tine. Sufficient plants could be propagated so that within 1 to 2 years several blocks of about 0.5 hectare could be established on growers' properties in each of the main fruit-growing regions. If these trees were inspected by MAF[1] inspectors any off-types could be marked and only true-to-type trees used for further propagation. This scheme has the advantage that blocks large enough for cultivar evaluation would be rapidly established and the suitability of the cultivar for micropropagation could be established. If the cultivar was needed for large scale planting the trial blocks could provide sufficient scionwood for propagation by either conventional means or by micropropagation. In the case of rootstocks, these trials would supply information on suitability for different regions. If the rootstock was needed in large numbers either micropropagation, stools or cuttings could be used.

REFERENCES

1 Cheng, T-Y. 1978 Clonal propagation of woody plant species through tissue culture techniques *Proc Inter Plant Prop. Soc* 28 139-155

2 McComb, J A 1978 Clonal propagation of woody plant species with special reference to apples *Proc. Inter Plant Prop Soc* 28 413-426

3 Zimmerman, M 1978 Tissue culture of fruit trees and other fruit plants *Ibid* 28· 539-545

[1] Ministry of Agriculture and Fisheries

APPLICATION OF MICROPROPAGATION METHODS FOR BLUEBERRIES AND TAMARILLOS

D. COHEN

Plant Physiology Division, D.S.I.R.
Palmerston North, New Zealand

At last year's annual meeting I presented a paper (1) outlining procedures for the micropropagation of high bush blueberries and tamarillo (tree tomato). Over the past year, we have applied these methods to a range of cultivars and several commercial laboratories are now using the methods. In this paper I wish to bring you up-to-date with our progress.

BLUEBERRIES (*Vaccinium corymbosum*)

Incubation Conditions. The standard conditions in our culture room are as follows: temperature 26 ± 1°C with lights on for 16 hr/day. Illumination is supplied by 40-watt cool-white fluorescent tubes mounted 40 cm above each shelf. Two rows of two tubes illuminate a shelf of 2,400 × 1,200 mm.

Culture Medium. We have rechecked media requirements for multiplication and have clearly demonstrated that ½ strength Murashige and Skoog (½ MS) minerals are superior to ¼ strength MS. This was particularly evident in the case of the cultivar Darrow, where with ¼ MS minerals the growth of shoots were weak, leaves were small, and stems became red. With ½ MS the leaves expanded and the colour of both leaves and stems were green. A distinct improvement in growth was found with every cultivar tested.

The requirement for auxin was also checked and cultures were found to grow better without any naphthaleneacetic acid (NAA) in the medium.

When cytokinin levels were increased from 5 mg/l iso-pentenyladenine (IPA) to 15 mg/l there was an increase in the number of shoots formed from single node sections but shoot length was decreased. In addition, adventitious buds were found to arise, not only from the swollen basal callus of the stem, but also adventitiously from the leaf in contact with the medium. In a system in which the plants produced are going to be used as mother plants for further propagation, adventitious bud formation is considered undesirable, unless the system has been thoroughly checked for genetic stability. This might take several years. Hence the more conservative proliferation system using 5 mg/l IPA, in which any adventitious shoots can be readily identified and discarded, is recommended at this stage. Neither benzyl-adenine nor kinetin (at any concentration) can substitute for IPA in this system.

Rooting. Rooting performance has been found to vary among cultivars. Atlantic, Berkeley, Stanley, Dixie, Jersey and Blueray routinely gave 90 to 95% rooting within four weeks. Some other cultivars were much more difficult to root. These include Ivan-hoe, Bluecrop and Earliblue. Not only does the first root take longer to appear, but the small cutting begins to senesce and the final rooting percentage is reduced to around 60%.

Treatment of the cutting using a quick-dip in a 400 ppm solution of IBA in 10% alcohol or an overnight soak in a 50 ppm IBA aqueous solution proved to be toxic.

Further trials are needed to improve rooting percentage in those harder-to-root cultivars.

Subsequent Growth. Rooted plantlets of all cultivars appear to grow at a very satisfactory rate and, on transfer to propagating tubes, plants with 1 to 3 shoots over 30 cm long are produced within 4-5 months of transfer from tissue culture medium.

These procedures have now been used to produce a total of more than 6,000 plants of the following blueberry cultivars: At-

lantic, Jersey, Dixie, Stanley, Burlington, Darrow, Berkeley, Ivanhoe, Blueray, Bluecrop and Earliblue.

TAMARILLO (*Cyphomandra crassifolia* (Syn.: *C. betacea*))

Cultures are incubated under the same conditions as the blueberries. There have been no modifications to the procedures outlined last year (1). Plants which came out of culture in March, 1979, were grown in a glasshouse and flowered in November, 1979, and fruit ripened in the autumn.

There is considerable interest in a new selection of a yellow tamarillo released by the Division of Horticulture and Processing, DSIR, Auckland. This cultivar has been put into culture and proliferating cultures have been distributed to several nurseries who are now in the process of multiplying this new cultivar.

LITERATURE CITED

1 Cohen, D. and D Elliott 1979 Micropropagation methods for blueberries and tamarillos *Proc Inter Plant Prop Soc* 29:177-179

THE ROLE OF THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE IN HORTICULTURAL EDUCATION AND EXAMINATION

J.O. TAYLOR

Dept. of Horticulture
Landscape & Parks, Lincoln College
Canterbury, New Zealand

Historical development. An understanding in a concise manner of the origins and purpose of the Royal New Zealand Institute of Horticulture is important in reviewing the Institute's role in horticultural education.

As early as the turn of the century the Department of Agriculture was training four young orchard instructors at the State Horticultural station, Waerenga (now Te Kauwhata). Because this station began supplying fruit trees, trees, shrubs and hedge plants to growers, the nurserymen of the time banded together to protest this movement by the State. The outcome was the formation in 1904 of the New Zealand Nurserymen's and Seedsmen's Association.

It was at the conference of the Nurserymen's Association in Wellington in 1916 that Mr. A.H. Shrubshall gave a paper on the subject of "Education in Horticulture." From this beginning the idea of horticultural training began and the need evolved for an