An example is of ferns in 4 litre pots transported 7000 miles from Oregon to sell at 40p. There are twenty-one micropropagation units in Florida, many doing ferns.

I could tell of dumping of nursery stock. A large nursery is dumping daily. Well-trained *pyracantha* plants are being dumped to make way for younger stock, but the frames and containers are saved. I could frighten you with an account of one nursery with 1¼ million *Juniperus sabina* 'Tamariscifolia', and 1⅓ million *Picea glauca* 'Conica' 1 to 7 feet high, all on one nursery.

In Holland recently I met an American who intended to dominate the nursery stock industry. In the first 18 months he had planted 1200 acres of containers, and in the next five years aims to put in 14,000 acres.

Our natural advantage in the U.K. is proximity to our customers. I ask you to consider the story of A Y R chrysanthemums, where propagators have now moved abroad to areas of better light. I hope the same does not happen to nursery stock. One can be devil's advocate. I.P.P.S. has been a blessing to the nursery industry, but a disaster for some individuals who were specialists in propagating some difficult species. Knowledge has now been shared, so they no longer have a special advantage. The real danger on the horizon is micropropagation, so there will no longer be any difficult-to-root plants. We shall then have a system of costing our plants according to the production costs, rather than subsidizing the cheap plants by more difficult to propagate plants for which we can ask an over-economic price.

On the West coast of America I saw many micropropagation units. I saw two specialists in Washington and Oregon, and one specialist vine producer. In California I visited the Oki Nursery in Sacramento, who installed the first micropropagation unit with an initial annual output of two million plants, and it has been extended since then. I saw other more specialist units as I travelled down the U.S. West Coast. It seems many are aiming at one item; for example, Bruce Briggs with rhododendrons, and another down near Santa Barbara doing over a million staghorn ferns a year. With one exception the most successful are nurserymen, rather than people set up specially to do it. Many nurseries started in a small way. Bruce Briggs started in a kitchen and now has a commercial set up.

Micropropagation is a commercial technique and it will affect this business of ours. I checked the I.P.P.S. literature to

see what various Regions were doing with micropropagation. G.B.&I. has been lagging behind. In the Proceedings for 1978, 9 out of a total of 106 papers given in other Regional conferences were in micropropagation; for G.B.&I. the figure was nil in 15. In 1980 we had two papers on micropropagation in a total of 17; other Regions 9 out of 127. We have been falling behind and we must not.

In the July issue of the French equivalent of "The Grower", there are 16 advertisements for plants and seeds, and three are for micropropagated material. We must not be ostrich-like.

Micropropagation will save time in producing a plant. In the commercial bulking-up of rhododendrons it can save between 9 and 17 years. It means we can propagate rhododendrons like roses and roses like grass. We can now produce 200,000 rhododendrons of one cultivar to launch such a cultivar, with a potential of a million. The potential is there as it will be worthwhile promoting a cultivar and building up a marketing and selling organization.

There are a number of problems with micropropagation. I know in the Joint Consultative Organization we had considerable discussion on the possibility of genetic variation. The Americans agree that in a batch of 100,000 there may be a few dozen variable plants, but the same would happen with other methods. The methods might be slightly wrong, such as nutrition and hormones, but this would only be a small percentage. It could be a problem with timber trees, for example if a genetic defect was propagated and this did not become evident until after cutting for timber.

To quote from the 1979 edition of the I.P.P.S. Proceedings, Bruce Briggs did a lot to pioneer the technique and share his knowledge. He still does it on the cheap. I recommend reading another article in the same edition, which advises starting with simple equipment and building up. It seemed to me these were the people doing a successful job in the United States.

P. GAUT: How do you see the development in the U.K. with regard to specialist micropropagation laboratories for nurseries?

J. EDMONDS: I hope the nurserymen will do it themselves; if not the potential could come from abroad. There will be an enormous surplus in the U.S.A. and, perhaps, in France. We need to develop small units on nurseries and do it soon.

J. GAGGINI: What about the disease situation in micropropagation?

J. EDMONDS: It could be serious; there is every potential for disease, but development could overtake us. We need to get in and start now.

J. GAGGINI: A range of 20,000 kinds of plants can be grown in the U.K. and another 3 to 4000 imported. How will micropropagation units cope?

J. EDMONDS: There is a danger of over-production, as with hybrid rhododendrons in the U.S.A. We have reached this stage with common things in this country. I feel micropropagation could be used to develop new cultivars, with an opportunity to build up larger stock numbers for promotion of some lines with a guarantee of supply. It will alter the business for several plants.

J. COSTIN: Are those in the U.S.A. doing a range?

J. EDMONDS: Nurserymen are doing single lines or a small range.

P. BROOKING: Why do nurserymen do a better job than specialist propagators?

J. EDMONDS: I don't know.

R. MARTYR: Has Bruce Briggs got one blueprint formula for all cultivars of rhododendron?

J. EDMONDS: He varies the cytokinins, and has to find out the specific requirements for each cultivar. There is no rhyme or reason.

R. MARTYR: This might be difficult for small nurserymen specializing in one group but a large number of cultivars.

P. ALDERSON: There are differences in normal propagation so why the surprize.

D. GILBERT: There are tremendous facilities and resources in the U.K. and these ought to be recognized by the I.P.P.S. Long Ashton has recipes for woody ornamentals and these will be extended when the unit is moved to East Malling. There is enough scientific work going on in the U.K.

J. EDMONDS: I can't judge the scientific scene but, as a nurseryman, I know the commercial scene, and I want nurserymen to do something about it.

P. GAUT: Do American nurserymen do their own research and development?

J. EDMONDS: Bruce Briggs is an exceptional person. A number of people are spending money on graduates, who are doing work for two or three years.

C. KAYANGE: How does growth from tissue culture propagation compare to that from cuttings?

B. HUMPHREY: Rate of growth from tissue culture is faster.

P. ALDERSON: There is increased vigour in tissue cultured plants.

1982 G.B.&I. ROSE BOWL AWARD

The Rose Bowl, given to G.B.&I. in 1974 by the Eastern Region, is presented annually by the G.B.&I. President to someone who has made a special contribution to plant propagation. This year the award was made to Tom Wood, currently Secretary of the G.B.&I. Region.

Tom joined I.P.P.S. in 1974 and has always been a very active member, becoming Vice-President in 1978 and organizing an excellent conference at Bristol University. During his Presidency in 1979 the Region's varied range of activities were consolidated and our links with the International organization were further strengthened during his term as International Director in 1980-81. Tom took over the Secretariat on Bruce MacDonald's departure for Vancouver, British Columbia in 1980.

He trained at Kew Gardens and, on his return from Uganda in 1965, joined Oakover Nurseries in Kent, specializing in seedling production, a subject on which he is a recognized authority. He is a Governor of Hadlow College, which has a strong nursery stock department; he is involved in many aspects of the nursery industry and its promotion, hosting many groups of international visitors. In presenting the Rose Bowl, the President said that Tom's contribution to our knowledge of plant propagation epitomized the I.P.P.S. motto of "Seeking and Sharing", and it was a privilege to be allowed to present the Award to him this year.