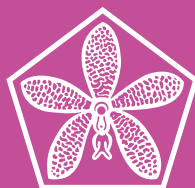


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Don't miss this:

"Growing Dendrobium Nobile"

See Pages 2 and 3

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Growing *Dendrobium Nobile*

An attractive product

In the past, *Dendrobium Nobile* was primarily a spring-flowering variety, even in Dutch greenhouses with numerous facilities. However, *Dendrobium Nobile* has been made to flower all year round by applying a short-day regimen and cooling as from a few years ago. The number of weeks a specific variety needs to be exposed to a short-day regimen is becoming increasingly clear. However, this depends on the season and is therefore very specific to the variety involved. The plants even undergo cooling without daylight; instead they are exposed to LED lighting in a cell. The advantage to this method is that it heightens the efficiency of the cooling pro-

cess and keeps outside influences (radiation and temperature) in check. Because this orchid needs more water and to be watered more frequently than *Phalaenopsis*, for example, there is always a risk of potworms. This problem can largely be tackled by using a finer (coir) substrate. This ensures that the *Lyprauta* are unable to burrow into the substrate. If they do so at all, they can only create a problem at the basis of the plant. Plants grown on this substrate must be watered meticulously, considering that moss and algae can easily grow at the top of the pot if the conditions are too wet and/or too dark.

Optimising cultivation processes

The past few years have shown an increasing focus among growers on the optimisation of their cultivation processes. Floricultura supplied its plugs in a 52-hole tray that consisted of a combination of a small sphagnum and coir plate. In consultation with our clients, we have now opted for a 45-hole tray with coir plugs. This allows the plants grown from seedlings in Floricultura plug trays to make better use of light. Tests have shown that the young shoots are more vigorous and therefore easily produce multiple shoots per plant after they have been brought to our customers. This also makes it easier for the plants to gain access to nutrition and moisture. The number of new trays has gradually increased and more will be supplied in the next few months to come. We will, however, keep a close eye on how these changes are affecting the cultivation process. This is often only discernible when really big volumes are in use at the nursery. The advantage of having bigger volumes at a nursery is that it is easier to control the various factors involved.

Pest control

With regard to pest control in *Dendrobium Nobile*, this is becoming more difficult be-

cause customers are becoming increasingly critical of (legal) crop protection agent residues. As a result, there is virtually no other method but to combat pests biologically and, above all, to start doing this at an early stage when the plants are still young. At Floricultura, young plants are scouted on a weekly basis by a large group of employees. Additionally, biological pest control (predatory mites) is regularly used by introducing *Stratiolaelaps scimitus* (also known as *Hypoaspis miles*) and *Amblyseius swirskii*. Our customers have been combating pests like spider mites and trips more and more frequently with natural enemies. The disadvantage to this is that the caterpillar problem (e.g. *Duponchelia*) appears to be worsening - or is already doing so. In other crops, the use of *Atheta coriaria* has apparently produced successful results. Eggs and small caterpillars of the *Duponchelia fovealis* moth are, after all, part of the predatory beetle's natural diet. The product range currently consists of primarily white and purple, but more colours will be available in the next few years to come. It is therefore important to continue to retain *Dendrobium Nobile* in the product range as an attractive and exclusive commercial product.

Part 2: Day length determines flowering in Phalaenopsis!

Optimising cultivation processes

In our newsletter 2016-2 of October 2016 we reported on the surprising test results for Phalaenopsis grown under varying day length conditions before and/or during cooling to discover how this would affect the development of spike initiation and flowering. This information was presented by Adrie Smits at the FlowerTrials in the summer of 2017 at the conferral of the Klaas Schoone Memorial Award. It was announced during the presentation that a series of follow-up trials had been set up in collaboration with VAN OS research. We would like to share the results with you in this article.

The first two trials, executed in 2016, consisted of three regimens:

1. Control = raising and cooling: day length of 14 hours and longer*
2. 8 weeks before and during cooling: day length of 12 hours
3. 8 weeks before cooling: day length of 14 hours* and cooling for 12 hours

The results of this trial were presented in the Newsletter referred to above. Effects have been produced!

*Lighting was applied for up to 14 hours; the natural day length in summer can rise to 16.8 hours.

One of the questions that we would like to see answered by the follow-up trial is how being exposed to a regimen based on a 12-hour day length 8 weeks before cooling and a 14-hour* day length during cooling would affect the plants. This is why a fourth treatment was added to the trial: a 12-hour day length 8 weeks before cooling and a 14-hour day length* during cooling.

The trial was started in Week 14 of 2017 and was conducted jointly by three nurseries: two with a standard product range and one with multiflora: three varieties per nursery, 500 plants per regimen type, and a total of 2000 plants per variety. All plants were grown in vases/collars.

The trial started with a short-day regimen during the raising process in Week 14, in which the plants were moved to the cooling unit in Week 22. This means that the plants were given a day length of 12 hours (which is normally 15 hours or longer) eight weeks before the cooling phase was initiated. In this week, plants were switched: those that remained at the participating nurseries for

long-day raising were moved to short-day cooling, while the plants had been subjected to short-day raising were moved to long-day cooling. The plants undergoing a short-day regimen were grown in a test greenhouse

in Assendelft and the plants subjected to a long-day (normal) regimen were grown on the premises of the participating nurseries. An overview of the results of the previous trials is included in the following tables:

% Multi-spiked plants at:

	Control (1)	12-hour day length raising + cooling (2)	≥ 14-hour day length raising 12-hour day length cooling (3)	12-hour day length raising ≥ 14-hour day length cooling (4)
Winter 3 -4 spikes	43	19	24	-
Summer 2- 3 spikes	81	94	91	-
3 rd trial summer 2017	91	75	81	86

What is remarkable is that the control batch scores better in this third trial in comparison to the other regimens, also in comparison to last year. This can be attributed to various causes, one of which is that the exterior screens were closed during the cooling phase (during which the weather was extremely warm). As a result, the daily light integrals did not exceed 6 mol per day during this trial, which was higher in the participating

nurseries' control batches (namely: 7 - 9 mol). During the cooling phase (June 2017) we had 232 hours of sunlight, while this had been 185 hours in 2016. The average is normally 205 hours. This is also reflected in the average daytime temperature. Normally speaking, this is 15½°C, while it was 17° in 2016 and 18°C in 2017. To achieve the desired temperature the trial made use of exterior screens. A previous study conducted by Plant Light-



ing revealed that a lower daily light integral during cooling, as opposed to raising, clearly produced a negative impact on photosynthesis. In practice, and particularly in warmer foreign regions, we saw the same results: fewer 2-spike, fewer flowers/spike and similar. Another cause is that growers have been setting to work with progressive insight with the results of the 2016 trial in mind. A negative DIF was attained in the cooling unit in Assendelft due to the high temperatures, regardless of whether exterior and interior

screens were used or the cooling capacity. This can influence plant growth. We have noticed that regimen comprising a 12-hour day length in raising and a 14-hour day length in cooling produces a better result than a 12-hour day length in cooling or a 12-hour day length in raising + cooling alone. The positive effect of branching remains clearly visible and, as such, the 12 hour day length in the last 8 weeks before cooling, with a longer day length of 14 hours in cooling, produces the best results.

% Plants branched:

	Control (1)	12-hour day length raising + cooling (2)	≥ 14-hour day length raising 12-hour day length cooling (3)	12-hour day length raising ≥ 14-hour day length cooling (4)
Winter	52	70	72	-
Summer	47	57	54	-
3 rd test summer 2017	45	48	50	59

The same trend is in fact reflected in the number of flowers per plant.

Number of flowers per plant:

	Control (1)	12-hour day length raising + cooling (2)	≥ 14-hour day length raising 12-hour day length cooling (3)	12-hour day length raising ≥ 14-hour day length cooling (4)
Winter	21	23½	23	-
Summer	16	19½	18½	-
3 rd test summer 2017	18½*	17,6	16½	19,3

*Not enough for a reliable result

The results give Phalaenopsis growers a foothold for reviewing the possibilities provided by lighting. A lot of light, in the sense of giving the plants more light for a longer period and a longer day, inhibits the development of buds in the last phase of the raising process. In conclusion, after all the tests were conducted it became clear that external climate conditions play a significant role in deciding when to apply a shorter, 12-hour day length regimen. When cooling it is imperative that you attain the daily light integral for a higher percentage of multi-spike plants if you want a good result. An orchid's habit in terms of spikes is initiated in the raising phase. A shorter day results in a better-developed spike. The optimum cultivation process for achieving the best finished product is up to the Phalaenopsis grower: more spikes, speed of growth, spike length or habit. In this, screening in the

six-month summer period is just as important as sufficient lighting in the six-month winter period. The test series launched in October 2015 has prompted many Phalaenopsis growers to start using screens as a normal cultivation measure for an optimum result.

Summary

A lower daily light integral during cooling, as opposed to during raising, produces a lower percentages of 2-spike plants. A 14-hour day length regimen in cooling produces faster flowering and longer spikes. A 12-hour day length regimen in cooling produces shorter spikes (no inhibition spraying needed at spike length). A 12-hour day length regimen 8 weeks before cooling and a 14-hour day length regimen during cooling produces the highest number of flowers/spike and percentage of branched plants.



Lark Song,
moderate activity



Perceval,
substantial activity



Misty Mountain,
moderate activity

Sodium and chloride retard growth

When growing Phalaenopsis and Cymbidium a drain analysis is a method that is often used to see what is happening in the pot. This is a particularly good method if you are using substrates that retain little or no nutrients (e.g. bark for Phalaenopsis and perlite or rockwool for Cymbidium). Bark, in particular, binds very few elements and also retains very little water with fertiliser. Rockwool, we have noticed, retains a lot more water but it can easily be rinsed out. It does not easily bind with the substrate. The amount of nutrients in the water retained in this substrate is certainly high in comparison to bark.

If a drain analysis reveals an EC of 1.0 mS/cm and the EC dose is 0.9 there is, generally speaking, no cause for concern. If the analysis reveals an EC of 1.5 and the dose is 0.9, this may be a good time to intervene with clean water. When growing Phalaenopsis the addition of peat, coir and sphagnum will aid moisture retention, while also enabling the nutrients to bind better with the substrate, thus giving the organic matter an important extra buffer with regard to nutrients. These nutrients can sometimes bind strongly to the substrate. We decided to perform a substrate analyses on Phalaenopsis plants grown on coir plugs to gain a better impression of the elements retained in the substrate. When conducting a substrate analysis water is added to isolate the elements. However, this will also result in their being diluted. In organic substrates a substrate analysis with an EC of 0.7 produces an entirely different reaction. To compensate for the dilution that occurs during the analysis we multiply this value by 3 to find the approximate value in the substrate,

"A higher EC can ensure stronger growth"

which is 2.1 in this case. If the EC dose is 0.9, the value measured during a drain analysis will usually be only 1.1 or 1.2.

We have noted that when conducting drain analyses on organic substrates the value on the substrate is often higher than the value measured during a drain analysis. A higher EC can ensure stronger growth. This high EC can, ultimately, be the cause of a low water and nutrient absorption. The plant adjusts itself by allowing casting off its roots, and has difficulty in growing new roots. Because of the high EC values the pH of the substrate will drop and can become too low.

Sodium is one of the positive elements that can bind to the complex of the organic matter. Other positively charged elements are calcium, magnesium, potassium and ammonium. If the same multiplication factor is used that is applied to the EC, a sodium value of 0.7 mmol in the substrate would immediately result in 2.1 mmol. This value approaches element's danger zone. In a test conducted earlier this year, a sodium value of 1.2 mmol was measured despite a low substrate EC.

The roots refused to grow in the new substrate, even after six months. Constriction to the roots was visible, as well as black root tips, a brown discolouration on the roots and few or even no new root tips. When growing Cym-

bidium, which is a perennial plant, organic matter is created by roots that are dying off. In this case, elements can also be detected. As a result, it can often be noted in winter that, despite giving the plants clean water, the EC remains remarkably high. The older the plant, the more organic matter.



Why is there sodium and chloride in the crop? Here are some of the possible reasons:

- The substrate (coir) contains a large quantity of these elements;
- The water (spring or tap water) contains these elements;
- Basic fertilization of the substrate;
- The recirculation of water
- The use of fertilisers containing sodium (e.g. iron 3%, all solid potassium fertilisers and even sodium molybdate);
- The use of disinfectants containing chlorine dioxide, chlorine bleach, ECA water;
- Seaweed and biological preparations.

What can we do if sodium values increase?

- Increase the EC values of the irrigation water to promote growth and ensure that the elements inhibited by sodium (potassium and calcium) remain sufficiently available.
- Use clean outlet water. Regularly conduct quality inspections.
- Prevent high values of chlorine dioxide or ECA water, for example, from reaching the plants

through the clean pipes. Always inspect the water coming through the pipes on these substances.

- Use only fertilisers without sodium, or a very low sodium content, if possible. This is a precondition for recirculation.
- Try to rinse out high values. This will not work and just want to go and depends on the quantity of the organic matter and the properties of the substrate.
- Equipment is available nowadays to extract sodium from recirculation water (Poseidon).





Growing Cymbidium in summer

After a mild winter

Last winter the weather was particularly mild, although there were several months with no sunshine. We had more sun in the first two weeks of February than in the three months that came before. Immediately after this, we had a good week of severe frost, which means that the aridity level in the greenhouse suddenly rose from standstill conditions (hibernation) to high. As a result, the roots had to be stimulated, which may have had an impact on the ultra-early product range. The consequences may be that the buds will be dried out because the plants were unable to absorb enough water. In the mid- and late season you will notice this earlier (bud blast). This problem can easily be solved by checking your plants' water consumption, i.e. how much water you are giving per m² and the amount you are finding in the drain! Scales provide a great deal of insight. Failing to use them is like driving a car without a speedometer. IR (infrared) leaf temperature meters and PAR meters will provide clear insight into the effect of chalk and screening on the greenhouse climate, for example.

Ultra-early varieties

The early-flowering varieties that flower in August-September should be given 24-hour average temperatures of approximately 20°C by now. Starting now, it is important to ensure that these averages do not exceed 21°C, and preferably remain between 19½ and 20½°C. Temperatures of 21°C and up will hamper spike elongation if the spike buds are smaller than 2-3 cm and will also lead to poorer quality. Depending on whether you have external screens and/or a misting system at your disposal, as well as the weather and the weather condi-

tions at the end of May, you may have to start whitewashing your greenhouse with chalk at the end of May. If you have a good misting system you will be able to lower the daytime temperature until sometime in July. Until then, the night temperatures will be low enough, but after the third week of July this will become more difficult, particularly at night because this is when the relative humidity rises. Substantial differences between day and night temperatures may cause red flushing and black pollen caps later on in this season.

Very early varieties

The very early varieties that flower in October require the same cultivation methods as the ultra-early varieties. It is especially important to attain the recommended 24-hour average temperatures. If it is cold, dark and rainy throughout June, July and August heating will be imperative. Not heating may mean saving money, but will postpone flowering until after 1 November. This will also cost you money. So, what is the best approach? Whitewashing? Around the longest day of the year.

Early, Christmas varieties

A Christmas flowering on time depends on the temperature is attained starting in July. Flowering can be delayed in the hot summer weather. If the weather is normal in August and September there is no cause for concern. However, if it is too cold, wet or dark in these months additional heating is imperative to remain on schedule. Keep a close eye on 24-hour and weekly average temperatures to avoid having to catch up. Compare the spike length and the number of bound spikes each week so that you can compare this data to

that of the previous years. This way, you will have greater insight into whether or not you are on schedule.

Middle range varieties (Valentine's Day – Women's Day)

Middle range varieties are actually the easiest to grow. One of the biggest problems with these varieties is that they need to start growing at a day length of over 14 hours. Cymbidium has difficulty with this. Additionally, a leaf temperature over 27°C can prevent the plant from assimilating. Allow light to enter the greenhouse, and do not apply whitewash too early - it's best to postpone this as long as possible. Note: if August and September are dark and cold, activate the crop by switching on the heat, if necessary. This will lead to a better quality and planning: benefits that far outweigh the disadvantages of heating. Additionally, this will save labour costs because less sorting will be necessary due to the higher quality and uniformity. Easter will be on 21 April in 2019. This is very late! This means that flowering which was brought forward to mid-March this year will need to be delayed for the 2019 market in certain varieties. In November, you may decide to slightly lower the average 24-hour temperatures from December through March in order to accelerate growth in the varieties you will want then (e.g. for Women's Day) insofar as this is possible. However, you will need to anticipate on this earlier.

Late varieties

Chalk will now need to be re-applied to greenhouses in which late varieties are grown. Use can be made of a misting system to lower the daytime temperature. The night-time temperatures are no cause for concern at the moment. Thanks to the cool temperatures, the flowers will be even more beautiful. Con-

tinue to check the plants' water consumption by measuring the amount of drainage and or the plants' weight. It is important that you do not remove the chalk on greenhouses in which late varieties are grown until early July. Wait for a while if the weather is extremely good to avoid a too strong transition. An average 24-hour temperature of 20-21°C should be attained in August-September. This will ensure that the new shoots grows sufficiently so that they will be able to survive the cold winter climate before flowering in the spring of 2020, and also ensure that the spike elongation is impeded before spring of 2019.

Spider mites:

Regularly scout your crops for spider mites (on a weekly basis). Biological pest control is effective, provided you conduct regular inspection rounds! This will tell you if it is time to introduce predatory mites or will need to resort to applying chemical agents locally. A precondition for biologic pest control is creating a moist climate (higher relative humidity) in which predator mites thrive but which spider mites find less attractive.

Slugs and snails

Snails are a greater problem to Cymbidium growers than you would think. Small snails feed on roots while larger slugs may cause problems later in the season (e.g. in the flowers). You will see more snails as soon as there is more light and greenhouse temperatures rise, particularly there where substrate and air come together, at the foot of the shoots. Make sure that your paths are clean and that weeds are given no chance to grow. Scatter slug/snail pellets in April/May, and again in August/September. If your crop is severely infested, it is best to scatter these pellets every three weeks according to the dosage instructions.

Growing Phalaenopsis

In spring

Spring is primarily characterised by low humidity levels, fluctuating weather circumstances, lengthening days and, of course, the increasing power of the sun. The latter is a very important factor for growers of Phalaenopsis, which prefers the shade. Some varieties have more difficulty with this 'higher light' and others. Leaves can become discoloured (often reddish) and even dull, or they can form edges and concave spots - sometimes even contracting leaf burn. The latter can also occur when the plant is first exposed to a higher daily light integral for a few days. If this is followed by a darker day with a clearly lower daily light integral, i.e. a drop from 6 to 4 mol, the malate produced during the good weather may not be sufficiently broken down, resulting in leaf problems. Damage like this can be prevented by using screens and whitewashing the greenhouse with chalk on time. This way, the leaf temperature and relative humidity around the plant will be better controlled or, in other words, the vapour pressure deficit (VPD) will remain at a better level and the greenhouse conditions will have less effect on the leaves. We recommend applying chalk (a thin layer) for the first time in Week 9 or 10. However, this year there was quite a bit of frost in Week 9, so in many cases chalk was applied later. Moisture is essential to plant growth. We have noticed that when plugs are used plants generally have more and longer access to moisture because the root ball is wetter. Certain varieties that encountered difficulty in spring are now doing much better. With regard to the relative humidity in relation to the plant, increasingly clearer results are being obtained. It is known, for example that larger stomata are formed in Miltoniopsis and Cymbidium (Newsletter, April 2011) when the plants are raised to with a higher relative humidity. Therefore, it is crucial that a close eye is kept on the relative humidity when growing Phalaenopsis, particularly when the stomata are open. This often occurs as early as 9 to 10 hours after the lights have

been switched on. If the stomata are closed, relative humidity is less important, but the circumstances must not become too extreme with regard to drying out considering that the stomata are not entirely closed and that this will cause moisture to be extracted from the leaves. Taking into consideration that the plant's 'engine' is running faster on account of the higher temperatures and greater amount of light, it is important to control its development by other means. We have already mentioned relative humidity, but irrigation and fertilising are also important factors. In the past few years, we have had several springs with little rain. Therefore it is important to mix your irrigation water in due time with other, clean water, preferably derived from osmosis.

XXXXXXXX Hogere insectendruk

The increasing temperature will also cause more insects, from inside and outside, to appear. Scouting on a regular basis can prevent leaf problems. With regard to potworm, we are still diligently seeking solutions. A few new prevention agents (attractants and a Bacillus preparation) have recently been put on the market. The next few months will show if this can contribute to reducing the problems. However the necessity of finding a solution is becoming increasingly important for all players in the sector, including growers, auctions, traders, financial institutions, advisers and suppliers. In the past few years, we have noticed more problems with trips in the cultivation of Phalaenopsis, even in the initial raising period. Be sure to hang up blue and yellow sticky traps on time and check these regularly. Of course, you know best which of your varieties are first plagued by pests, such as (false) spider mites. Some varieties are simply considered a greater delicatessen among the insect population than others. If necessary, use a clear marker and keep a close eye on this. Your plants themselves are often the best measuring device!



Floricultura Brasil

Opening 22 June at 3.30 p.m.!

After a full year of preparation, construction and installation, Floricultura's new build is ready. It contains 4,000 m² of greenhouse, in which cultivation, technology and processing have each been given optimum space. It goes without saying that we are extremely proud of this!

The official opening will be held during the Hortitec Fair on Friday afternoon, 22 June 2018 at 3.30 p.m. We hope that the arrangements you will be making for visiting Hortitec will allow you to attend this event! Please feel free to contact us for more information about Floricultura Brazil or the opening.



You are welcome to visit our 4,000 m² greenhouse, of which 3,000 m² will be used for cultivation and 1,000 m² for processing, on **Friday, 22 June 2018**.

News from our product range managers

New product range anticipated

The Phalaenopsis market is growing rapidly. It is very important for a seed enhancement company that its product range is continually innovated. Floricultura has always been in search of improvements with regard to the colour composition of all colour groups and the performance of new varieties in terms of spike formation and flower size. In the past six months, we have succeeded in adding a few beautiful new varieties to our product range.

315240

Floricultura has been searching for an apricot/orange variety for quite some time now. We finally found one! It has not been given a name yet, so we will have to make do with calling it Number 315240 for now. It is large-flowered, grows to 60 cm and has a distinctive colouring.

Variety code	315240
★ Spike length (cm)	60
↓ Flowers size (cm)	10
▣ Pot size (cm)	12



314253

White with a stripe may not seem really spectacular, but this does not apply to 314253. This orchid has a good basic colour with a subtle pattern in the flower. With a flower size of almost 10 cm this is a splendid addition to the product range. The first test batches will be available soon.

Variety code	314253
★ Spike length (cm)	60
↓ Flowers size (cm)	9,5
▣ Pot size (cm)	12



333869

We are also continually in search of innovation in the less unusual colour groups. We selected number 333869 in the pink colour group, a highly productive variety with a length of around 60 cm. One may think that pink is simply pink, but this is a genuine eye-catcher. Plants of this variety are available in plugs for testing.

Variety code	333869
★ Spike length (cm)	60
↓ Flowers size (cm)	8
▣ Pot size (cm)	12



314263

A polka-dot orchid is always sought after. Whether supplied in a mix or by variety, there is always a great demand for varieties like this. We have discovered a spotted variety in Number 314263 that has also contributed added value with regard to the shape and size of the flowers. The first plants are currently available in plugs.

Variety code	314263
★ Spike length (cm)	60
↓ Flowers size (cm)	9,5
▣ Pot size (cm)	12



315240



333869



314253



314263



324105



234215

324105

Another new variety with a deviating colour composition is 324105. White with a yellow or a red lip has become a standard in our product range. This variety's lip is a different colour: pink/orange. This makes it a genuine exception. With a flower size of almost 10 cm it is a marvellous complement to our product range. The first tests have been completed.

Variety code	324105
★ Spike length (cm)	65
↓ Flowers size (cm)	9,5
▣ Pot size (cm)	12



234215

With this multiflora variety we have succeeded in combining a good spike length and performance with a good flower size. With an attractive pattern in the flower, this variety is a splendid addition to our multiflora product range. Although it is already available, Number 234215 does not have a name yet, but we are certain to find the right name when it is in bloom.

Variety code	234215
★ Spike length (cm)	40
↓ Flowers size (cm)	6
▣ Pot size (cm)	12





Floricultura®

ORCHIDACEAE & ARACEAE

You are
welcome to visit
our greenhouse
in Heemskerk
during the
FlowerTrials!

Calendar

- FlowerTrials - 12 - 15 June 2018
- Seminar 'A world to win!' - 13 June 2018
- Hortitec - 20 - 22 June 2018
- Opening Floricultura Brazil - 22 June 2018
- RFH Trade Fair Aalsmeer - 7 - 9 November 2018

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