

nurseries, which not only propagate, but also sell both wholesale and retail are doing quite well.

A few of the larger nurseries have their own export businesses. We have also an organization called "Danplanex" which consists of a group of growers sharing common sales management and a common sales office. To some degree, therefore, the growers in this organization will be told what to grow as the salesman will know best what their customers in the various countries want. The export trade has been helped considerably by the extensive use of cold storage which has lengthened the season and evened out labor peaks.

CLEMATIS ARMANDII GRAFTING

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We find that the most economical way of propagating this plant is by grafting.

Preparing scion material. We first planted a stock plant on an east wall, with some protection from the north side. When this plant had established itself after the first year, we waited for young growth to commence, which normally is about late April or the beginning of May; when growth has reached about 18 — 30 inches (45 — 80 cm) and just before the main terminal bud ceases to grow, we cut back to about half its length. If this is not done, it will go on to produce excellent flowering wood for the next season; by cutting back we encourage more young growth to come from the remainder of the stem which will produce the right size and type of material for which we are looking, i.e. about 5 — 8 mm in thickness and with no "flowering wood" which normally will not produce a plant after grafting.

Stocks. Stock required for clematis grafting is *Clematis vitalba* — commonly known as old man's beard or travellers' joy which is raised from seed, sown in February to March in a light sandy loam, and lifted in December. We, however, buy our stocks from a nursery which specializes in growing stocks for the trade. The best size for grafting *C. armandii* is 5 — 8 mm; the smaller sized stocks (3 — 4 mm) are normally used for grafting clematis hybrids.

Propagation pit space. Any propagating pit in which one can obtain a temperature of 65° to 70° F (17° to 21° C) and cover with a polythene sheet or frame will be adequate for grafting *C. armandii*. Plenty of good daylight is essential, so make sure the glass is washed

down and all shading removed. We use clear polythene 500 gauge sheeting to cover the pit.

Scion material. The choice of material is determined at the beginning of December when grafting commences. We select all material to be about 5 to 8 mm in size with no flower buds and, on returning to the house where grafting takes place, we pick up a bundle of 50 stocks to start grafting.

Grafting. This is carried out in the glasshouse. We first cut the clematis bine up into pieces by cutting about $\frac{1}{4}$ in. (6 mm) horizontally above the node. An average clematis bine will give up to 16 — 20 scions. The top pair are not used unless material is short. After cutting the bine, we select some suitable stocks $\frac{1}{4}$ in. (5 to 8 mm) thick and clean around the collar. We now proceed to cut the head of stock just above the collar, leaving the root and a collar of about 1 inch (25 mm) in length. Then cut about $\frac{1}{16}$ in. (2 mm) off the side of the collar starting from the bottom and exposing the cambium layer. After placing the stock back on the bench in a clean area (we use newspaper laid out on a bench) we proceed to cut the scion vertically down through the middle of the stem to about $\frac{3}{4}$ to 1 in. (20 — 25 mm) below node (remembering we have previously cut the scion $\frac{1}{4}$ in. (6 mm) above the node); this gives us two scions at each leaf joint.

Tying in of grafts. We place scion on top of stock, pairing the two together by starting at the bottom of the stock and holding the two with the left hand. We start to tie with a cotton twine or similar material (not raffia) from the top of the graft working in a downward direction, making sure the eye of the scion is left exposed, and finish up with a double half hitch or a reef knot, keeping the twine taut while tying. Finally trim the top of the graft to give a neat union and replace on the bench for potting.

Potting of grafts. We use John Innes compost No. 1. Pots used are $2\frac{1}{2}$ in. (60 mm) diameter which, though rather small for the size of the stock, are very pliable. If a circular movement is made when inserting the stock into the pot, it will wind itself around the inside of the pot. The top of the union is kept just level with the top of the pot and the pot filled to about $\frac{1}{2}$ in. (12 mm) from the top, making sure the “eye” of the graft is above the soil level. After potting, some water is applied using a small watering can with a narrow spout to avoid flooding the graft; an ideal can is one that is used in most houses for watering house plants. Then the pot is placed into the propagating pit with a bottom temperature of 65° to 70° F (17° to 21° C).

Attention required. For the next 3 to 4 weeks check the temperature and guard against drying out; if watering is required spray lightly with a fine rose and turn the polythene or frames about three times a week because too much condensation may cause rotting between the unions. Callusing takes place after 2 or 3 weeks and the plants will begin to unite. At about 4 to 6 weeks, young growth will

start from the "eye" in the middle of the scion (similar to roses after they have been headed back); once this commences remove the plant to an open bench with a temperature of about 50° to 55° F (10° to 13° C). When it has produced two sets of leaves, pinch out to harden and encourage fresh roots to form on the stock and, finally, pot on into a 4½ in. (11 cm) pot and stake with a 4 foot (120 cm) cane. We much prefer to use clay pots for this purpose. Place in a cold greenhouse or polythene house and within 6 to 9 months of grafting one will have saleable stocks.

PROPAGATION BY ROOT CUTTINGS

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The root cutting method of propagation is one of the least used methods of vegetative propagation. It is certainly one we hear little about. The primary reason for this may be the inconvenience in obtaining the propagating material. In most cases the stock plants have to be dug up or else the soil round the roots of the plants must be excavated to expose the roots prior to their removal; at best a rather tedious procedure. As this has to be done in mid-winter, it is not surprising that propagators find other ways of increasing their stock.

Despite the difficulties involved, the root cutting method is by far the best way to increase certain plants which do not easily grow from stem cuttings. The Californian poppy, *Romneya hybrida*, is very readily increased by root cuttings. At Woodbridge, we find this operation is best done in late December or early January.

Stock plants are grown in large pots and planted in our display borders where the flowers are very useful during the summer for Flower Shows. The stock plants are carefully dug up, and the roots which grow over the top of the pot and through the hole at the bottom are ideal for our purposes; only a very small amount of this fleshy type of root is produced on plants dug up from the open ground. These are cut off and carefully put into a box, making sure all pieces of root are the right way up; they are taken into the greenhouse and cut into lengths of about one inch. To avoid confusion when potting, it is best to cut horizontally across the top of the root and slanting at the bottom. The cutting is then potted vertically into 1½ in. peat pots, covering the top with 1 in. of compost. For ease of handling, these small pots are put into plastic seed trays and placed in a warm greenhouse at 55° F. When the roots begin to show through the wall of the peat pot, usually in March, they are ready to pot on into 5 in. pots. Great care is needed with romneyas at this stage, because the roots must not be disturbed. This is why we use the peat pot as it can be planted "pot and all".