

Clematis Propagation

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Clematis is the queen of climbing plants and its popularity is constantly increasing. I think it is important that we become aware of the various ways that clematis can be propagated.

SEED PROPAGATION

Seeds of *Clematis* species should be collected after ripening — most often in October — without waiting too long because they can easily be blown away by the wind. Seed tails should be detached and seeds dried indoors.

Most small-flowered clematis seeds should germinate within 6 to 7 weeks. It is best to sow them in early spring.

Large-flowered clematis, as well as, certain small-flowered species (e.g., *C. viticella*) germinate after 6 to 18 months. These seeds should be sown in November. When clematis taxa are propagated on a small scale it is best to sow them in cases or flats filled with sowing medium, adding grit for better drainage. Seed should be sown evenly but not too densely. A space of 1 to 2 cm between seeds is best for most species. Cover the seeds with a thin layer of medium and spread a 5-mm layer of sand or grit on top. After watering they should be placed in a cold greenhouse or tunnel, in a well lighted position, but out of direct sunlight.

The seeds should be protected from mice, checked occasionally, and watered so that the soil is damp but not wet. When the seedlings reach the height of 5 cm they can be transplanted into containers.

The easiest seeds to propagate are: *C. tangutica*, *C. orientalis*, *C. flammula*, *C. alpina*, *C. macropetala*, *C. vitalba*, and *C. recta*. Some of these species can be ready for sale in one growing season.

However, it should be noted that clematis propagation from seed is rarely applied in commercial nursery production. It is better for this reason to only propagate from seeds those species that have stable characteristics, such as *C. vitalba* and newly bred hybrids. In other cases better results are achieved by vegetative propagation using cuttings or grafting.

GRAFTING

Grafting was the dominant method 25 to 30 years ago. It was thought that grafted plants were more resistant to disease and their production time was shorter. This method didn't work in practice.

When using the grafting technique, you first have to produce a 1-year rootstock; most often using *C. vitalba*. Secondly, you have to force stock plants 6 to 8 weeks in a warm greenhouse to obtain scions for grafting in January and February. Newly grafted plants are plunged into a moist medium in a warm greenhouse (20 to 22C) and covered by a plastic film. Then a salable plant can be grown in 6 to 8 months following grafting. This method increases the cost of production. Interestingly,

German nurseries use this method. In other cases some nurseries choose cutting propagation which can produce a salable plant in 12 to 16 months.

CUTTING PROPAGATION

Clematis can be propagated by micropropagation, but this is usually more expensive than by cuttings. Clematis taxa propagated by this method are more difficult to strengthen.

Propagation by hardwood cuttings is possible only for certain species such as *C. montana*, for example. However, this is limited and can only be applied in regions with a temperate climate.

Most often the propagation of clematis is achieved through softwood cuttings. One method is to collect cuttings between February and May from maternal plants raised in greenhouse or in plastic tunnels. You can also collect cuttings from May to autumn from plants growing in the open. Cuttings taken before mid-August root the best.

Cut shoots and prepared cuttings should always be moist, and if circumstances permit, kept in the cooler at a temperature between 4 and 7°C. Most often single-node cuttings are prepared, making an upper cut 0.5 cm above the node and 3 cm below the node. One leaf is removed and the second leaf, if it is big, can be reduced. In single-node cuttings the bud touches the medium. In double-node cuttings the bottom node is the only portion covered. In our nursery we use only single-node cuttings.

Certain nurseries in Europe and the U.S.A. use cuttings with two nodes, removing both leaves from the bottom node and one from the top. A greater number of buds increases the chance for the cuttings to produce a new plant, but also increases the amount of work and requires more stock plant material.

In Japan the nurserymen do things differently. Cuttings are prepared with two nodes cut 0.5 cm below the bottom node and up to 3 to 5 cm above the top node. They do not remove any leaves from the cuttings. These kinds of cuttings are supposedly stronger and a longer shoot protects against infection.

Cuttings can be treated with root initiation stimulators, although many taxa root well without the treatment. We treat the base of the cuttings with a powder containing 0.1% NAA, but also commonly used is the powder containing 0.2 to 0.3% IBA. Thick cuttings and/or hardened ones can be wounded at the base on a segment measuring 1 to 2 cm.

The medium used for cutting propagation can have a diverse composition. We use a mixture of peat moss and perlite (1 : 1, v/v), and sprinkle 2 mm of sand on the surface.

It is not wise to stick cuttings too densely since it increases the potential for disease. Depending on the size and strength of the cuttings and length of the rooting period, we stick between 400 and 800 cuttings m⁻².

After watering in the cuttings, it is advisable to spray fungicide which protects against *Botrytis* (we most often use Rovral). The cutting cases are tightly sealed with 0.02-mm milky plastic film. Heavy shading of clematis is used throughout the rooting process. It takes about 4 to 8 weeks to root cuttings. When the cuttings root we harden them and remove the plastic film.

In England various types of plastic film protection systems are used. Cases can vary in height between 50 and 150 cm. Mist is applied manually or automatically. In regions of Japan where there is a high level of humidity, propagators use a white, dense shading material. And as I see it, mist is rarely needed in rooting clematis,

however, some nurseries in Europe, U.S.A., and Japan apply this method successfully.

Clematis cuttings rooted during spring or autumn root best when the medium temperature is between 20 and 23C during the day and 17C at night.

Electrical heating systems are less expensive and simpler to install, however, heated water circulating in pipes costs less to maintain. Heating pipes are placed in sand or concrete and flats are placed on the top for the duration of the rooting. Concrete is easier to disinfect but sand ridges allow for better moisture containment. Additional application of CO₂ into the air (800 to 1000 ppm) provides an environment for better rooting.

In late autumn and winter rooting of clematis, the lengthening of the day through artificial lighting speeds up the rooting. The best way to do this is to interrupt the night every 3 h for 30 min beginning 1 Sept.

In the spring rooted cuttings are planted out until mid June in 1- or 2-liter containers. If roots are established by the end of July, clematis could be planted in 7 cm × 7-cm or 9 cm × 9-cm pots. Later-rooting plants should be planted the following spring.

During summer and autumn propagation, cuttings are kept in tunnels until November; then we lift, clean, grade, and tie them in bundles of 25 plants. The bundles of clematis are lightly covered with moist peat moss, placed in plastic cases, and put in a cooler at a temperature between -2 and 2C. Species sensitive to lower temperatures should be kept at temperatures above 0C: *C. montana* and *C. texensis*. Some nurseries keep cuttings as they were rooted in flats in the cooler throughout the winter.

TRANSPLANTING

In our nursery clematis planting begins in March when the plants are removed from the cooler and potted. The stronger cuttings (those with 3 or more thick roots) are planted in 2-liter pots (14 cm). Weaker cuttings are planted on 0.5-liter pots (9 cm × 9 cm × 9 to 10 cm).

We use a medium composed of peat moss, bark, styrofoam, and sand (5 : 3 : 1 : 1, by volume) with and added 2 kg of dolomite, 2 kg of chalk, and 2 kg of Osmocote, 5-6 month release m⁻³.

The 2-liter-potted plants are placed outside and staked with 90-cm bamboo canes. When newly grown shoots reach between 40 and 90 cm they are cut at the second node. From those node buds grow 2 to 3 shoots, which are tied 2 to 4 times to the bamboo stick. During the course of 6 to 8 weeks plants reach a height of 90 cm.

MARKETING

Colorful photo labels with the name of the plant are attached and plants are packaged into wooden cases of 25 (40 cm × 60 cm × 25 cm). During summer and fall we sell approximately 60% of the clematis which we produced in containers. The rest of the plants, after overwintering, are sold in the spring.

Throughout the winter the majority of the plants are kept in tunnels, covered with a double layer of transparent plastic. We prepared the plants for overwintering in November. In the nonheated tunnels we apply a 2-cm layer of pine bark on the containers. In the gas-heated tunnels the containers are not covered with bark, but are maintained about -4C. Clematis which cannot be placed in the tunnels due to lack of space are left outside on a well drained, sheltered field. Containers are

covered with 5-cm layer of pine bark. Smaller clematis in 0.5-liter containers (9 cm × 9 cm × 19 cm) are prepared in the same manner, as I mentioned earlier, using bamboo canes 40 cm long. We sell these packaged in plastic bags with large colorful tags or in colorful cardboard packages. We sell these in a box of 24 plants containing six colors of clematis.

I believe that the production of clematis will continue to grow and that the plant has an excellent market potential with appropriate promotion.

Innovative New Plants and Future Trends

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OBJECTIVES

I will attempt to outline some of the present and future trends in the field of ornamental horticulture in North America and illustrate these trends with a selection of new plant introductions which I personally feel are of potential outstanding ornamental landscape merit. My personal instincts regarding trends have been formulated from information gathered from a range of sources including: commercial growers, professional and amateur horticulturists, and especially from customers of our retail mailorder company.

General Trends in Marketing and Merchandising.

- Past decade has seen an escalating demand at consumer level for more unusual plants of outstanding ornamental merit.
- Consumers are now offered an ever increasing range and diversity of plants from an increasing number of sources—mass retail merchandisers are for example, increasingly emphasizing the importance of diversity and quality of their plant offerings. These mass retail merchandisers are assuming an increasingly important role in the marketing of live horticultural products.
- Consumers are becoming more informed and knowledgeable, requiring products which will fulfill specific needs, combined with the potential of cultural success.
- Increased knowledge combined with a wider choice of sources is creating consumers who are demanding “value for money” (i.e., given products assume a perceived value).
- Improved and increased consumer education is going to be vital as demand for our products increases—ultimate consumer satisfaction and success is critical!
- Education will increasingly be targeted and focused on a more regional and local basis. Cultural methods and product suitability are critical factors in such a vast geographical area as North America, therefore, horticulture is destined to become more regional in many facets.

Specific Trends Related to New Plant Introduction.