

GROWERTALKS

Features

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Kalanchoe Culture

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Kalanchoe—with the common names of Mother-In-Law Plant, Devil's Backbone, Chandelier Plant and Mother of Millions—may not be at the top, or even on, a grower's production list. But North American greenhouse growers should be considering this very interesting, if somewhat obscure, potted plant.

Pictured: Maxine is a new single-flower kalanchoe from the Danish nursery Knud Jepsen. It has one of the largest flowers to date.



In Europe—especially Germany, Denmark and Switzerland—kalanchoes are a leading potted crop. Why should it be considered by the North American greenhouse industry? For one, they can be predictably forced into flower and marketed any time of the year as a centerpiece, dish garden or as a gift. Second, with people having extremely busy lives or for those living in care facilities, plant watering can easily be neglected, which in the case of kalanchoe, is of no great concern. They're succulents and can survive well with minimal water.

The most popular species among the 100 or so in the kalanchoe genus to be grown as potted plants is *Kalanchoe blossfeldiana*. It's native to Madagascar, an island off the Southeast coast of Africa, where it grows under semi-arid conditions with less than 15 in. of rainfall per year. It was discovered there around 1926 and introduced by German plant breeder Robert Blossfeld to Europe in 1932.

The original red soon became popular in Europe as a winter potted plant, which as a result of extensive breeding during the 1960s and 1970s, expanded into the availability of an extensive array of colors. The majority of these early cultivars were propagated by seed, which was a long, tedious process. In addition, many of the cultivars were too tall, too sensitive to heat for flower initiation and often had poor uniformity in growth rate, plant form and flower color. The ability to asexually propagate cultivars greatly increased the popularity of kalanchoe and today all propagation is done this way. Breeding continues to improve plant form and flower color.

The introduction of a series being marketed under the name Calandiva was the result of a chance finding of a multi-petaled kalanchoe in a nursery in Sweden in 2002. Calandiva hybrids have 32 petals arranged in tight rosettes like miniature roses, instead of the normal compliment of four petals, and are available in all colors seen in the species.

Growth requirements

Photoperiod needs

Kalanchoes are short-day plants, and by manipulating the length of the day and night, growers can have plants flowering at any time of the year, much like potted mums. Long days (LD) are given in the beginning of the culture to promote rooting and vegetative growth. Short days (SD) are given in the rest of the culture to promote flowering. It's important to determine when the LD period ends and the SD period starts and this depends on a number of factors.

The number of consecutive short days influences the number of flowers initiated. For most cultivars, 42 short days (six weeks) are suggested for complete flower induction, at which time buds will be visible. Returning plants to long days after this treatment has the advantage of producing a compact plant. Kalanchoe cultivars fall into response groups and it's important that growers know the response group for the cultivars they intend to grow. The response time is the period from beginning of the short day until opening of the first flowers and ranges from nine to 13 weeks, although within a given response group, flowering can be longer in winter than summer, due to a combined effect of temperature and light intensity. Plant age can also be important, with older plants flowering faster than younger ones.

Nathan Nauta, head grower for Balfour Greenhouses in Fenwick, Ontario, and one of the foremost producers of potted kalanchoe, said that all the cultivars they grow fall into the nine-to-12-week response, and when deciding on cultivars to add, they take the response time into consideration.

"As we produce weekly, from a planning and sales perspective, we try and match the response of all colors so we have a good color mix every week," said Nathan

Propagation

At Balfour, plant production is a result of cuttings from Balfour's home-bred cultivars and those brought in from Fides and Jepson.

Nathan explained that they maintain stock plants of four cultivars (Lady—a yellow, Fancy Tenario—a red with variegated leaves, Yellow Starburst and Orange Starburst) from their own breeding program. They also buy in cuttings in a range of colors from Fides of their single-flower kalanchoe, along with Calandiva, a double-flower kalanchoe and Grand Diva—like a Calandiva, but with extra-large flowers. From Jepson, they buy the single kalanchoe from the Queen series in a range of colors, from white through yellow to purple. If growers wish to take cuttings from plants they produced from Fides, Jepson or ForemostCo Inc., Nathan said that growers need to determine if the cultivar is protected, in which case they'll need to pay royalties. All three companies currently have protected and unprotected cultivars.

Breeders, particularly in Europe, do release new cultivars fairly frequently. At this year's world-leading horticultural trade fair IPM Essen in Germany, Chris Beytes reported on the new releases of Calanday

Kalanchoes, and Kalanchoes Ellen and Maxine. Calanday is from Dümme Orange (out of their Fides breeding) and has large, single flowers that come in 15 colors and bicolors. Ellen and Maxine are from the Danish nursery Knud Jepsen. They have the Queen brand of kalanchoe and these two new cultivars have the largest flowers seen to date on kalanchoe. Ellen is a double white and Maxine is a single-flowering cultivar. Both are currently limited editions.

Whether you grow the plants in 2.5-in., 4-in. or 6-in. pots, in some cases it depends upon the need of the customer, but in other cases it depends upon the cultivar. Nathan said that at Balfour they trial cultivars in different pot sizes and have a couple of cultivars that grow in 2.5-in. pots, but won't grow in 6-in. pots.

"It is important to know your cultivars," he said. Placing pots on the bench (quantity of pots per square yard) is determined by many factors, not the least is cultivar. However, during the rooting stage, they can be close together.

Growth media and fertilization

With kalanchoes being succulents, both the rooting media and subsequent growing media needs to be fast draining and high in organic matter. The pH is also critical and should be in the 6.0 to 6.5 range. Kalanchoes are sensitive to zinc deficiency, which can be aggravated by high phosphorous. But at this pH range, both zinc and phosphorous should be available at suitable levels. Kalanchoes also have high calcium requirements.

Producers should use a fertilization program for kalanchoes with ratio 3:1:3 (N:P:K) until bud formation. During the flowering period, the ratio should change to 2:1:4 or 3:1:4. It may be necessary to make supplemental applications of major elements, including calcium and magnesium and trace elements, particularly iron and manganese.

Temperature requirements

Temperature is one of the most important aspects of kalanchoe culture. Cuttings normally root in about three weeks during the summer months and four to six weeks in the winter at temperatures of 70 to 74F (21 to 23C). Using bottom heat may increase rooting speed.

Once rooted, the optimum temperatures range between 64 and 68F (18 and 20C) day and night. If temperatures are under 61F (16C) day and night, this can delay plant growth and development and may cause blind eyes or no flowering.

Even though kalanchoes can tolerate drought, this shouldn't happen during greenhouse production, with the plants never being allowed to wilt. The growth media should become dry between watering, but wet soil should be avoided. The foliage should be kept as dry as possible and, therefore, using a system, such as drip irrigation, is best.

How to encourage branching and reduce stem elongation

Many of the new kalanchoe cultivars have good basal branching, so no pinching is required, which was a very labor-intensive project necessary with the older cultivars. However, if a cultivar requires pinching to encourage

branching, today the plants are normally treated with growth regulators.

Controlling elongation of the flower stalk is still required, even in the current cultivars of kalanchoe. However, compared to the older cultivars, it's minimal. Nathan said that older cultivars may need to be sprayed four to six times throughout the growing cycle compared to once or twice with today's improved cultivars. B-Nine and Bonzi have both been shown to be effective plant growth regulators on kalanchoes for controlling plant growth.

Disease and insect control

Along with some bacterial and fungal pathogens, there are many viruses that can affect kalanchoes and, therefore, starting with cuttings obtained from a producer who has virus-tested stock plants is important. Prior to planting cuttings, they should be inspected for evidence of pests or pathogens.

Bacterial stem rot (*Erwinia* spp), fusarium species, pythium species, *Phytophthora nicotiana* and powdery mildew can all cause issues for the kalanchoe grower. At Balfour, they preventatively treat only the white varieties of kalanchoe because they're quite susceptible to infection by fusarium species. For mildew, they use sulphur pots. Nathan said that, in their experience, as long as you start with a disease-free cutting and enforce sanitation, they've not run into any major problems.

Producers shouldn't use chemicals as dusting powders on kalanchoes, as they're extremely sensitive to such powders.

Insect issues with kalanchoes are similar to those experienced with other greenhouse-grown flowering succulents, with aphids, thrips, mites and mealy bugs all being potential problems. Succulents are sensitive to many insecticides—Malathion, for example—and derivatives shouldn't be used.

Growers can start in the kalanchoe business by either “testing the waters” by purchasing plants all ready to sell from a greenhouse like Balfour. If they feel confident of their markets, they can grow the plants from cuttings. All the companies that produce the cuttings and ready potted plants provide growing instructions and producers are encouraged to adhere to these and contact the company for any additional help they may require.

Toxic to pets

As kalanchoes contain naturally-occurring poisons that if eaten by dogs or cats can affect the heart, growers should add a label to indicate that the plants should be kept out of the reach of domestic animals. **GT**

Please note: The specific directions on fungicide labels must be followed and supersede any statements in this article, if there is a conflict. Any reference to commercial products, trade or brand names is for information only.

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