3) *Control of vigour*, e.g. the clonal fruit tree rootstocks: the E.M. and M.M. series, the various quince rootstocks, and 'Colt', 'Pixie', etc.

c) *Changing the cultivar of established plants*, e.g. family trees, pollinating branches, stem building, framework grafting, etc.

d) *Hastening the development of seedling selections*; this technique appears to overcome juvenility and induce earlier flowering, thus accelerating breeding programmes for plants with long periods of juvenility.

e) *Repair of ornamental/amenity subjects*, e.g. bridge grafts to repair bark ringing; crotch strengthening, etc.

f) *As a tool in plant study and especially as a technique in virus indexing.*

All these reasons for grafting may decline in importance with time as plant breeders screen plants for other than purely ornamental characters, but that day is still in the future. However, one day all bush roses will be grown on their own roots, and clonal tree selections will be selected for their rootability and life may be easier!

In conclusion, there is one certainty when grafting plants — that the resultant crop must warrant the expense and that this is recouped in its selling price.

IDEAS FROM THE NURSERY PRACTICE FIELD PRODUCTION UNIT

DAVID A. HUSBAND

Somerset College of Agriculture and Horticulture
Somerset, Cannington, Bridgwater

INTRODUCTION

The aim of the unit is to be basically self-perpetuating, enabling students to gain an insight to field production of fruit and ornamental subjects. We have no glasshouse on site. It is an *old* site, with many years of horticultural use behind it comprising 0.557 ha, or so, total land, with approximately 60m² of seed beds, and 800m² of layer beds, and seven cropping plots averaging 440m² each.

Where possible, the propagating material — (i.e. cuttings, bud sticks, or grafting scions) comes from stockplants lined out as "hedges" in between plots.

PRODUCTION FIGURES

The figures we give are what we aim for. These are arrived at by multiplying the number of students requiring tuition by the number of plants each student will require to reach an acceptable standard during the teaching time; e.g., 20 students requiring 30 stocks to bud/graft will require 600 stocks — all of which must be of a suitable subject for the type of graft proposed (e.g. chip-bud, whip and tongue graft).

Our 1976/7 statistics were:

1. Worked trees: 1500 stocks in all; approximately 800 apples, 300 prunes, 100 pears, 300 ornamentals.

APPLES: 600 domestic fruit cvs., 200 ornamental crab apples

PRUNUS: 60 domestic plums, 100 ornamental prunus, 140 ornamental cherries

PEARS: 20 ornamental pears, 80 domestic pears (40 to show double working)

ORNAMENTALS: 20 ash - weeping, cut leaved, 50 *Acer platanoides* 'Crimson King', *A. pseudoplatanus* 'Brilliantissimum,' 50 *Aesculus* × *carnea* 'Briotii,' 50 *Sorbus* - Joseph Rock, matsumurana, poterifolia, 50 *Betula* b. *papyrifera*, *B. pendula* 'Youngii,' *B. utilis*, 80 *Crataegus* - double red, Glastonbury thorn

2. Roses: 1000 to 1200 stocks are planted; worked as bush roses to floribunda and tea roses.

3. Soft Fruits: Bushes, approximately 1000, comprising 500 blackcurrants, 20 redcurrants, 300 gooseberries.

4. Slow-Growing: shrubs, conifers. Approximately 500.

5. Quick-Growing Trees: *Salix* from H/W cuttings, a) Made and lined out November, b) Made and lined out through black polythene, c) Made November. Cold stored, and planted out in April/May. Approximately 100.

6. Herbaceous Plants: Approximately 1500 - Various spp and cvs.

7. Shrubs From Hardwood Cuttings: Approximately 1500 - Various spp and cvs.

8. Strawberry Runners: Approximately 1000; 3 or 4 cvs, bought in as 'A' Certificate Stock each year.

Plans of the area show the way in which these crops rotate, with a grass ley following the worked trees, and the 1 year crop following the roses, before the worked trees.

The worked trees are grown in 1 plot for 3 years.
Year 1. Plant rootstock in November; bud in July
Year 2. Graft in April; cut hard back in November
Year 3. Train/feather; lift in November

These worked trees are either (a) disposed of at this stage - (fruit trees mainly), or (b) lined out in plot J for a growing-on period of 2 or more years, or (c) used for teaching and assessment purposes.

An important feature of the Unit is the area allocated to layers. The keynote of this area is the production of usable stocks and ornamental trees and shrubs, without the use of heated or other glass structures, without recourse to expensive equipment of any source.

Layering is in two main parts.

1. Raising of fruit tree rootstock, and ornamental rootstocks.
   A. Mound layers - Apples: M.9, M.26, M.7, MM.106, MM.111, M.16, and M.25.. Pears: Quince A. Syringa: *Syringa tomentella*, S. *vulgaris*.
   B. Trench layering - Cherry: 'F/12/1. Plum: 'Myrobalan B,' 'Brompton,' 'St. Julien A.'
2. Raising of ornamental trees and shrubs.
   C. French layering -
   Cornus alba 'Sibirica', and similar cvs.
   C. stolonifera
   Viburnum tomentosum and similar spp.
   V. × bodnantense
   Liquidambar (Enabling named coloured forms to be handled)
   Cotinus coggygria 'Royal Purple'
   Weigela florida 'Foliis purpureis'
   Corylus contorta
   D. Simple layering - A selection of the stool plants of *Liquidambar*, *Tilia*, *Syringa* and cultivars are simple layered to produce a larger plant in the first year.
3. Field Working. The establishment of trees from field lined stock is economic, and needs no capital apart from the stock itself. Again, no capital outlay on expensive equipment is required. Rather "less than easy" lines are looked at. Success to some limited degree has been achieved in the case of seedless chestnut - *Aesculus × carnea* 'Briotii,' on to 1-year seedlings of *Aesculus hippocastanum*.

Birch — *Betula papyrifera*, *B. pendula* 'Youngii', *B. utilis*. All these from *buds* - (chip - budding). With *Betula*, it is important to line out *small* stocks, and to bud them in late July or so. Grafting on these has not proved very successful.

Walnuts — Fruiting cultivars of walnuts have been worked in the traditional manner (grafted in early spring on to seedlings, in a closed area, using both heat and containing the plants afterwards).

Beech — Purple beech worked in the field on seedlings has proved successful.

CONCLUSION

In all, we feel that the nursery field unit at Cannington produces:

1) A lot of interest in the economic production of hardy plants.

2) A fair measure of skill in the keen student.

3) A good basic understanding of propagation by seed, layers, cuttings and grafting.

PROPAGATION OF CAULIFLOWER FROM CUTTINGS

MICHAEL FARMER

Rosewarne Experimental Horticulture Station
Cornwall

It is very difficult to grow seed from Cornish winter cauliflower (broccoli). They mature in the middle of winter, and so cannot be left to seed in the field. Transplanting to a glasshouse is rarely successful owing to their susceptibility to bacterial rots developing both in the pith of the stem and also in the middle of the curd.

To overcome this problem, various methods have been tried to propagate vegetative shoots. These vegetative shoots can be grown under glass to produce plants with relatively thin stems and small heads which are not susceptible to bacterial rots and which can produce high yields of seed.

Some research work in Edinburgh about fifty years ago demonstrated that pieces of cauliflower curd could be propagated successfully. Following this, at Seale Hayne College it was found that when rooted pieces of curd were grown on in a warm glasshouse, the flower buds aborted and vegetative shoots developed on the inflorescence.

This technique has given quite useful results but it needs very strict attention to hygiene at all stages. Also it has the disadvantage of a long delay in development of shoots and the late cultivars may fail to seed in the following year if there is a delay in planting.

In the course of this propagation work it was noticed that some plants formed adventitious shoots at the base of the stem. Such shoots were much more suitable, but not all plants produced them. Some French visitors to Rosewarne E.H.S. noted these basal shoots and made further experiments which have