HOW TO GET FREE PLANTS AND SAVE THE EARTH

CAROL SIEGEL

"The best way to keep a plant is to give it away." Charles Marden Fitch

WHEN I FIRST STARTED growing orchids, I bought a spectacular, big *Maxillaria tenuifolia*. Luckily, I broke off a piece for my dear friend Diana, an experienced grower and a species lover. A year later, hers was big and beautiful and blooming, and mine was dead. She then gave ME a piece of my plant to try again. I had provided my plant with an insurance policy by giving it away.

I will tell you a way to make more of your favorite plants by a process called "vegetative propagation," multiplying the plants without using seeds. It is a relatively fast, totally free way for a hobby grower to get more plants. You do not need a laboratory, expensive equipment, or a great deal of patience. It just might help save the Earth or at least save valuable, threatened orchid species.

There are many reasons to produce "free" plants from your existing plants. Of course, everybody likes free. In an expensive hobby, "free" cheers the heart. You may also have a very special plant, an endangered species, and you may want it growing in several collections to preserve it. Commercial nurseries often do not bother with vulnerable species because they are not commercially profitable. You can make a difference. You can be a valuable part of the orchid conservation movement, a worthy goal in itself. Also, you may want orchids to donate for society sales, auctions, or raffles. You may want to have plants to sell or give to friends, schools, or interested young people. Moreover, you might want to compare growing conditions and see which plants do better under different cultural conditions with different potting mixes, fertilizers, or light conditions.

There are six primary techniques used for orchid propagation:

1. Division
2. Keikis
3. Backbulb
4. Cuttings
5. Micropropagation
6. Seed Culture

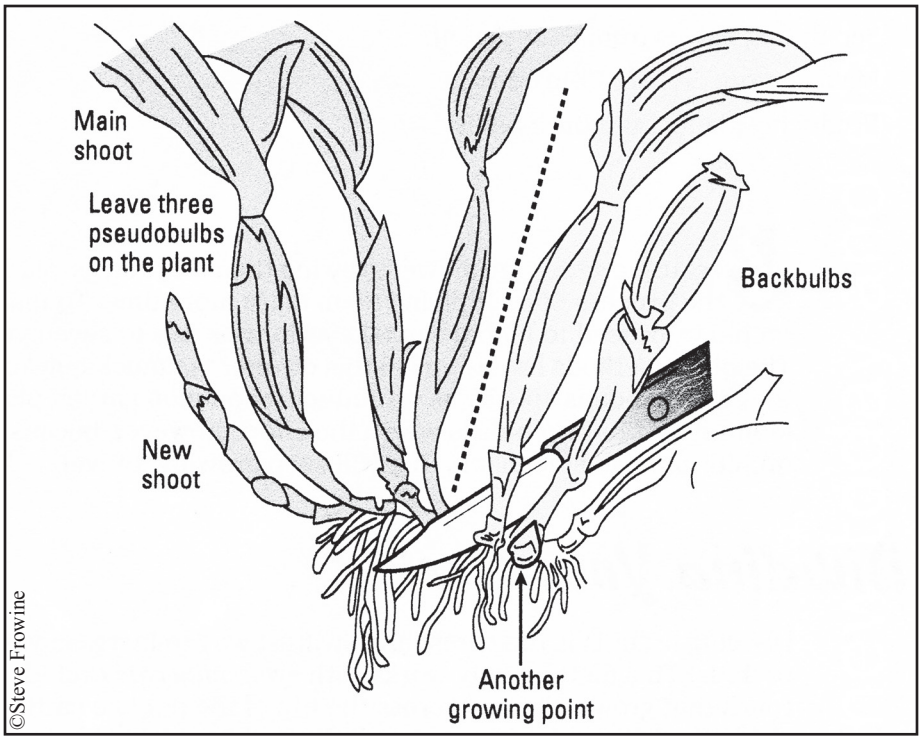
Today, I will discuss methods one through four. Methods five and six are best left to the professional. They require expensive equipment, sterile laboratories, and a great deal of expertise and time. These methods also produce too many plants for most home growers.

Divisions

The surest and swiftest way to get two or three plants from one is to divide it into two or more parts and then pot up each part separately. You may notice that your plant has become a monster at potting time. Sometimes, through your excellent care (other times just by a miracle), a plant gets too big and heavy to handle or pot up. Sometimes the creeping stems of the orchid (rhizomes) grow all over the place in a tangled mess or hang over the pot's edge. It is now time to break the plant up.

A specimen-sized plant to be divided: *Cattleya percivaliana* 'Summit'.

Identify the pseudobulbs you want to remove to make a division.



Example of the rhizome being cut.

Dividing the plant is the easiest method for sympodial orchids (one whose pseudobulbs creep horizontally along the medium like a snake). You can divide brassavolas, calanthes, cattleyas, cymbidiums, dendrobiums, epidendrums, laelias, miltonias, odontoglossums, and oncidiums—basically any plant with clearly defined pseudobulbs.

You only want to divide healthy, vigorous, big plants, not weak, sickly, or small plants. You need at least three pseudobulbs in a cattleya. Dendrobiums can be divided with fewer growths, but larger divisions with more pseudobulbs take less time to establish and bloom more quickly. Smaller divisions can take forever to establish and bloom.

You want a minimum of three healthy pseudobulbs for each plant. One of the pseudobulbs needs at least one viable "eye" at the base of a pseudobulb. An eye looks like a developing bud. If the bud is green, it is likely viable. These buds will likely grow and form a new lead for that plant. You may need to remove the sheathing at the base of the pseudobulb to determine the eye's condition.

Plan before you divide a plant. Make a drawing on paper first and think of what the divisions will look like when they are severed. Before you begin, make sure you have disinfected your equipment.

Let's say you have a large cattleya you want to divide—this also applies to less than specimen-sized plants! You select three to four pseudobulbs for one plant. The division must have at least one live eye. Review the plan you made earlier and mark the spot on the rhizome. Sever the rhizome at the mark and pull the plants apart. Sometimes, you need another person to help pull apart a large plant. You should know that your "helper" will probably want a division…

This cattleya is divided into two pieces.

Paphiopedilum Julius 'Austin Creek'

Some growers like to divide the plant after blooming but BEFORE repotting while the plant is still established in the pot. They cut the rhizome where they want to divide the plant, either cutting halfway through or completely severing the two pieces. It is a good idea to sprinkle a little cinnamon on the cut ends; it is a natural fungicide.

If a plant is growing over the edge of the pot with roots hanging down the sides, you can attach a medium-filled pot to the mother pot and let the overflowing growth establish in the attached pot. Once at least three growths are established, you can sever the rhizomes and have two plants. This method is particularly useful for bifoliate cattleyas that are fussy about being repotted and must be repotted only as new roots emerge.

Paphiopedilums are monopodial and have one stem rather than pseudobulbs. Paphiopedilums make a new growth or two each year. However, divide only when necessary. If you find that the newer growth naturally falls from the parent plant on repotting, you can consider dividing the plant.

Keikis

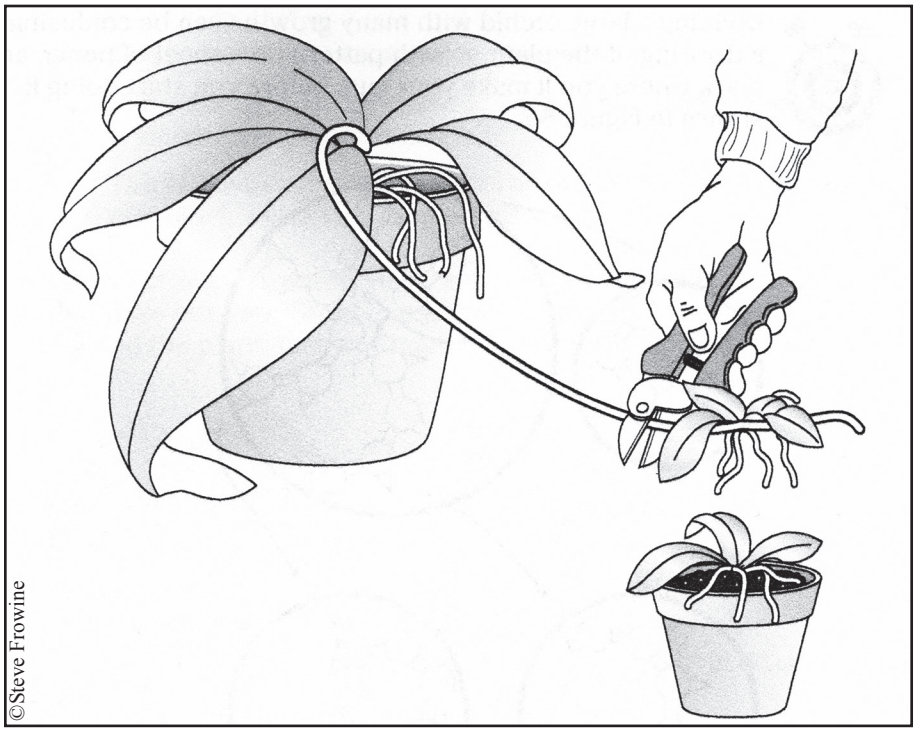
Another fun way to get free plants is through "keikis." You are watering your orchids one day, and you notice a tiny plant growing on your flower spike or stem, a bonus baby plant. At first, it looks like a new leaf or two, and then a root starts to grow. What you have is a free plant growing on your old plant, a "keiki." In Hawaiian, "keiki" means "baby." This baby is genetically identical to the mother plant and can be detached and grown on its own when the roots are several inches long. The keiki develops naturally from buds at nodes when growth hormones accumulate. The keiki appear on the flower spikes or the canes of various orchids.

Sometimes, however, keikis can be a sign that your plant is unhappy. Dr. Clair Ossian, writing about antelope dendrobium, said, "…. if you get few flower spikes and lots of keikis, the plant is unhappy…." You should check the health of the mother plant to help you decide if you want to keep the keiki. If you have a healthy mother plant, you can let the keiki develop.

Many phalaenopsis, dendrobiums, sobralias, and vandas will spontaneously produce keikis. Catasetinae, Oncidiinae, and some other orchids with pseudobulbs occasionally produce them.

It is best to wait until the keiki has a few small leaves and roots about two to three inches long before removing it. You want the keiki to be strong enough to survive on its own. When separating the keiki, be sure to use clean, disinfected clippers, or wear gloves if you are snapping it off with your hand. Cut the cane about two inches above and below the keiki. Dress the wounds with a fungicide like cinnamon to prevent infection. Place the keiki in a small pot using your preferred potting mix. Don't expose the keiki to too much bright light. Once you see signs of growth, you can increase the amount of light every few days until it is well-established. Then it can take the same light as the mother plant. Hold off on fertilizing until after you see leaf growth.

Phalaenopsis with a keiki.



Remove the keiki after the roots have developed.

A basal phalaenopsis keiki.

Rather than removing the keiki from the mother plant, some phalaenopsis growers bend the flower spike down and set the keiki in a small pot, pinning it in place while still attached to allow the mother plant to continue to nurture the keiki until it is better established. It is already potted up when the keiki is ready to separate from the mother. The folks at repotme.com suggest snipping off the keiki and setting it next to the mother plant in the same pot during the first year. They believe that the mother plant helps regulate the pot's moisture conditions, allowing the keiki to do better.

Your phalaenopsis may also form a basal growth that some people call a "basal keiki," but it is a side growth, a "pup." Some phalaenopsis form these naturally, but they can also result from injury to the mother plant. The injury may cause a new pair of leaves to grow out of the base, which will produce a whole new plant next to the damaged one. Under the bottom leaves, along the stem, are dormant nodes that can be activated by injury to the plant. This type of keiki is left on the plant and will rapidly replace the mother plant because of its existing extensive root system.

Phalaenopsis equestris naturally develops keikis.

A naturally occurring dendrobium keiki.

Dendrobiums tend to keiki at one of the nodes (rings of meristematic tissue). The keiki can grow on the mother plant until the roots are two inches long, then it can be removed and potted. Alternately, you can place sphagnum moss around the plantlet while still attached to the mother plant and secure it with a piece of nylon stocking or fishing line so that the roots will grow into the sphagnum moss and be more established when you are ready to separate it from the mother plant.

Can you encourage your plants to produce a keiki? Yes! Commercially available plant hormones, such as Keiki Grow Plus, Keiki Pro, or similar products, contain growth regulators such as cytokinins that activate dormant nodes and stimulate keiki growth. The hormones are called plant growth regulators when they are synthetic compounds.

Keikis are produced in the wild because of the natural hormones present in the plant. Plant growth regulators assist the plant's natural inclination to produce cytokinins, prompting dormant reserve buds into growth, producing lateral side shoots and keikis. The paste stimulates the growth of a keiki on a healthy, happy plant. A small dab of the paste starts a keiki forming in a matter of weeks.

Do not apply the plant growth regulator until the last flower on the spike has opened fully. If the mother plant is mature, you can do one or two additional buds, but it is best not to do too many. Carefully slit the bract covering the second node from the bottom of the inflorescence. Be careful not to damage the bud beneath the bract. The bottom node seldom produces a keiki, so only treat nodes two, three, or four, counting from the base of the inflorescence. Apply a small amount, the size of a pea, to the bud and surrounding tissue. The lanolin in the product helps it resist being washed off during watering. In a week or two, the bud should show signs of developing.

Dendrobium canes can be rubbed with a plant growth regulator. The top buds generally respond with numerous keikis or sometimes extra flower spikes. Buds at the base of the canes form new shoots. The manufacturers claim that the same technique works for cattleyas, oncidiums, and many other genera with dormant buds. They also claim that catasetums can form keikis with applications to dormant buds on pseudobulb rings. A little of the paste goes a long way; too much can cause flower crippling.

Some growers don't like to use a plant growth regulator for several reasons. It is possible to damage your plants if they are incorrectly used. If you overstimulate the plant, it can cause deformed flowers. The good news is if you stop using the growth regulator, the plants seem to return to normal. You can get keikis without the use of these products.

A plant growth regulator applied to a node on a phalaenopsis spike.

The keiki development at ten weeks after application of the plant growth regulator.

Vanda merrillii

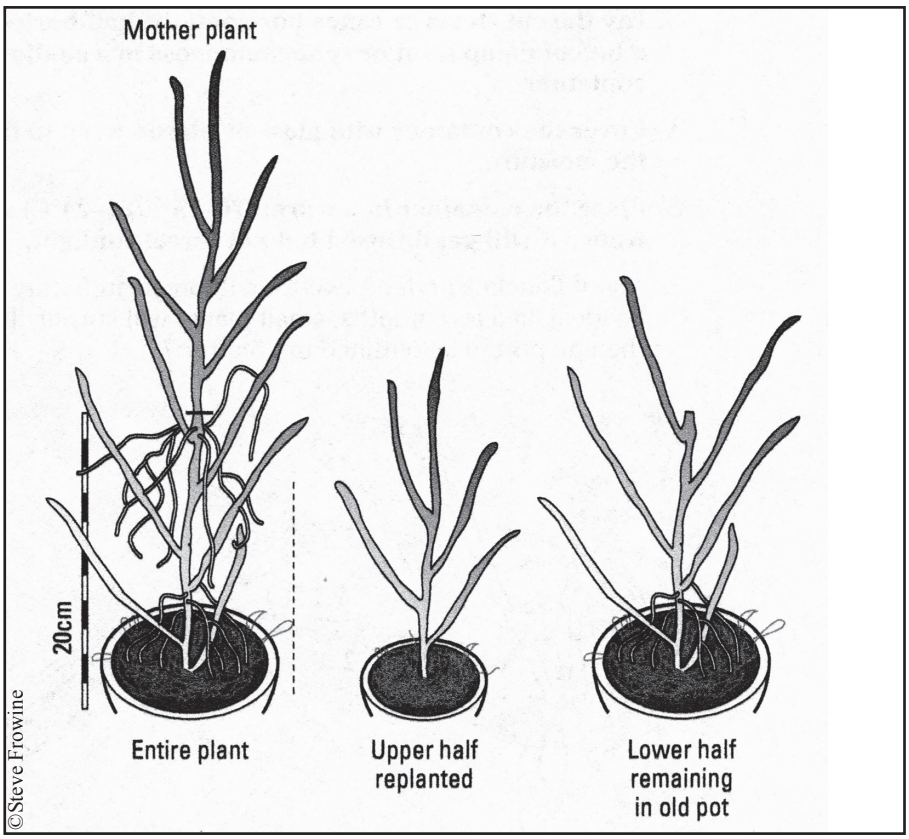
Vandaceous Orchids

Vandaceous orchids, like vandas, renantheras, and aerides, can grow very tall and lose their bottom leaves. They look top-heavy and unattractive, and roots start to extend out of the upper stem. You can both "divide" the plant AND get lots of new growths to form. It is called "topping" the orchid. Cut off the top of the plant just under the portion of the stem with at least five roots and pot it up. The bottom half of the plant will then miraculously sprout many growths along the stem and from the base. Typically, you leave about 2/3 of the plant for the top and 1/3 for the bottom portions. For shorter plants, you can divide it in half. When you remove the top of the plant, you encourage the lateral growth of the bottom half. According to expert Ron Parsons, these new growths are called branches. Those that come from the base are considered side growths or pups.

The three steps to topping the orchid are:

1. Remove the top portion with ample roots.
2. Pot the removed portion.
3. Leave the mother plant (the bottom portion of the plant) in its container.

Set up the mother plant in 50% shade, and lots of side growth should grow from the axillary nodes/buds found at the joints of the remaining leaves and stem. The remaining nodes are capable of producing one new growth each. The new growths or "branches" can be removed and potted up once their stem is long enough to produce aerial roots.



Topping a vandaceous orchid.

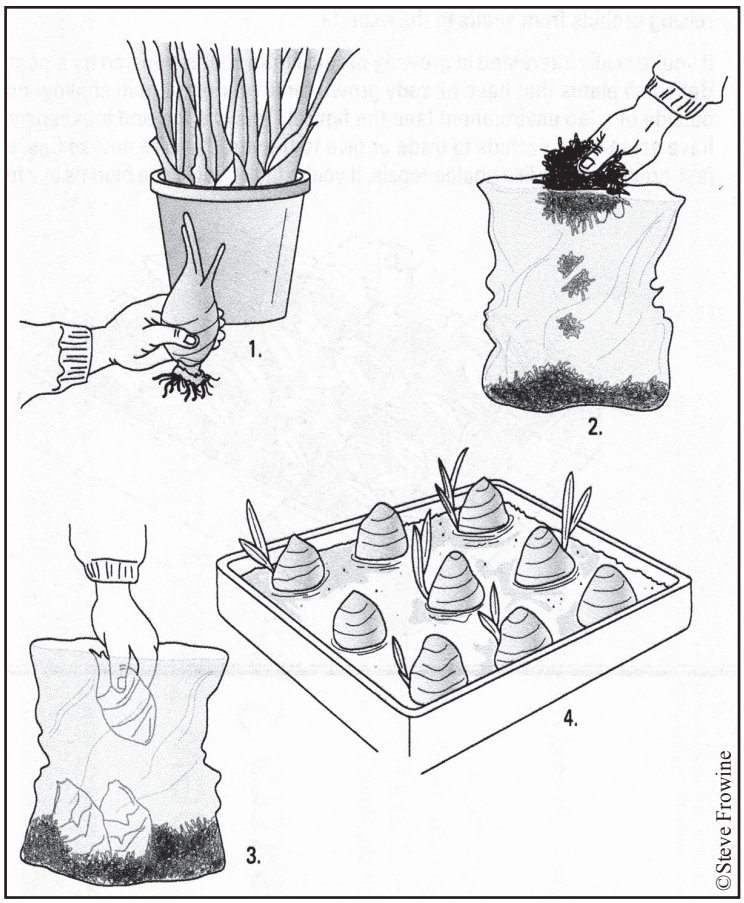
Cymbidium suavissimum

Backbulbs

Cymbidiums, cattleyas, coelogyne, and stanhopeas are easily propagated from backbulbs. As pseudobulbs age, they eventually lose their leaves and become dormant. New pseudobulbs develop and have active growth. The old pseudobulb, called a "backbulb," has energy reserves for the growing plant and is usually left on the parent plant. However, if the backbulb is separated from the plant, dormant eyes that are green are often forced into growth, and you get a free clone of the original plant. The resultant plant can take several years to flower from a single backbulb, so having at least two is desirable. It doesn't matter if the pseudobulb has ever flowered or not. Severing the backbulbs before repotting can initiate a dormant eye, and when repotting time arrives, you will have two active divisions to pot separately.

Detached backbulbs can be planted in pots or communal trays containing a well-drained and porous medium such as fine-grade Douglas fir back, sand, sphagnum, or peat moss. Plant the pseudobulbs so the eyes are above the level of the potting mix. Spray frequently, but do not water the bulbs. If kept in a humid environment out of the direct sun, shoots and roots start to grow in three or four months. When shoots and roots start to grow, transfer them to a coarser medium, and the following spring, place them in pots large enough

Stanhopea tigrina backbulbs sprout after eight weeks.



1. Remove backbulb; 2. Place layer of moss in bag; 3. Place bulb in bag; 4. Place in shallow tray.

for two years of growth. By that time, they should be near flowering. A caution: backbulbs may lay dormant for a long time before growth begins.

Some recommend putting a two-inch layer of damp sphagnum moss in a plastic bag, placing the backbulbs with the bottoms buried in about ¼ inch of the moss and then sealing the bag. Place the bag in a warm spot with bright diffused light. In about two months, new growth should start. When the leaves are a few inches long, place the young plants in a shallow container as a group in diffused light, allowing them to grow for several months before potting them up.

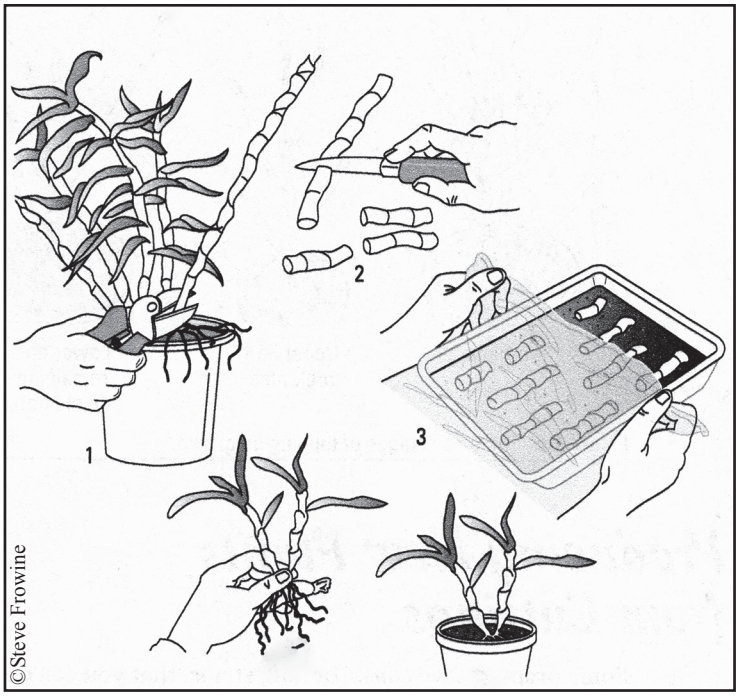
Some suggest treating cymbidium backbulbs with coconut water to increase success. Manufacturers of plant growth regulators suggest their products can encourage new growth from old, shriveled backbulbs with viable eyes in species like cymbidiums and *Dendrobium speciosum*.

Dendrobiums sometimes produce aerial shoots on the leafless, old canes (the canes are actually elongated pseudobulbs). They usually develop on the upper part of the cane and grow slowly. These aerial shoots usually take 90-120 days to develop roots. They can then be detached along with the portion of the cane and potted up independently.

Catasetinae bulbs can be propagated by placing them horizontally on sphagnum moss.

Cuttings

Some orchids have canes that you can cut up in pieces called "cuttings" to produce new plants. Steven Frowine describes how to propagate these cuttings. Be sure to disinfect all the tools you use for cutting the plant. First, you cut off one of the canes. Then, locate the circular scars around the cane that mark the nodes (where the leaves were attached). With a sharp knife, cut sections of the cane so that each section has at least two nodes. Lay the cut canes horizontally, half-buried in a bed of damp sand or sphagnum moss in a shallow container, and cover with plastic wrap. Place the container in a warm (70 to 75˚F or 21 to 24˚C) area with diffused light. In a few months, a small plant will sprout.



1. Cut cane from plant; 2. Cut pieces at circular scar; 3. Place in tray and cover.

Dendrobium bracteosum

It is possible to take cut phalaenopsis flower spikes after the flowers have faded and develop keikis. One way is to treat one of two buds with a plant growth regulator on the bare spike. Place the cut flower spike in clean water, change it regularly, and cut the end of the spike every few days to keep the water flowing into the spike as the plantlet forms. A YouTube video, "How to Make 100 Orchids From One Without Keiki Paste," also suggests using phalaenopsis flower spikes. They suggest cutting off a section with several healthy green nodes. Wrap the cutting in shpagnum moss and place it in a tall, thin vase or water bottle partly filled with water. Cover the top with perforated plastic wrap (available in florist shops or wrapped around flowers or vegetables). I imagine you could make small holes in regular plastic wrap with a piece of wire or a big pin. Little keikis eventually form.

Phaius flower spikes can also produce new plants. Discard the section where the flowers have bloomed because that bud is not viable. Cut sections of the flower spikes between the nodes on the spike, so each section has one node with a green bud. Place the little sections upright like little trees in sphagnum moss and place the container in a plastic Ziploc bag. Eventually, plantlets will grow out of the nodes.

Flower spike cuttings can be used for calanthes and thunias as well. Place the whole cut growth flat on the medium, and new plantlets will grow out of the nodes. Treat ends of cut tissue with a fungicide like cinnamon.

Labeling Your Division

All vegetative propagation results in plants identical to the mother plant. Whenever there is more than one genetically identical orchid plant, you need to have a cultivar name. The parent plant should have a cultivar name, and all the plant divisions should have an identical cultivar name. In this example, the plant *Cymbidium bicolor* has a cultivar name 'Sailor's Wisdom'. The cultivar is noted with single parentheses. The label will tell you and all future owners of the plant that these plants are genetically identical and indeed the same.

If the parent plant or any of the divisions gets an award, all divisions of that plant carry that award as part of their name. *Cattleya bicolor* 'Sailor's Wisdom' was awarded an American Orchid Society Award of Merit. The parent plant and all the divisions carry the name *Cattleya bicolor* 'Sailor's Wisdom' AM/AOS.

Vegetatively propagating your orchids is a fun way to produce free plants for you to sell, donate, experiment with, or give away. If your orchid is endangered or unique, it is a great way to be part of the orchid conservation movement.

Acknowledgement

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