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## NAVIGATING UNCERTAINTY

If there is one thing most of us have learned over the past seven months is that the Coronavirus is not a light switch that you can turn on or off. Curves can flatten as fast as they unflatten, making your day-to-day situation as an entrepreneur unpredictable and bumpy.

Speaking of bumpy, everyone recalls how uncertain the road ahead for European garden centres looked when they had to deal with the all too sudden closures in March. The clarity that British garden centres will remain open under the country's newly introduced three-tier system is comforting news for the UK's garden retail industry and hopefully exemplary for politicians and decision-makers around the world.

From hindsight, the contrast between crowded aisles in garden centres throughout summer and the dumping of tonnes of unwanted flowers and plants in spring is interesting as it proves the importance of staying focused on the horizon. The importance of staying calm and thinking clearly, even if none of us have experienced a pandemic before and the vision of the future is blurry. Thoughtful leaders not only address the immediate threats – keeping workers and customers safe and daily operations up and running – but also link current moves to future outcomes, in other words, spot the blooms among the gloom and doom.

The 2021 *'The Great Reset' American Garden Trends* report highlights how shoppers will look for gifts with more meaning, for experiences and not just material goods. As such new flagship retail stores, providing a mix of retail and entertainment (and strict safety and hygiene protocols) are still opening despite the ongoing health crisis.

Is this a sign that beyond the widely accepted need to digitise business lies another reality? Most of our work and socialising is currently happening virtually. This situation can create a universal feeling of virtual fatigue. Will this overtime on devices (and on sofas) drive shoppers away from thumbnail product images, and the monotonous sound of clicks? Is the enforcement of physical distance, ushering in a new era of 'customer experience' in the real bricks and mortar world? It may sound less contradictory, considering people are increasingly feel trapped inside their four walls, especially when pubs, cafes, theatres, and restaurants are no longer open.

Every crisis invites us to ask more profound questions. General ones such as: what was it that has made me more resilient as a horticultural entrepreneur? And the industry-specific ones: what are the signs we can pick up from the first radio advertising of health insurance companies highlighting the health benefits of parks and green areas? How will global disruption in incomes influence floral spending? If edible gardening is the trend, how do I successfully align it with a consumer craving convenience, eco-friendliness and instant success? And when will governments start scaling back their aid packages and to what extent will this 'hard pruning' cut back the future growth of our industry?

Needless to say, that the pandemic will continue to drive stress into our industry, but it will also drive innovation. Positive trends appear more quickly than anticipated, so stay ready to shift in the growth gear and rise the waves of uncertainty.

Ron van der Ploeg







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## EXHIBITORS GUIDE

TOP BRANDS STAY RELEVANT  
EVEN WHEN THEY CAN'T EXHIBIT



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NETHERLANDS

## Hybrid lighting installation provides more beneficial light spectrum in lisianthus

Dutch lisianthus grower Lugt Lisianthus says that a hybrid lighting installation not only adds to stem strength and caliper but also promotes higher bud count.

Lugt Lisianthus, a quintessential family business celebrating its 100<sup>th</sup> anniversary this year, is always looking for even better product quality and longer shelf life in lisianthus. As such the company opted for a hybrid lighting installation, using a combination of SON-T (HPS) lamps and 25 per cent LED lights with Philips GreenPower LED lights with a light level of 364  $\mu\text{mol}/\text{m}^2/\text{s}$  on 5.8 hectares in Monster, the Netherlands. Commenting on his decision to combine the efficiency of HPS with the advantages of LED, grower and company owner Marcel van der Lugt says, "We opted for Signify because of the quality and reliability they provide. We believe that the Philips GreenPower LED is the most beautiful fixture. It is compact and also offers a long service life.

In recent years, Lugt Lisianthus has successfully

worked to improve the image and quality of its lisianthus. "Where we used to have five flowers per stem, we are now at 15 flowers per stem. We have also been able to decrease crop time to 8 weeks and prolong shelf life to 14 days," says Van der Lugt, who is the first lisianthus grower amid a growing community of growers who adhere to principles of Het Nieuwe Telen (HNT). HNT loosely translates as the New Way of Growing or Next Generation Growing with a strong focus on environmental conditions such as temperature and humidity. The combination of LEDs and climate control based on the principles of the Het Nieuwe Telen (HNT) brings top quality and sustainability closer. In winter, the air in the greenhouse is refreshed and brought up to temperature with outside air, reducing humidity and keeping the



crop more active. As a result, the climate in the greenhouse remains the same all year round.

Growing Lisianthus requires a lot of energy, but with Next Generation Growing, Lugt Lisianthus tries to be as sustainable as possible. Lugt Lisianthus chose the Philips GreenPower LEDs, which give less radiant heat, use 40 per cent less energy and have a payback time of 5 years. Lugt Lisianthus also found that it was possible to use the LEDs also during the summer. Until now, the grower chose

to light the crop less in the first four weeks to prevent the lisianthus from growing too fast and the head of the plant from getting too hot. With the new LED lighting, with little (convection) heat, it is now possible to start with LED lighting only. Based on the customer's specific greenhouse situation, Signify's application engineers determine the most optimal lighting solution. Using a hybrid lighting installation, it is possible to grow a high quality crop all year round with lower energy costs.

SPAIN

## State aid package for battered ornamentals growers

Spain's Consejo de Ministros (Council of Ministers) has approved a €10.5 million aid package for distribution to the country's ornamentals sector.

In an extraordinary meeting on Tuesday 6 October, the Council gave the green light to a new Royal Decree Law that will partially compensate Spanish flower and plant growers for the losses of turnover suffered due to the coronavirus outbreak. Depending on the cultivated species, the State may grant aid of €7 up to €80 per square of an ornamental crop that ended up in the landfill because there were no buyers. In April, Spanish sector body FEPEX sounded the alarm

over Covid-19, stressing that the outbreak of the pandemic had come at a business-critical time of the year, which is usually peak season for flower and plant sales because of traditional festivals and holidays. According to the Secretary General of FEPEX, Mr Jose Maria Zalbidea, the floriculture sector is the sole agricultural sector the EU's Common Agricultural Policy does not financially support. Adding that the situation is critical as almost all cut

flowers and ornamental plants growers and garden centres lost their entire spring sales.

At the height of the outbreak, one of the problems the sector faced was that significant numbers of Moroccan workers returned home from Spain. In contrast, other seasonal workers who were ready to help Spanish farmers with harvesting their crops could not enter the country due to the closure of Spanish borders for the transit of people. The closure of street food markets, flower shops, flower stalls, and garden centres meant losses of around 50-60 per cent of sales.

Meanwhile, Spanish agriculture minister Luis Planas has announced a range of measures to support the country's ornamentals sector including a nation-wide campaign to tempt consumers to buy flowers and plants more often. Spain's ornamental horticulture industry, relying mostly on exports for a substantial share of revenue, represents 3.2 per cent of the country's final plant production and occupies a production area of approximately 4,500 ha, with a production value of more than 1,000 million euros.



CHINA



## What pandemic?

### Crowds enjoy Shanghai's mega out-of-season tulip show

Marking China's Golden Week, an eight-day holiday, was an off-season tulip extravaganza on Chongming Island, Shanghai. For the occasion, a group of Chinese, Dutch and New Zealand growers forced more than 1.8 million tulip bulbs to bloom.

Oriental International Shanghai Floriculture Industry Development Ltd (OISF) is one of the driving forces behind the event. They told FCI that they had been laying the groundwork since 2019 developing the crop plan and preparing the sourcing contracts involving bulb suppliers from China, the Netherlands and New Zealand. "We had to find solutions against all seasons and odds," says Ms Coco Yang, OISF's general manager.

Under natural circumstances, Shanghai's subtropical climate is rather inhospitable for tulip plantings in the open landscape. Summers are hot and humid and tulip while tulip bulbs require 3-4 month chilling to force them out of dormancy, help them develop strong roots and high-quality flowers. OISF imported 1.8 million tulip bulbs from New Zealand which were subsequently potted in June and cold-stored until mid-September.

The pre-rooted tulip bulbs were trucked from different locations across China to their final destination, Chongming Island where 400 workers planted the tulips into the landscape of the beautiful Zhongzhong Forest in Miao Town.

Mr Ibo Gülsen, managing director of IGMPPR, a consultancy and design firm

offering a full spectrum of services for floral attractions, flower festivals and parks, provided support, guidance and advice. He says, "Pre-rooted tulips allows for the perfect timing of the bloom time and may be used to prolong the season of parks and festivals. We are honoured and proud for having contributed to the project. Despite the world-wide pandemic, the challenges in the supply chain and travel restrictions, we managed to stay on track. Eventually, we achieved a magnificent result, thanks to OISF and all partners that were involved."

Although visitation was capped at 1,000 visitors at any moment in the park due to Covid-19 hygiene protocols, over 5,000 visitors per day attended the shows, with peaks of even 10,000.

The timing of the event around China's Golden Week was perfect. China's National Day that celebrates the founding of the People's Republic of China coincided with this year's Mid-Autumn Festival. The eight-day holiday often referred to as Golden Week, attracted huge crowds.

*The show was an ante premiere of the 10<sup>th</sup> edition of the China Flower Expo flowerexpo2021.shcm.gov.cn which will be held on Chongming Island from 21 May to 2 July 2021.*



## ESTABLISHING IDENTITIES

**Natalie Porter** is the business development manager at Porters Fuchsias (established 1985), a family-run wholesale bedding plant grower based in Formby, just outside Southport, on England's North West Coast. The company owns the Happy Plants garden centre brand, including 99 per cent homegrown grown on-site plants.

*"Know what your customers want most, and what your company does best. Focus on where those two meet" – Kevin Stirtz.*

To understand what our customers want, we must first establish who they are. Whom were they pre-lockdown? How have they evolved? And how does the interaction of the two shape our longer-term behaviour?

Pre-lockdown, our industry's consumer analyses tended to outline groups of active customers neatly, then lump together under-thirty-fives as 'young people, not-yet-engaged'. With 2020's seismic shift bringing many 'unattainable' under 35s within reach, they deserve more individualised identities.

Whilst we cannot account for every potential sub-division of a new gardener, social media quickly uncovers two, distinct, variations; those whose new-found interest stems from a love of houseplants, and those for whom it originates from house-prouddness.

For the first – the 'Plant Parents' – function is key: plants that clean the air, plants that feed the bees, plants that you can eat. Influencing their choices are collectability, sustainability, and wellbeing. They thrive on achievement – be it acquiring a 'rare' plant or mastering how to nurture a more difficult specimen best.

The house-proud instead prioritise the aesthetic values. Plants are ornaments, with a perceived value dictated by instant appeal and social-media-prescribed desirability, rather than variety credentials. Indoors, their gold-standard features grey paintwork, decorative rugs, and scatter cushions: without experience to draw from, they adopt the same principles for their gardens. Their approach is less 'gardening' and more 'decorating', thus they are 'Garden Decorators'.

Both have provided a life raft for horticulture to weather a frightening year. Nurturing both would add significant value, resilience, and longevity to our industry. But the two could not be more different from one another – nor our older, cornerstone consumer. They are three corners of a very big triangle.

A cookie-cutter approach will not suffice. Not for marketing, not for product design, not for price-points. With ongoing risks leaving many older customers reluctant to leave their homes AND newly able to shop online, it is time to replot the intersections between what our customers want and what we do best.

# Wrapping beauty around the world

## *One new plant at a time*

FCI sat down with 'plant breeder's agent' Angela Treadwell-Palmer to discuss how her Plants Nouveau business has grown since its inception in 2005, identifying the significant issues for the industry and her plans for the future.

AUTHOR: RON VAN DER PLOEG PHOTOS: PLANTS NOUVEAU

**P**lants Nouveau is a new plant introduction and marketing company, which does not sell plants, but acts as an agent. They support breeders with the introduction process, by navigating them through the regulations of protecting their invention with patents and trademarks; and marketing the product for them, and making sure that the people who grow the new plants pay a royalty for every product they sell. The breeders and Plants Nouveau then use the royalty income to create and introduce even more new plants. Linda Guy joined Angela as a partner in 2011, bringing many new breeders with woody and tropical plants.

### **How did you start in the horticulture business?**

"I have a University degree in Plant Science and Ornamental Horticulture. My first job out of university was working for Star Roses and Plants. I worked my way into a job managing the new plant introductions there and was fortunate to be on the cutting edge of plant introductions in the late 1990s with the introduction of the original Knock Out Rose. I went on to work at the Chicago Botanic Garden, managing their plant introduction programme called Chicagoland Grows. It was there that we introduced and marketed the very first commercially available orange echinacea. That said, I fell into some good places at the right time and made horticultural history."

### **How important are novel plants for the industry?**

"Plants that grow easier, require fewer chemicals, flower longer or have better flower colours, and plants that are novelty breakthroughs - like the first orange coneflower, are important for the industry. They keep the selection exciting, they can solve production problems, and they can be more profitable. These are all important to the growers. For the retailers and consumers, the novelty needs to solve a problem or just be a really cool, exciting new addition to their mix - a new colour or shape, for example."

### **Ornamental plant breeders are the backbone of your company. Who are they, what ornamental crops do they focus, and where are they located?**

"Our breeders are the company. Without them, there is no Plants Nouveau for we do not breed in house. We have breeders from all over the world that we are working with, and they each have a speciality. From hydrangeas to echinacea, small flowering trees and tropicals, we have a lot of bases covered."

### **In deciding what breeders/breeding programmes to accept what is your criteria?**

"We look for solutions. If a breeder has a plant that fits a consumer niche, or solves a consumer space and time concern, or solves a growing or shipping problem, we take it on for trialing. Of course, the plants need to be nice, look pretty and they need to perform in the garden as well."

### **Who are your customers?**

"Our customers are growers. From perennial and tropical liners to large tree farms and everything in between, we license growers to grow and sell the products we represent."

### **Plants Nouveau touts itself as the fashionista of the new plants world. What are the significant, most fashionable breeding breakthroughs now?**

"I would say our hydrangeas in the Everlasting(R) and Magical(R) lines from The Netherlands. There is nothing like them on the market. Their thick foliage, strong stems, and hard flowers in various colours do not exist elsewhere. I also think our Mariachi™ Helenium series is a breakthrough, the colours are so bold and the plants stay smaller than most. They are perfect for late summer colour in the garden and the greatest compliment to summer mum sales."





***You work both with large, commercial breeding companies and small, independent breeders. Typically the big ones often breed with the usually conservative growers. The latter mostly focus on the economic and technical aspects such as yield, plant habit, crop time, crop density, uniformity, transportability. Is this the right environment to present novel plants and new marketing ideas?***

"We do find that the large growers are only concerned with the performance of the plant until it reaches the retailer, which is sadly putting plants on the market that do not perform well in the garden for the consumer, but they look really nice at retail. Retailers and consumers do want plants that will perform well in the garden, so we feel this is creating a problem for the future where consumers don't trust that plants will live or they will think they killed the plant and that it is their fault. We realise that the big growers sell the most plants and if the plants can't be sold through the big chains - we will make no money for the breeders, but the industry needs to be careful about not trialing plants in actual garden settings. This could backfire on us in the future and diminish consumer trust. They already know so little about gardening - if everything they plant dies, we will turn them all off. One of our biggest hurdles is competing for shelf space with the large breeding companies. Sometimes our plants are better garden plants, but they will never be grown by large growers because the big companies make it too easy and cheap for the growers. Therefore we work with large co-ops in the USA that sell to independent garden centres. These co-ops see the value in a plant being great in the garden, so they are willing to pay a little higher price to ensure their customers' success."

Angela Treadwell-Palmer (right) and her business partner Linda Guy who joined Plants Nouveau in 2011.

***Do you think that true innovation is more likely to happen with dedicated and passionate plantsman who have ideas that will make a difference?***

"I do think that the large breeding companies with dedicated breeders can make things happen more quickly. They can also guide their breeding to a specific trait. They can use one novel introduction and breed it to make a series of different colours in the same line. Independent breeders can do that, but it takes them much longer, so they spend their time looking for truly novel traits and working with unusual species to spice up the gene pool."

***If plant breeding is about solving the needs of today's consumer. What are these needs precisely about?***

"We feel the needs are consumer-based and we are trying to get more consumers in North America to garden. If we can get more people, who may have never bought a plant before, to buy a plant and fall in love with it - we can get them to garden. The gardening population in America is dwindling, but the house plant market is really picking up. We are using this trend in marketing and showing how our plants can do well in a pot - in a setting on a patio or porch or balcony or to show they too can be used in small spaces, and even spaces without gardens. Today's consumers also want to know a lot of information about what they are buying. They need a 'manual' to take care of it, so we are developing tags and web based information that gives as much information as we can to help the consumer be successful."

***We live in a fast-moving, ever-changing world with ever-changing consumer behaviour; what is hot today***



## Breeding the future

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The Netherlands





**is not tomorrow. The average plant variety market life reduces, and as a result, breeders' returns are under pressure. In consequence, breeders may choose not to protect their releases. What's your stand on this?**

"Sometimes it's okay to introduce a plant without a patent if you know there will be very few sales, but with the costs of the patent being less than \$2,000, we feel there are not many plants that fit that bill. If you cannot sell enough plants to pay back a \$2,000 patent, that plant should not be introduced. I will say that occasionally a plant comes along that cannot be patented, but it is so good that we feel it should be introduced. In that case, we will use a trademarked name to help get the breeder some money for his work."

**Speaking of plant protection, do you feel that novel plants have more protection under the Plant System in the USA?**

"I feel the original plant is protected, but what we are missing in our laws in the USA are the essentially derived clauses that protect breeders from others breeding with their inventions – or finding sports and introducing them. There is much better protection for that in the EU, and we hear the USA is heading that way soon."

**The Plant System in the USA is nearly 100 years old but has barely advanced? What are its benefits and its deficiencies?**

"The benefits are it is fairly easy to get a plant patent. The deficiencies are the same – it is fairly easy to get a plant patent. There is no true variety comparison, so look-a-like plants come along all the time. And – as stated above, we are lacking the essentially derived clauses that are available in other countries to protect the breeders."

**A new merchandising concept, a novel plant on its own will not get very far. The supply chain is showing more vertical integration with increased cooperation between breeders, propagators, growers, wholesalers, and retailers. What's your company's role in improving communication among such a so big and diversified set of actors?**

"We work closely with companies who work closely with the big chain stores to try and come up with merchandising and marketing ideas that solve today's consumer problems. We send trial plants out all over the USA and Canada to growers who help us evaluate the plants on a yearly basis. A lot of times, it is the independent retailers who want the marketing concepts, not the chains. The chains tend to want pretty plants that will sell fast based on an impulse buy. There is not much marketing or merchandising there. Monrovia is changing that, and we work closely with them to get out plants into their LOWES program. We are hoping their success will change the way the chains sell plants."

**The renowned Japanese plant breeder Mr Hiroshi Sakata predicts that this century will not be an easy one. To quote him: "It is impossible to know the full extent of the problems we will face in terms of responding to**



*Helenium  
Mariachi.*

**environmental changes and increases in population and ensuring biodiversity and safety. Nonetheless, vegetables nourish the body and flowers nourish the soul." In light of this, what is your company's future mission?**

"In today's sad, angry, hostile world, we feel flowers and pretty gardens which not only nourish the gardener's soul but feed wildlife and the people who garden there are most important. Plants need to do something for the consumer or the other creatures that live on that property."

**Researchers in the USA have the go-ahead to use gene-editing techniques to alter crops and plants. The decision opens the door for scientists to create a new generation of genetically modified crops without severe restriction. In contrast, the EU's top court has ruled that plants (and animals) created by innovative gene-editing technology have been genetically modified and should be regulated as such. What is your stand on this as this might be a hindrance when exporting gene editing ornamental crops to Europe?**

"The large breeders we work with are mainly in the EU and Australia, so we do not see this being a problem right now for Plants Nouveau breeders. In the future, we hope to work with more university breeding programs and we know they will be using gene modification techniques, so we know this is coming and we will just have to work harder for those breeders in the North American market – knowing these plants are not going to be allowed especially into the EU."



*Carin van Huët, director of Food & Agribusiness at Rabobank. A specialist agricultural bank.*

# The route to recovery is not sprinkled with rose petals

AUTHOR: RON VAN DER PLOEG  
PHOTOS: EDWIN WALVISCH AND BIANCA FENNE

FCI sits down with Carin van Huët director of Food & Agribusiness at Rabobank. She speaks about the impact of the coronavirus on the Dutch ornamental horticulture industry. She looks at the challenges that lie ahead in 2021, including high unemployment rates, lower consumer confidence, reduced labour turnover, and the global disruption in incomes.

**B**orn the daughter of a dairy farmer in the north-western part of the Netherlands, Van Huët experienced working in horticulture since she was a kid. She took her education at Wageningen University with floriculture being the subject of one of her graduation thesis. More recently, Van Huët delivered a keynote speech at AIPH's virtual Recovery from Crisis conference

about the state of floriculture post-Covid-19, will it wilt or flourish?

## PRE-COVID TIMES

Van Huët starts by saying that before we knew Covid-19 even existed, the picture was looking rosy. Confidence among Dutch entrepreneurs in ornamental horticulture was soaring high, especially during the final quarter of 2019.

A survey of business opinion by Agridirect, for example, found that

before the coronavirus outbreak 35.8 per cent of potted plant growers, 31 per cent of bedding plant growers and 25.5 per cent of cut flower and perennial plant growers were looking to expand their business. "Pre-Covid-19, the outlook for the Dutch industry in 2020 was very positive with an estimated Compound Annual Growth Rate of consumer spending spread between one to two per cent in Europe, two per cent in the USA and more than



five per cent growth in Asia,” recalls Van Huët.

#### WILD ROLLER COASTER RIDE

That was all before coronavirus. Now, nearly nine months later, Van Huët concludes that this global pandemic has put the Dutch ornamental horticulture sector on a wild roller coaster ride. One that is hurtling, at dazzling speeds downhill as of 16 March with auction clocks in a free fall, and the composting of tonnes of unwanted flowers.

Countries introduced mandatory border checks which resulted in widespread disruption in the logistics chain. In road traffic, this situation led to a significant number of delayed cross-border deliveries. At the same time, the global air freight market faced capacity constraint from the loss of available ‘belly cargo space’ as passenger aircraft remained parked. “In addition, the severity and timing of the lockdown measures differed from country to country. What made things worse was that the pandemic prompted seasonal workers from Poland and Romania to return home, creating immediate labour shortages.”

#### ACCELERATING AUTOMATION

Van Huët believes that the pandemic will accelerate automation in horticulture and more importantly, that the money needed for it is there. The Dutch government has launched a stimulus package that

brought in much-needed relief, and banks continue to play a central role in not just supporting customers and employees, but society as well. She says, “Over the past few months, we all witnessed how incredibly resilient Dutch horticulture is. Almost all market segments have recovered very well. Upon entering this period of stress, the sector had built significant cash buffers to finance some of the cash flow deficit.”

“The outlook for the ornamentals sector remains positive,” she continues, highlighting the fact that Covid-19 should not be a barrier to progress and that horticultural companies should be thinking about automating some processes. “Even for smaller companies there are automation solutions such as robot harvest carts, grading machines, potting machines and conveyor belt systems. It is not always necessary to implement the most advanced technology to reduce your dependency on foreign labour.”

#### BOOST IN ONLINE SALES

The massive disruption in the supply chain because of Covid-19 has given some reason to believe that online delivery of flowers and plants will be the future. Commenting on the boost in online sales, Van Huët says, “First, we noticed an increase of digital B2B communication, followed by a surge in demand for online B2C flower purchases. Now, nine months later consumers are already becoming

familiar with the vast landscape in online flower delivery.”

#### GOODWILL

What is more, notes Van Huët, at the height of the pandemic, flower and plant growers did their utmost to stay connected with the end customer. “Around the world tens of thousands of flowers and plants were given away to health care professionals to thank them for their incredible efforts. These tokens of appreciation created a lot of goodwill, which prompts me to ask the question in what way we can use this in our market approach post-Covid 19.”

She continues by saying that the sector did increase sooner than anticipated. “In mid-April, the market showed early signs of recovery with Mother’s Day sales being rather buoyant, that is, in countries where florists and garden centres could open their doors. Initially, there were a lot of concerns regarding the bedding plant sector, its growers and the perishability and seasonality of the plants, but in the end Dutch garden centre reported sales of 25 per cent up from last year during the first 30 weeks of 2020.”

#### GLIMMERS OF HOPE IN A DARK PERIOD

Van Huët sees booming garden centres sales as welcome glimmers of light in a dark period, which she touted “the deepest economic crisis since the Great Depression in the 1930s”. In its Global Economic Outlook as of 21 July 2020, Rabobank’s baseline forecast envisions a 4.1 per cent contraction in global GDP in 2020 with economies such as Spain (-13.3 per cent), Italy (-11.5 per cent), United Kingdom (-10.9 per cent) and France (-10.1 per cent) being among the hardest-hit.

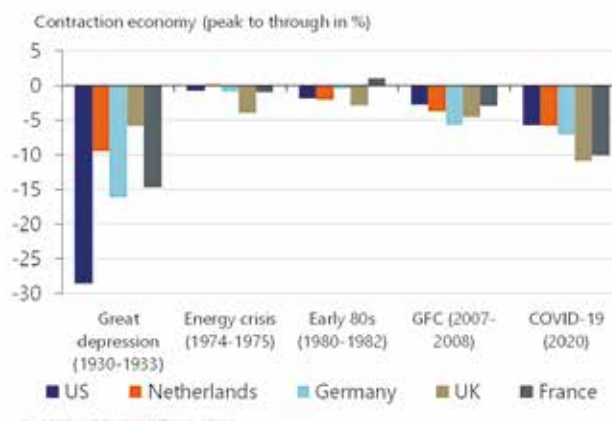
*According to Rabobank, ornamentals growers must take steps to stand out from their competition by providing customers insight into their sustainability footprints. Pictured are workers at Dukker Chrysanten, in Bleiswijk, the Netherlands. This chrysanthemum nursery successfully integrates sustainable practices into business operations and strategy.*



## Global economic outlook as of 21 July 2020

Real y-o-y growth (%)	'19	'20	'21
Gross domestic product			
World	3.0	-4.1	4.3
US	2.3	-5.7	0.7
Eurozone	1.3	-9.1	6.1
- Germany	0.6	-7.0	5.0
- France	1.3	-10.1	7.4
- Italy	0.3	-11.5	7.0
- Spain	2.0	-13.3	8.4
- Netherlands	1.8	-5.7	2.9
United Kingdom	1.4	-10.9	5.0
China	6.1	1.2	4.7
Japan	0.7	-4.8	2.9
Brazil	1.1	-7.3	4.5
India	5.3	-3.8	8.7
Australia	1.8	-6.8	4.5

## The deepest economic crisis since the Great Depression in the 1930s



Van Huët warns that the road to recovery will be uncertain and not sprinkled with rose petals as expenditures on ornamentals (especially on cut flowers) correlate highly with disposable income. In 2021, Rabobank anticipates higher unemployment levels and lower disposable income which will translate into a market turnover that is down by 5 to seven per cent. This calculation considers a three to four per cent drop in supply volumes and two to three reduction in prices.

### WINNERS AND LOSERS

"The global health crisis is generating winners and losers with the cut flower segment undoubtedly feeling more pressure as couples rethink their wedding arrangements and other celebration events continue to be cancelled and postponed. Cash-rich flower farms are set to get bigger but there will be a debt shake-out of smaller companies in Kenya, Colombia and Ecuador," says Van Huët.

### NAVIGATING SHIFTS IN GLOBAL TRADE PATTERNS

Van Huët is one of the co-authors of Rabobank's Vision for the Dutch agriculture and horticulture sector 2030. The report foresees that trade flows will go into reverse. The pre-Covid global market was already under pressure with trade wars shifting gear, and trade barriers putting a brake on economic growth. Under the new

normal, Rabobank anticipates even more changes in the global agricultural and horticultural trade and the Netherlands is no different. In the middle range of Dutch agricultural exports, for example, the customer base will be increasingly in an 800km radius. The outlook for high-value Dutch seed potato and seed exports is unchangeably good, regardless of their distance to the market. By contrast, the picture for long-haul exports of cut flowers, predominantly classifying as mid-range products, is less rosy. Van Huët notes, "To a certain extent plants and flowers fall into the middle range category. In different parts of the world people will produce more flowers and plants locally or regionally, rather than importing these from the Netherlands. Countries will become more self-sufficient in ornamentals. However, Rabobank's Vision project is a roadmap to 2030. As such, it is only natural that along the way there will still be business opportunities to seize at long haul destinations." Closer to home, key export markets for Dutch flowers and plants such as Germany, the UK and France are almost saturated marketplaces with fewer people buying fewer flowers. With signals of de-globalisation and self-sufficiency becoming more of a mantra, Van Huët believes, that it has never been more critical for ornamentals growers to take steps to stand out from their competition

*Coronavirus: worst economic crisis since 1930s depression, Rabobank says.*

by providing customers insight into their sustainability footprints. She adds, "These must be part of a unique selling proposition, including other aspects such as consumer appeal, emotional value, and the fun experience that surround floral purchases."

### LOCALLY GROWN

Van Huët, stresses that locally grown Dutch flowers are not per se better than flowers sourced from other growing regions in Africa and South America. "The pertinent question is if flowers imported into Europe have a greater environmental impact than the same flowers produced within Europe? Our sources tell us that this is not automatically the case. Using the latest storage and preservation techniques, growers in Africa may well succeed in transporting their flowers by sea instead of using air freight. This will move their business one step ahead of the competition in terms of climate action. By contrast, if Dutch greenhouse growers start to adapt renewable energy sources to reduce their footprint, they can make use of the same competitive advantage. There is a lot of potential out there but also a lot of work to do. In Africa, horticulture faces also other challenges such as social footprint, water footprint and reduction in crop protection products. Sustainability is a complex idea going beyond mere climate action."



## Biophilic design brings real economic benefits

GLOBAL: Neurological and physiological studies are revealing quantifiable benefits of biophilic design. Including plants into office design and décor can lower tension and anxiety levels by 37 per cent, reduce feelings of anger by 44 per cent, and reduce fatigue by 38 per cent. Loss of productivity costs is 112 times greater than energy costs in the workplace, which translates employee well-being into cost savings. Better still than having plants in the office are views of nature from the office desk. Seeing movement in nature stimulates feelings of engagement with nature, and it is this dynamic interaction that provokes the optimal physiological responses that are the core of biophilia. Biophilic design works outdoors as well as indoors. It has also been put to the test that a minimum of 120 minutes per week spent actually in nature is associated with greater health and well-being. Benefits increase with time spent in nature up to 200-300 minutes per week, beyond which no further benefits are achieved. It does not matter how much or little time is spent in any visit, simply a total of 120 minutes per week.



AUTHOR: AUDREY GERBER, TECHNICAL ADVISOR TO AIPH

## Biophilia – the importance of nature for feeling good

Although the term biophilia has been around for several decades, it is now being used more frequently with a renewed interest in biophilic design and our biophilia gene triggered by lockdowns. With initiatives in all sectors to bring nature into our cities, how does biophilia differ from other more technical terms, and is the terminology of consequence? FCI asked Tim Beatley, an active promoter of biophilia working at the University of Virginia in the USA.

‘Biophilia’ is a word that has an obvious connection to nature, being a combination of the Greek root words ‘bio’ meaning life, and ‘philia’, meaning love. It was introduced by biologist Ed O. Wilson in 1984 to express “the urge to affiliate with other forms of life.” With initiatives in all sectors to bring nature into our cities, how does biophilia differ from other more technical terms, and is the terminology of consequence?

### ‘GREEN’ CAN MEAN ANYTHING

The terminology around plants and nature in cities has become blurred with issues of environmental sustainability. ‘Green’ can mean anything from recycling paper to using LED lighting, and the concept of ‘green infrastructure’ often has little to do

with ‘living green’. ‘Urban greening’ might be more suggestive of bringing plants into cities, yet could be seen as failing to include all nature, which is neither the intention nor the reality.

‘Nature-based-solutions’ (NbS) is a term increasingly used, though it receives criticism for being too technical. ‘Rewilding’ is a term that people connect with, though this often refers to ‘natural’ nature, not ‘designed’ nature, even in the urban context.

### CROSSING ALL THE THEMES

Professor Tim Beatley at the University of Virginia is an active promoter of biophilia. Tim considers that the wide range of terminologies is quite acceptable because each has its relevance in different

## New Green Factor Tool sets the targets of Melbourne's green infrastructure

MELBOURNE, Australia: The City of Melbourne has launched a new Green Factor tool to direct development of the built environment to include green infrastructure. The Green Factor Tool is an assessment method that benchmarks the capacity of new buildings and delivers the following benefits: urban heat island effect reduction; biodiversity and habitat provision; stormwater reduction; social amenity such as recreation and mental well-being; urban food production; and aesthetic values. Driven by the latest research on the environmental and social benefits of green infrastructure, the tool aims to increase the quantity of vegetation cover on private land in Melbourne. Starting as a voluntary action for use by landscape designers and architects, planners and developers, the tool will be used in the future to ensure that new buildings comply with planning policies that address climate action. The online tool uses details about a site's location, and quantities / volumes and basic specifications of green infrastructure elements to calculate a Green Factor Score. Although people can use it to benchmark existing infrastructure, the score sets targets for new developments to fit within – a score that takes into account the relative volume and efficacy of green elements, in comparison to the overall area of the site. Following a pilot phase, there are plans to include this tool into the formal planning policy, proposing industry target scores of 0.55 or 0.25.



*The Biophilic Cities movement has already inspired many cities to implement intentional changes in urban design and planning policies.*

conversations. “Reducing carbon emissions is a key objective that crosses all of these themes”, he says. Biophilia, however, is a better way of describing the outcome of how the experience of nature is curated, alluding to the broader ecological context of our evolution. Recognising that we are part of nature and immersing ourselves in nature, even in cities, enables us to flourish beyond mere survival.

### THE POWER OF NATURE

In the last decade, there have been many studies that demonstrate the power of nature and how it affects us emotionally and intellectually, such as stimulating generosity and pro-social behaviour. Biophilia refers specifically to our innate connection with all life, and how our conscious and subconscious responses to nature offer immense benefits.

### GROWING AWARENESS

As the evidence for biophilia grows, so does the awareness of biophilic design and why it is essential in our communities.

The International

Living Future Institute (IFLI) recognises the need to explain how to achieve the biophilic design. It is bringing together leading experts in the field to gather existing resources in an accessible language and format that will lead to broad adoption of biophilic design by designers, home and building owners, and cities.

Although the principles of biophilic design are increasingly connected to evidence, much of its relevance in the city context comes from personal story-telling and narratives about living richer and more fulfilling lives through a deeper connection with nature. It inspires a language that opens conversations to promote and reach more people and players who desire to effect change.

### BIOPHILIC CITIES

The organisation, Biophilic Cities, was founded by Tim Beatley to connect cities, giving inspiration and sharing best practice, and building a global community around the vision. This international organisation has already inspired many cities to implement intentional changes in urban design and planning policies. There are many reasons why people might change their behaviour, and there are many layers of society that can be inspired to achieve change. Biophilic Cities now invites other organisations and individuals to join, to expand the potential for influence. It attracts interest through its different emphasis. “Governing authorities can be very siloed”, says Tim, “making holistic thinking difficult.” The benefit of talking about biophilia and biophilic design is that it opens conversations between formal and informal sectors. The

power of telling compelling stories lies in the ability to change behaviour, and relationships are fundamental to achieving lasting change. To see cities as natural systems

## IMMERSING OURSELVES IN NATURE, EVEN IN CITIES, ENABLES US TO FLOURISH BEYOND MERE SURVIVAL

themselves, not just places that include nature. Initially, activities might apply to local circumstances, yet, as the global biophilic community grows, there is increasing recognition and interest in the role of a city beyond its boundaries.

### A GREATER CONNECTION WITH NATURE

Technical terms, such as GI and NbS have relevance in conversations about policy, yet they imply that nature is here to serve us. Biophilia suggests a greater connection with nature and a recognition of mutual benefit from this interaction. The strength of biophilia as a word and a concept is that it inspires and motivates across sectors.





## THE B-WORD

**Bruce Harnett** is Managing Director of Kernock Park Plants, Cornwall a grower and distributor of young ornamental plants. Kernock offers a wide range comprising over 1200 different varieties of seasonal and perennial plants.

There is no doubt that the new C-word in our lives will be stealing the headlines for many months, if not years to come. But amid the virus turmoil, the B-word, a phrase that we in the UK had become used to dominating our front pages, was out of sight and nearly out of mind for several months. Suffice to say, it is back with a vengeance, yet after four years since the referendum, we are still unsure where we should focus our attention regarding the UK exit from the EU. I fear that we might not understand the actual situation until the eleventh hour, as we welcome the dawn of a new year.

I own and manage a young plant nursery, Kernock Park Plants in Cornwall, United Kingdom. Whilst a significant portion of our plant produce originates from stock held at our nursery in Cornwall, we import many cuttings from countries around the world and have considerable dealings with the EU, in terms of importing plant products as well as sundries, royalties and more besides. Our export market is proportionally small at just under 6 per cent of turnover, mostly to the Republic of Ireland and France. Still, if we include Northern Ireland, then the percentage is closer to 8 per cent (€400,000), so not insignificant.

I hold on to the hope that by the time you read this, there will be some more clarity on proceedings. At the time of writing (at the beginning of October), there is a great deal of political posturing during the negotiations, with recent threats of legal action against the UK regarding their contradictory bill ratified by the UK parliament. With all the other things going in recent months, I have somewhat had my head in the sand with this situation, merely waiting for some definitive decisions. I am now getting more twitchy, trying to understand the current UK guidelines and putting some preparations in place, whether the deal or “no deal”.

We can only guess which of the current rules and regulations will apply come January 1. We have a schedule of tariffs to apply to UK imports from the EU<sup>27</sup> in the event of no deal. There is plenty of ambiguity just to decipher the detail of the listed commodities, but what is more unnerving for exporters is the possibility of common external tariffs (CET) applying to exports to European customers, if there is no free trade agreement. Depending on the destination of the customer, different VAT rules might apply to exported goods. It also seems that we will need to understand which exports will be deemed “at risk” of onward transit from Northern Ireland. These goods will be subject to refundable tariffs, assuming the items remain within Northern Ireland. The British government have made a gesture to importers, by phasing the introduction of border controls on imports up to July 2021. This date will be upon us before we

know it, yet the EU plan to implement controls immediately in a no-deal situation. So, fears of congestion at ports and visions of perishable goods awaiting entry or clearance, could become reality as soon as January 2021.

It seems inevitable that we will need to create phytosanitary certificates for each export to the EU. It also appears certain that we will have to produce documents for deliveries to Northern Ireland. The Northern Ireland protocol within the withdrawal agreement dictates that Northern Ireland will have to share EU plant health standards. Even for a relatively low scale exporter of our size, the act of exporting goods to EU and NI zones will place an incredible administrative and financial burden on ourselves and our plant health inspectors. We are currently devising the most effective method to achieve this, whilst preventing delays for product delivery and keeping costs sensible. The logistics and scale of checks involved are substantial as they stand, so will penalise both customers and exporters such as ourselves, something I believe the UK government was keen to avoid. In this situation, growers in Northern Ireland remain at an unfair disadvantage compared to UK mainland equivalents based on the current position.

The other main area of unease for our industry, that has been well publicised even before considering Brexit, concerns the availability of European seasonal workers for horticulture and agriculture. These anxieties are indeed not improved with the uncertainty of our EU exit and immigration policies to be defined, compounded of course by complications of Covid-19.

At this point it is challenging to look past the self-inflicted bureaucracy – we appear to be surrounding ourselves with both ‘green’ and ‘red tape’. For Brexit in general, we can always seek some “silver lining” in this thundercloud that is developing on the horizon. The uncertainty and predicted difficulties of importing plants and goods will inevitably lead to more local sourcing, particularly for smaller purchases from the EU. We and others will undoubtedly try to capitalise on this shift. There are likely to be other potential benefits and opportunities that arise as a consequence of Brexit. Still, quite honestly, they seem too far away for me to even contemplate at this point.

A common theme of cries I hear from the trade (whether from Brexiteer or Remainer), is that they seek clarity and stability. So, if it's not too late, there are a few items on my New Year Brexit wish list. Arrangement for some form of continuity agreement, or free trade deal would come top and concessions on phytosanitary costs, and administration would be welcome, to help relieve the significant administrative and financial burden that we will face as a result of leaving the EU in January.

A portrait of Hortense Harang, co-founder of Fleurs d'Ici in Paris. She is wearing a black turtleneck sweater and a large, elaborate crown made of dark purple and red flowers. She has a slight, thoughtful expression on her face. The background is a dark, textured grey.

# A tale of two flower markets

Harnessing the power of technology and at the same time reconciling social and environmental responsibility, is a huge accomplishment. One such pioneer is Hortense Harang, co-founder of Fleurs d'Ici in Paris. Harang focuses on home-grown French flowers. But does local automatically mean sustainable?



**A**ptly named after the Latin word meaning “of the garden”, Hortense tells me about her childhood, smelling roses in the garden and picking wildflowers on walks in the Loire with her grandmother. Her shop – pertinently translated ‘Flowers From Here’ – is located, a ‘whiff-away’ from the Botanical Gardens. Her business mantra is “The preservation of French horticulture”.

### BEAUTY REFLECTS THE SEASON

In 2018, she created a digital platform, that caters for online-savvy clients looking for luxurious blooms, with the added unique selling point that the bouquets contain home-grown cut flowers. So, with a click of a mouse, a carefully chosen bouquet can express deliver just-in-time with the sentiments of the giver. Excellent customer service, with an added eco-bonus, but how does this work during the winter months? Harang assures me that the bouquet choices change with the season. “Beauty reflects the season; Beauty is the season. We have beautiful blooms from spring right until November. There a lot of foliage, and flora, grown all year-round. Yes, December is tricky, but berries, ivy, and dogwood, make beautiful bouquets. Despite less variety in winter, it does not mean there is no beauty.” Her social media photographs do testify her resourcefulness.

### BLOCKCHAIN TECHNOLOGY

Using blockchain technology, engineered in partnership with Ecole Polytechnique the whole process from the customer’s click is documented, and quality checked throughout the transaction, from the source to the doorstep. All the participants, snap pictures on their smartphones and upload their actions to a digital suite. Every shot tells a tale, which Harang and her team of 15 can check for quality, and the sender and receiver can keep for provenance. Harang illustrates further: “We can precisely calculate the energy, water, what worker picked the stems, which

florist transformed them, which driver gave them to the customer. We also have details of when the grower planted the flowers, the energy used to grow them, and the compost in the soil.

“With our digital mapping, we can link local trade at a national level. So, if the

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## USING BLOCKCHAIN TECHNOLOGY, THE WHOLE PROCESS FROM THE CUSTOMER’S CLICK IS DOCUMENTED, AND QUALITY CHECKED THROUGHOUT THE TRANSACTION, FROM THE SOURCE TO THE DOORSTEP

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sender is in Paris and the receiver is in Bordeaux, our florists in Bordeaux can be put in touch with local suppliers, who can deliver, keeping it in the community and not from a shipping port.”

### MAKING A TRANSFORMATIVE DIFFERENCE

Harang says there are 3,500 local growers in France solely produce flowers and she relies upon 500 nationally – and it’s growing. She says: “We have a collective of individual growers and florists who want to work differently, they are a collective who want to make a transformative difference.”

She freely admits, “The coronavirus pandemic did accelerate our transition in the market. In the past, florists viewed us as an expensive alternative, but we were able to show them that we were not costly, and we could provide more diversity, in a bouquet, rather than the standardised mass production offerings they were used to. We were able to support the flower growers, not by demanding big batches but by offering consumers more diverse flowers, and we were strategically positioned to put florists in touch with them all over France.”

She adds: “We do not make it hard for florists and growers to be entrepreneurs. They can pick and choose who they work with however, if we have a customer who is requesting through us for local flowers, then we ask that this is respected.”

### ADVOCATING SUSTAINABILITY

Harang says that her mission from day one was to become a trusted business partner for independent florists and growers and an advocate for sustainability (local flowers for local consumers) and the preservation of the environment nationally in France.

Online her customers make 20 per cent of the business. The 80 per cent portion comes from corporate contracts, supplying weekly local flowers to all over France, ACOR hotel group, telecommunications company Orange, insurance firm AXER, BNT, and many more. She explains that by managing and streamlining

the contract processes for big business, they do not need to deal directly with a smaller company.

Harang explains: “We are giving a consolidation solution to corporations, and what we are also doing is safeguarding the local production and local florists, so they have a more informed picture of what the locals want, and not what someone overseas tells them to use.” That is not a bad thing.

### IS IT RIGHT TO CREATE A MONSTER OF OTHER TRADERS?

Creating more choice for consumers, supporting local growers, and local businesses, it is all ‘tres bonhomie’. However, by raising the spirits of growers and giving florists a choice and consumers a clear conscience, is it right to create a monster of other traders? She sets her stall, by stating: “My business model is harking back to the pre-war time of flower markets, where local growers met local florists. This esprit de collaboration existed until the 1970s before Holland took over the route to market. We are recreating the traditional flower markets through modern, digital tools.”

To make it clear, Harang says she is not an activist, asserting: “We never blame growers in Africa. We are the alternative to consumerism. I want to drive change and not to depend on international exports. I want to increase consciousness.”

### THE LACK OF FRAGRANCE AND MASS PRODUCTION

However, on the other hand, her actions speak louder. She implies she became involved in the industry, as a revelation against perfection, “the lack of fragrance and mass production”. She passionately implores: “Imported flowers are from industrial farming rather than natural gardens. Florists are told to use the wholesalers and not encouraged to find out what is growing locally. Instead, they use flowers cultivated in other countries by women who are working for little money and they are being poisoned by the chemicals. It is not a sign of development for that country when the women are on slave wages, and many have lung cancer from the pesticides at the age of 40.” She continues: “In France, many flower farms have disappeared because local production is made redundant by these imports, it has an impact on the country’s biodiversity, and local labour and local knowledge and there is no food for the bees.

“I have a moral obligation to inform people, make them aware of issues. I have a sense of what is common good and how we all contribute to this planet. I believe in sustainable virtues and ethical production.”

So, by exposing the ‘problem of importing’, to the buying public, she creates a moralistic demand. To date, Fleurs d’Ici has sold 15 million local stems since 2018 “saving 35,000 tons of carbon.”

Reality check: not everything is that black and white.

Even in Hareng’s previous employment as a BBC reporter, she admits she has never visited a grower in Kenya. Never witnessed how these farms provide healthcare, schooling, and jobs for large communities. Yet, she has launched herself against the floriculture industry, believing it to be “completely delusional and polluting”. Audiences in France may have already heard and seen the interviews she has given to the media rallying a cry for the “preservation of French horticulture”. She admits to me she bases her contention upon a thesis written at the University of Lancaster by Rebecca Swinn in 2017. This research identifies “the carbon footprint of bunches of flowers coming in from overseas (which accounts for some 90 per cent of the flowers used in the UK) was around 30kg of CO<sub>2</sub> per bunch while bunches grown in the UK and sold locally were as little as 1.7kg a bunch.” By comparing the carbon footprint of British, Dutch, and Kenyan cut flowers, Swinn won a prize for Best Collaborative Project in the Lancaster Environment Centre (LEC).

It needs pointing out, that Fleurs d’Ici is not the only organisation attributing this same research to support their ecological argument for buying locally. A quick Google search reveals quite a few other firms are using this document’s analysis to create a moralistic demand.



## Claiming that imports are ‘detrimental’ to the environment, does not give justice to the reality

**Before we use climate change as a reason to hurt the African flower farmers who are already struggling with the loss of incomes due to Covid-19, let’s make sure the sums are correct. Here is the response from Sylvie Mamias, secretary general of UNION FLEURS.**

“Disruptive business models such as the one promoted by Fleurs d’Ici tend to fulfil a useful function on the market in that they challenge the status quo and force the traditional flower supply-chain to address possible inconsistencies or weaker points. The Covid-19 crisis has increased challenges even more by shaking the highly integrated international flower supply-chain to its core and unveiling to the wider public its strong dependency on European and global sourcing. There is a greater awareness, including among final consumers, of the intrinsic complexity of the supply-chain behind flowers sold in shops or supermarkets. This awareness is not in itself a bad thing, and it fits with the growing and legitimate curiosity of consumers to understand what is behind the products they buy.

“What is rather striking is the underlying assumption, that Fleurs d’Ici seems to promote, that local necessarily mean sustainable. ‘Local’ does not say anything about the sustainability of a flower or the environmental or social performance of its methods of production. It just indicates that flowers have been grown closer to where they are sold and implicates that the steps are shorter along the chain and the number of intermediaries reduced. Does it mean that it is always better than sourcing flowers from other places of production in Europe or beyond? Not necessarily. Mode and length of transportation are only one of the many elements that contribute to the environmental performance and carbon footprint of a product. It is essential to look at the complete cycle of production and supply to get the real and full picture of the environmental impact of a product. Life Cycle Analysis (LCA) models demonstrate this very conclusively and help identify the various hotspots and points of attention along the chain from production to final disposal - in the case of flowers: methods and conditions of production, energy, water, agrochemical inputs, packaging, besides transportation alone.

“Responsible sourcing has been the attention of the international flower supply-chain for many years. Flower operators have not been sitting still and waiting for business models such as the one of Fleurs d’Ici on the French market to take stock and adjust. There are many initiatives, such as the Floriculture Sustainability Initiative (FSI), to precisely stimulate





## WHOEVER STOPS, FALLS BEHIND

Fourth-generation **Jan-Dieter Bruns** is CEO of one of Germany's leading plant nurseries Bruns Pflanzen.

greater transparency and accountability when it comes to the respect of minimum internationally recognised environmental and social standards across the flower supply-chain and wherever the place of production. These initiatives also push for a greater share of responsibly produced and traded flowers on the market, more and more with the help of structured data and reporting and practical measuring tools. Operators themselves, and wholesalers, have fully integrated these requirements in their ways of operating and sourcing flowers for retail or flower shops. Flower assortments put on the market are usually the result of an optimisation of the responsible sourcing available throughout the year and the seasons to offer the best of locally and internationally produced flowers as they are available.

"Further educating consumers on the dynamics of the flower supply-chain has its value as it helps them make informed choices. But it is not to say that value-based assumptions should drive the market. Claiming that imports are "toxic" or detrimental, does not give justice to the reality. The modern floriculture industry is a global web of businesses. It comprises wholesalers, distributors, specialised and non-specialised retailers. They all operate in an inter-dependent manner to bring year-round colourful and natural products to destination markets for the ultimate delight and wellbeing of billions of consumers around the world. It does not give justice either to the many benefits this industry has brought to producing countries and societies in Africa and South America, which are a prime example of economic development through diversification and international trade.

"To claim that only locally produced flowers would make sense ignores the actual reality of this industry and the flower market. There is space for everybody on the market in a complementary way rather than by antagonising one origin against the other. What the Covid-19 crisis has demonstrated first and foremost is the importance of promoting flowers and plants as essential elements in our daily lives, and for the industry to join forces to sustain the market and make it grow as a whole. It will ultimately positively benefit all operators and flower producers, rather than risking to discredit an industry as a whole by pointing fingers and making unsubstantiated and unverified claims, which might end up misleading consumers and limiting the actual market uptake of sustainable flowers.

Note: Emissions are based on a functional unit of 12,000 marketable cut stems and are shown as Global Warming Potential (GWP) expressed in kg of CO<sub>2</sub> equivalents using the IPCC (2001) conversion factors. GWP and CO<sub>2</sub> emissions from Kenya include the IPCC altitude factor. Source: The Dutch Ministry of Economic Affairs, Agriculture & Innovation (2012), who adapted the table from Edwards-Jones et al. (2008) with reference to Williams (2007).

At the time of writing, the number of coronavirus infections worldwide is nearing eight million and global deaths 1.1 million.

With partial lockdowns and travel restrictions still in place, outdoor recreation close to home is becoming increasingly popular. Well-maintained parks, biodiverse gardens and tree-lined streets are crucial to cities and the well-being of their residents.

Politicians across Europe have come to understand that funding for green spaces is needed to ensure the quantity, quality, and accessibility of the cities' green lungs continues.

Before the pandemic, the European Commission acknowledged the health benefits of immersing ourselves in green space by supporting the Green Cities for a Sustainable Europe platform, a joint initiative of the European Nurserystock Association (ENA) and its member trade associations across Europe. The industry is currently taking decisive action to extend this vital programme for another three years. The number of participating ENA associations will almost double to a total of 14. The idyllic setting behind the front door also comes to the fore for individual garden owners. People are finding they can preserve their sanity in the sanctuary of their garden, and escape from the entire everyday world, which is partly disturbed and partly destroyed by Covid-19. This cocooning plays right into the hands of our industry. Is there another product out there more associated with so many positive emotions than our flowers and plants?

Of course, we must now ensure the "going green" trend sustains. In the long-term, we must promote the benefits to our EU Member States and the European Commission that green infrastructure should be top of the political agenda, especially in the face of climate change. Europe needs billions of euros to be fit for climate change to increase the welfare impact of green for people in cities and rural areas significantly.

In the many years in which I have been active as an entrepreneur, I have seen many crises. Covid-19 is undoubtedly one of the biggest challenges for our industry. Business processes are changing, and it is unsure whether the leading horticultural trade shows will retake their places. Alternatively, companies can choose to organise a so-called in-house exhibition with customers being personally invited by the companies to inspect and buy the products.

We also must take on electronic business initiatives. In a business sector where we evoke the most incredible emotions in the face of the natural environment, it is not easy to do this on a computer. Nevertheless, online business will grow massively in the coming months and years. We have already experienced this in 2020 in the initial, acute months of the crisis. Crises, as we all know, offers opportunities. And this time is no exception. Whoever stops, falls behind. Those who seize new opportunities can turn challenges into opportunities and ultimately into profits. But we are also facing the great challenge of recovering billions of euros, spent as an aid in various countries, of the coming years. However, plants will continue to be a vital part of meeting the challenge of climate change, and so I am optimistic that our sector will also survive this crisis well.





# Costa Rica

## How crop diversification has helped Costa Rica to develop its flowers industry

This issue is arguably the most extensive overview of Costa Rica's ornamental horticulture industry, including the most recent available facts and figures and their background information.

AUTHOR: MARTA PIZANO

**O**rnamental plant production and exports in Costa Rica date back to the 1960s, however interesting and significant changes taking place in this sector over the past two decades can give the impression that it is an emerging or new activity. For many years, chrysanthemums were the staple floral product of Costa Rica, but this is no longer the case; steep competition and low prices forced growers to look for alternative products and production of these

flowers has now all but disappeared. A clear diversification trend set in and at present, they produce a wide variety of flowers. Costa Rica has become an accomplished producer and exporter of a diverse range of tropical flowers and foliage. It is also the first supplier of cut lilies to the USA and has expanded its markets significantly. Fourteen years ago, Costa Rica was one of the world's largest growers of leatherleaf fern (production in 2006 reports around 1800 ha), when consumer-ready bouquet sales became interesting. This crop is still currently important, but the cut foliage offer has also diversified widely.

### KEY PLAYER IN CUTTINGS

Costa Ricans are now key players in the international market of cuttings and young plants. These include cuttings for cut flower production but most prominently for annual and perennial pot and garden plants. Rooted plant exports are also on the rise, to various destinations (in general, roots need to be washed

as most importing countries will not accept attached soil or substrate). Costa Rica's geographic position concerning the United States and its popularity as a tourism destination, which has increased air traffic. In consequence, improved airfreight options (this report was written pre-Covid!) are clear advantages to explain why the US is by far the primary target market, in particular for cut flowers. Costa Rica presently stands as the seventh largest exporter of ornamental plant products to the United States (including cut flowers, plants, cuttings and foliage). However, Costa Rican exporters are also successfully developing trade with neighbouring countries in Central America and the Caribbean such as Nicaragua, Panama, Honduras and Puerto Rico. New markets, for plants and cuttings in particular and also foliage, include for example Colombia.

### TOTAL EXPORTS OF ORNAMENTAL PRODUCTS

Costa Rica exports more than 90 per cent of ornamentals produced. The





following figures illustrate trade in ornamental products made by Costa Rica over the past decade. Trends in total exports between 2008 and 2019 appear in Figure 1 on page 28. Increased presence of plants and cuttings in the product mix is apparent.

Total exports in 2019 amounted to \$133 million USD distributed as follows:

- Live plants including cuttings, scions and rooted plants \$63 million USD
- Foliage, grasses and mosses \$36 million
- Cut flowers \$33 million
- Bulbs, tubers and rhizomes \$395,000 USD

#### MARKETS AND VALUES

About 50 per cent of total ornamental product exports in 2019 was sent to the US, 32 per cent to the Netherlands, four per cent to Belgium, two per cent to Germany, 1.5 per cent to Canada and the remaining 10.5 per cent to a variety of destinations including China, Nicaragua, Panama, Ecuador, Japan and the Republic of Korea. Plants and cuttings follow a similar pattern to that of total export, with some significant changes in the past two years, especially in the case of cut foliage where exports to the USA have increased.

When considering cut flowers, exports to the USA are 93 per cent, with the remaining 7 per cent reaching mainly Nicaragua and



*Costa Rica has become an accomplished producer and exporter of a diverse range of tropical flowers and foliage.*

Panama, and small amounts to the UK, the Netherlands, El Salvador and others.

In the case of cut foliage, export is 73 per cent to the Netherlands, 17 per cent to the USA and 7 per cent to Belgium.

#### CUT FLOWERS

After wide variation in the late 1990s and early to mid-2000s, Costa Ricans have focused on specific flower types that they can produce very successfully and total cut flower exports show an overall upward trend during the last decade, and new destinations coming into scene, as shown on Figure 2 on page 28. Flower types have changed drastically; chrysanthemums have almost disappeared from the scene and lilies (*Lilium* sp) are currently

among the most widely grown cut flowers.

Currently, over 50 per cent of the lilies imported by the US comes from Costa Rica. Interestingly, dried flowers are also gaining ground as shown in Figure 3 on page 28. Live plants, cuttings and scions Production of propagation plant material for export purposes has been in place in Costa Rica since the 1980s, with various renowned international companies settling there.

Although at present Guatemala has taken the lead over Costa Rica as a supplier of live plants (garden, bedding and pot plants), cuttings and scions, this remains an important sector for Costa Rica, now exporting to many markets around the world including Panama, Nicaragua, Mexico, the Dominican Republic and more distant destinations like China and the Rep. of Korea. Trends over the last 10 years appear in Figure 4 on page 28.

#### CUT FOLIAGE

Aside from leatherleaf fern, there are many kinds of cut foliage products from Costa Rica, including tropical species. It is exported mainly to Europe (the Netherlands, Belgium, United Kingdom) and the USA. However, these exports show a reduction trend over the past ten years. This is due to new suppliers taking a share of the markets, for example African countries in Europe (Kenya, Ethiopia, and others) and various



*Although Costa Rican producers generally report high production costs – often higher than those of their competitors in the region – they have succeeded in maintaining a well-recognised place in the international floriculture scene.*

**Figure 1. Total exports of ornamental products from Costa Rica 2009-2019**

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Live plants incl. their roots, cuttings and slips	57694	77401	81084	83372	78676	72418	70145	63267	62679	67288	69129
Foliage, grasses, mosses	51545	60596	55012	44531	40763	41370	39760	37049	36036	28387	29624
Cut flowers	26901	33739	32801	35654	35798	36933	37643	38551	33270	28387	29624
Bulbs, tubers, corms, crowns and rhizomes	27	11	84	10	13	0	0	15	34	7	395

Source: International Trade Centre ITC TradeMaps, 2020

**Figure 2. Total cut flower exports from Costa Rica 2009 – 2019**

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
USA	23711	30504	27829	30582	29802	29634	34652	35210	30782	26365	27531
Nicaragua	69	96	96	205	173	204	324	634	879	499	520
Panama	7	9	94	121	186	231	228	314	510	556	608
Canada	652	782	2268	2656	2350	2204	1492	1006	292	254	200
United Kingdom	484	622	602	609	624	771	441	346	220	156	91
Netherlands	247	265	335	570	2055	3412	108	137	158	165	392
El Salvador	100	135	118	160	102	93	100	112	131	142	166
Other	1630	1325	1461	751	505	385	297	791	298	250	116

Figures in thousands USD. Source: International Trade Centre ITC TradeMaps, 2020

**Figure 3. Cut flower exports from Costa Rica, by flower type 2009 – 2019**

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Chrysanthemums	655	435	988	1711	1186	276	313	609	840	665	653
Other flowers	21782	27450	25595	6150	5593	5915	6029	5184	4451	3192	3503
Lilies	0	0	0	19946	21047	20896	23348	23478	21327	18170	18201
Dried flowers	4216	5676	6034	7597	7796	9713	7808	9165	6513	5828	6822
Orchids	84	166	173	227	149	118	91	73	108	512	394

Source: International Trade Centre ITC TradeMaps, 2020

**Figure 4. Total exports of live plants from Costa Rica 2009 – 2019 (including cuttings, rooted plants)**

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
USA	26056	34172	35959	35312	31224	32689	32684	29627	28438	32061	33260
Netherlands	15713	20607	20069	26506	24096	21631	19394	14942	15276	15863	18502
Belgium	2103	5645	7727	3865	4161	2675	2601	3693	4329	3889	3036
Germany	2635	2841	3282	3049	2922	2610	2962	2587	2906	2640	2519
China	1821	1746	2192	1712	1971	2183	2177	1614	1599	1511	1730
Canada	3119	3577	3796	3486	2827	2016	1970	1697	1234	1458	1704
Ecuador	99	161	266	146	263	2	49	32	72	443	1004
Japan	643	1047	1073	1326	1337	1126	1063	837	932	856	863
Nicaragua	9	18	88	1015	1193	790	637	458	533	886	795
Korea, Republic of	268	688	538	740	754	599	833	1050	801	862	791
Dominican Republic	36	54	132	132	1285	257	270	434	713	1408	763
Other	5191	6844	5965	6079	6343	5840	5507	6298	5849	5408	4163

Source: International Trade Centre ITC TradeMaps, 2020

**Figure 5. Total exports of Costa Rican cut foliage 2009 – 2019**

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Netherlands	32444	42402	30548	28601	25094	25794	24141	23216	19073	17254	24636
Belgium	6702	7570	15650	9071	9275	8263	9107	8496	10873	11004	2434
USA	4397	5619	4221	4151	4001	4663	3595	3373	4124	5228	5770
United Kingdom	1109	1301	1317	898	763	818	1022	877	891	229	78
Canada	344	399	435	458	496	447	542	417	334	302	308
Japan	982	708	825	647	603	497	455	348	237	259	141
Germany	3140	790	441	44	22	60	7	31	74	37	55
Other	2426	1806	1575	662	510	829	892	292	428	327	404

Source: International Trade Centre ITC TradeMaps, 2020



Greenhouse production of gerberas.

Latin American countries in the US (Ecuador, Colombia, El Salvador, Honduras and others). Cut foliage has become particularly important in association with exports of consumer-ready bouquets which sell to supermarkets and other mass marketers in both North America and Europe. Figure 5 shows the evolution of Costa Rican cut foliage exports over the past decade.

## OUTLOOK

Costa Rica has consolidated its ornamental product sector by diversifying its product mix and identifying new opportunities and specific market niches. Supplying neighbour markets and focusing on cutting production as well as on specific flower types (i.e. lilies and tropical flowers and cut foliage) are giving positive results. Many exporters abide by sustainable certification schemes such as the Dutch MPS, Rainforest Alliance or GlobalGAP.

Although Costa Rican producers generally report high production costs – often higher than those of their competitors in the region – they have succeeded in maintaining a well-recognised place in the international floriculture scene. Costa Rica enjoys important advantages for ornamental plant product trade such as competitive airfreight, and zero tariff exports of ornamental plant products to the USA granted by the Caribbean Basin Economic Recovery Act (CBERA).



# PREPARING FOR THE NEW REALITY

One of Royal FloraHolland's key investment targets for 2020 is the digitalisation of all transactions by the end of 2020.

With Floriday, the growers will be able to make all kinds of deals with their customers using one single platform. We are on track to succeed. More and more growers and buyers are on board and start doing business online. Digitalisation not only marks a change in the way people can do business, but it certainly gives many possibilities to improve current procedures. The information can be used multiple times, and will be available in one system. The availability of stock is always accurate, and it is much easier to get in contact with a large group of buyers. And buyers can quickly source products around the globe.

But being online also leads to the need to meet more frequently offline. Unfortunately, this year there were not many occasions to meet each other due to Covid-19.

At the IPM in Essen, January 2020, we looked at the situation in China and could not imagine what would be the worldwide impact of the pandemic. For an extended period it was impossible to travel, and although countries have opened, it is currently still difficult to move. This had its impact on the fairs that are normally held around the globe. Big events like the Iftex Nairobi was first postponed and later cancelled. Also, the Trade Fair Aalsmeer will not take place this year, for the first time in the more than 20 years of existence of this international trade fair for floriculture.

It demands a different approach to meet. As Royal FloraHolland we started looking for alternative ways. Regional meetings are currently organised via digital programmes such as MS Teams, Zoom, YouTube, or specialised broadcasting software. Sometimes in combination with an interactive broadcast on location for the participants. Where we do organise physical meetings, hygiene protocols and distancing measures are strictly

adhered to and a broadcast for the digital visitor is also offered.

We expect meetings and trade fairs to take place digitally at least until January 2021. With the experience that we gained over the past months we also created a new reality. Digital and hybrid events are an added value beside the purely physical trade fairs.

How do you prepare yourself for this new reality? Being online visible for your customers but also being able to meet them and show them the possibilities of your products. Interesting times for all of us but also big opportunities for the ones that can be adept to this situation the best. I wish you all a lot of inspirations and let's meet on- or offline.

**Fred van Tol**  
Manager of International Development  
Royal FloraHolland



# Boxwood: Recover, replant or replace?

After 26 years of box blight, how close is the industry to defeating it?



*Château et les jardins de Villandry.*

AUTHOR: AUDREY GERBER

**B**ox, Buxus, or boxwood continues to be a prominent horticultural crop globally. The Netherlands are the leading European country for Buxus, producing more than 17 million of the European total of 43 million plants, says Didier Hermans of Herplant BVBA, quoting 2017 figures sourced from Royal FloraHolland. Horticultural Research Institute (HRI) President, Mr Gary Knosher, confirms that “Boxwood is the most popular broadleaf evergreen sold in the USA, and has significant presence in landscape and historic gardens.”

## MARKET FIGURES SHOW A DECLINE

Despite its popularity, Buxus is under threat as a successful ornamental plant. The AIPH International Statistics –Flowers

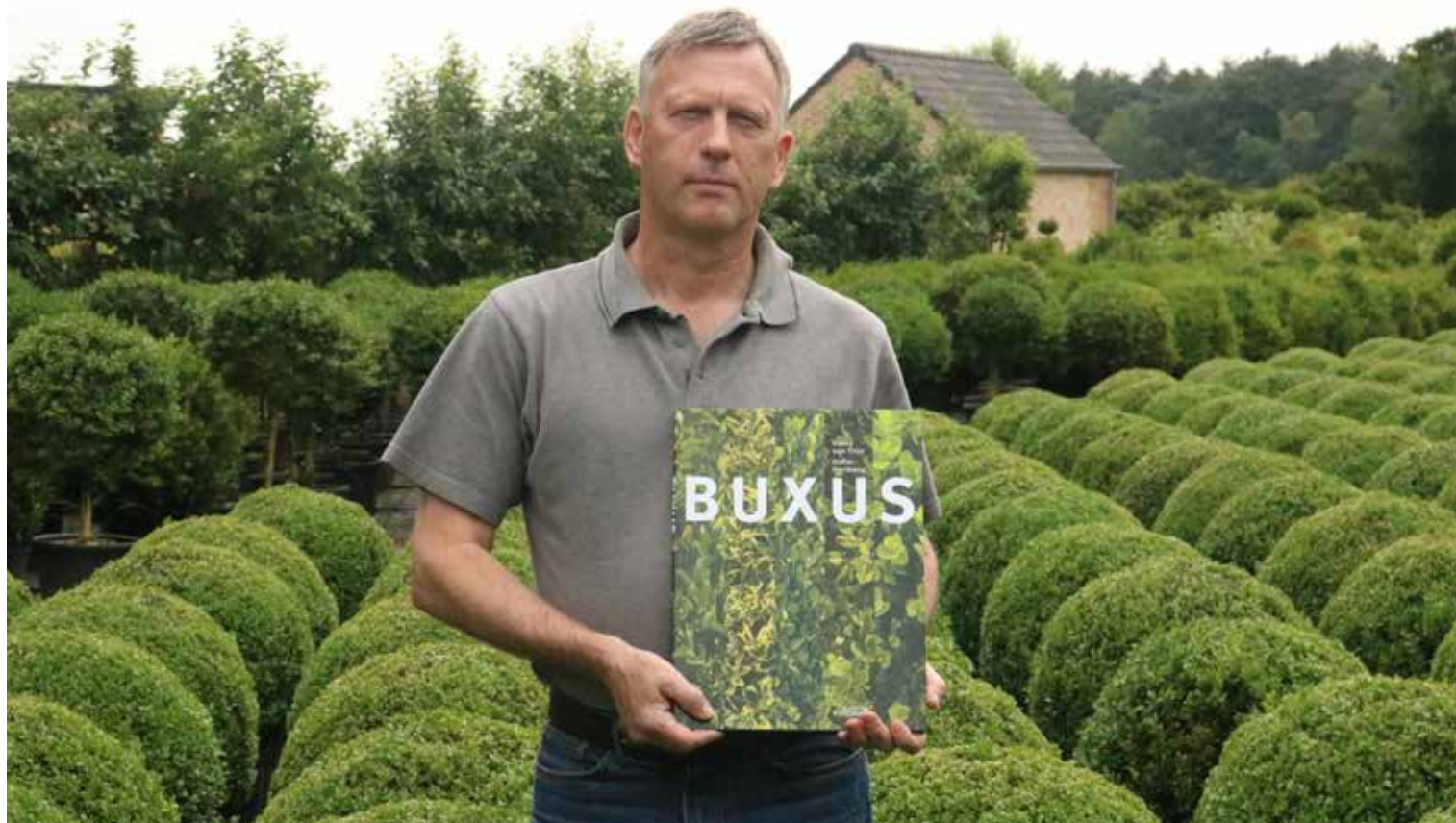
and Plants 2019 yearbook indicates changes in market trends of Buxus production, prices and sales over time. In the Netherlands, there was a decrease in turnover of about 1/3 from 2015 to 2018. Although quantities dropped by a third, prices were relatively stable. During this period when Buxus maintained its price, approximately 40 per cent of the top ornamental products showed a decline in average price. Over the ten-year period from 2008 to 2018, the nursery stock area in the Netherlands producing Buxus initially increased to a peak of 1,684ha in 2011, followed by a steady decline to a 2018 production area that was only 70 per cent of the 2008 figure. This decrease in area was accompanied by a decline in the number of growers: from approximately 800 in 2010, to 200 in 2019 (Centraal Bureau voor de

Statistiek). Likewise, in Japan, a slight decrease in nursery stock production area of Buxus from 2011 to 2015 was accompanied by a significant decline in grower numbers, with the number of farm households producing Buxus almost halving over this period.



*Buxus ‘Heritage’.*





#### PROGRESS OF DISEASE TOLERANT VARIETIES.

Although box blight (*Cylindrocladium buxicola* (syn. *Calonectria pseudonaviculata*)) is not the only pest or disease problem, it is the most severe. It was first detected in the UK in 1994, and has spread through Europe and around the world, being confirmed in USA in 2011.

*Didier Hermans is co-author of the great Buxus book, which was first published in 2005.*

In 2007, in response to these pest and disease issues, Herplant BVBA in Belgium started a breeding programme (in collaboration with the Flanders Research Institute for Agriculture, Fisheries and Food ILVO) to develop tolerant varieties. Didier Hermans explains that from their collection of over 200 species and varieties, the nursery invested years of focused breeding and screening of thousands of hybrids to deliver four varieties that are soon to become available to the industry. Each of the BetterBuxus® varieties (in the USA trading as BetterBoxwood) has their own merit. 'Heritage' is most similar to the standard *Buxus sempervirens*, though a little more compact. 'Renaissance' is a low growing, small-leaved variety suitable for low box pattern designs, and only needing clipping once a year. The fastest growing is 'Skylight', and its vigour makes it well-suited to topiary and tall, cloud-pruned hedges. 'Babylon Beauty' has a low, spreading habit useful for large ground-cover sheets of box. Release of these BetterBuxus® varieties to the industry is being done in a phased manner, first providing plants to famous historic gardens that rely on box for their

design integrity. These are all in Europe: Château et les jardins de Villandry, Paleis Het Loo, and Herrenhäuser Gärten.

#### THERE IS NO SINGLE BEST ALTERNATIVE

There have been many suggestions and trials for replacements of boxwood in landscapes and gardens. What is becoming apparent is that there is no single best alternative. There are many reports where a different plant has done the job, but these seem to be very situation specific. The real value of box has always been its reliable performance as a design element: a compact evergreen of rich, dark colour, with low maintenance requirement and reasonable vigour. Anything else introduces some level of compromise: Yew (*Taxus baccata*) is compact, though slow growing and a very somber green. *Lonicera nitida* is compact and a good, fresh green, yet requires more regular clipping to maintain shape. *Ilex crenata* has larger leaves than box and so does not provide quite the compactness of form. *Phillyrea angustifolia* clips well to a good shape, though only for large-scale forms, and is a different colour green.



*Herplant grows 30ha of Buxus and Taxus and has currently more than 1 million BetterBuxus plants ready to enter the market. Last month, the first batches of plants grown in P13 pots (height of plant 20/25cm) found their way across Europe through Herplant's exclusive network of distributors.*



## MANAGEMENT OPTIONS FOR PRODUCTION AND LANDSCAPE

Best practice guidelines for both production nurseries and landscapers have recently been revised by the Horticulture Research Institute (HRI), USA, and are endorsed by National Association of Landscape Professionals (NALP). The changes in strategies of prevention and management of the disease in this report are led by research. The important discovery that 70 per cent ethanol kills the conidia is of critical importance in defining cleaning protocols of work surfaces and equipment to prevent spread. Understanding the conditions for infection and spread

*The King's  
Garden at Het  
Loo, on 17  
September 2020,  
5 months after  
the replanting.*

*Herrenhäuser  
Gärten in  
August 2020.*



reduce the likelihood of widespread disease in the landscape. Box blight prefers an enclosed, moist, humid environment, and pruning, therefore, should be done when plants are dry or during periods of low humidity. The spores are sticky and can easily be transported on equipment, clothing, and animals. Early detection is critical to on-site management of the disease, and the HRI guidelines offer advice for training of personnel to scout, recognise and report symptoms.

### EACH SITUATION MUST BE CONSIDERED SEPARATELY

Historic gardens provide a particular challenge where box is part of the historic design, and to change plant species would impact the integrity of the heritage design. In gardens of the National Trust

in the UK where box blight is a problem, cultivation strategies such as improving soil management, watering, pruning and nutrition, are often ineffective. Mr Simon Toomer, National Specialist for Plant Conservation at the National Trust, says that where changing management is ineffective, gardens look to replace box with alternative species. "Some gardens are using alternatives including common yew (and cultivars) and Japanese spindle (*Euonymus japonicus* 'Microphylla'). We are also considering other alternatives such as *Ligustrum delavayi*." Summing up the situation, Simon Toomer concludes, "Box blight is just one plant disease threat among many that result from globalised plant movement. These threats will undoubtedly be exacerbated by climate change, and managers of historical gardens will need to adapt management and plant choice accordingly. Our 'plantscapes' will inevitably change, and maintaining historical aesthetic qualities (within new constraints (plants and resources) will be an interesting challenge that will make current discussions about box seem quite parochial!"

*The right cultivation strategies combined with a balanced use of fungicides allows growers to manage box blight outbreaks. Herplant in collaboration with ILVO's Bjorn Gehesquire and Kurt Heungens, has carried out extensive research and have published their research findings. <https://bit.ly/3iSOcfj>*

## BETTER BOXWOOD MAKES DEBUT IN USA

**Plant Development Services Inc. and Tree Town USA partner to introduce Better Boxwood, 'the first collection of scientifically bred blight-resistant boxwood in the industry'.**

The newly formed partnership named Boxwood Solutions Inc. began taking liner orders in September 2021 for Spring 2022 delivery to grower partners across the United States. Kip McConnell, Business Development Director with Plant Development Services, is excited about this groundbreaking release and the new partnership with Tree Town: "Our expertise in licensing and marketing, coupled with Tree Town's production engine and nationwide reach, will allow Better Boxwood to make an immediate impact in the marketplace." David Kirby, Executive Vice President of Tree Town, highlights the need for improved genetics in the boxwood market: "Understanding the importance of boxwood to the North American landscape and the devastating effects of the Boxwood Blight, we are proud to provide consumers and landscape professionals with the largest collection of new varieties actually bred for blight resistance. The four uniquely shaped Better Boxwood varieties will fill a wide variety of landscape needs." The Better Boxwood line will be available to American consumers beginning in Spring of 2023.

For more information visit [www.plantdevelopment.com](http://www.plantdevelopment.com)

For more information visit [www.betterbuxus.com](http://www.betterbuxus.com)





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# From tree trash to treasure?

Since 2018, Dutch-based bay laurel grower Gova has diversified by collecting bay leaves from pruned branches to derive essential oil from them in a purpose-built laboratory. This action they call the valorisation programme – it means adding value to the green clippings, by converting them into skincare products, hand sanitiser, ice cream, liquorice, or herbal tea. Valorisation helps the Gova plant nursery to improve its green credentials, broaden its value proposition and, hopefully, in the long run, to generate an additional income stream and increase revenues. Participation in the plant repurposing project is open to any grower.

AUTHOR: RON VAN DER PLOEG

**E**ven before the coronavirus pandemic started to make headlines around the world, recycling, re-use, upcycling and repurposing of waste was reaping the benefits of an increasingly eco-conscious market. The environment-friendly call to swap wasteful linear material consumption patterns of manufacturing for a more circular

economy in response to increasing signs of resource depletion all led to this growing trend. Now, with the world adapting to strict hygiene and cleaning protocols, Gova's VARTA (which is the Dutch abbreviation for valorisation of horticultural and agriculture waste) is gaining momentum. The first batches of bay laurel soap with disinfecting properties and hand sanitiser are currently coming out of their wholly-

owned laboratory. And if you were lucky, you might have been treated to a bay laurel ice cream in the Decorum stand at this year's IPM Essen show.

## **NEW BUSINESS OPPORTUNITIES DESPITE COVID-19**

With the backdrop of a global health and economic crisis, Gova launched its new products.

Charl Goossens, who with his brother Jack (the current chairman



of Royal FloraHolland) took over their parent's family business in 1998, recalls how in March and April, at the height of the coronavirus outbreak in Europe, Gova plant nursery had its fair share of problems. Their most significant export market, the UK, went under strict lockdown and cut off the retail supply chain at a crucial time.

Like many of the flower and plant growers in the Netherlands, they felt a bit anxious when in days of unfolding dramatic developments Royal FloraHolland saw its turnover drop 83 per cent on 16 March with subsequently tons of unwanted flowers and plants ending up in the landfill. But as soon as the UK garden centres reopened and other European countries eased their lockdowns, they were happy with a noticeable surge in demand for their bay laurels.

Meanwhile, in an ironic twist of fate, the coronavirus crisis created new (side) business opportunities and a positive buzz around their latest plant repurposing venture. With such vast amounts of discarded flowers and plants, the question of how to repurpose them had never been more topical – literally. Plus, horticultural businesses in financial distress meant there was a high interest in alternative income streams.



#### CHALLENGING CURRENT THINKING

Charl himself explains about establishing the valorisation programme two years ago to develop innovative solutions to the pruned branches, which are an unavoidable by-product of the growing process. He says, "Previously composting the woody waste resulted in an organic material which we would use in our potting soils, but we were looking for ways to add more value." This new approach challenges current thinking. Charl notes,

*Gova harvests around 100,000 litres of cut offs per year, air dries, milles, sieves and stores the clippings in a dry and cool environment ready for the extraction process.*

"Herbal extracts might conjures up images of stinging nettle fertiliser, druids and herbal medicine. But by contrast, VARTA's method is highly scientific with laboratories and offices available at the Green Chemistry Campus, located at the premises of SABIC in Bergen op Zoom, one of the world's largest petrochemicals manufacturers. They are keen to work with safer ingredients by bringing alternatives that are more environmentally friendly to the market. In the benchmarking of products we use supercritical carbon dioxide as the extraction solvent of choice. In its supercritical state, carbon dioxide achieves high mass transfer rates and as such high extraction rates. The result is a pure, in absence of any solvent residues."

Charl says that valorisation requires a fair deal of re-imagination. "As a grower of bay laurel, a plant which is often used in cooking, I can assure you that my plants will not cause harm to the consumer when prepared and eaten as attested by a wide range of certifications based on the results of tests and audits. So, when I prune my plants the off cuts may drop to the soil but they will continue to be a certified product. It all boils down to converting under-utilised material into high value products. That is why I speak about powerful by-products instead of low-grade waste."



Gova products include kitchen bay laurel, lollipop standards, laurel balls, pyramids and mini trees, with ornately plaited or spirally trained stems.



## POTENTIA E PLANTIS

Subscribing to the Potentia e Plantis adage – the power of plants – the Goossens brothers saw inspiration from the centuries-old soap making techniques from Aleppo in Syria using olive and laurel oil.

This idea had the backing from innovation platforms such as SIGN and Biobased Delta. Today, VARTA works with people, companies, flower auctions and universities to find and drive the science and technology innovations that will grow the bio-based economy.

When drawing up the VARTA business plan, Gova soon decided to develop an in-house laboratory. Charl elaborates, “A clear benefit was cost. Outsourcing the research process to a third party not only is very expensive – the starting fee is approximately €15,000– and the single conclusion is misty. More research is always needed. What is more, you mostly end up dealing with bio refineries that are well equipped but whose large scale operations are not easy to match with our ambitions.”

The VARTA lab employs two FTEs, Kim Rijnsburger and Nicole van Beers and one part-timer, Michelle Jongenelen, who are on Gova’s payroll. Other investments included a giant vat used for the steam distillation and extraction with an organic solvent, which is necessary to make product samples.

In the run-up to the early spring

*In summer, container-grown lollipop standards are placed outside.*



sales, staff clip the plants from November to March and before the longest day of the year. Gova harvests around 100,000 litres of cut offs per year; air dries, mills, sieves and stores the clippings in a dry and cool environment ready for the extraction process.

“In one round, you can steam-distillate up to 600 litres of foliage yielding 0.75 litres of essential oil. When steaming *Laurus nobilis* for 45 minutes to 1 hour, the distillation yields an highly concentrated extract. This process can be repeated several times per day. Gova’s laurel oil has a full and rich scent. This natural beauty comes at a price of a few hundred euros per litre. With that you can produce a whole lot of laurel-based liquorice,” says Goossens jokingly.

## TAKING ONE DAY IN A TIME

The sibling bay laurel growers believe in taking one day at a time. Charl says, “You cannot expect to conquer the world in one day. The challenge is to stay focused on a few core products. And especially in the food supplement business we strive to be open and honest above all. The one thing that makes us better is our short and localised supply chain. In the diabetic tea project, we collect certified plant material from four Dutch growers and extract them here, in our own country. It is not like yew clippings which are collected in the Netherlands, then sent to China to be processed for chemotherapy drugs.”

Although VARTA is born out of a genuine commitment to the environment and belief in the cradle-to-cradle design principle,

the Goossens brothers candidly admit that the essence is to find out what their customers want. How they want it, how to get organised to meet those need best and how to get paid for doing so to make a profit. Charl notes, “Our biobased lab offers the competitive advantage of speaking the language that both growers and academics understand while communication and reporting is instantaneous, and rates are reasonable. The first step involves a research literature review available for €1,500.”

## EXCITING BUSINESS CASES

Meanwhile, other plant growers are showing an interest in this repurposing trend with high-value ornamentals and fresh produce. For instance: potted herb growers Jacqueline and Christ Monden who run their De Kruidenaer nursery in Etten-Leur, and Lommerse Breeding from Mariahout who are involved in the breeding of *Stevia rebaudiana*, the natural sweetener. Both have sought to find more uses for high value compounds their plants contain.

Finding new uses for discarded plant material creates a unique flow of inspiration and collaboration enthuses Charl. “We have teamed up with the following companies: bromeliad breeder and propagator Corn Bak; pepper and curry grower Westlandpeppers; and basil grower De Kruidenaer to unlock the anti-diabetic potential of our plants. This cooperation has resulted in an anti-diabetic tea blend. Another exciting exercise is made with sugar beet company Cosun. There is quite obviously a lot of synergy between



*Lab technician Nicole van Beers adds the final touches to VARTA’s latest product, hand sanitiser with antiseptic laurel oil and celosia extract as a natural red colourant. For the marketing of the product VARTA teamed up with specialist cleaning product supplier TriStar and Celosia grower Ammerlaan-Sosef.*



Gova and Cosun as the compounds in the roots of sugar beet roots may serve as bio treatment against harmful insects in *Laurus nobilis*, while the laurel oil might protect sugar beet roots against harmful insects.”

### THE STORY BEHIND THE PRODUCT

Charl stresses that he does not use spurious health claims in the labelling of products. However, to sell them, MPS Product Proof and MPS GlobalGap certification are mandatory.

“When participating in the Dutch Design Week (DDW) we met with young and upcoming designers such as Jalila Essaidi with whom we created a band aid treatment with bay laurel oil which is naturally antibacterial. They told us, consumers are most interested in the real story behind a new product instead of asking for health claims for which you need to enter the complex world of regulations and laws. Our presence at DDW also helped to identify future target clients for the saleable product – millennials or Gen Z- and to outline the market segment.”

Charl concludes by saying, “The funny thing is VARTA is the prime example of a start-up company which belongs to the world of tech savvy and young entrepreneurs. Both Jack and I are in our fifties, so we are no longer spring chickens. That is why we need young people with science, technology, engineering, and mathematics skills and with creative minds. Together we will use our passion towards making a difference.”



*Adding value to the green clippings, by converting them into skin care products, hand sanitiser, soap, ice cream, liquorice, or herbal tea.*

## GOVA QUICK FACTS

**Charl and Jack Goossens are the third generation of what is a quintessential family business. The company traces its origins back to their grandfather Charles Goossens, who in 1931 started to grow vegetables and fruits in his backyard. Nearly five decades later, his son Harry swapped the fresh produce for bay laurel.**



*Left to right brothers Jack and Charl Goossens.*

Situated over two locations in Nispen, a land that once was called a seignory (a territory over which a lord hold jurisdiction), Gova grows 25ha of bay laurel and produces more than 300,000 plants annually. The products include kitchen bay laurel, which in terms of volumes, is the most significant product. Then there are lollipop standards (turnover wise a staple crop), laurel balls, pyramids and mini trees, with ornately plaited or spirally trained stems. Charl took his early education at the Aalsmeer horticultural school and joined the company at 19. Jack studied business management, worked for a bank and came onboard in 1995. Three years later the two brothers took over management of the plant nursery from their parents.

*Laurus nobilis* is a host plant of the plant-bacteria *Xylella fastidiosa*. This health risk is why Gova opted for a closed-loop cultivation system where they no longer source plants from abroad. They take softwood cuttings in August and September. *Laurus nobilis* is a slow-growing tree with kitchen laurel finishing in 16 months, while lolly pop standards require four to eight years to grow into saleable plants. In the winter, all the plants are brought indoors to the greenhouse to protect them against frost, moist climates and cold winds.

The company is also involved in plant breeding, with botanical collections set aside to develop for example varieties that are more frost resistant or produce sturdier stems. To (container) grow the perfect *Laurus nobilis* a grower needs to understand the tricks of the trade: water moderately to avoid root damage and add preferably water-soluble fertilisers instead of coated granules. Charl explains, “Slow-release fertilisers are a firm favourite with many nursery stock growers but we prefer to use water-soluble fertilisers as these allow us to steer the crop better and give us better insight what is happening inside the container.”

In terms of crops and diseases, *Xylella fastidiosa* is currently the most dreaded bacteria. In contrast, while the plant can be susceptible to aphids and oleander scale (*Aspidiotus nerii*) which parasitic wasps can regulate. More challenging to combat biologically is the bay sucker (*Lauritioza alacris*) which causes leaves to thicken and curl downwards at the margins and turn yellow.

Bottom line is that in protecting kitchen bay laurel they use biocontrols *only* with MPS Productproof and MPS Global Gap being two significant licenses to produce. On specimen plants they use very few chemicals. Gova stresses that despite the increased use of biological control the plants do not grow organically. Charl says, “To grow organically you are forced to refrain from manufactured fertilisers and use cow manure for example. For annuals this might be an option, mixing the manure into your potting soil but this will not work in a four-year long containerised production.”

As a member of Royal FloraHolland, Gova sells its plants through the auction-based wholesalers with the UK, Germany and France being the most successful export ventures. However, their lollipop standards are also a firm favourite with Norwegian, Swedish, and Finnish customers. (Discount) sales to Eastern Europe are also soaring.

# RECOVERY FROM CRISIS

## The future for ornamentals' at AIPH's virtual conference

On 15th September 2020, the International Association of Horticultural Producers (AIPH) brought together an impressive line-up of expert international industry speakers to share experiences of the impact of Covid-19 on the horticultural industry and the prospective outlook for the future.

AUTHOR: MARTA PIZANO PHOTOS: TEAL AGROTECH

**T**he 200 plus delegates at 'Recovery from Crisis – the future for ornamentals', AIPH's first international

conference held in a virtual format, heard about the key challenges faced by the industry over the last six months, the lessons learned, and plans for the future.

The opening session on Crisis Management was opened by keynote speaker Dr Charlie Hall from Texas A&M University, USA. He spoke about the requirement for strong leadership during this challenging period with the need to balance an empathetic

approach to your workforce and customers with a rational line to protect financial performance. Ms Carin van Huët, director of Food & Agribusiness at Rabobank looked at the challenges that lie ahead, including higher unemployment, reduced labour turnover, and lower disposable incomes. Page 14. Mr Frank de Hek, horticulture global head at mid-market investment bank Oaklins outlined how April saw a substantial dip for the sector in terms of mergers and acquisitions with May matching 2019 figures and June and July exceeding 2019. A trend set to continue in the future as the professionalisation of the sector, an increasing knowledge base, pressure from large retailers and e-commerce platforms,

involvement of any external factor. In 2013, the Netherlands had 3,796 ornamentals growers, in 2017 their number was 3,316. The acreage per Dutch grower in hectares was 7.7 in 2013 and 9.7 in 2017. The figures prove how economies of scale are an important concept in the horticulture business and represent the cost-savings and competitive advantages larger businesses have over smaller ones. At the floral wholesale level, companies such as Dutch Flower Group (DFG), Fleurametz and Royal Lemkes have grown 70 per cent in five years. Booming M&A activity at retail level does not bode well for florists as this will lead to a reduction in market share of 40 per cent to 30 per cent at florists between 2016 and 2027.

Mr Josh McBain from the Foresight Factory, UK highlighted that many existing consumer trends have accelerated as a result of the Covid-19 environment. Increased use of digital platforms is one notable trend that the industry needs to capitalise on. The 'Back to

### TO LEVEL UP R&D IN ORNAMENTAL PLANT BREEDING YOU NEED TO HAVE SCALE

succession issues, a shorter product lifecycle and shifting consumer demand will continue to reshape the ornamentals sector.

Especially in breeding, the consolidation drivers are the strongest with Dümmen Orange (24), Ball (11) and Syngenta (96) having the largest number of M&A deals. To level up research and development in ornamental plant breeding, De Hek says, you need to have scale. Ultimately this reality will result in around five to eight 'breeding platforms' next to a variety of monocrop breeders. At the same time, Dutch flower and plant producers grow by using internal resources and through the natural system without the

Nature' trend is also favourable for horticulture. Research shows that in the UK, 36 per cent of people did more gardening during lockdown with 18 per cent saying they will continue to do more post lockdown. Significantly, this number rises to 30 per cent for 35-44-year-olds demonstrating the opportunity ahead to engage with this new audience to keep them gardening. In the next session, The Future for Cut Flowers, delegates heard Ms Emma Coupe from UK based retailer, Marks & Spencer, talk about the importance of really knowing your customer and working to ensure that new habits in terms of buying everyday flowers more frequently are sustained. Mr Simon Ogrizek, President of



AIPH Secretary General Tim Briercliffe, steers a panel meeting of floriculture experts





Florint highlighted how those businesses that diversify their business models are most likely to survive and thrive. Innovation will also play an important role. This point was echoed by Mr Steven van Schlifgaarde, CEO Royal FloraHolland, who outlined their plans to evolve the Floriday system into a B2B platform for the worldwide horticultural market.

In Australia, Craig Musson from WAFEX highlighted how the impact of the reduction in production and logistics will impact the market for the year ahead. Demand for more local and native plants grew and whilst the wedding/events sector continues to suffer they are looking forward to a bumper season in 2021. Mr Vadim Bogdanov from online wholesale business Potted showed how their sales have grown with B2B customers expecting the same digital experience at B2C customers. Ms Gao Rongmei from Kunming International Flower Auction, China explained how as well as dealing with the pandemic the industry suffered from a period of heavy snowfall as well, causing the loss of 20 million stems in the first quarter. A panel session on creating a more resilient supply chain for flowers provided great insight into the experiences of trading through the pandemic from three continents. It appears that there were common issues caused by the pandemic in Colombia, Kenya, and Japan – most notably around freight and logistics.

*The view from the virtual 3D auditorium*

Mr John Simko from Sunshine Bouquet Company/Esmeralda Group spoke about how they held their nerve throughout the pandemic, enabling them to be in a strong position when demand from the supermarkets returned. He encouraged us to highlight the importance of plants and flowers for our emotional needs, given the role they play in so many occasions throughout our lives.

The afternoon session on The Future for Ornamental Plants and Trees heard from Mr Jan-Dieter

Bruns, President of the European Nurserystock Association (ENA) about how they supported their members throughout the crisis communicating regularly and sharing resources. Speaking candidly about their experience Mr Michiel de Haan from Royal Lemkes said that whilst it had been an impactful period it had also been one providing great insight for them. The key messages they are taking forward are the greater need for flexibility, the importance of genuine cooperation throughout the supply chain, and the role that sustainability will play in the future.

The 'Creating a strong industry for the future' panel session looked at the impacts of the pandemic across

the world, despite the challenges some have found operational efficiencies in new ways of working which they will take forward in a post-Covid environment. On a worldwide basis, there has been greater recognition of the positive effect of the industry on climate, health, and quality of life. The key message was 'be ready to adapt' to take advantage of the opportunity for growth over the next few years. Stimulating market demand is key for the future, and the final panel session looked at various initiatives taking place including 'Flowers for the Soul' in Brazil, 'Let Hope Bloom', and 'Feel the Distance with Beauty' in Holland/Europe.

With an increased focus on social media, marketing campaigns must continue to capitalise on increased interest. This promotion will help to sustain demand, especially amongst those that have created new habits in regularly buying plants and flowers.

Closing the conference AIPH Secretary General, Tim Briercliffe said "With the very real prospect of

businesses facing disaster as a result of the Covid-19 pandemic it was reassuring to hear how many

are emerging from this difficult period positively. Whilst there is a recognition that this is not the case for all, and there are challenges ahead, it is truly inspiring to see how the global horticulture industry is responding to face a bright and positive future. Innovation and best practice have come to the fore with some operational changes made resulting in lasting efficiencies for the future. With people spending more time in their gardens and green spaces during lockdown there is a new consumer group to nurture and understand to grow the future market."

## AUSTRALIA IS LOOKING FORWARD TO A BUMPER SEASON IN 2021

*The conference videos and PowerPoint slides are available on the AIPH website: [aiph.org/conference-2020](http://aiph.org/conference-2020)*

# Globalisation increases the risk of invasive plant pathogens

The demand for new varieties of ornamental crops is never-ending. At the same time, the rapid increase of movements of plant products between countries has increased the risk of spreading plant pests and diseases. For many years, Agroinnova (a competency centre and agricultural innovation hub of the University of Torino) continuously monitors farms, plant nurseries, public and private gardens to detect emerging pests and pathogens.

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**T**his article lists the new diseases and their fungal pathogens reported on ornamental and flowering plants in the last ten years, in the Piedmont and Liguria regions (northern Italy). We end this review with a list of judgements about the new pathogens. Ornamental horticulture in Italy occupies an area of about 30,000ha with a production value

of €1.2 million/year (CREA, 2015). The primary plant production is in the north, concentrating in Liguria and Piedmont. These regions host a large number of greenhouses and nurseries growing potted plants, cut flowers and cut foliage and acid-loving plants respectively with the Lake Maggiore area benefiting from a benign micro-climate.

The production of ornamentals is a very dynamic sector with plant nurseries, public and private gardens continuously introducing new genera, species and cultivars to satisfy the demand of customers. The introduction of new hosts exposes the production of ornamentals more than other sectors to the risk of introducing new pathogens. Therefore, there is a need for more vigilance in monitoring to detect the appearance of new diseases.

In Italy, Agroinnova, the Competency Centre and Innovation Hub for agriculture at Torino

University has a long-standing reputation as a leading centre of plant health expertise, undertaking research and surveillance activities on a range of diseases in ornamental horticulture.

Staff from Agroinnova work with academia, growers, breeders, landscapers and other professionals in the field to detect and respond to emerging pathogens in ornamental cash crops. Ornamental plants represent a fascinating case study as recently documented (Garibaldi *et al.*, 2017).

Table 1 lists the soil-born pathogens reported for the first time in Italy, and often in Europe and worldwide on ornamental plants in the last ten years. All the pathogens were identified both by morphological characteristics observed on the microscope and by the molecular analyses carried out on the DNA extracted from the parasites. The pathogenicity was demonstrated, in line with the Koch's postulates, a set



Figure 1. Symptoms caused by *Fusarium oxysporum* f. sp. *echeveriae* on *Echeveria agavoides*.





Figure 2. Powdery mildew caused by *Golovinomyces, cichoracearum* on inflorescences and ligules of *Echinacea purpurea*.

of conditions which need to be fulfilled to establish which organism is causing a particular disease.

#### SOIL-BORNE PATHOGENS

Most of the soil-borne pathogens of ornamentals reported in the last ten years (Table 1) belong to different *formae speciales* of *Fusarium oxysporum*. Among these, *F. oxysporum* f. sp. *opuntiarum* was detected on many succulent plants of the Cactaceae and Euphorbiaceae families (Bertetti *et al.*, 2017), as an example, *Mammillaria zeilmanniana* and *Sulcorebutia heliosa*, while *F. oxysporum* f. sp. *chrysanthemi* expanded the range of host of Asteraceae family on *Rudbeckia fulgida*. Moreover, the new *formae speciales* *crassulae*, *echeveriae*, *papaveris* and *lavandulae* were identified for the first time, respectively on *Crassula ovata*, *Echeveria agavoides* (Figure 1), *Papaver nudicaule* (Ortu *et al.*, 2014), and *Lavandula × allardii*.

Among the *Verticillium* wilts, the identification of *Verticillium nonalfalfae* on *Pelargonium grandiflorum* is remarkable, which adds to *V. dahliae*, already known on the same host for some time in Italy.

In the susceptibility trials subsequently carried out on several cultivars of *Pelargonium* spp., *P. grandiflorum* species was the most susceptible to *V. nonalfalfae*. In contrast, the most cultivars belonging to *P. peltatum* and *P. zonale* showed different levels of susceptibility and only a few numbers of these were partially resistant.

*Rhizoctonia solani* mostly belonging to the anastomosys groups AG-1

Table 1. New soil-borne pathogens of ornamental plants detected the last ten years.

Host - genus and species	Common name	Pathogen	Year
<i>Abelmoschus manihot</i>	Sunset huskmallow	<i>Rhizoctonia solani</i> AG-4-HG-I	2020
<i>Aquilegia flabellata</i>	Fan columbine	<i>Sclerotinia sclerotiorum</i>	2011
<i>Astrophytum myriostigma</i>	Bishop's cap	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2016
<i>Campanula carpatica</i>	Carpathian bellflower	<i>Rhizoctonia solani</i> AG-4-HG-I	2018
<i>Campanula rapunculoides</i>	Creeping bellflower	<i>Rhizoctonia solani</i> AG-1-IB	2015
<i>Campanula trachelium</i>	Nettle-leaved bellflower	<i>Rhizoctonia solani</i> AG-4-HG-I	2018
<i>Campanula trachelium</i>	Nettle-leaved bellflower	<i>Rhizoctonia solani</i> AG-1-IB	2015
<i>Cereus marginatus</i> var. <i>cristata</i>	-	<i>Fusarium oxysporum</i>	2014
<i>Cereus peruvianus</i> florida	-	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2015
<i>Cereus peruvianus monstuosus</i>	Apple cactus	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2011
<i>Cereus peruvianus monstuosus</i>	Apple cactus	<i>Bipolaris cactivora</i>	2014
<i>Crassula ovata</i>	Jade plant	<i>Fusarium oxysporum</i> f. sp. <i>crassulae</i>	2011
<i>Echeveria agavoides</i>	Crested molded wax agave	<i>Fusarium oxysporum</i> f. sp. <i>echeveriae</i>	2013
<i>Echeveria tolimanensis</i>	Mexican Hens	<i>Fusarium oxysporum</i> f. sp. <i>echeveriae</i>	2015
<i>Edgeworthia papyrifera</i>	Oriental paperbush	<i>Phytophthora nicotianae</i>	2010
<i>Euphorbia mamillaris</i> var. <i>variegata</i>	-	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2015
<i>Echinacea purpurea</i>	Eastern purple coneflower	<i>Rhizoctonia solani</i> AG-4-HG-I	2019
<i>Echinacea purpurea</i>	Eastern purple coneflower	<i>Verticillium dahliae</i>	2020
<i>Echinocereus rigidissimus</i> subsp. <i>rubispinus</i>	-	<i>Bipolaris cactivora</i>	2019
<i>Gaillardia × grandiflora</i>	Blanket flower	<i>Sclerotinia sclerotiorum</i>	2015
<i>Helichrysum bracteatum</i>	Paper flower	<i>Sclerotinia sclerotiorum</i>	2020
<i>Kalmia latifolia</i> "Olympic Fire"	Mountain laurel	<i>Phytophthora cinnamomi</i>	2012
<i>Lampranthus</i> sp.	Figmarigold	<i>Verticillium dahliae</i>	2010
<i>Lavandula × allardii</i>	Allard's Lavender	<i>Fusarium oxysporum</i> f. sp. <i>lavandulae</i>	2018
<i>Lavandula officinalis</i>	Lavender	<i>Rhizoctonia solani</i> AG-1-IB	2013
<i>Lavandula stoechas</i>	Butterfly lavender	<i>Rhizoctonia solani</i> AG-1-IB	2015
<i>Lavandula stoechas</i>	Butterfly lavender	<i>Sclerotinia sclerotiorum</i>	2015
<i>Lychnis coronaria</i>	Rose campion	<i>Rhizoctonia solani</i> AG-1-IB	2015
<i>Mammillaria painteri</i>	-	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2020
<i>Mammillaria zeilmanniana</i>	-	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2016
<i>Melissa officinalis</i>	Lemon balm	<i>Sclerotinia sclerotiorum</i>	2014
<i>Mentha spicata</i>	Spear mint	<i>Sclerotinia sclerotiorum</i>	2013
<i>Nigella damascena</i>	Love in a mist	<i>Rhizoctonia solani</i> AG-1-IB	2013
<i>Origanum vulgare</i>	Oregano	<i>Rhizoctonia solani</i> AG-1-IB	2013
<i>Papaver nudicaule</i>	Iceland poppy	<i>Fusarium oxysporum</i> f. sp. <i>papaveris</i>	2015
<i>Pelargonium grandiflorum</i>	-	<i>Verticillium nonalfalfae</i>	2016
<i>Plectranthus scutellarioides</i>	-	<i>Verticillium dahliae</i>	2011
<i>Phlox paniculata</i>	Perennial phlox	<i>Verticillium dahliae</i>	2014
<i>Rebutia perplexa</i>	-	<i>Rhizoctonia solani</i> AG-2-2-IIIb	2014
<i>Rosmarinus officinalis</i>	Rosemary	<i>Rhizoctonia solani</i> AG-1-IA	2013
<i>Rosmarinus officinalis</i>	Rosemary	<i>Sclerotinia sclerotiorum</i>	2017
<i>Rudbeckia fulgida</i>	Orange coneflower	<i>Fusarium oxysporum</i> f. sp. <i>chrysanthemi</i>	2017
<i>Salvia nemorosa</i>	Woodland sage	<i>Rhizoctonia solani</i> AG-1-IA	2010
<i>Salvia nemorosa</i>	Woodland sage	<i>Rhizoctonia solani</i> AG-4	2010
<i>Salvia officinalis</i>	Common sage	<i>Phytophthora cryptogea</i>	2015
<i>Satureja montana</i> "Repandens"	Winter savory	<i>Rhizoctonia solani</i> AG 1-IA	2012
<i>Spilanthes oleracea</i>	Toothache plant	<i>Rhizoctonia solani</i> AG-4-HG-I	2018
<i>Sulcorebutia heliosa</i>	-	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2019
<i>Sulcorebutia rauschii</i>	-	<i>Fusarium oxysporum</i> f. sp. <i>opuntiarum</i>	2020

and AG-4, was identified as the causal agent of crown and stem rot, web and leaf blight on several hosts. Finally, *Bipolaris cactivora* (Syn.: *Drechslera cactivora*; *Helmintosporium cactivorum*) was identified on *Cereus peruvianus monstrosus* and *Echinocereus rigidissimus* subsp. *rubispinus*, confirming its presence on Cactaceae, on which this pathogen is already known in Italy. Among the obligate parasites described in the last 10 years, the majority of reports concerns causal agents of powdery mildews, such as *Golovinomyces* spp.

*Golovinomyces cichoracearum* expanded its range of hosts on *Echinacea purpurea* (Figure 2), *Gerbera jamesonii* and *Symphyotrichum novi-belgii* (Compositae family); *G. neosalviae* has been recently detected on *Lavandula stoechas*.

Less common are the new reports of downy mildew, among which *Plasmopara obducens* on *Impatiens walleriana* and *Hyaloperonospora parasitica* on *Matthiola incana* that is added to *Peronospora matthiola* that is already known in Italy on stock plants. Among the new hosts, are listed also some species used in low-maintenance gardens (*Digitalis purpurea*, *Oenothera biennis*, *Verbascum* spp.) on which both powdery mildews and downy mildews were detected (Bertetti et al., 2018).

## FOLIAR PATHOGENS

Among the airborne pathogens several belong to the genera



Sporulation of *Botrytis cinerea* on young tissues of *Rudbeckia fulgida*.

*Phoma*, *Colletotrichum* and *Alternaria* (Gilardi et al., 2019). They were detected on new hosts mainly grown in gardens, both herbaceous (for instance *A. alternata* on *Campanula rapunculoides*) and shrubby (*Phoma exigua* on *Hydrangea paniculata*) but also arboreal plants (*Colletotrichum kahawae* on *Liquidambar styraciflua*). *Botrytis cinerea* was identified particularly on Asteraceae such as *Calendula officinalis*, *Echinacea purpurea*, *Helichrysum bracteatum* and *Rudbeckia* spp. (Figure 3).

Such a high number of new detections confirms not only the dynamism of the ornamental horticulture industry, but also its vulnerability to the spread of new pathogens.

Among the new ones reported, the soil-borne pathogens are particularly dangerous because of the difficulty of management. Toward *Fusarium oxysporum*, more attention must be paid in case many susceptible species are grown on the same plant nursery, such as the species belonging to the Cactaceae and Asteraceae families, respectively susceptible to *F. oxysporum* f. sp. *opuntiarum* and to *F. oxysporum* f. sp. *chrysanthemi* (Table 1). In this context, it is particularly

important to prevent the pathogen, starting with the use of healthy propagation material, to avoid the spread of *F. oxysporum*, which can be transmitted also through infected seeds, as demonstrated for the new forma specialis on *Papaver nudicaule* reported above. In many of the reports listed in this review, the rapid detection of symptoms due to the intense collaboration between growers, technicians and researchers made it possible to quickly identify the causal agents of the diseases thus to prevent serious losses. This confirms the need to develop fast, reliable and sensitive molecular diagnostic tools in support of the traditional diagnostic methods, specially towards the emerging diseases caused by invasive alien species.

Climate change may have favoured the appearance and the spread of some of the new pathogens, as the causal agents of powdery mildews detected in a geographical area of northern Piedmont that has long been known for its rainy and cool weather.

Finally, numerous of the new parasites listed in this review were found in private gardens, where the aesthetic value of affected plants was compromised and the disease management was difficult. In this context, the corrected sixth on plants and the respect for the ecological needs of the hosts help to mitigate the severity of attacks of foliar pathogens such as *Alternaria*, *Botrytis*, *Colletotrichum* and *Phoma* spp.

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Pictured left to right AgroiInnova researchers Maria Lodovica Gullino, Domenico Bertetti, and Angelo Garibaldi.

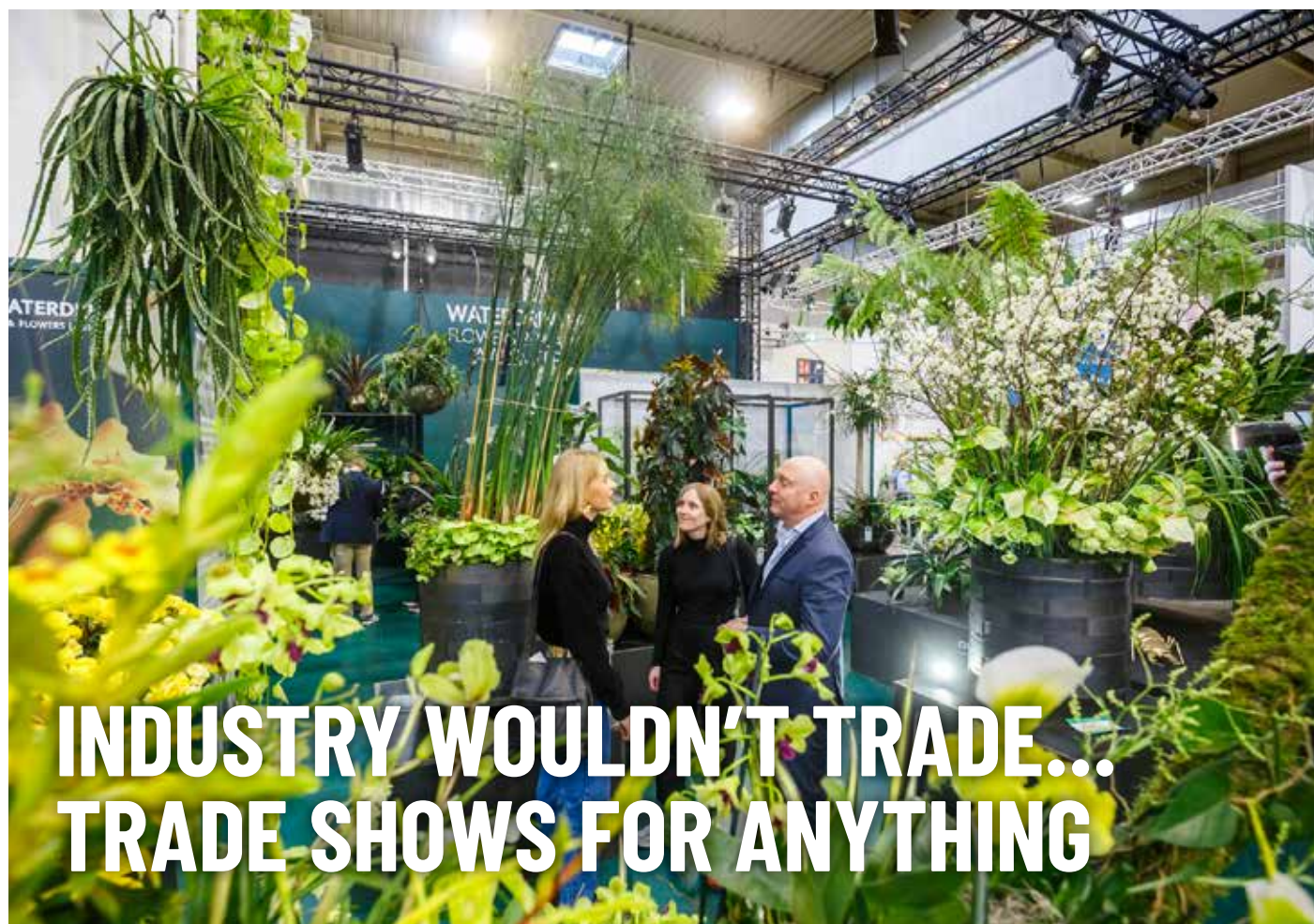


# FC EXHIBITORS GUIDE

**TOP BRANDS STAY RELEVANT IN THE WAKE OF COVID-19 EVEN WHEN THEY CAN'T EXHIBIT**







# INDUSTRY WOULDN'T TRADE... TRADE SHOWS FOR ANYTHING

These days, the job of an exhibition organiser or event supplier is not an easy one as it comes with a lot of pressure and opposite opinions among attendees and exhibitors, urging them to go on with the show or advising them to postpone. Not to mention their biggest dilemma of all: staying relevant online while incurring the risk that digital technology and virtual formats may upstage their physical trade show for good.

According to the latest Covid-19 damage assessment (20 July 2020) of UFI, the Global Association of the Exhibition Industry, the worldwide exhibition business is to contract by 60 per cent compared to 2019 and €260 billion of contacts between trade show participants will not happen.

The coronavirus pandemic is not scaring off all event planners, however. In Russia, FlowersExpo opted for a dual format, combining physical and virtual components, that allowed face-to-face interaction at a live trade show and an extensive online programme.

## ZOOM FATIGUE

At the same time, a lot of trade show converted into virtual formats, which are

cost-effective, scalable and accessible (re-watch the event on demand). Live streaming is here to stay but also prone to 'zoom fatigue' as video conferencing does not provide the same level of engagement due to an seemingly endless flow of information and rather static images coupled with little interaction between participants.

Of course, we have all had a good laugh when there was a pet or kid popping up in a video conference, but there is nothing to beat the one on one discussions experienced during a physical trade show. Not to mention the beautiful sights and fragrances that happen at an ornamental horticultural trade show. The intangible sense experiences that are irreplaceable: walking crowded aisles and taking the pulse of what is really happening in the industry, spotting the latest trends and having the pleasure to reunite with industry peers. Our industry would lose a lot without IPM Essen, Trade Fair Aalsmeer, IFTE, Four Oaks, FlowersExpo, Green is Life, Flormat, Myplant&Garden, Florall, Tios, Greentech, The Flower and Plant Show Turkey, TPIE, Salon du Végétal, Iberflora, the HTA National Plant Show and Plantarium. The overall consensus is that

our favourite trade exhibitions will make a 'retour en force', creating new features and even better services under the new normal.

## PROVIDING ADDITIONAL PROMOTIONAL OPPORTUNITY

The trade show and events industry has been hit hard by the coronavirus pandemic. So have been their exhibitors who overnight saw one of their most significant revenue drivers cancel or postpone. Successful companies who have made design, creativity and innovation their engines of growth.

This Exhibitors Guide provides horticultural suppliers an additional promotional opportunity and is also a way to express gratitude. Without the substrates, fertilisers, breeding breakthroughs, irrigation products, lighting and growing beds of these suppliers, the road to the industry's recovery would be so much harder to manage.





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# RUSSIA MAKES HISTORY FOR HOSTING THE FIRST HORTICULTURAL TRADE SHOW UNDER THE NEW NORMAL

There has been a never-ending list of cancellations and postponements of horticultural trade shows and events in 2020. The coronavirus pandemic is not scaring off all event planners, however. Russia, becoming the first country in the world to approve a possible vaccine against coronavirus. It made also history for hosting the first international horticultural trade exhibition under the 'new normal'; FlowersExpo 2020.



*Event organiser Nadeshda Grigorieva (centre) sees the 2020 edition of her show merely as an investment in the future.*

AUTHOR: RON VAN DER PLOEG  
PHOTOS: ALEXANDER  
KRASNOBORODKO/INSPIRO

**F**lowersExpo 2020 was a three-day exhibition that took place in Moscow between 8 and 10 September 2020. The programme was extensive, both in the Crocus Expo convention centre, and online including a webinar which our magazine, FCI, held in association with our publisher AIPH, FlowersExpo and hosted by Jungle Talks. At this event we took the pulse of what is happening within the Russian flowers industry.

## RUSSIAN RESILIENCE

Invited as one of the keynote speakers were Dmitry Vorontsov and Olga Glad, CEO of floral wholesale company 7flowers and director of procurement at 7flowers, respectively.

7flowers sources cut flowers, indoor plants, garden plants, florist supplies, and home décor from around the world to sell these through distribution hubs and cash and carry stores in Saint Petersburg, Moscow, and Novosibirsk.





*Floral arrangement demonstrations.*



Business activities include floral art schools and the company's customers find themselves in Kaliningrad to the North to Kamchatka in Russia's far east. A global audience, representing more than 300 industry professionals from 40 countries was eager to learn how 7flowers responded to the crisis. Vorontsov freely admitted that the outbreak of the pandemic took him by surprise, causing disruption, fears of recession and uncertainty. At the same time, he remains very hopeful about the future. "Maybe I am too much of an optimist, but our industry peers from other parts of the world shouldn't worry too much." He said, adding, "I don't expect any drama in the Russian consumer market, nor do I believe that the coronavirus will crush the Russian economy. In my twenty-year career, I have seen how resilient this industry is. Of course the crisis impacts people's income, prompting them to buy fewer and cheaper flowers. But Russian consumers will continue to spend on florals even when they suffer economically." He adds, "In Russia, flowers are something of an obligation for loved ones at holidays. But due to Covid-19 they have also become a substitute for our social lives

*Russian exhibitors occupied most of the space this year.*

now that so many places are closed. It is too early to draw conclusions as we need at least the statistics over one year. But hopefully this trend of more flowers for own-use will continue."

Referencing Vorontsov's remarks, it is worth remembering that even if Covid-19 is a once-in-a-century event, it is not the first time the Russian flower industry must cope with unforeseen circumstances and force majeure. Life in Russia is always unpredictable, and Russians come quite easily to terms with a highly volatile market. Just remember the devaluation of the ruble by the end of 2014. Or 2016, when the flower imports from the Netherlands came to a standstill after Russia's Plant Health Inspection Service seized Dutch flowers because of the presence of western flower thrips.

### **SUSTAINED GROWTH ONLINE**

Vorontsov continued by saying that after a significant drop in sales in March and April, recovery was swift, but not completely unexpected. "In some way it is a proof that our efforts have paid off. Long before the crisis, we started to digitise our business so were already well prepared for the boom in online sales caused by Covid-19."

When asked if the online flower purchasing habit is here to stay, Vorontsov drew a parallel with the trend of ordering fresh food online. "The crisis accelerated existing demand to a new level of sustained growth. The same thing is happening in online flower delivery. People are getting used to the online sales platforms and their benefits. So, a significant portion of these new customers will stay on board."

### **DEARLY MISSING FACE-TO-FACE INTERACTION**

During the webinar, show organisers Nadeshda Grigorieva and Elena Zarubina connected with their audience in a remarkably personal and expressive way. Stressing they dearly miss the face-to-face interaction and that they cannot wait to welcome back all of their friends next year.

Over the past 20 years, the duo has become known as the anchor-women of Russian horticultural expo industry, gathering growers, traders, decision makers and other stakeholders from within the global ornamentals industry to network and forge deals. The GreenExpo

*Dekker Chrysanten was among one of the few Dutch exhibitors this year.*







event organising company is theirs. And this private ownership guarantees a level of commitment which is almost impossible to generate in publicly owned firms. The additional benefits of FlowersExpo is a good understanding of the industry, more personal relationships and more effective sales and marketing.

#### GOOD FOOTFALL AND LOCAL AUDIENCE

Grigorieva told FCI that this year's special edition of FlowersExpo demonstrated how it moves with the times. From day one, she saw relatively good footfall and a more local audience. International attendance was significantly down.

"For many businesses, including the trade show industry, the coronavirus pandemic is one of the toughest problems they have ever faced. But amid threats and uncertainty, FlowersExpo has found a way to forge ahead. Frankly speaking, we did not know what to expect but the show turned out to be an overwhelming success. The mood was unusually upbeat. Apparently, attendees and exhibitors were craving face-to-face meetings."

The show was more compact with 181 exhibitors from 12 countries this year, against 250 plus exhibitors from 30 countries under normal circumstances. "However, we were pleased to see an influx of new exhibitors: 20 per cent of exhibitors made their debut at FlowersExpo 2020. International participants opted either for a

*From day one, the event organisers saw relatively good footfall and a more local audience.*

*Strict safety protocols at FlowersExpo.*



*Attendees and exhibitors were craving face-to-face meetings.*

physical stand or a dual format by being live with stand and a strong online presence in our virtual event. Russian exhibitors occupied most of the space this year. Particularly exciting was the Live&Online event which took the form of presentations and panel discussions in a studio setting with growers and traders sharing their experiences and thoughts during the broadcasts of FlowersExpo Live, the show's TV channel."

#### INVESTMENT FOR THE FUTURE

Grigorieva candidly admits that with 9,800 attendees this year FlowersExpo 2020 attracted fewer visitors than in previous years: 1,000 of them visited the exhibition online only, whereas 500 more attended both physically and online. The remainder came to CrocusExpo in person only. The feedback organisers received has been excellent. "Financially speaking, however, the exhibition was hardly profitable. It was too small for such a diverse project. But we merely see this as an investment in the future. Also, we consider ourselves lucky for in the beginning of September the coronavirus had been reducing, and the second wave was just about to start. However, preparations were extremely difficult with both exhibitors and attendees reluctant to visit the show in person. Now that Europe braces itself for a second wave, uncertainty for next year's show remains." Watch the video on FlowersExpo 2020 here

[www.youtube.com/watch?v=X7FJ7AXEHb4](https://www.youtube.com/watch?v=X7FJ7AXEHb4)



*An overview of the showfloor.*





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# GREEN IS LIFE'S SPECIAL EDITION COMBINES PHYSICAL AND VIRTUAL COMPONENTS

Designated Green is Life & Flower Expo Polska Online, this year's special edition of Poland's leading horticultural trade show used a format combining physical and virtual components.

AUTHOR: RON VAN DER PLOEG PHOTOS: GREEN IS LIFE

Originally set to take place at Warsaw's EXPO XXI convention centre from 3-5 September 2020, the event has now confirmed its rescheduled show dates: 2-4 September, 2021.

Meanwhile, show organiser the Polish Nurserymen Association, who have organised the event for the past 29 years, has added an online trade directory/virtual catalogue to their website, [www.greenislife.pl](http://www.greenislife.pl)

## ONLINE B2B PLATFORM

This online B2B platform brings industry professionals together 24/7 and enables buyers to browse through the grower's product portfolio. With 92 featured companies from Poland, Belgium, the Netherlands, France, Denmark, Germany and Italy the content is genuinely impressive. The trade show organiser hopes that this virtual tool will empower the grower's visibility, drive innovation and improve industry collaboration.



*Geum 'Bohemian Pink' was one of the most popular plants among journalists.*



*Gold medal winner Actinidia arguta 'Hokey Pokey'.*

## TOP-NOTCH EDUCATIONAL SESSIONS

Coronavirus pandemic or not, this year's virtual edition of Green is Life featured top notch educational sessions. The Green City Conference opted for a hybrid format with a limited number of attendees meeting face to face in a conference room and real-time coverage of the event online. The conference on urban green spaces, initiated in 2000 by Agencja Promocji Zieleni and the Nurserymen Association, focused on proper water management in





*Parrotia persica* 'Persian Spire'.



*Clematis* 'Golden Dream'.



*Rosa* 'Maja Babylon Eyes'.

landscaping and provided tips for planting the right trees, grasses, perennials and roses in the right places.

#### GARDEN CENTRE DEBATE

Providing food for thought was the online garden centre debate on 4 September with Swiss garden centre owner Erwin Meier-Honegger shining his light on the current state and challenges of the garden centre industry. Fourth generation Meier-Honegger has been running the family business, Ernst Meier AG, together with his sister since 2012. The garden centre section of the business ranks among Europe's most innovative. The company was established in 1894 in Tann, Switzerland. At this time it was a seed trading company with 28 employees. Today, the company employees over

*Buddleia*  
'Rocket Star'.



200 people and has moved to a new location spanning 35,000 square metres in Dürnten in the Zürcher Oberland. The garden centre has already won many prizes: For example the Graines d'Or in 2012 for the best international garden centre of the French Groupe J and the This-Priis in 2016, an award for companies that sustainably integrates disabled employees. In addition to the garden centre, Ernst Meier AG also maintains a large nursery, a horticulture department as well as a publishing company.

#### PLANT NOVELTIES COMPETITION

True to tradition, a highlight of Green is Life each year is the Plant Novelties Competition which for the first time was held virtually. To get the most balanced opinion, an international panel of expert judges were asked to select the awards. The Green is Life Gold Medal went to *Actinidia arguta* HOKEY POKEY® submitted by *Clematis* Źródło Dobrych Pnaczy and *Parrotia persica* 'Persian Spire' submitted by Szkołka Piech.

Silver medals went to Szkołka Krzewów Ozdobnych Bogdan Hajdrowski for its *Rosa* 'Maja Babylon Eyes', Szkołka Drzew i Krzewów Ozdobnych Maria i Janusz Szewczyk for their *Berberis thunbergii* 'Anna' and finally to Szkołki Kurowscy which submitted *Buddleia davidii* 'Rocketstar Indigo'.

*Clematis* Źródło Dobrych Pnaczy was also presented with a bronze medal for its *Clematis* 'Golden Dream'.

The most popular Green is Life plants among journalists this year were *Clematis* 'Golden Dream' submitted by Źródło Dobrych Pnaczy, *Geum* 'Bohema Pink' submitted by Ogrody o Zielonych Progach – Szkołka Bylin, Przemysław Godlewski, and *Rosa* Maja Babylon Eyes' by Szkołka Krzewów Ozdobnych Bogdan Hajdrowski. Poland's most significant horticultural trade exhibition Green is Life & Flower Expo Poland rescheduled its upcoming trade show due to the Covid-19 crisis and subsequent travel bans and quarantine rules.



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# ABZ SEEDS INTRODUCES HOT PINK COLOUR TO SUMMER BREEZE SERIES

Following the highly successful product launch of Summer Breeze Rose and Summer Breeze Snow, a new hot pink colour joins Summer Breeze series. The Summer Breeze Cherry has semi-double flowers in vibrant pink. It reflects the breeding goal of ABZ Seeds: superiority in the strawberry market with vivacious colours, good flavour and, more importantly, outstanding garden performance. Summer Breeze Cherry is truly a beauty and holds its petals for a long time which is excellent news for both trade and consumers.

## HOMEMADE HAPPINESS

New trends find their way through the garden plant market: next to ornamental features, consumers are also longing for a healthy lifestyle, relaxation and time well-spent with their family. Kids picking strawberries, family and friends chatting and laughing, surrounded with lots of flowers and the sweet aroma of fresh strawberries. ABZ Seeds, a company dedicated entirely to breeding seed-raised F1 hybrid strawberries, playfully describes this as: 'Homemade Happiness'. With Summer Breeze Cherry, ABZ Seeds takes 'Home Gardening' with edibles to the next level.

## SUMMER BREEZE CHERRY

Because of the large amount of colour on the plants, the Summer Breeze Cherry performs well on the Point of Purchase. Its blooms are enchanting and look like cherry blossom. It is an absolute eye-catcher in garden centres that will have it flying off the retail shelves.

When it comes to bringing a splash of colour to a patio, balcony, porch or deck, think Summer Breeze Cherry producing flowers all summer long. On top of that,



a rich summer fruit enjoyment of delicious strawberries feels like the proverbial 'Cherry on the cake'.

## FINISHING TIMES AND PRODUCT MIXES

From transplanting out of the plug tray to finished product takes 6-8 weeks. Flowering plants are ready to be delivered during the whole springtime. The container sizes varies from 12 cm/4,7 inch pots to hanging baskets or tubs of 25 cm/10 inch. The last ones will contain three strawberry plants. A combination of the three flower colours, white, hot pink and deep rose will do well. Also, a combination with herbs is well appreciated by consumers.

## AWARD-WINNING VARIETIES

Dutch-based ABZ Seeds, launched Strawberry Summer Breeze Rose two years ago, laying a solid foundation for future strawberry success. As soon as in November 2019, the strawberry breeder introduced a white colour in the Summer Breeze series: Summer Breeze Snow, born

to be a winner. At the Aalsmeer Trade Fair, a panel of expert judges nominated the snowy white variety for the Glass Tulip Award. Only two months later, in January 2020, Summer Breeze Snow scooped up the coveted Innovation Award at the world's premier horticultural trade show IPM Essen. Meanwhile, expectations are high for the eye-catching Summer Breeze Cherry which will be a show stealer at the forthcoming IPM 2021. The new variety will be one of the stars at the BLOOM's WORLD PURE STYLE show. Here, visitors can see the complete colour palette of Summer Breeze series

## SEED PROPAGATION AND AVAILABILITY

Like all strawberry varieties of ABZ Seeds Summer Breeze Cherry is a seed propagated F1 hybrid. Growing strawberry plants from seed means disease-free young plants at the start of the culture. When correct hygiene measures are applied, less plant protection products are required to keep the plants healthy. For pricing and availability, ask your supplier.



Homemade Happiness.



Summer Breeze Snow.



Summer Breeze Cherry.



## ABZ Seeds

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# ENHANCING GREENHOUSES WITH HEATING, HYDRO AND OPTIMISED AIR

BioTherm's enhancements range from root zone heating systems and greenhouse climate control to dissolved oxygen irrigation systems, dehumidification and more. Knowledge and experience have made BioTherm one of growers' most trusted sources for greenhouse technologies. BioTherm's greenhouse products and systems are proven to enhance operations by cutting costs and increasing plant yields.

From the first industry-revolutionising invention, which showed the world why heating plants from below made sense, BioTherm has been making a difference for growers. This invention, the MicroClimate™ tubing system, reduces energy consumption and disease occurrence, as well as increasing production. BioTherm continues developing products to change the way the industry grows.

## ROLL'N GROW®

One of the newest innovations, Roll'N Grow®, makes heating benches and floor areas easy. Roll'N Grow is the perfect way to apply root zone heating to growing beds



*Roll'N Grow is the perfect way to apply root zone heating to growing beds or benches. Simply roll the mat out, then connect the manifolds and supply/return lines to a hot water source and pump.*

or benches. Like a carpet, it covers growing surfaces with growth-enhancing heat in a fraction of the time it used to take to install – providing all the benefits of root zone heating, such as reduced fuel costs, increased production, more compact plants and reduced disease issues. To produce Roll'N Grow, BioTherm developed a one-of-a-kind automated machine that bonds various types of heating tubes to weed barrier or open mesh. Roll'N Grow mats come in multiple sizes – one optimised for bench applications, and one that is ideal for floor production areas. Simply roll the mat out, then connect the manifolds and supply/return lines to a hot water source and pump. A soil probe thermostat controls the system based on media temperature. Roll'N Grow comes in 10-foot master rolls but can be customised in any size to match your floor or bench needs.

## DISSOLVING OXYGEN IN WATER WITHOUT MAKING BUBBLES

The TOOB dissolved oxygen infuser is another new invention from BioTherm, a groundbreaking way to economically boost dissolved oxygen levels in irrigation systems and enhance plant health and production. As every grower knows, water is the lifeblood of plant production

– but research confirms that significant available dissolved oxygen must be present for plants to efficiently absorb nutrients and properly hydrate. Until now, inefficient air blowers or bubble diffusers were the only way. Now, the TOOB system dissolves oxygen in water without making bubbles. The TOOB uses pure oxygen, injecting individual molecules between water's H<sub>2</sub>O molecules, where they remain in stable suspension throughout irrigation. Simple, efficient, easy to install – and it connects to a locally sourced oxygen tank or an optional oxygen concentrator. The TOOB is designed for long life with no parts requirement – and for immediate return on investment.



*The Toob is simple, efficient, easy to install – and it connects to a locally sourced oxygen tank or an optional oxygen concentrator.*



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# VITRO PLUS WILL CONTINUE TO SERVE THE MARKET WITH SUPERIOR FERN VARIETIES

Dutch fern breeder and propagator Vitro Plus B.V. was founded 30 years ago. They started with the production of tropical ferns only, from tissue culture and developed a very special tray in which every fern has its hole to grow. This protected tray is called vitro-tray126 and makes sure that Vitro Plus' customers receive a very even and beautiful product.

After about 15 years, Vitro Plus wanted to start adding hardy ferns to their assortment as well, but they found out that this wasn't that easy. They struggled for several years because they wanted to produce hardy ferns in the same way as they do produce their tropicals.

It didn't work out well and in the end they decided to take a different approach. Now the hardy ferns are sown from spores, but not in the old fashioned way. The sowing is done in the lab as well, and also in a sterile way. Afterwards the trays are closed with a breathing foil that makes sure no diseases or bugs can enter the trays. Because this product is completely 'clean' Vitro Plus is allowed to export these trays to their customers all over the world who can get an import permit for this kind of product.

Since about 5 years the hardy ferns are growing to a considerably larger part of



the assortment of Vitro Plus. And each year about 10 new hardy ferns are added to the assortment. In about a few years from now the part of hardy ferns will equal the part of tropical ferns and together they will grow to about 200 different species in total.

During the Covid-19 pandemic we have seen that people are putting more and more ferns in their homes and gardens, because of their air purifying qualities. We expect that this interest will only grow in the upcoming years. Vitro Plus wants to respond to that trend by adding more and more special and different ferns to their assortment.



## Vitro Plus

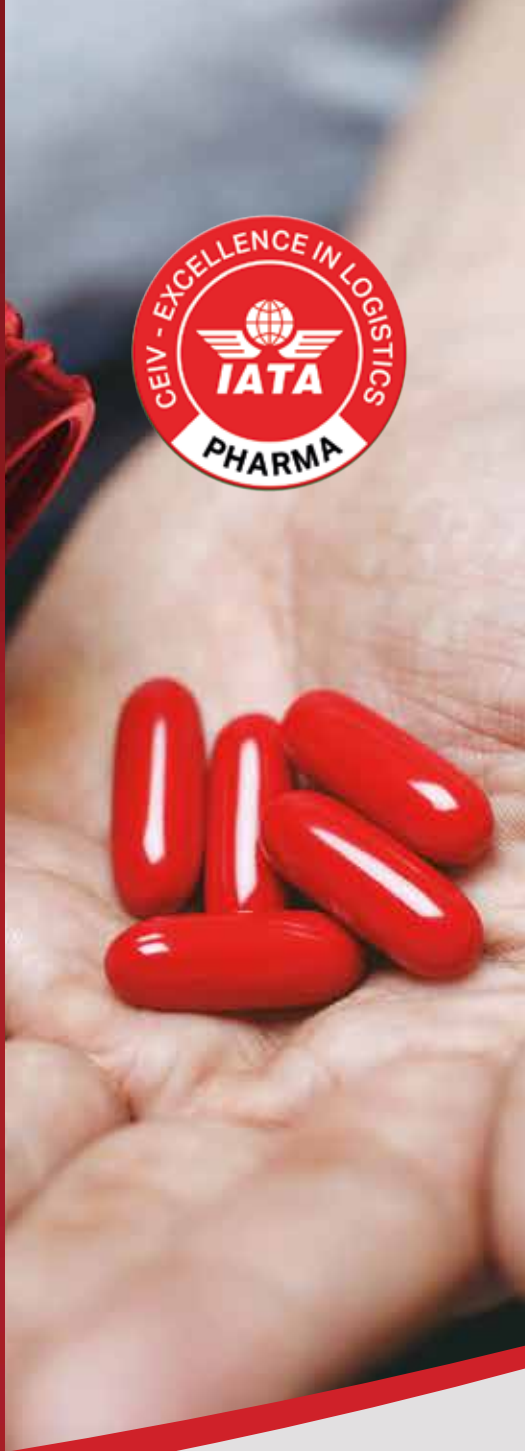
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