

WAGENINGEN WORLD

MAGAZINE OF WAGENINGEN UR ABOUT CONTRIBUTING TO THE QUALITY OF LIFE

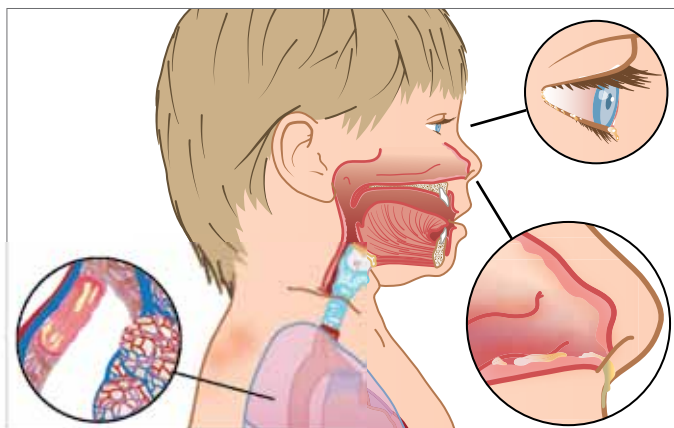
nr.3 2011



**'Agriculture has only
become cleaner and
more productive'**

Rudy Rabbinge, page 22

Methane emissions can be cut | Between **patent law** and breeders' rights | **Detecting bacteria** fast
New: **farming at sea** | **Gene bank seeks wild spinach** | Tackling **allergies** through the immune system



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TIPPING THE ALLERGY BALANCE

The number of allergy sufferers has tripled in the last fifty years. The Allergy Consortium Wageningen is looking for a way of restoring balance to an overactive immune system. 'We want to re-educate the immune system through a controlled use of dirt.'

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RUDY RABBINGE, BELIEVER IN PROGRESS

Frénk van der Linden and Pieter Webeling take a whistlestop tour of the life and work of Rudy Rabbinge, who will soon be bowing out as professor of Sustainable Development and Food Security. 'The end of hunger. I believed in that.'



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AND THE COWS KEEP ON BURPING

Big reductions can be made in agriculture's contribution to the greenhouse effect by improving animal feeds. The farmer stands to benefit and so does the south. 'It could make a world of difference there.'



COLOPHON Wageningen World is the quarterly magazine for associates and alumni of Wageningen UR (University and Research centre) and members of KLV, the Wageningen Alumni Network. A PDF version of the magazine can be found at www.wur.nl/UK/publications/Periodicals **Publisher** Wageningen UR, Viola Peulen, **Editorial Board** Paul den Besten, Hans Bothe, Ben Geerlings, Wilbert Houweling, Lotte Kerkhoven, Jeanette Leenders, Francine Loos, Jac Niessen, Judith Pierik, Helene Stafleu, Erik Toussaint, Brenda van der Zee **Editors-in-chief** Gaby van Cauil (Editor-in-chief Resource), Pauline Greuell (Corporate Communications Wageningen UR) **Magazine manager** Miranda Bettonville **Magazine editor** Rik Nijland **Alumni news** Alexandra Branderhorst **Translation** Catharina de Kat-Reynen, Clare McGregor, Sara van Otterloo, **Language editor** Clare McGregor **Art direction and design** Jenny van Driel (Wageningen UR, Communication Services) **Cover picture** Corbis **Overall design** Hemels Publishers **Printer** Mediacycenter Rotterdam ISSN 2210-7908 **Address** Wageningen Campus, Akkermaalsbos 12, 6708 WB Wageningen, PO Box 409, 6700 AK Wageningen, telephone 0317 48 40 20, wageningen.world@wur.nl **Change of address alumni** www.wageningenalumniportal.nl **Change of address associates** (mention code on address label) wageningen.world@wur.nl **Change of career details** alumni@wur.nl

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, Wageningen University, and Van Hall Larenstein University of Applied Sciences. These institutions have joined forces to contribute to finding answers to crucial questions related to healthy food and a 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, PPO, Wageningen UR Livestock Research, Central Veterinary Institute, Wageningen UR Food & Biobased Research, IMARES and RIKILT.



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A field lab has been bobbing about on the Eastern Scheldt estuary since the summer. The idea is to get to grips with the principles of marine farming. 'There is space enough at sea.'

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It will soon no longer be possible to apply for a patent on plant characteristics, if it is up to the Dutch parliament. And not everyone is pleased at the prospect. Read the views of Ben Tax from Rijk Zwaan, Gerard Meijerink from Syngenta, Anke van den Hurk from Plantum and Niels Louwaars from CGN.

SYNERGY

28 Michel Klerks of Innosieve developed a quick test for detecting bacteria. He worked together with ex-colleague Jan Bergervoet of Plant Research International. A fertile collaboration.

BIODIVERSITY

30 Chris Kik from the Wageningen gene bank travelled to the Caucasus to collect wild spinach seed: fresh input for spinach seed producers. He brought back 8 boxes containing 53 sachets of crushed plants.

RUBRIEKEN**40 LIFE AFTER WAGENINGEN**

Eric de Deckere and Anne-Marie Ruiter both graduated in Environmental Management 25 years ago. Ruiter is now putting the finishing touches to her fashion collection. De Deckere left academia last year to join a harbour company.

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PHOTO GUY ACKERMANS

Opportunities in Africa

'It is ethically imperative to send food aid to the Horn of Africa, even if it is not clear whether it will always reach the people who need it. Somalia does not have a government in overall control; the country is in chaos and there is widespread fighting. Such things are the underlying causes of the famine. The serious drought in the region is extremely unfortunate but is nevertheless a secondary factor. A properly functioning government could have been prepared, considering drought occurs in this region roughly every ten years. When southern Africa was hit by repeated rain shortages in the nineteen nineties, the population did not starve because the grain silos were full.

'There are plenty of opportunities in Africa for enhancing agricultural productivity, as long as approaches are locally appropriate. The continent is politically and culturally diverse, with many different agro-ecological zones and production systems. There is no sense in promoting one-size-fits-all plans everywhere – whether organic farming for instance, or the new green revolution – although governments and aid organizations find that hard to accept.

'But like farmers everywhere, African farmers can only improve production if they have access to markets and can buy things like fertilizer and appropriate seeds at the right time. As economic development picks up speed, farms tend to get bigger; that happened in the past in the Netherlands and also in North and South America. Africa is still at a stage in which land is further sub-divided into small parcels. Population pressure increases and farmers repeatedly divide their land among their children, which eventually makes sustainable farm management impossible. This process can only be reversed if alternative employment is created in other sectors and we have to question whether agriculture is the driver or beneficiary of general economic growth. All in all, if we at Wageningen want to contribute to development in Africa, it is vital that we tailor our support to the local context.'

Prof. Ken Giller, professor of Plant Production Systems, Wageningen University

NEMATOLOGY

Worms one kilometre underground

Roundworms, including a new species, have been found more than one kilometre underground in a South African mine. Up to now only single-cell organisms have been found so deep underground. The water the nematodes were found in has been under the ground for more than 3,000 years. Researchers at Wageningen University have been working on the discovery, which was published in *Nature*. Info: hans.helder@wur.nl

AGRICULTURE

Fertilizer waste costs millions of tons of grain

China could meet its own growing demand for food and livestock feeds if the available fertilizer was better distributed over the whole country, says a study by Xiaobin Wang of the Chinese Academy of Agricultural Sciences (CAAS) and agrotechnologist Willem Hoogmoed of Wageningen University.

In the wealthy east of China, arable farmers spread far more fertilizer on their fields than their crops can absorb, polluting groundwater and the air as a result. If the surplus were distributed in the poorer agricultural areas in the west of the country, China would harvest an extra 52 million tons of grain. That is 10 percent of the total Chinese production and 40 percent of what the EU produces.

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NATURE



Rescue plan for garlic toad

Inbreeding and isolation pose a threat to the garlic toad, which may disappear from the Netherlands within five years, in spite of investments in its habitat over the past ten years. Several organizations, including Alterra, part of Wageningen UR, have therefore put their heads together to draw up a rescue plan. An introduction programme has been started and the first nursery-bred toad larvae were released into existing populations in June, to give them a helping hand. Info: fabrice.ottburg@wur.nl

CONSUMER & BEHAVIOUR

Wary of test-tube meat

Yuck! That is often the first reaction to the idea of test-tube or cultured meat. This is because people assume that in-vitro meat has been tampered with using genetic manipulation techniques. Their disgust often diminishes once they realise that no intensive livestock farming or genetic modification is involved. This has been shown by research by the Agricultural Economics Institute LEI, part of Wageningen UR. The technique with which muscle tissue is cultured from animal stem cells is still under development. Research in the early stages into public acceptance of cultured meat will help scientists develop a product which appeals to people. Info: cor.vanderweele@wur.nl



PHOTO: "DRESSING THE MEAT OF TOMORROW", BY JAMES KING

BIOBASED

Large-scale algae farming in Wageningen

Since June, algae have been bred on a semi-industrial scale on the Wageningen campus. The algae are a sustainable source of fuel, proteins and vitamins.

Several different breeding systems are being tested at the Algae Production and Research Center, or AlgaePARC. The aim of the research is to increase the production of algae in reactors while slashing the cost price at the same time.

The algae grow on sunlight, carbon dioxide and minerals in 25 square metres of Plexiglas tubing and in a conventional pond. The nutrients are sourced from agro-industrial waste flows and fumes (CO₂). This means the nutrient ring is closed, and cleaner water and oxygen are the by-products.

The biomass produced by the algae in salt water is harvested, dried and substances such as oils, proteins, starch and pigments are extracted from it. These are the raw materials for biodiesel, biodegradable plastics, natural colourings, livestock feeds and food products. Potential locations for intensive algae farming include desert areas, floating systems at sea, road

verges, roofs and polluted sites. So the cultivation of algae does not compete with the production of food crops.

The AlgaePARC was launched on 17 June, along with the BioSolar Cells programme it is part of. This five-year programme, of which Wageningen UR is one of the initiators, is aimed at strengthening the scientific basis for the sustainable production of bio-energy and foodstuffs by making more efficient use of the biological process of photosynthesis. The programme will also look at artificial systems for fuel production such as artificial leaves, and at improving the efficiency of photosynthesis in plants.

There are 9 knowledge institutes and 25 industrial partners taking part in BioSolar Cells, which is financed to the tune of 42 million euros by the ministry of EL&I, the NWO, knowledge institutions and the business world.

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PLANT BREEDING

Superspud

After many years of puzzling over it, the genome of the potato has been unravelled. It took new techniques and a specially developed potato variety. Knowledge of the hundreds of millions of building blocks that make up the potato genome make it easier to find desirable characteristics such as the genes for resistance to diseases and pests. The initiator was Wageningen UR's Plant Breeding expertise group. The genome was published in July in *Nature*.

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HORTICULTURE



Wageningen UR partner Horti Fair

Wageningen UR is a gold partner at this year's Horti Fair, the biggest international trade fair on technology, innovation and inspiration in horticulture. The gold status is due to the importance of knowledge transfer in the horticulture sector, one of the most innovative and economically important sectors in the Netherlands. Staff at Wageningen UR will be contributing to thematic seminars, presenting important innovations at the trade fair and representing green degree programmes at the Careers Plaza.

Rector magnificus Martin Kropff is due to speak at the opening conference, which, like the trade fair, takes water as its key theme. The Horti Fair will be held from 1 to 4 November at the Amsterdam Rai.

Info: www.hortifair.nl



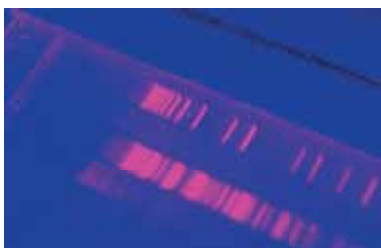
PHOTO HANS WOLKERS

More sensitive DNA test

Thanks to a new technique, it is now possible to conduct a reliable DNA analysis using quantities that are 1,000 times smaller. The technique was developed by Luisa Trindade of the Plant Breeding chair group at Wageningen University, part of Wageningen UR, together with French and Chinese researchers.

In the currently standard analyses, DNA fragments get missed and copies of copies are made. The new method, called LinDA, does copy all the DNA fragments and only copies from the original piece, thanks to a piece of DNA from a virus. LinDA makes it possible, for example, to research small quantities of stem cells, tumour tissue in the early stages or archaeological animal tissue. The method is also suitable for use on vegetable matter, to find out, for example, which plant genes are responsible for resistance to a fungus.

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CONSUMER & BEHAVIOUR

Health push

How can you give consumers a nudge in the right direction, so that they buy sustainable and healthy products, without limiting their freedom of choice? Does a better position on the supermarket shelves help, for example? The ministry of EL&I has asked Wageningen UR Food & Biobased Research, Wageningen University and other parties to answer these questions. The various potential stimuli will be tested in station kiosks and care institutions. Info: rene.dewijk@wur.nl



GM crop is just as sustainable

Genetically modified crops are not necessarily any worse for the environment than conventional food agricultural crops, says a study by Plant International and the LEI, both part of Wageningen UR, together with the research and advisory bureau CREM BV and Aidenvironment.

Very few genetically modified (GM) crops are grown in Europe, but the Netherlands does import a lot of livestock feed (soya and maize) from GM crops in countries such as Brazil and the US. The ministry of EL&I wanted to find out whether GM crops score lower on sustainability criteria than conventional livestock feeds.

The researchers looked at the environmental impact of crops with built-in herbicide tolerance and of GM crops that produce the insecticide Bt. By growing Bt cotton, farmers can save on insecticide, making this cotton more environmentally friendly than conventional cotton. But the factor that makes the biggest difference to the environmental impact is how environmentally aware farmers are: in other words whether they really use insecticides sparingly and are economical with water and fertilizer. The increase in the yields of Bt cotton compared to conventional cotton can vary from 0 to 83 percent. There are also big differences across the globe: the average yield

per hectare in Australia is 5.5 times that of Burkina Faso.

Another GM crop that proved to be no worse for the environment than its conventional counterpart is Roundup Ready, a soya variety that is resistant to the pesticide glyphosate. It is true that the crop is sprayed with glyphosate, but conventional crops are sprayed with harmful pesticides too.

This GM soya is no better, however, because eventually the weeds become resistant to glyphosate and farmers increase the amounts they spray on the crops. When it comes to water consumption, the differences between conventional and GM soya are negligible. Moreover, both types of crop contribute to deforestation in the Amazon region. If the Dutch government aims at sustainability, it is more useful to distinguish between different farming systems and regions than between genetically modified crops and conventional ones.

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NUTRITION & HEALTH

Diet does help prevent heart attacks

Eating the right fatty acids really can help prevent a heart attack, claims a study by Wageningen University, part of Wageningen UR.

To keep your risk of a heart attack low, the best thing you can do is to say no to meat, dairy produce, cakes and biscuits as often as possible and to eat more plant-based foods, with a serving of fish at least once a week. The Wageningen study analysed the results of nutrition tests done over the past forty years, in which saturated fats were replaced by polyunsaturated fats. The results were published in the British

Journal of Nutrition. The study contradicts last year's controversial publication in *The American Journal of Clinical Nutrition*, which denied any correlation between saturated fat and heart attacks. It turns out that the estimates of the intake of saturated fat in the studies analysed for this article were unreliable.
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ENVIRONMENT

Doing more with African garbage

In many African cities the garbage workers cannot keep up with the growth of the garbage dumps. A Wageningen pamphlet provides insight into how to make better use of garbage locally.

In Africa, very little organic waste gets used for animal feed, energy or compost. And yet soils are being depleted by drought and exhaustion. Managing organic waste separately is not usually one of the tasks of the municipal authorities. Wageningen UR has compiled a brochure in order to give policymakers, local advisors and entrepreneurs

more insight into the possibilities for sustainable, affordable, effective and efficient waste management in East African cities. The pamphlet provides three examples of compost production for agriculture in Kenya and Malawi. A fourth case profile describes the potential for the production of biogas from urban waste. The researchers conclude that there is substantial scope for adding value to Africa's organic waste, as long as the private sector and the advantages for the individual are given a central role.

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ENTOMOLOGY



Head for the mouth first, then the feet

Malaria mosquitoes track people down using the carbon dioxide they breathe out, and then swerve to head for their sweaty feet. The re-routing to the feet occurs because odours on the skin block the carbon dioxide signal and activate other olfactory receptor cells, causing the bloodthirsty mosquito to turn its attention to the signals coming from sweaty feet. This discovery was made by doctoral researcher Remco Suer of Wageningen University. It may be possible to apply this distraction technique in odour traps for mosquitoes.

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Not such fool's gold

Pyrite is known as fool's gold, but the ore really does contain gold. And Wageningen University doctoral researcher Alex Hol found a sustainable way of extracting the gold from pyrite. The trick is to break down the crystal lattice, releasing the gold. Standard techniques release sulphuric acid, which you cannot do much with. Hol therefore made use of bacteria which convert the sulphide in pyrite (FeS_2) into hydrogen disulphide (the rotten egg gas). This can easily be reduced to elemental sulphur. Info: alex.hol@wur.nl



NUTRIGENOMICS

'Dead' vaccine is effective too

Vaccines made from dead bacteria can be just as effective as those made from live pathogens, as long as you add genetic material from live bacteria to them. This has been demonstrated by an international team of researchers.

Through experiments in which they killed off bacteria in various different ways, the researchers, who included Wageningen University nutrition professor Michael Müller, discovered that messenger RNA ensures that the immune system recognizes and remembers the pathogens.

Vaccines made from dead bacteria generally cause fewer side effects than do live vaccines. Info: michael.muller@wur.nl

Superscanner for nutrition research

An MRI scanner of the very latest model was installed at the Gelderse Vallei hospital in Ede in May. The full-body scanner, which cost 2.5 million euros, was the first big investment by the Centre for Advanced Technology Agrofood.

An MRI scanner creates a powerful magnetic field and registers changes within it. It can show for example how the stomach processes different kinds of fibres, or how fats and proteins are digested. Companies can use this sort of knowledge to improve products or develop new ones.

The department of Human Nutrition at Wageningen University intends to use the apparatus for sensory tests and fat measurements, among other things. The Gelderse Vallei hospital wants to use the scanner for diagnosing patients. Other parties will also be able to make use of the new MRI scanner.

The Centre for Advanced Technology AgroFood is an initiative of Wageningen UR, the business world and the province of Gelderland. Its aim is to provide researchers and the business world with

better access to the latest micro- and nanotechnology. The research centre purchases equipment and makes it available for use at a fee.

In 2009, the then minister of Agriculture, Nature and Food (LNV) and the province of Gelderland put up 18.8 euros between them for four years, to give new impetus to research on healthy diets and new food products and processes. Thanks to the Gelderland Valley Food Alliance, the collaboration between Wageningen UR and the Ede 'nutrition hospital', supplementary equipment was purchased to go with the scanner. There is an olfactometer that registers aromas and an advanced beamer system with which you can record the effects of external stimuli such as food and pictures of food on the satiety response in the brain.

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The new MRI scanner at the Gelderse Vallei hospital.

PHOTO BART DE GOUW

NATURE & LANDSCAPE

Companies keen to support nature

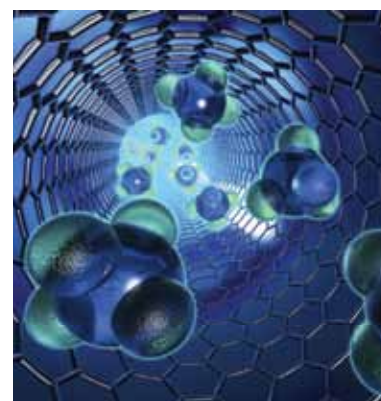
Now that the Dutch government is cutting its spending on nature, nature organizations would do well to look into what private companies could mean for them. Because businesses are quite willing to collaborate and to contribute funding through such initiatives as joint communications and making use of each other's image, knowledge and network of consumers and

clients. This finding came out of research by the LEI, part of Wageningen UR. A good example of such collaboration is the establishment of the Platform for Biodiversity and Business in which Dutch companies and more than 30 nature organizations have joined forces to look for ways of combatting the loss of biodiversity.

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CONSUMER PERCEPTIONS



Consumer not interested in nano

Thanks to nanotechnology, coffee creamer now dissolves better in coffee, but few consumers are aware of what this technology entails, and therefore few have an opinion on it. This has become clear from research by Wageningen UR Food & Biobased Research. The government is investing a lot in nanotechnology. Clear communication could prevent public discussion – which is almost non-existent to date – from focussing exclusively on the risks. Info: daniella.stijnen@wur.nl

CONSUMER BEHAVIOUR

When do consumers make sustainable choices?

The market share of sustainable food is only 2.5 percent. Yet 15 percent of consumers claim to place a high value on animal welfare, fair trade, naturalness and eco-friendliness. This came out of the first voedselbalans (food balance) drawn up by the LEI, part of Wageningen UR, which was published in May.

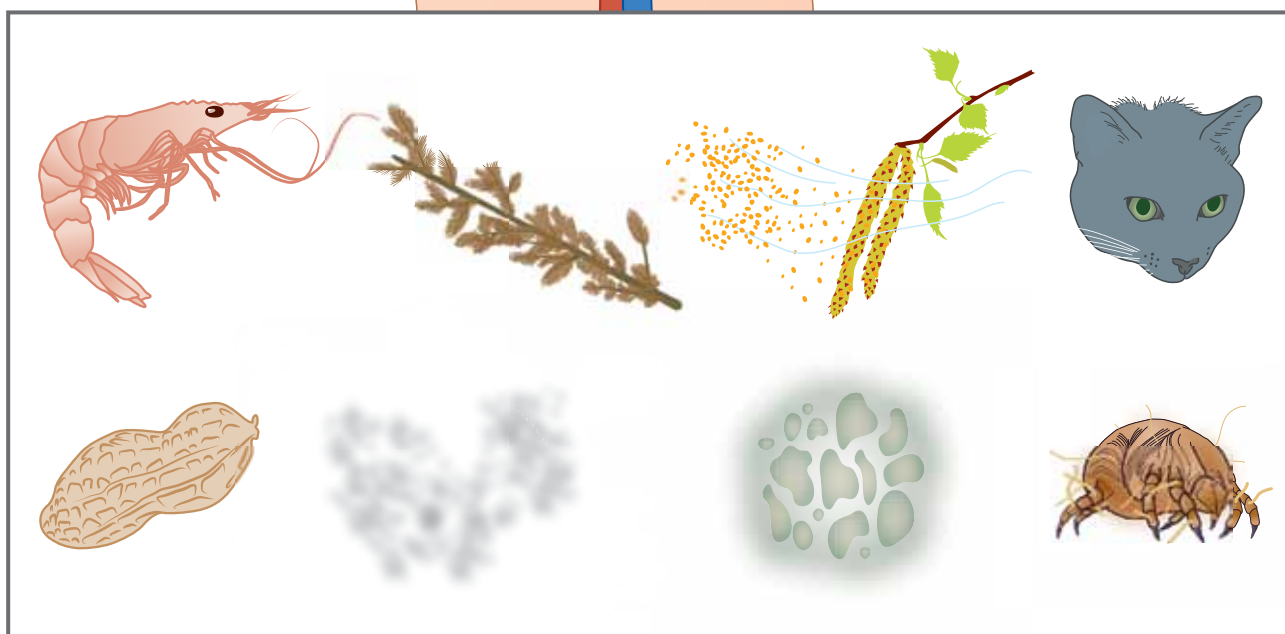
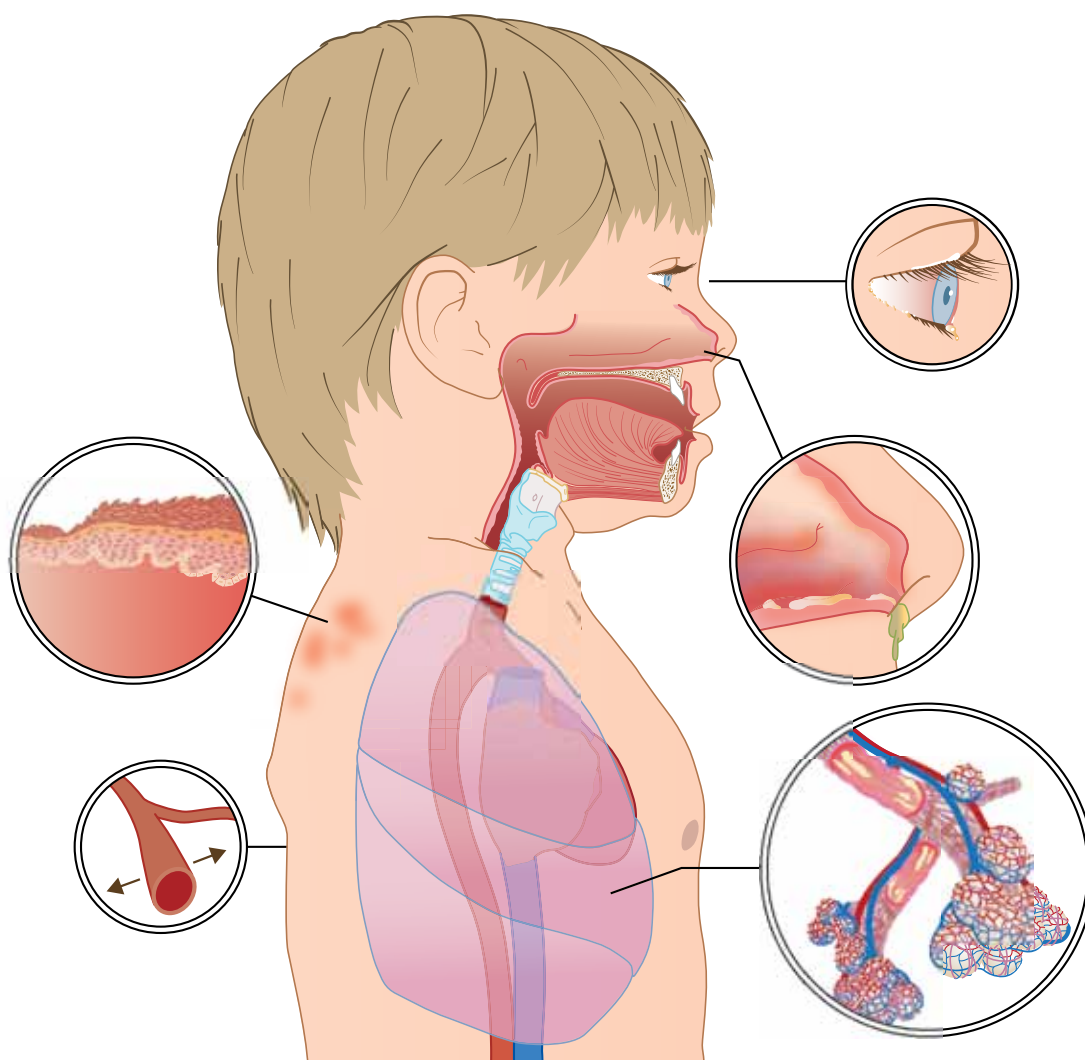
The voedselbalans describes the choices made by consumers and companies and the factors that are important in creating a system in which food is produced with respect for the environment, people and animals. There will be regular updates to the voedselbalans.

The fact that consumers' behaviour does not match their values is explained by the way purchases are often based on habits that relate to other factors. This habitual behaviour can be influenced by things

like attractive packaging for sustainable products, developing tasty products, and placing them prominently on the shelves. Increasing social pressure stimulates the purchasing of sustainable food too. Companies have put sustainability high on their agendas, but they pay more attention to the environment than to animal welfare. Consumers, however, generally care more about animal welfare than the environment.

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Tipping the allergy balance

The number of allergy sufferers has almost tripled in the last fifty years. We can only guess at the reason for this. The Allergy Consortium Wageningen helps patients to avoid allergens, and searches for ways to restore balance to overactive immune systems. TEXT ASTRID SMIT ILLUSTRATIONS MAARTJE KUNEN AND WAGENINGEN UR, JENNY VAN DRIEL

It started when Marijn was about two', says Jiska Beelen about her son, who is now eight. 'At a particular time of year, somewhere in spring, he would start to scratch his face open, especially round his eyes. "Perhaps it's hay fever", a neighbour suggested. Our doctor thought that was unlikely. "Hay fever is most unusual in children under four", was his reaction. But it turned out that Marijn did have hay fever. Since then every spring – when the birch, poplars and grasses bloom – we go through the same thing. In May and June this year, when the weather was gorgeous, the hay fever was really bad. We had to sit inside with the doors and windows closed for days.' Marijn is not the only one. About 25 to 30 percent of the Dutch population is allergic to substances in the air or in food, says Harry Wichers, professor of Immunomodulation at Wageningen UR Food and Biobased

Research. 'That's two to three times as many as fifty years ago.' The number of people with respiratory allergies, such as hay fever and asthma – the most common allergies – has risen in particular. And the sufferers are getting younger. Twenty to thirty years ago hay fever did not affect children until they reached 15. Now four-year-olds are affected, and in exceptional cases younger children too, like Marijn.

TOO CLEAN

Many factors are believed to be the cause. The most dominant seems to be the vastly improved levels of hygiene, Wichers thinks. Towards the end of the 1980s, the British scientist David Stachan introduced the idea that our lives are too clean. As a result, children are not exposed enough to fungi, bacteria, worms and parasites, so their developing immune system doesn't get a

chance to toughen up. If it then encounters an alien substance in food or in the air, the immune system can go into overdrive. Jean-François Bach, a French scientist, suggests that it's also related to the intensive vaccination programmes in most western European countries, and the increasing use of antibiotics. He points to a graph which shows how the decline in infectious diseases such as measles, mumps and tuberculosis between the 1960s and 1980s was accompanied by an increase in asthma and auto-immune diseases – where the body turns against its own immune system – such as diabetes 1, Crohn's disease and multiple sclerosis. But climate change (more pollen in the air as temperatures have risen), increased air pollution, changing infant nutrition (less breastfeeding, delayed introduction of solid food), the increase in the number of >

caesarean births (the birth canal is full of microbes), changing diets (more ready meals, more spicy and exotic food), lack of exercise and increased stress (which weakens the immune system) are all in the dock too.

NOT ENOUGH STUDIES

So there are plenty of suspects and many correlations, but scientists are still unable to pinpoint the culprits. The Netherlands Institute for Public Health and the Environment made a detailed survey of the literature on food allergies last year and was able to draw one clear conclusion: it is not at all certain which factors lead to an increased risk of food allergy. There are too few reliable studies and many of them contradict each other. When it comes to respiratory allergies you can draw the same conclusion, Wichers believes. 'We really don't know what causes them. We have our suspicions though, and that's why there's so much research being done.' Nine institutes at Wageningen UR, united in the Allergy Consortium Wageningen, are engaged in allergy research. Their activities include helping allergy sufferers to avoid allergens, trying to make certain foods less allergenic, and searching for faster and better tests and diagnostic tools. In addition, they are trying to find out how an overactive immune system can be brought under control. These efforts have already led to some useful results.

Together with Leiden University Medical Center, the Environmental Systems Analysis Group at Wageningen University, part of Wageningen UR, developed the *AllergieRadar* for hay fever sufferers. This website is rather

like the weather radar sites that show where rain is due, but instead of indicating rainfall it shows which pollens are prevalent, in what quantities, and how long they are likely to remain a problem. This gives hay fever sufferers a better idea of what they can expect.

Plant Research International, another part of Wageningen UR, has bred two apple varieties – Elise and Santana – for people who are mildly allergic to apples. The Food Process Engineering Group has developed wheat bread that people with gluten intolerance will be able to eat in the future. The gluten has been replaced by milk protein globules, which gives the bread a similar structure to that of ordinary bread. In addition, RIKILT (part of Wageningen UR) designed a test for rapid detection of twelve different allergens – in nuts, eggs and milk. This makes it much quicker and easier to check foods such as biscuits and chocolate for allergens. Working on restoring equilibrium in an overactive immune system – immunomodulation – requires more long-term work. Nevertheless, Wichers, who heads this project together with Huub Savelkoul, the head of the Cell Biology and Immunology Group at Wageningen University, is optimistic that products will be developed that will benefit allergy sufferers. 'We think we're going to be able to readjust the immune system in the right direction, so that people react less strongly to allergens and hopefully even overcome their allergies.'

SEESAW

Wichers reaches for a piece of paper and draws part of the immune system. It resembles a seesaw, with Th1 cells on one side and

Th2 cells on the other. In a mature system, these immune cells – which keep the unwelcome intruders out through a complex system – are supposed to be in equilibrium, Wichers explains. A baby, however, has more Th2 cells than Th1 cells, so the seesaw tips towards the Th2 side. If a young child catches enough infections from all sorts of different pathogens, more Th1 cells are produced, the seesaw achieves balance and the immune system reacts in the right way to intruders in the future. 'If a child is not exposed to enough infections, the immune system will continue to tip to the Th2 cell side and the risk of developing allergies is greater, we think', says Wichers. 'The Th2 cells are overactive and therefore they also attack the wrong – innocent – intruders.' The solution is to restore balance to the seesaw, Wichers says: 'But not by exposing people to infections they didn't have as children. Hygiene is a good thing, and has helped us come a long way. No, we are planning on re-educating the immune system through a controlled use of dirt'. 'We think we can do this by using parts of fungi and other microbes, and also using bacteria such as *Lactobacillus* and *Bifidobacterium*, both of which are used in probiotic drinks.'

A number of studies indicate that these microbial components or bacteria have favourable effects on allergies. A Japanese study has shown that people who are allergic to cedar pollen obtain relief from certain microbial sugars; a Chinese study has demonstrated that fungal proteins help reduce dust mite allergy in mice. And a Finnish study has proved that the incidence of eczema is reduced by half in children that are given probiotics in their bottle-feed and whose mothers had also been given probiotics two weeks before giving >

'We really don't know what causes allergies'

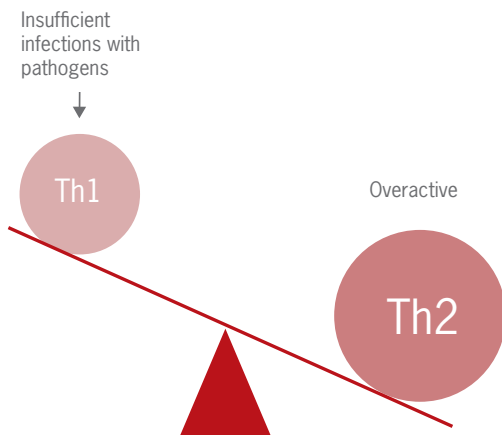
ALLERGY

Overactive

An allergic reaction is an excessive response by the immune system to harmless substances in the environment, such as pollen in the air or proteins in bread. After the initial contact with the substance the body starts making antibodies. After repeated contact the allergic reaction kicks in: the minute these substances, now called allergens, enter the body of an allergic person, antibodies spring into action and bring the 'intruder' into contact with 'mast cells'. These then produce substances such as histamines to eliminate the intruder. It is the histamines that cause the allergic reactions: a runny nose, puffy eyes, diarrhoea, vomiting or eczema.

Immune system

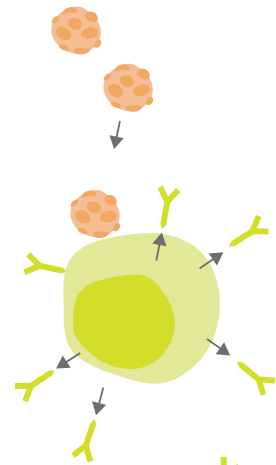
In a mature immune system the immune cells Th1 and Th2 are in balance. In babies there are more Th2 cells than Th1 cells. As the child is exposed to enough infections with everyday pathogens, the Th1 cells multiply and bring the system in balance. However, if there is not enough exposure to infections, the immune system remains dominated by Th2 cells. These cells are overactive and prone to attacking the wrong – harmless – intruders.



Allergic reaction type I

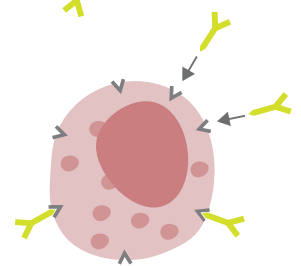
1

At the first contact with 'intruders', plasma cells make antibodies



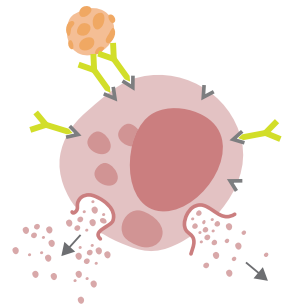
2

The antibodies attach themselves to mast cells



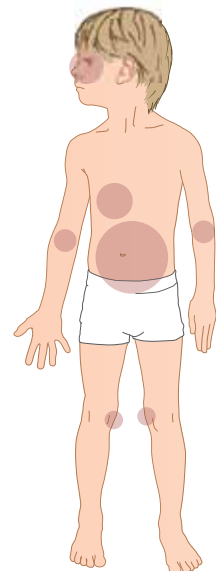
3

When the next contact with 'intruders' takes place, they attach themselves to the mast cells via the antibodies. The mast cells release their contents – histamines and other hormones – onto the intruders



4

The released histamines and other hormones cause allergic reactions



ALLERGIES IN THE NETHERLANDS

Patient numbers

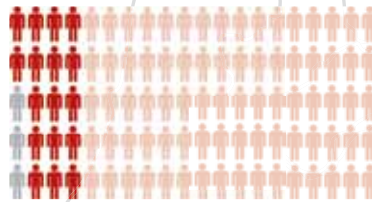
In 2008: **1,200,000** people with allergy symptoms

Respiratory tract allergies



Adults

20%



Asthma



Adults

3%



Children

4-6%

Food allergies



Adults

2-3%



Children

5-7%



Costs

Estimated costs of allergy attacks per year

€ 2,000,000,000

birth, compared with a group given a placebo. The problem is that there have been negative as well as positive results. Probiotics in particular – which have been the subject of much research – are yielding a diffuse and unclear picture. At the start of June this year, Yvonne Vissers, who is doing PhD research under Wichers and Savelkoul, announced that she had obtained positive results with probiotics. One strain of *Lactobacillus* is suitable for reducing markers, substances that indicate hay fever, Vissers wrote in her dissertation. But this conclusion – which had been formulated in a press release as: Probiotics can help wipe out allergies – came under heavy fire from Hans van Maanen, a columnist in the national newspaper *de Volkskrant*. Van Maanen believes that the groups of test subjects in

Vissers' research were too disparate to warrant the conclusions she drew. But Wichers argues that Visser's conclusion is much more nuanced. Moreover, the results have been published in peer-reviewed scientific journals and seven experts approved her dissertation.

The effect of probiotics on allergies is not only a source of controversy between journalists and the scientific community, but among academics themselves too.

Wichers: 'I think that in future we have to select the bacteria strains we use more carefully. Five years ago we thought that all strains were pretty much the same, but we now know this is not the case. In my opinion, this explains the contradictory results.'




















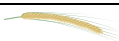
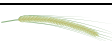


















Wichers is convinced the future lies in im-

munomodulation. 'But we still have a long way to go.' If immunomodulation does turn out to work, this form of therapy has one big advantage. 'It's likely to be effective against a broad spectrum of allergens because you intervene at a very fundamental level in the immune system. And that's good news for patients, because they usually react to more than one allergen.' The disadvantage for allergy sufferers – and the advantage for manufacturers – is that they may well have to take immunomodulators for the rest of their lives. The minute they stop, the immune system's seesaw will tip out of balance again.

TRICKY BREEDING

Wichers reckons that immunomodulation has more to offer than technological solu-

CROSS-ALLERGIES

If allergic to:		Risk of an allergic reaction to at least one of the following:				Risk (%)
A pulse	 Peanut	Other pulses	 Peas	 Lentils	 Beans	 5%
A nut	 Walnut	Other nuts	 Brazil nut	 Cashew	 Hazelnut	 37%
A fish	 Salmon	Other fish	 Swordfish	 Sole		 50%
A shellfish	 Shrimp	Other shellfish	 Crab	 Lobster		 75%
A grain	 Wheat	Other grains	 Barley	 Rye		 20%
Cow's milk	 Cow's milk	Goat's milk	 Goat			 92%
Cow's milk	 Cow's milk	Horse's milk	 Horse			 4%
Pollen	 Birch  ambrosia	Fruit, vegetables	 Apple	 Peach	 Melon	 55%
Latex	 Latex gloves	Fruit	 kiwi	 Banana	 Avocado	 35%

Sources: National Public Health Compass of the RIVM, Health Council, Allergy Consortium Wageningen

‘We want to re-educate the immune system through a controlled use of dirt’

tions such as breeding new varieties of allergenic food crops. ‘Apples are really the only product that is easy to breed, because they only contain one allergen, and the allergy is a mild one that is not life threatening. Most other foods that humans are allergic to contain a set of allergens. That makes breeding tricky. Other methods of

getting rid of allergens such as heating are not effective. Most allergens are impossible to destroy.’ Margreet van Putten, who obtained her PhD last year in the Marketing and Consumer Behaviour Group at Wageningen University, part of Wageningen UR, agrees that eliminating allergens from foods is unlikely to

work, but for a different reason: allergy sufferers are extremely cautious. They are not prepared to risk trying a product that may contain minuscule traces of allergens, and therefore tend to avoid new products like this. Only people with mild allergies are likely to benefit from these. For the time being, Marijn’s parents resort to a homeopathic remedy. ‘We manage to keep his hay fever under control with this, which helps us to get through the season without too much trouble’, says his mother. ‘But we’d welcome other solutions.’ She looks outside. ‘We live opposite a park with lots of birch trees. I can imagine that at times some hay fever sufferers feel like taking an axe to the trees or would like to move house. It’s really hard going sometimes.’ ■

SUSTAINABLE SEAWEED

Farming at sea

Seaweed grows rapidly, is extremely nutritious and can be cultivated sustainably at sea. Since this summer, a floating laboratory has been bobbing about in the Eastern Scheldt in an attempt to learn the first principles of sea farming. TEXT AND PHOTO HANS WOLKERS



This seaweed has grown almost a metre in four weeks.' Seaweed researcher Julia Wald holds up a large piece of brownish sugar kelp, a seaweed growing on ropes suspended from a floating frame in the Eastern Scheldt. Four of these seaweed rafts tied together form the modest field station where Wageningen researchers are studying seaweed cultivation. It's not much fun working here today; there's a force-five wind blowing, which has transformed the Eastern Scheldt into a rough sea with white-tipped waves and the field station is being tossed about. The next rope that Wald hauls up is almost empty. 'Two weeks ago there were still big pieces of sea lettuce, about thirty

centimetres', she says. 'Maybe the current has torn them off.' The researchers are not disappointed though. 'This way we learn a bit more each time', says the project leader Willem Brandenburg with a laconic smile. The driving force behind the project, Brandenburg is a man with a mission. He regards seaweed cultivation as the solution to the world's food problem. In forty years' time the global population will be nine billion. To feed all those mouths we need to double food production. In the seaweed researcher's view, conventional agriculture just isn't an option. It is unsustainable because of excessive use of fertilizer and because nature is being destroyed to make way for agri-

culture. Brandenburg sees far more potential in sea farming. 'There's plenty of space at sea', he states. 'On top of that, seaweeds grow very fast and contain as much as 25 per cent high-quality protein.' This can be processed in food, but also in animal feed. He has calculated that we would need much less space to provide the entire world population with protein from sea farming than from conventional farming on land.

PURIFYING EFFECT

At present, over 90 per cent of all seaweed cultivation takes place in Asia, but it is taking its toll on the environment. Inefficient application of large quantities



Researcher Julia Wald and project leader Willem Brandenburg on the floating algae farm on the Eastern Scheldt.

of fertilizer results in high yields, but the surrounding coastal ecosystems are being destroyed. Brandenburg and his team, from Plant Research International, part of Wageningen UR, are focusing on environment-friendly seaweed cultivation for which they intend to make use of nutrients that have already made it to the sea as a result of human action. More than thirty million tons of phosphates are discharged from rivers into the world's seas each year. A sea farm near the mouth of one of these rivers doesn't need extra fertilizer. Seaweeds absorb these nutrients and thus purify seawater. Because of this purification effect Brandenburg sees potential in using sea-

'There's plenty of space at sea'

weeds as bio-filters in fish farms. Sea lettuce, for example, is ideally suited for integrated culture of fish, or crustaceans, and shellfish. This seaweed absorbs the nutrients that are released from the fish excrement. It can work the other way too: you

could protect corals from excess nutrients by building a ring of seaweed cultivation systems around vulnerable reefs.

The opportunities for seaweed cultivation in the Netherlands are excellent, according to Brandenburg. A number of indigenous edible species grow well in the conditions here. By making clever use of the fact that different seaweeds grow at different depths, a sea farmer can increase production by growing crops in layers. 'Sea lettuce is a green seaweed that absorbs mainly red light. You need to grow this kind in shallow water, as red light does not penetrate very deep', explains Brandenburg. 'Brown and red seaweeds, such as oarweed and sugar kelp, absorb green and blue light from the spectrum, and as these two colours penetrate to greater depths it's possible to grow these seaweeds further down.'

LEARNING TO HARVEST

Before the first commercial sea farmers can start, a lot more water will have to flow through the Eastern Scheldt. Learning to grow seaweed is the first step; efficient harvesting and partial processing at sea are the next hurdles. Brandenburg and Wald think that large-scale cultivation will have to be done mainly on the open sea, as space is limited in coastal areas. Making use of oil drilling platforms and wind parks at sea would be an ideal way to farm seaweed. But the problem there is that you don't have the nutrients that wash into the sea from rivers. 'You could deliberately introduce seaweed cultivation in estuaries where you want to improve water quality', says Wald.

Both researchers are also focusing on the economic aspects of seaweed cultivation. It is possible to process seaweed biomass as a whole, but extracting its components – proteins, sugars and fats – individually yields a better price per kilogram. This will require new bio-refining techniques. 'But sustainability is at the top of the list of criteria', Wald stresses. 'Without sustainable sea farming there'll be no seaweed cultivation.'

Info: willem.brandenburg@wur.nl ■

Rights and wrongs

Do patents on plant traits hinder innovation? Or are they indispensable for safeguarding the intellectual property of plant breeders?

TEXT MARION DE BOO ILLUSTRATION IEN VAN LAANEN PHOTOGRAPHY JACQUELINE DE HAAS

The global trade in vegetable seeds is worth roughly 3 billion euros per year, on a market dominated by about ten big players, including three Dutch plant-breeding companies. That market changed dramatically in 2004, when it became possible to patent not only new methods and techniques but also live material. Already 150 patents on vegetable traits have been applied for or granted in Europe. Patents have been granted, for example, on resistance to mosaic virus in capsicum and on resistance to aphids in lettuce. Previously, breeders' rights were in force, which meant that plant breeders were free to use existing varieties to develop and select new hybrid varieties. 'The new patent law makes our work extremely complicated', says Ben Tax, director of breeding company Rijk Zwaan, a large family-run business in De Lier. 'You could be far advanced in a breeding programme before finding out that a patent application is pending for one of the parent plants, because these applications are not immediately made public. And then it can take years before it becomes clear whether the patent will be granted. This means years of uncertainty. After that you have to start negotiating the terms of a possible licence, a permit to make use of the parent plant, and the patent holder can sometimes demand very high royalties.

So you don't know in advance which plants you can still use for breeding purposes.' This is why the Dutch Parliament has asked State Secretary for Agriculture Bleker to take measures in both the national and the European contexts to ensure that breeders can go back to making use of all plant material in their breeding programmes, through a broad breeders' exemption (see box). 'This exemption is extremely important for preventing monopolization and safeguarding the global food supply', believes Tax.

NO TIME TO RECOUP

Not everyone agrees with this standpoint. 'Patent law plays a very important role in plant breeding, especially when it comes to protecting broadly applicable innovations', says external relations manager Gerard Meijerink from Syngenta, a multinational that has taken over breeding company Zaadunie in Enkhuizen, among others. 'If you come up with a new disease resistance that you've been working on for some 20 years and that is commercially very interesting, within three or four years it's likely to be present in every one of your competitors' commercial varieties', says Meijerink. 'Then you don't have enough time to earn your money back. That's why we are in favour of patents on plant characteristics, as long as

they are genuinely innovative. Some patents granted 10 to 15 years ago would not be considered innovative today.'

At the end of May, the Dutch Parliament debated with State Secretary Bleker about revising the patent law. The Wageningen report *Veredelde Zaken*, commissioned by the then Ministry of Agriculture, Nature and Food Quality (LNV), informed the debate. 'The many patent applications inhibit innovation', says Niels Louwaars of the Centre for Genetic Resources, the Netherlands (CGN), a part of Wageningen UR, and co-author of a report suggesting that plant breeding companies need more lawyers than breeders on their staff these days. State Secretary Bleker has agreed to revise the Dutch patent law as requested by the Dutch parliament. He will also meet with European colleagues to discuss whether the expanded breeders' exemption can be implemented within the EU. Breeders would then be free to develop hybrids using existing varieties and to introduce these new varieties onto the market. 'Our study shows that the patent law together with technological developments in the field of biology contribute to the current concentration in the plant breeding sector and constitute a threat to future innovation', says Louwaars. 'Particularly the current use of the patent law, which results in large ➤



numbers of far-reaching patents, is causing problems.’ Recommendations in the Wageningen report include revising the law and regulations, increasing the quality of patents and improving patenting procedures. ‘We are pleased that Bleker agrees’, says Louwaars. ‘France and Germany also already have a breeders’ exemption. Competition and profitability in the breeding sector are crucial for the sustainability of the food chain. Farmers and gardeners – including those in developing countries – benefit from competition on the seed and planting material market.’

‘If Dutch patent law is revised, as Bleker has promised, breeders will once again be free to

BEN TAX,

director of plant-breeding company Rijk Zwaan

‘You don’t know in advance which plants you can still use.’



use patented material in their hybrids’, says Anke van den Hurk of Plantum, the association for the Dutch plant reproduction material sector. ‘But with the limited breeders’ exemption a licence will still be required to commercialize the resulting varieties, so we are not quite there yet. We do by the way support the idea of patents to protect innovative techniques or methods. But biological material must remain freely available for breeding.’ According to Van den Hurk, the value of such a broad breeders’ exemption has been demonstrated since the nineteen forties.

‘Our government representatives now have to gather support for the Dutch standpoint among their European colleagues, because our members are international companies.’ ‘Plant-breeding is the basis of the food supply, adds Rijk Zwaan director Tax. ‘A handful of companies now control a large segment of the market in this sector. It’s very important to preserve sufficient competition and biodiversity. That’s what the breeders’ right is for. Our sector has thrived thanks to this right, which offers sufficient protection for plant varieties. In creating the EU biotechnology directive in the late nineties, legislators underestimated how many patents on plant traits breeding companies would apply for. Wageningen professor Rudy Rabbinge, a Labour Party senator at the time, warned against this. Now the politicians have to fix the problem.’

Taking advantage of the most advanced molecular techniques, large corn-breeding companies now put every new maize variety that enters the market through a DNA scanner to check whether it might contain any DNA patented by the company itself. If any are found, damage suits will follow.

Louwaars: ‘For this reason breeders are now afraid to use any crossing material that does not originate from their own gene pool, out of fear that it may be patented by someone else; this restricts innovation and progress. Patent offices are incidentally becoming more reluctant to grant broad patents.’

Large breeding companies invest 15 to 25 per cent of their turnover in research and development. New plant varieties tend to be successful for three to seven years, until a successor takes over that is even better at



GERARD MEIJERINK,

external relations manager of plant-breeding company Syngenta

‘We are in favour of patents on plant characteristics, as long as they are genuinely innovative’



ANKE VAN DEN HURK,
senior policy staffmember
sector organization Plantum

**'Biological material must remain
freely available for breeding'**



meeting producer and consumer demands. In that short time span the plant breeder has to make a profitable return on investments. This is why the breeders' right has been in effect since 1941. According to this law, plant breeders can use existing varieties for the development of new varieties. Thanks to this broad breeders' exemption, the best varieties are constantly being improved.

A patent is granted for 20 years, calculated from the application date. But according to Syngenta, the breeding company often cannot start recovering its investment until ten years later, when the first variety with the patented trait enters the market. In practice patent applications are submitted as soon as possible, sometimes even before the first test hybrids are created. This is very different from the breeders' right, which is valid for 25 years from the time the new variety enters the market.

According to Meijerink from Syngenta, good patent protection is crucial for innovation in many sectors and especially for the leading sectors of food (agri-food) and horticulture, which are expected to play a pivotal role in Dutch innovation. 'Innovation needs the stimulus of good patent protection to enable companies to continue making the high annual investments. At Syngenta we invest more than one billion dollars each year in research and development. 'We are looking for a solution based on the motto "Free access, but no access for free". You have to be free to use patented material for breeding, but if you introduce new varieties onto the market, you have to pay for the patents used. Clear rules have to apply so that all parties know what is allowed and how to proceed – negotiations between breeders and patent holders are now often very time-consuming. Incidentally, the

possibility to protect innovations through patent law and to earn back research money in this way is an interesting source of income for universities and institutes as well.'

According to Rijk Zwaan director Ben Tax, patent law is not needed to safeguard breeders' incomes. 'Thanks to the breeders' right, this sector has been highly profitable for the past 70 years; that system has proven itself. Plus, advances in biotechnology have made it possible for us to improve our varieties faster and with more precision. The development period for a variety has decreased from 10-20 years to 6-12 years. Effective use of biotechnology has made our work cheaper, not more expensive.' ■

NIELS LOUWAARS,
senior policy staffmember CGN

**'Plant breeding companies should
almost be employing more lawyers that
plant-breeders'**



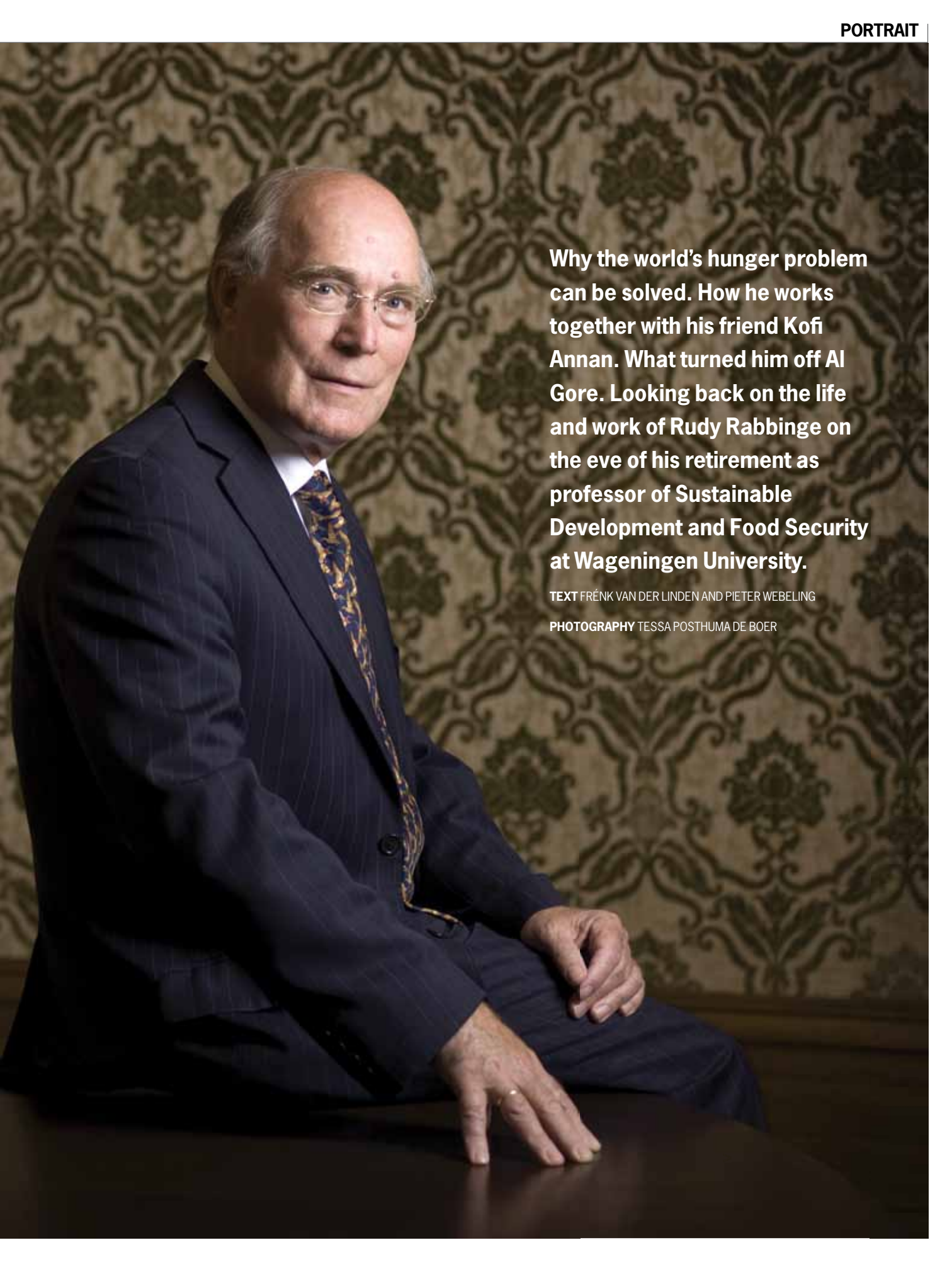
THE RIGHT TO BREED AND THE RIGHT TO PATENT

EU legislation allows for the patenting of plant characteristics, doing away with breeders' rights to use existing plant varieties to develop new ones. Following years of controversy, the Dutch State Secretary for Agriculture Henk Bleker agreed in May to a limited breeders' exemption so that new plant breeds can now be freely developed. But to market their new breeds, breeders must still apply to the patentholder for a licence. The Dutch parliament has therefore asked for a broad breeders' exemption covering marketing as well.

The background image is a photograph of an interior space, likely a study or library. It features walls covered in a dense, repeating damask or floral pattern in a light beige or cream color against a darker background. In the foreground, a wooden table with a light-colored top and dark legs is partially visible. On the table, there are some indistinct objects, possibly books or papers. The lighting is soft and somewhat dim, creating a quiet, contemplative atmosphere. The text is overlaid on the upper left portion of the image.

RUDY RABBINGE, A BELIEVER IN PROGRESS

**‘You think:
dammit, this
cán’t be allowed
to happen’**

A portrait of Rudy Rabbinge, an elderly man with glasses, wearing a dark blue pinstripe suit and a patterned tie. He is seated at a dark table, looking towards the camera with a slight smile. The background is a wall with a complex, repeating damask pattern in shades of brown and gold.

Why the world's hunger problem can be solved. How he works together with his friend Kofi Annan. What turned him off Al Gore. Looking back on the life and work of Rudy Rabbinge on the eve of his retirement as professor of Sustainable Development and Food Security at Wageningen University.

TEXT FRÉNK VAN DER LINDEN AND PIETER WEBELING

PHOTOGRAPHY TESSA POSTHUMA DE BOER

Professors are not known for their self-criticism; have you ever been completely wrong about something?

With a twinkle in his eye: 'That is indeed a very difficult question.'

There is silence for ten seconds.

'Like every professor I suffer from bias, and sometimes I get it wrong. In the eighties and nineties I got it completely wrong. I thought that scientific progress would help rid the world of hunger relatively quickly. I was far too optimistic. At the start of this century at the United Nations we formulated the Millennium Development Goals for 2015. Goal number one was "No more hunger". I believed we could achieve this, but nothing has come it, not even of the aspiration. Now I'm involved in an attempt to bring about a green revolution in Africa. I'm very positive about it, but maybe I'll be wrong again.'

'Rudy Rabbinge is a hopeless optimist', some of your colleagues say.

'I have heard naïve optimist too. But I don't base my expectations on faith alone. Knowledge and understanding are also important, as well as our past achievements. In the course of the twentieth century, the world population increased sixfold, but we managed to increase world food production by seven times. So now there is more food available per head of population.'

Yet there are now more people suffering from hunger; more than one billion already.

'Yes, it's terrible! That's one of the main reasons for me not to give up. I hope for improvement. I'm a real believer in progress.'

...

You come from a farming family in the province of Drenthe. Both of your grandfathers were mixed farmers. Is there still a farmer in Rudy Rabbinge?

'I know how to milk a cow. I learned that long ago from my uncles. But it always took me ages; my fingers aren't very strong. The farm where I live, on the land where my

ancestors started in 1600, is now property of Het Drentse Landschap. Production is now secondary to nature and landscape conservation, where the focus is on maintaining certain types of flora and fauna. I'm not a particularly hands-on person, but I do still have a great affinity with agriculture. I opted to be involved in it through science.'

...

Imagine you are president of the world for a day, with unlimited power and financial means. What would be the ideal measures you would take to solve the problem of hunger?

'The idea of one man being in charge is unacceptable, but putting that aside... In the first place I'd make sure that agricultural development in Africa gets a strong boost, by providing good inputs such as seed, artificial fertilizer and machines, by extending credit, especially to women, and by developing local markets. The leit-motif is: greater food security, more people able to take care of themselves.

'In addition, I would want to solve all sorts of political disputes that cause so much trouble. Take the water shortages that are threatening the world, for example. Ethiopia, Sudan and Egypt are fighting over the water of the Nile. Mali and Burkina Faso are in conflict about the Niger. In Mozambique, Zambia and other countries they're squabbling about the Zambezi River. I would create regional water boards to ensure fair distribution of water.

Now you're preaching about what Africa should do with the Nile and the Niger, but the Netherlands can't even manage to sort out the conflict with Belgium about the river Scheldt and whether or not the Hedwige polder should be flooded.

'Yes, yes, you're right. If you make a commitment, you should stick to it. Otherwise it has serious political consequences. You can imagine how difficult it'll be in Africa.'

...

'The Netherlands is losing its reputation as a country that stands for justice, solidarity and tolerance' says Agnes van Ardenne, former Christian Democrat minister for development cooperation. Is she correct in saying that the Netherlands is losing its position in the international pecking order?

Resolutely: 'Yes. That's absolutely true. I'm always being asked about this. Kofi Annan, former secretary general of the UN, says to me: "What's the matter with you

**'An end to hunger –
I believed in that'**



RUDY RABBINGE

Dr. Rudy Rabbinge is University Professor in Sustainable Development and Food Security at Wageningen University in the Netherlands. He holds degrees in Phytopathology, Entomology, Theoretical Production Ecology and Philosophy of Science from Wageningen Agricultural University.

Rabbinge is a chair of the High Level Panel of Experts of the Commission on Food Security of the United Nations. Also he is a member of the board of the Alliance for a Green Revolution in Africa (AGRA) and chairman of the Council for Earth and Life Sciences of the Royal Academy of Sciences. Rabbinge also serves on the boards of various international agribusiness firms.

Formerly he was a chair of the board of trustees of two CGIAR centers (Consultative Group on International Agricultural Research) and chairman of the Science Council of the CGIAR. He was also chair of the Inter-Academy Panel on Food Security and Agricultural Productivity in Africa and deputy chairman of the IFDC board (International Soil Fertility Development Centre).

Rabbinge is a former member of the Senate of the Netherlands Parliament and chairman of the Board of Trustees of the Royal Tropical Institute. Rabbinge has led various missions and agricultural programs in developing countries and served as editor of several journals.

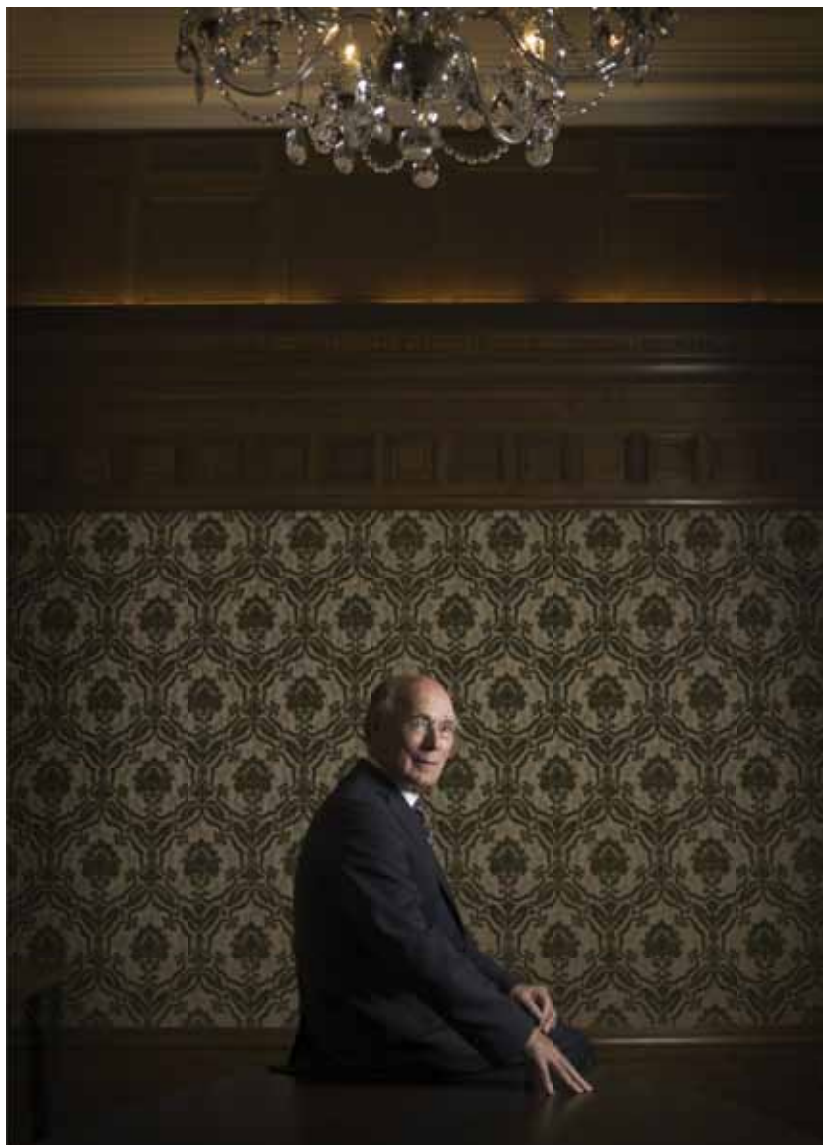
lot?’ He’s referring to the incitement to hatred and the anti-Islam stance of Geert Wilders’ PVV, and to the extreme nationalism and the negative attitude towards Europe and the rest of the world. I share your concern, I tell him, but the majority of the Dutch are not like this. Fortunately there are still lots of people who do have an enlightened view of the world. And they still have the upper hand.’

■ ■ ■

International top dogs are often far from ecologically responsible. Who lacks integrity here?

‘I think Al Gore is a typical example of someone who doesn’t practise what he preaches. He has a pretty flamboyant lifestyle: look at how he lives and how he travels. If you’re always going on about the environment... and then just look at the fees he commands. He asked 900,000 dollars just for giving a half-hour introductory speech at some meeting or other in Rotterdam. Even if that money went to climate research, I still find it unacceptable. I’ve gone right off him.

‘But it doesn’t have to be like that. Three months later one of the speakers invited for the opening of the academic year at our university in Wageningen withdrew. I called Kofi Annan. Even though he had all sorts of other commitments I managed to persuade him to come. Then we called the Queen, who was very friendly and said, ‘he must stay with me.’ The Royal Family put their security service and a car at my disposal so I could collect Annan from Schiphol airport. First we went to the Prime Minister’s office for a talk with Balkenende, and then we drove on to Wageningen. Annan paid for his own flight and charged nothing for speaking. As he said, “I’m doing this as a good turn.” So when the local newspaper asked me how much his visit had cost, I said, nothing. They didn’t believe me.’ >



Suddenly there's a serious famine in the Horn of Africa. Are we too late, for the umpteenth time?

'If you don't deal effectively with chronic hunger, the effect of calamities – drought and so on – is so much greater. As long as we don't solve the problem of chronic hunger, we can expect to see lots more disasters of this kind, unfortunately. This is a reason to adopt the structural approach that I've been arguing in favour of for so long.'

■ ■ ■

Genetic manipulation makes it possible to create varieties that are resistant to disease and insects. We have also developed plants with 'built-in' nutrients. Are you in favour of these developments?

'I have never regarded this as a panacea. Genetic manipulation means we can surgically remove the genes that are responsible for certain characteristics and implant them elsewhere. You can work faster and more efficient-

ly; it's far less hit and miss than conventional plant breeding. When I was chairman of the board of trustees of the International Rice Research Institute in the Philippines, I initiated research on enriching rice with vitamin A and iron. That was pretty successful. Genetic manipulation is an attractive tool. But bear in mind, it's a tool; it won't save the human race.'

Do you understand why some people react, 'this is Frankenstein'?

'No. On the contrary, for me genetic manipulation is a fantastic product of insight and human ingenuity. And, even for those who are deeply religious, surely it is wonderful that we can correct creation's shortcomings'

■ ■ ■

'Once you've seen someone die of hunger, you never forget it', you once said. What image comes to mind?

'A woman on a waste tip in Manila. She was trying to scrape some food together for her children. And then ... she wasn't there any more. You think to yourself: damn-it, this can't be allowed to happen.'

She wasn't there any more?

'She collapsed. The only thing you can do is to make a sympathetic gesture. A squeeze of the hand, a pat on the head.' He is close to tears. 'Sorry about this. This never happens to me.'

■ ■ ■

In the newspaper *Het Financieele Dagblad* you predicted that a green revolution would wipe hunger off the face of Africa within ten years. To be honest, we're tired of hearing this. People have been saying things like this for fifty years, and nothing has been achieved.

'I can tell you exactly why not: as long as these statements remain at the level of intention, of course nothing will happen. But we are now setting up the AGRA, the Alliance for a Green Revolution in Africa. The board of directors, headed by Kofi Annan, consists of six people from Africa, including Mo Ibrahim, the founder of Celtel telecom company, and Moïse Mensah, former minister of finance of Benin. The members from outside the continent are the president of the Gates Foundation, the president of the Rockefeller Foundation and myself. It's a group to be reckoned with. Passionately: 'We have set up practical programmes to make seed, chemical fertilizer and the like available, to open up fertile agricultural land by building roads and to develop regional and local markets. And local trade needs a boost. In the last four years we've already

reached millions of farmers this way.

‘Of course, Kofi Annan has enormous clout. He can say to the president of an African country: investments in agriculture are only half a percent of your gross national product; you need to make that at least two and preferably ten percent. Many countries have already pledged to comply with this norm and production is growing fast.’

...

Many people are fervent believers in organic agriculture. Why are you fighting a personal battle against this?

Indignantly: ‘I’m doing nothing of the kind! In fact, I was the first in the Netherlands to introduce organic farming on a research farm. And that was way back in the seventies! Later, as a professor, I gave students the freedom to specialize in this sector although there wasn’t even a formal department.

But you also say claims that organic agriculture can feed the world are unfounded: ‘There should be no taboos on chemical fertilizer, pesticides and genetic manipulation. If we choose this path, we will lose almost all the world’s nature, as far more land would be needed.’

‘Exactly: you don’t have to eat organic food to save the environment. It would be a disaster for the world food supply and it’s not better for your health either. Actually, spreading animal manure on vegetables is risky – as the EHEC bacteria has probably demonstrated. So why then do people so consciously choose organic products? Because so many of the things we do just aren’t rational. Look at how many people drink bottled spring water, while objectively tap water is better quality and five thousand times cheaper.’

So actually your message is: organic agriculture is self-indulgence.

‘Yes, but if that makes people happy and they enjoy it, I’d be the last person to want to deny them this pleasure.’

...

You state that there is enough food available to feed the world. That means that hunger is a question of distribution. So what’s the solution?

‘The multilateral organizations need to become far more effective. The FAO is in a real mess. The organization is becoming a victim of its own bureaucracy and internal power struggles. The United Nations also needs a thorough overhaul. The one-country-one-vote system is

‘Genetic manipulation is a fantastic product of insight and human ingenuity’

a disaster: a tiny country like Luxembourg, with less than half a million inhabitants, has as much say as the United States and India. We need to develop a system that has more clout.

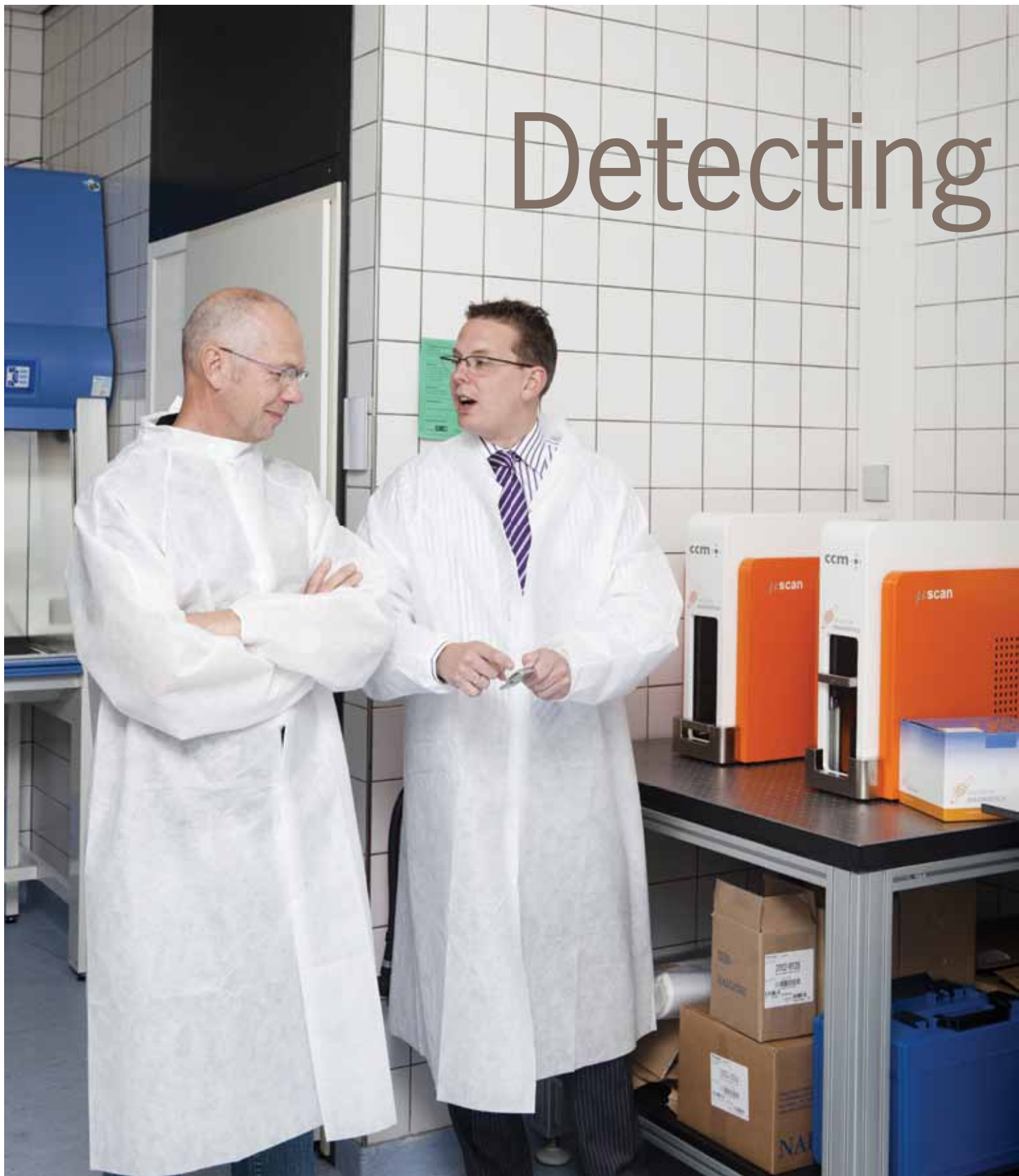
‘The world food programme (WFP) is designed to provide emergency relief, and that really does help, but it won’t rid the world of chronic hunger. Most of the world’s food is produced and consumed at a local and regional level; it doesn’t reach the regions where hunger reigns. Only a very small proportion of the food available is traded on the world market. To give an example, 650 million tons of rice is produced and consumed every year; only 40 million tons makes it to the world market. If China were to get 10 percent of the 15 million tons it requires from the world market, the whole system would fall apart. The only structural solution is to produce more food in areas where the population density is increasing. And then we are talking mainly about Africa.’

...

Would you dare to claim that Rudy Rabbinge, with all his zeal, research and international connections has made a difference to people’s lives?

‘Well, thanks to our insights and assistance, Dutch farmers have succeeded in raising their average wheat yields from six to nine tons in the last forty years. We have reduced the use of chemical fertilizer by half and of pesticides by about a third. We’ve also managed to develop dairy livestock systems with zero greenhouse gas emissions. We have made land use more effective, so there’s more space for nature and biodiversity. We are still doing all we can to make further improvements, but we have certainly achieved a lot. I can say with confidence that agriculture has only become cleaner and more productive. Otherwise our approach wouldn’t have been adopted in so many parts of the world.’ ■

Detecting



Jan bergvoet of Plant Research International (left) and Michel Klerks of Innosieve.

bacteria faster

Detecting bacteria in water or food can take an awful long time. Michel Klerks of Innosieve Diagnostics and Jan Bergervoet of Plant Research International think they have found a solution: a test that can sometimes give results in an hour.

TEXT KORNE VERSLUIS PHOTOGRAPHY PETER DE KROM

Anyone wanting to find out whether there is legionella in drinking water could be busy for days. Michel Klerks: 'We can do it within an hour. And that can make all the difference – take a care home for example. You don't want to have to wait ten days after an outbreak of legionella before the plumbing is declared safe.'

Klerks developed the quick test together with Jan Bergervoet of Plant Research International (PRI), part of Wageningen UR, who is an ex-colleague of his. Before Klerks set up his company Innosieve Diagnostics in 2009, he worked for ten years at PRI on the development of new methods of detecting bacteria, and he received his PhD for research on salmonella on lettuce. According to Bergervoet, Klerks was already more business-minded than his colleagues in those days. 'It was certainly clear that he wanted to go in this direction.'

FINDING A SINGLE BACTERIUM

Klerks saw his chance to build up a company thanks to a new, quick test for detecting bacteria. The main reason this can take so long is the slow growth of the pathogen. For a test to be reliable, the bacteria from a water sample should be cultured for days in a lab. Only when enough bacteria have been bred is it possible to say whether the sample was infected or not. According to the rules in operation, this procedure takes ten days for legionella.

The Sieve-ID test developed by Innosieve

does the test without that long incubation period. A water sample is pushed through a special filter and the bacteria which stay behind on the filter are coloured with antibodies which only attach themselves to, in this case, legionella. A type of automatic microscope, the muScan, then analyses the surface of the sieve.

This year Klerks and Bergervoet completed a European research project in which they worked with French and German researchers to find ways of using the quick test on bacteria in food as well. A good test should find just one bacterium in 25 grams of meat or cheese. 'The trick is to get the sample clean enough so that the filter doesn't get blocked up straightaway, whereas on the other hand you don't want to lose the bacteria you are looking for.' One and a half years of research delivered protocols for fast detection of bacteria such as salmonella, listeria and campylobacter, making use of the micro-sieve and the muScan analysis.

CHASING DEFAULTERS

Bergervoet: 'Thanks to close cooperation with Innosieve, we can work fast and effectively. An additional advantage is that the cooperation also offers extra scope for sourcing funding. For example, there are subsidy programmes which a small- or medium-scale entrepreneur should be involved in.'

Bergervoet is linked to Prime-diagnostics, a department of PRI that develops tests for detecting pathogens in plants. He has never

had any ambition to start up a business of his own. 'In the end what I like doing best is research on new tests. I am happy to leave all the other stuff to someone else. I have no wish to go chasing after defaulters.'

Klerks: 'It is true that those sorts of things take up a lot of time and energy. But I enjoy doing it, and it is nice to build up something yourself and see it grow.'

STEALING THUNDER

Innosieve rents office and laboratory space from PRI. Klerks: 'It is the ideal place for me. The facilities are here and I know the people. Partly because of that I was able to get off to a flying start. And yet some things did change once he was working for himself. 'I can still knock at everyone's door, but now I am an ex-colleague. The relationships have become more businesslike.'

'You are a bit more careful what you talk about when he is around', says Bergervoet. But they are not afraid that anyone will try to steal someone else's thunder. Klerks: 'The collaboration serves above all to reinforce each other and to get access to new markets.' To this end, PRI also has a muScan at its disposal for research and diagnosis. Clear agreements have been made about potential marketing. 'If Jan finds a client tomorrow for whom he can develop a test, that's fine. I stand to gain if my technology is used by other people.' ■

www.innosieve.com

www.primediagnosics.com



IN SEARCH OF WILD SPINACH

Popeye in the Caucasus



Chris Kik, who works at the Wageningen gene bank, travelled through the southern Caucasus to collect wild spinach seed. Plant breeders eagerly awaited his return; they are desperate for fresh genes to develop new spinach varieties. TEXT RIK NIJLAND PHOTOGRAPHY GUY ACKERMANS

Here, put your hand in here!’ Chris Kik holds open a grubby linen sachet and nods encouragingly. ‘Then you’ll feel the difference.’ And indeed: ‘ouch’. ‘Our spinach has round seeds; the seeds of this wild species have big spikes on them. You can’t miss them, especially when you’re picking the plants.’

In the drying room of the Centre for Genetic Resources the Netherlands (CGN), part of Wageningen UR, which could be considered the gateway to the Wageningen gene bank, the latest acquisitions have just been brought in: eight grey crates containing 53 sachets filled with withered and crushed plant specimens. This is the tangible evidence that Kik, chief curator of the gene bank, brought back at the beginning of July from his quest for wild spinach. The journey took him through Azerbaijan, Georgia and Armenia. It was a one-man expedition, with a rucksack, a half-empty Samsonite suitcase that got filled to

bursting with specimen bags, and a pile of official papers to convince customs officials of his good intentions. In each country he had help from a local colleague.

NOT A SINGLE PLANT

‘Perhaps it doesn’t seem like much for a journey that took over a month, but I can assure you we worked hard for long hours, at temperatures of up to 35 degrees’, Kik recounts. ‘These wild spinach plants are pretty easy to miss. They don’t have conspicuous flowers or anything, and goat and sheep like to graze on them. On top of that, some local people eat large quantities of the wild spinach, as it’s the first spring vegetable for them. At one point in Georgia I hadn’t found a single plant for six days. And that is enough to get you down.’

The seeds he collected will soon find their way to research and breeding programmes, Kik expects. ‘The genetic base of the modern >



CHRIS KIK,
head curator of the CGN's
gene bank

‘I expect that the material we collected will also be useful for developing drought and salt-tolerant varieties.’

‘Worldwide we are one of the most frequently consulted gene banks’



agricultural and horticultural varieties is not very broad. Every now and then we need new input from wild relatives – for research and to develop new varieties that are suited to different growing conditions, or that can offer resistance to new diseases. This is important to ensure food security. Gene banks are the obvious intermediaries for this, Kik says. They collect, propagate and distribute planting material for agricultural and horticultural purposes. At the same time they preserve biodiversity and ensure the survival of locally grown varieties in their deep freeze storerooms. Wageningen focuses on vegetable crops, explains the curator. These are badly underrepresented in the 1400 gene banks of the world. Only seven per cent of the stored seed is vegetable seed, and staple food crops such as

grains and legumes make up the majority of the collections. ‘There’s an economic reason for this specialization too’, Kik explains. ‘In the last twenty years the Netherlands has become a major player in the vegetable crop breeding world.’

FRESH GENES NEEDED

The breeding companies badly need new genetic material for spinach, and especially from the two wild relatives as these probably have interesting genetic traits. The cousins of the spinach we are familiar with are found in different regions: one is found in the area that Kik visited in the southern Caucasus; the other is found in central Asia, in Uzbekistan and Tajikistan. Kik made a trip to that part of the world in 2008 to enlarge his gene bank collec-

tion. Two spinach expeditions in three years? Kik: ‘Seed companies were insisting. The amount of planting material of these wild varieties worldwide is very limited. The number of accessions and locations where seed can be found – you can count them on your fingers.’ Meanwhile there is an urgent need for fresh genes, for example to fight downy mildew, a fungus that attacks spinach leaves and which is constantly mutating. Kik: ‘I expect that the material we collected will also be useful for developing drought- and salt-tolerant varieties. The southern Caucasus has a semi-arid climate.’

The wildlife in that area is also different, the researcher noticed. There are wolves, for example – ‘fantastic to see’ – but there are also snakes. ‘On the first day in Azerbaijan, as I

got out of the car, my local partner, Vahid Farzaliyev, warned me: “Chris, watch out!” And sure enough, there were two scary, poisonous snakes eyeing us. Before we started the trip Vahid had shrugged his shoulders nonchalantly when I asked if we could expect problems from snakes. Maybe he didn’t understand the question properly in English. I later learnt that there are 21 species in the area, of which four are poisonous. If I had known that, I’d have taken antidote along with me. Now I spent four weeks moving somewhat nervously through the low vegetation; you’re hours away from habitation.’

CONSULTING THE LOCALS

Kik enlisted the help of the local population to track down spinach plants. When he found a location with a plentiful supply of spinach plants – ‘It’s not the idea to cause local extinction’ – he would put about fifty samples of plants with seed into a plastic bag. Kik also determined the GPS coordinates and made a brief description of the conditions where he had found the sample. Back in his hotel room or his overnight accommodation in private homes, he transferred his harvest into the linen travel sachets.

The 53 samples that he brought back to the Netherlands are not all wild spinach; 14 sachets contain ‘ordinary’ domestic spinach that farmers in the Caucasus have grown and bred for generations in their vegetable gardens. These plants are well adjusted to local conditions and also deserve a place in the gene bank because of their unusual genetic combinations, according to Kik. ‘These kinds of local varieties are starting to die out in the Caucasus too. Whenever you go into a bazaar, you see seed packets from the big Dutch seed companies. And that’s a strange paradox of course. On the one hand the seed companies are dependent on genetic variation, and on the other hand the new varieties they come up with are squeezing out the local varieties.’

Right now, Kik’s 53 new sachets are waiting

for the long process to start. It’ll be another ten to fifteen years before we are serving up spinach with Caucasian genes. For the time being the seeds collected still have to dry out for another couple of months at 15 degrees Celsius and a relative humidity of 15 percent. After that the CGN will divide the yield among the seed breeding companies that helped finance the expedition, and these will develop planting material and multiply the seed. The companies will keep a large part of their yields for themselves. The rest is sealed in strong aluminium foil – protected with card to prevent the spines from piercing the foil – and stored in airtight packets of fifty to a hundred seeds at a temperature of minus 18 degrees in one of the cold storage facilities in Wageningen. A small proportion is also sent to the international gene depot on Spitsbergen, to spread the risk of a power failure or other catastrophe. Companies and universities, as well as institutes that conserve old vegetable varieties, can request genetic material free of charge from the gene bank once the three-year embargo has expired. This gives the seed companies that have invested a head start. ‘We already receive about 385 requests for spinach every year; that’s an awful lot for such a small collection, but altogether we actually deal with over five thousand requests per year’, Kik says. ‘That makes us one of the most frequently consulted gene banks in the world.’ Wouldn’t seed companies be better off organizing an expedition themselves? Then they wouldn’t have to share the fruits with their competitors. ‘That would be possible, but international agreements, such as the CBD (Convention on Biodiversity, 1992) and the IT (International Treaty, 2001) complicate matters. Gene banks are there to ensure that the necessary biodiversity is made available to third parties. Companies that go it alone run the risk of being accused of bio-piracy, and that’s a risk they are reluctant to take.’ The countries of origin are not left empty handed, Kik continues. ‘The regenerated

planting material is distributed among the parties so that gene banks also get their fair share, and we pay the local staff who help a good salary. And in the countries where we work, there’s usually a lot of interest in setting up research with ‘Wageningen’ or sending a researcher or student to us. And, wherever possible, we try to fulfil people’s wishes.’ Info: chris.kik@wur.nl ■

MALE AND FEMALE PLANTS

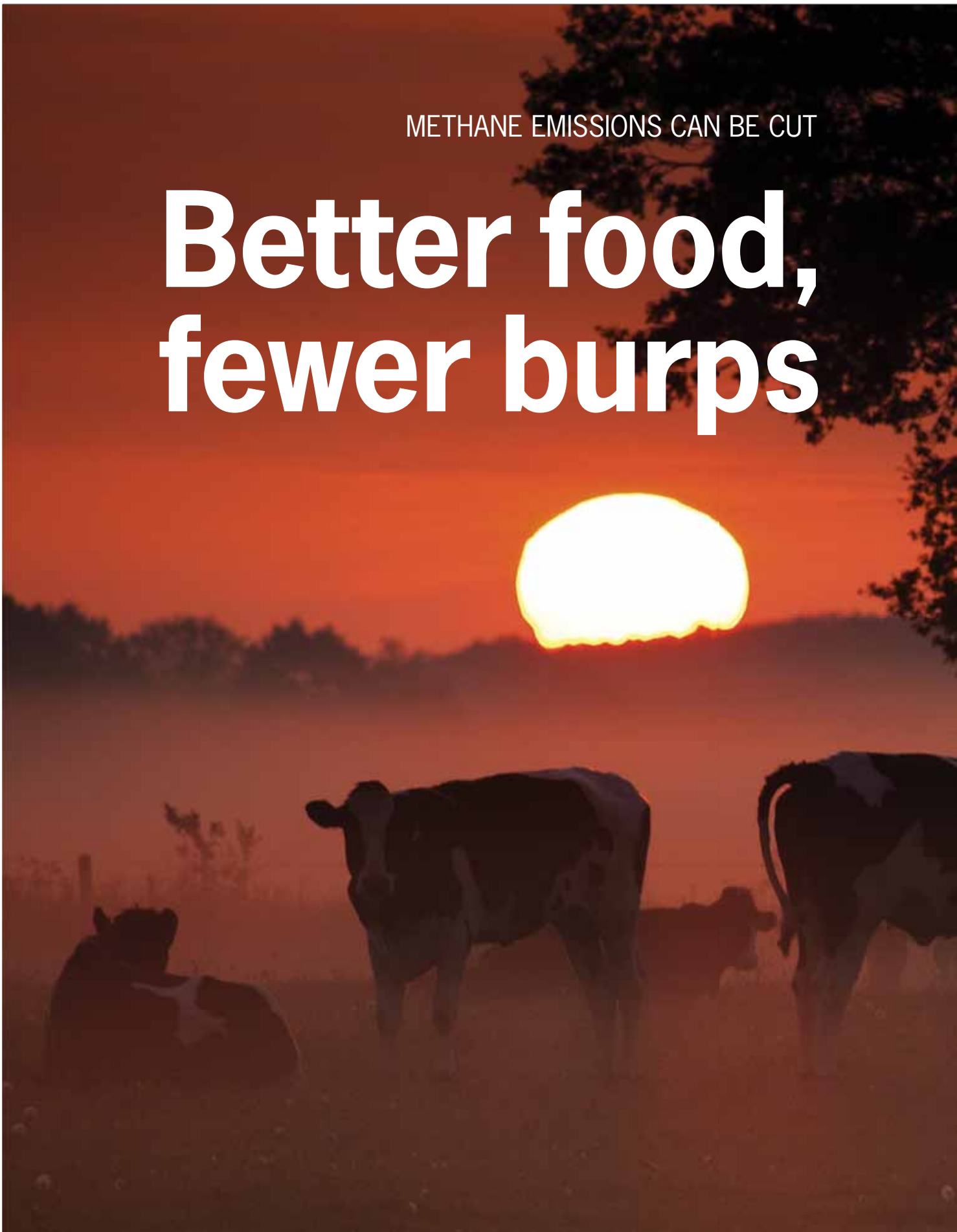
Spinach (*Spinacia oleracea*) is a species that originated in Asia and is no longer found in the wild. The plant was introduced in Europe in the 12th century, initially as a laxative. Two close relatives are still found in the wild: *Spinacia tetandra*, in the southern part of the Caucasus, and *Spinacia turkestanica* in Central Asia. All three species are dioecious: the male plants die as soon as they have produced pollen and the female plants form the new seeds.



PHOTO ORI FRAGMAN-SAPIR, JERUSALEM BOTANICAL GARDENS

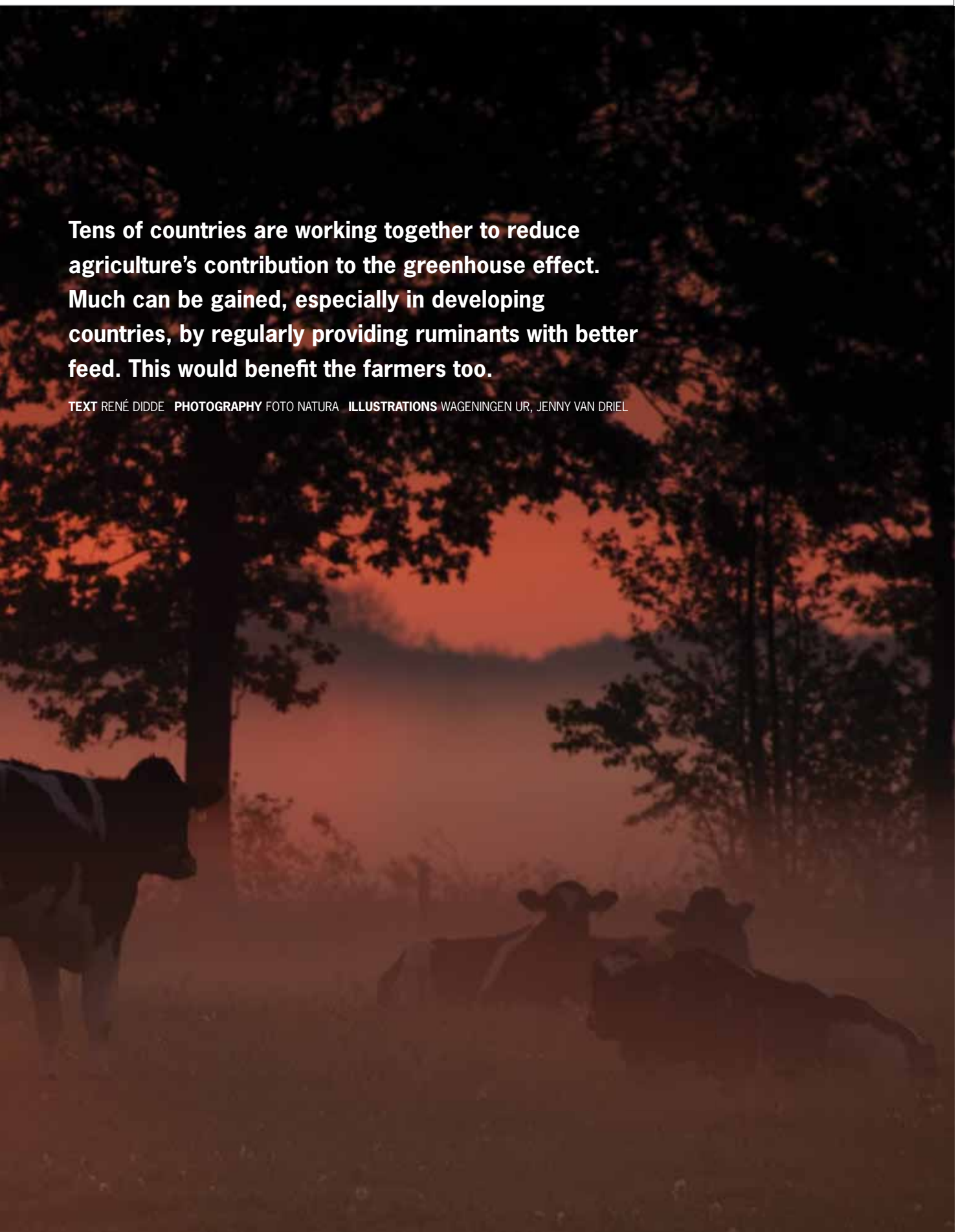
METHANE EMISSIONS CAN BE CUT

Better food, fewer burps



Tens of countries are working together to reduce agriculture's contribution to the greenhouse effect. Much can be gained, especially in developing countries, by regularly providing ruminants with better feed. This would benefit the farmers too.

TEXT RENÉ DIDDE **PHOTOGRAPHY** FOTO NATURA **ILLUSTRATIONS** WAGENINGEN UR, JENNY VAN DRIEL



Aeroplanes, cars, the chemical industry and energy companies are not the only ones contributing to climate change. Ruminants, particularly cows, also play a major role. Partly through the release of methane from their complex digestive system, these good-natured animals are responsible for almost three percent of the world's total greenhouse gas emissions. This is roughly equivalent to total air traffic emissions.

In other words, producing one litre of milk in western countries releases one kilogram of CO₂-equivalent greenhouse gases into the atmosphere. Half of this is methane (CH₄) from the animal's stomach; and 20 percent is carbon dioxide (CO₂) in part from the production of fertilizer for grassland. Another 30 percent comes from the emission of nitrous oxide (N₂O), which is released among other ways through the storage of manure and the fertilization of land used for producing livestock feed. Methane and nitrous oxide are particularly strong greenhouse gases. They have, respectively, a 21 and 300 times greater impact on global warming than the familiar carbon dioxide.

Especially striking is the poor climate score of livestock farming in Africa, South Asia and the Middle East. The free-roaming and generally poorly fed cows in these regions produce

little milk, but emit a relatively large amount of methane. Consequently, livestock farming worldwide is, according to the FAO, responsible for a whopping 18 percent of the greenhouse gas emissions produced through human activities, and thus for a significant share of the current climate change.

LIVESTOCK NUMBERS SOARING

If nothing is done, this contribution will continue to grow. Countries such as China, India and Brazil are experiencing enormous economic growth, accompanied by changes in consumption patterns from a traditional almost vegetarian diet to one containing more animal proteins. Add to this the expected growth of the world population from six billion today to nearly nine billion by 2050, and the inevitable conclusion is that the livestock population will also dramatically increase.

The relatively large contribution of livestock farming to climate change, especially caused by ruminants, came to light in 2006 through the publication *Livestock's long shadow*. This study conducted by the UN's Food and Agriculture Organization (FAO) was an eye opener. 'The one ray of hope to come out of the failed climate conference of 2009 in Copenhagen was that 21 countries, including the Netherlands, joined forces to further research into agricultural emissions', says Jac Meijs of Wageningen UR Livestock Research. The resulting Global Research Alliance (GRA) was officially launched in June of this year in Rome.

Meijs, whose background is in cow research, serves in the secretariat of GRA on behalf of Wageningen UR. He is enthusiastic in describing the many research projects planned for the coming years, focused for example on feed adjustment, breeding, manure storage, manure application, influence of soil use on carbon fixation in the soil, and establishment of standardized methodologies for measuring emissions. 'We also want to strengthen researcher networks and work together more effectively by making more coordinated use of national research funds and contributions from Brussels', says Meijs. Already 36 countries are participating, including China and Brazil with their emerging economies. Aside

from the research group dedicated to livestock farming, there is a research team looking into the contribution of rice production, as well as a third group looking at possibilities to reduce greenhouse gas emissions from arable farming, horticulture and fruit production.

'A lot of research is being conducted in the Netherlands that will eventually contribute to the reduction of greenhouse gases. More than 50 projects are already underway related to the livestock sector alone; and another thirty will follow for other sectors', explains Meijs. He points out that the livestock sector in the Netherlands voluntarily pledged to reduce greenhouse gas emissions by 30 percent in 2020 compared to the 1990 level. 'The sector is maintaining this commitment, despite the lower environmental ambitions of the current cabinet', says Meijs. Almost 20 percent – or two-thirds of the aimed reduction – had already been achieved in 2008. The agricultural sector was thus responsible for nearly half of the Netherlands' total reduction in greenhouse gas emissions.

POLITE BURP

One of the most obvious measures is to improve the efficiency of feed for ruminants. Reducing the emission of methane by these animals would already make a significant difference. 'Methane emissions account for one third of livestock's contribution to the climate problem', says Jan Dijkstra, associate professor in the Animal Nutrition group of Wageningen University, part of Wageningen UR. Using a life-size model of the digestive system of a cow, he explains how this colossal portion of the emissions produced by human activity takes place. 'The first fermentation of a cow's food takes place in the gut and the rumen. In this oxygen-free environment, micro-organisms break down rough fibres, sugar and starch into volatile fatty acids, for example, which are the main components of the cow's energy supply. In the process a surplus of hydrogen gas is produced', instructs Dijkstra.

Too much built-up pressure from the hydrogen gas would disrupt the digestion process, but cows have a solution for this: they burp. 'Methanogenic micro-organisms take care ➤



JAC MEIJS,
Wageningen UR
Livestock Research

'The Netherlands is doing a lot of research that will help reduce greenhouse gas emissions.'

GREENHOUSE GAS EMISSIONS FROM LIVESTOCK

Greenhouse gas emissions

Emissions in CO₂ equivalents*
per year

World

45,000 Mtons

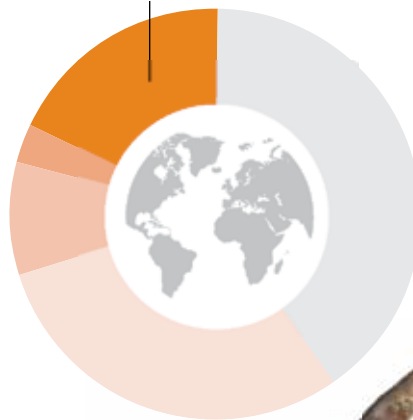
Netherlands

200 Mtons

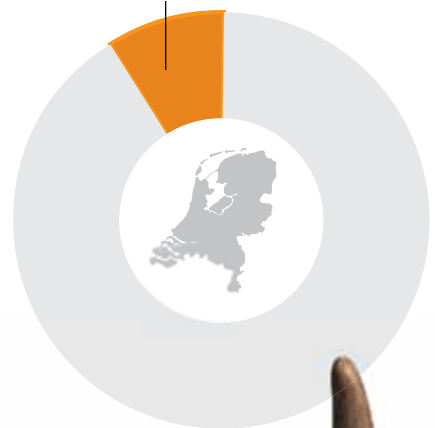
Contribution of livestock to
greenhouse gas emissions

- Livestock
- Road transport
- Air traffic
- Industry
- Other

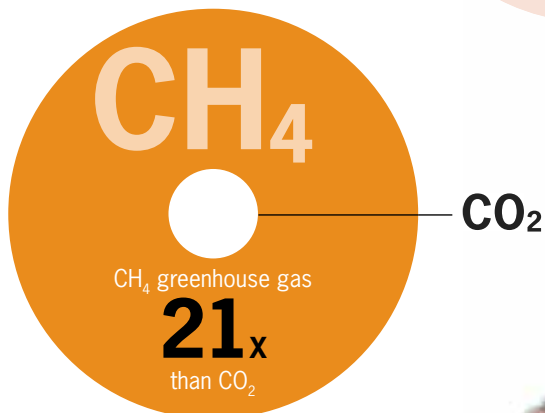
18%



9%



*CO₂ equivalents



Emissions of non-CO₂ greenhouse gases are usually expressed in CO₂ equivalents. Methane contributes 21 times more to the greenhouse effect than the same amount of CO₂.

Methane emissions per cow

20 grams CH₄ per kilo feed



of the hydrogen gas by combining it with carbon dioxide, which creates methane. This gas is released by the cow as a burp. Quite inoffensively, by the way', adds Dijkstra. 'The animal keeps its mouth politely closed, and the gas escapes through its nostrils.'

Dijkstra has calculated the exact contribution made by the methane-burping cows in 'respiration chambers'. 'We measure the methane content of the incoming air and determine the methane concentration also in the outgoing air', explains Dijkstra. This revealed that cows that eat a relatively large amount of young grass emit less methane than animals that are fed primarily silage made of older grass.

GRASS GROWS SLOWLY

Feeding animals more young grass would in itself lead to a 15 percent reduction in methane emissions. But there is also a factor working against this. 'In recent years grassland in the Netherlands has been treated with less fertilizer, which means that the grass grows more slowly. When less arti-

cial fertilizer is used the production of nitrous oxide declines, but the emission of methane increases due to the application of animal manure. In practice we still think we can achieve a net reduction of at least 10 percent', says Dijkstra.

There are plenty of other measures that are also in some way counterproductive. A cow on feed containing more maize instead of grass emits less methane. 'This is because the starchy maize produces propionic acid in the stomach', explains Dijkstra. 'That acid bonds with hydrogen, which is then not available to produce methane. But farmers cannot do this indefinitely. In the first place, maize is more expensive than grass. And secondly, it absorbs less nitrogen as it grows than grass does. To satisfy EU requirements for nitrate in groundwater, most livestock farmers cannot dedicate more than 30 percent of their land to the production of maize.'

Tests have shown that a more fatty diet also reduces methane emissions. 'Sunflower seeds, rapeseed and linseed all have a hydro-

gen-bonding effect that is comparable to that of propionic acid, but they also inhibit digestion. Here too, it is a question of fine-tuning', says Dijkstra. He nevertheless estimates that an additional 10 percent reduction can be achieved through the addition of more maize and fat in livestock feed.

All of the changes to cattle feed combined could lead in theory to a 50 percent reduction in emissions of methane. 'There is indeed great potential, but in practice I think for the time being we should be content with a 25 percent drop in methane emissions', says Dijkstra. This would already amount to a 1.5 percent reduction in global greenhouse gas emissions.

The fact that there is a big difference in methane emissions produced after eating young, leafy grass compared to old, longer-stemmed grass is not only of interest to the Netherlands, emphasizes Dijkstra.

'Application of this knowledge is especially important for developing countries, where fodder is often of a lower quality. It could make a world of difference there by reducing methane emissions.'

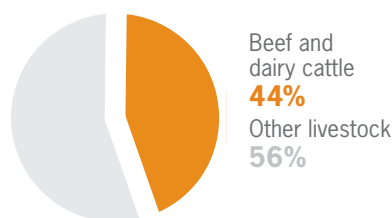
Theun Vellinga agrees that the greatest potential lies in Third World countries. A researcher at Wageningen UR Livestock Research, he believes this would also improve the farmers' income. Improving the production per animal through better nutrition, improved breeding methods and better disease control are all important in this regard, explains Vellinga. 'This shows that improving food security in Africa and Asia, improving the income level of farmers and achieving a drastic reduction in emissions can go hand in hand.' And it's not rocket science, adds Vellinga. 'In fact, the knowledge required is already readily available. In the Netherlands, consistent improvements in efficiency over the past forty years have led to a doubling of the milk produced per cow, while over the same period methane emissions dropped by half.'

SERIOUS OVERGRAZING

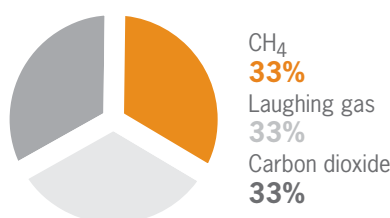
Vellinga supports Jan Dijkstra's conclusion that improving the quality of cattle feed tops the list of needed measures. 'In many extensive agricultural systems cows graze on com-

Global livestock emissions of greenhouse gases

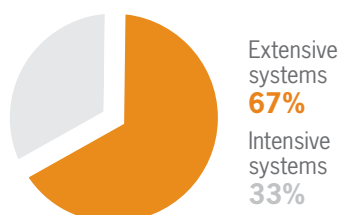
Per type of livestock



Per type of greenhouse gas



Per type of system



mon ground. No one feels responsible, and this results in serious overgrazing, weight loss among the animals, fewer calves and a low production level of five hundred kilograms of milk per cow per year.' Joint management of the grassland would have a direct impact, according to Vellinga, who spent a year and a half at the FAO in Rome calculating the effects of such measures.

Offering the animals more digestible feed would also lead to an increase in milk production and a decrease in methane burps per cow. 'Now they are often fed poorly digestible straw from rice, wheat or sorghum. We normally optimize the protein content and kernel size of such grains for human consumption. But the International Livestock Research Institute (ILRI) in Nairobi is currently working on improving both the grains and the straw.'

WALKING BANK ACCOUNTS

Socio-economic factors also play a role in developing countries. Cows often represent a farmer's capital – they are walking bank accounts in a way. 'At the FAO we could see when school fees were due in a particular country, because the farmers would sell a cow', recalls Vellinga. 'If farmers had access to a better infrastructure of banks and micro-credit, they wouldn't have to save in the form of cows. These are often old, non-productive cows anyway, so this would tackle two problems at once.'

In countries with more intensive cattle breeding it is actually desirable to keep dairy cows longer. Cows in the Netherlands currently live for only six years, with a productive lifespan of approximately 3.6 years. So far the policy has been to always have a ready supply of newly and better-bred heifers. This is not only expensive, but also requires a greater number of young animals, which produce nothing but greenhouse gasses in their first years. Cows' milk production does not go down until they are 10 years old. If the farmers kept their dairy cows for 10 rather than 3.6 years, they would save on young animals, feed and environmental emissions. One measure that is already having a global impact, both in terms of the farmers' wallets

and the environment, is fermentation of cow manure. Theun Vellinga: 'Manure fermentation is producing energy-rich biogas both in the west and in developing countries. In the west this energy can be used to supply electricity, heat or fuel for cars. In southern countries biogas can be used as a relatively clean cooking fuel that does not require a day-long search for kindling. This spares the forests and leads to less air pollution. The nice thing is that the residue from the fermentation process contains nutrients such as nitrogen and phosphate. This by-product can be used without any problem as a fertilizer.'

Wiebren van Stralen, a member of the Dutch Federation of Agriculture and Horticulture (LTO) working group on livestock farming, sees additional challenges closer to home. Milk quotas will cease to exist in the Netherlands in 2015, but this must not lead to more cows. The sector aims to produce 'climate neutral' milk by 2020. 'This means that we will produce all the energy required to run the whole milk production chain ourselves', says Van Stralen. 'Moreover, the dairy industry has laid down that emissions from livestock farming must not increase; so the answer is not more cows but even greater efficiency.'

After one hundred years of improvements in both the production and efficiency of cows, we are slowly approaching the limits of what can be achieved in these areas. 'This is why we will have to start directing our attention to environmental efficiency', says Van Stralen. 'This includes both large-scale manure fermentation operations and small-scale manure refineries that break up the manure and extract proteins, energy and phosphate. We will also be tapping energy from the relatively warm milk produced by the cows.' ■



JAN DIJKSTRA,
Animal Feeds chair group at
Wageningen University

'I think for now we should be content with a 25 percent drop in methane emissions'



THEUN VELLINGA
Wageningen UR
Livestock Research

'Improving the income level of farmers and reducing emissions can go hand in hand.'

KNOWLEDGE EXCHANGE

Global Research Alliance partners will have the opportunity to meet three times this autumn in the Netherlands, starting at the end of October with a congress on climate-friendly agriculture. The Sixth International Symposium on Non-CO₂ Greenhouse Gas (NCGG6) will take place in Amsterdam in early November, followed directly by a separate meeting of the ILivestock Research Group of the Global Research Alliance.

TWENTY FIVE YEARS IN ENVIRONMENTAL SCIENCES

Clean water, sustainable fashion

Environmental management attracted many students in the nineteen eighties. Some graduates are doing what they wanted to back then, such as Eric de Deckere, who is working to protect the river Scheldt. Others, like Anne-Marie Ruiter, have followed a more unexpected path.

She now designs clothes. TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY HARMEN DE JONG

In the nineteen eighties it was predicted that acid rain would lead in the near future to the dramatic dying out of forests. This was what motivated Anne-Marie Ruiter to study environmental management. 'After finishing secondary school I worked for a while in a youth project in Germany. That's where I first learned more about acid rain, and I wanted to do something about it. I was interested in many different things, and environmental management combined natural science with the broader political and social context.' Now, twenty-five years later, she is putting the final touches to the first collection of clothing for her own fashion label Bolais. She designs sustainable clothing for businesswomen. 'I call it *slow fashion* – timeless and made with love and attention to detail.' Her career has taken her from development work and a job as a bureaucrat in The Hague to fashion design. The common thread has always been sustainability. 'Everything I use has to be produced sustainably, from the fabrics to my business cards. Many false claims

are made in the fashion industry about sustainability, and my background enables me to see right through them. I want my label to offer transparency on the origin of the materials and products used.'

FISH WITH TUMOURS

The recurring theme in the more straightforward career path of fellow graduate Eric de Deckere is water, particularly that of the river Scheldt. As a child De Deckere always went fishing with his grandfather in the Western Scheldt. 'We often caught fish that had tumours. These were caused by the water pollution in the estuary, which was at its worst in the seventies and eighties. 'At a young age I already decided to focus on this', says De Deckere.

For his first independent study project in college he investigated the further deepening of the Western Scheldt waterway. A later internship in Australia got him hooked on research. In 2003 he earned a PhD for his research on the impact of mud shrimp on the

movement of mud particles on sand plates in the Wadden Sea. 'We drove really early in the morning to Groningen, so that we could catch the right tide and sail out. Sometimes we stayed out there for a whole week', De Deckere recalls. 'As a doctoral student you can delve deeply into one particular subject. I miss that sometimes now.' With his Flemish accent, gained in the past seventeen years of living in Flanders, you could easily mistake him for a native Belgian. After completing his doctorate, De Deckere started working for the University of Antwerp. Within a few years he became a professor, the Belgian equivalent of Assistant Professor in the Netherlands. Mud, or sediment, continued to hold his interest, which extended to the broader European context. In 2001 he became co-founder of the European knowledge network SedNet. 'All waterways in north-western Europe are heavily polluted with hormone-disturbing substances, PCBs and heavy metals. Many of those contaminants attach themselves to sediment >

A man with short brown hair, smiling, stands on a ship's deck with his arms crossed. He is wearing a dark grey jacket over a plaid shirt. The background shows a harbor with other ships and a cloudy sky. The ship's hull is visible on the left, and a rope is coiled on the deck in the foreground.


‘Professors in Belgium spend most of their time managing’

ERIC DE DECKERE

Age: 43

Degree: Environmental Management 1986 – 1992

Work: Technical Manager at Antwerp Harbour

A woman with short brown hair, wearing a blue short-sleeved top and black pants, is smiling and working on a white long-sleeved shirt on a mannequin. She is standing outdoors in a garden setting. In the foreground, there is a wooden table with a blue textured top, holding a sewing machine, a brass bell, and some papers. A wooden chair is visible in the background.

‘I didn’t want to carry on
taking the obvious route
suggested by the knowledge
and skills I’ve gained’

ANNE-MARIE RUITER

Age: 44

Study: Environmental Management
1986 – 1992

Work: Designer and owner of
sustainable fashion label Bolais
www.bolais.com

particles. This sediment is also the basis for plants and animals living in the water. So all those contaminants pose a threat to them.'

FIRST LOVE

Anne-Marie is less focused on one particular cause. 'Idealism, a challenge and adventure are all equally important to me. I am not driven by one specific issue.' During her final college internship, she worked for a women's organization in Lahore, Pakistan. 'Apparently you tend to fall in love with the first place you work in far away from home. This was definitely the case for me. Lahore is a lively big city and Lahoris really know how to enjoy life; they are very hospitable and have a Dutch sense of humour.'

Her first job was in Nepal for an irrigation project at the foot of the Himalayas, where Ruiter helped the farmers organize themselves. She later went back to work in Pakistan, for a project looking into how farmers could drain land that was not being reached by large drainage systems. After six years abroad she returned to the Netherlands. She would have liked to stay in Lahore, but not in the context of development cooperation. 'I was not even 30 yet and I was living in a beautiful house on a luxurious compound with a swimming pool. I had a cleaning lady and chauffeur at my disposal. Wonderful – but I didn't want to get used to the idea of being important just because I have fair skin.'

Back in her own country, Ruiter ended up at what was then the Ministry of Agriculture, Nature and Food Quality, where she worked for eight years, first in its expertise centre and later in the Department of Knowledge and Innovation, initially as a policy advisor and eventually as a policy coordinator. Her time spent as a civil servant was not at all boring. 'That kind of political/administrative organization can be incredibly dynamic. You really have to be on the ball when working on a dossier that is at the centre of the political debate.' She also found it a challenge to get something done. 'A minister or secretary of state thinks about the political risks, but

as a civil servant you are more interested in weighing up the practical considerations. Once you have the system figured out, you know exactly what arguments will sway your minister and you can highlight the considerations you find important.'

CHANGE OF COURSE

After switching jobs from The Hague to the Utrecht Municipal Health Services, where her management position was quickly transformed as part of a reorganization, she changed course. 'I didn't want to carry on taking the obvious route suggested by the knowledge and skills I've gained. Instead I decided to do something creative and socially relevant.'

Her mother was a seamstress and Ruiter had always loved fabrics and well-fitting clothes. This led to the idea of a new fashion label for sustainable clothes for businesswomen. 'Plenty of people talk about sustainability, but walk around in regular clothes. The women in my former working environment are my target group.'

Learning a new skill and how to run a business is very satisfying, she says. But things will start to get really exciting after her first collection is released this fall. 'I have invested my own savings, but it needs to become a healthy business not just a hobby.'

De Deckere has also taken a step in a new direction. This year he left the university to work for the Municipal Port Authority of Antwerp. De Deckere found that there wasn't enough opportunity in the Flemish academic world to work on the things that really matter. Not enough time or appreciation was devoted to teaching, for example. Nevertheless, he was responsible for the Master's programme on Technology for Integrated Water Management and the summer school for students from developing countries. 'Environmental and water issues are inextricably tied up with North-South relations. So much water is used in the South to produce gold or cut flowers for western companies, for example, that local populations no longer have access to water. Few people here are aware of this yet. If we do

WHERE DO ENVIRONMENTAL SCIENTISTS END UP?

Of the 424 Environment Management students who graduated between 1986 and 1992, we know what three quarters of them are doing now. More than one third of them, work for the Dutch government. One-fifth work for technical or consultancy firms. About 12 percent work at a university or research institute; 9 percent in industry or in the agricultural sector and 7 percent in the commercial service sector.

nothing about this problem, we're just hiding our heads in the sand. Ultimately it is about ensuring that people both here and there have quality drinking water.

The university also offered insufficient opportunities to pursue his first love, research. 'Professors in Belgium spend most of their time managing, and securing project money. I had the feeling that I was focusing too much on administration and not enough on content.'

At the Port of Antwerp De Deckere is responsible for projects focused on sustainability and water quality and for the generation of knowledge related to water problems. Other advantages are the international character of the port, which is also involved in SedNet and works together with ports in developing countries. 'Antwerp is becoming known for sustainability. At the port, whose most important access route is the Scheldt, I can concentrate more broadly and more exclusively on water issues. ■

Wageningen University is organizing reunions on 1 October for the class of 1986 (25 years ago) and on 21 October for the class of 1961 (50 years ago).
www.wageningenalumniportal.nl

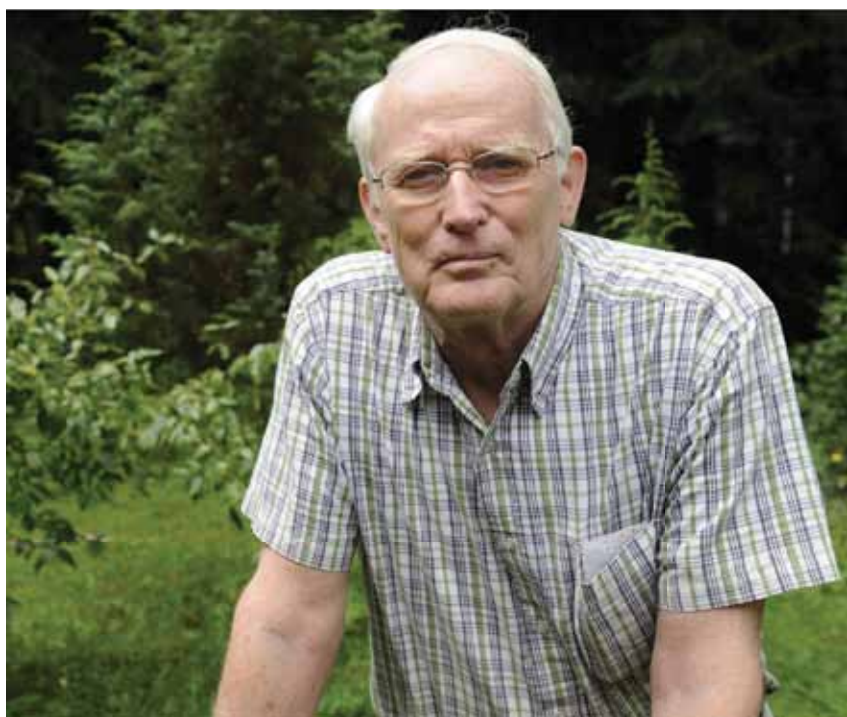
60 YEARS OF WUF

Career-changing, life-changing

For the past 60 years, students, PhD researchers and associations have been able to apply to the Wageningen University Fund (WUF) for support.

The fund has existed since 1951. Without the WUF, many people's lives would have unfolded quite differently. TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY GUY ACKERMANS

‘The rice tour has had a big influence on my career’



Derk Hille Ris Lambers

Between 1964 and 1966, nine Wageningen students made a world tour to study rice cultivation. The Agricultural College Fund paid 25,250 guilders for the trip. Derk Hille Ris Lambers was one of the students. He went on to do research on rice breeding.

‘The rice tour had a big influence on my career. I carried on with rice breeding research at the International Rice Research Institute in Thailand, the Philippines and Egypt, and later in Suriname with a consultancy firm. I only worked in countries I had been to on the rice tour.

I lived in Indonesia until I was 14; my father was a coffee breeder there. During the rice trip we were welcomed in Tokyo by a sympathetic Japanese man who had behaved very decently during the war. During the first year of the occupation he had been my father's boss. That was an extraordinary meeting.

The rice tour was prepared very thoroughly by rice expert Dr Robert Best, who had already visited all the venues himself. The ‘rice tourists’ found the international orientation and the contacts it gave them very valuable in their careers. The experience also convinced me that international cooperation is more effective than international aid.

The participants in the rice trip published a personal retrospective in 2007; see: <http://edepot.wur.nl/117178> ■

Fred Wamalwa from Kenya was already working in development when he came to Wageningen to do an MSc on the Management of Agricultural Knowledge Systems (MAKS), thanks to a grant from the Anne van den Ban Fund. Now he applies his Wageningen knowledge in his work for the Community Development Trust Fund (CDTF) in Kenya. 'After graduating with a Bachelor's in Agriculture in Nairobi in 1992, I became a field coordinator for an NGO that provided farmers in irrigation projects with microcredit. But I was keen to get a better understanding of participatory development processes. A friend who was studying in Wageningen told me about the MAKS course and I was impressed by the curriculum. Thanks to the Anne van den Ban scholarship I was able to fund my studies. I learned all about project management and how you can involve the local community in a project. After graduating in 2001, I became regional manager of the CDTF, which sets up projects in the fields of infrastructure, water, education and health care, with EU funding. I initiate, plan, support and evaluate community projects, but the people at local level do the actual implementation. It is a fantastic job for me. It has changed my life and that of people in my community.' ■



Fred Wamalwa

'It changed my life and that of my community'



Wout Middelhoven

'Without that money I wouldn't have got the job'

After studying Microbiology at Utrecht University, Wout Middelhoven came to work in Wageningen in 1961. His appointment was funded by the Heineken brewery, through the then Agricultural College Fund. Now this retired researcher supports microbiology students via a fund in his name with the WUF. 'Without the money from Heineken I wouldn't have got the job in Wageningen then. At that time there was a shortage of doctoral students. Professor Mulder was keen to have me in the department and he arranged for a research grant. After two years I was employed by the university itself. Thanks to Heineken's support I felt obliged to study yeasts – otherwise I would have studied bacteria. The yeast research made me the odd one out in the department, which had its advantages. For example, I discovered new species of yeast, and I am the first author of papers on at least 20 different species. When I turned 60 I set up my own fund, from which students and staff can obtain a contribution to internships and study tours. In the old days, when I was studying in Utrecht, I didn't get the opportunity to take a look across the border.' ■



HOW TO FEED CHINA?!

Jubilee conference in Beijing, 25 June 2011

'How to feed our world?' At the alumni conference in Beijing in China, KLV's jubilee theme was once again central. "Actually, we mostly discussed the problem of how to feed China," explains Sanwen Huang, the chairman for the day. He is a professor at the Chinese Academy of Agricultural Sciences (CAAS). The population of China will grow to 1.6 billion by 2030. Will China be able to provide food for its own population in future?



Chairman for the day Sanwen Huang
photo: KLV

"China is capable of feeding itself," says Sanwen Huang. "But the question is how well. There's no problem in terms of quantity, but mass production alone is no longer enough. Living standards have risen substantially over the last thirty years, and along with them the demand for high-quality food. This means that the agricultural system will have to be reformed."

Sanwen Huang's research looks at the genomes of agricultural crops. "Good seeds are crucial to the production of good food. I believe that science and technology can provide the farmers with high-quality starting materials. As a scientist, I see

it as my personal goal to make that particular contribution to securing food supplies, both in China and throughout the world. We will soon be publishing an article in *Nature* based on a large international study that both Wageningen UR and CAAS were part of. In just five years, we identified 40,000 potato genes. Once we have a picture of the crop's genome, we can identify genes much more quickly that are crucial for crop improvement at the molecular level. Developing a new potato cultivar took ten to fifteen years until recently, but this will let us shorten that interval considerably. It's a major step forward!"

The KLV Jubilee Conference was held on 25 June 2011 in Beijing, China. The conference was organised jointly by KLV and the Wageningen UR China Office. Eighty people took part in the conference at the Yuyang Hotel in Beijing. More information can be found on www.klv125.nl.

Technological advancement is an initial step, but how can farmers and consumers benefit from it? Chinese farms are often small scale, farmers are poorly organised and the chain from farm to consumer is not transparent, with numerous links. Dinghuan Hu, director of the Wageningen UR Office in China, spoke about an initiative to let farmers deliver directly to the Carrefour China supermarket chain. Eliminating the middlemen lets the farmers get better prices for their products. Chinese farmers have a poor negotiating position. In terms of organisation of the chain, China could learn a lot from the Netherlands. China should be moving towards the Dutch system of commodities boards, cooperative organisations that both set the rules and represent farmers' interests.

Sanwen Huang himself is a former Wageningen student, where he also investigated potato genes. His thesis for the Plant Science group was on isolation of genes that make potatoes resistant to *Phytophthora*. "The big plus at Wageningen is how the various disciplines that look at aspects of ensuring food supplies can all work together," says Sanwen Huang. "Plant sciences, animal sciences, food and nutritional technology, environmental science and social sciences - I see them as successive phases in guaranteeing the food chain. Everything comes together in Wageningen."

MAIN CONFERENCE: “HOW TO FEED OUR WORLD”?

The results of a year of brainstorming, exchanging ideas and discussing the theme of ‘How to feed our world?’ will all come together on 10 November. The main conference will have plenty of interesting content, as well as being a festive and contemporary finale to KLV’s jubilee year. The conclusions from both the Dutch and international jubilee debates will be presented in a surprising format, along with the results of crowdsourcing deliberations among KLV members.

Results

What have the key results been so far? “The things that really stand out for me are consumer choices, small-scale entrepreneurship and population policy,” explains Paul den Besten, director of KLV. “The importance of consumer choices was a major theme, linked to the question of whether and how policymakers should steer it. Should you be thinking of a tax on fat, perhaps, or on animal protein? Opinions differ on that one. Small-scale businesses are a second theme. The food is transported less, and more effort is put into local production and distribution. That’s good for small businesses, as well as being in line with the trend towards sustainability. It also means paying more attention to local initiatives and relying less on financial support from the authorities. Finally, I think it’s striking that there’s not nearly as much of taboo as I would have expected among the Wageningen alumni on discussing population policy. What would be an ethically acceptable policy?”

Well, the general opinion is that women’s education holds the key.”

Interactive

KLV made sure that Wageningen alumni were involved in setting out the jubilee theme. That bottom-up approach can also be seen in the format of the main conference. Paul den Besten says: “It will definitely not be a routine, boring conference like so many others, with a couple of keynote speakers, discussion workgroups and a forum debate.” So what will it be? “We don’t want to spill the beans yet, but I can say that the participants will at any rate be able to count on an interactive, multi-media gathering with surprising presentation and working formats. Not that it means that the various elements will just be thrown together loosely - there still has to be an end product, of course. We do expect to come up with concrete recommendations and prospects for activities that can be undertaken.”



The main conference will be taking place on 10 November 2011. The programme is still under development. Keep an eye on the website www.klv125.nl or scan this QR-code for the latest details.



ACTIVITIES

Info: www.klv.nl/en
(unless indicated otherwise)

September 23

Young KLV - Course CV writing

October 4

Young KLV - CV check walk in session
Have your CV checked by a professional

October 4

Young KLV - Workshop - Speed Reading

October 16

KLV 125th jubilee - Eat and meet
www.klv125eatandmeet.nl

October 20

KLV 125th jubilee - ELLS and scientific
Student conference
www.klv125.nl

November 1

Young KLV - Work Search Café

November 3

KLV 125th jubilee - Young KLV party
Bit.ly/youngklv125

November 7

Young KLV - Workshop - Time Management

November 10

KLV 125th jubilee - Main conference
www.klv125mainconference.nl

November 18

Young KLV - Course CV Writing

WANT TO BECOME A MEMBER?
Go to <http://bit.ly/membershipKLV>

3rd most enterprising

Wageningen University is the third most enterprising university in the Netherlands, according to a survey done by ScienceWorks for the weekly magazine Elsevier. In first place overall was the Technical University of Delft, followed by the University of Amsterdam and Wageningen University. When it comes to collaboration with the business world, the Technical University of Eindhoven came first and Wageningen came third. Wageningen took third place for its media presence as well. Tilburg scored the highest in this category.

EDUCATION

More teachers

More students at Wageningen University will be able to qualify to teach in Dutch secondary schools from this September. Students from a range of Bachelor's courses can now follow a Minor programme in Education with a view to teaching physics, geography or biology on practically oriented VMBO courses or in the lower years of the more academic HAVO and VWO courses in Dutch secondary schools. The idea is that the Wageningen teachers help solve the shortage of science teachers in Dutch schools. The teacher trainees will come from the programmes in Soil, Water and Atmosphere, International Land and Water Management, Landscape Architecture and Spatial Planning, Animal Sciences and Plant Sciences. Students of Biology, Molecular Life Sciences and Economics have already been able to qualify to teach biology, chemistry and economics since 2009.



PHOTO: HOLLANDESE HOOGTE



PHOTO: GUY ACKERMANS

Food affects mood

Good food, better mood is the theme of this year's edition of Food4You, an annual festival held at the beginning of October in Wageningen, Ede, Barneveld and Veenendaal. The festival presents the latest insights from the food sciences through experiences for the general public, aiming at spreading knowledge and stimulating healthier eating patterns. Wageningen UR provides the knowledge and the Rijn IJssel vocational catering school provides delicious healthy food. Last year the festival attracted more than 13,000 visitors. Info: www.food4you.nl.

COURSES

Get more out of Horti Fair

By following the English-language course on Business Planning, entrepreneurs and managers in the horticulture sector can get more out of the biggest international horticulture trade fair in Amsterdam this autumn.

Participants in the course learn how to improve their profit margins through strategic planning and innovation. The course starts one week before the Horti Fair, to equip participants to collect information at the fair in a

focussed way. After the Horti Fair, the participants will draw up a creditworthy plan that can be submitted to a bank in their own countries. The course will be run by Wageningen UR's Centre for Development Innovation (CDI), which also runs English-language courses on topics including natural resource management and climate change, multi-stakeholder processes, food security and management and fisheries.

The full range of courses offered by the CDI can be found online. Info: www.cdi.wur.nl/

REUNION

Class of '54 keeps in touch

Sixty alumni who joined Ceres in 1954 will be getting together on 13 October. Every couple of years they organize a reunion themselves.

'The main point of the reunion is to catch up with each other' says Willem Geluk. He is on the reunion committee for the group of Ceres members who joined the student society or its counterpart for women, WVSU, in 1954. The group gets together every five years for an anniversary, and once in between as well. Geluk:

'It's important to meet up again. What is more, we want to stay abreast of developments in Wageningen.' On 13 October, the group will visit the Forum building on the Wageningen campus, the Dutch Institute for Ecology (NIOO-KNAW) and the Restaurant of the Future. Their agenda also includes topics such as future sources of protein and measuring climate change using tree rings. The Alumni Office at Wageningen University supports initiatives such as reunions which aim at reinforcing links between alumni and with the university. Info: alumni@wur.nl

WAGENINGEN WORLD



Wageningen in the world!

Wageningen World has readers in all corners of the world. Like the University of Dar es Salaam in Tanzania, where BSc student of Molecular Biology and Biotechnology Caesar Oweitu borrows it from a Wageningen alumnus. He writes: 'I am amazed by all the breakthroughs made in Wageningen, and can only wish to become part of such an incredible community.' Are you reading this magazine faraway from Wageningen too? Mail the photographic evidence to Wageningen.world@wur.nl

FUNDS



PHOTO GUY ACKERMANS

Ex-professor starts fund for crop scientists

Emeritus professor of Crop Ecology Huub Spiertz has launched a fund for young agrobiologists and crop scientists. Scientists at the start of their careers can apply to the fund for a contribution towards a study tour.

'It is precisely the first phase of your career that is crucial', explains Huub Spiertz. 'I would really like to do something for young people aiming at an international career.' The fund was launched by the emeritus professor of Crop Ecology and his wife in September 2011, exactly 100 years after his great uncle Emile á Campo

went to study in Wageningen. His great uncle's stories were part of what led Spiertz to choose to study in Wageningen himself.

PhD researchers and young scientists doing research on sustainable food production can apply to the fund for a contribution towards a study tour. 'Laying down new contacts that are relevant to their research is a key part of it', says Spiertz, who emphasizes that he had such opportunities himself when he was younger. It was an encounter with a distinguished Australian scientist, for example, which gave him the decisive push towards doctoral research. Info: www.fondsen.wur.nl/UK/

IN MEMORIAM

J. Achterstraat, WU Crop Sciences 1943, died at the age of 93 on 24 April 2011.

H. Corver, WU Irrigation Science 1951, died at the age of 89 in May 2011.

Bram Frencken, WU BSc student of Biotechnology, died at the age of 21 on 10 June 2011.

R.W. Garming, WU Agricultural Economics 1953, died at the age of 88 on 10 June 2011.

H.B. Goettsch, WU Crop Sciences 1951, died at the age of 89 on 4 June 2011.

Dr. J. Janse, WU Plant Breeding 1984, died at the age of 52 on 2 June 2011.

M.E. Kapteijn, WU Bioprocess Technology 2009, died at the age of 38 on 25 March 2011.

B. Kiës, WU Tropical Crop Agriculture 1948, died at the age of 89 on 22 February 2011.

D.J. Mansholt, WU Tropical Irrigation Science 1975, died at the age of 67 on 9 June 2011.

W.A. van Meegan, WU Irrigation Science 1952, died at the age of 86 on 13 May 2011.

H. van Os, WU Horticulture 1959, died at the age of 80 on 21 May 2011.

J. Schipper, WU Tropical Crop Sciences 1973, died at the age of 67 on 9 June 2011.

Dr. T. Quené, WU Agricultural Economics 1956, died at the age of 80 on 5 June 2011.

AWARDS

Prizes for bio-based building blocks and fish

Four Wageningen alumni in two startups received prizes on 23 June in the New Venture competition. Waste2Chemical, set up by alumni Niels van Stralen and Kirsten Steinbusch, won the Biodiversity Innovation Award worth 20,000 euros. Harm Luisman and Jeroen Schuphof's fish-farming company Vallei Vis won the Food Innovation Award worth 10,000 euros.

Van Stralen and Steinbusch want to use their own innovative technology to process various types of organic waste into usable bio-based building blocks, thus forging a link between the chemical industry's need for new bio-based building blocks and waste processors' wish to extract chemicals with high added value from organic waste flows. The jury described the business as 'highly promising'.

Niels van Stralen obtained his MSc in Biobased Technology in 2010. Since obtaining her PhD in 2009, Kirsten Steinbusch has worked as a Postdoc in the Environmental Technology section of Wageningen University.

'Six months of hard work has finally borne fruit', says Van Stralen. The alumni will put some of the prize money towards new testing apparatus.

Vallei Vis won a Food Innovation Award worth 10,000 euros. This small company farms trout sustainably in the Netherlands'



Harm Luisman (l) and Jeroen Schuphof

Food Valley. The sustainable fish farm was established this year by Jeroen Schuphof, Aquaculture graduate, and businessman Harm Luisman, Geo Information Systems graduate. They have plans to farm other species of fish as well in the future. New Venture is an initiative of McKinsey and the ministry of EL&I. The competition consists of a process in the course of which startup companies develop a fully-fledged business plan.



Niels van Stralen and Kirsten Steinbusch

PHOTOS PIM HENDRIKSEN

PERSONALIA

PHOTO TED CONFERENCES 2010



Marcel Dicke

Prof. Marcel Dicke,

professor at the Laboratory for Entomology at Wageningen University, part of Wageningen UR, has been appointed member of the Dutch Royal Academy of Science, the KNAW, from 26 September. 18 May 2011.

Dr. Aalt Dijkhuizen, WU Agricultural Economics 1977, chair of the Executive Board of Wageningen UR, has been appointed member of premier Najib Razak of Malaysia's International Advisory Board. 17 May 2011.



Anton Haverkort

Prof. Anton Haverkort,

WU Crop Sciences 1978, working at PRI Agrosystems Sciences, has received the Liupan Mountain Friendship Award from the Director General of Agriculture in Ningxia in China for his project for the Ministry of

EL&I to develop a potato seed production line for export. 11 April 2011.

Dr. Martijn van der Heide, Dr. John Janssen and Dr. Derk Jan Stobbelaar have been appointed associate professors in Integrated Nature and Landscape Management at Van Hall Larenstein in Velp, part of Wageningen UR. They will use their expertise to establish the new discipline of integrated landscape management.

Van der Heide, WU Agricultural and Environmental Economics 1997, also works as a researcher in the department of Environment, Nature and Landscape at the LEI.

Janssen, University of Utrecht 1991, also works as a researcher on vegetation and landscape ecology at Alterra, part of Wageningen UR.

Stobbelaar, WU Environmental Sciences 1990, also teaches Forest and Nature Management at Van Hall Larenstein.

Giel Hermans, VHL alumnus, has been named agricultural entrepreneur for 2011 by the Dutch newspaper *Agrarisch Dagblad* together with the ABN Amro Bank, the Gibo Group and Vion. 18 April 2011.

Dr. Matthijs Jore, WU Molecular Sciences 2006, who works at the Laboratory for Microbiology at Wageningen University, has won third prize from DSM Science and Technology Awards (North) for his doctoral research on the immune mechanism of prokaryotes. 1 June 2011.

Inge Kersten MSc, WU Landscape Architecture and Planning 2011 and **Jorrit Noordhuizen MSc,** WU Landscape Architecture and Planning 2011, have jointly won second prize from the International Federation of Landscape Architects. 26 June 2011.

Prof. Joop van Lenteren, emeritus professor of Entomology at Wageningen University, has been awarded an honorary doctorate from Warsaw University of Life Sciences. 20 May 2011.



Hua-Fen Li and Elvire Schlosser

Dr. Hua-Fen Li,

WU Environmental Sciences 2001, has been awarded the biennial Bram Steiner Award 2010 for plant cultivation without soil, for her research on the absorption of nutrients from nutrient solutions. 25 June 2011.

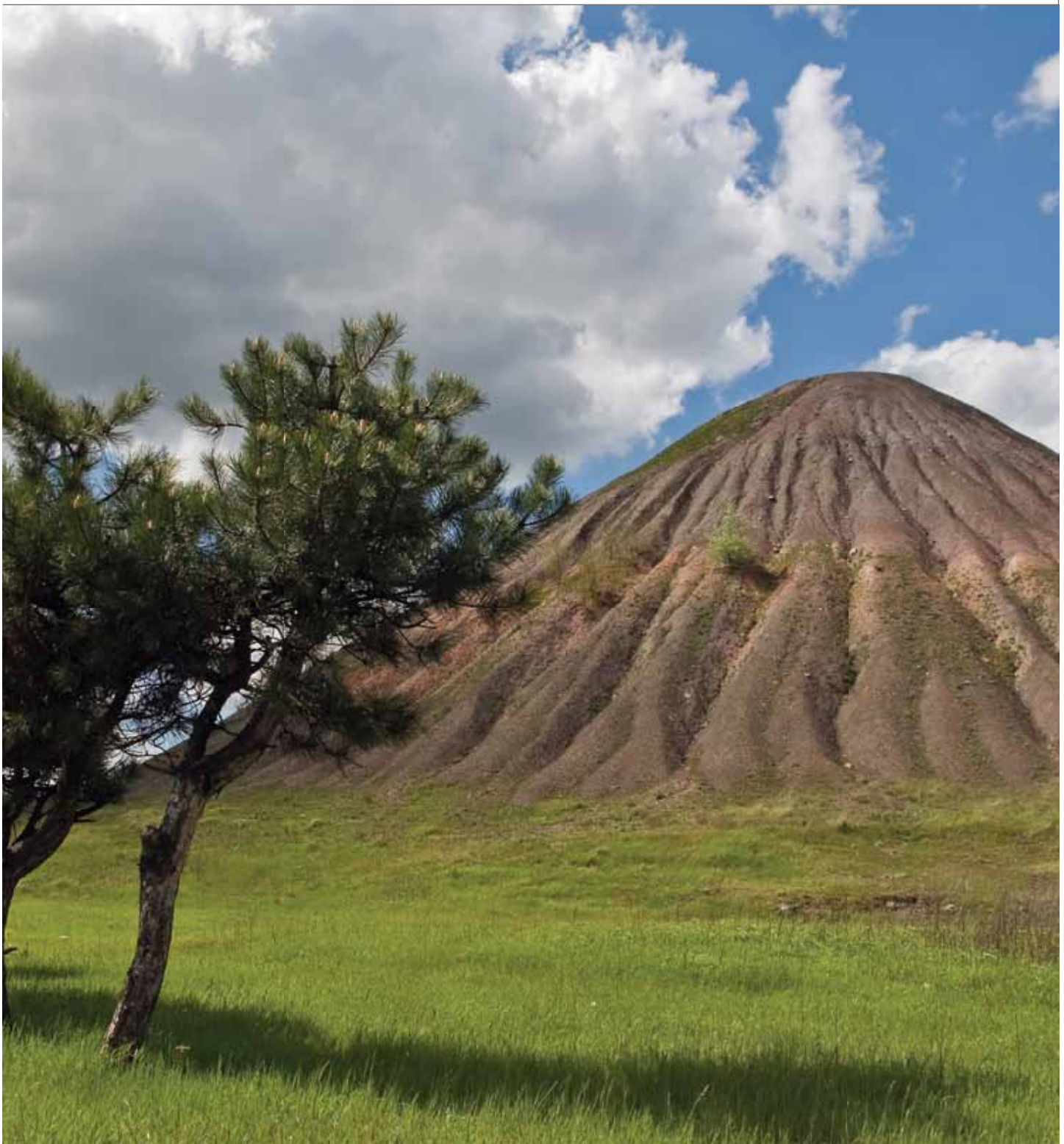
Dr. Niels Louwaars, WU Plant Breeding 1982, until recently researcher at the Centre for Genetic Resources, part of Wageningen UR, has been appointed director of Plantum NL from September 2011.

Prof. Bernd van der Meulen, professor of Law and Governance at Wageningen University, has been awarded the VAR-Michiels prize by the Dutch Association for Public Law (VAR). 20 May 2011.

Dr. Machiel Reinders, researcher on consumer and society at the LEI, has won the Dutch PIM science prize for 2011 for his thesis on 'Managing consumer resistance to innovations'. 4 May 2011.



Joop van Lenteren



Colour returns to Ukrainian steppe

Three years ago Alterra, part of Wageningen UR, started a project to combat land degradation in the steppes of Ukraine. A showcase study for two provinces, Belovodsk and Antracite, has been well received, says project leader Theo van der Sluis of Alterra's Crossing Borders team. 'The top priority was to restore some of the

natural wealth to the eroded grasslands, which had lost much of their biodiversity through overgrazing, illegal mining and arable farming in the past. This can only be done in consultation with farmers; there have to be sustainable prospects for them too.' This resulted in a multidisciplinary project to investigate how farmers can benefit

from grasslands being managed more naturally, the investments needed to do this and how to convince those involved of the benefits. In addition, Alterra developed an ecological network for the region, which the parliament has adopted as the starting point for its regional development plans. Info: theo.vandersluis@wur.nl ■