

areas at Rosewarne devoted to seeds and tubers have been reduced to those necessary for the provision of basic material and reserves in case of emergency. The whole of the work of maintaining the basic groups, and the breeding of replacements have now been taken over by the Somerset producers. Plant health, hardiness, flower yield and quality are still to receive the highest priority.

Development of the Saint Piran strain has improved the prospects of anemone flower production and provided opportunities to develop home and export markets for tubers. The success of this venture has combined the best elements of ADAS and specialist resources with grower co-operation.

*Question to Mrs. Gill:* Are anemones being grown in gardens apart from the southwest of England?

*Mrs. Gill.* Yes, they are grown in areas as far north as Perth in Scotland with protection, such as in cold greenhouses.

## **NEW NARCISSUS AND THEIR PROPAGATION**

W. JAMES HOUGHTON

*Tomlin Brothers Ltd.*

*Polgoon, Penzance, Cornwall*

We owe the beauty of new cultivars of daffodils to the dedication of past and present hybridizers and daffodil lovers. During the last 100 years daffodils have been collected from the wild and crossbred, with the selections becoming better and more colourful with each generation.

In this world of daffodils the names of breeders that have given us the beauties that we enjoy today, to mention a few, are Reverend William Herbert, Edward Leeds, Peter Barr, Reverend George Engleneart, William Backhouse, The Brodie of Brodie, Guy Wilson, Lionel Richardson, P.D. Williams, and so many more very dedicated folk, including those hybridising today. At daffodil shows the results of their work can be seen in all its splendour. There are eleven distinct divisions of narcissi. Each year at shows a new cultivar more elegant than its predecessors will surprisingly come to light. It may be one of the large trumpets, a double, a small cup, tazetta, or a cheeky little rock daffodil.

Most of the new cultivars have been bred specifically for the show bench. Rosewarne Experimental Station, however, at

the request of Southwest growers, started a breeding programme in 1963 to create a group of daffodils suitable for the cut flower and bulb trade. The requirements were for hardier, taller, prolific, earlier and disease resistant cultivars with customer appeal. This is some task! The task was given to Miss Barbara Fry whose achievements and dedication in the work are quite remarkable. Her resultant cultivars, produced with the help of the Rosewarne staff, are also remarkable.

The first two of these were released and sold in 1981, named 'Tamara' and 'Tamsin.' Both are yellow; 'Tamara' is a 2YY and 'Tamsin' a 1YY. Two tazettas were also sold and bought by the Isles of Scilly growers. Tazettas grow very well on the Scillies. 'Tamara' was bought by the Cornwall Area Bulb Growers Association, and 'Tamsin' by a company in Lincolnshire. Since C.A.B.G.A. bought 'Tamara' it has been propagated and is now divided between the growers who shared the cost of the stocks and propagation. More cultivars will shortly be released from Rosewarne after rigorous testing and then sold by N.S.D.O.

Commercial daffodil production in our country is very important as more are grown here than anywhere else in the world. Exports of both flowers and bulbs are increasing. Bulbs and flowers are exported to the U.S.A., Canada and to the countries of the European Economic Community, (E.E.C.) chiefly to Holland and Scandinavia. Daffodil flowers and bulbs are produced anywhere from Cornwall to Scotland but Lincolnshire is the largest producer.

When a new cultivar has been tested and is becoming known, then it is bulked up until it becomes commercially viable.

**Propagation.** When an outstanding new cultivar is introduced it is, of course, in great demand and bulbs are eagerly bought by amateurs, commercial growers, and hybridizers.

The natural increase of daffodil bulbs is painfully slow and new techniques have been recently introduced. These are (a) twin scaling, (b) chipping, and (c) tissue culture.

(a) *Twin scaling.* This method entails the cutting of the bulb in a special way. It is cut through the root plate into eight or more pieces, each piece retaining a portion of the plate. These portions are then cut with two scales on each piece, hence the term twin-scaling, giving 32 to 40 or more twin scales from each parent bulb. A bulbil should develop on each section. The smaller the pieces the smaller the bulbil and some do not emerge the first year. Quite a few fail completely.

(b) *Chipping.* This is almost the same method as twin scaling. The bulb is cut across the root plate into 16 pieces



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

BILL SIMPSON<sup>1</sup>

*Pershore College of Horticulture  
Pershore*

**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-

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<sup>1</sup> Principal