

only. With these larger pieces there are no fatalities and indeed some sections develop two bulbils on them.

In both the above methods knives are disinfected after cutting each bulb and the chips are given a "bath" of a fungicide solution for 30 minutes. They are then drained and stored in damp vermiculite for 90 days at 20 to 21°C. Then they are planted in a sheltered site near the nursery and left down for two years. The crop is dug when the bulbils are large enough and they are then field-planted.

If further bulking up is desired then the larger of the bulbs can be cut again. The smaller bulbs will wait until they are lifted the next year; 6½ times the weight of the mother bulbs has been achieved in two years. Over 17 bulbs to one parent can be produced.

(c) *Tissue culture*. Small portions of the bulb are placed in flasks onto a nutrient agar solution and small bulbils are rapidly produced. At present, however, it is costly and not a reliable method.

Great difficulty has been experienced in weaning the propagules into soil or compost. However, given time this method could become the best of the three.

Most cultivars of commercial daffodils have some virus in them. Some show virus symptoms more than others. G.C.R.I. has been busy during the last few years virus indexing daffodils. This should lead to better cultivars in terms of texture, colour, and size in the future.

EDUCATION AND TRAINING FOR THE NURSERY INDUSTRY

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Introduction — Education and Training. Over recent years technological advances in the production and marketing of hardy nursery stock have emphasised the need for high standards of education and training for the industry. With a greatly reduced labour force and an increased reliance on mechanical and scientific aids, staff must be highly skilled as craftsmen, technicians, supervisors, technologists, managers, and scientists. The training and education services have met this challenge. The Agricultural Training Board (ATB) through its advi-

¹ Principal

sory field staff, identify where and what training is needed and see that it is provided. Local Education Authorities (LEA), through their colleges, or the universities, offer comprehensive technical horticultural courses.

Training Groups. The nursery sector is well served by colleges, while the Board has encouraged the formation of Training Groups in major areas of production. Examples of such groups are the Hampshire Nursery Training Group, the East Anglian Training Group, and the Mercia Training Group. In each case an employed officer undertakes training needs assessments for members, organises courses, liaises with the Board and the colleges. Thus, small businesses are able to enjoy a service comparable with that offered by the Training Department of a large firm.

Youth Training Schemes. New workers in any industry, need organized training if they are to reach the standards of skill and proficiency which will be expected of them. The Youth Training Scheme (YTS) is designed to provide young school leavers with a structured programme of training and education together with planned on-job experience and supervised practice. The Programme based on published guidelines must include 13 weeks of off-job training and education consisting of an induction period, occupationally based training preferably leading to certification — Phase I qualification; transferable and enterprise skills; personal development skills taught in an integrated manner together with counselling, assessing and advising. For the remainder of the year, approximately 34 weeks, the trainees are engaged in occupationally based work experience, supervised practice and training on the holdings.

The Craftsman. Formal craft education and training for a three-year period comprises attendance, part-time, on day-release or block-release courses, plus acquisition of craft skills. This is certificated by taking nationally recognized, practical proficiency tests developed by the National Proficiency Tests Council (NPTC). Analysis of employment categories by specialist panels has resulted in the design of test activities to assess a skilled craftsman. The detailed notes and schedules ensure that uniform standards are applied by the examiners — selected from the nursery industry, who are trained in the principles of assessment using objective methods.

Craftsmen receive a 15% wage premium under the Agricultural Wages Board (AWB) regulations. Day or block release educational provision prepares candidates for Phases I and II qualifications of City & Guilds of London Institute (CGLI) or the equivalent regional examining body.

The National Farmers' Union/Horticultural Trades Association Nurserymen's Committee was instrumental in seeking specialist educational courses — part-time over two years (2 × 180 hrs) for Phase II Hardy Nursery Stock Production. Additionally, they approved educational centres with appropriate facilities and resources as follows:

Askham Bryan College of Agriculture and Horticulture
Brooksby College of Agriculture and Horticulture
Hadlow College of Agriculture and Horticulture
Merrist Wood Agricultural College
Persnore College of Horticulture.

Hadlow and Persnore Colleges have block release courses in Garden Centre Practices while other educational establishments offer Phase II courses to meet local needs.

Fourteen colleges in the U.K. provide a one-year full-time course for those aiming to work in practical horticulture, which leads to the National Certificate in Horticulture (NCH). Students must have completed at least twelve months pre-college horticultural work experience. Horticultural principles and practices, mechanisation, and supervisory management are covered, but considerable emphasis is placed on practical craft skills. Nursery practices are included in all courses, though Merrist Wood and Persnore Colleges have developed this specialism to a greater extent. Other specialist provisions at an advanced level includes a supplementary one-year, full-time course in Garden Centre Management leading to the Advanced National Certificate in Horticulture (ANCH) offered at Persnore College. The course also prepares students for a National Examination Board in Supervisory Studies (NEBSS) qualification in Supervisory Management. This is a bridge between craft and technician levels of education designed for the potential supervisor/enterprise manager.

Technicians. At middle management, the nursery sector seeks technicians having practical knowledge and ability combined with the qualities of a supervisor. The three-year sandwich course prepares personnel for technician posts. Introduced in 1969, the National Diploma (formerly OND) is now an established, recognized qualification for those responsible for the day to day running of a small business or the supervision of other workers. Applicants must have completed one year of practical work experience before entering college and have passed at least four subjects at GCE 'O' level (grades A, B or C) or equivalent. The subjects must include two sciences (or mathematics and a science), together with a subject testing the command of English.

The structure of the National Diploma (ND) course is two years of full-time education at a college, integrated with one year of supervised, practical training. In most cases, the first college year is of a general nature designed to develop an understanding of the principles and practices of horticulture and includes a substantial science component. During the industrial placement "sandwich" year, students develop practical skills on a nursery approved by the College. Reports and projects are compiled based on employment which form a significant element of the final award. Five colleges in England currently offer such courses in commercial horticulture, some of which are of a general nature, while others enable a student to study a specialist branch of horticulture in the final year. In the latter category, Hadlow College has a well developed nursery option. Two centres offer highly specialised Diploma course — Merrist Wood Agricultural College, with a National Diploma in Nursery Practices, and Pershore College of Horticulture, with a National Diploma in Horticulture (Hardy Nursery Stock Production). Pershore also has a Garden Centre Management option within its Diploma course, i.e., National Diploma in Horticulture (Garden Centre Sales & Organisation).

The West of Scotland Agricultural College at Auchincruive has a good reputation for nursery work and has just introduced the "sandwich" Diploma, validated by the Scottish Technical Education Council (SCOTEC). Curriculum planning is at an advanced stage to launch a new eleven-month Higher Diploma Course at Auchincruive for those who have the ability and wish to progress and gain a technologist qualification.

Technologists. In England, the *ab initio* Higher National Diploma in Commercial Horticulture equips students for managerial posts. A technologist is responsible for planning, developing and organising production and marketing on a nursery. The structure of the course is similar to ND but there is a greater emphasis on science and management. Academic entry requirements are the same as for National Diploma though GCE 'O' level mathematics is compulsory and, additionally, applicants must have passed one science GCE 'A' level and studied a second to advanced standard. Specialist aspects of the nursery industry are developed in the latter stages of the Writtle Agricultural College Higher National Diploma in commercial horticulture course.

Award Making Organisations. All Diplomas in England and Wales are now validated by the Business and Technician Education Council (B/TEC), as from October, 1983. The equivalent body in Scotland is SCOTEC, soon to be renamed the Scottish Vocational Education Council, (SOVEC).

Managers and Scientists. Graduates with appropriate experience are qualified for managerial positions, technical and scientific posts in the nursery industry. To meet university entry requirements, applicants must have passed at least five subjects at GCE 'O' level together with two at 'A' level, preferably biology and chemistry. Horticultural degrees are conferred at the following universities — Bath, London (Wye College) Nottingham, Reading, and Strathclyde. Each course is distinct, but due emphasis is placed on basic sciences and their application to horticulture. The economic significance of horticulture and management aspects are also studied. Specialisms such as nursery stock production can be developed through project work or individual investigations.

Finally, a formal professional qualification held in very high esteem is the Master of Horticulture Award of the Royal Horticultural Society (MHort (RHS)). No specific courses cover the entire syllabus but Pershore and Writtle Colleges have one-year programmes of study which prepare candidates for the appropriate examinations. Besides possessing five specified GCE 'O' level passes or equivalent, all candidates must have been employed full-time in horticulture for six years. Of this period, at least three years must have been spent in bona-fide practical work, other than as a student in training. Graduates seek employment as Advisory Officers, Lecturers, Research Assistants, Scientific Officers, Consultants, and in nursery businesses in senior management posts.

Career Development. The needs for mid-career training in the nursery sector are met by the range of ATB short courses on new techniques, such as propagation methods, grading, containerising nursery stock, supervisory management, etc. The Professional, Industrial and Commercial Updating (PICKUP) courses are also available through colleges and other agencies on technical developments, e.g. micropropagation; computers for stock control and labelling, etc. The HTA regularly holds training seminars while three colleges, Hadlow, Merrist Wood, and Pershore have annual conferences to deal with the latest research and commercial nursery practices.

Summary. Thus, the Board and its training groups, colleges, universities, and the research establishments all ensure that there is an adequate supply of well educated and trained personnel at craft, technician, and technologist level for nurseries and garden centres.