

EDUCATION AND TRAINING OF THE PLANT PROPAGATOR IN THE 1980's

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THE PRESENT

The plant propagator of today is not only a craftsman but also a technician. The environment in which cuttings or seeds is placed, is now equally important as the techniques used in preparing them. In the past decade, advances in technology have become as much a part of the nursery industry as any other enterprise. There is a greater understanding of HOW a plant functions, WHY it develops, and WHAT is required to make it grow. With improved growing systems and sound business management, there is now greater potential for efficient plant production than ever before.

THE NEXT DECADE

In the next decade there will be a continuing need to develop more efficient methods of production and energy conservation to offset increasing costs of production and reduced net profits. It will be increasingly important, not only to train the propagator to be proficient in skills and techniques, but also to ensure he has a thorough understanding of plant development and be able to make the most of the environmental technology he has at his disposal. The propagator will also need to be able to recognise the trends of change and to translate them into profitable applications to the nursery business.

The EDUCATIONAL area of training will become increasingly important to the propagator and to the nursery business in the future. The propagator will need to be a motivated and skilled technician with an awareness of how the plant is best propagated and raised to a saleable state at minimum cost and how that plant will suit the environment in which it is to be grown. You may well say, surely it is up to the manager to determine production and profitability. Certainly, but the propagator needs to be part of the operation and to be educated accordingly.

TRAINING REQUIREMENTS

Demand for trained people in the nursery industry will increase in the next decade and will include further development of both full-time and part-time courses which exist at the various educational institutions and colleges.

There will be an increasing demand for training and re-training of personnel working within the nursery industry, particularly in the form of short courses, seminars, workshops and specialist courses in advanced techniques. Educational institutions and colleges are now aware of the need to provide courses of training which are relevant to the needs of the horticultural industries.

TRAINING OBJECTIVES

The aim in educating and training plant propagators is to provide a sound understanding of plant growth, development and production techniques.

This can be achieved by practical skills training interlaced with a theoretical background of principles and related practices. Subjects will include plant science, plant protection, and plant nutrition. Other areas of training must include management, economics, marketing, engineering and plant identification.

In areas of practical application, it must be remembered that the student will learn best by DOING. At least 70% of the time allocated for a topic should be spent in practicing. It is not sufficient for the student to be familiar with the technique of taking stem cuttings. He must be able to select the material, treat it, place it in the right environment, pot up the cuttings, grow them on, and be aware of the many factors involved in producing a marketable product. He must be able to get a result. If he doesn't, he needs to know why.

This initial practical training is the responsibility of the educational institution. The necessary additional practical training is the responsibility of the nursery industry.

DIPLOMA COURSES AT BURNLEY HORTICULTURAL COLLEGE

After extensive consultation with the horticultural industries, Burnley Horticultural College began in 1978 a revised three-year diploma course designed to cater primarily for people desiring a career in nursery and amenity and ornamental horticulture. Specialisation was introduced, and Diplomas of Applied Science in Nursery Production and Management and Amenity Horticulture, were instigated.

An important addition to student training is the inclusion of the Industry Experience Programme of practical employment at the end of the second year of the course. This is the 'sandwich course' system which has proved successful overseas. In the final year of the Diploma course students specialise in either Nursery or Amenity Horticulture.

Stages of Nursery Training for Diplomates at Burnley.

1. Initially the student is taught to develop an understanding of nursery practices, including the phases of growth, plant identification, culture and maintenance of the major groups of nursery plants. Training is structured to cover basic principles and practical skills associated with plant propagation. Being a common first year, the student also learns the basics of plant growth and management by exposure to other subject areas.
2. In the second year the student builds on his knowledge and acquires an understanding of the scientific principles and techniques used in nursery production. For example, he learns to produce native plants using the techniques and skills attained in first year. He learns to use tissue culture techniques to produce ferns and orchid mericlones
3. After the Industry Experience programme, the student specialises in management techniques and is taught to make the decisions needed to manage a nursery business. He also learns to evaluate the effects of changes in the environment in which his business is operating and develops the skills required of a competent nursery supervisor

Methods of Training the Plant Propagator at Burnley.

A close relationship between theory and practice is an important feature of training at Burnley. Practical skills and related theory are taught according to the seasonal cycle of plant growth. For example, budding of ornamental trees takes place in late summer, half-ripe stem cuttings in autumn, and root cuttings in late winter. By exposure to good practical facilities, techniques applicable to the industry can be demonstrated and taught realistically and each student has the opportunity of achieving results from his efforts.

Nursery studies are taught in the following way:

1. *Classroom lectures* — the necessary theoretical background is taught by College staff and visiting experts from industry and horticultural research whenever possible.
2. *Practical sessions* — usually of half day duration with students in small groups. Apart from skills and technique training, maintenance of the teaching complex, demonstrations and record keeping takes place.
3. *Day visits to nurseries* — to illustrate commercial production of plants and flowers. These are timetabled on a regular basis and are an important application to training at the College.
4. *Tours* — usually of one week's duration, at least four are conducted during the three years of training. These tours enable the students to move further afield and see nurseries and areas of horticultural interest outside the limits of day trips.

5. *Plot work* — at the commencement of training each student is allocated an area of open ground (approximately 39 sq m), on which he must grow a range of plants. In the first half year vegetable crops are grown. The area is then planted with rootstock and scion cultivars which he propagates and raises to maturity. The student is responsible for the propagation and management of his plot area including pest, disease, weed control, and nutrition. This is a satisfying experience to the student and an excellent training method. Future additions will include the erection of polythene tunnels over the plot areas for cut flower growing.

Certificate of Horticultural Studies. Part-time courses being offered at Burnley include the Certificate of Horticultural Studies, which has been developed as an evening course for students engaged in working in some branch of the horticultural industry.

This involves units of the following subjects: Plant Propagation, Soil Studies, Plant Studies, Plant Function, Plant Pathology, Entomology, and Ornamental Plants. Each unit consists of 30 hours involving fifteen evenings, each of two hours extending over one semester.

Propagation for Nurserymen. An additional unit of part-time study, Propagation for Nurserymen, is available for those working in the nursery industry. This is a refresher course which concentrates on more advanced techniques applicable to nursery production and management.

Conducted over a duration of 30 hours, it can be slotted in as part of the Certificate of Horticultural Studies. Lectures used for this course include practising experts from the nursery industry and horticultural research.

Nursery Trends and Developments. Beginning in 1978, a two-day short course for people working in, or associated with the nursery industry, is now an established part of the College year. This course makes available information from horticultural research and current developments of importance within the industry. Response to this type of course has been overwhelming, and only 200 can be accepted because of Burnley's limited resources. Participants attend from throughout Australia. An important feature of this course is the availability of printed notes, which are also available as a reference for those not attending the course. Short courses, seminars and workshops are an important avenue for dissemination of knowledge and will develop further in the next decade. They are also a means of getting people together on common ground to discuss their ventures and problems.

Industry Involvement. For the educational and training processes of nursery personnel to be successful, industry must be

involved, not only in planning and assisting with practical training, but through membership of Advisory Committees, and by maintaining a close and meaningful link with the teaching institution and the staff involved in teaching. Unfortunately, trained and skilled teaching staff are scarce in Australia. Staff need training too, and they will become more efficient teachers by industry contact and observation, than they can from theoretical knowledge and limited college training.

Burnley Horticultural College and the Apprenticeship training schemes at Oakleigh and Collingwood are indeed fortunate to have the enthusiastic support of the Nurseryman's and Seedsmen Association, members of the International Plant Propagators' Society, and the many nursery enterprises within easy reach of the training centres.

In the next decade it will become increasingly important for the plant propagator not only to be a skilled technician, but to have effective knowledge of plant growth and development. He will also need to be aware of what is going on around him and have the ability to "trouble-shoot" when the occasion arises.

VIRUS-INDUCED DWARFING OF CITRUS

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A major change in attitude towards management of citrus orchards is the interest in smaller, densely planted trees which yield well and can be easily sprayed and harvested.

There are various methods currently being investigated to control tree size in citrus. A simple method is the use of a bud transmissible factor which can produce dwarf trees on certain rootstocks. This follows from work done in New South Wales which showed that citrus on *Poncirus trifoliata* rootstock inoculated with exocortis or scaly butt virus produced pronounced dwarfing, while trees on Troyer and Carrizo citrange and Rangpur rootstocks were less dwarfed. Most other citrus rootstocks did not respond.

Different inoculants produced varying levels of dwarfing on *P. trifoliata*. From these, two dwarfing budlines have been selected as future sources for inoculations. They are classed "mild" dwarfing budlines and produce moderately dwarf trees with no symptoms of scaly butt, periodic leaf drop or unthriftiness which can be associated with exocortis.