

WAGENINGEN WORLD

MAGAZINE OF WAGENINGEN UR ABOUT CONTRIBUTING TO THE QUALITY OF LIFE

no.4 2014



‘Getting everybody
out is not always the
best solution’

Judith Klostermann, page 18

Arnold van Vliet: **Mr Citizen Science** | The long-lived dairy **cow** | **Quality seed** for African farmers
Bioplastics on demand | Willem&Drees: **delivering local produce** | Ridding an island of **malaria**



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BIOPLASTICS ON DEMAND

More and more companies are considering making their products with plant-based plastics. Christiaan Bolck of Wageningen UR Food & Biobased Research helps them find the right formula.

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WHEN THE WATER COMES UP

The Netherlands should prepare better for possible dike breaches, thinks Judith Klostermann of Alterra Wageningen UR. The consequences could be massive. 'We don't like talking about floods in the Netherlands.'



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ARNOLD VAN VLIET: MEDIA SUCCESS

Arnold van Vliet is Wageningen UR's big media success. With the help of the public he exposes the impact of climate change on our daily lives. 'To me an appearance on the TV news is more important than a scientific article.'



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The mission of Wageningen UR (University & Research centre) is 'to explore the potential of nature to improve the quality of life'. Wageningen UR includes nine specialist applied research institutes and Wageningen University. These institutions have joined forces to contribute to finding answers to crucial questions related to healthy food and a sustainable living environment. Wageningen UR has a staff of 6,500, 10,000 students, 35,000 alumni and 40 sites, with a turnover of 662 million euros. Institutes of Wageningen UR: Alterra, LEI, Plant Research International, Applied Plant Research, Wageningen UR Livestock Research, Central Veterinary Institute, Wageningen UR Food & Biobased Research, IMARES and RIKILT.



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Many African farmers still lack quality seed. The project ISSD Africa aims to change this.

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Cheese specialist Zijerveld wanted to sell a tasty goat's cheese with only 30 percent fat. Wageningen UR Food & Biobased Research helped with a new recipe.

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Kondwani Khonje from Malawi and Steisianasari Mileiva from Indonesia studied in Wageningen with support from the Anne van den Ban fund. Now they are contributing to the development of their countries and the fight against poverty.

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FOTO GUY ACKERMANS

Milk with added value

'Dairy farmers are anticipating the abolition of the milk quota next spring. They are building extra barns and increasing their herds. That will lead to a big expansion in milk production: the Netherlands expects a growth of 10 to 20 percent, and Ireland as much as 40 to 50 percent. A lot of that milk will find its way to Asia in the form of milk powder. The demand there is massive. But can we really cater for it here in the Netherlands? Wouldn't we be better off using our knowledge and expertise to improve the dairy industry there? Should our farmers focus so strongly on the world market and thereby on the lowest possible cost price?

We face two problems in the Netherlands which justify these questions. Emissions into the soil, water and air have been reduced considerably, but because of the high livestock density in the Netherlands, the livestock sector is still close to its environmental limits. What is more, growth will mean larger farms. Experience shows that cows on large farms graze less outdoors, whereas grazing is a crucial aspect of a cow's welfare. And the dairy sector itself, including farmers' organizations, sees the importance to its image of putting cows out to pasture. So it is time to change tack: not to opt for the lowest possible cost price but for milk with added value, produced with respect for the environment and animal welfare. I don't think more government regulations and requirements are the way to go: incentives work much better. Work with dairy processors and supermarkets to establish a price that rewards farmers for sustainable production, for an efficient use of nutrients and for allowing their cows to graze. Farmers are inventive and innovative enough to do this, especially if it improves their image with the public.'

Imke de Boer is professor of Animal Production Systems at Wageningen University, part of Wageningen UR

RANKING

Wageningen is the best agricultural university

Wageningen University is the best university in the world for agricultural research, as it was last year, according to the National Taiwan University (NTU) Ranking of October 2014. Wageningen is followed by the University of California in Davis and Cornell University. The ranking is based on scientific papers: the number of publications, their impact and the degree of excellence of the studies. NTU compiles rankings for six academic fields.

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ANIMAL ECOLOGY



PHOTO GUY ACKERMANS

Bees get tracking devices

In August and September, 4000 baby bees were fitted with mini tracking devices on their backs at the Droevendaal experimental farm in Wageningen. The devices, which are being used for research on winter deaths, weigh only five milligrams. Nothing the bees cannot handle, given the 30 milligrams of pollen or 40 milligrams of nectar they usually carry during a flight. The bees with tracking devices have been infected with the varroa mite or the digestive tract parasite *Nosema microsporidia* or have been fed imidacloprid. The devices measure how often and how long a bee leaves the hive to look for food. Data collection will continue until the summer.

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PLANT BREEDING



EDUCATION



A lot of interest in online courses

The first full-scale Wageningen Massive Open Online Courses (MOOCs) are due to start in January 2015 on the non-profit platform edX. Professor Sander Kersten is responsible for an introduction course on nutrition called 'Food for Health'. The MOOC will start on 12 January, last eight weeks and cost students six to eight hours a week. Professor Ken Giller's course 'Growing our Future Food' is intended for people interested in plant science. This course starts on 26 January, takes six weeks and costs four to eight

hours a week. A basic knowledge of biology should be sufficient for both courses.

The course materials and online lectures are in English and anyone can register free of charge. If you want a certificate of participation, you have to complete some assignments, pass an exam and make a donation of at least 50 dollars. By early November, 11,000 people had already registered for the nutrition MOOC and 4500 for the plant science course.

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Financial award for salt-tolerant quinoa

The project 'Salt-tolerant quinoa for China, Vietnam and Chile' was awarded half a million dollars in early September by Securing Water for Food, an initiative of the development organizations USAID (USA) and Sida (Sweden) and the Dutch Ministry of Foreign Affairs. Wageningen

researchers have been working on the development of new quinoa varieties since 1990. The hybrids they have developed turn out to do well in salty soil, which opens the door to increased production and higher incomes for farmers.

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GROUND MANAGEMENT

App for weed control

The new app Weedviewer makes it much easier for people in charge of paved areas to evaluate and record how much weed is growing on pavements and in car parks. Using 10 photos of a measurement section taken using a smartphone or tablet, the Weedviewer calculates the percentage weed cover and compares it with national quality standards. The Weedviewer works on all surfaces. Wageningen UR developed the app in collaboration with the engineering firm Tauw and the consultancy Peter van Welsem Advies. Info: chris.vandijk@wur.nl, www.weedviewer.nl



EDUCATION

Lectures in Singapore

In mid-August, lecturers from Wageningen University started giving a three-year major in Food Science and Technology at the Nanyang Technological University in Singapore. They cover the material online in interactive lectures. For the practicals, the lecturers travel to Singapore for two to three weeks. Nearly 30 students are taking the specialist course alongside their Bachelor's degree programme. They mainly learn more about what goes on in the food industry. Info: ben.geerlings@wur.nl

MEETING



PHOTO ROY BORGHOUTS

Students interrogate Bill Gates

The Dutch television programme College Tour welcomed Bill Gates as a guest mid-November. Hundred of students were in the audience, including many from Wageningen. Gates' presence was partly thanks to Wageningen UR.

The ex-Microsoft top man has a link with Wageningen via the Bill & Melinda Gates Foundation, which spends a lot of money on combatting hunger and disease in poor countries. Among the programmes the Foundation funds are Wageningen research projects on combatting malaria and improving soil fertility in Africa. A total of 1600 students, 350 of them from Wageningen, came to the Circus theatre in Scheveningen for the recording. The richest man in the world spent an hour answering questions from presenter Twan Huys and the students. Gates sees malaria as the most important disease to find a cure for. 'Anyone with a good idea for combatting it should get in touch with us.'

Gates' collaboration on College Tour came about partly thanks to soil researcher Gerlinde de Deyn of Wageningen University. 'He was one of the inspiring figures that we as Wageningen Young Academy would really like to get to Wageningen, because of what he has achieved, his involvement in research and the space his foundation allows for wild ideas.' Because Gates is interested in students and their vision of the future, the WYA got in touch with the editors of College Tour. Thanks to De Deyn's perseverance and the contacts of Wageningen UR and Louise Fresco, the ball eventually got rolling. The programme, broadcast mid-November, can be seen on uitzendinggemist.nl

WAGENINGEN ACADEMY

International Trade and the WTO

The World Trade Organization is the only international body dealing with the rules of trade between nations. At the heart of the WTO's work are trade agreements laying down the rights and obligations of the participating countries. The English-language masterclass will provide a broad and up-to-date overview of the key issues in the

WTO agreements, including thorough coverage of the SPS and TBT agreements.

22 and 23 January 2015 | Course leaders: Rien Huige and Prof. Gerrit Meester

For the full range of courses see: www.wageningenacademy.nl

Earthworm boosts crop yields

Earthworms boost crop growth by making nitrogen available to plants through their excrement. The effect is greatest if large quantities of plant remains are added to the soil as worm food, for example via organic fertilizers or by digging in crop remains. Crop yields are 25 percent higher on average when the soil contains a normal number of earthworms. These soil workers are indispensable for farmers who cannot afford artificial fertilizer or prefer not to use it, such as organic farmers. These conclusions come from Wageningen, American and Brazilian researchers who studied the effect of earthworms on crop farming. They conducted a statistical analysis of data from more than 100 years of earthworm experiments and investigated the underlying mechanisms.

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METABOLISM

Exercise stimulates the inactive muscles too

When you exercise, you don't just train your active muscles; you indirectly influence the rest of your body too, including the muscles that are resting. This finding comes from lab research on the muscle tissue of subjects who had been cycling using only one leg. PhD candidate Milène Catoire of Wageningen University found that not only did the activated muscles switch on various genes; the activity in the resting muscles changed too. With this result, she has produced the first hard evidence that active muscles control other organs by secreting signal compounds into the blood. Her results help explain why exercise is so healthy. Catoire also examined the effect of physical exercise at the level of genes and proteins. She found indications that it is better for diabetics to concentrate on endurance training. Catoire received her doctorate on 15 October.

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Artificial virus to deliver medicine

Wageningen chemists have produced an artificial virus. This is a first step towards the design of viruses that are able to deliver medicines to the precise spot where they are needed.

Medicines cannot always reach some parts of the body, for example the brain, or else they cause unwanted side effects because they end up in some part of the body where they are not wanted. Researchers at Wageningen UR and Dutch colleagues hope to help resolve this problem through virus research. Their hopes are based on the fact that viruses have developed a wide range of techniques for penetrating cells and spreading.

A virus is basically little more than a piece of hereditary material (DNA or RNA) with a special protein coating. Inspired by the shape of the naturally occurring tobacco mosaic virus, the researchers designed an artificial virus consisting of a DNA molecule with a protective coating of specially designed proteins. In their paper in *Nature Nanotechnology* in August, they showed that the virus could deliver its DNA cargo to human cells. As proof,

a light-emitting protein was produced in these HeLa cells – a cell line used in scientific research – after the DNA had been delivered.

The researchers are now looking at new functions, such as recognizing cells or adding a key that fits the lock of only one type of cell. That would bring us one step closer to gene therapy or delivering 'suicide genes' to tumour cells.

'The advantage of creating your own viruses rather than using naturally occurring viruses is that you understand them better and have more control,' says Renko de Vries from Wageningen University, who was involved in the design of the virus proteins. At the same time caution is needed as new structures can be toxic to the body and an artificial virus could provoke a severe response from the immune system.

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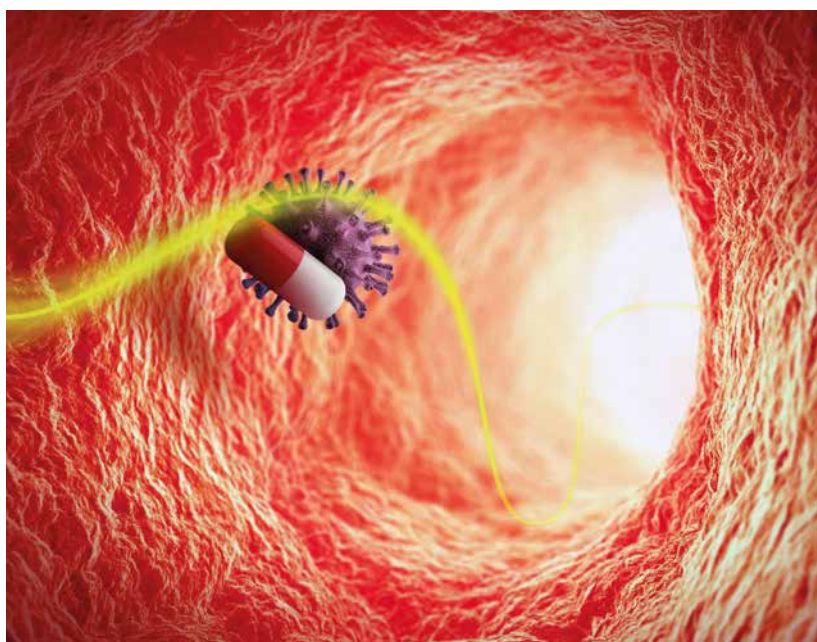


ILLUSTRATION PASCAL TIEMAN

NUTRITION AND HEALTH

AQUATIC ECOSYSTEMS

Four types of eater among elderly

Research with Wageningen UR's senior citizen test panel show that the elderly can be divided into four groups based on how they experience mealtimes.

The biggest group is the 'agreeable averages', who make up 50 percent. These senior citizens find health and taste important. They might try something new from time to time but they are not looking for culinary surprises. A further quarter can be characterized as 'intrepid adventurers'. The rest are either 'convivial companions', who place greater value on the people with whom they are sharing the meal than on unusual dishes, or 'indifferent critics', who are relatively uninterested in their meals. The elderly

in this group run most risk of becoming malnourished because they are more likely than people in the other groups to associate meals with negative terms such as 'awful'.

The researchers say that the study findings can help product developers and marketers create food products that fit better with the requirements of the swelling ranks of older consumers. In the long term, this could help elderly people live independently for longer.

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PHOTO HOLLANDE HOOGTE



Plastic particles affecting water fleas

Organisms are being affected by roving plastic particles, not just in the seas and oceans but also in inland waters. Plastic nanoparticles – miniscule bits of plastic – restrict the growth of algae and cause growth disorders and deformities in water fleas. They also disrupt chemical communication, for example the functioning of signal compounds secreted by fish that act as a warning to water fleas. These findings were published by Wageningen University and IMARES Wageningen UR in October in *Environmental Science and Technology*. Plastic nanoparticles are released during various processes, such as cutting plastics, 3D printing and from the wear and tear of small plastic particles in contact with sand. 'But we don't yet really know how big the problem is,' says Ellen Besseling, who hopes to get her doctorate for this research.

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MARINE ECOLOGY

Some grey seals are British tourists

Researchers from IMARES Wageningen UR seem to have found an explanation for the successful return of the grey seal to Dutch waters. Hunting killed off the grey seal in the Netherlands in the Middle Ages. But grey seals have been swimming again in Dutch waters since the 1950s. There are now as many as 3000. The reason for this is Great Britain. A ban on hunting introduced about a century ago enabled the remaining small populations of grey seals in isolated coastal areas to grow again. Individual seals then

left these colonies to spread across the North Sea.

That development is still having an effect. The grey seal population in the Wadden Sea, off the coast of the northern Netherlands, has grown by 15 to 19 percent in recent years, much more than would be expected on the basis of the birth rate. That is partly due to young British seals immigrating and partly due to seals swimming around for a couple of months as tourists.

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Root parasite threatens African rice

Rhamphicarpa fistulosa, a fragile little weed with white flowers that is little known among agricultural experts and extension workers, is causing increasing damage to rice crops in Africa. The rice parasite, a relative of the broomrape, is found in almost all countries south of the Sahara, mainly in low-lying paddy fields dependent on rain.

The parasite can reduce harvests by as much as a fifth and can even destroy the entire crop. These are the findings of studies by seven Dutch and African research groups, headed by Wageningen UR, that have been cataloguing the problems with *Rhamphicarpa* since 2012.

The partners are now developing educational material on *Rhamphicarpa* for farmers and agricultural extension workers. They are also conducting field trials to see whether better fertilization, growing different varieties or changing sowing times helps combat the weed. Herbicides are often unavailable or are too expensive.

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ENTOMOLOGY

Success of Asian ladybird explained



PhD candidate Lidwien Raak at Wageningen University investigated why the multi-coloured Asian ladybird, which was imported to combat aphids, is supplanting the native ladybirds. She found that *Harmonia axyridis* consumes other ladybirds, fights a lot and usually wins, lays more eggs and does so more often, is better at surviving the winter and is hardly affected at all by diseases or lethal parasites in the Netherlands. Raak received her PhD on 8 October.

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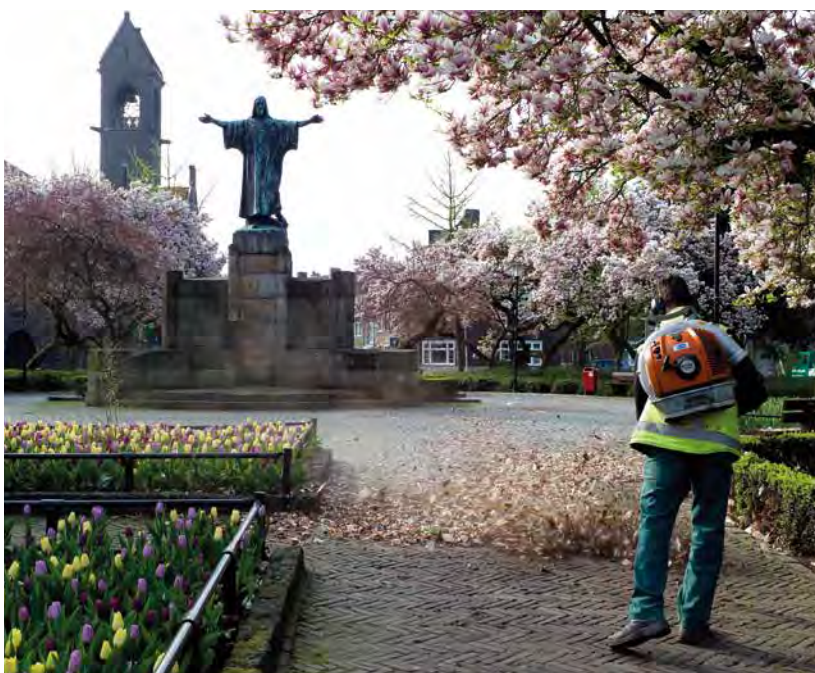


PHOTO: HOLLANDE HOOGTE

Heerlen still the greenest city

Heerlen is still the greenest of the 31 biggest cities in the Netherlands with the most public green spaces, as it was five years ago. The four largest Dutch municipalities – Amsterdam, Rotterdam, The Hague and Utrecht – are doing better than five years ago.

Urban greenery helps make cities pleasant places to live and attractive to businesses. It has a positive effect on people's health, reduces air pollution, dampens sounds, stores the water from heavy rainfalls and keeps cities cooler during hot periods. For some years now, Alterra Wageningen UR has been investigating how green cities are and how their inhabitants experience greenery, for example via Facebook (How green is your city?) and Twitter (#groenindestad).

This year, the institute once again calculated the number of square metres of public greenery in the built-up areas of the largest Dutch municipalities. They only looked at green spaces the public could enter, such as parks; private gardens and greenery on streets did not count.

The latest figures show that cities have not become any greener on average since 2009, but there are big differences between

individual cities. Amersfoort, which was doing well anyway, and Utrecht, which brought up the rear in 2009, both became 25 percent greener, while the green space in Almelo fell by 30 percent. The figures also show that half of the 31 cities fail to provide the 75 square metres of public greenery per home that the Spatial Policy document gives as a guideline.

In the Green Cities programme, which started this year, Alterra is working on different kinds of greenery in the city and combining functions. Researcher Annemieke Smit: 'For example, buffer greenery next to a stream for capturing excess water could also be used for recreational purposes. If you plant trees to counter the heat, perhaps they could just as easily be fruit trees that you can harvest. Combining functions also makes greenery affordable.'

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NUTRITION

Gluten-free oat beer tested

In September, a select group gathered in beer cafe De Vlaamsche Reus in Wageningen to sample the first gluten-free beer made from oats. The oat beer was developed by Wageningen UR and microbrewery Witte Klavervier.

The new beer fits in with an old tradition. The Dutch used to drink oatmeal beer in the Middle Ages. This beer was made either entirely from oats or a mix with 20 percent wheat (known as *hoppebier*). Oats have hardly been grown at all in the Netherlands since the 1960s and the main grain used in brewing now is barley. Luud Gilissen, a researcher at Wageningen UR, stumbled on oatmeal beer when looking for products for people with coeliac disease, who have an adverse reaction to gluten. Oats are a healthy, gluten-free grain. The oats were malted in Plant Research International's climate chambers. Hops, yeast and water were added and this

summer, the first 24 bottles of oatmeal beer were produced in a small brewing kettle. The people sampling the beer say more work is needed on the flavour, a combination of sweet and bitter, to make it more appealing. But the experts think the beer should combine well with winter dishes. The oatmeal beer needs to be developed further before it goes on sale to make sure a constant quality can be delivered. Info: luud.gilissen@wur.nl



NUTRITION

Wageningen student cookbook

Wageningen University has its own student cookbook: *Food for Students*, the best recipes for your student life. It contains 40 recipes submitted by students and alumni. A culinary production team from Wageningen added clear-cut instructions and attractive photos. The book offers inspiration both for quick weekday meals and for special occasions, with recipes such as saoto soup, marinated chicken with coconut rice, buckwheat and porcini, and 'bare buttocks in the grass' (a bean dish). The cookbook costs 14.95 euros and can be ordered from the webshop, wur.unigear.eu.



NATURE AND RECREATION



PHOTO GETTY IMAGES

Locals benefit from wilderness tourism in Kenya

The millions that the Dutch embassy in Nairobi has given in grants to four Kenya nature conservation organizations between 2007 and 2013 have had an effect: nature was protected and tourism grew. Researchers at Wageningen University concluded that more than 400 people found work in the tourism industry in the study area, with more than 2000 people benefiting indirectly. In addition, at least 100,000 people saw improvements in the infrastructure, water supplies, livestock farming, security and healthcare as a result. Revenue from tourism was also used for 2500 scholarships for more development opportunities and as an incentive for preserving biodiversity. Info: arjaan.pellis@wur.nl

THE RAW MATERIALS CAN BE HARVESTED AGAIN AND AGAIN

Bioplastics on demand



The time has come for bioplastics. More and more companies are considering making their products out of plant-based plastics. Christiaan Bolck from Wageningen UR Food & Biobased Research helps them find the right formula.

TEXT RENÉ DIDDE ILLUSTRATIONS IEN VAN LAANEN INFOGRAPHIC REMY JON-MING

This morning, a furniture maker phoned to ask whether bioplastics could be used for the seat of a chair they were designing. Even though this is not a standard query and it is for a small-scale application, Christiaan Bolck is still prepared to consider the matter and discuss the options with the craftsman. But the Wageningen UR Food & Biobased Research programme manager's busy agenda is mostly taken up with potential assignments on a larger scale. One example is Océ in Venlo, now part of Canon, where they are working on frames made of bioplastics for photocopiers. Bolck is helping the chemicals company Croda in Gouda find ways to make bioplastics tougher so that they can withstand knocks and are suitable for use as car bumpers.

In collaboration with Synbra in Etten-Leur, a method has been developed to produce foam packaging based on vegetable sources.

WORKING OVERTIME

And Bolck could list plenty more examples. The labs on Wageningen campus are working overtime. Multinationals such as Braskem (Brazil) and Corbion (formerly Purac, Purac/CMS CSM) are regular clients. 'We can make pretty much anything here,' says Bolck. 'The challenge is to do so while keeping costs affordable, as we managed with the bioplastic foam. We are often able to develop a biobased product to replace a conventional product in less than a year, based on existing biopolymers. That includes arranging patents and testing prototypes on a commercial scale.' The companies, often from the SME segment, generally come to Wageningen UR wanting to know whether a specific finished product can be manufactured from biomass. 'Based on that request, we work with them to identify the product's features and then look for the appropriate biomass sources. We work directly for the private sector,' says Bolck.

He gets an espresso from a vending machine and proudly brandishes the coffee cup. 'It looks like ordinary plastic, and luckily it's just as heat resistant and not much more expensive. You can't tell, but the cup is actually made from sugar beet. Bacteria convert the sugars into lactic acid molecules that we string together to produce polylactic acid (PLA). And the great thing is that we can use sugar beet here in the Netherlands, but Brazil is better off using sugar cane, the United States has maize and in Thailand cassava is a good source of vegetable raw material for such coffee cups.'

OIL IS RUNNING OUT

The advantages of bioplastics are obvious: they do not have the problems associated with plastics based on petroleum. Whereas oil reserves are rapidly running out, the raw materials for bioplastics can be harvested afresh after each new growing season. As long as the biomass is of sustainable origin and not grown in places that used to be covered by rainforest, generating it is environmentally friendly, whereas oil extraction involves considerable damage to the environment plus the risk of accidents on drilling platforms and with oil tankers. ➤

PLASTIC FROM PLANTS

Traditional plastics, thermoplastic polymers, are made from oil. These polymers can also be manufactured from plant materials. The characteristics and applications of bio-plastics are just as varied as those of traditional plastics.

BREAKDOWN AND CONVERSION

Biomass

Biomass – such as sugar beets, sugar cane, cassava, maize as well as beet leaves, potato peel, tomato leaves and straw – contains natural polymers.



BIOREFINERY

Plant fibres

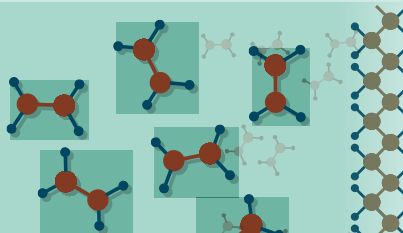
Some polymers present in plants can be extracted directly without breaking them down.



CONVERSION BY MICRO-ORGANISMS

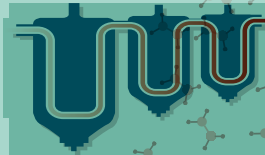
Green waste and sewer water

Micro-organisms can make polymers out of green waste and sewer water too.



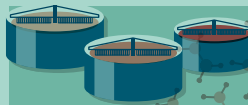
Bio-monomers

Natural polymers can be broken down and converted into bio-monomers, the basic building blocks for plastic, using enzymes, bacteria or traditional chemical processes.



Extraction

Using biorefinery (extraction and separation processes) natural polymers can be extracted directly from plant material.



Conversion

Fruit and vegetable waste or sewer water can be converted into fatty acids in the form of PHA (polyhydroxyalkanoate), and into other polymers.

Plastics

Bio-monomers can be used to make common traditional plastics such as polythene (PE), polystyrene (PS), polyethylene terephthalate (PET) and polyurethane (PUR), as well as polylactic acid (PLA), a biodegradable plastic.



Fibres

Tomato growers and Wageningen UR developed a tomato plant tray made entirely of tomato leaf fibres. Other examples of materials made by extraction are hemp and flax fibres.



PHAs and other polymers

PHAs can serve as the base for paint. One much-studied PHA has characteristics similar to those of polypropylene and polyethylene. An advantage of PHAs is that micro-organisms can break them down again.



Finally, the CO₂ emitted in the combustion of bioplastics after use is about the same as the amount of CO₂ fixed during growing. When oil is burned, CO₂ is released that was fixed long ago and this causes global warming.

Wageningen UR has been working on products based on vegetable sources for 25 years now. In the days of agricultural surpluses such as butter mountains and milk lakes, this research was mainly motivated by the desire to find new uses for agricultural products. Later on, the impetus was to reduce waste and toxic compounds, such as the plasticisers used in pvc. The focus shifted to climate problems at the turn of the century. In the last few years, biobased products have also been seen as a way of making efficient use of the available raw materials, thus enabling the needs of the growing and increasingly affluent global population to be met. Bolck says the rise of bioplastics does not have to be at the expense of farmland for food – a frequently heard objection to biobased products. ‘We get an increasing proportion of the basic raw material for bioplastics from the inedible or discarded parts of crops, such as stalks and husks. In addition, we can do more and more with agricultural residues, such as beet foliage, potato peelings, tomato leaves and straw.

Fruit and vegetable remains and even the organic residues in sewage can also be used as raw material for bioplastics.’

This means that the impact on land use is limited, says Bolck. If biomass (excluding biofuels) was to replace oil in all products made from petroleum in the petrochemicals industry, it would require less than 10 per cent of the available farmland in Europe.

FREE PLASTIC BAGS

In short, bioplastics have great sustainable potential, which cannot be said for their fossil-fuel friends – plastics based on oil. Plastic packaging in particular has come to symbolize the ‘throw-away society’ in recent decades, with the free plastic bags for your purchases at supermarkets and in markets as the ultimate culprit. The European Commission wants to put an end to the uncontrolled consumption of plastics. Bolck keeps a close watch on the debates. Both the EU and the Dutch government consult him about biobased products, including bioplastics. For example, in an assignment for the Ministry of Economic Affairs, he concluded last spring that replacing conventional plastic carrier bags with bioplastic carrier bags was technically feasible.

He expects there to be far more bioplastic options available in the years to come.



CHRISTIAAN BOLCK,
Programme Director Biobased
Performance Materials,
Wageningen UR Food &
Biobased Research

**‘The government should
introduce more incentives’**

**‘Bioplastics are
increasingly coming from
the inedible parts of crops’**

‘A key factor is the price of oil,’ he says. Up to ten years ago, oil prices were 40 dollars per barrel. It was difficult for bioplastics to compete with that price, certainly given the state of the technology at that time. ‘I can still remember a study by LEI Wageningen UR in which they only included a scenario with an oil price of 70 dollars after quite some pressure,’ says Bolck. ‘And now oil prices have been consistently above 100 dollars per barrel for several years. At the moment there is a slight dip, but prices are bound to go up again.’ That high oil price is one reason for the increasing popularity of biobased materials among the international business community. Based on estimates by the German institute NOVA in Cologne, the current volume of production of biobased materials will increase threefold or fourfold by 2020. ➤

WHAT DO CONSUMERS WANT?

At LEI Wageningen UR, Marieke Meeusen is investigating the acceptance of bioplastics. In the EU project Open Bio, she took six groups of 18 people from six different EU countries, including the Netherlands, and presented them with various biobased products, including a plastic bag, a patio tile, a T-shirt and paint. 'Consumers in all countries accept the biobased product if it is at least as good as and preferably better than the conventional product,' says Meeusen.

The 'entire message' also has to be right. 'Suppose a manufacturer claims that biopaint is healthier than ordinary paint. The subjects were inclined to accept this provided that the claim was made to seem plausible.' There are also negative 'frames'. 'If a bioplastic bag comes from China, consumers immediately associate that with child labour and have doubts about the product.'

Consumers are not necessarily prepared to pay more. 'It seems as if consumers will only pay more for bioplastics if the product is better too.'

LEI Wageningen UR is currently investigating that willingness to pay more and the degree of acceptance in a follow-up study. This will involve 1000 people in each country completing a questionnaire.

Figures for 2013 from the European bioplastics industry give production levels of 195 thousand tons of bioplastics per annum, about 3.4 percent of the total market of 57 million tons. But the industry says the market is growing by 20 to 30 percent per annum. The industry is expecting 10 percent of all packaging to be made from bioplastics by 2020. Car interiors (dashboards, seats, interior parts of car doors) could even consist of 40 percent bioplastics by that time.

SPOILING LESS QUICKLY

But oil prices are not the only factor. Bolck's ambition is to use bioplastics to create products that have superior properties to their fossil-fuel equivalents. 'Materials that are just a little bit lighter, for example, or

packaging for fruit and vegetables with improved gas permeability, so that apples and tomatoes don't spoil so quickly.' The Biobased Products business unit, part of Wageningen UR Food & Biobased Research, is also working on high-grade biopolymers such as polyamides made from natural oils. 'These materials are used "under the hood" because they have greater heat resistance than polyamides based on petroleum.' Sometimes a new biobased product will supersede an existing biobased product. Bolck: 'One example is the new technique we discovered together with Plant Research International Wageningen UR for extracting natural rubber from dandelions and the desert shrub guayule. This helps satisfy the demand for natural rubber, which has risen sharply.'

Investigations into a biopolymer can sometimes have interesting spinoffs. 'For instance, when we were developing the coffee cup, we discovered an additive that makes the bioplastic less pliable. That substance can also be used in conventional polystyrene coffee cups.'

SETTING A GOOD EXAMPLE

Now that bioplastics are an increasingly attractive option, Bolck feels that the government and NGOs should adopt a more positive attitude. 'The government could introduce more incentives, such as a lower VAT rate, to encourage businesses and consumers to opt for biobased products.' The government should also set a good example by purchasing bioplastic products or stipulating their use in public tenders for major projects such as motorway renovation.

And then there are NGOs that are not keen on biobased materials. 'It's right that questions are being asked, for example about where the biomass comes from or whether there is a risk of biomass competing with food,' says Bolck. 'However, NGOs that delve more deeply into the subject often conclude that many biomaterials are a step in the right direction. But good is not good enough for some NGOs. An attitude like that holds back progress in sustainability.'

An example is Coca-Cola's PlantBottle, says the researcher. The PET (polyethylene terephthalate) bottle is based partly on cane sugar. 'The NGOs said the bottle couldn't be called a "PlantBottle" because bioplastics only make up 30 percent; the rest comes from traditional petrochemicals.' He thinks taking Coca-Cola to task for this is not fair. 'The important thing is that Coca-Cola has taken this first step and is now collaborating with Danone and other PET users to persuade



**‘You don’t want
microorganisms
breaking down your
bumper’**

the whole production chain to use PET-like materials that are made entirely from biomass.’

ON THE COMPOST HEAP

What many consumers find confusing is that not all bioplastics are biodegradable. What is more, it is possible to make biodegradable plastics from petroleum. The wrapper around this magazine bears the text ‘7P0059 Compostable’, the code for what is known as a starch blend. ‘It is made from about 50 percent vegetable material and 50 percent petroleum that are both biodegradable. Wageningen World’s wrapper is certified in accordance with the European standard for compostable packaging material. The plastic can simply be thrown on the compost heap.’

But some other bioplastics are not biodegradable at all. And sometimes that is just as well, says Bolck. ‘You don’t want your car’s dashboard or bumper to be broken down by microorganisms. In the case of these products, we are actually working on making them less biodegradable.’ So it depends on the product whether it is made from bioplastic or petroleum-based plastic and whether it should be degradable or not.

However, all plastics can generally be reused for a while, by refilling them with soft drinks or reusing them for groceries. But that is inevitably followed by the waste disposal stage. ‘If bottles or bags are made from polyethylene and they end up in the plastics recycling process, it doesn’t make

any difference whether they were originally biobased or mineral,’ says Bolck. Neither is degradable and their properties are exactly the same. When they are sorted after the rubbish collection, they can easily be chopped up into granules, after which they can be melted as recycled material to produce bottles or bags.

So people who think bioplastics are a solution to the plastic debris threatening to clog up the world’s oceans are mistaken. Bolck says that both petroleum-based plastics and bioplastics should be put out for the rubbish collection and not be left as litter in the street or on the beach. ■

www.wageningenur.nl/en/bioplastics

Ridding an island of malaria

On an island in Lake Victoria, a big test case is in progress for the eradication of malaria without chemical pesticides. Wageningen entomologists hope ultimately to rid Africa of malaria using a mosquito trap equipped with a strong odour lure.

TEXT ALBERT SIKKEMA FOTOGRAFIE WAGENINGEN UR

Medical entomologist Willem Takken has been studying options for combatting malaria for years. The time has come for his research to pay off. Takken's research group is half way through a project which aims at wiping out the disease on an island in the heart of Africa. The place in question is the Kenyan island of Rusinga in Lake Victoria, which is isolated enough for the Wageningen approach to be tested without interference from external influences.

All 4500 households on Rusinga island are being equipped with a malaria trap. Every week technicians from the project are installing 50 traps containing a mix of odours partly developed in Wageningen, which are highly attractive to malaria mosquitoes. Thanks to the traps, the mosquitoes no longer reach the residents' bedrooms. Because the odour-baited traps require a little electricity, the project is also placing small solar panels on the roofs of the Rusinga houses, providing many of the island dwellers with electricity for the first time.

The malaria project is very popular with the local population, says postdoc Alexandra Hiscox of the Laboratory for Entomology. She coordinates the project in Kenya, where the implementation is a joint effort with the International Centre of Insect Physiology

and Ecology. 'The residents benefit directly from the project because, quite apart from the expected drop in malaria, they no longer have to buy paraffin for their lamps and they can recharge their mobile phones whenever they want to.'

Takken and Hiscox consult a residents' committee four times a year. The committee is made up of two chiefs from the island, and representatives from education, small businesses, the church, fishing villages, and women's organizations.

ONLY ONE CHANCE

The entire operation, including material and installation, only costs 150 euros per household. The solar panels cost only 20 euros each, because they are supplied by a Dutch company in Kenya which imports substandard solar panels and refashions them into smaller models. The project, costing a total of 3.5 million euros, is financed by the COMON foundation through the Wageningen University Fund's Food for Thought funding programme. A multidisciplinary team of researchers keep track of the project, monitoring the mosquito density on the island and checking the population for malaria three times a year. Takken does not have any research results yet; these will only come in next year once the whole island is provided with mosquito traps. He does not



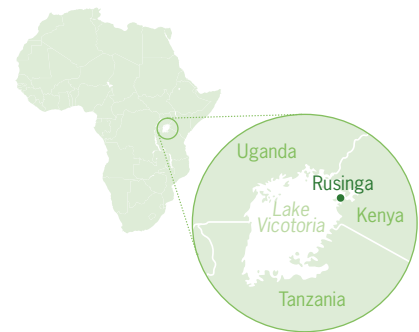


want to draw conclusions prematurely. 'We'll only get one chance. If the results are disappointing, that's the end of this approach. But if it goes well, everyone will want to come on board and use this odour mix.' What Takken can say is that one quarter of the 2500 island dwellers currently have malaria parasites in their blood. Ten years ago, that figure was 50 percent. The drop has nothing to do with this project, but came about because the Kenyan government distributed free mosquito nets in an effort to reduce the incidence of malaria. That has been a big success both here and elsewhere in Africa, says Takken, but it does not completely solve the problem. In fact, Takken has evidence that mosquitoes adapt to the use of bed nets.

In some African countries people are now being bitten out of doors and during daylight hours. This is why the fall in numbers of malaria patients levelled out in recent years, and the mosquito traps are still badly needed.

UNAVOIDABLE TRAPS

Earlier research has established that odour-baited traps catch 32 percent of the mosquitoes present around the house. Model-based calculations show that when the whole population of Rusinga is equipped with traps, the malaria mosquito will disappear. But whether events will really unfold according to this model, Takken cannot yet say. He does not think the mosquitoes can adapt so as to avoid the



traps, because they also need their odour recognition to find food. This could well make the odours a sustainable alternative to insecticides for combatting malaria mosquitoes. ■

www.wageningenur.nl/en/malaria

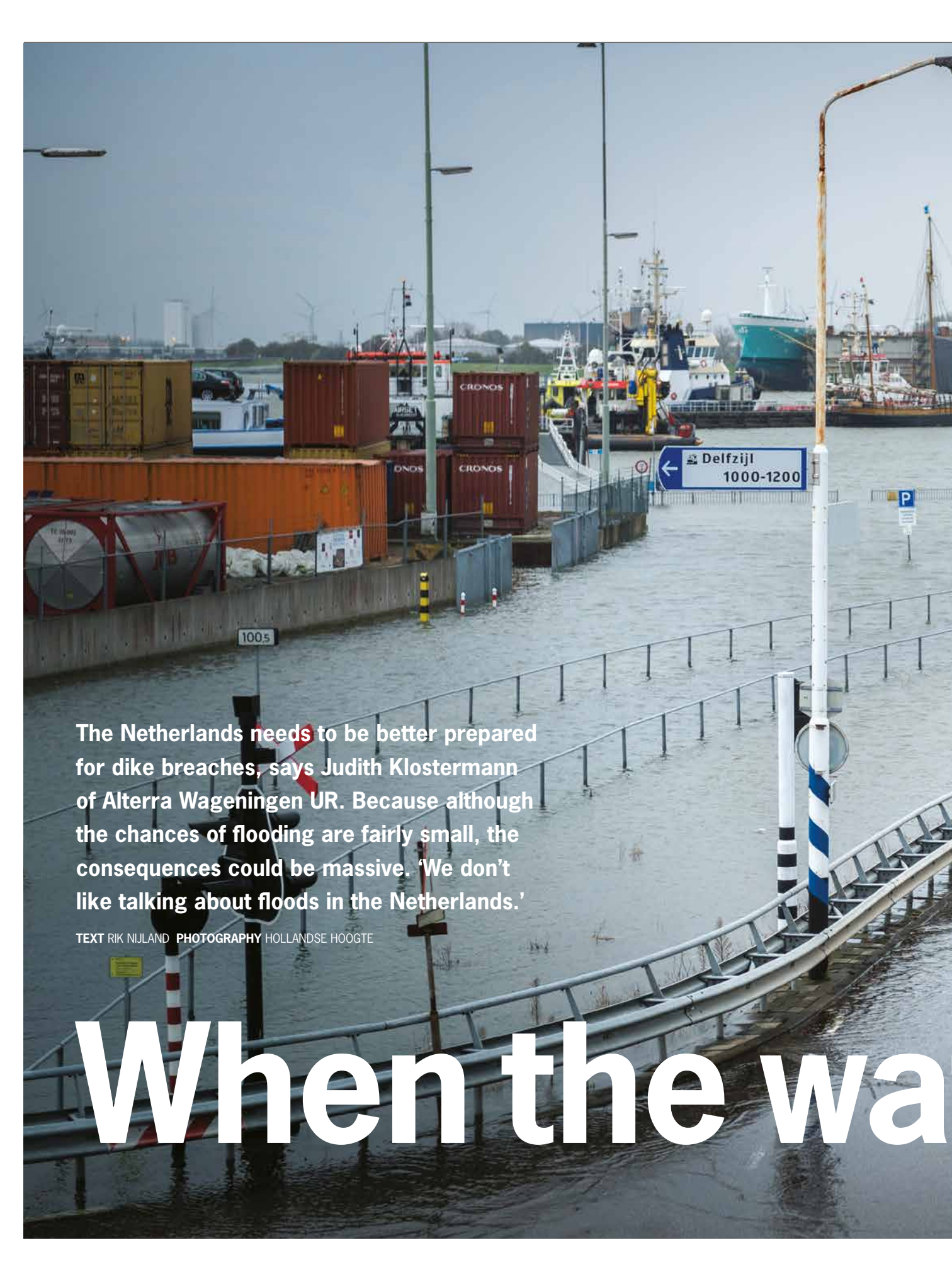


AS ATTRACTIVE AS THE SMELL OF HUMANS

Malaria is the most common infectious disease in Africa. Every year, millions of Africans are infected with the *Plasmodium* parasite which is transmitted by malaria mosquitoes. Half a million Africans, most of them young children, do not survive this infection.

The basis of the project is a powerful odour bait. According to Takken, tests reveal that this odour mix is just as attractive to the malaria mosquito as the smell of a human being. The odour mix attracts the two main malaria-carrying mosquito species, which are found throughout sub-Saharan Africa.





The Netherlands needs to be better prepared for dike breaches, says Judith Klostermann of Alterra Wageningen UR. Because although the chances of flooding are fairly small, the consequences could be massive. 'We don't like talking about floods in the Netherlands.'

TEXT RIK NIJLAND PHOTOGRAPHY HOLLANDSE HOOGTE

When the wa

Delfzijl, 22 October 2014:
the first autumn storm of
the year caused high water,
flooding the quays.



ter comes up

Of course you need strong dikes and dunes to protect the Netherlands from flooding: Judith Klostermann (51) of Alterra Wageningen UR does not doubt that for one moment. But the sense of security the Dutch get from these primary food defences should not turn into blind faith. Because hard technology sometimes lets you down, especially if climate change makes nature less predictable, bringing more rain and higher water levels. 'But we don't like talking about floods in the Netherlands. If you look back through history, we have had one or two disasters in every century, with hundreds, if not thousands, of deaths. Apparently that doesn't stick in our memories.'

In recent years, Klostermann has been working on the Wadden Sea Delta programme, one of the research projects that preceded the Delta Plan and Delta Decisions which were presented on budget day last September. These documents outline how the Netherlands intends to arm itself against greater volumes of river water and rising sea levels in the course of this century.

Klostermann's report on climate change-related spatial planning and disaster prevention measures in the Wadden Sea region came out straight after the third Tuesday in September, the traditional budget day in the Netherlands.

Together, Klostermann and consultancy bureau HKV Lijn in Water studied how the northern Netherlands can defend itself better against water. The emphasis did not lie on dikes and dunes, the primary lines of defence. Plenty of research gets

done on that already. Klostermann focused particularly on spatial planning measures inside the dikes, in what is called the second line of defence, as well as on improving disaster prevention and making citizens more self-reliant – a third line of defence. She wondered whether such steps could make the Wadden region safer. Is it worth spending money on these things?

EXTRA DIKES ARE COSTLY

What emerged from the report is that second-line measures are seldom worth it. Such measures as building an extra dike around a crucial installation inland, to limit the damage in case of flood, are expensive. So expensive that they rarely pay off, according to model calculations by HKV. These models calculate in the chances of a flood, the economic damage and the number of victims. 'If you spend money on improving security, it is almost always more efficient to spend it on the primary defences, so that you protect a much larger area at once,' says Klostermann.

There may be one exception to this rule: protecting the gas extraction and transportation installations in the north-east of Groningen province. It would only take the loss of a couple of these installations and the gas supply for the whole of the Netherlands would be brought to a halt, with causing disruption that would cost 20 to 30 billion euros. And this key infrastructure lies in a flood-prone area around Delfzijl. There is land subsidence in the area due to gas extraction and peat oxidation,

and there is cause for concern about the state of the dike along the Eems river.

A north-westerly wind can cause North Sea waves to batter the dike, and if it should break a large area would be flooded, up to the city of Groningen. But that is not the only danger. Local waterways such as the Eems canal can flood too, as almost happened in 2012 after persistent rain. 'Because of climate change, we don't know exactly what to expect: how extreme the rainfall will be, and how high sea levels will rise,' says Klostermann. 'If that goes wrong, it will do a massive amount of damage. Yet here as well the conclusion was drawn in the end that these installations should primarily be protected just with the usual primary and secondary defences.'

BUILD ABOVE SEA LEVEL

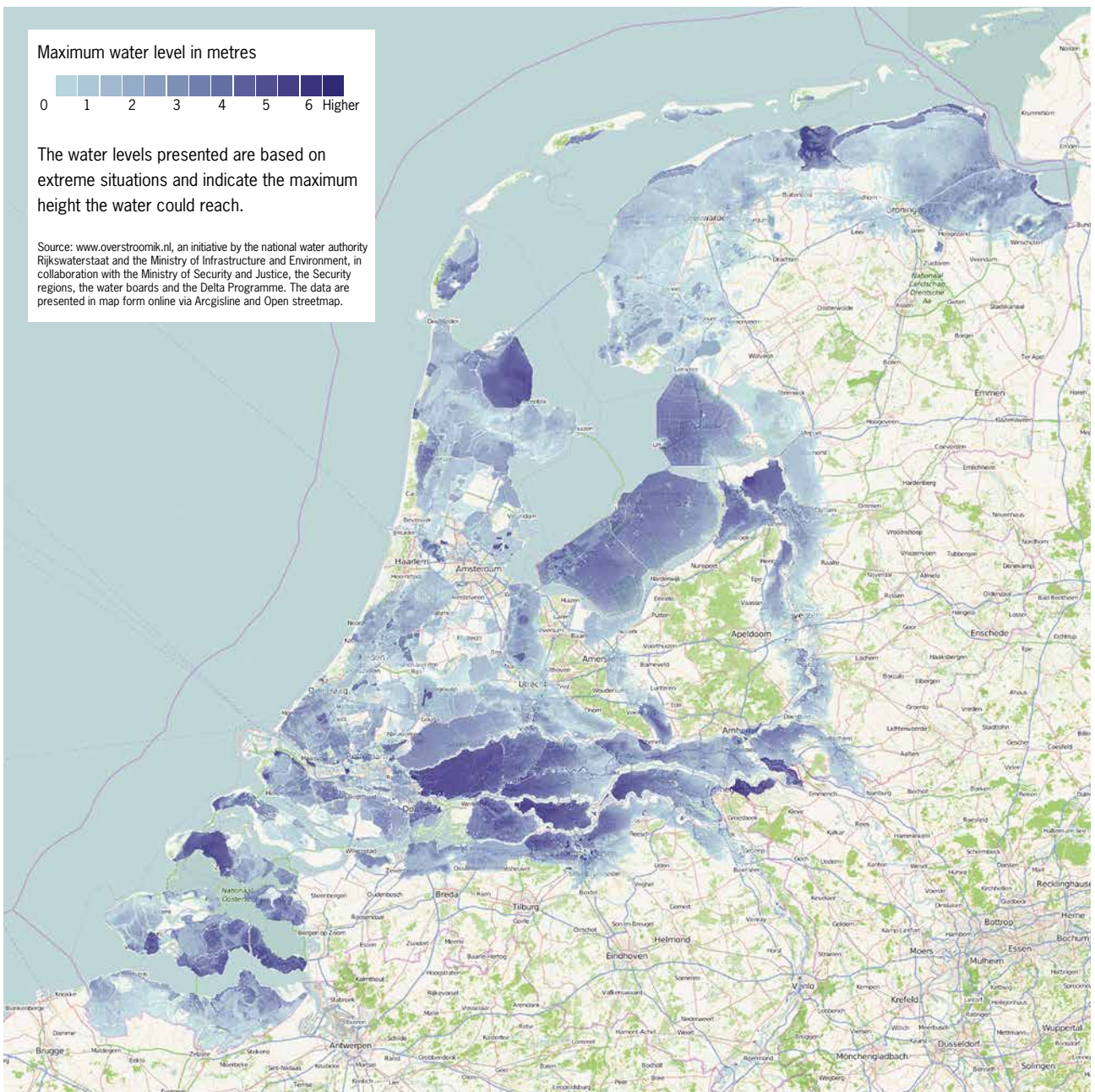
The provincial government of Groningen supports this conclusion, says civil servant Matthijs Buurman of the provincial government, one of the study's clients. The water boards in charge of the dikes are working on improving the sea dike and the dikes along the local waterways. 'After that it is up to the NAM and The Hague to determine how the remaining risks are dealt with'.

Buurman thinks Klostermann's work will force central government to face the facts: safety from water must play a role in spatial planning. Wherever possible, build new housing estates on slightly higher ground, and make sure hospitals would still be accessible after flooding. 'We need to make building projects more flood-proof,' says Buurman.

This is certainly the case in places which lack primary flood defences, such as the village of West Terschelling, which lies outside the dike, and in parts of the harbours along the coast between Den Helder to Delfzijl. The report calls for a lot more attention to addressing this issue with preventive measures such as locating new businesses and electrical installations higher above sea level.

Even right at the coast, the theme of water security has not really caught on, as the

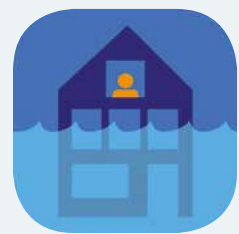
‘Getting everyone out of the area is not always the best solution’



WILL I BE FLOODED?

At the end of September, minister of Infrastructure and Environment Melanie Schultz presented the website www.overstroomik.nl and an app to go with it. By filling in their postcode, anyone can see what would happen if dikes or dunes gave way. About 60 percent of the Netherlands could flood, but how high would the water come in your street? Would it be life-threatening or just a big nuisance?

Where will it still be dry, and which roads will still be passable? 'Everyone can then weigh up whether it is sensible to stay put and look for a dry spot in the neighbourhood, or to get out,' explained the minister when she presented the site and app. 'A Delta Plan does not provide 100 percent security. People also need to be better prepared themselves for what could happen.'



WAGENINGEN SOLUTIONS

Protection from the sea and flooding rivers has traditionally been the domain of Delft engineers. But Wageningen experts have a role to play too. One of them is Pier Vellinga, professor of Climate Change at Wageningen University, who supports the use of the unbreachable dike. This is a broad, heavy line of defence that not only holds back the water, but can also serve as a carpark, for example, or provide housing.

At the beginning of October, Jantsje van Loon got her doctorate for research under Vellinga's supervision on the protective function of vegetation on mud flats with a green dike behind them. The theme running through Wageningen's contribution to water security is making use of nature. An example from IMARES Wageningen UR is the work of researchers Alma de Groot and Marijke Tangelder on Building with Nature using 'bio-builders' such as shellfish on coastal reefs and dunes. The role of dunes in climate change is the topic of University researcher Michel Riksen's work too. Besides nature, a second Wageningen angle is governance. Together with Deltares and IMARES, Saskia Werners of Wageningen University and Jeroen Veraart and Annemarie Groot of Alterra Wageningen UR researched the socio-economic, governance and ecological design criteria for sand replenishment.

Wageningen researcher noticed at the port of Eemshaven, just north of Delfzijl. 'About one third of the 25 or so businesses located outside the dike there are well aware of the possible dangers. Especially the storage and transshipment companies, which have experience of the sea. But many of the businesses which have been attracted by the economic opportunities here, such as caterers or employment agencies, have no idea. The harbourmaster of Groningen Seaports has a list of phone numbers of companies that should be warned in an emergency, but most of the companies did not know of the existence of that list, or that they were on it.'

EXTREME WEATHER

Awareness-raising about the risks, development of resilience and an emergency plan for rescue workers – the third line of defence – have been neglected, says Klostermann. Renewed efforts are especially important for the Wadden islands,

she thinks. 'Because of their location, the islands have always been on their own in extreme weather, and the medical facilities are limited. What is more, a lot of tourists stay there who do not know the area. Where should they go if the water comes up? How will the emergency services be organized? You had better sort these things out when it's quiet rather than wait until the crisis is in full swing.' Awareness-raising and emergency services often slip through the net. There is no culture of discussing risks of flooding in the

Netherlands, says Klostermann. And in the security regions there is a lack of knowledge about the complex issue of water security. They face many different tasks, from fire fighting to emergency services for road accidents and terrorist attacks. If they hear that the chances of a breach of a dike are 1 in 4000 years, flooding goes to the bottom of the priority list. They think: if it happens, we'll just follow the water board's instructions. But security regions have a lot more contact with the public so they are in a better position to get the message over to people. To do that, though, these organizations need to be in tune with each other.' The chances of a flood may be small, but the consequences are big. You can compare it with using seat belts in your car, says Klostermann. 'The chances are that you will wear them all your life without ever needing them. But if the moment does come that you need it, that belt will be the difference between life and death.'

RESIDENTS EVACUATED

This weighing up of costs and benefits is important in the third line of defence too, she believes. At the beginning of 2012, areas near Woltersum and Tolbert in Groningen province were in danger of being flooded. Residents and their livestock were hastily evacuated, perhaps unnecessarily. 'There was a risk of flooding, but not to a life-threatening extent. Most of our experience in the Netherlands is with horizontal evacuation: get everyone out of the area. But that is not always the best solution. Horizontal evacuation is expensive and affects the residents a lot. It can be necessary if the

‘I think citizens have
the right to know where
they stand’



Delfzijl, 22 October 2014: the highest water level measured was 4.06 metres above sea level.

water comes up really high, but often you can go up to the first floor, or to the neighbours who live just a bit higher – a kind of vertical evacuation. The advantage of that is that people in these areas can carry on with their lives as soon as the danger recedes.’ In order to make sensible decisions about such things, people need good information. Is there just minor flooding, and should we remove anything valuable from the cellar, or could the situation become life-threatening? It is not easy for individual citizens to assess this. At one spot there may be hardly any problem while a couple of kilometres away the water may come up to three meters high.

‘The app developed by the ministry of Infrastructure and Environment (see box), on which you can fill in your postcode to see how high the water could come, is certainly a step in the right direction, in my view.’ As for the question of whether the money the ministry spent on the app could have been better spent on dikes, if the chances of flooding are extremely small, Klostermann is quite clear: ‘According to HKV’s calculations, the second line is expensive but the third line isn’t. What it requires above all is a change of mindset. I also think citizens have the right to know where they stand. A lot of people will just shrug: a risk of

flooding is something abstract, but people who have experience of high water, or who were evacuated from the Betuwe in 1995, understand the importance of good information. In 2006 high water did a lot of damage in the harbour at Delfzijl, in spite of all the water board’s warnings. There was high water again in 2007, but then there was much less damage. Everyone had taken precautions. The trick is for the government to get that message across in areas where there hasn’t been any flooding yet too.’ ■

www.wageningenur.nl/en/delta

The healthy greenhouse

Four years of research by Wageningen UR and 30 Dutch and German partners in a European Interreg project produced 'The Healthy Greenhouse': an extensive crop protection system which gives horticulturalists early warning of diseases and pests as well as advising them on suitable steps to take.

TEXT ALBERT SIKKEMA ILLUSTRATION MARTIJN BOUDESTIJN

1 MEASURING EQUIPMENT

Climate sensors

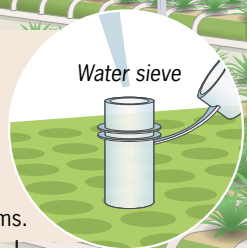
Dotted around the greenhouse are wireless sensors which continuously record temperature and humidity, both in the air and in the soil substrate. High humidity indicates over-watering and a raised chance of disease. The temperature can also affect the development of disease.

Spore collector

The spore collector detects pathogens in the air. It is a kind of vacuum cleaner which catches fungal spores in a sieve, so they can then be identified.

Water test

Specimens of the irrigation water are analysed using the water sieve, a piece of equipment for detecting and counting micro-organisms.



Cameras

Cameras move throughout the greenhouse, scanning the plants for stress or the first signs of diseases and pests, even before symptoms are visible to the naked eye.

Chlorophyll-fluorescence camera

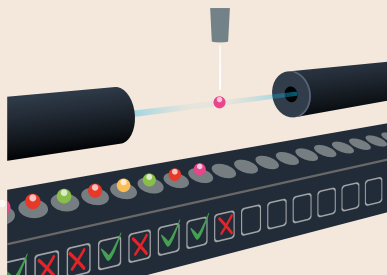
The chlorophyll-fluorescence camera measures the photosynthesis, and can then determine whether the leaves or stem are under stress or have been damaged.

Multispectral image sensor

The multispectral image sensor examines the health of leaves and stalks using light spectra.

2 SPECIFIC TESTS

If unusual values are detected, suspect plants can be examined more closely. The DNA test developed by Wageningen company Nsure establishes within 24 hours whether a tomato plant is sick.



3 DASHBOARD

All the data from the monitoring appear on a dashboard and are translated into advice by underlying decision-supporting software.



The screen shows the grower reports of diseases and pests using traffic light coding: Green stands for 'no risk', yellow means 'watch out' and red means 'take action'.

4 ACTION

Biological crop protection

Each crop can be protected from pests using specific natural enemies of pest insects. The impact of the predator insects can be increased using endophytes – fungi and bacteria which strengthen the plant. The endophytes probably ensure that predator insects find their prey tastier than the plant itself.

Ichneumonid wasp



Endophytes



Targetting spraying

If prevention and biological crop protection are not adequate, chemical substances can always be used. It is preferable to dose these with a crop-dependent spraying system, which only sprays if the sensor detects plant parts. The precision sprayer is even better: it only sprays plants in which stress has been detected.

Long-lived cows

Dairy cows usually go for slaughter after about six years. They are often put down for health reasons, but with the right approach they could have at least two more years of life. Which is good for the cow's welfare, for profit margins, and for the environment.

TEXT HANS WOLKERS PHOTOGRAPHY ISTOCK



For more than 20 years, the average lifespan of dairy cows has been barely six years. It is difficult for farmers to keep the animals healthy and productive for longer than that. But according to Roselinde Goselink, cow and animal nutrition expert at Wageningen UR Livestock Research, it is certainly possible to keep cows alive and well for longer, and to keep up the milk production. It is not easy, however, even though it is clear where things go wrong in older cows. 'Loss of fertility, mastitis and hoof problems are all common,' says Goselink. 'That leads to lower milk production.' And that is enough reason for the farmer to take the cow to the slaughterhouse.

It would be better for both the animal and the farmer if cows led longer healthy lives. During its first two years of life, the farmer invests a lot in the growing animal. Only after the first calf, when the cow is about two years old, does it begin to supply milk so that the farmer starts to get a return on his investments. The longer the cow stays healthy and gives milk, the better for the farmer's purse and for the cow's welfare. Not to mention the environmental benefits of cows living longer. In their first few years, growing cows use up large quantities of nutrients, minerals and vitamins, while producing no milk and plenty of manure. The longer the animal can live, the lower the environmental cost of each litre of milk. In 2011, the Dutch Federation of Agriculture and Horticulture LTO's dairy farming sector formulated the wish to raise the average lifespan of dairy cows by two years by 2020. According to Jelle Zijlstra, an expert in dairy farming systems at Wageningen UR Livestock

‘The road to the long-lived cow starts before birth’



Research, this is not a realistic target in the short term. ‘It is a complex process in which we have to improve many aspects of dairy farming,’ he explains. ‘It will definitely take a few decades before that target is reached.’

BREEDING CALVES

The road from calf to an older cow has not yet been traced in detail, but Goselink does have some ideas how it will look. According to her, what is needed is to make the cow’s life healthier right down the line. ‘The road to the long-lived cow starts before birth,’ she explains. ‘Extra attention should be paid to hereditary traits; healthy offspring are the basis of a long and healthy life for cows.’ More attention should also be paid to how calves are raised so that the young animals get a good start in life, reducing their chances of developing problems later in life. ‘By preventing health problems in cows at an early stage, they stand a better chance of a healthy old age. A broad plan of campaign is needed for this,’ thinks Goselink. She wants to study what a cow really needs in order to live a long, healthy life. Could a softer barn floor on which the animals do not slip perhaps help prevent lameness and hoof problems? Sufficient physical exercise is important for keeping muscles and bones healthy and strong. Could pasture grazing play a role here?

EXTRA VULNERABLE

Doing something about extra vulnerable periods of a cow’s life could also contribute to a longer life. From

two years of age, a cow calves roughly once a year in order to keep up milk production. But in the period around and just after calving, the cow is vulnerable and needs extra care and attention. This is because her metabolism changes a lot when milk production gets going after calving. With the onset of lactation, the cow’s requirements of energy, protein and minerals suddenly shoot up.

If their feed is not right, cows can suffer from lack of energy and calcium, with serious consequences for their health. Good nutrition can keep cows healthy and prevent problems. But Goselink sees other possibilities as well, such as postponing the vulnerable period as long as possible. ‘Instead of getting the cow to calve once a year, you can try to prolong milk production,’ she explains. ‘That might be possible by using different feed or by selective breeding for longer lactation periods between calves.’

A lot of interdisciplinary knowledge and additional research will be required for the process of extending the lifespan of the dairy cow. One research project, called ‘Resilient Livestock’, is studying the natural resistance to disease of cows on a dairy farm. Scientists and farmers collaborate in this project, and there is also collaboration with LTO in a project called ‘Lifespan Dairy Cows Phase II’. New insights will be shared on the annual course for livestock farmers, which Zijlstra set up: Extending the lifespan of Dairy Cattle (24-25 March 2015), Wageningen Academy. ■

www.wageningenur.nl/longevity-dairycows



Quality seed for Africa

Many African farmers still lack quality seed, and neither national governments nor commercial companies can meet the demand. The Centre for Development Innovation in Wageningen is working with farmers' groups to meet the demand for quality seed at the local level. TEXT MARION DE BOO PHOTOGRAPHY CORBIS

Maggie's bean plants look beautiful. Healthy, uniform plants with shiny leaves and a plentiful harvest. Maggie is a member of a farmers' cooperative for which she has been growing seed for several years now in her small village in south-west Uganda. The cooperative sells her seed on the local market. It did not take long before she could rent more land, because there is a big demand for quality seed. And now her eight children can go to school. 'There is a lot of demand for the seed from this cooperative, because they are vigorous, healthy seeds of a new and productive variety which was bred at a national research institute,' explains Marja Thijssen of Wageningen UR's Centre for Development Innovation (CDI). 'We put this Ugandan farmers' cooperative in touch with that institute so that the farmers could get to know this new variety.' Thijssen coordinates the seed programme ISSD Africa, which was launched in Nairobi mid-September.

ISSD stands for Integrated Seed Sector Development. Together with the Royal Tropical Institute (KIT), CDI carried out several studies in eight African countries, including Ethiopia and Uganda, between 2010 and 2013. The new umbrella programme, initially for two years, is funded by the Dutch government and the Bill & Melinda Gates foundation. 'Quality seed is increasingly considered a key factor for sustainable growth in agricultural production, so as to combat poverty and improve food security,' says Thijssen. 'We research exactly what it takes to make interesting new varieties available as quality seed to the farmers. Who should tackle it, what are the incentives to take it up, and how do you get businesses on board?'

SEED MULTIPLICATION

In many African countries, plant breeding is a public activity. There are international and national research institutes which work on developing new varieties.

‘Good seed is considered a key factor for food security’



This work is public-funded. ‘However, once a new variety is added to the list of released varieties, the researchers consider their job done,’ explains Thijssen. ‘They don’t start promoting their material themselves, because that is not their role. Yet a few steps still need to be taken to produce the ‘basic seed’ before multiplying it for the market as commercial seed. As long as all commercial seed producers have equal opportunities to get exactly the same variety and basic seed from public breeding programmes, they are not usually very interested in multiplying that seed, as there is no way for them to stand out from the competition.’ Meanwhile, smallholder farmers and local farmers’ cooperatives are often not sufficiently aware of the existence of new varieties. Thijssen: ‘Access to quality seed is a big challenge for smallholder farmers all over Africa.’ Smallholder farmers get their seed from many different sources. They get at most 20 percent of it from seed companies; the other 80 percent they either grow themselves or obtain through barter or from buying it at the local grain market.

From 2006, Thijssen worked on a local project in Ethiopia which aimed at producing better seed for smallholder farmers, and which was gradually upscaled. During her fieldwork she saw that farmers who grow crops such as sorghum and wheat for their own use keep aside some of their seed. ‘They eat the rest or sell it on the local market. That often goes fine for years on end. But, if a disease gets into the crop, the seed can be infected too, and the disease is carried over to the next generation. And with this approach, farmers may carry on growing older varieties for years, even though better

varieties are available. Sometimes a farmer makes a once-off purchase of seed of a new wheat variety and then goes on to grow it himself or herself for years.’ Farmers are usually reluctant to spend money on new seed for their food crops. And the commercial plant-breeding companies are not very interested in developing new varieties of these food crops, because they cannot make much money out of them.’

CASH CROPS

When it comes to cash crops, however, farmers do not mind investing. Examples of such cash crops are maize, vegetables and sunflowers. If the farmer buys quality seed, it pays off in a better harvest and higher incomes. In the case of maize, a lot of use is made of hybrid varieties which deliver extra high yields and a uniform crop. However, the farmer has to buy new seed every year, because the hybrid varieties are not genetically stable: if farmers harvest and then plant their own seeds, their next yield will be drastically lower. Big companies operating in many African countries sell one or two hybrid maize varieties throughout the country. ‘That can be pretty lucrative,’ says Thijssen. ‘Farmers buy that hybrid maize seed, even if it costs twice as much as seed of a non-hybrid variety. And there is also a market for commercial seed of onions or other vegetables, some of it coming from Dutch plant-breeding companies. At the same time we see a role for local farmers’ cooperatives and small seed companies producing commercial seed on a small scale for the local market of crops such as wheat, sorghum, rice or teff. By doing this you can really strengthen the agriculture sector: farmers get access to quality seed and there is also more chance of it becoming available at the right moment.’

ISSD programmes also focus on propagation material for cassava and potatoes. Healthy planting materials for such vegetatively propagated crops are a must too. Potatoes are particularly vulnerable to severe outbreaks of disease. Farmers are often prepared to pay a bit more for healthy seed potatoes and strict quality control. Thijssen: ‘If you tackle this at the local level, your overheads are small and so are your transaction costs. Then it soon becomes commercially viable.’

SEED COMES TOO LATE

‘It is not just the commercialization of new varieties that causes problems; it is also tricky to get the seed of these

varieties to the right place at just the right time,' says Gareth Borman, one of Thijssen's CDI colleagues and originally from South Africa. 'In the 1960s and 70s, seed supply was seen as a government task in sub-Saharan African countries. There were a lot of problems. Seed did not reach the farmers on time and stayed in warehouses until the sowing season was over. In response to that, people wanted to privatize the seed sector, but many food crops turned out not to be lucrative enough for commercial breeding companies and seed multipliers. 'In our ISSD programmes we are trying to set up a commercial programme for local farmers' cooperatives and small companies, to produce quality seeds of locally adapted varieties. We think this could enable farmers to achieve 30 percent higher yields,' says Borman.

Once an improved, productive variety with good genetic characteristics is available, you need investment in knowledge at the local level. Seed crop cultivation, seed harvesting and seed storage all need to meet certain standards. Thijssen: 'We advise using the best, most fertile tract of land for growing seed, and if the farmer only has a little fertilizer, putting it on the seed crop. The crop should be kept clean so that no seed from other varieties, diseased plants or weeds can get mixed in with the harvest. The harvested seed has to be dried well so that it keeps better, and stored properly to protect it against fungal diseases or rats. Besides all this, we are investing in business-planning, market orientation, promotion and marketing.'

SENDING SAMPLES

Seed laws and regulations and quality control pose serious challenges too. Borman: 'In countries like Kenya and Ethiopia all the seed has to be certified centrally, even if it is locally produced and destined for the local market. Seed producers have to send in samples which the authorities then sow and test for quality and varietal purity. The sale of uncertified seed, by local farmers' cooperatives for example, is technically illegal in this context. But, governments are often defeated by the task of checking and certifying all that seed, with a lot of bureaucracy and delay as a result.' There are fake seeds in circulation too, which is a big problem in Uganda. What should be used as grain and is of inferior quality gets onto the market as quality seed through admixing by unscrupulous traders in

ISSD AFRICA

The seed programme ISSD Africa was launched in Nairobi, Kenya, on 18 September. The objective of ISSD (Integrated Seed Sector Development) is to give farmers throughout Africa access to quality seed by bringing donors and organizations together, by supporting entrepreneurship in the seed sector, by translating international agreements on seed into national legislation in developing countries, and by collaborating with the African Union's agricultural programmes. The ISSD Africa programme dovetails with existing national seed programmes in various African countries including Ethiopia, Uganda and Burundi, and with previous research by CDI Wageningen UR and the Royal Institute for the Tropics (KIT).

the seed value chain. It is sold with a professional-looking coloured coating at the price of quality seed, which is often more than twice its true value. But it is fake and it delivers a poor harvest. There are hardly any seed inspectors and few penalties for perpetrators. Borman: 'Quality control starts in the field. We want more decentralized controls. And that needs to be reflected in seed regulation. After all, the most important interventions for ensuring seed quality are carried out in the field by the seed producers themselves. If he or she is a reliable source of quality seed, you don't have to test every batch separately. What is more, you can let the market here do its work. Because only when a business delivers seed of good quality do the customers come back for more.'

Maggie succeeded in this. Participating in the cooperative was not a bad move for the Ugandan farmer. Her thatched round mud hut has been replaced with a solid brick house with several rooms. And her husband has bought a motorbike so as to be able to expand their trade further. ■

www.issdseed.org

Low-fat and still creamy



Cheese specialist Zijerveld wanted its range of cheeses to include a tasty goat's cheese with only 30 percent fat. Nobody had managed that using traditional techniques. Wageningen UR Food & Biobased Research came up with a new formula. Healthier and just as tasty. TEXT AND PHOTOGRAPHY HANS WOLKERS



Goat's cheese light is healthier than the full-cream variety but not nearly as tasty. Cheese wholesaler Zijerveld in Bodegraven had had one of these 30+ goat's cheeses in the assortment for some time, but was not satisfied with it. It lacked the soft, creamy texture of the full-cream variety, and was harder and more rubbery. It did not seem possible to improve on this with traditional artisanal methods, however. At the behest of the cheese specialist, the team led by Miriam Quataert, product development project leader at Food & Biobased Research, went in search of a new 30+ goat's cheese which did not have the drawbacks of the existing low-fat goat's cheeses.

CREAMIER

Quataert's team and technologists from Zijerveld tested several possible changes to the formula. This was done at Amalthea BV in Rijen, where goat's cheese is produced for Zijerveld. The team studied whether the use of certain fats or of a different culture led to

a better end product. 'Using the right fats can make the cheese tastier and creamier,' explains Quataert. 'But cultures have a big impact on the taste and the feel in the mouth as well.' Enzymes from extracts from calves' stomachs (rennet) cause milk proteins to clot into a solid mass. In combination with protein-splitting enzymes in rennet, these enzymes influence the ripening of the cheese. During this process the tasteless rubbery lump of clotted proteins is turned into a creamy, flavoursome product. After various tests with different kinds of fat and cultures it turned out that using a different culture produced the best 30+ cheese. 'This ensures the presence of long carbohydrates in the cheese,' says Quataert. 'These weaken the protein network that keeps the cheese together, which leads to an open texture.' This makes the cheese retain more water, resulting a creamier end product.'

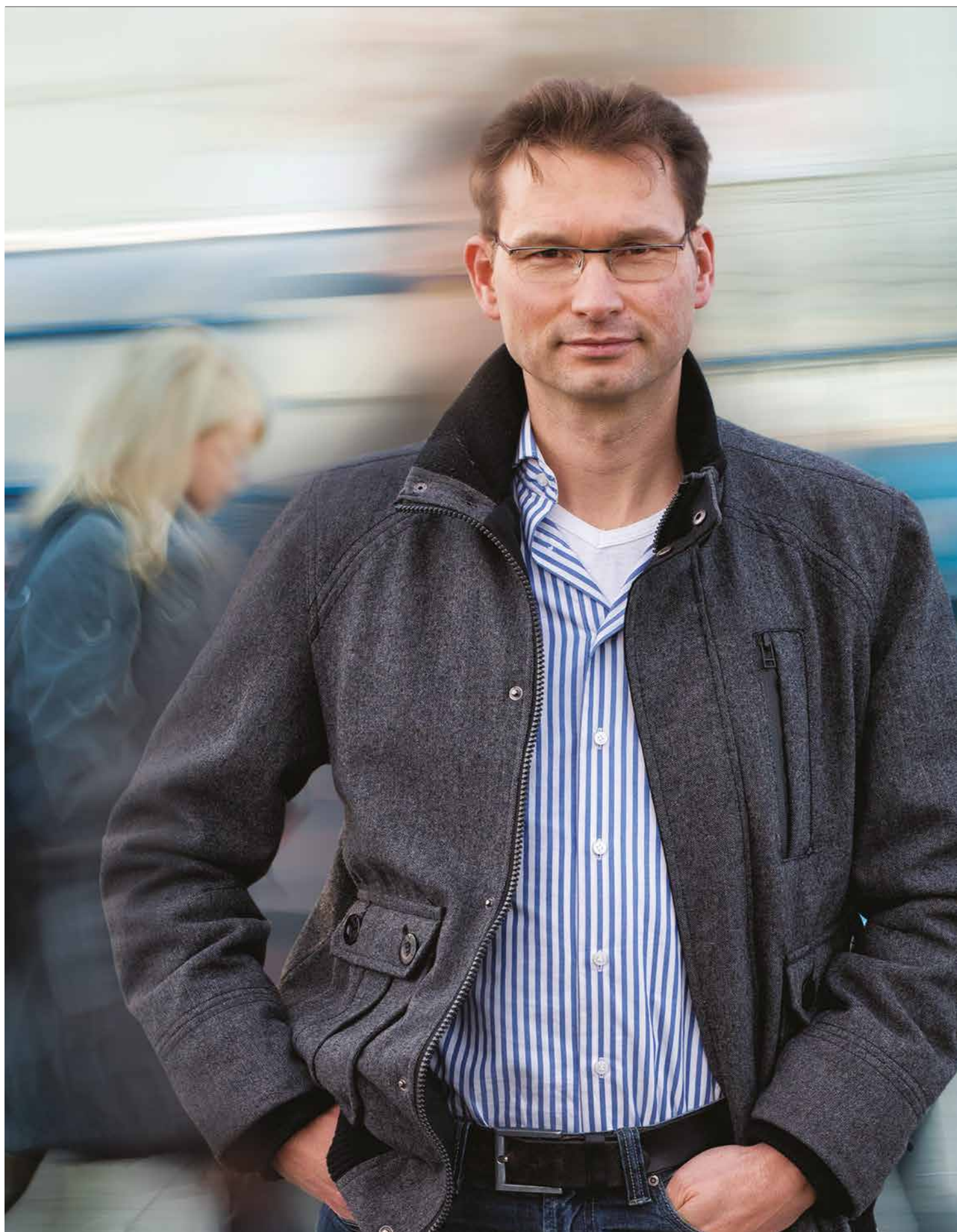
TURNOVER GROWING

The client, Zijerveld, is enthusiastic about the new goat's cheese. 'Compared with the existing low-fat cheese, the new variety really is significantly tastier,' says food technologist Philippe Coerten, operations manager at Zijerveld. 'In blind taste trials, the new cheese scored convincingly better on taste and creaminess.' The new cheese is going down well with the consumer, partly thanks to active publicity. 'We are seeing a strong growth in the turnover; sales are going up by as much as 20 percent per year,' says Coerten enthusiastically. 'Sales of this cheese are running at more than 70 tonnes a year, and are still increasing.' ■



'Sales are going up by 20 percent per year'

www.wageningenur.nl/productdevelopment-food



ARNOLD VAN VLIET: SCIENTIST OF THE PEOPLE

‘Media attention is crucial’

Arnold van Vliet is Wageningen UR's great media success. Helped by members of the Dutch public he exposes the impact of climate change impacts on our daily lives. The time this takes has put his academic career under pressure. 'To me the impact of an appearance on the TV news is more important than one more academic article.'

TEXT ROELOF KLEIS PHOTOGRAPHY GUY ACKERMANS



ARNOLD VAN VLIET, HAASTRECHT 1973

1991-1996	Degree in Biology at Wageningen University
1996	Wageningen University, Environmental Systems Analysis
1997	Institute for Forest and Nature Research (now Alterra)
1998	National Institute for Public Health and Environment (RIVM)
1999	International Center for Integrative Studies, University of Maastricht
2000	Board of Foundation for Sustainable Development
2001	Launch of Natuurkalender.nl
2008	PhD. Thesis: Monitoring, analyzing, forecasting and communicating phonological changes
2008	Launch of Natuurbericht.nl
2009	Launch of AllergieRadar.nl
2011	Launch of Splashteller
2012	Launch of tekenradar.nl
2014	Launch of Muggenradar.nl

The year is not over yet, but it is already clear that 2014 was an extraordinary year for the natural world. ‘A spectacular year,’ says Arnold van Vliet decidedly. And he should know. He has his finger on the pulse of nature like no one else in the Netherlands. And the patient is running a temperature: 2014 was the hottest year ever. ‘Or at least, since records began.’ You only have to look outside to see what that means. It is mid-November and there are still leaves on many of the trees: the fall is still going on. And yet it started so early. ‘The leaves began to turn in August, much earlier than we expected,’ says Van Vliet, patiently repeating what he had just been explaining on Vroege Vogels [Early Birds], his regular platform on Sunday morning radio. ‘High temperatures after August slowed the turning of the leaves and in the end it was a late autumn.’ This is what Van Vliet does: study changes in the timing of cyclical natural phenomena. Phenology, to a biologist. When do the crocuses blossom and when do the swallows go back to Africa? He focuses especially on the way climate change affects that timing. For his data he relies on about 8000 enthusiastic volunteers who pass on their observations of nature in their surroundings.

MEDIA REACH

Van Vliet has made this ‘citizen science’ his specialism: conducting research together with the lay people. There are probably very few people in the Netherlands who have never heard of the Nature Calendar or of other hits from Van Vliet’s repertoire such as the Midge Radar, the Tick Radar, the Allergy Radar or the Splash Counter. And it is not difficult to substantiate that claim. Van Vliet keeps track of his media activities. For years he has calculated his ‘reach’ through the media using print numbers and viewing and listening statistics. In this respect too, 2014 was a top year. ‘Last year was a record with 200 million people. Now, with six weeks still to go, I am already at 280 million people.’ For the sake of clarity: these are not ‘separate visitors’ but all the readers, viewers and

listeners who could have seen or heard his message. Through 462 newspaper articles, for instance, and 49 TV programmes, including 14 times on the RTL News and 15 times on the NOS News.

YEAR OF PLAGUES

There are a couple of explanations for this year's success story. Van Vliet: 'This year we drew attention to Alterra's Green Monitor in the media, as well as the Midge Radar, together with the Laboratory for Entomology. This was the year of plagues of birch parent bugs and spotted-wing drosophila fruit flies. And 2014 has also been an extraordinary year weather-wise. On top of that, Natuurbericht.nl, our nature news website, is being used more and more by journalists as a reliable source of information on nature. Everything we put on there is effectively a press release and can go straight into the papers. And that happens quite regularly.' Heaps of files

Van Vliet first discovered the power of citizen science back during his student days in Wageningen. 'For a final research project at the IBN (now Alterra) I got in touch with the archives of the Dutch Phenological Observation Network. Heaps of files full of citizens' observations going back to 1868. When you analyse that data you see that temperature has a clear effect on what happens around you. Phenology has proven a very good gauge of changes in weather and climate. On the basis of observations by volunteers you get a good picture of what a year looks like and how it compares with other years. The march pansies bloomed 29 days earlier this year than 50 years ago, and 11 days earlier than the average over the last 12 years. That was because of the very mild winter and spring.'

In search of an answer to the question of how nature is changing on a global scale, Van Vliet created an email forum in his student room on the Haarweg, with the aim of improving international communication between phenologists. 'As a student, I soon became a linchpin in the system. It was an

eye-opener for me that you could exchange ideas that way and mobilize the scientific world.' This experience provided the basis for the development of the European Phenology Network, funded by Brussels. A press release about this brought radio programme Vroege Vogels calling. The programme had covered phenology regularly and now the makers wondered whether it would be an idea to tackle it together. During the interview Van Vliet suddenly had a brainwave: ask listeners to send in their phonological observations. 'I had no idea that half a million people listen to Vroege Vogels every week. I had never heard of it. What do you expect, when it's broadcast between eight and ten on a Sunday morning? Hello! I had only just left university.' The first appeal brought in 2000 responses. Van Vliet had to get cracking to communicate with all those people and create and send off forms for them to fill in.

MEDIA TALENT

Van Vliet gets into the media on a regular basis. That is a talent, but there is also a clear strategy behind it. 'You see, I want to achieve certain goals in my work. For Nature Calendar, for instance, we want to monitor timing in nature and the effects of climate change on it. We want to trace the ecological and socio-economic consequences of those changes and develop the tools with which people can adapt to them. One of the ways we do that is AllergieRadar.nl. Attention in the media is a crucial part of the process of citizen science. That attention is the driver for bringing in observations and funding. If you cannot mobilize masses of people it gets difficult.'

There are limits, though. The Splash Counter set up in 2012 has already been abandoned. The idea was to get a picture of insect populations in different parts of the Netherlands and see how their densities varied over the years. After every car journey, participants counted the number of dead insects on their number plates. The figures were astonishing. 'In July 2012 we had an

'We had on average two insects per kilometre on the number plates'

VAN VLIET'S NATURE EMPIRE

Arnold van Vliet was the founder of De Natuurkalender in 2001. About 8000 volunteers form the basis of this knowledge network about timing in the natural world. They monitor 300 species of plant and animals and send their observations to Wageningen. Meanwhile Van Vliet and his team of two colleagues and many volunteers are also working on other related activities. Together with Leiden University Medical Centre they manage AllergieRadar.nl, linking the symptoms of about 7500 hay fever patients with the flowering season of plants. The site also provides pollen count alerts during the growing season. On tekenradar.nl, a collaboration with public health organization the RIVM, people can see what the risk of a tick bite is in a given area. That 'tick forecast' is based on the weather and the number of ticks caught by volunteers at 15 locations. A new initiative this year is the Muggenradar, which Van Vliet set up with the Laboratory for Entomology. The public are asked to report problems with midges and send in dead specimens. The aim is to gain insight into what species of midge are present, and when and where. Arnold van Vliet also developed and managed the news site Natuurbericht.nl, where he publishes a minimum of two bulletins a day.



average of two insects per kilometre on our number plates. If you do the sums you arrive at 133 billion victims per month during the peak season.'

There was tremendous media interest but the number of participants was disappointing. 'Just try getting down on your hands and knees to inspect your number plate and then wipe it clean. You do find yourself wondering what the neighbours will think. Only about 500 people signed up. Anyway, there was no budget to continue this research. But I still think it is a way of getting a good idea of changes in insect population density.'

Short-lived though it was, the Splash Counter was Van Vliet's biggest media hit. 'I gave interviews with the BBC, CBC in Canada and SBS in Australia. It was an eye-opener to see how easy it is to get into the living rooms of America and Australia. I find that fascinating.'

SAD NOTE

Impact is the key word in everything van Vliet gets involved in. As a young lad in the small town of Haastrecht he was not much of a nature-lover. It was the stories about the threat to nature and the severe loss of biodiversity that attracted him to biology. 'Nature documentaries on television always ended on a sad note. And they still do, really. As a secondary school student I realized things were going in the wrong direction. At some point I said to myself: I want personally to make a significant contribution to solving these problems.' It was an obvious decision to come to Wageningen. 'In those days there was a television programme called 'Yes Naturally', presented by Jan-Just Bos. And he was just walking around here in Wageningen!'

His media fame has made Arnold van Vliet an ambassador both for his own field and for Wageningen UR. 'Van Vliet is by far our biggest crowd-puller. And that reflects on our institution,' says press officer Bouke de Vos. 'In fact, Arnold has become his own brand. And he doesn't let himself get carried

away by hypes. What he has to say is always down-to-earth.'

But that focus on the media does have its price. Van Vliet's scientific impact is modest. Van Vliet, whose PhD in 2008 was about his work on the Nature Calendar, is aware of the criticism but does not go along with it. 'Yes, I could publish more academic articles. But what would I achieve by that, in terms of the ultimate goal I have set myself? There are various ways of generating impact. You can build an academic career and gear everything to that. And then you are a top scientist with publications in Nature and Science. And then? To me the social impact of an appearance on the TV news is much more important than one more scientific article. I love the fact that through my work with the Tick Radar, far fewer people get Lyme's disease, and that we are coming to grips with the issues.'

In the academic world – van Vliet works at the Environmental Systems chair group – this focus on social impact makes him a bit of an oddball. Promotion to assistant professor is therefore unlikely, in spite of all he has done for the university. 'When graduate schools are inspected, relevance to society is one of the main focal points in the evaluation. Our group gets maximum scores for that. But at the moment that is not reflected in the university's evaluation system.'

A DREAM COME TRUE

His own thing will soon be taking Van Vliet beyond the borders of the Netherlands. Next spring sees the launch of Nature Today, an international version of the Dutch website *Natuurbericht*. This is his dream, as he says himself. 'It will be a global news service on nature. Internationally, so much data is generated without getting any publicity. There is so much potential. Journalists have so many questions and they don't know who to call about what's going on.' Nature Today is intended as a platform for scientists and their stories. After all, who reads all those scientific articles, Van Vliet wonders aloud. 'They play a fundamental role in the



'Thanks to the Tick Radar far fewer people are going down with Lyme's disease'

scientific process. Absolutely. But ordinary people don't read them. Scientists themselves hardly read scientific articles anymore. I even think they would reach more of their colleagues with their story through a platform such as Nature Today. As a scientist you want to change things, don't you? You want to generate knowledge that is of some use to society. So share that knowledge too!' ■

Would you, as a scientist, like to share your knowledge and stories about changes in nature?
Email Arnold.vanVliet@wur.nl

WILLEM AND DREES LINKED UP AFTER GRADUATING

‘Our products are in hundreds of supermarkets’

During their student days in Wageningen Willem Treep and Drees Peter van de Bosch only knew each other by sight. But after their careers in the food industry, they decided to go down a different route together. ‘Willem&Drees’ delivers sustainable food from regional farms to supermarkets, and now directly to consumers too. TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY HARMEN DE JONG

On a bleak patch of ground along the main road at Cothen there is a door behind the air pump at an automatized petrol station. Beside it hangs a sign: Willem&Drees. Through a hall you reach a vast space piled high with crates of fruit and vegetables sorted by region of origin. A man standing at a long table is putting together individual orders. Each little crate is filled with a selection of products such as apples, potatoes, carrots, parsnips and rocket, as well as organic milk, cheese, bread and meat. ‘We already have a big turnover with supermarkets like Jumbo, Spar, Crooo and the Coop, and with catering companies like Sodexo. Recently we started delivering directly to consumers too. They can order online,’ says Willem Treep, who graduated with a degree in Agricultural and Environmental Economics in 1998. He and Drees Peter van den Bosch, who graduated

in Agrosystems Science in 1998, launched their business, Willem&Drees, in 2009. They make sure farm produce gets to local consumers. ‘Our products are now on the shelves in more than 300 supermarkets. There is a story behind every grower and producer, but you can’t tell that story in the supermarket. There is much more scope online.’ Customers can sit at home with their tablets on their laps and see where their products come from, Willem continues. In the ideal world envisaged by Willem&Drees, people eat mainly organic, regional and seasonal produce. Yet before this both partners worked in the food industry, a world of mass production.

EATING MAGNUMS

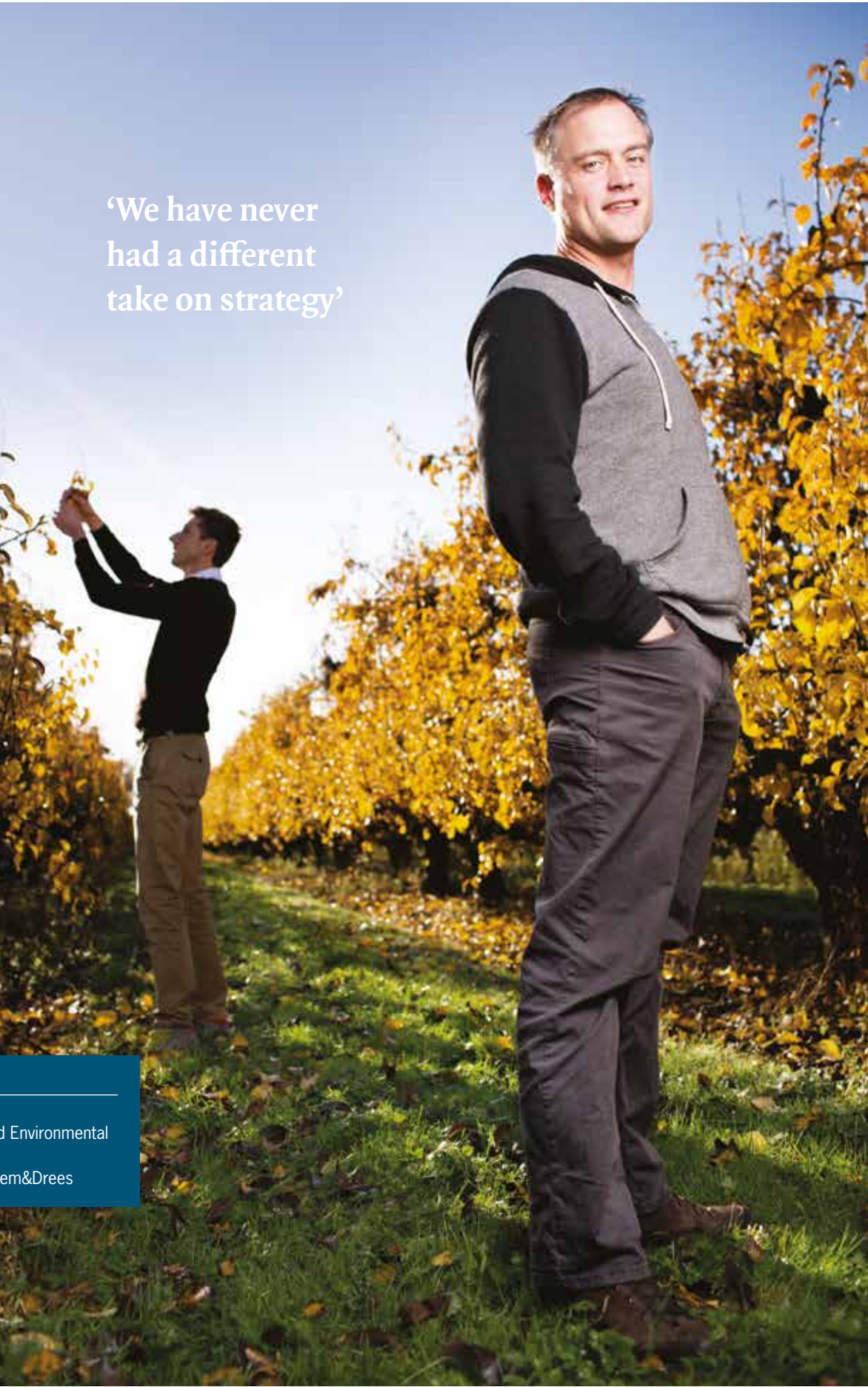
‘When my son was a year old I was promoting drinks containing half our daily requirements of fruit and vegetables. I said to my

wife, ‘I don’t want our child eating like this later. I started to think about food production and global food chains and about buying locally produced organic food,’ relates Drees. ‘I wondered what I could contribute in that area. Unilever is doing good work on sustainability but in my job I was mainly trying to get the Dutch to eat twice as many Magnums or drink three times as much Cup-a-Soup.’ Drees talked these issues over with his colleague Willem. They had not seen much of each other back during their Wageningen days. In 1993, Willem took over the room Drees had been living in. Drees had started one year earlier and they were following different programmes. What is more, Drees was a member of Ceres and Willem of KSV. So they only got to know each other properly during the three years they both worked at Unilever. Drees was doing the sales for Cup-a-Soup and Willem for Ola and Lipton Ice



**DREES PETER VAN DEN BOSCH****Age:** 40**Studied:** Agrosystems Science
1992-1998**Work:** Co-founder of Willem&Drees

‘It is important
that we feel a
connection with
our food’



‘We have never
had a different
take on strategy’

WILLEM TREEP

Age: 39

Studied: Agricultural and Environmental
Economics 1993-1998

Work: Co-founder of Willem&Drees

Tea. They regularly exchanged ideas over a beer. Willem: 'A bond developed between us that led to Willem&Drees. At Unilever I wanted to develop a food line in a developing country. The company does have projects in developing countries but things tend to move very slowly and laboriously. The urge to go into business ourselves became stronger and stronger.'

In 2008 they went to London to get some inspiration. There they found a lot of local produce on the supermarket shelves. They decided they wanted to be a link between regional farmers and shops selling fruit and vegetables. 'The Dutch supermarkets could see that people were interested in locally produced food, but they have a centralized system. They didn't know how to go about it. We saw a gap in the market there,' says Drees.

FILLING SHELVES

So they both resigned and Willem&Drees was born in January 2009. They first went to talk at the head offices of the supermarkets. 'Everyone thought it was a good idea, but they did say: you don't know anything about fruit and vegetables. First show us what you can do. In March it dawned on us that we had to start on a smaller scale,' says Drees. Willem asked whether they could fill a shelf at the Plus supermarket in Amersfoort for eight weeks with locally produced potatoes, fruit and vegetables. Nine other supermarkets in the region, including Spar and Jumbo, were eager to join in. Meanwhile Drees had got a few local farmers on board. And from 8 June, a minivan was driving around delivering their garlic, broccoli, cauliflower, lettuce, cabbage, strawberries and cherries to the participating supermarkets.

'We soon developed relationships with the farmers and the shops. And the consumer response was very positive,' says Drees. The next step was for Willem&Drees to expand to other regions. They borrowed more money and took on the logistics themselves. Willem: 'It grew from a nice little concept to an operational business with its own vans, drivers and order pickers.' The early years were enjoyable but hard going too. 'In the initial phase you constantly have

to prove you can do it,' explains Willem. If someone was ill, they had to drive or put orders together themselves. Asked whether they were ever despondent, Drees answers: 'That kind of period shouldn't go on too long of course. You realize that when you find yourselves sorting orders yet again on a Sunday evening.'

After a long phase of operational development Willem&Drees added bread, dairy products, meat and eggs to their range. The company is now growing by 30 to 40 percent per year and got out of the red for the first time in 2014. Willem&Drees now employs 60 people.

MORE OPEN AND HONEST

Drees's parents had a dairy farm. Drees: 'People in the farming business are more open and honest than those outside it. That has always appealed to me.' Even as a child, Drees was interested in food, and he wanted to know where the milk from the family's farm went. He also liked mathematics, physics and economics. So Agrosystems Sciences, with all the calculations involved in agricultural chains, was a logical choice of degree subject. And he still benefits from his degree, says Drees. 'When we set up the logistics flow for Willem&Drees, I was able to optimize it myself. And then the experience of putting together your own degree path and learning to work independently has stood me in very good stead in life.' After graduating Drees did a traineeship at Unilever, where he had previously done an internship. 'I was on the financial and logistics side but all I was doing was trying to cut costs and boost efficiency. Then I transferred to sales. To start with I sold soap, and in the end food.' Willem was brought up on the idea that he should use his talents 'to make the world a better place.' His father is a theologian and his mother a social worker. He wanted to study economics, but was averse to commerce. That was why he went to Wageningen and not to Rotterdam. He specialized in econometrics, marketing and development economics, doing an internship in that area in Honduras. He then did an internship at Unilever too, after which he opted for a traineeship with Heineken.

'I was a bit of an odd one out there as a Wageningen graduate; I didn't know what sort of suit and shoes I was supposed to wear. The company had a hierarchical corporate structure, but I learned a lot about myself there – things like your role in a team.'

Three years on, he was responsible for marketing the soft drinks Pepsi, Sisi and 7-UP, and for supervising eight people. 'I found that tough; I was only 26 years old. At some point I resigned and went travelling through Africa for 15 months with my wife.' On returning, Willem moved to Unilever, a company which was more active in developing countries.

SUPERMARKETS AND CATERERS

Since 2012, Willem&Drees has been on Dutch newspaper *Trouw's* Sustainable 100 list. *Trouw* picked Drees the first time in 2012, and it has stayed that way. 'My ambition is for us both to be on it,' laughs Willem. Within the business he still works with the supermarkets, caterers and consumers, and on the marketing. Drees mainly works with farmers and does the internal operations. 'We take the important decisions together. We keep each other on the ball,' says Drees. Willem adds: 'There is no argument on the big issues. Our capacities are in the same area and we are both innovators. We have been at it for six years now and we have never had a different take on strategy.' Willem sees Drees as a man of principles and vision. 'Drees keeps his eye on the goal.' In turn Drees says, 'Willem breaks things open, in terms of ideas but also on the marketing side, for example the national contract with Sodexo one and a half years after starting the company. He doesn't stop thinking and innovating.' Their ambition is not to grow as big as possible but to change the food chain. Drees: 'We make use of the efficiency of supermarkets, but we introduce local products and specialities into their range. That way we increase the diversity. It is important that people all over the world become less dependent on global food transportation and feel a connection with our food again.' ■

Alumni fight poverty, thanks to Anne van den Ban

Kondwani Khonje from Malawi and Steisianasari Mileiva from Indonesia both studied in Wageningen with the support of the Anne van den Ban Fund. Now they are both making a real contribution to the development of their country and the fight against poverty – one of the fund's main objectives.

TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY GUY ACKERMANS



KONDWANI KHONJE

'I have Wageningen University to thank for my multidisciplinary capacities'

'My focus is on improving food security in local communities. We promote sustainable intensification of agriculture,' emails Kondwani Khonje from Malawi. He is working on acquainting small farmers with innovations which raise their standard of living, improve food security and gender relations, and reduce the pressure on the ecosystem. Khonje did an MSc in Organic Agriculture at Wageningen between 2009 and 2011, with support from the Anne van den Ban Fund. He learned to develop sustainable farming systems for small, poor farmers, and was already working for a local NGO at the time. 'Most farmers in Malawi cannot afford artificial fertilizer or pesticides. With my Wageningen knowledge and skills I can train farmers in soil and water management techniques for improving soil fertility.' He also works with local communities on the use and management of communal and public land such as natural forests, common grazing grounds and water sources. Khonje: 'I have Wageningen University to thank for my multidisciplinary capacities.' Since May this year, Khonje has been working at Land Trees and Sustainability International Ltd, a British consultancy that is active in Malawi. As an agriculture specialist, he is involved in a management programme for the Shire river basin. The water is very important for farming, fisheries, electricity generation, transport,

‘The group work in Wageningen gave me confidence’

tourism and urban water supply. ‘Given the importance of the Shire basin for national growth and development, we should try to harmonize all those conflicting interests as well as possible,’ emphasizes Khonje. ‘What is more, it is important to tackle the causes of the degeneration of the environment and nature in the area.’ Khonje is committed to combatting poverty outside his job as well. He has just established an NGO for sustainable community development and climate adaptation, the Foundation for Building Resilient Communities. He also sponsors three students in Malawi, including a male student of agriculture and a female student of Community Development. ‘That is my contribution to combatting poverty through education. I see this as an indirect extension of the work of the Anne van den Ban Fund. It is an expression of my appreciation for what I am today, thanks to the fund.’

CONTRIBUTING TO THE DEBATE

For Steisianasari Mileiva from Indonesia too, her work is an extension of her Wageningen studies. She works as an analyst at Poverty Global Practice, in the World Bank building in Jakarta. She did an MSc in Development and Rural Innovation at Wageningen between 2009 and 2011, and benefitted from a contribution from the Anne van den Ban Fund. ‘That programme sharpened my skills for conducting social science research and contributing to the development debate,’ emails Mileiva from Jakarta. ‘I analyse not only figures and data but also processes, and I think up solutions.’

At Wageningen, Mileiva learned to develop user-friendly training materials and gained experience with qualitative research. In her day-to-day work she develops and delivers a training programme for poor households in Indonesia, Family Development Sessions (FDS), in collaboration with the Indonesian Ministry of Social Affairs and the National Planning Agency. Mileiva: ‘The programme helps the participants understand the importance of education and a sound upbringing for young children. It also offers book-keeping skills and skills for making a business plan for climbing out of poverty.’

Mileiva is also developing training programmes on poverty analysis for research institutes and thinktanks, as well as a conference on poverty and inequality. In this



STEISIANASARI MILEIVA

‘The programme stresses the importance of a sound upbringing for young children’

work she notices the benefits of her time in Wageningen in her interaction with colleagues. ‘The group work with different nationalities during my Master’s course has given me confidence in the collaboration with my colleagues in Jakarta, who come from Colombia, Italy, Australia and other places. ■

www.wageningenur.nl/annevandenbanfund

THE ANNE VAN DEN BAN FUND

The Anne van den Ban Fund offers financial support to promising students from developing countries so they can follow a Master’s programme at Wageningen University. The thinking is that well-trained and highly skilled experts can help solve the problems faced by their countries in the fields of agriculture, rural development and the environment. Besides their academic performance, students – most of whom already have work experience in their countries – are selected for their motivation to return. The fund was founded in 1992 by Anne van den Ban, who was then professor of Extension Studies. To date, the fund has helped more than 200 students, mainly from Asia and Africa, with supplementary support or a full bursary.

MEETINGS

Inspiring entrepreneurs

The focus of the alumni meeting in the Rotterdam/The Hague region on 5 November was entrepreneurship. It turned out to be a popular choice: a large number of fresh graduates attended the meeting, and for many of those present it was their first alumni gathering.

‘Curiosity, drive, self-knowledge and the right balance between daring and caution. Those are the most crucial qualities in an entrepreneur,’ said Jan Karel Mak. He is director of Deerns Group in Rijswijk, the Netherlands, a consultancy firm in the field of installation technology, energy and construction engineering. The company hosted this evening for alumni from the Rotterdam/The Hague region.

Mak graduated in 1983 with a degree in Environmental Health. He led Deerns through a cultural change at a time when it was still a hierarchical organization with a passive workforce. Now he told an audience of 75 about both the successes booked and



the failures – such as the first attempt at internationalization, when the takeover of a firm in Dusseldorf did not get off the ground. Born entrepreneur Glenn Nohar, who got his degree in Cell Biology in 1996, treated the audience to a resounding success story. He has built up and partially sold off two biomedical companies. He developed magnetic

pellets for isolating DNA and RNA, and he works on nano-pipetting, next generation sequencing and special software and hardware. ‘I look to see which challenges in the life sciences offer opportunities,’ said Nohar. He seeks to get hold of interesting patents and develop a business around them, with the aim of selling it on.

‘Inspiring’, was how the audience described Mak’s and Nohar’s stories. ‘The stories make you think, for example about how important it is to have the courage to decide for yourself,’ said Robert Stolker, who graduated in Plant Sciences in 2010 and now works as a plant breeder for Deliflor. He was attracted by the theme, to see what he should be more alert to in his work. Carolina Urrea Hernandez completed her MSc in Sustainable Agriculture in 2011 and, as an entrepreneur and knowledge broker in the Netherlands, wants to help develop new markets for arable products from her country, Colombia. ‘It was interesting to hear about failures as well,’ she commented afterwards.

www.wageningenur.nl/regiobijeenkomst5november

REUNIONS

‘We were the first baby boomers’

Their student days might have been only yesterday, so easily did the 144 ex-students at the reunion for the class of 50 years ago pick up the thread. Many of the alumni are still in touch with their friends from university days.

Fifty years ago the university went through a period of rampant growth not unlike that of the last few years. In 1964, 450 first-years – 64 of them women – suddenly registered at the then agricultural college, instead of the expected 200. ‘We were the first of the baby boom generation,’ says Maarten Vierhout (Tropical Irrigation). Fortunately the agricultural college had seen the growth coming. ‘The Dreijen campus was brand new when we started.’

Sietske van der Meer (Plant Breeding) and Gerrit Walstra (Agricultural Economics) both live at Nassauweg 13, later known as the ‘Under the Magnolia’ House. A mixed house and very jolly, they relate after the dinner in

the Forum in the evening. ‘Then I would come back from the bar (SSR) at six thirty and Sietske would make coffee while I read the newspaper aloud to her,’ Gerrit recalls fondly. ‘And you couldn’t take a bath because it was full of the washing-up,’ adds Sietske. Kees van Dijk is suddenly reminded of the Broekman practicals in Inorganic Chemistry. This compulsory first-year course was as much of a stumbling block as mathematics. ‘You had to find out which substances were present in a mixture. And then Broekman went through the results and called out, ‘Kerstens, correct, Van Dijk, wrong’, and you had to start all over again. After my first year I quickly switched to forestry.’



PHOTO GUY ACKERMANS

The alumni at the reunion raised over 1600 euros for a water-saving irrigation system for the hydrangeas at the Belmonte Arboretum. More information and photos of the reunion can be found at: www.wageningenur.nl/reunies50jaars

FUNDS

Learning from an American organic farmer

'Farmers must learn once again to cope with surprises from nature,' claims the famous organic farmer Joel Salatin. Student organization De Boerengroep (Farmers Foundation) were able to get Salatin to Wageningen thanks to the Wageningen University Fund (WUF).

'The Boerengroep foundation builds a bridge between science and farming practice, or in other words, between farmers and students,' says Caren Krul, the coordinator of the group. The organization's aim is to contribute to students' education through thought-provoking activities.

Thanks to the financial support of the WUF, they were able to get Joel Salatin to

Wageningen in May. The Times nominated Salatin the most innovative farmer in the world. His farm, Polyface Farm in Virginia, is an example of 'total farming', a holistic approach in which everything is interrelated. Soil, plants, animals and people... Salatin calls them all 'friends' sharing one nest. 'If we embrace the large ecological patterns and look after our nest properly, farming

delivers us more than we can imagine,' he told 500 students, scientists and farmers. Krul: 'Salatin shows how things can be done differently. He knows how to make money while respecting nature, and without using artificial fertilizer, pesticides or antibiotics.' Salatin's creativity made a big impression on her. He often scatters grains of maize in the barn, for instance. The pigs rootle around in the encrusted cow manure to find the maize. And this produces good, aerated manure.

www.wageningenur.nl/nl/donateurs.htm

NETWORKS



Sharing good memories in India

Meenakshi Kaul (fourth from left) got her PhD in Wageningen in 2010 and is now Wageningen UR's alumni representative in India. As the local contact person for India, she helps people with their choice of degree programme, and with preparations for studying in Wageningen, such as filling in forms. On 8 October she was in Bengaluru at an informal alumni meeting, which coincided with the visit of two student recruiters from Wageningen. 'The atmosphere was nice and the alumni were very positive about studying at Wageningen. The people there shared good memories,' says Kaul. 'They said they would like to come to future alumni meetings as well.' Work is going on to organize a follow-up to this alumni meeting. Masters.infowur@gmail.com

WAGENINGEN IN THE WORLD

Greetings from Mkuze!

Stef Stevens lived in Mozambique from 2006 until this summer, he writes in an email from his new home in New York. Fifteen years ago he and his wife Maaike Arts got to know Petrie van Gent and her husband Rob Ukkerman, when they were all working in Honduras. 'Since then we have been meeting up at all sorts of places around the world.' This year, Van Gent and Ukkerman, who live in Bonn these days, took a trip with their friends to Mozambique with Safari's Op Maat, a travel agency run by Geert van de Wiel and his wife Freya Adamszyk – another new generation of alumni.



From left: Geert van de Wiel (Biology 2007), Rob Ukkerman (Tropical Plant Breeding 1983), Petrie van Gent (Tropical Soil Science 1984) en Stef Stevens (Biology 1990).

PERSONALIA

Prof. Johan Bouma, WU Soil and Fertilization Sciences 1966, emeritus professor of Soil Science at Wageningen University, received the Soil Science Society of America's Presidential Award in California. 5 November 2014.



Prof. Johan Bouman

Prof. Klaas van Egmond, WU Food Technology 1972 and professor of Environmental Sciences at Utrecht University, has been awarded the 2014 Wubbo Ockels Brandaris Prize for improving sustainability in the broad sense of the term. 26 September 2014.

Prof. Louise Fresco, WU Rural Sociology of the Non-Western Regions 1976, chair of the Executive Board of Wageningen UR, has been appointed the chair of the expert group that will be evaluating the European Union's Seventh Framework Programme (FP7). 7 November 2014.

Jac van der Gun MSc, WU Land Development 1972, has been given the 2014 President's Award by the International Association of Hydrogeologists (IAH) for his contributions to the development of groundwater science. 16 September 2014.

Prof. Sander Kersten, WU Human Nutrition 1993, has been appointed professor in Nutrition, Metabolism and Genomics by Wageningen University. 11 September 2014.

Djûke van der Maat MSc, WU Landscape, Architect and Planning 2008, fruit grower and livestock farmer, has won the Innovation Prize for Women Farmers.

She was handed the prize for the most innovative woman farmer in Europe at the annual congress in Brussels of Copa-Cogeca, the European association of farming organizations. 7 October 2014.



Djûke van der Maat MSc

Dr Melanie Peters, WU Food Technology 1990, the director of General Studies at Utrecht, has been appointed director of the Rathenau Institute with effect from 1 February 2015.

Krijn Schretters, MSc student in Agrotechnology, came third in the Dutch National Judo Championships. 21 October 2014.

Dr Piet Simons, WU Zootechnics 1963, former president of the World's Poultry Science Association and Ambassador for the Dutch Poultry Centre, has received the 2014 Poultry Personality Award from the international poultry press for his international services. 21 May 2014.

Jelmer van Veen BSc, Master's student in International Land and Water Management, and **Priska Prasetya MSc**, WU Urban Environmental Management 2014, have won first prize in the 2014 Climate Adaptation Business Challenge with a business plan for water recycling stations in Vietnam. 25 September 2014.

Prof. Richard Visser, University of Groningen Biology 1984 and professor of Plant Breeding at Wageningen University, was awarded a Silver Medal by Wageningen University following his 100th doctorate. 29 September 2014.

Prof. Paul Vlek, WU Soil and Fertilization Sciences 1973, former director of the Center for Development Research at the University of Bonn, was awarded the GCHERA World Agriculture Prize for his achievements in training students and researchers and his participation in global collaborative projects. The prize of 50,000 dollars was handed to him at the Nanjing Agricultural University in China. 20 September 2014.



Prof. Paul Vlek

Dr Arnold van Huis, WU Plant Breeding 1974, professor holding a personal chair at the Laboratory of Entomology and co-author of the first insect cookbook, has retired. 20 November 2014.



Dr. Arnold van Huis

Dr Peter Zuurbier, WU PhD 1984 and Wageningen International Account Manager for Latin America, is retiring. 1 January 2015.

AWARD



Student competition for Global Development

A team of three students from Wageningen and one from Utrecht have won the Battle of Ideas organized by WOTRO Science for Global Development, part of the Netherlands Organization for Scientific Research (NWO), with their innovative idea 'Back to the basics: establishing a trade by barter food network with dried fruits and vegetables in Nigeria'. Each team member was awarded 1500 euros. The photo shows the three Wageningen team members Oluwaseyi Alalade, Camilla Ponte and Lavinia Plataroti and Marisol Amador from Utrecht University.

RANKING

Alumni in Trouw's Sustainable 100 for 2014

With input from readers of Dutch daily newspaper *Trouw*, 13 experts have put together the annual Sustainable 100 list, a ranking of people who have made a significant contribution towards a more sustainable Netherlands over the past year. The top 100 includes 12 Wageningen alumni and PhD candidates. In order of ranking:

- 14 Sjoerd van de Wouw**, WU Biology 1997, campaign leader at animal rights organization *Wakker Dier*.
- 21 Prof. Klaas van Egmond**, WU Food Technology 1972, on the board of Princess Irene's *NatuurCollege*, faculty professor of Geosciences and special professor of Environmental Sciences at Utrecht University.
- 23 Prof Rene Wijffels**, WU Environmental health 1987, head of Centre for the Biobased Economy at Wageningen University and scientific director of research centre *AlgaePARC*.
- 26 Jan Paul van Soest**, WU Environmental Health 1982, Energy consultant and author of *De Twijfelbrigade*.
- 46 Dr Ruben Smit**, WU PhD 2002, ecologist and nature photographer, maker of the film *De Nieuwe Wildernis*.
- 63 Dr. Willem Brandenburg**, WU Plant breeding 1987, seaweed cultivation researcher at Wageningen UR.
- 68 Drees Peter van den Bosch**, WU Agrosystems Studies 1998, cofounder of *Willem&Drees*, distributors of local fruit and vegetables.
- 72 Dr Christine Absil**, UU Biology 1988, PhD WU in Marine Toxicology 1993, marine biologist, introduced a sustainable fish label *Goede vis op de kaart*.
- 85 Reinier van den Berg**, WU Environmental Health 1986, meteorologist and presenter, founder of TV company *Ecoland.tv*.
- 92 Fred Wouters**, WU Forestry 1981, director of society for protection of birds *Vogelbescherming*.
- 97 Liset Meddens MSc**, WU International Development Studies 2011, coordinator of Fossielvrij NL campaign.
- 99 Prof. Louise Fresco**, WU Non-Western Rural Sociology 1976, chair of executive board of Wageningen UR.

IN MEMORIAM

W.M. Aarts MSc, WU Food Technology 1975, passed away at the age of 67. 8 August 2014.
J.C.A.M. Bervaes MSc, WU Forestry 1972, passed away at the age of 66. 2 September 2014.
J.G. Bluemink MSc, WU Agricultural Plant Breeding 1957, passed away at the age of 87. 18 June 2014.
F.H. Borms MSc, WU Domestic and Consumer Studies 2000, passed away at the age of 43. 18 September 2014.
A.L.H. Daemen MSc, WU Food Technology 1974, passed away at the

age of 64. 10 October 2013.
Prof. D.B.W.M. van Dusseldorp, WU Tropical Rural Economics 1955, passed away at the age of 83. 18 October 2014.
W.H. Feteris MSc, WU Tropical Forestry 1951, passed away at the age of 90. 14 August 2014.
A. Gaberšek, WU MSc student of Environmental Sciences, passed away at the age of 29. 14 October 2014.
A. Kadijk MSc, WU Agricultural Plant Breeding 1956, passed away at the age of 87. 29 September 2014.

J. Lammerink MSc, WU Tropical Rural Economics 1950, passed away at the age of 90. 29 September 2014.
Prof. W.H. van der Molen, WU Agricultural Plant Breeding 1948, passed away at the age of 91. 30 July 2014.
M.F.H. van Moorst MSc, WU Land-Use Planning Sciences 1999, passed away at the age of 50. 10 May 2014.
B. Westenberg MSc, WU Landscape Architecture 1952, passed away at the age of 91. 11 November 2014.



Wageningen Dialogues

KLV wants to stir up public debate

The time is ripe for a 'new enlightenment', said Louise Fresco at the opening of the academic year. With this she was referring to the gap between science and society: "We must find a new way of engaging society in the development of knowledge." Her call for a 'Wageningen Dialogue' fits seamlessly in the findings of KLV following the KLV2020 review process. KLV will help to shape this dialogue over the coming year. Jannemarie de Jonge and Paul den Besten talk about this new course and the collaboration with the university.

"The KLV2020 review process revealed that members think KLV has an important role to play in fuelling and leading the public debate", says KLV board member Jannemarie de Jonge. "Of course we already did that. Our lecture series *Wereldlezingen* is a successful formula and in the anniversary symposium 'How to feed our world' we showed what Wageningen's role in the world could be. This whetted people's appetites and now we want to make even more effort in this respect." "And", adds Paul den Besten, "if you are talking about the public debate around Wageningen themes then, to put it mildly, there is certainly room for improvement. I think that as Wageningen UR we need to take a broader look at the public context and what current issues are and that we need to involve other groups and target audiences in this."

Mindset

That fits in the current mindset. "I see more and more well-informed dialogues taking place", says Jannemarie, "for example about protein consumption and



Jannemarie de Jonge



Paul den Besten

production, what that means for the global food issue and the significance of this for agriculture in the Netherlands. You can see that in newspapers, TV programmes, on a platform such as Foodlog, and in discussion evenings in the Rode Hoed in Amsterdam. The infrastructure for this dialogue is increasingly diverse and interwoven thanks to the old and new networks in which people meet. I think it is fantastic that the discussions taking place are less driven by emotions and increasingly based on specific knowledge. Of course different viewpoints will remain based on people's values but on platforms such as Foodlog you can no longer get away with making unfounded statements."

Close to the source

In a nutshell, the time has come for Wageningen to connect with and contribute to this public debate, thinks Jannemarie. "As a scientific institution Wageningen UR is one of the first parties to know about new discoveries and their opportunities or threats for society. So I think we have the moral duty to put these on the agenda at an early stage as well."

Dare more

"I think that we need to go out on a limb

more", adds Paul, who will also help shape KLV's contribution to this ambition. "People's confidence in science is under pressure and we must find ways to talk more with the outside world so that we can cultivate more trust. Not from the position of 'we have the facts' but with due consideration for people's concerns." And what does that mean in practice? Paul has some initial ideas. "Go and talk with the obesity association. What are their concerns? How do they view Wageningen? Or enter into a dialogue with the Amsterdam canal ring area, where - to put it bluntly - the idea exists that mass-produced food is unhealthy. I think we need to do something about genetic modification because since politicians banned it, the subject has become taboo. But that is merely sticking our heads in the sand. Why don't we talk more constructively about it?"

Networks and study circles

KLV is ideally suited to contribute to the dialogue. "We have a tradition of study circles and networks. These function as focus points around certain themes with people who care about their discipline and understand it", says Jannemarie. "Such themes are ideally suited for fuelling the dialogue and shaping it." Especially as 'inside' and 'outside' are interwoven. "That is a fine aspect of our network: well-informed people who differ in opinion on the basis of their values. And who are citizens as well. All of this gives rise to a valuable dialogue, and rightly so."

High on the policy agenda

Last spring, KLV devised a joint project with Wageningen UR to improve the in-



FOTO DOLFI DEBROT

Reforestation on Bonaire repairs damage done by wild goats

Dolfi Debrot, a Caribbean ecologist at Imares Wageningen UR, is working on reforestation on Bonaire. He is collaborating with the nature organization STINAPA to restore the nature area around Slagbaai to its former glory. The first step is to catch and sell the goats that have run wild and live in the area. Then volunteers plant young bushes and trees from nurseries elsewhere. This means a new chance for a dozen native hardwoods, such as the West Indian satinwood (yellow-heart), which is at risk globally. 'These

trees will not grow back of their own accord as there are no more viable seeds in the soil,' explains Debrot. 'The intention is not to cover the entire area with new plants. Instead, we are putting in a few trees at suitable spots. If they produce seeds, reforestation will take off without any further help.'

This approach has already been shown to work on Klein Bonaire, a small uninhabited island off the coast. It now has fruit-bearing trees and bushes that attract birds, as it

did in the past. The native, fruit-eating, scaly-naped pigeon is back on the island after decades of absence. These birds help spread the seeds further. 'Reforestation is good for nature,' says Debrot. That makes Bonaire more appealing to tourists, not just on land but also at sea. The trees prevent the soil from being washed into the sea during rainstorms to quite the same extent. And that is good for the mangrove forests and the coral reef. ■

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