

# BLAD



A publication by the Horticoop investment cooperative

Year 3 - Issue 4



**Biosensors for plant-oriented cultivation**

**Wishing well**

**Hydroponic flagship product**



**HORTICOOP**  
GROWING TOGETHER

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Cover photo: **Rob Wubben**, Operational Director at Elstgeest Potplanten  
Photography: **Tuinbouw Ondernemersprijs / Studio Vlekke**

## Foreword

The horticulture industry is in continuous development. Horticoop aims to play a major role in this by sharing its knowledge and investing in companies that make a difference. This BLAD issue is all about development: development at Horticoop, at the companies we invest in and at companies that each aim for development in their own way.

We reflect on Horticoop's first deep dive; a successful day that left you wanting more. Erik Pekkeriet was one of the speakers at the event and captivated the audience with his views on robotics and greenhouse automation. And as we don't want to deprive you of his vision, we're sharing it here in this magazine. Skytree, part of Horticoop's portfolio since 2023, is also creating a furore with their pioneer programme and provides an update on the latest developments. We also reflect on CE-Line, a high-tech company we recently added to our portfolio. And, of course, we share stories from practice. VDE plant and Elstgeest Potplanten share their secrets for a successful business. And they certainly are successful, with nominations for, respectively, the Tuinbouw Innovatieprijs and the Themaprijs Circulair Ondernemen. Hoogweg Paprikakwekerijen is also pursuing continuous development. In this issue, you can read how this enables them to scale up.

Horticoop is actively seeking partnerships for ongoing future horticultural industry investment. We investigate the possibility of establishing an investment fund, which will help the cooperative head towards a new destination. I'll be chatting with Ruud van der Vliet about this, an experienced investor and horticulture enthusiast. You can read his ideas about Horticoop's future plans on page 8.

As well as background stories and in-depth interviews, this magazine also includes our 2023 financial figures. Horticoop's sound foundation enabled us to navigate the uncertainties that 2023 presented to us. You can read more about this on page 46, where CFO Hend van Ravestein provides a detailed explanation of the annual figures. I'm looking forward to being able to end 2024 just as successfully, together with the companies in which we invest, our knowledge partners and, above all, with you!

I hope you all have a fantastic summer!

**Patrick Groeneveld**  
Managing Director at Horticoop



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# Hoogweg Paprikakwekerijen given the green light

When consumers see the familiar 'traffic light' sweet pepper mix in the supermarket, they're probably unaware of the advanced process that lies behind this. Horticoop member, Hoogweg Paprikakwekerijen, aims to ensure that the efficiency and sustainability of the process improves every day. Starting small and dreaming big has enabled this nursery to utilise every opportunity to realise that ambition. Energy Manager, Erik Hoogweg sees a wealth of opportunities to combine quality and sustainable business operations.



Erik Hoogweg, Energy Manager  
Hoogweg Paprikakwekerijen

**But first, let's look back to how it all began. After following in your father's footsteps, who started the company in Nootdorp in 1987, Hoogweg Paprikakwekerijen has now grown to become one of the Netherlands' biggest players. How did you expand from some 6.8 hectares to the 160 hectares you're growing on now?**

'My father started growing tomatoes in 1987 and made the switch to sweet peppers in 1998. The expansion possibilities in Nootdorp proved minimal, which is why we started a second location in Noordoostpolder's Luttelgeest in 2008. This new location offered a wealth of opportunities on top of the extra space, including being a favourable location with respect to trading partners and offering good infrastructure. It was a perfect match for my father's ambitions for growth and we're still always looking for ways to continue developing our company today. We aim to organise the entire cultivation and packaging of our sweet peppers in-house, and we can achieve this through scaling up. We now grow our sweet peppers at four sites in Luttelgeest and

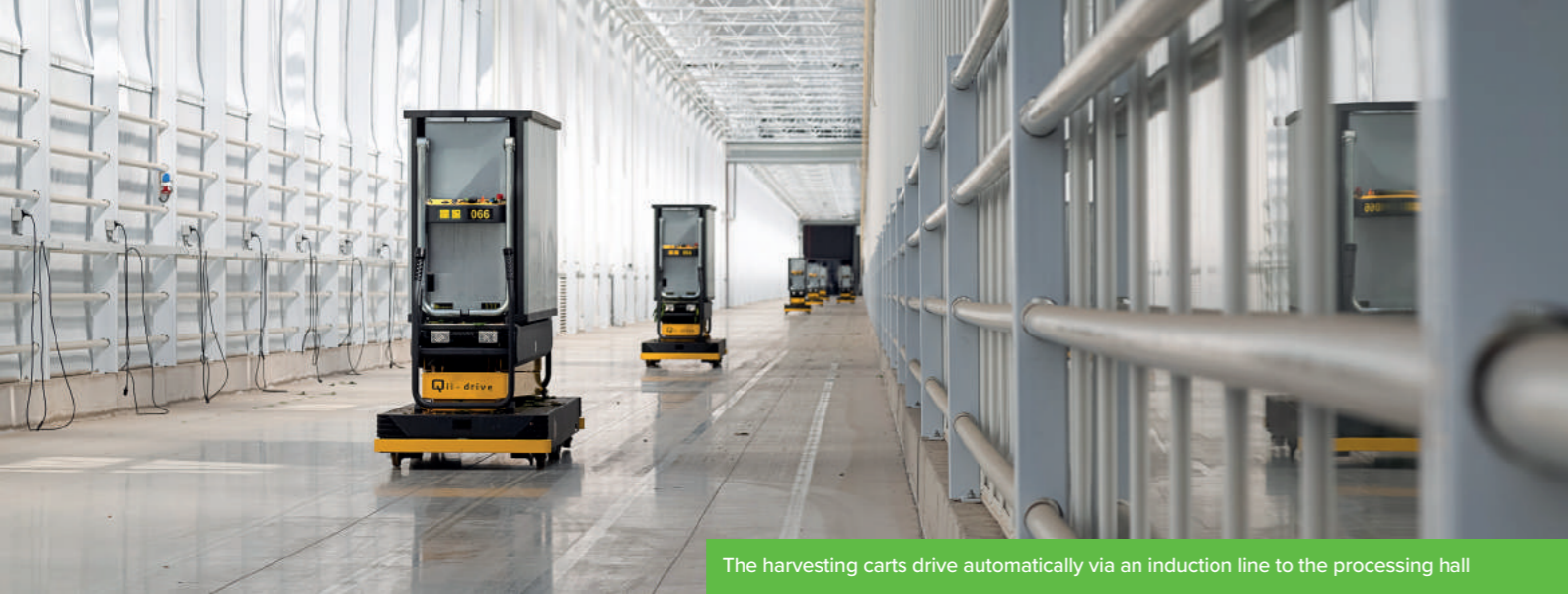
Marknesse, and we're adding a new thirty-two-hectare site in late 2024.'

**So, scaling up is something you're familiar with and has resulted in you being largely self-sufficient in packaging sweet peppers. What advantages does that have?**

'The large scale on which we grow our sweet peppers enables us to automate the sorting and packaging of the peppers. We have the facilities to sort our sweet peppers at all our locations and the Marknesse location is where our peppers are also immediately packed ready for sale in supermarkets. This means we don't need transport between our locations and a warehouse, and we can distribute the end product directly to buyers. Packing the sweet peppers ourselves enables us to eliminate a link from the chain. As well as being more efficient, the reduced transportation also makes the process a lot more sustainable!'

**That's certainly a sustainable feature! Which other innovative solutions do you use to make your processes more sustainable?**

'We always aim to be progressive in terms of sustainability. Our mission is to grow high-quality sweet peppers in a sustainable way, while maximising efficiency. Scaling up also plays a role in this. It gives us the option to implement processes in-house in a way that works for us. Of course, we're very much aware that this is not a luxury that's available to every grower. We're able to set up certain projects that would not normally be possible on a smaller scale, such as various heat and energy projects. The heat network at all locations and the liquid CO<sub>2</sub> distribution network were both constructed in-house and enable us to meet our heating needs in the most sustainable way possible. Two-thirds of our greenhouse heating is currently provided by geothermal heating (ground source heat). So we don't need gas. Last year, we also installed both a huge number of solar panels on the roof and rainwater catchment systems. In the summer, these solar panels supply more electricity than we can use so we use an e-boiler to convert the electricity into heat. This ensures we never lose any energy.' >



The harvesting carts drive automatically via an induction line to the processing hall

**Heat is a ‘hot topic’ in many horticultural companies. What are you doing to optimise heat retention in your greenhouses.**

‘We use diffuse glass in all the locations that were constructed after 2009. Whereas traditional glass reflects sunlight, the diffuse glass coating allows more sunlight and heat to get through. And as far as sweet peppers are concerned, every extra bit of sunlight results in higher production. Using diffuse glass means we can harvest up to 10% more sweet peppers from the same square metre of greenhouse. We always like to think ahead with respect to heat retention. Over the past two years, we’ve installed double screens in all greenhouses and this is the standard at the new location that’s currently under construction. We used to have one screen suspended in the greenhouses, which kept the heat in at night. This second screen enables us to retain even more heat, which means we need and consume less heat. I think it’s an amazing eco-friendly solution!’

**It’s clear that you’re aiming to minimise the company’s impact on the environment, not only with respect to energy but also in terms of water consumption. How are you doing this?**

‘Water management is fully circular at all our locations. Water that the plant doesn’t use is returned via the channel before being disinfected and reused. The advantage is that we also reuse the fertilisers from the water as well as using the available water sustainably.

We use rainwater to irrigate our sweet pepper plants, which we collect in large rainwater catchment systems. We now have huge rainwater storage capacity, which is great as it seems likely that we’ll be facing longer and dryer summers.’

**Using these resources efficiently enables you to produce sustainably. How do you view the horticulture industry’s future in terms of sustainable production?**

‘It’s important that we keep our focus on energy, now and in the future. This can still actually sometimes be a major challenge for our industry. If growers have to start paying energy tax on the gas used for the combined heat and power (CHP) system, the cost price of running CHPs will be much higher. We’ll be obtaining increasing amounts of heat from geothermal heat, biomass and heat pumps at Hoogweg Paprikakwekerijen in the future. It’s a rather complex process but from a sustainability perspective, it’s an extremely positive intention. These kinds of alternatives will play a much greater role in greening the industry and, as growers, this is something we need to arrange together. The same applies to meeting the demand for CO2. On the one hand we aim to use less gas to heat the greenhouses and on the other we need CO2 during the production process. That CO2 needs to come from somewhere, which means that it needs to be supplied. It’s a difficult market because CO2 is simply not available in the quantities needed.’

**The need for CO2 isn’t something that’s likely to reduce in this industry. How are you handling this fact?**

‘We obtain our CO2 from various waste processors right now, but we’re aware that this will become more difficult in the future, which is why we’re investigating the construction of a carbon capture system behind our biomass combustion plant. This process enables us to produce the heat we need for the greenhouse. The released CO2 is then stripped of flue gases, captured and liquefied. Producing the CO2 ourselves will enable us to retain the quality we currently get from external parties, but we’ll largely no longer need to have it supplied. This offers a potential solution for Hoogweg Paprikakwekerijen, but we also need to continue to look collectively for solutions so we can continue to meet the industry’s future CO2 needs.’

**Infrastructure is a huge part of scaling up. But corporate social responsibility is just as important for high-quality cultivation. What’s your vision on this?**

‘That’s entirely right! We regularly experience peaks and troughs in our sweet pepper production. We actually have various greenhouses with different varieties and colours, and different cultivation processes. When there’s less work in one greenhouse, there’s a lot to do in another, which makes it easier to distribute the workload. This is an important part of corporate social responsibility: providing good working conditions for our employees. At Hoogweg Paprikakwekerijen we very much value our employees and do our utmost to create the best conditions for our people. We’ve worked with a temporary employment agency to realise on-site accommodation for 300 employees at our location. We also make sure that our schedule doesn’t result in people needing to work too long hours, we distribute the work fairly and we introduce systems to make the work less strenuous. Our internal transport system is a good example of this, with sweet peppers cut

from the plant being taken automatically in a container to the processing hall via an induction line, before returning the empty container for reloading. This makes things easy for our employees and the work is less taxing.’

**For you, growth and innovation go hand in hand. What does innovation mean for you?**

‘For us, innovation means looking for alternative solutions for our company as well as for the industry. And it’s just as important that we use all the existing technologies in the right way. Because there’s a huge amount of knowledge available! At Hoogweg Paprikakwekerijen we put a lot of time and energy into testing and learning. It’s the only way we can anticipate the future of greenhouse horticulture. Because improvements will always be needed, whether that concerns energy consumption, water management or instrument innovations. And these improvements certainly don’t need to be radical; they can start small and still have major impact. Our motto is: think in terms of minor improvements, as every step counts!’ ■

‘Think in terms of minor improvements, as every step counts!’

Erik



The sweet peppers are collected in harvesting carts

# 'You can really sense the urgency for innovation'

Professionalising the ecosystem through the eyes of a heavyweight



Patrick Groeneveld (left) and Ruud van der Vliet (right)

With years of experience in banking and an above-average interest in greenhouse horticulture, Ruud van der Vliet, former Bedrijven Rabobank Westland Director, is a keen follower of developments in the industry. And Horticoop's transition has also not escaped his notice. Horticoop CEO Patrick Groeneveld talks with Ruud about Horticoop's direction, the importance of investing in the industry and the challenges associated with this. A view of the industry through the eyes of an experienced veteran.

**Patrick:** 'Great to talk to you, Ruud! I'm delighted to be able to exchange ideas with you about the need for investment in greenhouse horticulture because, with your Rabobank background, you're certain to have a vision about this.'

**Ruud:** 'Certainly! At Rabobank, I was responsible for the Westland bank's greenhouse horticulture activities. We served all the major companies that had links with the industry, including Horticoop. I'm a huge advocate of the transition Horticoop has chosen. This has provided the cooperative with a new boost and that's a great move for all stakeholders. I'm really curious about your future plans.'

'We're aiming to establish an independent investment fund, with Horticoop as the most important provider of capital'

**Patrick**



**Patrick:** 'I see the transition from purchasing cooperative to investment cooperative as an interim period en route to Horticoop's new destination. We're currently investigating what form that destination should take, but our role in terms of providing capital for greenhouse horticulture innovations is certain. Capital is an important factor if you're aiming to be future-oriented and decisive. We're investigating Horticoop's opportunities to take a leading role in this.'

**Ruud:** 'Are you looking at the opportunities to set up Horticoop investment funds so you can partner with other investors?'

**Patrick:** 'That's certainly one of the scenarios we're investigating. We're aiming to establish an independent investment fund, with Horticoop as

the most important provider of capital. Capital is needed to stimulate innovations, also after the initial startup phase. It's such a shame if an innovation doesn't get off the ground due to there not being enough capital available after the initial investment to take it through the next phase. Investing together with other parties releases more capital for innovation and we ensure risk diversification for our members.'

**Ruud:** 'Are you considering attracting capital providers from outside the industry for those funds, or are you mainly looking for parties who know the industry inside out?'

**Patrick:** 'That's a good question! On the one hand it's wise to look outside the industry so you can maximise the size of the pot. On the other, we're in a very specific market in which knowledge of the sector is vital. We aim to involve as many parties as possible that have a background in horticulture. That doesn't only result in an extensive network, it also offers us a pool of expertise to draw from. Informal talks are taking place right now with agrifood-oriented partners to gauge their interest in establishing a fund with us.'

**Ruud:** 'I can really understand your deliberation. The horticulture industry is dynamic. In this industry, you're dependent on crop growth cycles, the weather and developments in demand and supply. If you're not used to this, it can be nerve-wracking when things go wrong. Having confidence in the industry's future is vital. It's also essential to have enough resources available to bridge those less fruitful periods. The energy crisis was a decisive factor in the industry recently. Energy prices went through the roof and people started to get nervous, certainly in ornamental horticulture. The supply chain was under threat and there was less inclination to invest. If investment did take place, this was mainly in energy-saving measures. We'd been able to rely on an unlimited supply of cheap gas for decades, which meant that there wasn't really a tangible need to innovate in this area. That's now changed.' >

**Patrick:** 'Now that energy is playing a much more prominent role, the urgency is definitely getting through and we're catching up with investments in new technologies. There's a huge potential for innovation in greenhouse horticulture and it's good that this is now being used for energy innovations.'

**Ruud:** 'The need for professionalisation is inherent in this, which isn't so much about constructing more or bigger greenhouses in the Netherlands, it's about producing in a more market-oriented way. There's not much space for acreage expansion in the Netherlands, and social issues, such as housing and logistics, are putting enormous pressure on that limited available space. It's all about innovation.'

'We need to raise awareness in all layers of the chain'

Ruud

**Patrick:** 'The growers currently in charge may still be a bit uncomfortable about the next professionalisation step. But if you really want to make this shift, you also need the company management to go with the flow. Many industry entrepreneurs are used to doing business at small and medium enterprise level. They're not used to making major investments and are struggling to take the next step, simply because

they're not big enough to make the investments that trigger real innovation. Innovating and going green is often only possible if you're a larger company with a professional management. External capital can give the required boost and act as an accelerator.'

**Ruud:** 'We are at a tipping point. When the younger generation takes over a company, they sometimes seize this moment to engage with investment funds. Do things always go well? No, but that's part of entrepreneurship. I think investment funds or private equity parties can help greenhouse horticulture take the next step in professionalisation. And I don't only mean the growers, but the entire chain. Every link in the chain depends on the other links. Suppliers need locations to run trials and tests and to work with growers who speak the same language and understand this particular world. That's the Netherlands' strength, our cooperation with universities, universities of applied sciences, and local and regional governments that understand how things work. That combination, that ecosystem, is what made the industry so strong in recent decades. If we are to continue to profit from this, it's important that we keep a substantial acreage devoted to greenhouses in the Netherlands.'

**Patrick:** 'That ecosystem is now also enabling more rapid innovation. I do actually think that these innovations could be more coordinated so that growers aren't approached by several companies offering new technologies, which may mean they can't see the wood for the

trees. If you want to enhance the ecosystem, you need to work together to coordinate research and innovation. It is interesting to see what role Horticoop can play in this in the future.'

'If we are to continue to profit from the ecosystem, it's important that we keep a substantial acreage devoted to greenhouses in the Netherlands'

Ruud

**Ruud:** 'I agree! If we manage to coordinate innovations well, greenhouse horticulture can make an even more significant contribution to a more sustainable food supply. And we need to raise awareness in all layers of the chain for this. You can see a clear development at banks in this respect. They establish LCAs, product life cycle analyses that are used to determine the total environmental impact, from raw materials and production, to transport, use and waste processing. This makes the plans for sustainability transparent for every funding application. It's a great development, which I feel could also be adopted by supermarkets. They have the market power needed to bring about changes in the chain. If they asked their suppliers about their sustainability plans,

we could really take major steps towards a sustainable food supply.'

**Patrick:** 'It's also important that we consider fair pricing. Retailers are price driven. As long as consumers prefer cheaper, environmentally unsustainable products from places like Spain, to sustainably grown alternatives from Dutch greenhouses, retailers will feel no need to buy more sustainably. Innovations in our sector should, therefore, also focus on more efficient methods that enable us to compete on prices. Professionalisation is also important for this.'

**Ruud:** 'Professionalisation ultimately underlies everything. That's a fantastic challenge for Horticoop!'

**Ruud van der Vliet** earned his stripes in banking, including as former Director, Bedrijven Rabobank Westland, before specialising in improving and restructuring companies in the argifood market and specifically horticulture and greenhouse horticulture. Today, he has a consultancy firm Van der Vliet & Van der Oost BV and focuses entirely on tactical and strategic issues, and business development. Ruud is also active as a supervisory director or advisor at various companies and works for a London-based investment company focusing on greenhouse horticulture and sustainable food supply. ■



# Horticoop investment cooperative: tell me again, what does it do?

Horticoop actively invests in innovative companies in the horticulture industry. This is our way of contributing to a sustainable future for horticulture, in which members, companies and Horticoop can grow together. How does that work exactly? We'd be delighted to explain all about it.

## Horticoop is an investment cooperative. But what does that entail?

Horticoop has been representing its members interests for more than a century. Until 2021, Horticoop's assets were used for joint supply and wholesale activities. Since 2021, Horticoop has been investing as an investment cooperative in companies that develop innovative solutions for greenhouse horticulture. Sustainability is an important theme in the sector, which is why Horticoop is investing in Skytree, a company developing a technology to provide fossil fuel-free CO2 to greenhouses, and VitalFluid, which offers plasma water as a sustainable alternative to fertiliser. If you'd like to know more about other companies in which Horticoop invests, you can read all about it on pages 38-39.

## Horticoop members can receive dividends under certain conditions. How does that work?

The companies in which Horticoop invests generate returns for Horticoop. The Horticoop Board can propose returning an amount from these returns to the members. If this proposal is approved by the Supervisory Board and member council, the members receive a dividend (profit share). The amount of dividend to which a member is entitled depends on the number of participations they hold.

## What are participations, and how do these benefit members?

Horticoop's assets were registered in the names of the members on 21 March 2023, in the form of participations. A distribution formula was used for this. It enables members to share in the growth of Horticoop's assets. The number of participations also translates to the number of voting rights within the organisation, such as in member council elections. So it's very much worth having participations! The participations can be traded from two years after they are registered in members' names. The Horticoop board is currently investigating how best to arrange the trade in participations.

## Can members be held liable?

No. Horticoop is a cooperative Excluded from Liability (UA). This means that members are not liable for any of the cooperative's deficits and losses, even in the unlikely event of bankruptcy.

If you have any questions about the investment cooperative, feel free to ask David Brand, Horticoop's Communication & Community Manager via [cooperatie@horticoop.nl](mailto:cooperatie@horticoop.nl)



# From garnering opportunities to greenhouse reality

Kees Stijger talks about the value of practical experience



Kees Stijger, member of the member council

**When Horticoop has a potential investment in mind, its members' practical knowledge is indispensable. So it's no wonder that Horticoop actively seeks such knowledge from its members. Kees Stijger, tomato grower and member of the member council is happy to answer that call. He explains what motivates him to share his vision on potential investments with the Horticoop investment team.**

## Kees, why do you like being involved in Horticoop's investment process?

'Horticoop has the financial means and investment knowledge in-house, but ultimately, it's the members who know what's going on in practice. While Horticoop focuses on the investment process, as a member I can give input about the practical applications of an innovation and the factors that are important in this. This means I can help Horticoop make the right choices, and I ultimately reap the benefits myself.'

## When do you share your knowledge and insights with Horticoop?

'As soon as I hear that Horticoop intends to make an investment, my thinking cap goes on. I always try to work based on the greenhouse

horticulture industry's collective interests. Which of my co-growers would benefit from this tool? And what are my own experiences? If I think I have valuable input, I contact Wilco Schoonderbeek, Horticoop's Director Investments. We both like to stay in touch and can contact each other easily. Sometimes by phone, sometimes online or sometimes in an in-person meeting. That means I can share my knowledge both solicited and unsolicited!'

## Do you have any concrete examples of how you profited from this?

'Certainly! For instance, I talked with Wilco about how the Vivent sensors could help in practice in the greenhouse. I think that the data and insights provided by this technology are simply phenomenal. It gives me the opportunity to anticipate a plant's status, and there are plenty of situations in which that makes an essential difference during cultivation. I shared this practical perspective with Wilco and that's partly why Horticoop decided to invest in Vivent. That's great, because I now get to enjoy using the sensors in my own greenhouse and I can closely monitor my tomato plants' health!'

## A fantastic result. Is there anything else you'd like to tell other members?

'The combination between the practical knowledge of members and Horticoop's experienced investors is a goldmine. The most important thing we can do as members is to continue to share expertise with each other. We have everything in-house to improve the greenhouse horticulture industry together! So my advice is, let your voice be heard! Use the opportunity to brainstorm with the investment team and invite them to visit your greenhouse. It could lead to the next greenhouse horticulture investment!'

# Faster response to plants' water requirements

Horticoop invests in CE-Line's real-time nutrient analysis



The CE-Line system at WUR

Water is one of the most important elements in greenhouse horticulture. CE-Line enables monitoring of nutrient levels in irrigation and drainage water. This was more than enough reason for Horticoop to invest in this scale-up, which has an international future ahead of it. Wilco Schoonderbeek, Horticoop's Director Investments, talks with Simon Meijer, CE-Line's CEO regarding the role of CE-Line in data-driven cultivation.

**Simon:** 'Applying the right amount of nutrients is vital for crop growth. The difficulty the industry faces is finding out what a crop needs at any given time and then responding to this need as quickly as possible, which is why CE-Line developed a system to enable real-time analysis of nutrient levels in irrigation and drainage water. This enables growers to monitor nutrient needs much more precisely, which optimises growth. We're delighted that Horticoop sees potential in our technology!'

**Wilco:** 'Your technology will certainly help the horticulture industry; we're convinced of that! Our cooperative members pointed out your measurement system to me. When a mutual acquaintance brought us together and we started investigating your technology, we immediately saw the potential. Horticoop is investing in companies that can offer solutions for industry bottlenecks and CE-Line is a perfect example of this. We want to give growers control to do what is needed for crop optimisation, and to do this at the right time and by the right amounts.'

**Simon:** 'Our technology achieves that optimisation. The system takes samples from the various water flows and these are analysed on the spot. It used to take a week before the grower had usable data available, after having the sample analysed in the lab. That meant you were using outdated information to manage your crops; information that only represents a snapshot. For growers it's much more useful to stay informed of the current nutrient composition, as this enables stable nutrient dosage and timely action if things seem to be going awry. If you only get your hands on the data a week later, the harm's already been done. Delays in obtaining data can also lead to huge fluctuations in nutrients. If there seems to be a surplus, a grower will use less nutrients, but this can also go too far and create a nutrient deficiency. These fluctuations don't help crop growth.'

**Wilco:** 'The delay in obtaining data is even greater in countries outside the Netherlands. Here we're lucky that the horticulture industry has many laboratories. In other countries that's often not the case so it takes even longer before data are available. The fact that CE-Line's system enables us to generate and deliver data on the spot could provide considerable acceleration, especially for international growers.'

**Simon:** 'The response we often get from growers about our technology is: "I didn't know that I didn't know this". We want to provide growers with insight into what is happening, which will ultimately enable them to grow remotely in a controlled environment.'



Simon Meijer, CEO CE-Line

**Wilco:** 'That controlled environment is an absolute necessity. Products from the sector end up in a wider chain that demands reliability. Take the tight, logistical organisation of a supermarket, for example. They want specific products of a certain quality on the shelves at a set time. As a grower, you want to be able to operate in a similar tight environment. I think that CE-Line will play an important role in this.' >



**Simon:** 'Indeed, it's not market demand, but market supply that's increasingly determining the game. Growers used to produce for auction houses. Such things as the looming water shortages and a growing world population have clarified how vulnerable the chain can be. There's a greater need for certainty and the ability to plan, which is why greenhouses numbers are increasing worldwide as this enables us to control cultivation. So the control of the chain has reversed, which is an exciting development.'

**Wilco:** 'Data-driven control of production will become increasingly important in controlling cultivation. Soon the entire chain will be demanding this.'

**Simon:** 'Growers in other countries are also seeing the advantage of having data available more quickly. We have now installed just as many devices abroad as in the Netherlands. The desire to implement our technology is high because growers know that they can use it to prevent major errors. It's fantastic to be able to offer this eye-opener. It sometimes results in rather frank conversations.'

**Wilco:** 'Horticoop's portfolio includes companies with which CE-Line can create synergy in order to offer growers even more. Some companies in the portfolio are involved in greenhouse control. It's possible that they'll be interested in a collaboration with you. There's also a link with Vital Fluid, the company that makes plasma water. I see a huge number of opportunities, after all, water is one of greenhouse horticulture's core resources.'

**Simon:** 'We've had regular contact with Horticoop parties over the past six months. We're acting in the same market so we can really use each other's knowledge and network. I notice that Horticoop aims to really add value to the industry instead of only obtaining financial returns. It feels like a long-term cooperation, with the future in mind.'

**Wilco:** 'Certainly. It's not only about financial returns - it's also about returns in the greenhouse. I'm looking forward to the day that CE-Line becomes a permanent feature of greenhouses. That it's not up to the grower to decide whether to use the system or not, but that it's built-in as standard.'

**Simon:** 'That would, of course, be fantastic. I'd be absolutely delighted if the world's biggest greenhouse builders were to state that our system is standard in the drawings. But it's also a rather challenging route. The industry is facing many challenges, such as globalisation and automation. Fortunately, Horticoop has a good idea of where the sector is moving and how best to respond. We have a shared vision on that.'

**Wilco:** 'When companies are in a start-up phase, it's very easy to undermine concepts that are not quite there yet. While you should actually be thinking: if this succeeds it will really be worthwhile and will help the industry progress. That's certainly the case with CE-Line!' ■



Wilco Schoonderbeek, Director Investments Horticoop

# Elstgeest Potplanten nominated for circularity award

Plastic-free line, Natural Gift, already on the jury's radar during its pilot phase



**A pilot nominated for a major award: it happened to Elstgeest Potplanten. The Horticoop member from Nieuwe Wetering was one of the nominees for the Themaprijs Circulair Ondernemen from Tuinbouw Ondernemersprijs.**

In less than six weeks of plastic-free indoor plant line Natural Gift going on sale, Operations Director Rob Wubben received a call from Greenport Aalsmeer, one of the organisers of the circularity award. Rob: 'They were aware of our new product and thought that this was a great match for the award's criteria. This is how we unexpectedly ended up on the nomination list, along with three other horticulture-related companies that offer something distinctive in terms of circularity. A true honour!'

The nominated label Natural Gift embraces three specially developed Dieffenbachia varieties, in a biodegradable pot and a cardboard tray, without a sleeve and labelled with sustainable Stone Paper on a bamboo stake. Rob: 'Sustainability should now form an important part of every company's operational process. We've been dedicated to circularity for years now and are doing well in terms of water use, crop protection and separating waste. The next step is testing whether we can go entirely plastic-free with one of our plant groups in the chain.'

With the Natural Gift concept, we can discover how traders respond to this and whether there's demand.'

The company noticed that Dutch garden centres had a limited range of sustainable products. The most important criterion for buying plants is whether product appeals to the consumer. Rob: 'The target group that opts for sustainability is still quite small. That's why we started with a pilot, on our own initiative, and not following requests from customers. We did have intensive contact with our buyers to stimulate the demand for sustainable products. We also help them think about how they can best position this product in the shop. Hopefully, our efforts can overcome customer reluctance.'

Rob also has various tips for other horticulture entrepreneurs: 'You can already make a lot of sustainability gains in your company, without making huge investments. And, often you're already operating in a more circular way than you think! For instance, your waste streams and recyclable pots. We do advise talking with the producers of such things as your pots and sleeves and investigating the options for developing new circular products with them. You don't need to do everything on your own!'



Rob Wubben, Operational Director at Elstgeest Potplanten



# Horticoop's first successful theme day is a hit!

A robotics and greenhouse automation deep dive

Horticoop organised the first themed meeting for members on 30 May. A group of interested parties delved into the theme of robotics and greenhouse automation. It's a popular topic, as evidence by the flood of applications that came in immediately after the announcement. The nearly thirty lucky attendees at the event at rose nursery Porta Nova in Waddinxveen immersed themselves in knowledge. From experts and from each other.

As investment cooperative, Horticoop aims to use the expertise available within the cooperative, while also informing members about relevant innovations. After all, the cooperative's strength lies in shared knowledge that can be used to realise valuable investments in the future of the horticulture industry. Experts, those with practical experience and interested parties met during the deep dive into robotics and greenhouse automation, which resulted in a smooth exchange of knowledge between the parties. >

## Marco Koolhaas, Cultivation Manager a LKP Plants, attended the deep dive:

Horticoop member

'Greenhouse automation and robotics are hot topics at LKP Plants. I registered for the deep dive so I could stay informed of all the latest developments. There's a huge amount of expertise available in the group, both among members as well as among the Horticoop knowledge partners. The presentations were extremely interesting. I hope that Horticoop will be organising more of these kinds of deep dives because I can really recommend them to everyone!'



Marco Koolhaas

### Successful formula

Managing Director, Patrick Groeneveld reflects with satisfaction on the first deep dive: 'The themed meeting was a success. We exchanged knowledge and expertise, and the lively discussions produced some invaluable insights. The use of robotics differs per grower and per greenhouse. Everyone has different interests because every cultivation method is different. As the attendees had so many different viewpoints, we were able to explore various perspectives, which meant that the deep dive gave us space to examine this topic in depth.'

'The deep dive helps build bridges between research and practice'

Patrick



### From research to practice

The themed meeting started with lunch, after which Ronald Hoek, Blue Radix CEO, shared his vision for the industry. His presentation on trends in and applications of Artificial Intelligence in the horticultural industry fuelled the exchange of ideas at the table, which led to in-depth discussions. Erik Pekkeriet, Programme Manager Vision & Robotics at Wageningen University & Research (WUR), updated attendees on high-tech solutions in the greenhouse, triggering an interesting discussion on the translation of research into practice. Patrick: 'The deep dive helped us build bridges between the valuable research carried out by knowledge partners and its application in practice. Because, however promising an innovation is, as an industry we're also dependent on the market. If machine builders don't dare to build a robot before they have guaranteed buyers on the market, and if growers don't want to give that guarantee in advance, no innovation will get off the ground. Horticoop can play a role in overcoming these hurdles by bringing different perspectives together so we can reach a joint solution to put innovations into practice.'



### Read more?

If you're curious about the insights that Erik Pekkeriet shared during the meeting, you can read more on page 22 of this magazine.



Erik Pekkeriet

### Bullseye

The positive comments after the meeting showed that the deep dive is a successful formula for sharing knowledge and strengthening each other and the horticulture industry. We'll definitely be organising a follow-up to this themed meeting. Patrick: 'That the subject of robotics and greenhouse automation appealed to many people was evident from the speed with which the available places were taken up: it was full within a day of the announcement. I'm convinced that there are many more topics that affect all growers, such as labour, energy, CO2 and pesticide use. These are challenges that every grower is facing. So I can see a lot of potential for more Horticoop deep dives!'



### Don't miss any deep dives!

Horticoop is intending to organise deep dives more often on topics that impact the industry. Would you like to be part of a future Horticoop deep dive to share your knowledge, experience or vision on specific horticulture topics and further develop it together with other members and experts? Keep your eye on the newsletter where we'll be announcing new themes.

Scan this QR code to register for the Horticoop newsletter.



Leon Dukker, Director and Co-owner of Porta Nova

Of course, we didn't want to miss a tour of the host's company. Leon Dukker, Director and Co-owner of rose nursery Porta Nova in Waddinxveen, captivated attendees with an inspiring insight into his business that included a major focus on greenhouse automation. He creates the optimal conditions in greenhouses in Waddinxveen to grow Red Naomi roses. This large-budded rose with a velvety red hue



Porta Nova specialises in growing Red Naomi roses

blooms under Leon's inspired management in a stable climate, with exactly the right nutrition and an abundance of light, in which the aim is to ensure the lowest possible ecological footprint per rose. Leon shared valuable knowledge regarding the advanced techniques and automation processes Porta Nova uses to produce roses of the highest quality. ■

# Why investing in high-tech solutions is more important than ever



Erik Pekkeriet presents his robotics vision during Horticoop's themed meeting

Erik Pekkeriet, Programme Manager Vision & Robotics at Wageningen University & Research (WUR), shared his views on greenhouse automation and robotics during the themed meeting organised by Horticoop. In BLAD he re-emphasised the increasing need to invest in this technology.

Machines and robots have become indispensable in the greenhouse. Yet, according to Erik Pekkeriet, it's still mainly 'mid-tech' machinery that's used in the greenhouse, such as machines for logistics processes, sprayers and machines to store packaged products. There's still not much high-tech development. Erik: 'The next step is to develop technology that can handle these products, such as during harvesting or packaging. Such high-tech is complex and error-prone because the products are often fragile and can vary greatly from one application to another. The technology exists but needs further development before it can be used in greenhouses on a large scale.'

## Risks

According to Erik, the lack of high-tech in horticulture is associated with risks: 'The availability of labour in the agricultural sector has been increasingly under pressure in recent years and we're expecting this trend to continue. It has become more difficult to find suitable manpower and productivity is decreasing, resulting in sharp rises in labour costs in the Netherlands. If nothing changes, the production will move to countries in which sufficient affordable manpower is still available.' For many horticulturists, labour is their biggest expense. Why have relatively few high-tech alternatives been developed? Erik: 'Robot

technology is incredibly complex. It costs a lot of time, money and focus to develop these technologies and to then introduce it at companies. It may seem more attractive to keep using cheaper manpower, but that's unsustainable in the long term. Those who start innovating too late run the risk of losing their competitive edge.'

'In America, improving technology is considered to be a shared problem, but that's no longer the case in the Netherlands'

Erik



## A new phase

This is why Erik is appealing for a longer-term vision and a sense of urgency among horticulturists: 'Ten to fifteen years ago, there were relatively many horticulturists and few machine builders. The horticulture industry then felt responsible for reducing process costs and encouraged the development of technologies. In recent years, the focus shifted to product and market demands. This was a successful

strategy for many horticulturists, whose companies expanded to become multinationals. Although horticulture technologies partly grew with the industry during this period, no high-tech sector has emerged. Rising labour costs have created the need for a new phase, which is giving a boost to process innovations.'

## Routines for knowledge development

Horticulturists will need to invest in this new phase. Financially, in such things as startups and scale-ups, but also via knowledge development. Erik: 'Most high-tech systems that are currently being developed work on the basis of artificial intelligence (AI). These machines learn from the data they receive about crops via cameras and from feedback from greenhouse employees or sensor systems. The better the feedback and the more homogeneous the crop, the better a high-tech system functions, which is why it's important to implement routines for AI training and give people the space to work on these developments. In the early stages this costs time, effort and money for horticulturists, but if you succeed, you'll have a good advantage over the competition.'

## Joint innovations

Erik also advocates a new approach to the relationship between horticulturists and machine builders, which is often seen as a customer-supplier relationship. Erik: 'Most horticulturists are only prepared to buy a product if it works well and machine builders want to meet customer expectations. In practice robots are so complex that this is not always possible. In the Netherlands, this is often seen as being the machine builder's problem, but they can't solve the problems without the horticulturist's knowledge. It's different in America, for instance, where it is considered to be a shared problem and machine builders are given more time and support to develop and improve technology. Projects I'm involved in on WUR's behalf tend to go better there. That's why my motto is: instead of waiting for technology to arrive, let's take a pioneering role as horticulture industry to keep horticulture and the tech sector in the Netherlands!'



Erik Pekkeriet, Programme Manager Vision & Robotics at WUR

# Introducing

Horticoop welcomes two new recruits to the investor team! Olivier de Koste has started as Investment Manager and Patrick Barendse as Investment Analyst. Both come from true horticulture families and share a deep-rooted passion for the industry. They're delighted to introduce themselves to you.



## Background

'I'm Olivier and I live with my wife and son in Amsterdam. After completing my Finance and Accountancy training in Groningen, I started work as a Consultant in EY's business acquisitions department. I then worked as Investment Manager at TIN Capital, where I invested in companies that have a high growth potential. As independent financial consultant, I also mainly worked on an interim basis for Private Equity funds. These different experiences taught me the intricacies of the profession and I can put them to good use at Horticoop.'

## I was brought up with this

'Horticulture was a frequent topic of discussion at home around the kitchen table. My father had a greenhouse building company, which meant I had frequent exposure to the industry as a child. This played a key role in choosing Horticoop. It's a great place to combine my affinity with horticulture and finance.'

## Investment Manager

'Together with the Horticoop team, I'm seeking interesting horticulture companies to invest in. We contact the company, talk to them to determine where the growth opportunities lie and investigate how we can use these. We then conduct analyses and produce a growth plan for the company and use this to decide whether we want to make a bid. Once everything is in place, we start intensive collaboration to help the company grow. It's a fantastic process that gives me a lot of energy.'

## Valuable expertise

'Horticoop operates in a vibrant environment with enthusiastic entrepreneurs and experts in their fields. These are people who don't sit on their laurels and have strong opinions. It's incredibly valuable because this helps us make the right investment decisions. Certainly now the industry is facing many major challenges it's even more important that we share those opinions with each other, so we can work together for a future-proof industry.'

## Making impact

'One of the challenges we face as an industry is the global agricultural production issue. We need to produce more with fewer raw materials to keep the sector future proof. If we make the right investments, Horticoop can make a real contribution to this. With Horticoop's knowledge and huge support base, I'm convinced that we'll succeed in this and that the industry can look forward to a fantastic, sustainable future.'



## Career

'I'm Patrick and I'm enjoying living in Rotterdam. I completed my Economics and Business Economics bachelor there, followed by the Financial Economics and Strategy Economics master. This theoretical basis combined with practical knowledge that I gained during my internships have provided me with a strong foundation for my role as Investment Analyst at Horticoop.'

## Horticulture family

'People who know me are probably not surprised that I'm working at Horticoop. I grew up in Westland and later moved to Agriport, which means that I lived in two of the Netherlands' biggest greenhouse horticulture areas. Our family has been involved with greenhouses for generations, starting with my grandfathers. My father also used to have a greenhouse horticulture company and grew sweet peppers. My mother used to give excursions around this greenhouse, where I also enjoyed a lot of time during my childhood. My uncles, aunts and cousins also spend a lot of time in greenhouses. So, I can safely say that I come from a horticulture family. It's a background that I hope will enable me to make a strong contribution to Horticoop's investment team.'

## Role as Investment Analyst

'My role as Investment Analyst includes a wide range of tasks, but I spend most of my time searching actively for and assessing new investment opportunities. I don't wait for opportunities to come across my path but try to discover these myself. That's why I conduct market analyses that I can use to identify the major developments and players within the industry. I also keep my eyes open in daily life. An interesting opportunity could arise anywhere, perhaps even within my own network.'

## A match

'Horticoop and I are a great match. I knew that as soon as I stepped across the doorway for an introductory interview. Not only because of the warm welcome in the team but also because of the shared ambitions. I like to have social impact and get energy from making the right investments. Add my affinity with horticulture to the mix and voila: a role that suits me down to the ground!'

'It's our duty to keep steering the industry towards innovation.'

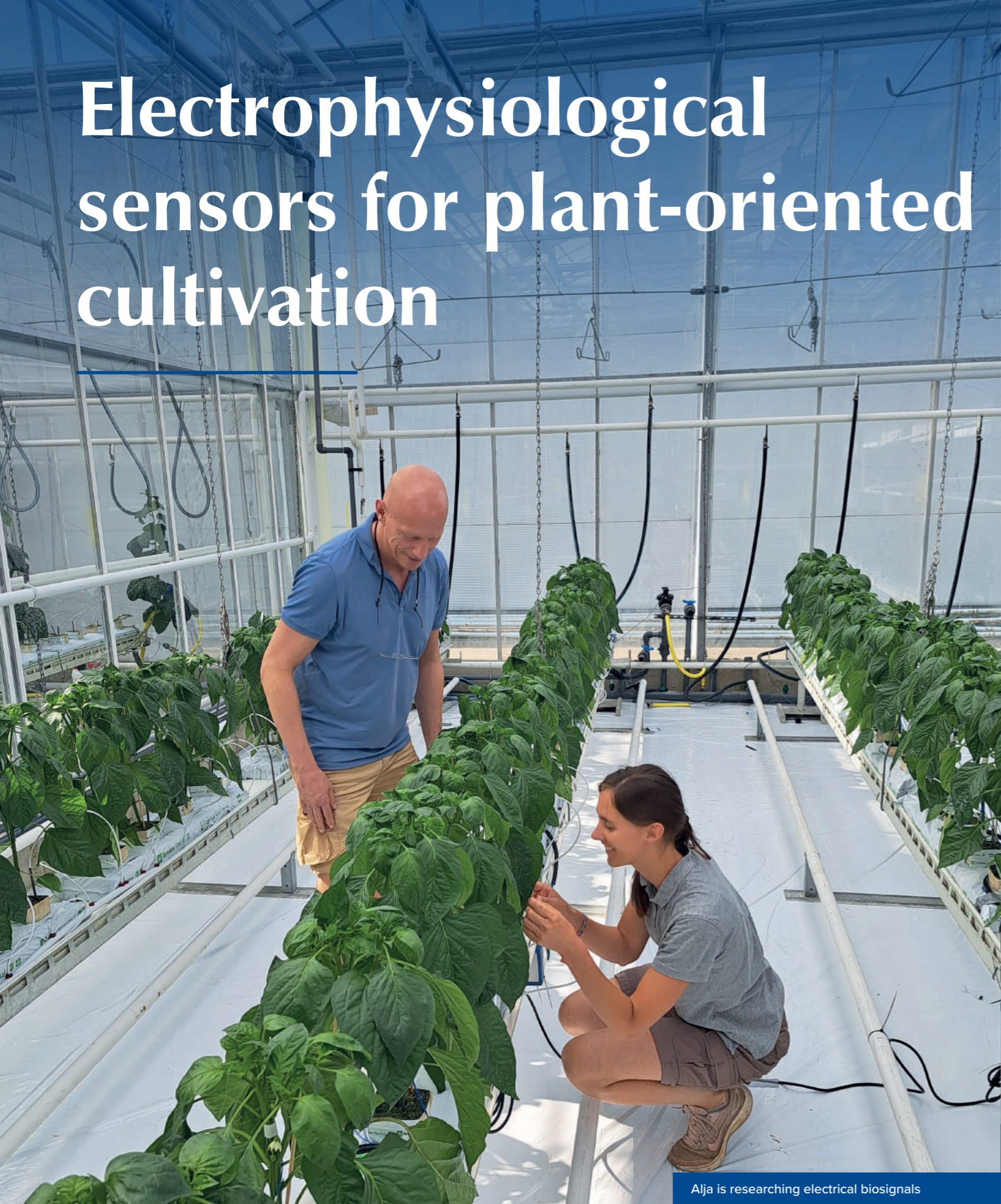
Patrick



## The Netherlands as pioneer

'The excursions that my mother used to give in the greenhouse attracted visitors from across the world, who wanted to see how we do things in the Netherlands. The Netherlands is a greenhouse horticulture pioneer. It's our duty to keep steering the industry towards innovation. The Horticoop members' practical knowledge, together with the cooperative's financial resources can offer a lot. I'm really eager to contribute to this!'

# Electrophysiological sensors for plant-oriented cultivation



Alja is researching electrical biosignals

Wageningen University & Research (WUR) has conducted research on using electrical biosignals for early detection of diseases and pests. Biosensors from Vivent were used for this. Alja van der Schuren, Plant Physiology Scientist at Vivent Biosignals and Kirsten Leiss, Senior Researcher Plant Health at WUR talk about the research process, the promising results and the possibilities this new method offers growers.

**Alja:** 'Plants use various internal communication mechanisms. For instance, a plant can indicate that its roots are being attacked or that the climate conditions have changed, so that the rest of the plant can prepare for this. One of those communication mechanisms is the electrical biosignal. At Vivent, we developed a method to read that signal. We produced several algorithms to be able to read small fragments of information from the electrical signal. This information indicates whether a plant is affected by disease. We then worked with Kirsten to examine fragments of the signal that show an attack by a virus, insect or fungus.'

**Kirsten:** 'That's right! We tested electrophysiological sensors in cooperation with the Club of 100. This makes us the first to have researched biosensors for detecting stress caused by invading pests or fungi. This form of stress is also known as biotic stress. Plants respond in very specific ways to insects and fungi. The question is: how can we recognise this response at an early stage?'

**Alja:** 'We can do that by measuring the electrical signals. You need a control group for this, comprising plants that are free from pests and diseases. There's also a group of test plants,

which are infected. We measure and then compare the electrical biosignals from both groups of plants. It's not always easy to ensure that plants are infested. Occasionally the insects don't do their job, and plants don't get infested. Of course, that's in nature's hands.'

**Kirsten:** 'We have indeed noticed that many experiments are needed to build a sound dataset. It is and remains research and to be able to make a good comparison, there needs to be a clear difference between the control and the test plants. Some datasets won't be usable so it's essential that we conduct many experiments.'

**Alja:** 'From the data we ultimately collected, we compared the signal from the test plants with those of the control plants. We also compared the signals in both groups with signals from the previous periods, to make sure we were studying the plant in the right phase. The computer then searched for differences between the signals. In doing this, we looked at around 700 signal characteristics, such as the level of the signal or how often the signal moves. The characteristics of signals that vary most between the two groups of plants, form the basis of the model we're developing.' >



Kirsten Leiss, Senior Researcher Plant Health at WUR (left) and Alja van der Schuren, Plant Physiology Scientist at Vivent Biosignals (right)

**Kirsten:** 'We chose two model plants for the research. For ornamentals, we worked with gerberas, and for fruiting vegetables, we used tomato plants. As we wanted to know if our models work on different organisms, we released a virus, a fungus, and an insect on these two plant species. We started with the virus. We were unfortunately unable to infect the plants enough and the plants didn't present with enough symptoms to build a model with. A different problem occurred with the fungus, mildew. The control group actually proved to be infected too.'

**Alja:** 'That was a real pity! The control plants really need to serve as a control. As soon as an infection is visible there, the data are no longer usable. Otherwise, the model might start seeing the early signs of mildew as control and that is something we want to avoid.'

**Kirsten:** 'The results from the insects were the most promising. We used thrips for this: tiny insects that suck out the cells of leaves, allowing air into them. This gives the leaves a kind of silver sheen. This cosmetic damage is a problem but also the virus that the thrips spread weakens the entire plant. The symptoms are only visible after 5-6 days, but with the electrical biosignals, we were able to detect the infection after just 2-3 days.'

**Alja:** 'This will be a huge help to growers. Ideally you want to detect a disease before it's visible on the plant and has had a chance to spread, as this enables the grower to intervene in time. We're testing all kinds of tactics with different parties in the chain, and things are looking promising! For the research with WUR, we used biosensors connected to the plant via a cable. For an experiment that's fine, but in practice a device without cables is preferred, which is why we recently developed a mini biosensor that works on batteries. This is easier to place these in various parts of the greenhouse.'

**Kirsten:** 'The information from the plant then has to be sent to the grower as quickly as possible so they can take timely action. Am I correct in thinking that you're also developing something for this?'

**Alja:** 'We are indeed testing a live dashboard with the first growers. As soon as the sensors identify a pest, the grower receives a push message on their telephone or computer. The signals arrive with just a few minutes' delay so they're getting almost live data from the greenhouse! This development enables us to switch to plant-oriented growing, putting the plant more at the centre of cultivation decision-making. Whereas the generation that is gradually retiring often relied on their own experience, the new generation of growers will be working with the latest technologies.'

**Kirsten:** 'From a researcher's perspective that's something I can really understand. I want to be able to read the plant from the inside and understand its language. That's a challenge but it also offers huge potential. Vivent's electrophysical sensor doesn't only measure biotic stress, it also measures abiotic stress, or stress caused by the climate. This is a unique combination and offers so many opportunities for new research! That's why I'm so delighted that the Club of 100 has enabled this research.'

**Alja:** 'I hope we can continue this research with the Club of 100 and WUR in the future so we can keep offering smart cultivation solutions!' ■

### The Club of 100

The Club of 100 is a partnership of different suppliers and commercial companies in greenhouse horticulture, including Horticoop. Together with WUR, the Club members develop knowledge for growers worldwide and in doing so contribute to a sustainable, future-proof greenhouse horticulture industry.



During the test with mildew on tomato plants both the test as well as the control group proved to be infected



Testing thrips on tomato plants in enclosed cages

# Skytree in the greenhouse

Learning together to ‘borrow’ carbon from the air

There’s a growing need for a sustainable alternative to fossil fuels in greenhouse horticulture. Skytree is involved with a pioneering initiative to enable this energy transition and achieve the set environmental targets. It’s an initiative that’s already off to a great start! However, you never stop making efficiency developments. Practical research, such as in the Skytree pioneer programme, is essential to this.

Fred van Veldhoven demonstrates Skytree’s DDAC unit during the WUR pilot



Bart van Meurs, Director Division Q (left) and Fred van Veldhoven, Business Development Director Skytree (right)

Skytree is the designer, developer and manufacturer of DDAC units (‘Decentralised Direct Air Capture’). This revolutionary technology enables growers to filter CO<sub>2</sub> directly from the outside air and use it for their crop growth whenever required. This eliminates the need to use fossil fuels. Skytree has developed two types of units for their technology: the Cumulus and the Stratus. The participants in Skytree’s pioneer programme will be testing the larger ‘Stratus’ type DDAC units, which are expected to start rolling of the production lines by end 2024. So although the pioneer programme trials aren’t quite starting yet, the first trials of the smaller Cumulus units have already taken place! These units have now been installed at various companies in Europe and Canada. Skytree’s Business Development Director Fred van Veldhoven explains why trials are so important: ‘Together with the growers we can learn in practice how the sustainable DDAC technology can best be used and where development is still needed. We are, for instance, curious about how the sorbent, the active material in the machines, can retain the heat even better and how we can further improve heat transmission.’

## Starting on time

Growers will profit from increasing their DDAC knowledge and experience. Fred: ‘Gas costs are

increasing every year. A CO<sub>2</sub> levy is also being introduced in 2025, with emissions from every greenhouse horticulture company being taxed individually. Customers are also increasingly setting demands on the products they buy. You simply can’t avoid carbon-neutral production. Participants in the pioneer programme will be among the first to learn how to integrate DDAC technology with their existing energy management systems, thereby reducing the CO<sub>2</sub> cost per kilogram. We clarify exactly how much that yields by making a total cost of ownership calculation. We also help the pioneers with subsidy applications and implement the entire software integration. The Stratus units will soon be installed at five companies, which is a good number, but we’re looking for even more interested parties to join the pioneer programme. Because for good data distribution, it’s important that we gain knowledge both geographically and in terms of crops in different greenhouses.’

‘We need to roll up our sleeves together, otherwise certain sustainability initiatives will pass our industry by’

Bart



## Minister gives the starting signal

Skytree DDAC units are not only being tested at the pioneers. At Wageningen University & Research (WUR) a test environment was recently opened by Piet Adema, Minister of Agriculture, Nature and Food Quality. A comparison test in growth and quality between two cucumber crops is being conducted at WUR. For one crop, CO<sub>2</sub> is supplied via a traditional transmission line, while for the other crop, Skytree’s technology filters CO<sub>2</sub> from outside air. Skytree’s Cumulus machine was used in this test phase. >





Minister Piet Adema opened the test environment at Wageningen University & Research

### An experimental breeding ground

A Cumulus is also being used at Koppert Cress greenhouse horticulture company, which grows edible flowers and leaves for international gastronomy. Koppert Cress has high ambitions with respect to emission-free cultivation. Bart van Meurs is Director of the sister company, Division Q, which takes on all the Koppert Cress sustainability projects. Bart: 'We've set ourselves the target of stopping using fossil fuels in our processes by the end of 2025. Our search for a sustainable replacement took us to Skytree and culminated in us testing their technology. Koppert Cress offers the ideal breeding ground to do that. Our crops are perfect for this test and we have experience with experimenting with new technologies. For this test, we're using one of our most important crops: shiso leaves. We grow this crop on a large scale and the CO2 dosage is very important. If we can maintain the quality we're known for in a sustainable way, by 'borrowing' CO2 from the air, we'll have achieved our target.' The Cumulus is now running full steam ahead at Koppert Cress. Bart: 'For us, this trial is mainly about fitting such a machine in our operations. What's the capacity, how much air is needed and does it need to be located inside or outside? As well as these practical issues, it's important that our employees become familiar with the technology. We have the ambition but don't yet have all the knowledge. For Skytree, this trial period is just as instructive in terms of streamlining the process. Our cooperation has, fortunately, been extremely open since the very start, enabling us to share new insights. That's something I'd also pass on to other growers: we

need to roll up our sleeves together, otherwise opportunities like this will pass our industry by. Fortunately, it's clear that people are increasingly feeling the urgency to cooperate!' ■



If you'd also like to be a pioneer, contact Business Development Director Fred van Veldhoven: +31 (0)634642742, [fred.vanveldhoven@skytree.eu](mailto:fred.vanveldhoven@skytree.eu)



**Harry Wubben**  
Founder and owner of Harry Wubben Flowers and member of the Horticoop member council is a pioneer testing the Stratus unit

'The horticulture industry is known as a pioneering industry in terms of responding to developments. We need to keep doing this in order to safeguard the industry's future. That's why I think it's vital that we explore innovations, advancements and other possibilities so we have these technologies ready when they're really needed. And testing these technologies in practice is just as important. That's why I'm so delighted to be able to participate in the Skytree pioneer programme so we can fine-tune this technology together!'



Harry Wubben



# Deeply-rooted concept

## How VDE plant is firmly in the ground

Can you create an experience from a green houseplant? Certainly, if you ask the VDE plant team! This Horticoop member is a pioneer in the sector in terms of innovative, creative and sustainable growing and they develop innovative and surprising concepts for their plants. That's why VDE plant was recently and rightly nominated for the Tuinbouw Innovatieprijs 2024. The jury was impressed by the ongoing innovative progress in small, and therefore, achievable steps. Co-owners Karin and Edwin van der Eijk, respectively responsible for Cultivation & Energy and Marketing & Sales, explain how their many small steps took them this far.



Horticoop  
member

© Fotostudio Vlekke



The family company, VDE plant has been active in Woubrugge, South Holland, since 1948. Following on from grandfather and grandmother Van der Eijk, father Teun and uncle Bert, the third Van der Eijk generation is now at the helm. Brother Edwin and sister Karin, together with associate Hein Visser, are running this innovative houseplant nursery in their own unique way. And they're doing this successfully too, as every year VDE plant sells around eight million houseplants to wholesalers, garden centres and florists in almost all European countries. Karin, Edwin and Hein have transformed the family company into a blooming nursery that stands out for its creativity, positioning and innovation & sustainability, the three pillars in which these creatives excel!

### Pillar 1: Creativity

Edwin's arrival at VDE plant in 2003 gave a real creative boost to the company. Karin: 'Edwin is incredibly creative and has a forward-thinking view of the market. While he was still at school, he was already asking questions about whether taking plants to auction was outdated and what we could do to add some flair. Over time, we gradually shifted our sales strategy from supply-driven to demand-driven. We carefully monitor developments in the European market and listen to our customers: who is our consumer, what are their requirements and do our products meet that demand? With these answers in mind, we develop and present new products and concepts, which are distinct from those offered by our competitors.'

### Hydroponic flagship product

A typical example is the hydroponic concept with which VDE plant won the Glazen Tulp in 2020,

FloraHolland's award for best market introduction. Edwin: 'Our hydroponic concept is one of our flagship products in terms of marketing and sustainability as well as cultivation and particularly in terms of creativity and team performance. We are incredibly proud of this concept, which enables consumers to experience the special growth process of plant and roots. Growing plants in water and presenting them in stunning glassware, creates a living work of art for your home. A lot of testing and thinking preceded the launch of the concept on the market. This includes the crop's shelf life, different living conditions - from nursery to living room - and the positioning in the market. A unique concept deserves an original presentation, especially to ensure that we make ourselves distinct from our competitors. The team was successful in that too! The different types of glass, LED lighting in the base and the stunning product packaging; it's simply oozing with creativity! The sale of hydroponic concepts now forms 20% of our revenue. So we're not the only ones who are delighted with this concept, as customers and consumers love buying them!'

### Pillar 2: Positioning

Thinking in terms of innovation and concepts is also reflected in the company's positioning. The VDE plant products are sold under the brand name Intenz, a name that according to Karin captures the imagination more than the company name. Karin: 'We're selling an experience. That goes much further than just buying a plant. The pot the plant is standing in, the experience on our website and the feeling people get when they enter our Concept Store in Woubrugge all contribute to this. It's a total experience.'

### Direct connection with the consumer

There's a well-thought-out strategy behind these marketing instruments. Take the Concept Store, which serves as a showroom for business clients on weekdays as well as a photogenic backdrop for the content Karin uses on social media channels. These channels are followed closely by consumers and commercial buyers. On Saturday mornings, the Concept Store opens its doors to consumers. They eagerly take the opportunity to admire products they've seen online or in magazines and ask expert staff for advice. >

And, there's another important advantage to this store. Edwin: 'Because of the Concept Store, as a production company, we're in direct connection with the end users. We can test new concepts on store visitors and fine-tune them if necessary, before launching them on the market. So we obtain lots of really useful market information here!' Data from the online shop that VDE plant launched last year also provide useful insights. Karin: 'Our online shop offers consumers an extra channel to purchase their desired product. The online shop is also a source of data to measure which concepts do or do not appeal to consumers. It's all valuable information that also helps our commercial customers buy in a more targeted way.'

### Pillar 3: Innovation & sustainability

The third pillar, innovation during cultivation is something we've been involved in from a very young age. Father and uncle Van der Eijk were already pioneers in the 1980s, particularly with respect to technology. They were one of the first to grow on rolling benches and run transport systems through the greenhouse. These creative innovations mainly focused on keeping the cost price of plants as low as possible. This made them a shining example to other growers, with busloads of colleagues coming to see how the brothers organised things in Woubrugge. The third Van der Eijk generation is now facing two major innovative and challenging changes. VDE plant eventually aims to be gas-free and no longer use peat in cultivation. Karin: 'We also prefer to keep taking small steps with innovations and investments, which will take us forward in a responsible way. We could immediately introduce an innovation across the entire company, but that carries additional risks, which is why we prefer to implement per department. This is more manageable, both in terms of change and financial investment. We gain experience and if the innovation is successful, we invest in the next department the year after.' VDE plant applies this philosophy to reducing energy consumption within the company. The greenhouse is gradually being fitted with a new insulating greenhouse cover, the traditional SON-T lighting is being replaced with LED and an e-border, condenser and dehumidifiers have been installed. This is all so that the company can grow as efficiently, sustainably and energy-efficiently as possible under optimum conditions.

### Tests on bedding options

As well as energy savings, the greenhouse horticulture industry is facing another challenge that requires innovative solutions: reducing the amount of peat used during cultivation. The Dutch government has an active policy of encouraging growers to switch to more sustainable forms of plant cultivation. VDE plant is also in the midst of this transition. Karin: 'We used to cultivate entirely using peat but we've now reduced that to 45%. We use coconut and woodchips as alternatives and are also testing other bedding types. Every test provides us with new insights. This enables us to increase the sustainability of crops, safeguarding both the quality of the plants and our sustainability ambition.' VDE plant's sustainability ambition extends beyond just peat-free cultivation. Pest control and composting are also being addressed sustainably. Its own green waste is kept separate and a circular fertiliser is used. VDE plant has also been working using organic pest control for over 20 years, as this is better for the crop and for people. People are an important asset because, as a close-knit family business, VDE plant considers all 85 employees to be family. Edwin: 'Sustainability is something that's also about our people. We take good care of them, as did our grandfather, father and uncle. We create good employment conditions, but their often long-term commitment and their know-how are also vital to how our company operates. Karin, Hein and I can't do it all alone.'

### Source of inspiration

The steps that VDE plant is taking are a source of inspiration to other companies. The company in turn also likes to be inspired by parties outside the horticulture industry. Edwin: 'Take, for example, companies like Rituals, Rivièra Maison, or platforms such as Pinterest and Instagram. There are so many beautiful things in the world around us! We translate this into our concepts and delight our customers with them. Isn't that just an amazing thing to do? We were recently at the Intratuin head office to present our latest concepts. They were so enthusiastic about the products and it's fantastic to see that the experience we create appeals to consumers. We also try to distinguish ourselves in terms of creativity, positioning, innovation and sustainability, and above all by being surprising. In the past, now and in the future!' ■



Karin and Edwin van der Eijk, co-owners of VDE plant and their associate Hein Visser

# Horticoop's companies

An overview of the investment cooperative's varied portfolio

Horticoop manages a varied portfolio of companies, each of which plays a unique role in promoting a sustainable and future-oriented horticulture industry. You can find an overview of these companies below.



## Lumiforte

Lumiforte makes smart coatings that help growers protect their crops from too much heat and light. Using these coatings allows the conditions in the greenhouse to be regulated. This creates the right greenhouse climate for each season. Lumiforte is the leading international producer of coatings, continually launching innovations on the market to optimise growers' yields per square metre.



**HORTICOOP**  
TECHNICAL SERVICES

## Horticoop Technical Services

Horticoop Technical Services combines and installs smart technology in the fields of water, light, climate, energy and data for the horticulture of tomorrow. From service and maintenance, to constructing new building projects and replacing or improving existing systems.



## Hort Americas

Hort Americas started out as a wholesaler in the American town of Bedford, Texas. It has since evolved to become a leading specialist in urban and vertical farming, horticultural products and LED grow lights. As well as being a sales channel, Hort Americas is also a knowledge centre that even offers certified training programmes. Through technology and education, the company is reinforcing progress in the horticulture industry.



## VitalFluid

### VitalFluid

VitalFluid translates knowledge of plasma technology to Plasma Activated Water (PAW) applications in agriculture and horticulture. PAW can revolutionise the field by offering a more sustainable and environmentally-friendly approach to growing crops. PAW applications can be used as a sustainable source of nitrogen and a natural alternative for chemical crop protection.



## CE-Line

CE-Line is a high-tech company that develops unique analysis equipment to conduct all laboratory analyses of irrigation and drainage water from within the greenhouse. This makes a lot of data available quickly. CE-Line has software, mechanical and chemical expertise in house and operates internationally. In addition to horticulture, the company is also taking initial steps in analysing such things as wastewater that is reused for the production of bioplastics. Horticoop welcomed CE-Line to its portfolio in December 2023. [See also page 14](#)



## Vivent

Vivent is a world leader in crop diagnostics and supplies 'wearables for plants' that provide growers with improved insight into crop health. Vivent's system makes ingenious use of plant electrophysiology for this. The advanced biosensor measures and interprets a plant's real-time responses to disturbances in the balance between the plant and the environment (stressors), even before visible symptoms appear. Diseases, pests, and other stressors are therefore recognised earlier, allowing growers to take appropriate crop measures at an early stage. [See also page 26](#)



## Blue Radix

Blue Radix is a market leader in Autonomous Cultivation, the technology in which artificial intelligence can take over human actions. The company develops AI solutions for virtually all day-to-day greenhouse activities. This enables it to provide solutions to the global challenges that arise with the growing global population's increasing demand for healthy and safe food. With Blue Radix's AI applications, growers can use their knowledge and experience in the most efficient and effective way.



## Skytree

Skytree works on innovative solutions to reduce carbon emissions and promote sustainability. As a leader in the battle against climate change, it aims to make a positive impact on the environment. Using Direct Air Capture (DAC) technology, Skytree captures atmospheric CO2 via a filter system to both reduce emissions as well as for compensation purposes. This technology is playing a key role in boosting environmentally-friendly methods and building a greener future. [See also page 30](#)



# Annual figures 2023

## Consolidated income statement 2023

	2023	2022
	x € 1,000	x € 1,000
Net turnover	124,034	162,055
Other operating income	1,313	514
<b>Total operating income</b>	<b>125,347</b>	<b>162,569</b>
Cost of raw materials and consumables	85,533	116,945
Staff expenses	18,716	21,383
Amortisation of intangible and tangible fixed assets	4,322	4,489
Other operating expenses	12,125	15,439
<b>Total operating expenses</b>	<b>120,696</b>	<b>158,256</b>
	4,651	4,313
Interest expenses	159	249
<b>Pre-tax profit</b>	<b>4,492</b>	<b>4,064</b>
Taxes	-951	-1,167
Share of unconsolidated participating interests	-915	654
Third-party share in the profits	-497	-1,000
<b>Group result after tax</b>	<b>2,129</b>	<b>2,551</b>



## Consolidated balance sheet as of 31 December 2023

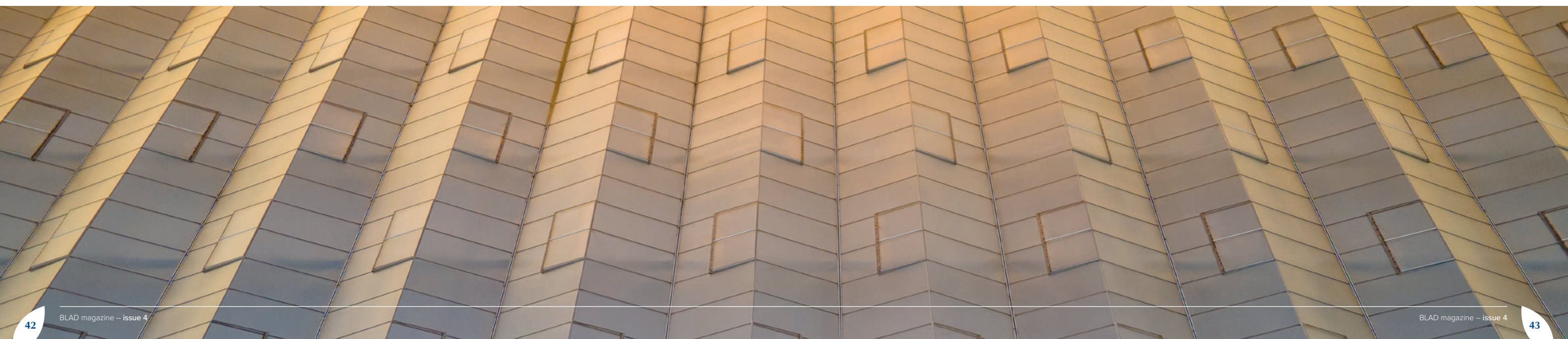
(proposed profit appropriation for accounting purposes)

### Assets

	2023	2022
Fixed assets	x € 1,000	x € 1,000
Intangible fixed assets	10,562	12,040
Tangible fixed assets	18,722	22,520
Financial fixed assets	8,992	1,595
<b>Total fixed assets</b>	<b>38,276</b>	<b>36,155</b>
Current assets		
Stocks	10,864	17,801
Trade receivables	9,499	11,915
Receivables	3,813	2,912
Cash at bank and in hand	16,856	11,325
<b>Total current assets</b>	<b>41,032</b>	<b>43,953</b>
<b>Total assets</b>	<b>79,308</b>	<b>80,108</b>

### Liabilities

	2023	2022
Equity	x € 1,000	x € 1,000
Solvency	71,4%	65,4%
Third-party share	1,214	1,955
<b>Group equity</b>	<b>57,832</b>	<b>56,540</b>
Provisions	883	1,461
Long-term liabilities	1,636	4,103
Current liabilities	18,957	18,004
<b>Total liabilities</b>	<b>79,308</b>	<b>80,108</b>



# Key figures

Turnover net  
x € 1,000

2023	124,034
2022	162,055
2021	142,575
2020	141,440
2019	129,432

Profit after tax  
x € 1,000

2023	2,129
2022	2,551
2021	3,009
2020	3,566
2019	-1,663

Equity  
x € 1,000

2023	56,618
2022	54,585
2021	52,030
2020	48,818
2019	45,433

Solvency:  
Equity-to-asset ratio

2023	71.4%
2022	68.1%
2021	58.9%
2020	56.5%
2019	61.5%

EBITDA  
x € 1,000

2023	8,973
2022	8,802
2021	9,941
2020	12,510
2019	7,046

Operating cash flow  
x € 1,000

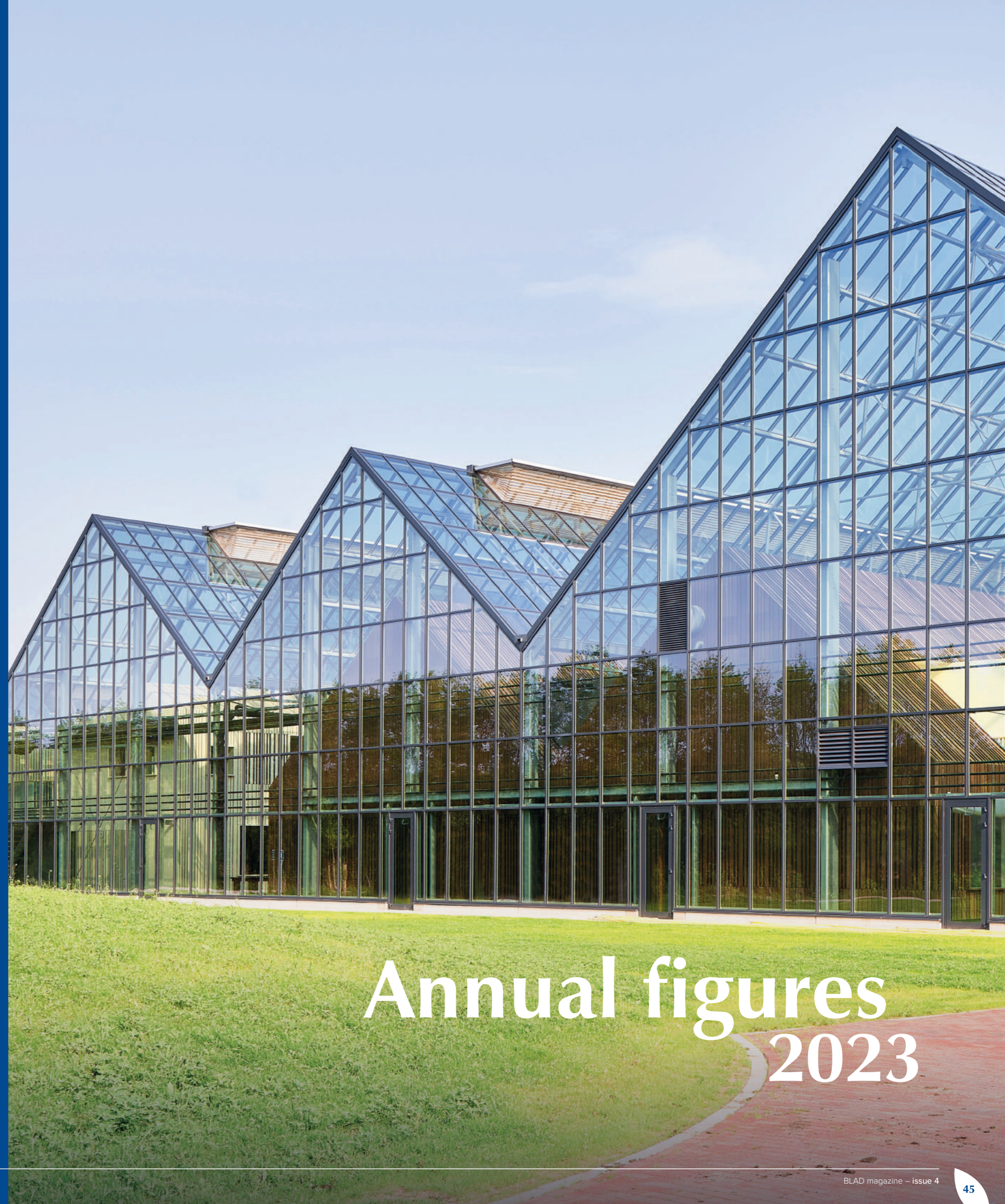
2023	8,785
2022	-447
2021	11,466
2020	12,221
2019	7,736

Number of members

2023	280
2022	380
2021	380
2020	394
2019	394

Average number of employees

2023	212
2022	286
2021	288
2020	350
2019	348



# Annual figures 2023

# Notes to the 2023 figures

CFO Hend van Ravestein explains the developments and financial results of 2023. You'll find an overview of the annual figures and key indicators on pages 40-45 of this magazine.

## Investments and disinvestments of activities

'Horticoop focuses on activities that promote the development of modern and sustainable technologies in the horticulture industry. Horticoop further detailed this direction in 2023 by making new investments that contribute to innovation in the industry.'

In 2023, Horticoop invested in the following strategic minority interests:

- **Blue Radix B.V.** (Rotterdam)
- **CE-Line B.V.** (Emmeloord)
- **Skytree B.V.** (Amsterdam)
- **VitalFluid B.V.** (Eindhoven)
- **Vivent SA** (Gland, Switzerland)

'Horticoop's existing business portfolio was also examined in 2023. These companies' growth plans were studied and if there are activities that no longer match the strategy we explored options for divesting these activities.' This led to the sale of six Welkoop stores and to the sale of the 100% equity interest in Gärtnereinkauf Münchingen GmbH ('GEM') in 2023. The activities of Lensli and Horticoop Scandinavia AS were also sold in early 2024.



Hend van Ravestein, CFO Horticoop

## Revenue development

The consolidated net revenue fell by 23.5% to € 124.0 million in 2023, compared with €162.1 million in 2022. This decrease is mainly due to the sale of the Welkoop stores and the sale of the equity interest in GEM in 2023. The table below shows the revenue development per geographical segment and per type of revenue.

### Revenue per segment

x € 1,000	2023	2022
The Netherlands	43,825	57,600
Other EU countries	46,058	57,614
Other countries	34,151	46,841
<b>Total revenue</b>	<b>124,034</b>	<b>162,055</b>

### Type of revenue

x € 1,000	2023	2022
Trade	54,848	94,055
Production	53,061	52,542
Technical systems	16,125	15,458
<b>Total revenue</b>	<b>124,034</b>	<b>162,055</b>

The impact of the sold business activities can also be seen in the decrease in revenue in trade, revenue in the Netherlands (Welkoop stores) and revenue in other EU countries (GEM).

## Profit

'We closed 2023 with a net profit after tax of €2.1 million. Net profit in 2022 amounted to €2.6 million. In general, 2023 was a difficult year for horticulture supply. Production volumes in the industry were under pressure due to market and economic conditions, resulting in a poor international investment climate.' The positive result increased equity to €56.6 million at the end of 2023 from €54.6 million in 2022. The solvency ratio – equity as a percentage of total assets – is 71% (2022: 68%). Cash flow was also positive and additional repayments were made at the bank.

Hend adds: 'The balance sheet is financially very sound. In 2023, we comfortably met our banking covenants in the financial agreement with the main banker. The covenants are also expected to be amply met over the next twelve months.'

## Employees

In 2023, on average there were 212 employees working in the group, down from 286 in 2022. Hend explains: 'This fall was caused by the sale of activities.'

## Investment strategy

'With the acquisition of the five above-mentioned minority shareholdings, Horticoop has invested in innovations in the industry in 2023. Making these kinds of investments will have a significant impact on the development of Horticoop's sales, financial results, positions and cash flows, also in the coming years. The actual timing and extent of future investments and the expansion of existing interests, depends on internal and external factors. The financial impact of this in 2024 is therefore difficult to predict.' Part of the investment strategy may also include the disposal of existing subsidiaries and participations that are no longer a match for Horticoop's strategy as an investment cooperative.

## Operational activities

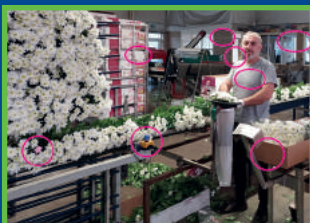
The target for 2024 is to further improve the operating result. Hend: 'We are committed to the growth of our portfolio companies that match Horticoop's strategy as an investment cooperative. Due to growth expectations, we expect that revenue and employee numbers will also increase slightly. The absolute change in revenue, number of employees and investments in 2024 compared with 2023 depends significantly on the investment strategy implementation, in which we will consider both investments and disinvestments. Moreover, macroeconomic developments can strongly influence the development of operating results. We are closely monitoring these developments so we can hold our course and ensure that 2024 is another successful year!'



# Find the 8 differences



Royal Lemkes in Bleiswijk



Solution of BLAD issue 3



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