

"Essentially, nature itself has already created the solutions to all the challenges. It's up to us to find and understand these solutions and apply them with respect."



### In partnership with nature

We may no longer need to convince every world leader, legislator, retailer or consumer that sustainable solutions are needed for the production of safe food that is free of harmful chemical residues. Most of us know that it's vital for our health and the planet. But that does not mean that our work is done when it comes to finding sustainable solutions for horticulture, agriculture and livestock production. More than ever, sharing our knowledge and working closely with experts and growers alike is bearing fruit in rewarding and successful ways.

While perceptions continue to change, the demand for sustainable solutions for better and more responsible food security increases annually with the global realization that horticultural and agricultural practices need to change to meet critical demands for clean and healthy food for growing populations.

Koppert Biological Systems continues to explore, formulate and introduce biological solutions that are locked in nature itself, to then make them applicable for sustainable and productive agriculture, horticulture and livestock production. We believe it's the only responsible way in which to pass on the earth to future generations.

### Our history

#### From start-up to thought leader

In 1967, cucumber grower Jan Koppert and his son Peter decided to dedicate themselves to finding an alternative method for crop protection. The chemicals available at the time were simply no longer working, as pests were becoming more resistant to them. So, they decided to explore the world of natural enemies, also known as beneficial insects.

As pioneers they were the first to introduce a biological solution, the Phytoseiulus persimilis mite, to combat spider mite. The results and effects were so impressive that Jan Koppert decided to produce this solution, not only for his own company, but to sell it to his fellow growers.

Koppert Biological Systems was born. Since our foundation in 1967, we have grown massively and now have 1500 people working with us at subsidiaries across the world.

Determined to find new solutions and further innovations to promote sustainable cultivation, we have continued to explore nature to harness the potential of natural solutions for more than five decades. After the first natural enemies we worked with, we discovered many more. Then came pollinators, microbial products, and natural plant strengtheners. All natural, safe solutions that improve the health, resilience, and productivity of crops – that is what cultivating with nature is all about. Our biological solutions are currently being successfully applied in more than 100 countries.

More than 50 years of professional dedication to finding sustainable solutions for horticulture and agriculture.



### Driven by sustainable solutions

To produce safe crops and ensure food security, it is necessary to think in terms of sustainable cultivation systems. Fortunately, this aim is increasingly endorsed by growers, retailers, legislators and other stakeholders. The foundation for sustainable food production lies in protecting and ensuring vital and resilient ecosystems as the basis for healthy and resilient crops. It is in this field that Koppert's expertise and strength lies. We are convinced that we can make a substantial contribution to this worldwide sustainable food safety and security goal. It is certainly our aim, but most importantly, it is our source of motivation.

#### **Our vision**

100% sustainability in horticulture, agriculture and livestock production.

### **Mission statement**

Koppert Biological Systems contributes to the better health of people and the planet. In partnership with nature, we help to make agriculture healthier, safer and more productive. We provide an integrated system of specialist cultivation knowledge and natural, safe solutions that increase crop health, resilience and production.





# Koppert's core values

## We partner with nature

We feel that in everything we do, we make sure nature and people contribute to and benefit equally. We have a deep respect for nature. Nature is smart. Solutions for our worldly challenges lie within nature itself. It is vital that we stay connected and understand how nature works.



## We work for growers

Koppert works for growers. Together we contribute to making safe, high quality and affordable food and ornamental crops available for consumers, while reducing the environmental impact. Growers are the key figures. We feel a strong responsibility to share our expertise to serve them in the best way possible.



## We build global networks

Collaboration is in our DNA. We cannot do this on our own. We know that in order to get closer to realizing our mission and vision, we need to work together. That is why we are open to building relationships, externally as well as internally.



## We keep improving

To achieve our ambition, we are continuously looking for better solutions and improving our processes, products, know-how and services. As growers rely on us, we work hard to keep innovating. We have an open mind to new ideas. We are pioneers.



## We are family

We care, respect and value each other. We are welcoming and open. This value is not about family DNA but applies to a much larger network. The Koppert 'family' is united through values and a strong belief in biological solutions and sustainable growing practices.



Reducing the use of chemical agents and synthetic fertilizers while maximizing sustainable input efficiency for growers.



### Aiming for 100% sustainability

We anticipate developments in the high-tech production of greenhouse vegetables, ornamentals and soft fruits on all continents and find solutions to new pests and diseases through continuous research and development in a growing range of crops. More than 300 consultants are in close contact with growers worldwide to give them the benefit of our experience and the latest news on applicable innovations, while finding local solutions for local problems. Growers' feedback is always welcomed, and we have come to regard this as a vital part of finding sustainable solutions.

Koppert has been successfully producing beneficial insects such as parasitic wasps and predatory mites, as well as microbiological solutions to help growers control pests and diseases and restore the natural balance in crops, for more than five decades. Our worldwide knowledge and experienced consultants are the key in this process. One of the areas with the greatest impact is in tomato cultivation. Through our biological solutions, the use of crop protection chemicals in this field has been reduced enormously. Having established ourselves as a dominant player in sustainable solutions for the horticultural market, we now aim to reduce the need for chemical agents and synthetic fertilizers to a bare minimum.

The completion of state-of-the-art premises with new production and R&D facilities means that the production of biologicals can now fully expand to support the company's growth. Focused research and continuous alignment with growers' demands worldwide ensure that we work closely with growers.

Our extensive knowledge of plant health and the production of both macro- and microbiological solutions are now being applied to open field agriculture.



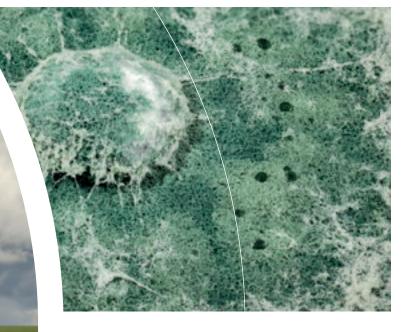


# Now applying decades of biological know-how to agriculture

While Koppert has earned its spurs in the biological control of pests and diseases in horticulture, we are now also playing an increasing role in providing biological solutions for outdoor agriculture. This sector has undergone exponential growth due to the demand for safe and secure food and cash crops from retailers, consumers, NGOs, and growers themselves. We can now invest more than five decades of accumulated knowledge in the development and application of beneficial insects, microbiological solutions and biostimulants to benefit a growing range of outdoor crops worldwide.

As public censure, retailers' demands and legislators shorten the list of chemical agents permitted for use in agriculture, and as the plant's own resistance to herbicides and pesticides grows, so the need for sustainable alternatives continues to rise. Koppert has responded to this growing market by investing heavily in its Research & Development Department to come up with effective and applicable solutions for pests and diseases in outdoor vegetables, fruit and other food and cash crops such as soya beans, sugar cane, rice and cotton. Crop trials in outdoor applications of a number of biological solutions show that both macro- and microorganisms, as well as biostimulants, developed for the agricultural market, not only control pests, but fight stress and diseases in plants to make them more resilient and productive.

Having turned our attention to agriculture, we are now using our knowledge of rearing beneficial insects and other biological solutions to stimulate innovation in the outdoor crop field with the development of accurate aerial and ground devices for dispersing biological products over large areas. Digital apps such as mobile scouting with image recognition also offer solutions for farmers who wish to solve their problems online in a growing number of ways. Koppert's sustainable innovations aim to reach farmers worldwide.



Biological solutions foster biodiversity in agricultural regions, benefiting not only crops but also ensuring safe food and food security. Working on sustainable solutions for alternative protein sources and exploring natural enemies to control pests and diseases in livestock.

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### Introducing Koppert's Livestock division

Providing insects for animal health and nutrition, that is what Koppert's Livestock Division has been doing successfully for the past few years from its location at Koppert headquarters in the Netherlands. The Koppert companies APPI and Bestico are our first to venture into this sector. Bestico is the production organization, and APPI takes care of the commercial activities.

Koppert's Livestock Division addresses three important issues facing the world today: that of facilitating sustainable practices in animal husbandry, contributing to food and feed security, and adding more value to existing waste materials.

Although EU regulations still prohibit feeding insects to pigs and poultry, insect-based feeds have been accepted for aquaculture since 2017. Currently, we produce insects for professional aquaculture and the pet food market, including feed for garden birds, reptiles, ornamental fish, zoo animals and many more. Over twenty products are produced by Koppert's Livestock Division, including applications for the control of pests and diseases in a range of animals that vary from exotic pets to commercially reared livestock. We aim to serve the livestock industry in the same way Koppert has served both the horticultural and agricultural sectors for more than five decades; namely by providing biological solutions that bring value to the farmer and reduce the use of pesticides.

The development of our biological solutions for animal health and nutrition contributes to our ultimate vision of achieving 100% sustainable horticultural, agricultural and livestock production.





# Our core products are alive

### 1. Biological control

Growers around the world are applying large-scale biological crop protection. As a result, the use of insecticides in horticulture has declined significantly, while growers enjoy larger and higher-quality crop yields. Products grown with the help of biological crop protection are healthy and safe for both consumers and the environment.

Pest management is one of the biggest challenges when it comes to successful agriculture. Each pest has a specific characterizes which can vary greatly in terms of cultivation, region and season. Koppert has been successfully producing natural enemies such as parasitic wasps and mites to help growers to restore the natural balance in their crop for decades. Our worldwide knowledge and individual

advice are the key to this success. One of the greatest impact areas has been seen in tomato cultivation. The use of crop protection chemicals in this field has been decreased by 95%.







Continuous research and development optimize the quality and efficacy of our bumblebees.

# 2. Our vital bumblebees are always ready to do their valuable work

Pollination is an annual challenge for growers when it comes to the production of vegetables, fruit and seed. We all know that well pollinated crops result in considerably higher yields and improve the quality and shelf life of these products.

In 1987, we discovered that bumblebees were the best pollinators for commercial tomatoes. This new commercial pollinator saved growers a lot of time and labour, while increasing both yield and quality of fruit and vegetables. The introduction of bumblebees also led to a significant reduction in the use of pesticides, less residue, and a healthier work environment.

In 1989, Koppert introduced the first bumblebees under the brand name, Natupol. We now produce over a million bumblebee hives to help growers cultivate their crops successfully around the world. The hives are produced at facilities located at four strategic sites so that they are bred close to their respective markets to ensure the highest availability. Our customers are supported by professional consultants worldwide. Today's horticultural market is very dynamic and continuously influenced by many trends. New varieties, changing production techniques, artificial lighting, closed greenhouses, and global warming all have a huge impact on the work environment of our Natupol bumblebees. These changes in circumstances have led to various innovations developed in response to our customers' changing requirements. Our pollination product portfolio and 'best practice' advice reflects this unique alignment with growers' needs.

To meet the increasing demand for more food and more efficient production while lowering the impact on the environment, Koppert's Marketing and R&D departments are constantly preparing future innovations while keeping pace with changing market requirements and regulations. Our motto: Bee prepared!



### 3. Microbiological solutions

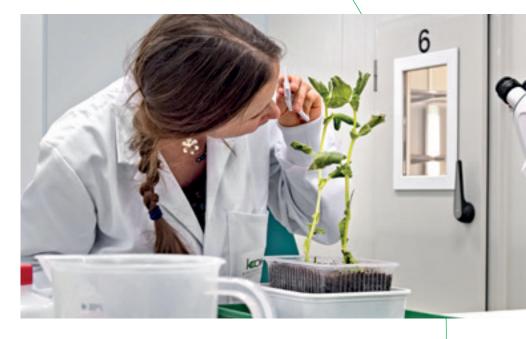
In addition to beneficials and pollinators, microbial products such as bacteria and fungi form a third pillar for the sustainable production of plants and crops. Even though they cannot be seen with the naked eye, these products – which can be used above ground and underground – have the potential to do incredible things. They combat diseases and pests, strengthen crops, and improve the absorption of nutrients.

#### **Disease suppression**

Microorganisms protect the crop against soil and seed-borne pathogens such as Pythium, Fusarium and Sclerotinia. The beneficial microorganisms are often lethal for a range of fungal diseases. The bacteria or fungi on the roots of the crop compete for space and nutrients with the crop disease, inhibiting their development and thus strengthening the roots. Besides working curatively, the microorganisms ensure that the plant is also protected against future threats by boosting their induced resistance. This puts the plant in a heightened state of readiness, increasing the resistance capacity of the crop that has taken root. It is the combination of cure and protection that distinguishes a biological treatment from a standard one. Moreover, there is no risk of pathogens building a resistance against these types of microorganisms, with the added benefit that they are harmless for both humans and animals.

#### **Resilient growth**

The factors that influence crop resilience and crop vigour are continually being developed as the demands of customers increase. The right climate, sufficient light, good water management, accurate plant nutrients, and integrated pest management are all examples of these positive influences. As genome technology







and variety improvements continue, the need to optimize plant health and potential will continue to play a fundamental role in sustainable agriculture.

Demands on resources are steering the industry towards a more sustainable form of agriculture in the 21st century. Koppert has been at the forefront of developments in crop biotechnology over the last 50 years, working closely with our partners to increase natural resilience, develop plant disease and pest management strategies, and optimize crop yield.

Integral parts of this approach include the creation and management of biodiversity within a healthy root zone, plus the steering of assimilates to influence and stimulate plant performance from field to end consumer.

NatuGro optimizes the synergistic relationship between the plant and its environment, both above and below the ground. As crops become more resilient and balanced, many opportunities become available. This results in numerous longterm benefits, including a greater tolerance for plant stress, improvements in yield and quality, and a reduced dependency on inorganic inputs to control plant nutrients and plant diseases.

#### Seed treatment

While the use of chemical substances to treat seeds occurs on a large scale worldwide, treating seeds with biological substances is an application that is still less common. Koppert's seed treatment programme is a good example of vision, knowledge and solutions coming together to produce a ground breaking application. Together, soil and seeds form a basis of every cultivation. Koppert has proved to be in a position to provide these primary materials with a very specific, tailor made coating, consisting of micro -organisms to provide the perfect start. This mix improves the condition and biodiversity of the soil, ensuring that diseases have less chance of taking hold. At the same time, the availability of water and fertilizers is substantially enhanced, with the result that crops grow more rapidly and robustly and are therefore more productive. The smart coatings will lead to a natural and sustainable start for crops such as maize, wheat and soya and eventually produce entirely residue free end products.

### A world of expertise in Crop Teams

#### Integrating resources internationally

A global working method in which a number of Crop Teams embrace all the company's expertise, professional skills and local knowledge for specific groups of crops, has been implemented and is taking shape within the company. There will eventually be five specialized Crop Teams that will utilize a worldwide database, R&D resources, and global strategy in the Soft Fruit, Ornamentals, High-tech Vegetables, Outdoor Vegetables and Row Crops sectors.

The international multi-disciplinary crop-based teams each focus on a clearly defined horticultural or agricultural segment in which we continuously collect, update and interpret the latest data for each group of crops and their specific pests and diseases. This forms the basis for a pro-active, crop-specific global Crop Plan with all the advantages of a multi-disciplinary approach that finds solutions for both present and future crop needs. It is a plan which gives R&D and Agricultural and Horticultural Development timely signals about each Crop Team's requirements for the constantly changing needs of growers, consumers, retailers and legislators.

This working method represents a total change of focus in which we give full attention to finding effective solutions for specific crops worldwide. Pooling the company's worldwide knowledge and expertise to find crop-specific solutions for local pests and diseases, opens a world of applicable solutions for the benefit of growers.





### International Crop Teams with a local focus

# Nature is our inspiration when it comes to innovation

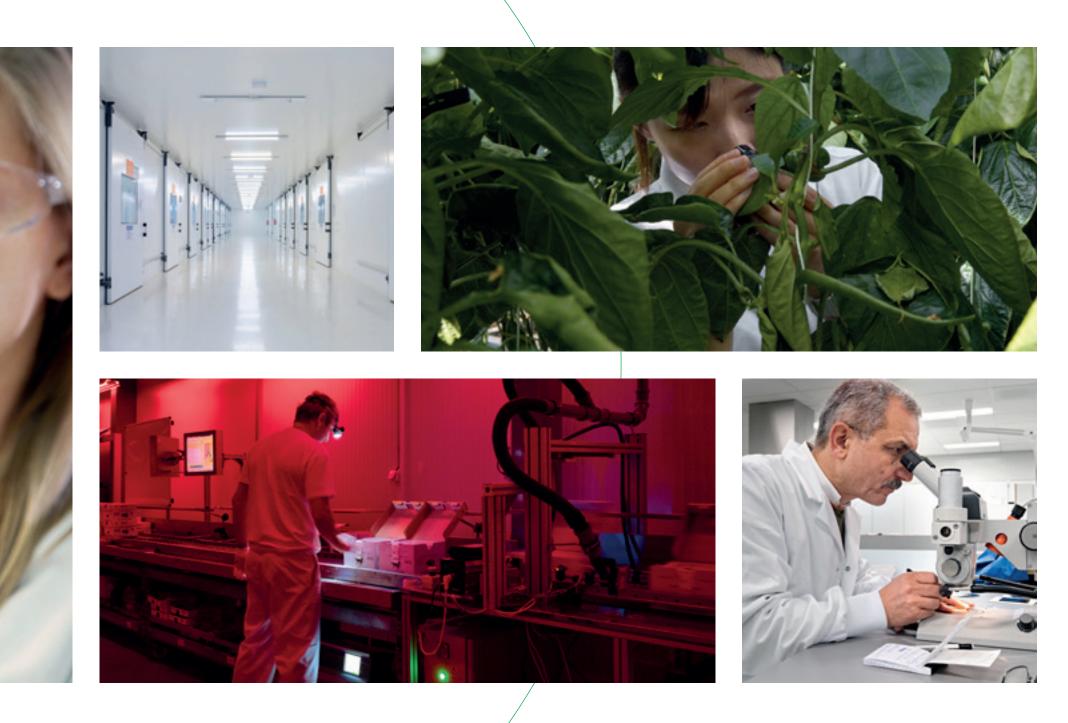
The ongoing drive to discover and utilize natural principles forms the core of Koppert's activities. Our strength lies in the ability to turn this knowledge into practical applications - using high quality industrial processes - to solve prevailing cultivation problems. From research into the vision of pollinating bees and the behaviour of beneficial microbes, to creating perfect breeding environments for predatory mites in high-tech sachets, and releasing beneficial insects from flying drones; the sky is literally the limit!

Collaborating with research institutes and associated organizations around the world, Koppert's Research & Development departments have frequently been the source of (micro)biological solutions which have subsequently been adopted worldwide. It is thanks to our persistent research and in-depth knowledge that a whole variety of specific insects, mites, micro-organisms, fungi and bacteria can now be introduced to control a growing number of infestations. Other products boost the plant's health and resilience in a holistic approach that significantly benefits the entire plant, below and above ground.

We have achieved a great deal by listening to growers. Their feedback has often been essential for finding workable solutions.

Similar ground-breaking discoveries with regard to pollination solutions have also provided the basis for enormous production efficiency and quality improvement in many crops worldwide. Solutions are only applicable and useful if they can be effectively reproduced and distributed. We at Koppert and our partners have been able to perfect this over the past few years.





### Meeting high supply chain and quality standards

If there is one thing that distinguishes Koppert's products from that of its competitors, it's the time, expertise and investment that it puts into the quality of its production, packaging and logistics. However long the production process and journey may be, Koppert does everything possible to see that our living products reach their destination ready to do their valuable work in the best condition possible.

Live cargo needs the utmost care and timing to reach its destination in top condition. Rearing and transporting organisms such as insects and microbials require:

- smart forecasting
- detailed supply planning
- total quality control
- specialized packaging and attention to handling storage and shipping conditions
- informative instructions for use when products arrive at their destination

To ensure that our products reach growers in prime condition, our departments need to cooperate closely to guarantee the quality and availability of our products globally. It takes a great deal of knowledge and technology, and strict adherence to protocols, to control the health and reproduction of beneficials and pollinators and ensure that these insects, microorganisms and bumblebees are ready to do their work on arrival. Our pro-active approach means that we can guarantee the quality and the best availability of our products on five different continents.

Production facilities in the Netherlands, Slovakia, Mexico, Turkey, Spain and the US ensure that the distance between our live products and the growers is as short as possible and much attention is given to the quality control, the life enhancing carrying material of organisms, and specialized packaging before the products leave the Koppert premises. With more than 100 distribution countries we have all been trained and equipped to receive, store, and dispatch live products which often need to reach growers in a matter of days. Special care is taken to keep our carbon footprint as small as possible. While some or our living products may be microscopic in size, our reach is big. We ensure that our products are ready to do their work on arrival.

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### Digital and technical support for our products

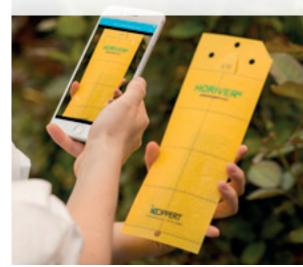
Ensuring that products are of the best quality and readily available is sometimes not enough. They also need to be supported by a growing range of technologies, many of which we design and manufacture ourselves.

Recent technological developments include the exploration of ways to release beneficial insects from the air. A release mechanism developed by our technical department was recently patented. This device not only disperses the insects more accurately over large tracts of farmland than was previously done manually, it also reduces costs through significant time and labour savings. The release mechanism has also been adapted for use on tractors.

We are also completing the development of a mobile digital scouting application with the latest image recognition that identifies pests and diseases to find the corresponding sustainable solutions for growers. A dashboard collects all relevant data that can be communicated to our consultants for interpretation and advice online. By changing the materials used to make the sachets in which predatory mites are dispersed, and strengthening the hook which attaches it to the crop, this effective product now has a prolonged life and substantially enhances the mites' breeding capacity. Ongoing innovation has resulted in significant improvements in a growing range of Koppert products.

Just some of the technical innovations designed to get the best out of our products.







# Calling for safe but speedier registration of sustainable (micro)biologicals

It can take years to register biological products both within the Netherlands and abroad, and the European Union has some of the toughest regulatory laws in existence. Part of the problem is that there is as yet no specific category for biologicals used to benefit horticulture and agriculture, so that all the laws that apply to chemical protection agents, also apply to sustainable biological alternatives.

We have been actively lobbying for more flexible and rapid registration of biologicals on many fronts; through the International Biocontrol Manufacturers Association and by keeping various influential lobbyists and legislators informed, locally, at national level, and within the European Union. In fact, we now have a specialized Corporate Regulatory and Legal Affairs Department established to smooth the way forward to a more equitable deal for biological pest and disease control products in general.

We share the view that much of the current legislation lags behind retail and consumer demand for safe and residue-free food, and actively promote the use of sustainable biological alternatives for healthy and safe food, now and in the future.

Legislation that promotes safe food and biodiversity.

The company's strength lies in its ability to turn its knowledge into sustainable solutions for horticulture, agriculture and livestock applications.

### We grow by sharing knowledge

As a growing knowledge company with 28 subsidiaries worldwide and more than 300 professional consultants operating at headquarters, sharing the latest research results and experience in the field is part of our daily routine. And that does not only happen internally. We daily exchange our knowledge with academic institutions, NGOs, distributors and growers themselves through our consultants in the field, our corporate and country-specific websites, online videos, and via a growing number of publications in the media and professional magazines. Knowledge sharing is one of our core activities.

Our 443-page reference book on pests and diseases and their biological solutions, 'Knowing and recognizing', is now in its third edition. In addition, the popular Koppert scouting and side-effects app is continuously developed and updated by our Technical Applications Department and consultants.



### **Koppert Foundation**

The Koppert Foundation supports educational projects around the world and works closely with local communities. Inspired by our growing success in the field of biological crop protection and pollination, we support sustainable projects in the field of education, health and economic development with a focus on three areas: smallholder farmers, the company's social responsibility which it shares with its employees, and innovation/educational projects.

## COPPERT

FOUNDATION

HANATI YA MIMEA

The world has many mouths to feed and sustainability issues to solve.

We cannot think of a better cause to dedicate our work to.

### We care - we share - we dare

Everyone working at Koppert Biological Systems feels that they can play a role in finding or supporting biological solutions for horticulture and agriculture. It's what motivates and inspires us each working day.

Whether we are exploring new beneficials or microbials in our laboratories, controlling the quality of our live products, or organizing the logistics for getting live bumblebee hives to customers around the world; our employees all help to promote sustainable cultivation projects in their own way. This means giving pests and diseases less chance to harm crops and giving growers sustainable solutions to increase yields while making them less reliant on artificial fertilizers and chemical protection agents. That is the challenge that we at Koppert face each day.

With more than 1500 employees on 4 continents and 28 subsidiaries worldwide, we are truly international and depend on expertise from all corners of the world. Nationalities and cultures may differ within Koppert, but we have one thing in common and that is our mission to contribute to the better health of people and the planet in partnership with nature. Join us and be part of the solution!

### Our experience centre

#### Experience our innovations and successes for yourself

Opened by Dutch King Willem-Alexander on the occasion of our Golden Jubilee in 2017, Koppert's Experience Centre annually draws thousands of visitors from a growing number of countries. The journey of discovery through the exhibition starts with our history and the exploration of nature to find solutions to the most prevalent pests and diseases. It then looks at the secret network of plants, introduces you to our natural enemies; the beneficial insects and microorganisms, and shows you how we partner with nature to find sustainable solutions for horticulture and agriculture.

The centre, located at the heart of our headquarters, has proved to be an exciting and informative experience for all those who have passed through this 250 m<sup>2</sup> maze of interactive displays on macro- and microorganisms, examined our giant bumblebee hive and pollination solutions, and viewed many of the company's R&D and production activities. It shows that we are more than just a production company and that, above all, we are a knowledge company and wish to share our hard-earned experience. The audio visuals in English, Spanish, German, Dutch and French inform a growing number of visitors that include foreign ambassadors, EU politicians, policymakers and a number of ministries, local and foreign journalists, NGOs and consumer groups. We also plan tours for interested students and academics from all over the world. But the mainstay of the Experience Centre continues to be Koppert's customers and distributors who visit the centre to learn more about the added value of biological solutions for their crops and companies.

Curious to know how Koppert aims to make horticulture and agriculture more sustainable and how it contributes to improve the health of people and the planet? Our Experience Centre at headquarters will show you how we apply our innovations and knowledge in the field.











Visit our Experience Centre and join our interactive journey through the world of sustainable cultivation.

### A board that is ready for the future

To anticipate and lead the projected growth of Koppert Biological Systems, the company's board has been strengthened to include members who broaden and complement our activities and representation worldwide. New activities include expansion into the fields of agriculture and animal feed, as well as ventures into technological and software applications, accelerated R&D procedures, investments in total quality management, improved logistics, professional support for growers, knowledge sharing, and a dedicated Regulatory and Legal Affairs Department to support and accelerate product registration.

The leadership of the company has acquired five additional members, more than doubling the size of the Board of Directors. While the new members come with fresh ideas and valuable competencies, the founder members continue to ensure that the core values are maintained and that the company's mission remains embedded in its DNA.

#### Paul Koppert | CEO and Managing Director

'We continue to work towards 100% sustainable agriculture and horticulture. Globally.'

#### Henri Oosthoek | CEO

'Our ambition is to be the best partner in crop management. To be the best provider of biological solutions and facilitate sustainable growing practices worldwide.'





#### LTR: René Koppert, Martin Koppert, René Ruiter, Peter Maes, Robert Pathuis, Joram Oosthoek, Henri Oosthoek, Paul Koppert

### **Robert Pathuis | CFO** 'As Koppert doubles its turnover every 5 to 6 years, we are professionalizing the organization on all fronts to meet our future needs.' Martin Koppert | Director Agriculture, Micro, R&D and Production 'We aim to increase the success of existing and future microbials and develop new agricultural markets.' Peter Maes | Director Corporate Marketing 'We never forget that we work for growers. We never stop asking ourselves how we can be of more value to our customers.' Joram Oosthoek | Director Finance & Control 'We increasingly invest in R&D and other competencies to bring our mission: "to contribute to the health of people and the planet", closer to realization.' René Koppert | Director Horticulture (sales), HR and IT 'Building up a professional customer focused organization where people enjoy working is our aim.' **René Ruiter** | Director Horticulture (marketing and sales) 'We are committed to representing Koppert's international character. With 28 subsidiaries worldwide, we need to

present an integrated profile to the world'.

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