



Floricultura®

The orchid professionals since 1933

Newsletter

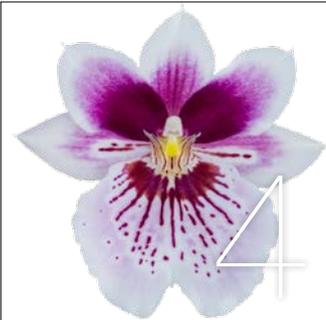
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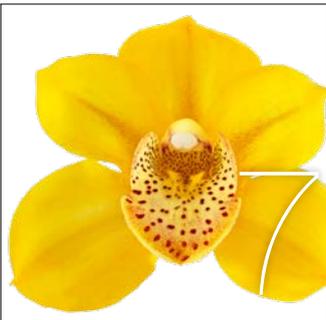
Phalaenopsis
cultivation tips
for the summer
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The balance
between growth
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Day length also
affects a plant's
behaviour



Cymbidium
throughout
summer!

Phalaenopsis cultivation tips for the summer of 2016

Light

Now that outdoor light intensities are increasing you must make sure your plants receive sufficient nutrients. We advise you to give them more sodium by increasing the N/K ratio, even if you succeeded in realising the desired light sum fairly well last winter. Don't underestimate the sun's power. Growers of course tend to focus on the PAR of the light inside their greenhouses, but the same lux intensities provided by daylight or lamp light result in large differences in PAR. 10,000 lux lamp light results in about 120-130 PAR, whereas that same lux intensity from the sun leads to around 180 PAR. That's almost 1.5 times as much growing light, and that's precisely why we prefer to measure PAR values. We also advise you to make the light less direct (diffuse) by using an LS10 screen. An added advantage of such diffuse light is that it will penetrate your crop better.

Whitewashing the roof of your greenhouse will ensure a far more stable climate. Various whitewashing products from different suppliers are available on the market. Some of them are specifically intended to filter out the infrared radiation and allow the rest of the light to enter the greenhouse. A lot of experience has been gained with this the past few years, in efforts to realise higher light sums. The light intensity and temperature in your greenhouse may have the desired values, but don't forget your plants' leaf temperature.

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Flower Trials®

14 - 17 June 2016

**Floricultura will be organising
flower trials as usual!**

*You are most welcome to visit us along
Strengweg in the Dutch town of Heemskerk.*



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ORCHIDACEAE

That may become too high at high light intensities, resulting in a too high VPD, in which case moisture may be extracted from the leaves even when the stomata are closed (they will rarely be entirely closed).

So try to avoid extreme light peaks and too high light sums. On dark days, on the contrary, you must beware of the light sum decreasing too much. The computers of most lighting systems can couple the time at which the lamps are switched on to the time of sunset. The lamps will then automatically be switched on a few minutes later each day, until they are no longer needed. And when the days start to shorten in August the lamps will be switched on again. Nights of at least ten hours are best to allow the plants sufficient time to rest (though they won't be resting entirely because night time is when they absorb CO₂).

Water

Never water your plants on autopilot. The first six weeks it's often good to help your plants through a difficult start by giving them an extra dose of water, to facilitate saturation of the pots. In the case of plugs, on the contrary, it's better to irrigate less in this early phase, to motivate the roots to grow out of the plugs. Scales are ideal for helping you to determine the right time to water your plants to your benefit.

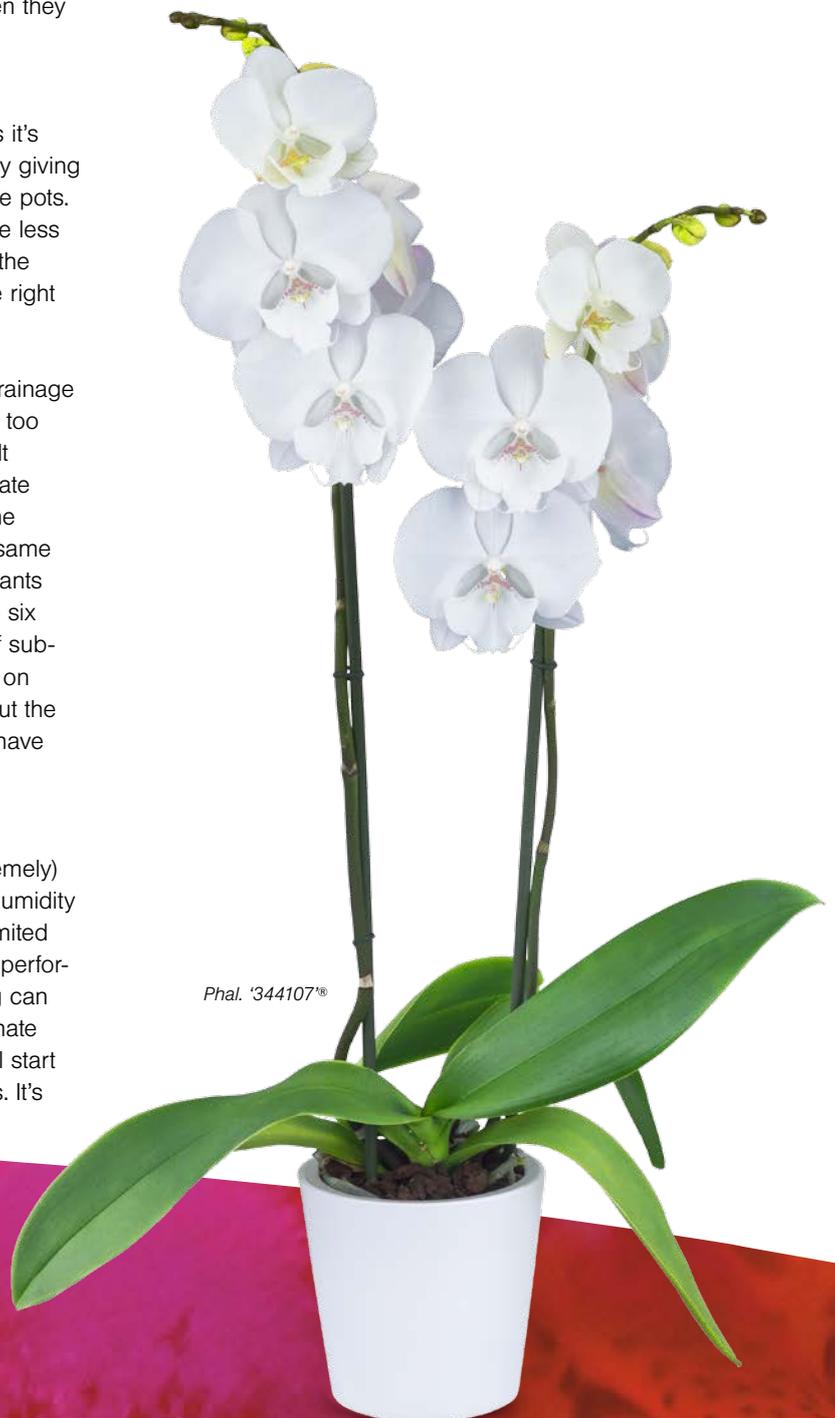
It's very important to measure the pH and EC of your drainage water. The top layer of the substrate may soon become too saline when water evaporates from the pots, leaving salt behind. So regularly (once every four to six weeks) irrigate your crop with clean water! If you frequently measure the values of your drainage water and you always use the same number of litres you'll be able to work out when your plants need clean water. Irrigate your plants once every five to six days if the substrate is dry after that time. In the case of substrates with a high coco or peat content it's best to rely on substrate analyses. The drainage values may be fine, but the substrate's salt content may meanwhile unintentionally have risen too much.

Temperature and relative humidity

In spring (April-May) the relative humidity may be (extremely) low, necessitating misting. You may try increasing the humidity via your ventilation windows, but that will have only a limited effect. So check your misting system to make sure it is performing properly. The pulse length and start of the misting can be set to be dependent on the light intensity (many climate computers now offer this option), so that the pulsing will start earlier and last longer on days with high light intensities. It's

best to try to keep all climate conditions as constant as possible. Strongly fluctuating relative humidities are known to involve a risk of *Pseudomonas* infections.

When the outdoor temperatures begin to rise, insects become more active, making frequent, efficient scouting very important. Insect lamps and traps may be of great help to you. Dry your substrate via the underbench heating pipes and decrease the overhead heating as the insolation increases (especially during the cooling and final propagation phases). Check whether the P-band values have been adjusted after the winter. If the settings are not adjusted the windows will be opened insufficiently and the greenhouse temperature will increase too much. The windows of some systems cannot be completely opened;



there will then also be a risk of the greenhouse temperature rising too much.

In such cases you should start ventilating earlier (or set the windows further open each time). You may now also reduce the ventilation and screen settings' dependence on weather conditions. We advise you to check how a certain percentage indicated by your computer relates to the degree of opening of your ventilation windows and screens. This will enable you to adjust settings where necessary, to control conditions in your greenhouse more precisely and more effectively.

From the viewpoints of climate and energy it's best to pay close attention to the use of your screens. Test your cooling system before the weather gets really warm. Bear in mind that mechanical cooling is more expensive than natural cooling, but involves the major advantage that moisture and CO₂ remain inside the greenhouse.

White worms

What has proved to be a major problem the past few years is controlling white worms (*Lyprauta*). Some growers have had more problems than others. Whether or not the pests can be effectively controlled often depends on a combination of factors: irrigation, heating and the type of substrate. The substrate's composition and the time at which it was harvested may well also have an influence on whether a white worm colony will develop. Good scouting with lamps (that also trap other moths, besides those of white worms) is essential. The only effective way of dealing with the moths is a cycle of greenhouse treatments. Spraying is less effective as there are no good chemicals for controlling the larvae. It's also difficult to get at the larvae in the pots. Varying results have been achieved with nematodes, but those treatments are rarely entirely successful. Fortunately research constantly leads to new promising results, such as the discovery of a predatory wasp and a predatory fly that occur spontaneously in greenhouses. The possibility of using fungi is also being investigated. Meanwhile, ever more information is becoming available on the cycle of *Lyprauta*. Such information is essential for finding a reliable solution to this problem. Drier cultivation conditions and the use of more insect lamps are reasonably effective, but a drawback of the former is that the plants grow less quickly. Wetter conditions will lead to faster growth, but may also increase the risks of more worms and fusarium infections. Dry, clean greenhouse benches will also reduce the risk of white worms. If you want to grow your plants organically you will have to stick to the rules concerned and ensure the right relative humidity, temperature, doses of nutrients and presence of natural enemies, while refraining from using chemicals with negative aftereffects. Organic cultivation can only be done properly with the right knowledge.

Substrate

The past few years a lot of experimenting has been done with different types of substrates and different ratios of the various materials used in substrate mixtures for pot orchids. Growers rarely use standard mixtures because most tend to have specific requirements with respect to irrigation and the drying of their substrate. Many conditions outside a pot have an influence on conditions inside the pot, such as open or closed benches, open or closed screens, open or more closed pots, the method (long or short sessions) and frequency of irrigation, the number of underbench heating pipes, the circulation of air under and above the benches, etc.

Since we started supplying almost all our plants in plugs just over a year ago we have come to the conclusion that finer mixtures are more suitable for plugs. Finer does not necessarily mean wetter; this depends on the ratio of the various substrate ingredients, such as peat, coco, sphagnum and bark. As no two nurseries, growers or ranges are exactly the same it's impossible to recommend a standard irrigation frequency. Comparisons have shown that growers using the same substrates and pots sometimes nevertheless obtain different results, much to their surprise. We have learnt a lot of useful lessons from such comparisons. Information like that is essential for learning things from one another and making improvements.

Thrips

Besides the familiar Californian thrips there are many other types of thrips that may damage *Phalaenopsis*. One of them is *Echinothrips*, which is also found in other types of orchid and can cause deformation. We have recently also come across damage that was initially assumed to have been caused by a moss mite. However, the type of damage concerned, as can be seen in the photo, is now believed to be too sharp for such a mite. It may also have been caused by some kind of thrips. If you find such damage and are in doubt, have it analysed.



The balance between growth and flowering in orchids

All our customers make constant efforts to optimise the growth and flowering of their various orchids. We know that temperatures of more than 26°C promote good vegetative growth in Phalaenopsis. But temperature is not the only factor promoting good growth; there are many other influential conditions. Different growers have optimised different conditions, such as light (intensity and day length), CO₂, relative humidity, water doses and fertilisation - to mention but a few.

Phalaenopsis are known to start to form spikes at 24-hour temperatures of around 19°C. The aforementioned factors also have an influence on their flowering. For example, CO₂ is known to result in a distinctly larger number of spikes in some varieties. Higher daylight sums also usually result in more spikes. In their initial propagation phase, Miltoniopsis require a distinctly lower temperature than Phalaenopsis, i.e. 21-22°C. And they need a temperature of around 18°C to flower. A night temperature of 14°C is necessary to get Dendrobium to flower. A plant's hereditary properties have a great influence on their growth and flowering. It is those properties that determine whether or not a plant will flower. Some Cymbidium varieties are known to go through a juvenile phase in which they can't flower. The length of this phase differs from one variety to another, and may be as much as three years. Cymbidium trials

have shown that the diameter of the bulb determines whether or not a plant will flower.

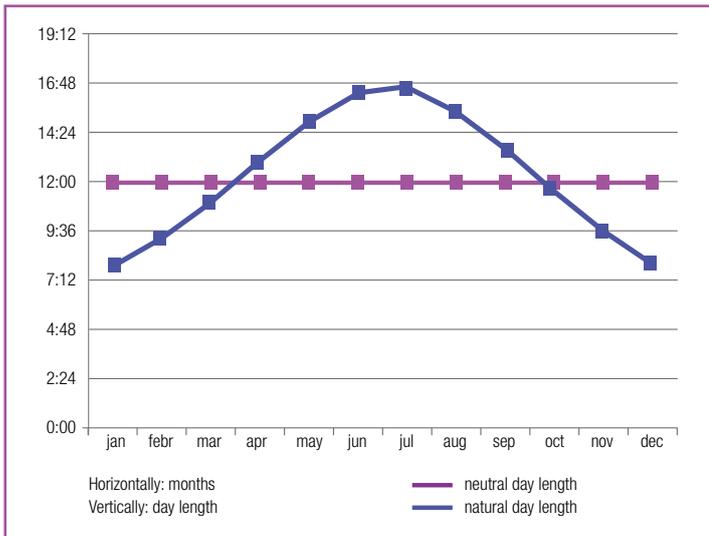
Our crossbreeding experiments have led to some well-growing plants with attractive inflorescences and flowers. A good example is Burrageara 'Nelly Isler', whose parents have entirely different growing and flowering requirements. One of the parents grows and flowers at much lower temperatures than the other. We used four different genera to create this Burrageara, i.e. Cochlioda, Miltonia, Odontoglossum and Oncidium. In such complex crossbreeding you don't know beforehand which of the ancestors' characteristics will prevail. This same hereditary material makes it very challenging to find the right climate conditions to get a plant to grow and flower well. The greater the spread in hereditary properties, the more difficult it is to find the right recipe. We believe that this cultivar's capacity to flower depends on several climate conditions. A long-day treatment alone does not lead to the same flowering results in 'Nelly Isler' all the year round.

A short-day treatment to promote growth does not enable you to propagate plants without spikes all the year round. The plant's hereditary material includes properties affecting its flowering that we have not yet identified or which we can't influence. Orchid propagators believe that the balance between growth and flowering can be best optimised via adjustments in the amounts of light and CO₂, the temperature and the relative humidity. All the orchids we have propagated show differences influenced by light, temperature, CO₂ and relative humidity. The coming years we are bound to find many new ways of controlling growth and flowering.

Day length also affects a plant's behaviour

In the past we have published articles discussing the possible effects of day length on the growth and flowering of orchids. See for example the article in our Newsletter of the spring of 2015 (pages 7 and 8). We have now done some trials with Miltoniopsis and Odontoglossum hybrids in two separate sections. One section was kept at a "neutral" day length of twelve hours all the year round, whereas in the other section the conditions varied along with the seasons, i.e. a day length of 16.5 hours on the longest day in summer and a day length of 7.5 hours on the shortest day in winter. In the case of insufficient natural light we used grow lighting with an intensity of 4,000 lux.

In this trial some of the plants of both sections were moved from one section to the other, so from a "neutral" day length of 12-12 hours to the "natural" day length section. This was done at the times of year when the days begin to lengthen or shorten, so on 21/3, 21/7, 21/9 and 21/12. So some of the plants growing in the "neutral" day length section were moved to the section in which the days were about to lengthen on 21/3, whereas other plants that had been growing at a short, but increasing day length since 21/12 were moved to the "neutral" day-length section of 12-12 hours.



The two diagrams show what happened. The first diagram shows some of the plants that had been continuously growing at a day length of 12 hours that were moved to the natural day length section around the longest day while the other plants were not moved. The second diagram shows the opposite. Only some of the plants were moved to the other section on the aforementioned dates. So many different options were studied.

All these movements at different times made this a very complex trial. It was carried out by VAN OS Research and led to some remarkable conclusions.

1. When the day length increases by around three hours the plants go into a different mode and start forming more shoots, resulting in a higher percentage of plants with two shoots. In subsequent trials we saw that this change takes place within four weeks. The effect in the middle of the summer (from the "neutral" 12-12 hours to 16.5-7.5 hours) is exactly the same as that in the winter, from 7.5-16.5 hours ("natural") to 12-12 hours "neutral". So the effect was the same in spite of the much lower PAR sums!

It would seem that not all varieties respond to this in a positive way. For example, some Miltoniopsis cultivars were observed to respond as described here, whereas others responded in exactly the opposite way. To achieve this effect, those plants had to start with long days, to then be moved to short days. We termed the first group Short Day (SD) flowering orchids and the second group Long Day (LD) flowering orchids. The cause of this difference lies in the plants' botanical background. The SD orchids are Miltoniopsis that originated in the highlands of South

America, whereas the LD plants are native to lowlands and are actually not Miltoniopsis, but Miltonia. Crossbreeding has led to differences in the plants' responses to various influences. We observed a similar effect in Odontoglossum hybrids. We will have to determine which varieties are LD or SD orchids in order to provide the right cultivation advice.

2. With a constant day length of twelve hours the young plants retained the same shape. If you allow plants to develop naturally, without control measures, you see little



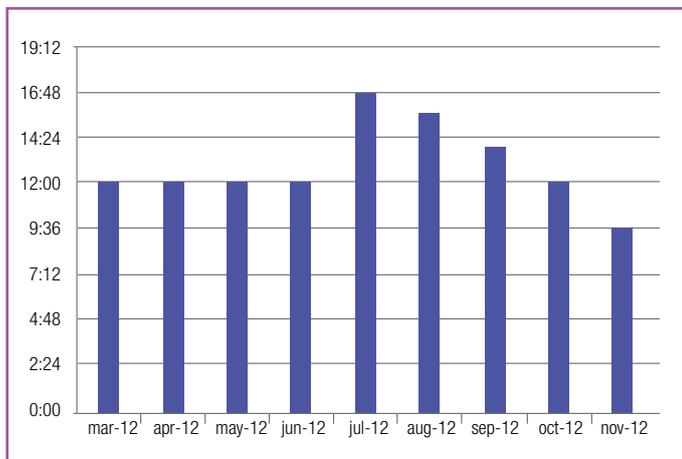
Den. Nobile '700009'

or no bulb formation in young plants in spring, but a rapid increase in the development of bulbs later in the year, in particular after the longest day. This means that young plants undergo different seasonal influences throughout the year, causing the plant material to behave differently and acquire different shapes. This prompted us to install screening throughout our entire propagation nursery, to enable us to realise the same day length for our young plants the whole year round (in summer and winter), so

that we can supply plants that have been 'programmed in the same way' all the year round. Of course the next link in the chain (our customers the growers) must be aware of this and respond accordingly.

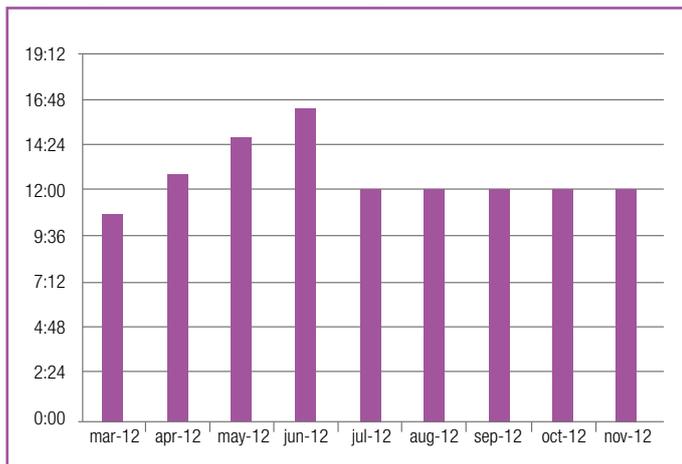
3. When the day length decreases by around three hours the plants flower more readily and more uniformly after some time. This is rather like the behaviour of *Phalaenopsis* meristems that are transferred to the cooling area at a specific time to boost the formation of a high percentage of uniform spikes.

Day length treatment with two shoots



From a 12-12 day-night length to natural conditions

Day length with uniform flowering



From natural conditions to a 12-12 day-night length

On the basis of the first trial that led to the PLUS 3-MINUS 3 conclusion we focused on determining the best time for the control measures. For growers it is most convenient to receive pre-programmed plants. Can we achieve this as suppliers of young plants? We therefore studied the effects of influencing plants after they have been removed from their flasks for a few months, plants just before they are potted in 11-12 cm pots, plants immediately after they have been potted, and plants after their roots have penetrated the pots. We found that the best time for this day length action is just after the roots have penetrated the pot.

We have noted that growers tend to want to realise specific light sums. However, a light sum is a combination of light intensity and time. In the case of *Miltoniopsis* and most *Odontoglossum* orchids, the light intensity may not exceed 140 micromol/s while day lengths of more than fourteen hours tend to have an adverse effect on most orchids. These are things that should be borne in mind. Studies focusing on the stomata's response to light have shown that most plants, including orchids, can tolerate relatively high light values in the morning, but the light intensity should be lowered around midday. Further research in the future will hopefully yield more information on the optimum values (three hours more or less) for effective control of these plants.

We have meanwhile formulated (preliminary) cultivation schedules for *Miltoniopsis* and *Burr. Nelly Isler* based on cultivation with variations in day length and temperature with the aim of improving the control of these plants' development to realise better growth (fewer losses, faster growth) and flowering results (more plants with three and four spikes), i.e. competitive products of better quality. This can only be achieved at nurseries with separate sections in which different day lengths can be realised. So an exciting challenge for you!



Cym. 'Super Pink'

Cymbidium throughout summer!

Like last year, we had an extremely mild winter. But last year we managed to realise good production after all, though a few varieties flowered poorly at some nurseries. Surprising was to find that, whereas some plants were flowering fine, with sufficient spikes, plants right next to them produced 50% fewer spikes. And when you looked closely, you'd observe shoots that shouldn't have developed at that stage.

In this period insolation leads to high leaf temperatures, preventing assimilation while increasing the consumption of sugars. This may soon lead to a shortage of sugars, resulting in the loss of spike buds in the period March-May. Plants respond to this with the formation of new shoots at the wrong time. The main cause of problems was the very dry weather, causing plants, and also their spike buds, to dry out. So check the moisture levels of your plants at least once a week, preferably every day. Use scales and record the weights of your drainage water.

Ultra-early range

On the basis of last season's results, growers of orchids that flower early, in the period August-September, may once again expect plants of a good quality, with sufficient flowers, providing they keep everything well under control the coming months.

So make sure your 24-hour average temperatures don't exceed 21°C, and preferably lie in the range of 19.5-20.5°C. At temperatures of 21°C and higher the spikes won't elongate if the spike buds are smaller than 2-3 cm, and your plants will suffer further loss of quality. Depending on your facilities (availability of outdoor screening and/or a misting system) and the weather conditions and weather forecast around the end of May, you may have to whitewash your greenhouse at the end of May already.

An effective misting system will enable you to substantially lower the daytime temperature until sometime in July. The night temperatures will still be low enough until then. After that time, however, the night temperatures may become too high after sunny, hot days, and then you won't be able to lower them by misting during the night. What you can do then is lower the daytime temperature by misting to keep the 24-hour average temperatures at an acceptable level. Major differences between day and night temperatures may result in red flowers with black pollen caps in the case of some varieties.

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Very early range

Orchids of the very early range, flowering in October, require the same conditions as those of the ultra-early range. Make sure you realise the recommended 24-hour average temperatures. Switch on your heating if the weather turns cold, dark and rainy for several weeks in June, July or August. Heating pays off in the end. If you don't switch on your heating to save costs your plants won't flower until after 1 November. They will then fetch lower prices, and you will find that you've lost more money than the small amount you would have spent on gas. Whitewashing will have to be done around the longest day, depending on the weather conditions around that time.

Early (Christmas) range

Flowering in December is largely dependent on the temperatures realised from July onwards. If it is too cold in August, you'll have to switch on your heating to remain on schedule. The past two years the plants of this range flowered in time thanks to the good weather in September-October. But things may be different this year, so keep a close eye on your 24-hour and weekly average temperatures so that you won't find yourself lagging behind schedule. The principle is the same as described in the previous section: if it is extremely hot in June-July (which would cause plants to flower later), you will have to be alert and take measures in August and later to prevent the risk of some of your orchids flowering after Christmas. From experience we know that this has an adverse effect on prices.

Middle range (St Valentine's Day - Women's Day)

Allow light into your greenhouse and don't start whitewashing too soon; preferably postpone it for as long as possible. If it turns dark and cold in August-September, switch on your heating and ensure an active crop. Heating in that period may sound odd, but can be very effective. A little extra heat will lead to a better quality and help you plan things more effectively. You will earn more than you would have saved on energy, and it will also imply savings in labour costs because of the smaller amount of sorting work.

In 2017 Easter Sunday will fall on 16 April, which is fairly late! So while you will have had to bring the flowering of your varieties forward a bit to get them in bloom for Easter (end of March) this year, you will now have to get those same varieties to flower later next year. You'll be able to realise this in November, by setting the 24-hour average temperatures a little lower for the period from December until the end of March.

Late range

For the very late range you will have to whitewash your greenhouse around now (late April-early May), especially if the weather is very sunny. Misting will help you to keep the temperature low enough in the daytime, resulting in plants of better quality. Keep checking your plants' transpiration by weighing the drainage water and/or the plants.

Very important for this range is to postpone removing the whitewash until early July. If it is particularly fine weather then, wait for a little longer, to avoid a too great transition. But do try to get it removed by mid-July. Again make sure that the required temperatures are realised in August-September, if necessary by switching on your heating! IR (infrared) leaf temperature meters and PAR meters can provide useful information, and show you for example the effects of whitewashing and screening on the climate in your greenhouse.

Snails and slugs

Snails and slugs can cause more damage in Cymbidium than is often realised. Small snails feed on roots while the larger slugs may cause problems later in the season, from March onwards. Snails and slugs multiply tremendously after periods of warm, humid weather. The best form of control is preventive control. Keep your paths clean and free of weeds. Scatter pellets in April-May, and once again in August-September. In the case of serious infestation, scatter pellets once every three weeks, following the dosage instructions on the packet.

Red spiders mites

Red spider mites are a frequently recurring problem. They may quite suddenly appear in great masses in warm, dry weather in spring. Regularly scout your crop. Good experiences have been obtained with biological control, subject to two conditions. The first is to create a humid climate in which predator mites will feel a lot happier than red spider mites. And the second is meticulous, regular scouting to enable you to take action at the right time by making more use of predator mites and/or spraying affected parts of your crop with pesticides.



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