

# Vegetative Propagation

By Charles Marden Fitch

## Multiply Your Favorite Orchids

INCREASING ORCHID PLANTS IS part of orchid-growing pleasure. There is a saying, “The best way to keep a plant is to give it away.” Horticulturally, that means to give away a propagation or division. By sharing your favorite orchids with other growers you are providing the clone with an insurance policy. Should some misfortune befall your plant, you have a good chance of getting a return propagation from the gifted division’s thriving in another collection. This is of major importance for select clones that have not been propagated by tissue culture.

**WHAT CAN HAPPEN** A common calamity in temperate regions is death by freezing. When winter weather brings heavy snow, ice, power failures and wind storms, a whole collection of orchids risks dying when temperatures fall below 32 F (0 C). Some genera will be badly damaged by cold even before water freezes. In warmer areas, the risks involve sunburn if shade material blows away, heat damage if automated vents fail to open in hot weather and violent storms that fell trees and dismantle buildings or even a strong hurricane.

If you lose orchid clones that are

already widely distributed from tissue culture or many years of division, as in the case of *Paphiopedilum*, you have a good chance of replacing favorite plants from commercial sources.

**REASONS** Besides the peace of mind in having a special clone growing in several collections, consider other reasons to propagate your superior orchids:

- ◆ Orchids to donate for local orchid society sales, auctions and raffles.

- ◆ Grow more of your favorite clones, perhaps to increase flower production.

- ◆ Test divisions of the same clone under varied cultural conditions. For example, to try different fertilizers, potting mixtures, container types, light exposure or temperature variations.

- ◆ Raise plants to sell. Extra money is handy when you are reading new catalogs or visiting an orchid show.

- ◆ Give plants to people newly expressing an interest in horticulture. It is especially rewarding to encourage young people beginning to grow orchids. Some outlets include schools where individual teachers are enthusiastic about plants in the classroom.

**CANDIDATES** When deciding which orchids to propagate, begin with your favorite clones. In my collection, I give priority to clones that do especially well under conditions that I can easily offer. You might enjoy propagating an orchid that won you an award or one that everyone admires when visiting your collection. Rare species are good candidates for vegetative propagation at home. Commercial growers needing thousands of plants will use meristem tissue culture (an efficient asexual method of vegetative propagation). If you want to have an orchid propagated by tissue culture, it is easy to have this done at a commercial orchid lab. I sometimes send stems of favorite *Phalaenopsis* hybrids to a lab for stem propagation. Having several plants of my favorite clones provides extra flowers to give away plus backup plants for testing or replacement when an individual dies from rot.

**DIVISION** Dividing multiple growth plants is the popular way to propagate many orchids. Genera that are easy to divide include *Cattleya*, *Oncidium*, *Brassia*, *Epidendrum*, *Cymbidium* and *Paphiopedilum*, among the most popular. Hybrids based on these genera are also multiple-growth orchids, botanically called sympodial.

Iris, the common garden plant, is an easy to understand sympodial plant, growing much like a *Cattleya* from a creeping rhizome having buds along the sides that sprout to make new growths (called leads by orchid growers). Not all of the live buds on a rhizome grow at the same time. Typically, several buds remain dormant unless the prominent growing lead (new growth) is damaged.

**USEFUL INJURY** You can induce the dormant buds to sprout, especially in orchids with easy-to-reach above-ground rhizomes, by causing injury to the rhizome. Choose a point two or three growths (pseudobulbs) behind an active lead on a healthy established plant. With a sharp sterile knife or other sterile cutting tool, cut halfway through the rhizome. Dust the cut with a fungicide powder such as Rootone. These horticultural powders have hormones to stimulate cuttings but they also contain a fungicide that reduces problems of rot. Dormant buds behind the cut frequently sprout, developing a new active leads. This useful injury is best done at least one season before you plan to repot the orchid. At repotting time you will already have at least two active clumps.

**NATURAL CLUMPING** A vigorous sympodial orchid grown well will form a multiple-lead plant in a few years. Some vigorous hybrids, both seed grown and tissue cultured, form

LEFT *Dendrobium* Friendship ‘Champion’ (Utopia × Ruby Blossom), a *nobile*-type *Dendrobium*, forms keikis on mature growths that can be removed and potted to make new plants.

OPPOSITE *Ascocentrum ampullaceum* ‘Lauray’, CCM/AOS, can be propagated from plantlets or offsets that grow near the base of the main plant. Grower: Judith Becker.







multi-lead clumps even before flowering. This natural clumping is common with cymbidiums, paphiopedilums, brassias, and oncidiums. Vegetative propagation by dividing multiple-lead plants is easy to do at repotting time.

**SEASONAL SELECTION** The best time to divide orchids is when they are actively growing. Seasonal variations occur around the world and within genera so it is best to remember a horticultural basic: Divide plants when they will have several months of good growing conditions to establish. For growers in temperate regions, this means spring and early summer, when orchids often are making new growth. With several months of warm bright weather ahead, the divisions made from spring into early summer have an optimum opportunity to establish before winter brings lowered light and perhaps cooler conditions.

Orchids divided when they are under stress or not active (resting) are more likely to suffer. Providing gentle bottom heat and humidity above 60 percent will help recently divided plants establish. In my greenhouse, I put such plants on a bench where heat warms the plants from below. A tray of water is under the pots. Using fluorescent lamps is another useful way to help orchids establish. The fluorescent light provides good illumination without the risk of sunburn or cloudy winter days.

**USING BACKBULBS** Divide clumping multiple-growth orchids, such as cymbidiums, into divisions of at least one active new growth and three or four live healthy backbulbs. Some of the cut-away backbulbs, the oldest of the clump, will still have live "eyes." Study the cut-off pseudobulbs for live dormant buds. Sometimes it is not easy to know whether a rhizome or back bulb has viable bud. You might as well take a chance that the cut-away section will sprout if you want to propagate a divided clone. To encourage older cut-off growths to sprout, dust the cuts with Rootone or similar hormone-fungicide powder. Place the divisions on moist coarse sphagnum moss in a tray or pot. Keep the back divisions in a shady moist place. In a few months, any live buds (eyes) should sprout and begin making roots. Once you see a division is active, pot it in a relatively small container. You may find that old orchid growths thrown on a compost heap during early



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summer repotting sprout into sturdy plants over the summer without any care from you. These vigorous orchids are fun to see but if you decide to save them be sure that they are pest-free. I recommend that you leave the truly discarded parts in the compost where you threw them early in the season. Having correct names and a healthy clean growing environment are better for choice divisions.

**CUTTING TOOLS** Use sharp sterile cutting tools to divide your orchids. Virus is dangerous for orchids because it often causes malformed and blotched flowers. Vigorous plants may not show blotched foliage or virus-spotted flowers, so it is important to sterilize cutting tools after each plant. I use flame from an alcohol burner or gas stove. Steam and boiling water are also useful sterilizing techniques, but more practical in a lab setting than in a home collection. Choose cutting tools that can endure the flame sterilization. I like stainless steel pruning tools for tough rhizomes. Sometimes a big clump of *Cymbidium* must be divided with a saw. A commercial grower I talked with said he uses a small handheld electric saw to divide his cattleya hybrids. Many of the older popular orchids became infected with various viruses at commercial collections before knowledge of viruses was common. Even now, one may occasionally encounter infected orchids in the commercial circle. Keep your orchids healthy by using sterilized cutting tools.

Repotting terrestrial orchids such as *Paphiopedilum* may require a trowel for potting mix plus a cutting tool to do dividing. A useful new tool made in China is called a Multi-Use Transplanter. I use the Oxo stainless steel transplanter that incorporates a strong straight edge with teeth (serrations) on the opposite side. The 4½ inch (11.25 cm) blade is strong enough to pry plants out of pots, while the sharp thin tip is good for scraping off tight roots. This clever little tool sells for about \$5.

For tougher dividing jobs, choose a pair of sturdy pruning shears. Good brands with several choices from each company include Fiskars (famous for precision scissors), Oxo “Good Grips” hand shears and Wilkinson (made in the United Kingdom). When you use a flame to sterilize these tools, avoid getting fire near the plastic or painted handle sections.

**MONOPODIAL GENERA** You can



OPPOSITE TOP LEFT One way to multiply *Oncidium* Gower Ramsey (Goldiana × Guinea Gold) is to pot backbulbs, water and wait for new growths, at which time the backbulbs can be potted individually.

OPPOSITE TOP RIGHT *Aliceara* Mervyn Grant ‘Talisman Cove’ (*Miltassia* Star Fighter × *Oncidium crispum*) is an example of a tissue-cultured plant.

OPPOSITE Among orchids that can be divided is *Epidendrum radicans*, including this specimen that was just potted with coconut fiber, gravel and charcoal.

TOP LEFT Plantlets (keikis) are seen more often on dendrobiums and phalaenopsis, but cattleyas can also produce them. Here, a plantlet is high up on the pseudobulb.

TOP RIGHT *Colmanara* Jungle Cat ‘Talisman Cove’ (Jungle Monarch ‘Everglades × *Rhynchostyle* [syn. *Odontoglossum*] *bictoniensis*) is a good choice for vegetative propagation by division or tissue culture .

ABOVE Backbulbs of *Cymbidium* Madrid ‘Forest King’, HCC/AOS (Vale of Kashmir × Peri) three months after cutting.

## ORCHID PORTRAIT

still have success with vegetative propagation of orchids that normally make a single growing point. These monopodial genera include all of the *Vanda* and *Phalaenopsis* relatives. Look for small offsets at the base of monopodial orchids. These can be safely cut off once they have five or more healthy roots. *Phalaenopsis* may form plantlets on the inflorescence. Some hybrids of *Phalaenopsis equestris* and *Phalaenopsis lueddemanniana* commonly form plantlets. In my collection, plantlets occur along with flowers on the same inflorescence. To ensure that small plantlets thrive when removed from the adult plant, get them rooted prior to separation. I put coarse sphagnum moss in a drained plastic pot or section of plastic mesh next to the adult plant. A wire twist keeps the plantlet in the moss as new roots become established. After a few months, the plantlet will have roots in the moss, a safe time for separation from the adult plant. Remember to make the cut with a sterilized tool.

**CUT DOWN** Mature monopodial genera including *Angracecum*, *Arachnis*, *Doritis*, *Renanthera* and *Vanda* benefit from being cut down to size. As plants grow taller, sturdy new roots sprout along the top stem, below the growing tip. Eventually, a plant grows taller than needed. Cut the top section below five or more active roots to form a more manageable plant. Growers with orchids outdoors in tropical settings can wait years to do this. Growers with orchids indoors prefer to manage shorter plants.

**ABOVE RIGHT** *Dendrobium* canes (mature pseudobulbs) laid on moist sphagnum moss will sprout buds from dormant "eyes," thus making vegetative propagation easy.

**OPPOSITE TOP LEFT** *Dendrobium* Super Star 'Dandy' (Malones × Utopia) is propagated by tissue culture.

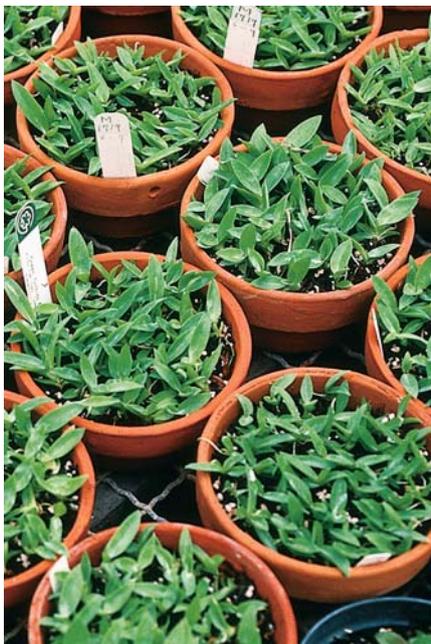
**OPPOSITE TOP RIGHT** *Dendrobium nobile* can be propagated from stem cuttings. At a nursery in Chiangmai, the canes are cut with a sterilized tool into short lengths and then inserted into coconut fiber.

**RIGHT** *Dendrobium* Vimarn 'KD Glade' (Mary Trowse × Jiad Gold), made by T. Orchids in Thailand, is a select awarded clone mass propagated by tissue culture for commercial sales. This specimen, grown in New York, has 2¼-inch (5.5 cm) flowers.



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TOP LEFT *Otaara Hwa Yuan Bay 'She Shu'*, AM/OSROC (*Laeliocatonia Peggy San* × *Brassolaeliacattleya Sunset Bay*) is a sympodial complex *Cattleya*-type hybrid bred for color and shape that has been mass propagated.

TOP RIGHT One method of vegetative propagation is tissue culture. Here, tissue-cultured plantlets at a commercial orchid lab in Taiwan are raised for export.

ABOVE LEFT A sprouting backbulb of *Oncidium splendendum*, a sympodial orchid.

ABOVE RIGHT *Soprocattleya Royal Beau 'Prince'* (*Cattleya Princess Bells* × *Beaufort*) has 3-inch (7.5-cm) fragrant

flowers. Although it is a tissue-cultured plant, it could also be divided.

OPPOSITE TOP Growers with some experience may want to increase the size of their collections by purchasing flasks of tissue-cultured plants. Here, *Phalaenopsis* plantlets are being removed from flasks. The agar will be washed off before the plants are transplanted to pots.

OPPOSITE *Ascocenda Sawita Delight 'Orchidgrove'* (*Vanda Fuchs Delight* × *Lenachai*) is a select clone tissue cultured in Thailand. The ¾-inch (8-cm) flowers are borne in upright spikes that last 30 to 40 days on monopodial plants.

**Safe Step** To be sure a top section will thrive after a cut down, give the upper roots a few months to grow into a tree fern pole, wad of coconut fiber or other sturdy material. Having roots prepared in this way will help the top section quickly establish after it is cut down. Monopodial orchids top-cut from spring into early summer will establish by autumn, even without this prerooting. Some commercial growers propagate terete vandas and tall-growing *Vanda* and *Arachnis* hybrids by top cuttings, especially when thousands of plants are needed for cut-flower production. You may find some hybrids offered for sale as top cuttings.

**Bottom Buds** Dormant buds at the base of a cut-down orchid may grow into new plants. When I top *Angraecum* or *Doritis*, the base usually has several sets of healthy leaves. This active foliage helps support bottom buds once they sprout. To save space, you can pot a top cutting with a healthy base. Be sure the potting mix is in good condition. Often you can tilt a pot to wash out old mix with a strong water stream, then fill in your mix of choice around the base, often with some roots still holding on to the container.

**MERISTEMS** Commercial vegetative propagation with tissue culture in an orchid lab is the modern way to increase special orchid clones. Under sterile conditions, a section of healthy active tissue (apical meristem) is excised from a vegetative bud, often from a rhizome in *Cattleya* types or from an inflorescence node bud in *Phalaenopsis*. Tissue is placed in a sterile flask with nutrient agar. Various genera require different nutrient agar mixtures. Flasks are kept in motion, typically on a vibrating table or rotating wheel. The motion speed and frequency vary, depending on the stage of tissue growth and genus involved. Light is often from fluorescent lamps to give strong illumination without danger of overheating the flasks.

Currently, all major orchid genera can be propagated with meristem techniques except *Paphiopedilum*. Up to now the Slipper Orchids have not been commercially propagated in quantity from meristem tissue as is used widely for other orchids. I have photographed vegetative propagations of *Paphiopedilum* clones doing well on agar in flasks, but these resulted from using small offshoots cut off the plant base or, in some cases, from seedling

tissue already in a sterile flask. Commercially, most *Paphiopedilum* are propagated by gross division or sexually from seed. Rare species are propagated sexually by crossing two clones of superior specimens.

**BENEFITS** Tissue culture is an efficient way to propagate many identical plants from select clones quickly. Most commercial orchid growers and some hobby growers use meristem propagation to increase their most valuable or favorite clones. Awarded orchids are often the first to be tissue cultured because these clones have already been praised by the judges. You benefit by having superior orchids available at a low price. Before meristem propagation, it was common to see divisions of special clones selling for hundreds or thousands of dollars. Now you can add the newest and best clones to your collection for \$50 or less. A skillful lab technician can often save a famous virus-infected clone by using meristem propagation. Orchid virus infects new tissue slower than the plant grows. By excising only the very newest tissue, meristem plants can be grown virus-free.

**MUTATIONS** Mutations are rare in gross divisions. When you cut apart a clump of orchids into several plants, each division will be identical. In contrast, propagation by meristem tissue in a lab involves culturing tissue clumps on nutrient agar with physical agitation. The clumps of tissue are cut apart and transplanted several times under sterile conditions before finally developing enough to be transplanted into pots. All of these steps increase the chance of mutations. Some commercial catalogs mention that "mutations may occur" in descriptions of meristem plants. Some mutations, such as pleasing color variations in the flowers, may be horticulturally desirable. Mutations become more likely if a tissue-cultured plant is used as the source of meristem to make another batch of propagations. To reduce spontaneous mutations, commercial propagators prefer to gather tissue only from original seed-grown plants or plants propagated by gross "old fashioned" division.

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