

high they should be staked with 18 in. splits. Six weeks later they will be ready for potting on into larger pots and growing on for sale the same year.

Cuttings. Stock plants should be prepared as for grafting, but they should be kept frost free during the winter. In the spring they will grow away very strongly and by late April or early May the wood should be ready for making the internodal cuttings. Cuttings 2 inches in length are ideal. Most of the wood can be used, discarding only the soft tips.

Cuttings are then dipped in Seradix No. 1 powder and inserted eight into a 3 in pot, in a compost of two parts sand, one part peat. The cuttings are arranged around the edge of the pot and dibbed as deeply as possible; by this method the buds are kept soft and moist.

The pots of cuttings are then placed into a closed case with a bottom heat of 70-80° F. Great care has to be taken at this stage because the spring sun can be very strong and shading will have to be used. The cuttings will be rooted in three or four weeks and ventilation can then gradually be given. When fully aired the cuttings should be potted on. We use John Innes seed compost and 2½ in. pots; the plants can be summered in a cold house or cold frame.

The buds having been kept soft and moist will now break and grow away quickly. The plants must be kept frost free in the early part of the winter and then potted before Christmas into 4½ in. 'Long Toms' using John Innes 3 mixture, and then kept frost free for the rest of the winter. The plants will then grow on early in the spring. By letting them grow this way one can do away with stock plants and use the young plants for propagation. They will still make strong plants for sale by late summer.

BERRIED FRUIT PROPAGATION

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The main reason for choosing our particular site in the Midlands for growing soft and berried fruits was the soil. It is ideal, in our opinion, for producing a strong fibrous root system which, though important to all plants, is especially so with berried fruits. In texture it is a sandy loam overlying water-bearing gravel and is, therefore, well drained and low in mineral nutrients. Regular fertilizer applications and FYM, when available, ensure that the plants remain healthy; a heavy rainstorm can wash a fertilizer application straight through but, on the other hand, during a dry period we find our irrigation system invaluable. The spring of each year seems to bring a regular

dry period which can hinder the establishment and growth of plants considerably. Whereas a large number of various kinds of shrubs can be planted fairly late in the year and suffer no ill effects at all, berried fruits need to be planted early to get good growth.

Stock Plants. Stock plants from which to propagate the various fruit bushes are maintained on the nursery. There is no need to go into the do's and don'ts of stock plant maintenance at this time to members of this Society. Suffice to say that they are kept weed free by using Simazine at 1 lb. (a.i.) / acre. Blackcurrants are sprayed with Metasystox from mid-May for the control of aphid, capsid and blackcurrant leaf midge. This is applied at 12 fl. oz per acre in 60 gallons of water, which gives a good control. Mildew is controlled with benomyl at 1 lb. per acre in 100 gallons water. Several applications are given from mid-May. Gooseberries and redcurrants also receive benomyl sprays against mildew, and the gooseberry sawfly is sprayed with Gusathion.

Hardwood Cuttings. Having established a healthy source of plant material, *Ribes nigrum* (blackcurrants), *R. rubrum* (redcurrant), *R. rubrum* 'Album' (whitecurrant) and *R. grossularia* (gooseberry) are all propagated from hardwood winter cuttings. This is usually kept as a bad-weather job which can be done when there is little else to do. Blackcurrant cuttings are made in bunches with little ceremony. The cuttings are made approximately 8 in. long and, if the weather is unsuitable for inserting, the cuttings are heeled-in to await more favourable conditions.

Redcurrant and gooseberry cuttings are made about 12 in. long and are prepared with more care. The buds of both of these, and the thorns of the gooseberry, are removed on the lower 8 in. of the cutting to make a "leg" for the plant. Care must be taken not to select the soft, unripened, wood of the gooseberry tips as this will rot. Although any time during the dormant period will do, we have found October to be the best month for making gooseberry cuttings. They are then heeled in until February, when they are lined out in the field. If the cuttings are inserted before February there is a danger that the cuttings will be lifted by the frost, and then later left with the base of the cutting in an air pocket $\frac{1}{4}$ in. or so above its original position. There is then very little chance of this cutting growing due to its having dried out. Before inserting the cuttings the ground is prepared with an application of fertilizer. The cuttings are inserted in rows 3 feet apart. These rows are made by single cultivator tines drawn through the ground at a depth of 5 to 6 inches; the cuttings are then pushed into the very soft ground to this depth and firmed thoroughly. After a light cultivation between the rows the ground is sprayed with Simazine, which keeps it clean throughout the summer. The plants are irrigated as required, particularly in any dry period in the spring and, in the autumn, the rooted cuttings are lifted, cut back and planted onto nursery rows.

Tip Layering. *Rubus x loganobaccus* (loganberry), *R. fruticosus* (blackberry), *R. phoenicolasius* (Japanese wineberry), and other hybrid berries, are propagated by tip layering of the shoots. They can be propagated successfully from summer "hammer cuttings" but, at present, we find that we get a stronger plant for lining out the following year by using the tipping method. This is done using established stool plants from which the shoots have been stopped twice to provide as much tipping material as possible. Tipping is usually done in August by making a sharp angled hole about 4 to 6 inches deep into which the tip of the shoot is placed. The soil is replaced and firmed. The tip roots in about three weeks and the shoot turns back up towards the surface. The following spring the old shoot is removed completely from the stool plant and cut off a few inches above soil level at the tip. The tips are lifted and lined out in the nursery 1 ft. apart in 3 ft. rows. There is a tendency for these plants to produce only one shoot, which is not sufficient, therefore they are usually cut back to encourage branching. The ground is sprayed with Simazine after planting.

Spawn Beds. *Rubus idaeus* (raspberries) are the only plants that we produce on spawn beds. The beds are planted up with small canes, which have been cut down to 4 in. above the root, at 4 in. by 3 ft. This is done in the spring. By November of the same year the saleable canes can be dug up. Any small canes remaining are cut down and, in January, the bed is sprayed with Paraquat. The second year's canes produce a solid bed and no rows can be seen. At the end of the second year's growth the whole bed is dug up, the large canes sold and the remainder planted once more. We find that we cannot leave the canes to spawn more often than this due to weed problems. In our sandy soil couch grass grows luxuriantly, appearing from nowhere, and covering a tremendous area in a season. Cultivations are not possible as there are no rows and, so far, we have not found chemical controls good or cheap enough.

ROOTING CUTTINGS UNDER POLYTHENE TUNNELS

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In this short review of the use of low polythene tunnels for rooting cuttings it will not be possible to consider all aspects of the technique. The system used at G.C.R.I. will be described and some observations will be made on its use.

The important advantages of low capital cost and labour saving come from the simplicity of the technique and I have tried, therefore, to maintain this simplicity wherever possible.