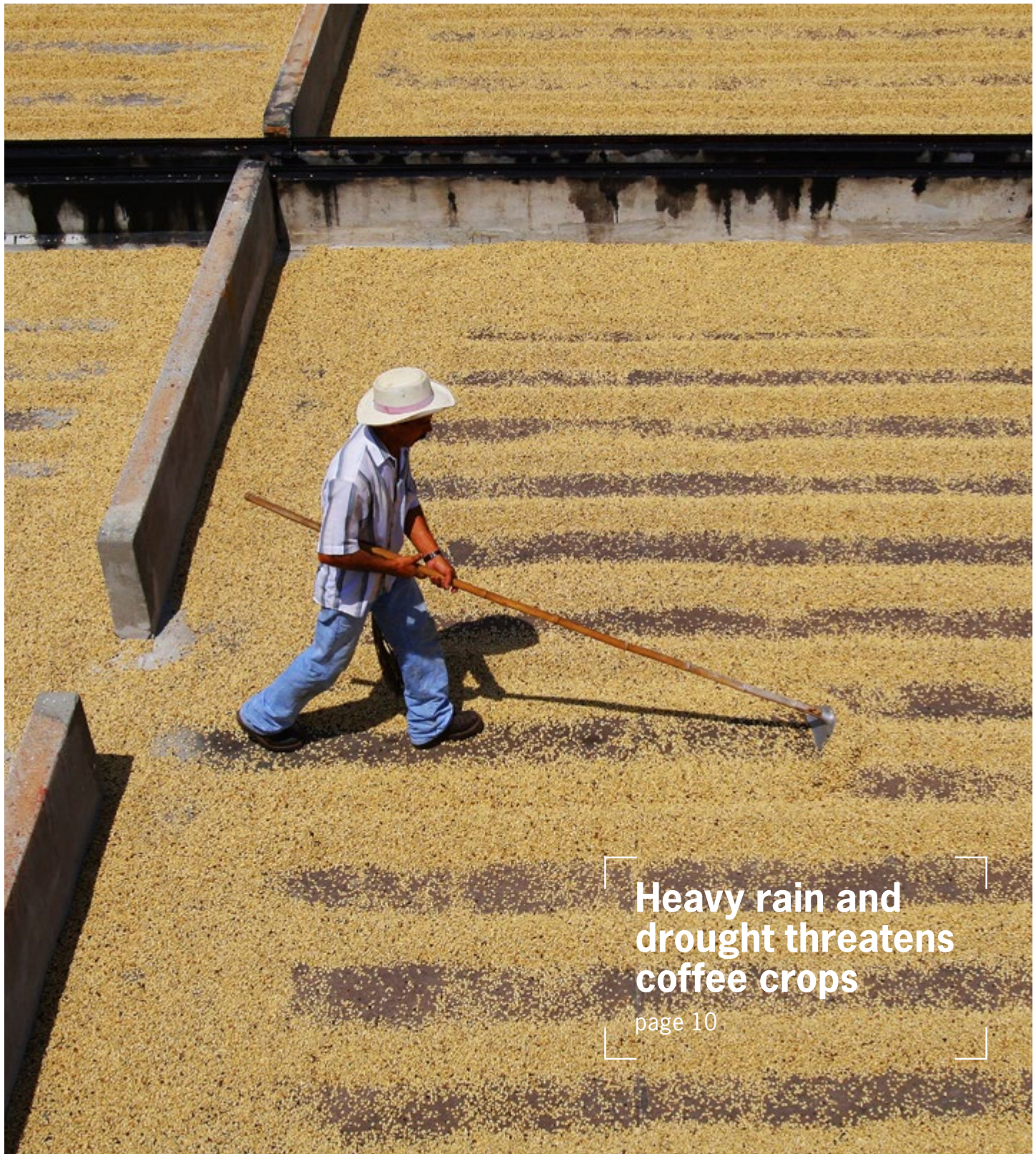


# WAGENINGEN WORLD

MAGAZINE OF WAGENINGEN UNIVERSITY & RESEARCH ABOUT CONTRIBUTING TO THE QUALITY OF LIFE

No.3 2016



Heavy rain and  
drought threatens  
coffee crops

page 10

Time to bring back **the bean** | Farming with **field birds** | Impact: guaranteed **gluten-free oats**  
Protecting **sea turtles** in the Caribbean | Towards a **sustainable city** | **Cockerel** back on the menu





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## HEAVY WEATHER FOR COFFEE FARMERS

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## BRING BACK THE BEAN

If we are to feed the fast-growing world population it's time the super-healthy, environmentally friendly bean made a comeback. As steak, for instance. A Wageningen take on the year of pulses.



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**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.eu/wageningen-world](http://www.wur.eu/wageningen-world) **Publisher** Wageningen UR, Marc Lamers **Editorial Board** Hans Bothe, Yvonne Fernhout, Ben Geerlings, Bert Jansen, Jeanette Leenders, Jac Niessen, Irene Salverda, Erik Toussaint, Delia de Vreeze **Editor-in-chief** Pauline Greuell (Corporate Communications Wageningen University & Research) and Edwin van Laar (Editor-in-chief Resource, Wageningen University & Research) **Magazine editor** Miranda Bettonville **Copy editor** Rik Nijland **Alumni news** Yvonne de Hilster **Translators** Clare McGregor, Clare Wilkinson **Art direction and design** Petra Siebelink (Communication Services, Wageningen University & Research) **Cover picture** Hollandse Hoogte **Overall design** Hemels Publishers **Printer** Tuijtel Hardinxveld-Giessendam **ISSN** 2210-9928 **Address** Wageningen Campus, Droevendaalsesteeg 4, 6708 PB Wageningen, PO Box 409, 6700 HB, Wageningen, telephone +31 317 48 40 20, [wageningen.world@wur.nl](mailto:wageningen.world@wur.nl) **Change of address alumni** [alumni@wur.nl](mailto:alumni@wur.nl) **Change of address associates** [wageningen.world@wur.nl](mailto:wageningen.world@wur.nl), mentioning code on address label **Change of career details** [alumni@wur.nl](mailto:alumni@wur.nl)

The mission of Wageningen University and Research is 'To explore the potential of nature to improve the quality of life'. Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.



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PHOTO MARTHA STEWART

## Rethinking innovation

‘Technological innovation is often extolled for its power to overcome major development challenges. Yet innovations frequently face resistance which hampers implementation. This resistance to change is nothing new. In 1674, English women submitted a petition against coffee, alleging that it caused sterility in men. The following year the king started to suppress coffeehouses, but his main aim was probably to protect the market for local beverages and the newly introduced tea. Down the years, the printing press, margarine, electricity, recorded music, tractors and genetically-engineered foods have all encountered their opponents. They protest, they employ slander, misinformation and even demonization – or they sing the praises of their existing way of life. Governments often end up deciding that it would be easier to prohibit the new technology than to promote it, or they issue heavy restrictions and taxes.

‘People very rarely reject technological progress out of sheer ignorance. Rather, they fight to protect their own interests and livelihoods, fearing losses of employment, income, power and identity. Tensions also rise if the benefits of new technologies will accrue only to small sections of society while the risks will be more widely distributed. The key to addressing a new technology’s downsides will be to focus on inclusive innovation, ensuring that those who are likely to lose from the displacement of old technologies are given ample opportunity to benefit from new ones.

‘For Wageningen this means sharing information about emerging technologies and helping incumbent industries to retool. Most important is training the next generation in inclusive innovation, and enlarging their awareness of how their inventions impact people at all levels of society, from early adopters to stragglers. Those impacted by innovation are more likely to embrace new technologies when they are developed in an environment that is sympathetic to their social needs.’

*Calestous Juma, Professor of the Practice of International Development at Harvard Kennedy School (USA), was scheduled to speak at the opening of the academic year in Wageningen on 5 September. Unfortunately he had to withdraw.*



PHOTO CIAT/NEIL PALMER

## DNA of banana fungus decoded

An international consortium led by Wageningen University & Research has decoded the DNA of the fungus which causes Black Sigatoka disease in bananas. This provides greater insight into the interaction between the fungus and the banana plant, as well as starting points for developing alternatives to expensive, environmentally damaging and less and less effective spraying with pesticides. 'For instance, by developing a banana plant which is suited to production and export as well as being resistant to Black Sigatoka,' says research leader Gert Kema.

The most widely cultivated banana in the world, the Cavendish, is extremely vulnerable to the ubiquitous *Pseudocercospora fijiensis* fungus. This fungus causes severe harvest losses as well as making fruit ripen faster, which hampers the export process. The researchers published their study in August in *PLoS Genetics*.

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## SPATIAL PLANNING

### Empty barns in Brabant

An estimated 30 to 40 percent of farms will be ceasing operations in the next few years in the province of Brabant. Half the barns and sheds that fall vacant as a result will not eventually find a new use. These findings come from a study by Wageningen Environmental Research (formerly Alterra). The disused buildings could fall into disrepair as well as causing problems for farmers who were relying on their real estate for their pensions.

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# Mosquito trap reduces malaria

**Widespread use of a mosquito trap developed with input from Wageningen University & Research can reduce the incidence of malaria. In a trial on the Kenyan island of Rusinga, the number of people infected with malaria dropped by 30 percent.**

Between June 2013 and May 2015, all the houses on the island were fitted in phases with a mosquito trap and a solar panel to run it on. The researchers picked this island in Lake Victoria for its isolated location and the proximity of a Kenyan research centre. Wageningen social scientists studied how to generate support for the installation of the traps, and supervised the process. The Suna trap (suna means mosquito in the local Dholuo language) contains odour-impregnated strips which smell as good as humans to mosquitos. A ventilator powered by a solar panel – the island has no power grid – sucks mosquitos that take the bait into the trap, where they dry out. 'The solar panel can also power some lighting and a mobile phone charger,' says research leader Willem Takken. Thanks to the combination of the information campaign, the accompanying study and the solar panel, all but three of the more than 4300 households on the island signed up. In the one and a half years it took to equip all the households with a trap, the researchers

compared the number of malaria infections in clusters of houses already fitted with mosquito traps with that of the clusters still waiting for traps. 'We saw the effect of 30 percent less malaria in the first cluster to get traps. And this effect was seen in every new cluster,' says entomologist Alexandra Hiscox. The traps also led to a 70 percent drop in the population of the main malaria mosquito (*Anopheles funestus*) in every cluster. The study by Wageningen University & Research and colleagues in Kenya, Switzerland and the Netherlands was published at the beginning of August in the leading medical journal *The Lancet*. The odour-baited traps still need some further testing before they can become part of anti-malaria programmes. The traps also have potential for use in combatting dengue fever and the zika virus.

The project was financed with a donation from the COMON Foundation, thanks to fundraising by University Fund Wageningen. Info: [willem.takken@wur.nl](mailto:willem.takken@wur.nl)



PHOTO ANP

Willem Takken with a mosquito trap and solar panel.



## WAGENINGEN UNIVERSITY &amp; RESEARCH

# One name for Wageningen University and Institutes

The coherence and internal collaboration among the university and the research institutes in Wageningen has been growing over recent years. This is reflected in the adoption in September this year of one new brand name for both the university and the institutes: **Wageningen University & Research**. The institutes' individual brand names are being dropped.

The new brand name is close to the old name, Wageningen UR, but makes clearer, the organization feels, what Wageningen stands for: a combination of a university with market-oriented research institutes. A combination of education, fundamental and applied research which is unique internationally.

Efforts will continue under the banner of 'One Wageningen' to promote further synergy within Wageningen University & Research – abbreviated to WUR. In the interests of profiling itself even more clearly as one organization, sub-brands such as Alterra, LEI and IMARES are being dropped. From now on the research institutes bear a domain specification.

[www.wur.eu/brand-policy](http://www.wur.eu/brand-policy)

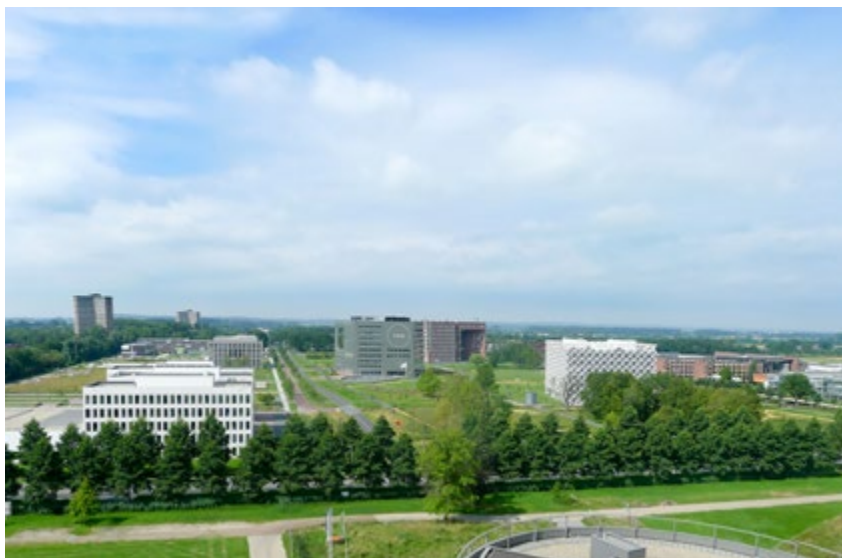


PHOTO: JONIS SCHAAPE

Old brand name	New domain specification
LEI	Wageningen Economic Research
Alterra	Wageningen Environmental Research
Central Veterinary Institute	Wageningen Bioveterinary Research
Livestock Research	Wageningen Livestock Research
Food & Biobased Research	Wageningen Food & Biobased Research
PPO and PRI	Wageningen Plant Research
IMARES	Wageningen Marine Research
Wageningen Academy	Wageningen Academy
RIKILT keeps the same name for the time being.	

## WAGENINGEN ACADEMY

## Nutrition and climate in poultry

Progress in nutrition and breeding has resulted in broiler chickens and laying hens that perform better than ever before. However, their higher production performance makes them more susceptible to heat stress, a worldwide problem in poultry production causing big economic losses. Poultry production in the European Union is also facing other constraints: consumers are increasingly voicing their opinions about the effects of poultry production on

the environment and animal welfare. These concerns have already resulted in legislation on nitrogen and phosphorus levels in feed and manure, and a ban on the use of several antibiotics as growth promoters. Wageningen Academy is running a two day course to broaden and deepen the knowledge and understanding of nutrition and (hot) climate in poultry.

Date: 8-9 November. [www.wur.eu/wageningenacademy](http://www.wur.eu/wageningenacademy)

## Tea, apples and cocoa prevent heart attacks

Nutrition researchers at Wageningen University & Research have found evidence in the Zutphen elderly study that the substance epicatechin provides protection against cardiovascular disease. Epicatechin is found in tea, apples and cocoa. In the Zutphen study more than 700 men were monitored for 25 years. The men whose diets included plenty of epicatechin proved less likely to die of a heart attack or other coronary heart diseases than those who consumed little of the substance. It was already known that tea increases the flexibility of blood vessels and lowers blood pressure. Now we also know which substance is responsible for this effect.

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### PLANT-SOIL RELATIONSHIPS

## Mars vegetables almost certainly safe

The vegetables which ecologist Wieger Wamelink of Wageningen Environmental Research (formerly Alterra) has succeeded in growing in Martian and lunar soil almost certainly do not contain dangerous levels of heavy metals, initial measurements suggest. The test soil comes from NASA and has the same composition as the soils on Mars and the moon. Wamelink grew ten kinds of vegetable in this soil this summer and took thorough measurements of the levels of heavy metals and vitamins they contained.

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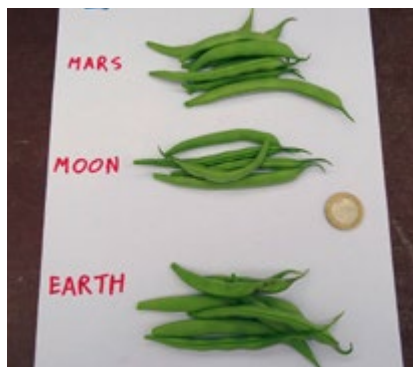


PHOTO DREAMTIME

# Diner is happy with less meat

**It is no problem for restaurateurs to serve their customers less meat and larger portions of vegetables. Their guests are just as satisfied, they eat more vegetables without noticing it, and less meat gets thrown out.**

Most Dutch people do not eat enough fruit and vegetables. The latest food pie chart with dietary advice recommends 250 grams of vegetables a day, but very few people manage that. And yet it would be healthier for them and good for the environment. Producing and processing meat costs 15 times as much water and produces eight times as much CO<sub>2</sub> as vegetable production. Wageningen Food & Biobased Research is researching ways of getting people to eat more vegetables. One of these is through portion sizes in restaurants. Working with a large restaurant chain, the researchers have shown that this principle works in practice.

Guests in three restaurants were divided into two groups for the study. One group was given 75 grams of vegetables and normal amounts of fish or meat; the other was given 150 grams of vegetables and 12.5 percent less meat or fish. Leftovers were weighed in the kitchen after the meal. The second group, with less meat, ate

31 percent more vegetables. And yet both groups felt the quantities were sufficient. It was also noted that guests ate more of the vegetables on their plates than of those served as side dishes in separate bowls. An additional effect of the smaller portions of meat was that 33 percent less meat was left on the plates and binned.

Possibilities for getting people to eat more fruit and vegetables at work were found as well: by putting out vegetable snacks at meetings. Baby tomatoes, cucumbers or peppers, for instance. Offered these snacks, people eat roughly one third of the recommended daily allowance of vegetables at a go.

Research is still ongoing into whether changing the choices on offer in school canteens can raise fruit and vegetable consumption among schoolchildren. The studies are part of the multi-annual public-private partnership 'Fruit and veg are good for everybody'.

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## WATER QUALITY

## Water pollution can be cleaned up

**In a special edition of the scientific journal *Water Research*, 60 scientists from 12 countries demonstrate that contamination of lakes and ponds with phosphate and nitrogen can be cleaned up using 'geo-engineering'.**

A global problem, this pollution is often caused by over-fertilization of the land. Fertilizers cause the growth of toxic algae and the loss of biodiversity. The poor water quality is a problem for fisheries and drinking water supplies. The combined studies show that it is possible after a good diagnosis to intervene in biogeochemical cycles (this is known as 'geo-engineering'). Green-blue algae can

effectively be lumped together to make them sink to lower water levels, and phosphate can be fixed to the bottom of the lake or pond using natural salts and special bentonite clay. Miquel Lüring of Wageningen University & Research supervised the publication of the June special edition, which includes several Wageningen contributions.

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PHOTO BUTENBEELD

## NUTRITION AND EATING BEHAVIOUR

## Fibre makes an empty stomach feel full

**Food with plenty of fibre creates a more satiated feeling than food with little fibre. This applies even when the food contains fewer calories. This emerged from a study using dairy-based drinks containing 100 or 500 calories, both coming in a thin and a thick, high-fibre variant.**

It turned out that test subjects felt fuller 40 minutes after drinking the thick milkshake with 100 calories than after the thin shake with 500 calories. This is remarkable because food with fewer calories actually passes through to the large intestine faster. That means that even though thick food with fewer calories goes through the stomach faster, it still creates a fuller feeling. Researchers call this 'phantom fullness'. The test subjects did not make up for the difference in calories by eating more at their next meal. The study by Wageningen University & Research was published in the *American Journal of Clinical Nutrition*.  
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## LANDSCAPE EXPERIENCE

## HappyHier records where we are happy

**Wageningen Environmental Research (formerly Alterra) has been collecting data over recent months about where and when people feel happy.**

This was done through an app called HappyHier. After it has been downloaded (free), the app asks smartphone users several times a day how they are feeling, what they are doing and in what company. Their location is established using GPS. More than 6000 people submitted their answers. 'We look at the variation within one person's answers,' explains Hans Farjon. The data should

provide researchers with insight into the importance of different types of green environment for human happiness. Governments and business could use this information in making decisions that affect the residential environment, such as positioning wind turbines or creating a park.

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## NUTRITION AND HEALTH

# More proteins for lower blood pressure

Eating more proteins and fewer carbohydrates reduces your blood pressure, concludes PhD candidate Susanne Tielemans of Wageningen University & Research after analysing 29 studies, including 17 clinical trials.

Replacing 40 grams of carbohydrate a day by 40 grams of protein reduces the systolic pressure by 2 mmHg. That reduction may seem small, but it can have a huge impact on public health, says Tielemans. 'It would mean an estimated six percent reduction in deaths from strokes and four percent fewer deaths from coronary heart disease, such as heart attacks.' It is still not clear whether the reduction is due to the increased consumption of protein or the reduced consumption of carbohydrate. Tielemans says the evidence is not yet sufficient to warrant a change in nutritional advice. She obtained her doctorate in June.

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## ENVIRONMENTAL POLICY

# Wageningen climate-neutral

Wageningen University & Research was climate-neutral for the first time last year. The main reasons for this were falling CO<sub>2</sub> emissions and growing energy production by the organization's wind turbine park in Lelystad. The CO<sub>2</sub> footprint was 40 percent smaller in 2015 than when it was first measured in 2010. At that time 70 percent of the emissions came from the energy consumption of the organization's buildings. This figure has been cut to one third by buying green energy and building low-energy buildings. One quarter of the emissions come from business trips by plane.

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## CONSUMER BEHAVIOUR

# Light products do not work in the long run

Consumers who switch to light potato chips not only start eating more potato chips, after a year they start eating regular potato chips again as well. By then they are buying 13 percent more calories on average. These findings come from a study by researchers including professor of agricultural marketing Joost Pennings of Wageningen University & Research. The researchers used data on purchases by households. According to Pennings, this means that light variants of sweets, soft drinks and savoury snacks do not help combat obesity in the longer term.

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PHOTO HOLLANDESE HOOGTE

## GENETICS

# Determining where wild boar and red deer come from

**Wageningen Environmental Research (formerly Alterra) has set up a database with the genetic profiles of 383 red deer and 1095 wild boar from the Netherlands and border areas in Germany and Belgium.**

Red deer and wild boar are only allowed in a few places in the Netherlands; in theory, they should be culled if found outside

those areas. The database makes it possible to determine whether animals living outside these habitats arrived there through natural expansion, through immigration or by being released. The data also shows that genetic diversity among red deer is still sufficient for a sustainable population. The wild boar population needs close monitoring, though.

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PHOTO BUITENBEELD



## AQUATIC ECOLOGY

# Sperm whale flukes recorded in database

**Sperm whales can be recognized by their tail flukes. Evert Mul of Wageningen Marine Research (formerly IMARES) wants to exploit that fact to obtain a good picture of sperm whale migration in European waters.**

Sperm whales are toothed whales. They have been classified as 'vulnerable' in the Red List of threatened species by the international conservation organization IUCN. These whales occasionally wash up on beaches. However in early 2016, 29 washed up in a short space of time in different countries around the North Sea, including six on the island of Texel. Wageningen Marine Research wants to investigate where these 29 sperm whales (all bulls) came from. 'This information is necessary to find out why they became stranded,' explains Mul. Sperm whales always show their tails (flukes) when they dive and this often gets captured in photographs. Mul and his colleagues therefore want to create a database with photos of sperm whale flukes. By collecting photos from all over Europe and comparing them, the researchers hope to discover whether the six sperm whales on Texel were spotted anywhere else before ending up in the North Sea.

To investigate where they came from, the researchers want to identify the whales using photos of their tails. The tail fluke is like a fingerprint. 'The scars and patterns of white and yellow spots are different on every tail.'

An estimated 7000 sperm whales live in the north-eastern Atlantic. Getting a picture of their migratory behaviour would show whether they are being affected by human activities at sea such as marine shipping, fishing and offshore oil and gas drilling. Plans for such activities and the creation of protected marine nature areas could then take whales' migration patterns into account. The researchers have raised the money for the creation of the sperm whale catalogue through crowdfunding. With extra funding they can expand the research to cover sperm whales stranded around the North Sea in the past ten years.

<https://crowdfunding.wur.nl/project/potvissen>

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## BIOLOGICAL PEST CONTROL

## More earwigs in the orchards

Fruit growers welcome earwigs in their orchards because these insects eagerly devour woolly apple aphids and pear psylla. Wageningen University & Research and the Dutch Fruit Growers' Organization has launched a study of the possibilities for improving conditions for this agent of biological pest control. This would enable growers to cut down on the use of synthetic pesticides. The study is subsidized by the Horticulture and Propagation Materials Top sector.

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## NATURAL TOXINS



## Maple trees not always harmful to horses

The leaves, seeds and saplings of maple trees are not always the cause of 'atypical myopathy' in horses. Researchers at RIKILT Wageningen University & Research and Utrecht University drew this conclusion after analysing hundreds of samples from three maple species. The culprit behind the disease is the plant toxin hypoglycin A, which causes severe muscular disorders. In 70 percent of cases, the horse eventually dies. The toxin was not found in the field maple or the Norway maple. It was found in the standard maple tree (the sycamore), but not all horses in fields adjoining sycamore trees become sick. Other factors may also play a role.

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A man wearing a straw hat and a striped shirt stands in a field of coffee beans. He is holding a long wooden pole. The sky is blue with white clouds. The foreground is filled with a large pile of yellow coffee beans.

# Heavy weather for coffee farmers

Climate change is hitting the Colombian Andes hard. Coffee farmers are seeing their harvests threatened by heavy rains alternating with long droughts. Young people armed with Wageningen knowledge are supporting their efforts to make their water and soil management climate-proof.

TEXT GERT VAN WIJLAND PHOTO HOLLANDSE HOOGTE INFOGRAPHIC JORRIS VERBOON





It came as no surprise to Maarit Ivalo of the Netherlands Enterprise Agency that the coffee plantations of the Colombian Andes were not located on gentle slopes. But when she went there on her first working visit, she was not prepared for quite how steep the slopes were, how inhospitable the landscape and how tough the conditions. This was brought home to her when she watched the pickers hanging over the edge of deep ravines to do their work. ‘They hang in the air on ropes to reach the coffee beans, sometimes in the hot sun, sometimes in torrential rain.’

It was precisely because of these increasingly tough weather conditions that Ivalo was visiting the area in her capacity as Public-Private Partnerships (PPP) advisor for Latin America at the Dutch ministry of Foreign Affairs. She coordinates the international aid project Manos al Agua, whose objective is to make coffee farming in the Andes more sustainable and more climate-proof. ‘We are doing this at the behest of the federation of Colombian coffee farmers FNC, whose harvests have been falling sharply recently.’ Climate change is hitting the region hard,

on Water – focuses on the watersheds of five big rivers that cut through the Andes mountain range. Currently this enables the partners to reach about 11,000 farmers. In Colombia there are a total of more than half a million small-scale coffee farmers. The Federation hopes they will all end up benefiting from Manos al Agua.

### IMPROVING HARVESTS

Wageningen’s main contribution is knowledge about water management and climate change, says Wouter Wolters, a researcher in Climate Change and Adaptive Land and Water Management at Wageningen Environmental Research (formerly Alterra). ‘Our focus is on adapting the water management and land use to the worsened conditions.’ Wolters works on extension and training along with his fellow researcher Laura Miguel Ayala at Wageningen Environmental Research. Their aim is to make the farmers aware of the importance of balanced local water management, and teach them how they themselves can improve the water system, and therefore their harvests.

their drinking water. This pollution is even worse now that the periods of drought are increasing and water is getting scarcer,’ says Wolters. Farmers who want to participate in Manos al Agua are asked to stop dumping the polluting waste from their production process on communities downstream. Besides, there is a simple and effective solution to this problem: the husks can be composted and then spread on the plantations as organic fertilizer. This means less pollution, less erosion and less need for artificial fertilizer. Not a bad harvest from a bit of awareness-raising and knowledge-sharing, reckons Wolters.

### AWARENESS-RAISING

This is how it works on a smaller scale too, as FNC worker Lina Echeverri knows from experience. ‘For some time now we have been making local residents aware that the way they run the plantations and their own communities has an impact on the environment and therefore on the yields.’ And with success, she reports with pride: after a campaign on saving water, domestic water consumption went down by as much as 90 percent in the local communities in just three years. ‘Manos al Agua thereby has a direct impact on the quality and quantity of water in all the watersheds.’ A better environment begins at home, that much is clear for Echeverri.

She stresses the fact that farmers stand to gain a lot from projects such as Manos al Agua. Without climate adaptation, she predicts that the coffee farmers will become less competitive on the world market. Harvests will diminish, endangering all the coffee farmers’ future prospects, given that most of them already have trouble making ends meet.

So Echeverri is very pleased with the initial results of the collaboration. ‘More than 11,000 coffee farming families are working on making their water management and their production more climate-proof. In ➤

‘They are champion coffee farmers,  
we are champion water managers’

says Ivalo. Heavy rains and long droughts are threatening the farmers’ livelihoods in the longer term. ‘There are years in which 30 to 40 percent of the harvest is lost to rot, diseases, drought or insect damage.’

In an effort to reduce these losses, the Dutch government is contributing 9.5 million euros to a collaborative venture (see text box) which Wageningen University & Research is involved in as well. Manos al Agua – Hands

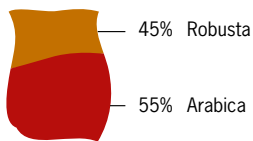
This begins, says Wolters, with tackling the environmental problems traditionally faced by Colombian coffee farmers: pollution, deforestation and erosion. Take the husks left behind after drying the coffee beans, for example. These husks are highly toxic for water and everything that lives in it, but tons of them have always been dumped, unprocessed, in the rivers. ‘And that when nearly all the villages depend on these rivers for



## COFFEE AND CLIMATE CHANGE

Worldwide more than 100 million people depend on coffee production for their livelihood. Coffee farmers are facing growing challenges caused by climate change.

Global production: 150 million 60-kilo bales, mainly Robusta and Arabica beans



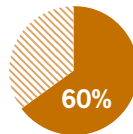
### Robusta

The Robusta bean is cheaper to produce: it is less vulnerable to disease and yields are bigger.

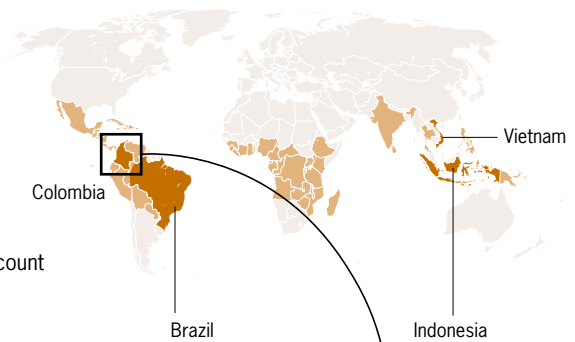
### Arabica

Coffee made with Arabica beans has a milder, more aromatic flavour than Robusta coffee, with its bitterer taste.

Seventy countries grow coffee



Four countries account for 60 percent of the production



Coffee-growing areas



### Climate measures in Colombia

There are more than half a million coffee farmers in Colombia, most of whom grow Arabica beans on steep mountain slopes. Heavy rains and long droughts threaten these farmers' livelihoods.

The Manos al agua project offers small coffee farmers in Colombia advice on steps they can take to cope better with drought and flooding.

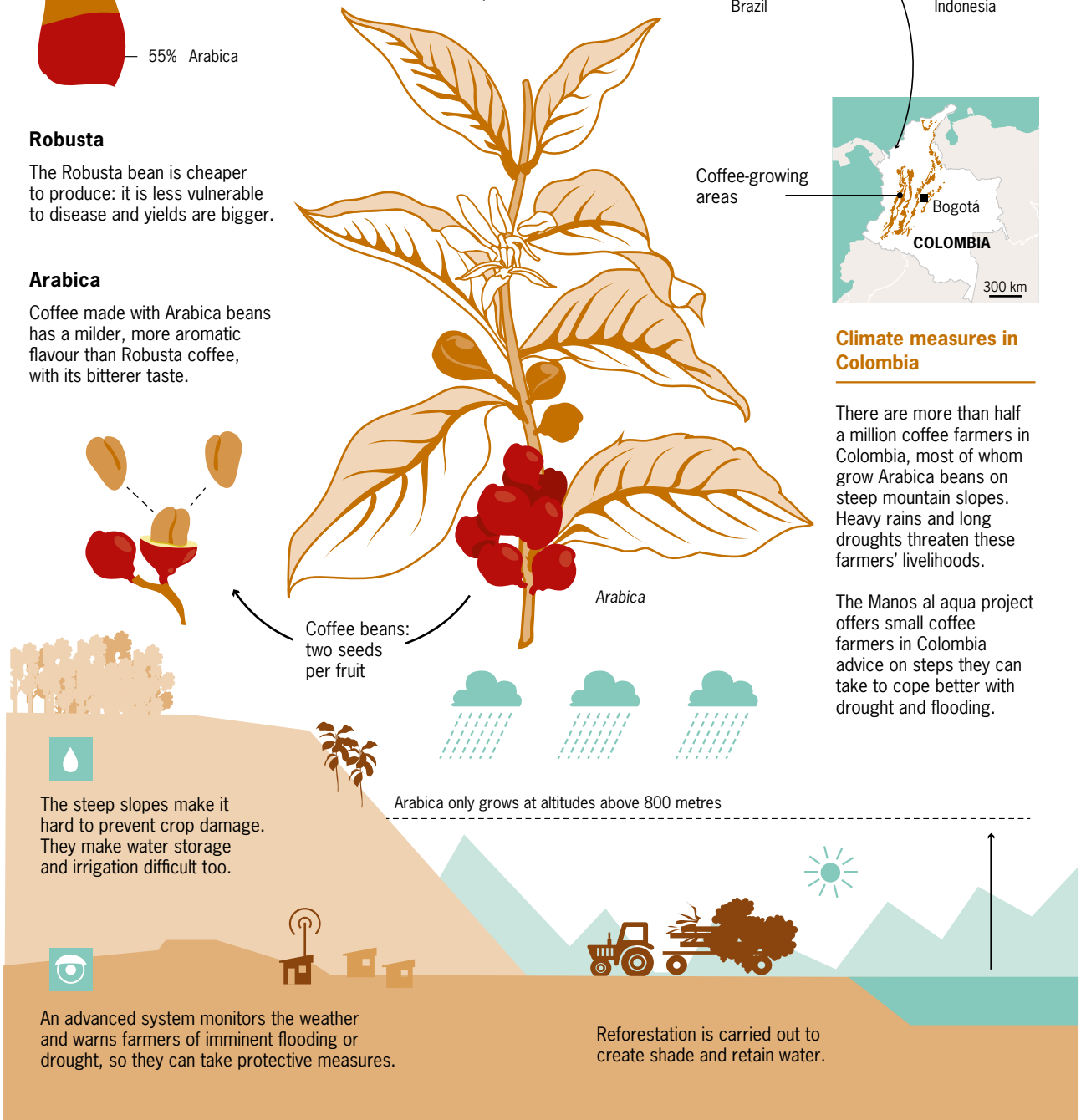




PHOTO CIAT / NEIL PALMER

A Colombian coffee farmer in the middle of his plantation.

spite of the increasingly extreme weather, we hope and expect that this will enable them to stay competitive on the world market.'

### WEATHER STATIONS

The most visible Wageningen input for the project, from the farmers' point of view, is in water management and meteorology.

Wolters: 'After three years of planning and data collection, local water purification systems are now being put in place. There are already hundreds in use, both for purifying the coffee production water and for domestic use. And the first reforestation projects have started now too.'

The farmers can also see the 24 meteorological stations which have been put in place on the slopes where the plantations are located. 'We use these to monitor temperatures, humidity and precipitation,' explains Wolters. Those data are fed into an existing local database which is used for a special weather

bulletin for coffee producers. 'Our task within Manos al Agua is to further refine these weather forecasts using local knowledge about the area in order to give more accurate warnings of flooding or droughts. If there is danger of flooding, we warn the farmers to clear their waterways, for instance, and take other steps to prevent flooding.'

When drought strikes, however, it is harder to prevent long-term damage to the crop, especially since the slopes are too steep for conventional irrigation. 'It is difficult to store water to use later to prevent drying out; creating a dam is no simple matter in these extremely high mountains. What we can do is advise the farmers not to use artificial fertilizer during long-term droughts, and to postpone planting vulnerable new bushes. We also encourage them to create shady areas on and around the plantations, to reduce evaporation.'

Wolters talks in 'we' terms because he feels involved in the project, but it does not mean

that Wageningen staff personally go into the mountains to advise farmers. 'We train local people who travel to the plantations to share this knowledge.'

To that end, the FNC has a staff of about 1400 people who have been advising coffee farmers for years about how to make their production as sustainable as possible.

Wolters is happy to make use of their services. He explains: 'Wageningen invites these advisors to workshops on water management and they then pass on this new knowledge when they visit the plantations. The farmers are instructed in how to use the new water purification plants provided by the project. They also learn simple methods of preventing flooding and get advice on how to adapt – by not using artificial fertilizers during droughts, for instance.'

### CLOSED COMMUNITIES

A major strength of a PPP construction such as Manos al Agua is its capacity to link up with existing networks, says Maarit Ivalo of RVO.nl. The collaboration with Colombian authorities, and with the FNC in particular, enables the project's staff to gain access to local farmers who would not otherwise be easy to reach. 'Don't forget that we are talking about traditionally closed communities that are not particularly open to contact with outsiders. The last thing we want is for a foreigner to go there to tell the farmers how they should be doing things. That would definitely backfire.'

For this reason, the advisors who go out to the plantations and farming communities on behalf of the FNC are crucial to the success of Manos al Agua, in Ivalo's view. She also sees these staff as the implementers and ambassadors of the project. 'For years they have fanned out over the steep slopes of the mountains, clambering from plantation to production centre, from farm to village. Villagers and farmers are more open to advice from them than from outsiders.'

And even that does not go without saying.



## 'The coffee from the Colombian highlands is among the best in the world'

'New advisers still have to prove their worth to the farmers,' says Ivalo. 'Young women in particular are put through the mill by the farmers. They have to earn their respect and show they can cope with the mountains. When I talk about clambering up the slopes I mean that literally.'

According to Ivalo, the advisers go by the nickname 'the yellow army', a reference to their unofficial uniform of bright yellow T-shirts. The authority of the advisers has grown since the farmers started experiencing the damaging impact of climate change for themselves. 'Especially now that, thanks to Manos al Agua, they are offering new insights on water management,' says Ivalo.

### LONG TRADITION

Echeverri of the FNC is pleased with Wageningen's input. 'We have a long tradition of knowledge about coffee cultivation; our knowledge institutions are rapidly developing new varieties which can withstand both drought and excess water. But knowledge about the coffee sector alone is no

longer sufficient: the changes in the weather are so serious that their impact can no longer be addressed just from one field of expertise.'

Wolters agrees, commenting that Colombia cannot cope with the impact of climate change alone, whether at the local or at the national level. 'They are champion coffee farmers, we are champion water managers. Within our collaboration we respect each other's roles and share the expertise we have. We won't be developing new resistant coffee plants because the FNC's institutes are much better at that. Our strength lies in making water systems climate-proof and forecasting the weather conditions, both short-term and long-term. By focusing on that we complement the expertise of the other partners.'

### QUALITY COFFEE

Coffee producer Nestlé/Nespresso fears for the future of coffee cultivation in Colombia if its water management is not improved. The coffee multinational is involved in the

project as a private partner. 'Our chief commercial interest is in securing a supply of quality coffee for the future,' explains technical director for water management Carlo Galli from the head office in Switzerland. 'We see the coffee from the Colombian highlands as among the best in the world and we still want to be able to work with it in ten years' time.'

But 'of course', Galli hastens to add, the top priority is to make coffee cultivation climate-proof and improve living conditions in the Andes. The company is putting 4.5 million euros into the project and paying participating farmers an extra bonus if they supply sustainable high-quality coffee. 'The joint approach and the shared commitment make the PPP collaboration valuable for us.' If this pilot scheme works out well, Nestlé wants to upscale the model globally. There's no good coffee without good water management, says Galli.

[www.wur.eu/coffee-climate](http://www.wur.eu/coffee-climate)



PHOTO ANP

### AID TO COLOMBIA

The international joint venture Manos al Agua - 'hands on water' – was launched three years ago at the behest of the Colombian National Federation of Coffee Farmers, FNC. This organization saw how the damage caused by both heavy rain and long droughts was getting worse every year, and asked the Dutch government's Sustainable Water Management fund for help. This led to the formation of an International Public-Private Partnership with a budget of about 20 million euros spread over a period of five years. Colombia has 570,000 coffee farmers, all of whom stand to benefit from the programme in the long run. The main participants in the programme are coffee producer Nestlé/Nespresso, RVO.nl, Wageningen University & Research and the Colombian government. Wageningen Environmental Research contributes its expertise on water and climate change on behalf of Wageningen University & Research. The Sustainable Water Management fund's contribution of 9.5 million euros makes it the partnership's chief donor, with the remaining funding coming from Nestlé/Nespresso (4.5 million), FNC, Cenicafé, the Colombian government and the farmers themselves.

# Cockerels back on the menu

**The cockerel chicks of laying hens are killed after less than one day. Efforts are being made to stop that wastage by persuading people to start eating cockerel meat again. With success, but it remains a niche market for now. Perhaps it would be better to prevent these chicks from hatching in the first place.**

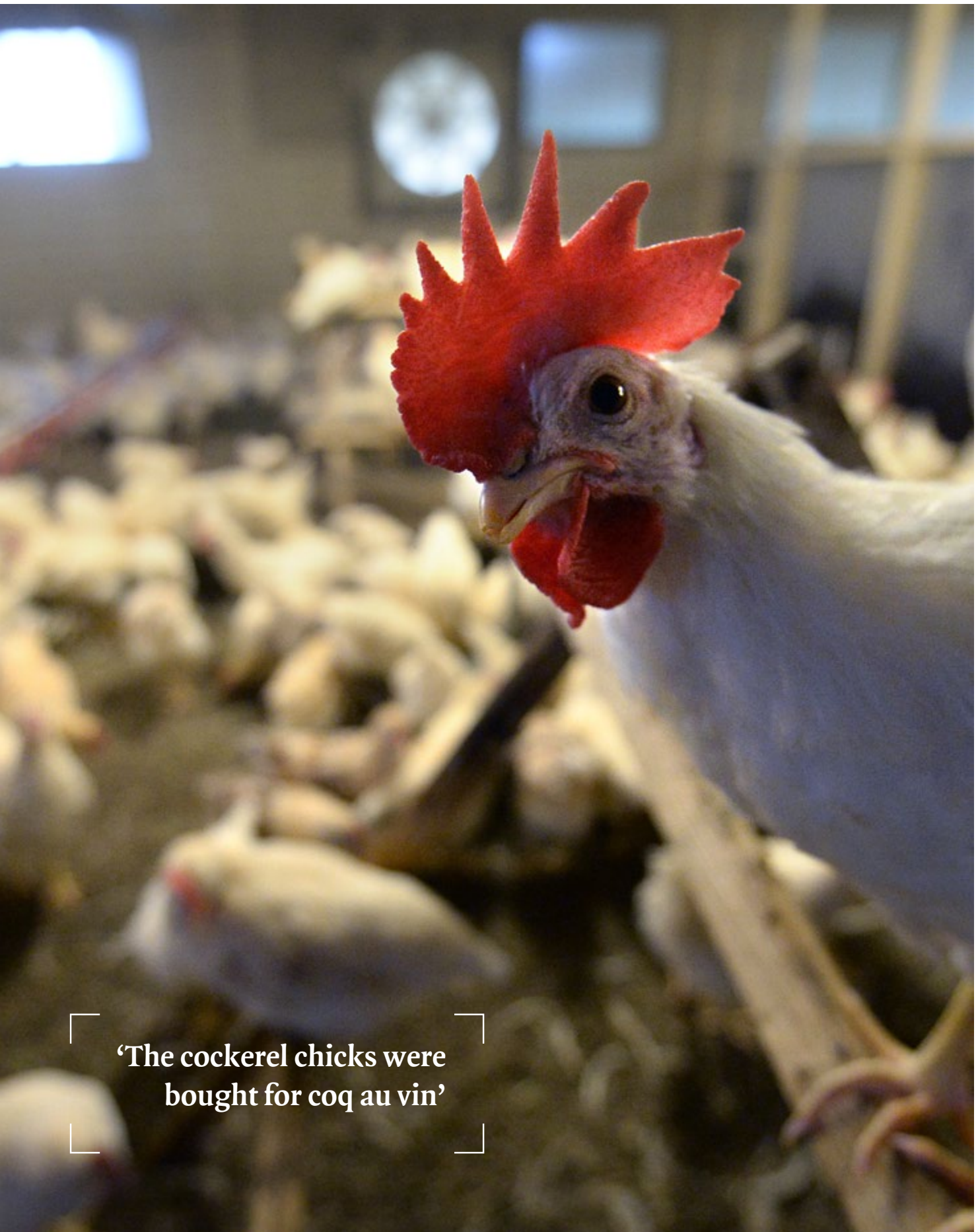
**TEXT** RENÉ DIDDE **PHOTO** HH / MARCEL VAN DEN BERGH

**I**n the Netherlands, 45 million day-old cockerel chicks – the male hatchlings produced by laying hens – are killed every year. While the female chicks go on to lay eggs, the males are worthless. After an ultra-short life of less than 24 hours, the birds are gassed – that qualifies as painless – and sold as feed for zoo animals and stork colonies. Falconers, snake owners and even cat lovers feed the day-old chicks to their hobby animals and pets. The gassing is causing controversy through-

out Europe. There is considerable criticism of this method in Germany in particular, but the issue of whether you can terminate a creature's life after only one day is regularly raised in the Dutch parliament too. This is also an issue with such valueless male offspring as bull calves and billy-goat kids. The male chicks' early demise is something that has developed in recent decades. Up until the 1950s, cockerel chicks survived for at least seven weeks because only then did the sexual characteristics become visible and ➤







‘The cockerel chicks were  
bought for coq au vin’

the poultry farmer know whether he had a future laying hen or a cockerel chick. The young cockerels, which had been getting feed and care for all that time, were reared a little longer and then eaten.

### LENGTH OF WING FEATHERS

Sexing day-old chicks – determining their sex – was introduced for laying hens in the mid-twentieth century. ‘That is now so advanced that workers on the big poultry farms can determine the sex at a glance within one day, for example from the difference between male and female chicks in the length of the wing feathers or the colour of the down. These properties have been bred in for such important laying breeds as the White Leghorn and the Rhode Island Red,’ says Ferry Leenstra of Wageningen Livestock Research.

That did not immediately lead to the early death of laying hens’ cockerel chicks. The male hatchlings were still being reared and exported to Mediterranean countries, Italy in particular, up until the 1980s. ‘Consumers in southern European countries, especially Italy, were prepared to buy a pricier chicken that tastes better,’ says Leenstra, who has been doing research on hens for 40 years now. ‘Cockerel chicks were bought for old-fashioned stews and coq au vin because of their flavour and firm bite. These traditional dishes had fallen out of favour in the Netherlands long before then.’

But eventually Italy followed other European countries in switching to chicken cuts that can be prepared quickly.

### DRUMSTICKS

Breeding farms are increasingly producing hens that are specialized either in laying lots of eggs or in fattening for meat, for sale as chicken breasts, legs and drumsticks. ‘For the past 20 years, consumers have preferred



PHOTO THEO TANGELDER

Day-old male chicks are taken off to be gassed or sold for zoo animal feed.

chicken breasts, which can be cooked quickly, or cubes for stir-fry dishes. We’ve forgotten how to pick at a bone,’ says Leenstra. It should be said that there is no sex discrimination in the table chicken breeds: both male and female chicks are reared for meat. So the chicken breast on your plate could easily come from a cockerel. ‘When they are slaughtered, there is no perceptible difference between males and females in flavour and bite,’ says Leenstra. ‘That only develops in older chickens.’

However, for more than 20 years, becoming zoo animal feed has been the fate of the cockerel chicks of laying breeds; they cannot compete with the large table chickens when it comes to meat production. But now there is a glimmer of hope. In part thanks to Leenstra’s efforts, cockerels occasionally feature on restaurant menus and are starting to appear in some poulterers and organic product shops. Rearing laying cockerel hatchlings for meat fits with the rise in top

restaurants in the Netherlands and the trend towards culinary curiosities, forgotten recipes and authentic products.

### MEDIA CAMPAIGN

Leenstra researched the economic options and technical aspects of rearing laying cockerel chicks and brought supply chain partners together in workshops. ‘We found abattoirs and poulterers that were interested and we helped poultry farmers market the cockerel chick as a new product.’ There is now a media campaign underway, including with recipes.

At present, it is still a niche market. Poultry farm De Lankerenhof in Voorthuizen, for instance, supplies the nationwide chain of organic wholesalers and retailers Estafette-Odin with organic cockerel chicks under the brand name Haantje de Coq. Part-time poultry farmer Ruud Zanders from Venray sells about 1000 male chicks every week that would once have been worthless. Now he rears them for 14 weeks. He says the cockerel chicks seem popular with retailers and the restaurant trade. ‘They are sold under the brand name Leghaantje to Sligro and various upmarket restaurants,’ says Zanders, who is also a lecturer in healthy poultry farming at Aeres University of Applied Sciences (formerly Vileantum University AS).

### SEX TEST

‘We are pleased to see the cockerel chick making a comeback,’ says Niels Dorland, spokesman for Dutch animal protection society Dierenbescherming. ‘However, we don’t think the entire laying hen sector will now start rearing male chicks.’ That is why Dierenbescherming is supporting a statement of intent from 2014 to stop the killing of day-old cockerel hatchlings by examining the eggs to see whether they contain a male chick. ‘We expect more from this sex test.’



## 'Currently, male chicks of laying hens end up as zoo feed'



Rearing cockerel chicks for sale as meat is not the only solution to the problem of the 45 million gassed chicks. The farmer can also take action when they are still in the embryo phase. Leenstra herself was involved some years ago in the early stages of a new method in which a gene that causes algae to fluoresce is inserted into the male sex chromosome of laying breeds. Researchers at Wageningen University learnt about the technique from the Roslin Institute in Scotland. 'If you shine blue light on the egg immediately after it has been laid, you know whether the embryo is male or female.'

The method is technically possible but has never been tested in practice. Leenstra: 'Despite the positive recommendation from the Dutch commission on biotechnology in animals, there was a great deal of opposition in parliament to eggs that light up because genetic modification is involved, so the plan has been shelved for now.' One alternative is the sex test for eggs that has been developed in Germany. 'They can determine whether the egg is a future male chick after 11 days, which is about halfway through the brooding period. Hatchery workers can remove those eggs, which can then be ground into animal feed, for example,' explains Leenstra.

She says the method still needs improvement before it can be used in practice. 'A lot of questions still have to be resolved around automation, hygiene and safety. For instance, you have to drill a hole in the egg to take a sample but that creates a risk of bacterial contamination.' In the Netherlands, the Leiden technology company In Ovo is working on the development of this method for 'peeping inside the egg'.

### MORE TIME FOR COOKING

The poultry sector also has high expectations of the sex test. At AVINED in Zeist, the

successor to the Poultry and Eggs Board, Alex Spieker says the test 'has potential'. 'This method looks the best option to poultry farmers.' However, he agrees that rearing male chicks for meat is an interesting niche. 'People have more time for cooking in the weekend, so they might well try a cockerel chick. But it would be a challenge to sell the three chicks per head of the population per year that we need to solve the problem.'

### LOGISTICAL PROBLEMS

Spieker also points to the logistical problems modern poultry farms would face having to separate the hens, which go on to lay eggs, from the cockerels after 17 weeks. 'The more bird movements, the more expensive it is and the greater the risk of infectious diseases.' He reckons that abattoirs would also have to make changes in order to be able to process the large cockerel chicks. Spieker expects to see a gradual shift in the market. AVINED thinks that rearing cockerel chicks for meat could potentially account for up to 20 percent of the total number of day-old male chicks. 'Roughly the market for organic chicken, which is currently 20 percent. That will absorb the table cockerel chicks. The remaining 80 percent will have the sex test.'

A key question is therefore whether consumers can be persuaded to start savouring cockerel chicken on the bone to further strengthen that niche market. 'It's incredibly tasty meat,' says Zanders, recalling what he used to eat at home. Leenstra also looks back fondly to the olden days. 'You would get cockerel chick meat on your birthday.' She says that spending a long time cooking elaborate dishes has come back in fashion, especially in the weekend with friends as guests. 'For example, I cook cockerel chick meat by braising it in hay soaked in beer. Delicious.' ■

### DUAL-PURPOSE CHICKEN

In addition to the possibilities for rearing the male chicks of laying breeds, Ferry Leenstra also investigated the potential for a 'dual-purpose chicken' that can both lay eggs well and produce a lot of meat. That would mean an end to the destruction of day-old male chicks as they could be used for meat production. Now, fast-growing table breeds are primarily used for this purpose, often denoted in Dutch as *plofkippen*, literally 'exploding chickens'. Her research shows that the dual-purpose chicken would leave poultry farmers with higher costs compared with separately rearing the male chicks of laying breeds. Dual-purpose chickens have to perform well on two fronts and that costs too much energy. These chickens are heavier than normal laying hens so they consume more feed while at the same time probably laying slightly fewer eggs. Moreover, Leenstra's calculations show that the meat produced by the male chicks does not compensate for this inefficiency.



PHOTO ISTOCK

# From school to lab

**Four Dutch high school students figured out a way of using algae to turn river water in the Gambia into drinking water and nutritional supplements. They got support from Wageningen researchers in writing the capstone project report about their idea in their final year in high school.**

TEXT DIDI DE VRIES

**I**t was very nice to see a real lab and to talk to our supervisors,' says Bram Klein Wentink. Last school year he, Carmen Swiers, Lisanne Peters and Tessa Mennink got a peek behind the scenes at Wageningen University & Research. They did a capstone project about algae with supervision from Ben van den Broek and Dorinde Kleinegris of Wageningen Food & Biobased Research. 'We could ask about anything we wanted and got specific detailed answers which helped us to develop a technically sound water purification system.'

The high school students from Ludger College in the Dutch town of Doetinchem entered the national capstone project competition IMAGINE last year. This competition aims to get high school students interested in life science projects in developing countries. Van den Broek and Kleinegris suggested the theme of algae but the four high school students came up with the application themselves: a water purification system for the Gambia which extracts drinking water and nutrients from river water. Algae convert the nutrients into proteins suitable for human consumption, for example.

The high school students wanted to meet

the needs of Gambians. About 16 percent of the population of the African country are undernourished; clean drinking water is scarce. 'You can also make oil or pigments using algae, but what use is that to people in the Gambia?' explains Carmen. 'Also, we wanted to keep the system simple so you can use it after a short training course.'

'They did a very good job of that practical application,' says Van den Broek. 'They knew a lot about the Gambia and made use of that knowledge in their design.' About the climate, for instance. The sun heats up the water and small windmills create circulation in the tanks with algae. The system was designed for Kerewan, a town of 22,000 inhabitants about 50 kilometres from the west coast of the Gambia on the river Mini Minium Bolon. Purification takes place in four stages in different tanks. The first tank is black. The water is heated by sunlight to 60 degrees Celsius, killing bacteria and viruses. In the second tank *Chlorella* algae grow which absorb heavy metals such as copper, lead and mercury. These algae are therefore not suitable for consumption. The *Spirulina* algae in the third tank are edible, however. They absorb nutrients from the river water

and are harvested and then dried. The powder made of them contains proteins, vitamins and minerals and can be used as a nutritional supplement. In the fourth stage of the purification system, the heat of the sun ensures that the water evaporates. The steam is then captured and cooled for use as drinking water.

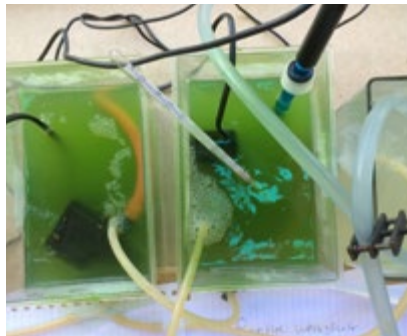
## TAKING SAMPLES

The project carried out by Bram, Carmen, Lisanne and Tessa is an example of a capstone project done at Wageningen University & Research. Fifth- and sixth-year high school students can get help at the university with getting ideas related to communication, animals, health, climate, people, technology and nutrition (see text box). Writing their capstone project at the university enables students to go a step further in their research than they could if they were supervised solely by their high school. With experiments in the lab, for instance, such as the one Bram, Carmen, Lisanne and Tessa did using water from the Oude IJssel river. 'In the Gambia people use the river as a toilet,' explains Bram. 'To get comparable water we mixed our own urine into the river water, and then we added algae to it.' The students took sam-





**‘We mixed our own urine with river water’**



ples at difference time to see how fast the algae purified the water. They also examined the algae under a microscope. The jury of IMAGINE thought the maintenance and labour costs of the application were too high so the algae system did not win the competition. But Van den Broek and Kleinegris are very satisfied with the results of the project. ‘The nice thing about working with high school students is that they think much bigger,’ says Kleinegris. ‘We focus on research on algae at a high level of detail. They tackle the subject from several different angles, from technology to economics. It’s very nice to see that integrated approach.’ ■

### HIGH SCHOOL PROJECT AT WAGENINGEN

Every year the department of Publicity and Recruitment at Wageningen University & Research helps about 370 secondary school students with the capstone project they complete in their final year. A team of university students is deployed to answer the high school students’ questions. The most popular topics are nutrition and health, biology, chemistry and food technology. Additionally, Publicity and Recruitment organizes five increasingly well-attended capstone project days for high school students in their fifth and sixth years. During these days they work in thematic groups on choosing an interesting topic and formulating a good research question. About 70 high school students sign up for every high school capstone project day. *More information (in Dutch):* [www.wur.nl/pws](http://www.wur.nl/pws).

For questions on a specific topic or help from a researcher, high school students can send an email to the Food Valley Network VO-HO ([betasteunpunt@wur.nl](mailto:betasteunpunt@wur.nl)), who will look for someone from the university who can help.





INTERNATIONAL YEAR OF PULSES



# Bring back the bean

**Pulses are becoming steadily less popular. And that is bad news, says the world food organization FAO. If we are to feed the fast-growing world population it's time the super-healthy, environmentally friendly bean made a comeback. As steak, for instance.**

TEXT ASTRID SMIT PHOTO STUDIO 38°C / REMCO LASSCHE

**B**rown beans, haricot beans, lentils, marrowfat peas... familiar-sounding foods, aren't they? Yet we've been eating less and less of these pulses over the past few decades. 'I don't say grace for brown beans', grumbled Bartje, a farm labourer's son in Anne de Vries's children's book. A sentiment apparently widely shared in the Netherlands as meat came onto the menu, pushing pulses off the plate. Currently half the population hardly ever eats pulses (the term denotes dried beans; green beans, mange-tout and peas count as vegetables), while ten percent of the population eats about eight grams a day. And the Netherlands is not alone in this trend. All around the world, as soon as consumers can afford it they opt for meat and dairy as their main sources of protein. Even in a largely vegetarian country such as India, the consumption of pulses has gone down and meat consumption has gone up. That has got to change, says the FAO, and declared 2016

the Year of Pulses. In the world food organization's view, it is time to put pulses back on the menu. For the sake of our health – pulses are rich in protein and important vitamins and minerals. For the sake of the environment – pulses use less water and energy than livestock. For the sake of soil fertility – with the aid of bacteria, pulses bind nitrogen from the air, improving soil quality. And for the sake of food security – pulses are cheap and can feed more mouths than meat.

Judging by the latest Dutch dietary guidelines, the FAO's message was already getting through in the Netherlands last year. The Dutch Health Council (led by Wageningen emeritus professor Daan Kromhout) published its new dietary guidelines early this year, advising people to eat pulses at least once a week because there is now firm evidence that they can lower levels of 'bad' cholesterol in the blood. So in the new 'Wheel of Five' depicting essential food groups, pulses are more prominent than >

## ‘The bean needs a new lease of life’

ever before. At around the same time, the ‘Happy Bean’ campaign was launched, in which bean producers, caterers, cooks and health experts seek to improve the humble bean’s image by seducing people with interesting recipes spread via travelling vans, company canteens or social media.

### WIND

Cor van der Weele, special professor of Humanist Philosophy at Wageningen University & Research, welcomes these initiatives but questions whether they will suffice. ‘Pulses have a long way to go in the Netherlands. We associate them with wind and with poverty, with Bartje’s bean mash. ‘In fact, the bean needs a complete makeover,’ says Van der Weele. ‘Not just technologically, but culturally. The bean will have to acquire new connotations and associations, such as ‘hip’, ‘global’, ‘paleo’, ‘high-fibre’, ‘packed with protein’ and ‘food of the future’.

An earlier attempt to promote pulses as meat substitutes was made in the 1970s, says Van der Weele, but that didn’t make us eat any more of them. She is hopeful though. She did research on the acceptance of in vitro meat and ordinary meat, and discovered that consumers today are more ambivalent about meat than they were then. ‘That is not causing behavioural change yet, but I think that beneath the surface the necessity of meat is no longer taken for granted. My guess is that consumers will be won over once an appealing and cheap alternative becomes available. But will that be the bean as such?’ Van der Weele wonders out loud.

### BEAN STEAK

To cater for confirmed meat-eaters there is another option: processing the pulse until it is just like meat. And considerable success is being booked. Several Dutch companies are selling products resembling hamburgers, chicken or sausages but made of protein from pulses, mainly soya. It is already hard to imagine a supermarket without these options, although they could still be further improved. Atze Jan van der Goot, professor of Protein Structuring and Sustainability at Wageningen: ‘The taste is pretty similar to that of meat and the texture’s not bad either. But sadly, the variation in texture is still limited and these products are still quite pricy compared with meat.’

So his research group is using new, cheaper technologies to try to imitate the bite of a wider variety of kinds of meat. Using the shear cell technique, which makes fibre out of plant protein, his group took soya and wheat and created something resembling a beefsteak which you can really get your teeth into. Van der Goot: ‘Now we are waiting for a company that wants to upscale our machine and invest further in the alternative steak – because the taste and juiciness could be even better.’ In order to widen the possibilities, his group is investigating the potential of other pulses than soya, such as green peas or lupin, a bean which is not eaten here but which contains as much protein as soya. Because you can’t just replace soya with any other pulse. Van der Goot: ‘Lupin binds the water in a different way than soya, and the pea has such a pronounced taste that you



PHOTO HOLLANDE HOOGTE

Pulses processed into vegetarian steak.

would have to mask it if you wanted to use it a lot in meat substitutes.’

He is also looking into whether the ingredients for vegetarian products could be produced more efficiently. Currently soya is processed in separate factories where the protein and carbohydrate are extracted before being taken to the factory where products such as soups and sauces are made. When they are used in meat substitutes, the protein and carbohydrate are often mixed again. ‘Maybe you don’t have to separate the protein and carbohydrate in the beans quite so completely. That could save a lot of energy and money,’ says Van der



Goot. An important point. Because some meat substitutes, for instance those in which animal proteins such as egg are used as well, consume so much water and energy that their scores for energy consumption and CO<sub>2</sub> emissions are no better than those of chicken.

## COUNTING BEANS

In the west the main arguments for putting pulses back on our plates are health and environment-related; in developing countries the key issues are food security and soil fertility. Pulses are cheap and the plants they grow on, legumes, are good nitrogen fertilizers. Farmers who grow beans can avoid undernutrition, do not have to buy as much expensive artificial fertilizer, and improve the soil quality in their fields. And beans are very marketable because even if people all around the world are eating fewer beans, demand is still growing due to population growth. Yet farmers in poor countries such as those in Africa are not benefitting enough from these advantages. Pulses are grown on about 10 percent of African agricultural land south of the Sahara. In 2010, therefore, Ken Giller, professor of Plant Production Systems at Wageningen, launched the project N2Africa, which is funded to the tune of 20 million dollars by the Bill & Melinda Gates foundation. 'In the first phase we sought to apply recently gained knowledge about cultivating pulses, working with small farmers – 250,000 of them in eight African countries.'

N2Africa chose four major types of bean (common bean, cowpea, groundnut and soya bean) and researched which conditions best suited each crop, what they do for the soil fertility, what forms of crop protection against pests and diseases they need, and what yields could be achieved. The bean plants were inoculated with nitrogen-fixing bacteria. This unusual move was a success, says Giller. Many farmers achieved higher yields, and the soya bean harvest in northern Nigeria almost doubled. Since 2014 Giller has been working on the second phase of N2Africa, in which the Bill & Melinda Gates foundation has invested 30 million dollars. 'We are trying to upscale the concept of the first phase, with 500,000 new farmers in 11 African countries, and we are aiming at even higher yields and profits.' The concept can be exported to other continents too, believes Giller, but he is concentrating on Africa for now. 'We've got our hands full with this project. And the need is greatest here. The



PHOTO N2AFRICA

One of the N2Africa project's trial fields in Uganda, with several different bean varieties and cultivation methods.

projection is that there will be one billion more Africans by 2050.'

## BETTER DIET

N2Africa is also doing research on the extent to which cultivating pulses really does improve the nutritional status of the farmers and their families. PhD researcher Ilse de Jager is studying whether young children in these families have a better diet if their parents harvest more pulses. Her initial data suggest that they do. She is also looking at what constitutes the best possible diet under local conditions. 'How much maize and soya beans do children need to eat, for instance, for an optimal diet? I compare that with their current intake and look for the shortfalls,' says De Jager.

What with all these initiatives and the global interest in the Year of Pulses, beans may yet make a comeback on menus around the world. Ideally the countries which already eat a lot of beans should carry on doing so, even as they become richer, while western countries should eat more pulses. Technologist Van der Goot: 'It would be great if the countries that are getting richer shifted straight to eating meat substitutes, and saw them as a product in their own right rather than a substitute for meat. That would give us far more scope.' ■

[www.wur.eu/pulses](http://www.wur.eu/pulses)

# Farming with field

**The editors of a new Dutch book about agrarian nature management in the Netherlands don't mince their words: hardly any of the goals set since 1975 have been achieved. But that does not mean you have to throw out the baby with the bathwater. The book also points to hopeful signs of growing public commitment.**

TEXT RIK NIJLAND PHOTO THEO TANGELDER

**A**grarian nature management has come in for a barrage of criticism in recent years. Although for 40 years now large sums of money – 60 million per year at the last count – have been channelled to farmers to be spent on saving nature, there is little sign of the desired positive impact on nature on farmland. Field bird populations declined rapidly in this period, rural biodiversity decreased and the landscape became less varied. Both its friends and its enemies deplored the system's unwieldy regulations and bureaucratic merry-go-round, which swallowed up over 40 percent of the funding before a single skylark could benefit from it.

## SOBERING PICTURE

The authors of the new book *Agrarisch Natuurbeheer in Nederland* paint a sobering picture of the impact of nature-oriented farm management. Yet it has not been doom and gloom all the way: there are now meadows where black-tailed godwit chicks thrive, field verges full of flowers and farmers who do cherish the Montagu's harriers that breed in their grain fields. More than 40 researchers, including 20 from Wageningen University & Research, describe in the lavishly illustrated book how this policy developed in the context of a fast-changing agricultural sector. They also offer a broad overview of the ecological aspects of agrarian nature management: what works and what doesn't, for field and





# birds

meadow birds for instance. And they discuss what should be done about all the geese in the Netherlands – quiet zones for overwintering birds and a big reduction in the number of geese breeding here – and appeal for more attention to ditches and their banks, where the authors feel much can be gained in terms of flora and fauna. The book also pays attention to economic and social aspects of the topic: What motivates farmers to embrace the nature on their land? Money of course, but also their self-image and the appreciation of their peers.

## STANDARD REFERENCE WORK

The book rounds off the period of eight years during which Geert de Snoo held the endowed chair in Agricultural Nature and Landscape Management at Wageningen. When he left in 2012, the idea came up of collating all the findings and knowledge in the field of agrarian nature management in a standard reference work, explains Dick Melman of Wageningen Environmental Research (formerly Alterra). Melman was in the core team that compiled the material, led by De Snoo, now professor of Conservation Biology in Leiden. Their objective was to provide a basis for courses for university students on both theoretical and applied degree programmes as well as to offer inspiration for policymakers, water boards, nature organizations and the farmers' collectives which took over agrarian nature management as of 1 January.

## NEW SYSTEM

*Agrarisch natuurbeheer in Nederland* has come out at an interesting moment. Trials started six months ago of an adjusted set of regulations which should give new impetus to the movement. In order to cut overhead costs the government – the provincial authorities these days – will no longer make contracts with more than 7000 individual farmers but

with 39 farmers' collectives. Control has changed hands too. Farmers used to get to participate in a system thought up by the government. It was not their problem if it was not effective. This top-down approach caused a lot of irritation. In the new system the collectives get to draw up their own plans, on the assumption that this will generate more commitment among the farmers. If the plans make ecological sense, the collectives will get funding to implement them. The authors expect this to lead to more tailor-made approaches but they also express a fear that central control within the collectives will become a new source of irritation among the farmers.

## KEY REGIONS

The new system also responds to a wish long cherished by nature conservationists. The money, for field birds for example, will be spent in key areas where the chances of recovery are strong. Formerly it also went to farms in areas where there were hardly any ruffs, godwits or redshanks left. But even with this new system in place, it is touch and go now for a bird like the black-tailed godwit, as calculations in the book show. Currently there are more than 35,000 pairs brooding in the Netherlands, but that number is going down by 5 to 7 percent per year in spite of all the efforts being made to prevent this. Only in the unlikely event of farmers being able to create an optimal biotope for this bird in the new key areas will 20,000 pairs survive.

## PUBLIC COMMITMENT

These kinds of conservation measures require funding. The gap between nature-oriented farm management and conventional farming is growing, which means the level of compensation per hectare needs to go up to motivate farmers. This will mean less nature even if the budget remains the same – which is not guaranteed under future cabinets.



PHOTO HOLLANDE HOOGTE

The authors of the book imply that their hopes are fixed on increased levels of public commitment to this cause. From consumers, for example, who are willing to pay a higher price for milk if they know that by doing so they are saving godwit chicks from the combine harvesters. And from recreational and catering businesses which help fund a natural countryside, or water companies which contribute to clean ditches. Whether this willingness really exists will be a decisive factor in whether the vision of Fred Wouters, director of the Dutch society for the protection of birds *Vogelbescherming*, becomes a reality: 'The knowledge in this book can contribute to ecologically sustainable agriculture with which farmers earn a decent living while using sophisticated agrarian nature management to make sure that we have skylarks singing again.' ■



**Agrarisch Natuurbeheer  
in Nederland**

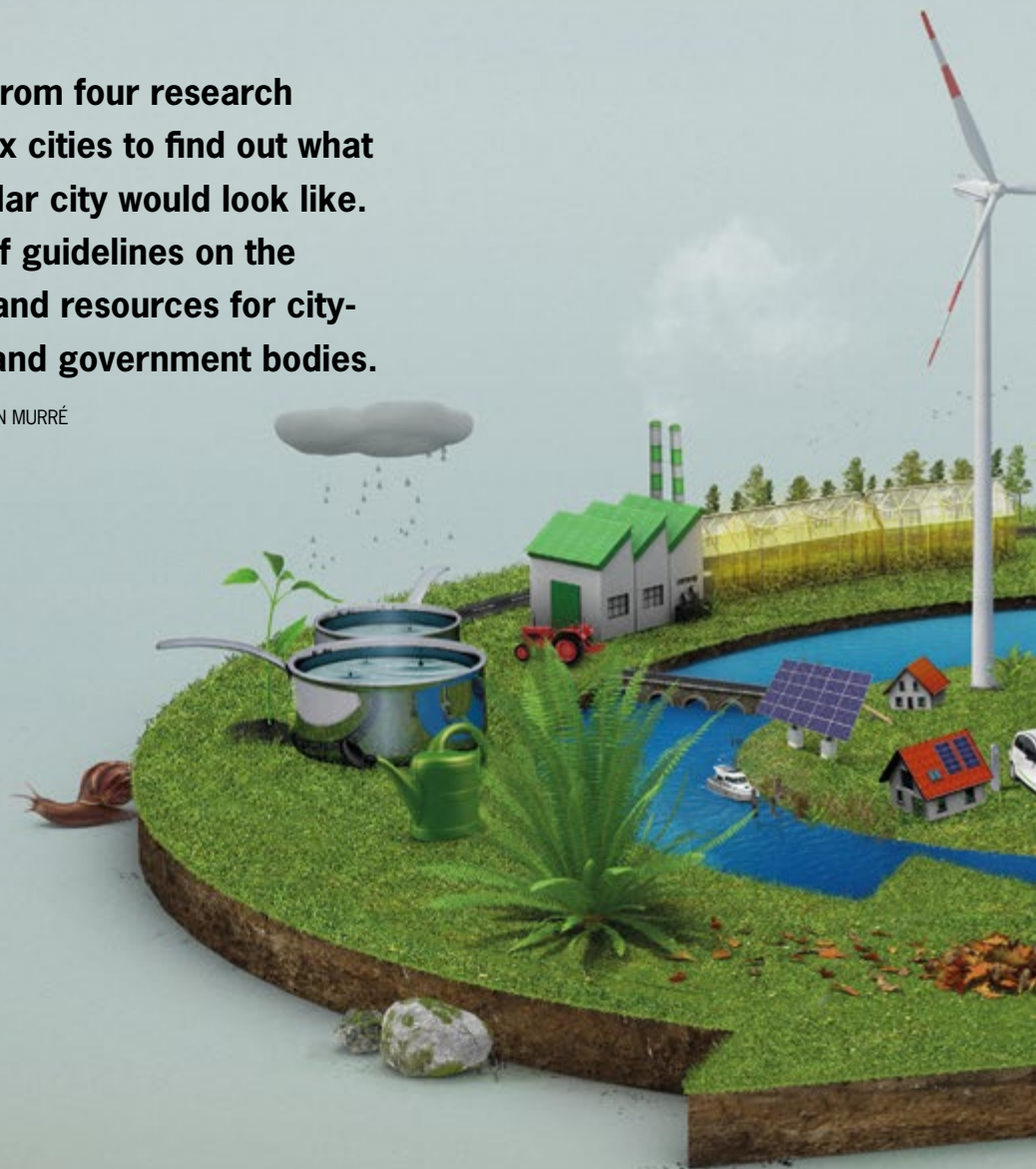
ISBN 978 90 8686 281 8

CIRCULAR ADAPTIVE CITIES

# Sustainability comes to town

**In 2015 researchers from four research institutes set off for six cities to find out what a climate-proof, circular city would look like. The result was a set of guidelines on the rational use of water and resources for city-dwellers, businesses and government bodies.**

**TEXT** RENÉ DIDDE **ILLUSTRATION** JEROEN MURRÉ







## ‘We must make sure all the good ideas don’t just evaporate’

The world’s cities are facing complex challenges. Not only must they accommodate more and more people, but they also need to deal with climate change and growing shortages of energy and resources. It is becoming more and more common for torrential rain to cause disruption in public spaces. Besides, cities are massive energy guzzlers, consume vast amounts of resources and generate mountains of waste. When it comes to sustainable energy, energy-saving and recycling, there is vast room for improvement in homes and business premises.

Nowadays, however, waste counts as a resource that can be converted into valuable products. Waste water can be reused, with fertilizer ingredients being extracted from faeces and urine, rainwater is allowed to filter into the soil to prevent streets from flooding after every shower of rain, and green roofs can store water too. More vegetation on the streets helps combat heat stress, while heat generated by industries can be used for heating houses and offices. The aspirations of cities in this regard are often expressed in catchwords: cities want to be ‘climate-neutral’, ‘emissions-free’, ‘rainproof’ and ‘circular’.

In the Adaptive Circular Cities project, Wageningen University & Research and the research institutes Deltares, TNO and ECN conducted research in a number of cities in 2015, with the aim of putting such ambitious ideas into action. Funding to the tune of 1.3 million euros was available from a Ministry of Economic Affairs fund for strategic research. The ministry sees adaptation to a changing climate and responsible use of scarce resources as crucial investments for cities. What is more, expanding the knowledge base on these topics could help create export opportunities for Dutch companies and institutions.

Project leader Marco Hoogvliet of Deltares, a specialist in water and soil-related issues, talks of a ‘unique collaboration’ between the four institutions. ‘We worked with various disciplines and we’d like to do so again. This project is finished but we are talking about follow-up research.’

### CONCRETE JUNGLE

‘Maybe the cities formulate their ambitions in rather abstract language,’ says Hoogvliet, ‘but what it boils down to is taking steps to make the city resilient and able to cope with climate change using existing techniques and design frameworks and within a given budget. Further goals of these measures are to make sure resources in the urban area are used as efficiently as possible, and to minimize how much the city encroaches on green spaces. The city of the future must not be a concrete and asphalt jungle.’ In 2015, researchers from the four research institutes set out for six urban areas in the Netherlands. One was Buiksloterham, a self-sufficient residential neighbourhood being created on the northern banks of the IJ, a former sea arm in Amsterdam. This 100 hectare area features many abandoned factories from the shipping and machinery industries and has become a breeding ground for socio-cultural initiatives. In Duiven, near Arnhem, the researchers studied a 60-hectare industrial estate which aims to become the most sustainable business park in the Netherlands. Wim de Haas of Wageningen Environmental Research (formerly Alterra) is delighted with the 30-odd studies carried out in the course of just one year at the six locations. De Haas coordinates the ‘water, food and energy’ component of the project. ‘The various studies constitute 30 pieces of a large puzzle made up of maybe 500 pieces that form a picture of a climate-proof circu-

lar city,’ he says. ‘That gives us some of the answers, mainly to technical aspects of a climate-proof and circular city,’ says De Haas.

‘One nice result of this is a new form of monitoring which cities and/or their residents can make immediate use of. With this monitoring you can map out the energy use and waste production at the neighbourhood level. Technical interventions which then reduce that energy use or waste production, or make it more sustainable, are decisions that can have far-reaching consequences,’ says De Haas. ‘Up to now, for instance, infrastructure has been created in every neighbourhood for natural gas, sewage pipelines and sometimes for heating if there is a heating grid accessible, as there is in Amsterdam. But the question is whether you need natural gas in new neighbourhoods if they are on a heating grid and if enough solar panels can be installed on the roofs.’

### COCKTAIL

These kinds of questions are more than just technical, they also touch on governance processes, the interests of companies and the concerns of residents. De Haas: ‘In the old days the town planning services just said: “This is what we are going to build, and we’ll build it there and there.”

Nowadays there are new relationships between government bodies, industry and citizens. In Buiksloterham, for instance, the initiative does not lie directly with the municipality. But implementing bodies such as the water board Waternet, the energy company AEB and two housing cooperatives are intensively involved in the cocktail of plans developed by residents, advisors and artists.’

Self-build projects, second-hand stores, greenhouses that produce food using ferti-

lizer obtained from toilet waste from the neighbourhood, solar panels and roofs that store rainwater: these are just a few of the many exciting ideas being experimented with in Buiksloterham. But these myriad blooms do require a bit of structure to form a bouquet that is not just harmonious but also stands a chance of lasting. 'If you want to make sure all the ideas don't just evaporate, leaving only good intentions behind, you need to get organized. We made a specific proposal for that,' says De Haas. The proposal came out of a study carried out by Wageningen Economic Research (formerly LEI).

As an example, a number of progressive residential projects were based on the assumption that there would be no connection to the sewerage system. Another idea the initiators are considering for self-build plots is sourcing drinking water from rainwater. 'But even if the mains water company is willing to cooperate, it will demand guarantees of the safety of the water, not just for these initiators but also for future residents,' says De Haas.

De Haas's research group also looked at possibilities for composting green household waste in the future neighbourhood. 'Of course you can do that with a compost heap at every home, but you can also digest green waste centrally and then compost it, as is currently done by waste disposal companies. To get more value and make more money out of organic waste, you could even consider an installation for the whole city which can isolate the components for bioplastics and then digest and compost the remaining organic material.'

## INDUSTRIAL SYMBIOSIS

At the Innofase industrial estate in Duiven, near Arnhem, Wageningen researchers documented the substances going into the

area and those coming out of it. 'On 46 hectares of the estate there are waste-processing companies for household waste, sewer sludge and wood waste. On the remaining 14 hectares the municipality's preference would be to locate companies that use these waste products in their production process,' says Bert Annevelink, who is involved in the study on behalf of Wageningen Food & Biobased Research. 'That could for instance include companies which can make use of building blocks for bioplastics extracted from sewerage sludge, such as polyhydroxyalkanoates. But businesses can also make

**'Is natural gas still necessary in a new neighbourhood?'**

use of each other's waste flows, heat or energy generated from waste. You need to create an industrial symbiosis,' says Annevelink. He and his colleagues put together a matrix to link existing production techniques and techniques still under development with the biomass waste flows in Duiven.

'The matrix is used to evaluate the opportunities in Duiven for using the waste flows from cities,' says Annevelink. 'We looked at three possible scenarios: a scenario with an emphasis on processing garbage that is driven by government bodies, a scenario with an emphasis on developing new products that is driven by the business

world, and a combination of the two. The scenarios show that the development of a circular economy in the Innofase area requires good collaboration and a shared ambition among all parties, business partners and government bodies.'

## MOTIVATING RESIDENTS

'We have not arrived at detailed figures on the costs and benefits. Partly because we don't know the exact price of the technology that needs to be developed,' explains Annevelink.

That is a pity, agrees project leader Marco Hoogvliet, but the lifespan of a complex project such as Adaptive Circular Cities is too short to specify all the costs and benefits very precisely. 'For that reason we couldn't yet come up with business models in 2015, but we are working on that now. For example you can create quite a bit of water storage on roofs and in the gardens but we don't yet have any financial systems for stimulating residents to do that or rewarding them for it.'

In the longer term, government and water managers should work towards a system such as that used for remunerating people for solar energy supplied to the network. You might for example get compensation in the form of lower charges for sewerage services, suggests Hoogvliet.

Ideally the researchers would like to do follow-up research to work out more complete calculation models that would let cities choose from a range of 'packages', depending on their ambitions as well as technical matters such as soil types and water situation. Hoogvliet: 'If we make that applicable for new climate-proof circular cities around the world, we'll have a great export product at our disposal.' ■

[www.wur.nl/eu/metropolitansolutions](http://www.wur.nl/eu/metropolitansolutions)

# Guaranteed gluten-free



PHOTO SHUTTERSTOCK.COM





**Gluten-free oat products have been in the shops in western Europe since 2011: a boon for people with coeliac disease. The first gluten-free production chain for oats was developed by the Scheemda-based seed company Vandinter Semo. Wageningen did research and established guidelines.**

TEXT & PHOTOGRAPHY HANS WOLKERS



Approximately one percent of people have an intolerance for gluten, a protein naturally occurring in grains. This gluten intolerance, or coeliac disease, damages the small intestine, affecting how well it functions. Oats are a grain which does not contain gluten, making them suitable for coeliacs. During cultivation and processing, however, oats tend to get contaminated by grains that do contain gluten, such as wheat. ‘That is why we worked with Vandinter Semo and in consultation with the Dutch Coeliac Society to create a clean production chain,’ says Luud Gilissen, senior researcher at Wageningen University & Research. The first certified gluten-free oat products came on the market in 2011: a first in western Europe.

#### **NO ORGANIC FERTILIZER**

It is not easy to prevent grains that do contain gluten from getting into the oat harvest. Wageningen therefore did extensive research and compiled a detailed protocol for gluten-free oat production for growers and food processing companies. The seed must be 100 percent free of other types of grain and the field should not have been used to grow a grain containing gluten for the past eight years. The use of organic fertilizer is banned as well, because it can contain grains of wheat, barley or rye which then germinate in the field of oats. ‘It is also important that the farm

machinery is cleaned to avoid contamination with other types of grain,’ says Gilissen.

Just to be on the safe side, Vandinter Semo do random checks for contamination with other grains. ‘The EU has set a legal limit on the amount of other grain gluten-free oats can contain: a maximum of 20 ppm, or one grain of wheat per two kilos of oats,’ explains director Bert-Jan van Dinter. ‘With our protocols we keep below 5 ppm.’

#### **BUSINESS CONTINUITY**

The seed company Vandinter Semo has had to invest heavily in this new area of operations, including in a machine for hulling oats that costs hundreds of thousands. Yet Vandinter is full of confidence in the future. According to him, oats are not just gluten-free but also healthy. What is more, oats are good for the soil, they are a useful rotation crop and they produce a reliable harvest. The oat production chain has brought the company new clients in the Netherlands as well as in Germany and Italy. They process the oats into porridge oats, bread flour and even pasta. ‘We used to deal mainly in grass seed, but with the withdrawal of EU subsidies those prices are fluctuating wildly,’ says Van Dinter. ‘Oats give us greater stability and business continuity.’ ■

[www.wur.eu/oats](http://www.wur.eu/oats)

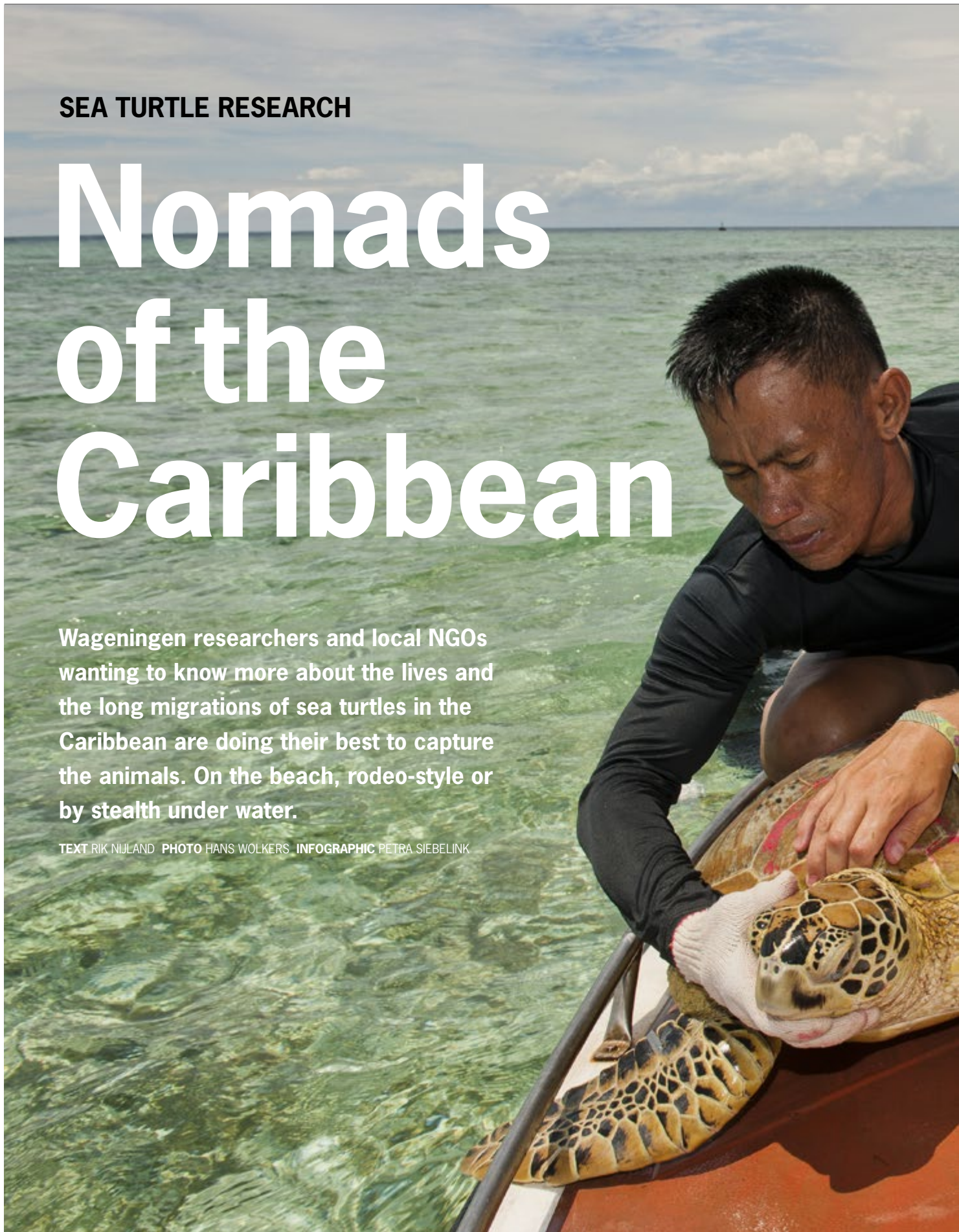
## **Oats tend to get contaminated**

SEA TURTLE RESEARCH

# Nomads of the Caribbean

Wageningen researchers and local NGOs wanting to know more about the lives and the long migrations of sea turtles in the Caribbean are doing their best to capture the animals. On the beach, rodeo-style or by stealth under water.

TEXT RIK NIJLAND PHOTO HANS WOLKERS INFOGRAPHIC PETRA SIEBELINK









## ‘It can take six people to get a sea turtle out of the water’

Scientific research is not usually physically dangerous, but a close encounter with her research subject left Marjolijn Christianen with a bad scar.

When she tried to capture a 100-kilo sea turtle, it gave her a severe bite, ripping open her abdomen with jaws designed to crack open shells. On the other hand, she does get to work in the kind of environment – for a few months a year at any rate – that most of us can only dream of. Christianen is a postdoc in a project run jointly by Wageningen Marine Research (formerly IMARES), the Marine Animal Ecology group at Wageningen University & Research, and the University of Groningen. ‘Together with the Groningen professor Per Plasboll and experts from local organizations, we aim to document how sea turtles are faring on the six islands of the Dutch Caribbean,’ explains co-project leader Lisa Becking of Marine Animal Ecology. The study is financed by the research-funding body NWO and the ministry of Economic Affairs.

Aruba, Curaçao and Sint Maarten are independent countries within the Kingdom of the Netherlands. The link with Bonaire, St. Eustatius and Saba is even closer: they are special municipalities of the Netherlands.

The turtles that breed on the islands and forage in the seas around them form a major tourist attraction but the Netherlands is also duty-bound by international treaties

to protect these reptiles. So the ministry of Economic Affairs’ Nature Policy Plan for Bonaire, St Eustatius and Saba gives high priority to turtles. The problem is that relatively little is known about these largely solitary animals which inhabit all the world’s oceans and cover vast distances. ‘If we are to provide protection on a sound scientific basis, we need to know exactly where the turtles live, how many of them there are, what state their habitat is in, how they use it and which migration routes they take,’ says Becking. ‘We are working on that with organizations in the Caribbean Netherlands, including Sea Turtle Conservation Bonaire (STCB), which has been systematically collecting data

on the migration routes of sea turtles since 2003. They asked us to help them process their data.’

### HUNGRY FEMALES

This collaboration resulted in a publication in May in the journal *Endangered Species Research*. In this article the researchers reveal the migration routes taken by the three species of sea turtle which lay their eggs on the beaches of Bonaire and Klein Bonaire. The males sometimes hang around there for a few months but the hungry females cannot wait to return to their foraging grounds. To make it possible to keep track of them, 24 of the turtles were fitted with a transmitter that was glued to their shells. Every time the turtle surfaces, the gadget sends out a signal that results in a new cross on the map. That is, as long as a satellite is passing at the right moment to pick up the signal, and if the gadget is working properly. The transmitters only lasted between two months and a year before succumbing to algae growth or an exhausted battery. Nevertheless, they helped the researchers get a fair idea of the turtles’ travels.

The team tracked five loggerhead sea turtles, six green sea turtles and thirteen hawksbill sea turtles. All but two of the turtles were females because they are easy to catch when they crawl ashore to lay their eggs. They do this several times during the breeding season, at intervals of about two weeks. In order not to scare off the turtles and prevent them from laying their eggs, the researchers only lay in wait with their transmitters the third time the turtles came ashore.

### RODEO TECHNIQUE

‘The males don’t come ashore so you have to take them off the reef. That is much more work,’ says Christianen, explaining the sex imbalance in the research sample. And catching male sea turtles is not without its dangers, as her abdomen illustrates. It is done in shallow water using nets or the ‘rodeo technique’: jumping onto the creatures from a boat. In deeper water, around Bonaire for instance, divers come across sleeping sea turtles on the reef. ‘You hold the turtle tight and try to swim calmly to the surface, while it flaps and struggles,’ says Christianen. ‘The males weigh between 70 and 150 kilos. It sometimes takes three people in the water and



**LISA BECKING**

Tropical Marine Ecologist at  
Wageningen University &  
Research



PHOTO MARJOLIEN CHRISTIANEN

Male turtles are captured in deep water to be fitted with transmitters.

three on the boat to get them out of the water.’

According to the journal article, the egg-laying females that come together on Bonaire and Klein Bonaire then proceed to fan out over the whole Caribbean, as far as 3500 kilometres away. Two popular destinations stand out for the sea turtles which were studied: shallow waters off the coast of Venezuela near Los Roques, and seagrass banks to the east of Nicaragua and Honduras.

### RISKY

These seagrass banks are a particularly risky option for the sea turtles, explains Becking. ‘There is a lot of fishing there. In Nicaragua you are allowed to catch green sea turtles to eat or to stuff, and other species are caught illegally as well. What is more, it is a tract of sea that several different countries lay claim to. In that situation hardly anyone bothers about nature conservation and management.’

Sea turtle conservation is well organized on Bonaire thanks to the work the STCB has been doing since 1991, says Becking. But because of the long journeys they make, the turtles are exposed to threats such as legal and

illegal fishing, getting caught in nets or injured by a rudder. ‘International cooperation is needed to deal with the problematic places such as those where adult sea turtles are poached.’

In order to provide more input for such cooperation, the fitting of transmitters is being extended this year to Aruba, Curaçao and St. Eustatius. The research team also hopes to gain some insight into the journeys made by the females which lay their eggs there, including the green sea turtles and the hawksbill sea turtles. Although the breeding populations on the islands are only small – anywhere between a single female to 20 at the most – these breeding grounds for sea turtles are nevertheless significant, in Becking’s view. ‘For keeping up the genetic variation, for instance, as well as for providing backup if disaster strikes in large breeding regions such as Costa Rica, where thousands of females go to.’ ➤

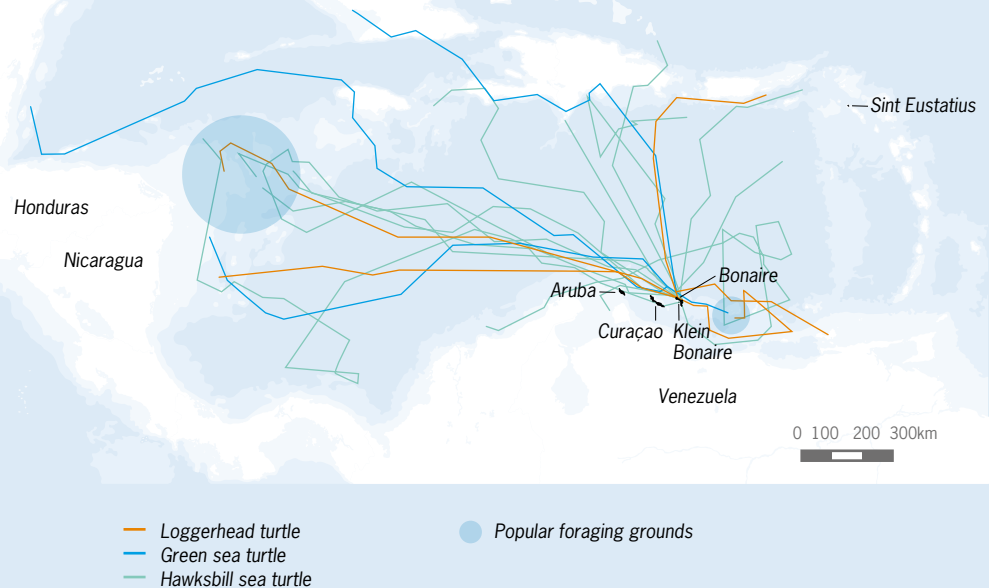


**MARJOLIEN CHRISTIANEN**  
Marine Ecologist at Groningen University and Wageningen University & Research

## MIGRATION ROUTES OF SEA TURTLES IN THE CARIBBEAN

With the aim of protecting sea turtles in the Caribbean, researchers are trying to find out where they go to, which migration routes they take and what condition their habitats are in.

The study revealed that the females disperse throughout the whole Caribbean, as far as 3500 kilometres away.



### The key players

#### The loggerhead sea turtle (*Caretta caretta*)



A sea turtle with a very muscular head and large jaws for cracking shells. Eats a varied diet including sea anemones, shell-fish, worms and fish. Breeds in small numbers on Bonaire, Curaçao and Aruba. Mainly inhabits deeper coastal waters. IUCN status: endangered.

#### The green sea turtle (*Chelonia mydas*)



A vegetarian with a penchant for sea-grasses in shallow bays, but algae are on the menu too. Breeds in small numbers on Bonaire, Curaçao and St. Eustatius. Lac Bay on Bonaire is a popular hangout for young specimens (under 20 years of age). IUCN status: threatened.

#### The hawksbill sea turtle (*Eretmochelys imbricata*)



A turtle found in shallow coastal waters, where it feasts on sponges and algae as well as soft corals and sea anemones. Its shell is much coveted for its deep orange colour. It mainly breeds on Klein Bonaire, but also on Bonaire, Aruba, Curaçao and St. Eustatius. IUCN status: critically endangered.

The researchers emphasize, however, that the Netherlands' responsibility goes beyond just protecting breeding sea turtles. Lac Bay, a shallow bay two kilometres across located on the eastern seaboard of Bonaire, provides a habitat for 1000 to 1500 green sea turtles. These are adolescents who eat seagrass by day and swim to the reef at night to sleep until they become adults at about 20 years of age. They then migrate to new foraging

grounds and the beaches they originally came from to reproduce.

Within the foreseeable future the sea turtles' DNA – tissue samples are being taken – will provide answers as to the beaches where they were born and to which they probably migrate once they have reached reproductive age. Currently the genetic differences between the breeding grounds in the Caribbean are being



## ‘International cooperation is needed to deal with problematic places’



PHOTO MARJOLEIN CHRISTIANEN

Researchers glue a transmitter to a turtle's shell so as to keep track of it.

mapped out by a Groningen PhD researcher so as to make it possible to trace where individual turtles come from.

### INCREASINGLY SCARCE

To be able to protect the ‘Dutch’ sea turtles properly, explains Becking, it is important to conserve their local habitat as well. ‘For example, the green sea turtles depend on seagrass fields such as those in Lac Bay for much of their lives,’ adds Christianen. ‘That habitat is becoming increasingly scarce in the region, due to coastal development and erosion on the mainland.’ What is more, the seagrass fields are affected by an invasive species: a fast-growing seagrass from the Red Sea. An initial study by Becking and Christianen reveals that the sea turtles prefer indigenous seagrass, which is more nutritious.

In order to find out more about green sea turtles, the way they use their habitat and exactly where they look for food, five sea turtles on Bonaire, St. Eustatius and Aruba are being fitted with a transmitter. The researchers also want to find out how adventurous the turtles are.

### TOO MANY FEMALES

The sex ratio among young sea turtles depends on the temperature of the eggs during the breeding season: the warmer it is, the more female turtles are brought into the world. There are signs, says Lisa Becking of Wageningen University, that this ratio is shifting due to climate change. She would like to study whether there really are fewer males hatching out in the Caribbean. ‘A Master’s student has already experimented with taking the temperature in the nests. We are still looking for a simple method of establishing the proportion of males to females among the young.’ She thinks taking blood for hormonal tests is too intrusive for the fragile baby turtles. Becking: ‘We are researching whether we can make use of the embryonic fluid that is left behind in the eggs after hatching.’



PHOTO HANS WOLKERS

A nest of baby turtles.

Last year a number of green sea turtles suddenly set off for French Guyana and Colombia, swimming hundreds of kilometres. ‘They probably went in search of new, perhaps deeper, foraging grounds. We don’t know exactly,’ says Christianen. ‘There is a great deal we still don’t know. That makes it so fascinating to do research on these animals.’ ■

[www.wur.eu/sea-turtles](http://www.wur.eu/sea-turtles)

**GEO-INFORMATION SCIENTISTS 9 YEARS ON**

# Fighting polio and mapping nature

**One of them is playing a key role in ridding the world of polio. The other is helping map out the quality of nature and residential environments in the Netherlands. Frank Salet and Nick Naus were both crazy about maps as kids; and both did the Master's in Geo-Information Science.**

**TEXT** ALEXANDRA BRANDERHORST **PHOTOGRAPHY** ASAD ZAIDI EN HARMEN DE JONG

**'A**ll I've got here is in one suitcase. A few clothes and a laptop – that's all I need,' explains Frank Salet in a Skype call from Islamabad. Salet, who graduated with a Master's in Geo-Information Science in Wageningen in 2009, works in Pakistan for the Bill & Melinda Gates Foundation. There he is helping to fight polio, having earlier helped eradicate the disease in Nigeria. 'We used satellite photos to locate all the villages and hamlets in remote areas of northern Nigeria. Then vaccination teams armed with maps and GPS equipment visited those places and vaccinated the children.'

The idea came from Bill Gates. It was implemented by the organization eHealth Africa, which took on Salet for his knowledge of Geographical Information Systems (GIS), which link information with locations and display it visually. In the northern Nigerian

city of Kano, Salet led 200 people who made maps and supported about 30,000 vaccination teams.

The area has become dangerous because of the terrorist group Boko Haram, so Salet was surrounded by security guards and kept a low profile. There was a lot of responsibility on his shoulders. 'I was still quite young and I had to appoint and train staff, purchase equipment and develop a good action plan.' After a successful trial, that approach was adopted throughout northern Nigeria. Now Africa is polio-free. The disease only occurs now in inhospitable regions of Pakistan and Afghanistan. So Salet moved to Islamabad.

## **EVALUATING NATURE MANAGEMENT**

The work of Salet's fellow student Nick Naus includes documenting the quality of nature and residential environments in the Netherlands. Since 2010, Nick has worked

in Den Bosch at Geodan, a consultancy bureau that specializes in spatial information services. One of the things he gives advice on is the Digital Nature Chain, established with a view to collecting, ordering and visually presenting important information for evaluating nature management.

'First we worked on standardization. The ministry of Economic Affairs, the provinces and the land management organizations all used their own definitions. It wasn't easy to get a consensus among all the policymakers and ecologists.' With one new system it is now possible to document the quality of nature in the Netherlands by, for example, showing which species of plants and animals are found in a particular area, and whether they are spread out or concentrated in one spot. 'This reveals the impact of nature management. That gives policymakers and managers a basis to build on,' explains



**‘A few clothes  
and a laptop  
is all I need’**

Naus. He also gives input for the Atlas Living Environment which provides professionals and the general public with information about the environment and the quality of their surroundings, in terms of problems such as air pollution or noise pollution. He enjoys the challenge of advisory work. ‘I am often at the table with various different parties, all of whom have their own wishes. The trick is to find out why a client has a particular need, and to get the various interests aligned.’

Having first done a Bachelor’s degree in Forest and Nature Management at Wageningen, the combination of GIS and

nature is right up Naus’s street. ‘I really get the benefit of that now that I frequently work with ecologists and policymakers at provincial councils and water boards.’

#### HIKING IN THE HIMALAYAS

Salet’s work in Pakistan entails lots of interaction with government bodies too. The campaign against polio is not going too smoothly at the moment, he says. ‘The law in Pakistan does not permit the use of satellite photos and GIS maps,’ he explains. So he is lobbying the Pakistan government for permission and cooperation. ‘Good map material showing every village is impor- ➤

#### FRANK SALET

**Age:** 31 years

**Studied:** MSc Geo-Information Science (2007-2009)

**Works:** As GIS Consultant for the Bill & Melinda Gates Foundation in Pakistan



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## WHERE DO GEO-INFORMATION SCIENTISTS END UP?

Between 1997 and 2013, 290 people graduated with a Wageningen MSc in Geo-Information Science. From 82 of them is known what they are doing. Of these alumni, 27 percent are working at research institutes, 21 percent for technical or consultancy firms, and 15 percent at universities. About 10 percent work in ICT, 6 percent work for the Dutch government and another 6 percent for other governments, 4 percent work in agriculture or plant breeding, and another 4 percent in the food industry or trade. The rest work in other branches.

Source: KLV Wageningen Alumni Network

tant for combatting polio and other diseases as well as for dealing with disasters.'

Life in the Pakistani capital is very pleasant. 'People are hospitable and friendly and I can walk the streets.' Salet has his own home and car. At weekends he goes into the Himalayas with Pakistani friends to go mountain-biking, hiking and camping. In between jobs he likes to take time off for travel. 'I like the freedom of backpacking: getting up in the morning not knowing where you will sleep that night. I hitchhiked from Europe to Singapore and I have trekked across every continent with a rucksack. I have already been to close on 100 countries.' He literally maps out his journeys and shares the maps with other map-lovers in online communities.

Salet's love of maps goes right back to his childhood. 'I started drawing maps of the Netherlands as soon as I could hold a pen, and when I was ten I made atlases,' he recalls. Having passed the Havo exams at secondary school he studied Geo-informatics at Utrecht University of Applied Sciences. He then went on to take the Master's in Geo-Information Science. 'I moved to Wageningen and threw myself into the degree programme wholeheartedly. I'd done student life in Utrecht. I thoroughly enjoyed the Master's programme. Our coursemates came from all over the world; everyone had different interests, such as agriculture or forestry. And the courses, such as software, maths and project management, were relevant to the work I went on to do afterwards.' Salet did an internship at the Royal Dutch Meteorological Institute KNMI, where he worked on the computer programme which makes the weather maps used on the NOS television news and in Dutch newspapers. Naus too is a map fan to the core. 'I can easily spend an hour looking at a map.' As a

child he used to find holiday apartments for his parents and research the sights worth seeing in the area. Naus: 'In those days you still did that with paper maps.' At the age of eleven he spent his paper-round earnings on a pair of good quality binoculars for bird-watching. 'As I got older I became more and more interested in large-scale problems such as the loss of biodiversity and climate change. I wanted to change the world and so I took a degree in Forest and Nature Management.'

In Wageningen Naus ended up staying in the Dijkgraaf student residence. 'There were 18 of us on the corridor and there was always something going on. I was the corridor rep but that was a grotty job: managing the kitty and making sure people did the cleaning.' His introduction group became a close-knit friendship group. 'We went swimming, worked out, and went on outings and game-spotting. We were quite a good knitsball team too.' The friends still get together on birthdays and go hiking every September. Naus: 'Of course it's always me who organizes that. This year we're doing a three-day hike in the Alps, sleeping in mountain huts.'


### ENTHRALLED BY GPS

During the Bachelor's programme he was enthralled by an introduction to GIS. 'You can do so much with it, such as monitoring deforestation using satellite images.' On the Master's in Geo-Information Science, Naus and Salet worked on many assignments together. Naus's internships and final thesis were very relevant to his current job. He did a study, for example, of the effectiveness of agricultural nature management and on the creation of a database for nature management by the Limburg water board. After graduating in 2009, he got a job with the American navigation systems company

Navteq. 'The corporate culture was pretty hierarchical and that didn't appeal to me much,' says Naus. After six months there he applied to Geodan, where he started work as an analyst and was seconded to municipal councils and ministries. He soon moved into a more advisory role and began to lead projects in the field of nature and the residential environment.

### SEASONED SALES STAFF

Meanwhile Salet has already worked for five different employers. After his degree and his first round-the-world trip, Salet started work at the startup company Localyse, which sold made-to-measure GIS software packages, but could not get enough clients in the end. Salet was then approached by Pitney Bowes, a company which produces software for various markets, from insurance companies, banks and supermarkets to the fire brigade and the police. 'As a junior I was allowed to accompany the seasoned sales staff. I was the link between the clients and the software developers and I informed the management of international retailers about the options for displaying their data visually: showing where customers live, for example, or where there is a potential target group. When you get to go along with these experienced sellers, it's like getting a masterclass in sales, retail business operations and marketing. I really got worthwhile training in that period.' After two years, Salet went off on his travels again, but interrupted his travels when he was offered a temporary contract with Boskalis at a bauxite mine in Surinam. From there he continued on to Nigeria. Salet does not expect to go on working in development aid for long. 'It wouldn't surprise me if I was the most highly paid GIS specialist in the world. But the main thing I'm looking for is variation. Now I am



**‘I can easily spend an hour looking at a map’**

changing the world but I don’t rule out working for an oil company at a later stage. I want to do something GIS-related in an international context. It doesn’t matter much what that is.’ In future he might start his own company in which he can combine his passions for mapmaking and traveling. ‘But there is no hurry.’

His university friend Nick Naus has not lost his idealism. ‘There is a lot of data on nature available in the Netherlands. I would love to be able to work somewhere where it’s not as well organized, such as parts of south-east Asia or South America where there is tropical rain forest. There are competing inter-

ests there too. There are the same problems all over the world: are we leaving enough space for nature or is economic development the only thing that matters?’

In his field there is more and more data available from satellite images or technology such as sensors which measure the air quality every 10 seconds. ‘There are plenty of opportunities there for nature conservation and management worldwide. You can quickly see a forest fire on satellite images, for example, or you can count animals and track migration routes. My role as a GIS expert is to advise people on how you can make optimal use of this data, and exchange it.’ ■

## NICK NAUS

**Age:** 30 years

**Studied:** MSc Geo-Information Science (2007-2009)

Communication Science 2004-2006

**Works:** As Geo-IT Consultant at Geodan in Den Bosch

## WELLENSIEK'S LEGACY

# In search of the perfect plant shape

**Prof. Leo Marcelis and PhD candidate Maarten Verhoog are researching the conditions that produce the optimally shaped plant, using a 3D computer model they developed themselves. Innovative research that was made possible by the bequest of the late Prof. Wellensiek.**

TEXT YVONNE DE HILSTER PHOTOGRAPHY JORIS SCHAAP

There is a portrait of Professor Wellensiek, a former professor of horticultural botany in Wageningen, on the wall of Leo Marcelis's office on Wageningen Campus. 'I sometimes used to see Wellensiek walking around the department when I was a horticulture student here,' says Marcelis, professor of Horticulture and Product Physiology. 'He was long retired by then but he continued working until a great age.'

When Marcelis was appointed professor in 2013, he could never have imagined that his famous predecessor would be helping to him by funding innovative research.

Susan Wellensiek, professor of Horticultural Botany in Wageningen from 1946 to 1969, was the founding father of horticultural botany in Wageningen. When he passed away in 1990, part of his estate was transferred to a fund for horticultural research. After the death of his widow Anneke Wellensiek-Manger in 2012, the fund received a further substantial sum

from the estate. Since it was established the fund has supported three young scientists in their work.

One of them is PhD candidate Maarten Verhoog. He studies tomatoes, investigating the variations in plant growth that arise from adjusting the plant spacing, the greenhouse climate and cultivation factors. His model crop is the tomato, for which he is developing new simulation models that show which changes result in a plant with the optimum shape and more homogeneity between plants.

### MORE UNIFORMITY

Having homogeneous plants is very important in greenhouse cultivation because the plants are grown in controlled conditions, explains Marcelis. 'Variation between plants causes problems; diseases occur when there are extremes. If a plant has a lot of leaves in one spot, that spot may remain more humid, giving moulds a chance to develop that can in turn affect other plants.

More uniform plants will make the micro-climate more uniform too, which allows more energy-efficient climate control.'

Marcelis submitted a grant application to the Wellensiek Fund for the development of new simulation models for the growth and development of plants. 'We have a strong base in crop growth models but many more scientific challenges lie ahead in the new dynamic, functional-structural plant models,' says Marcelis.

Traditional dynamic crop growth models perform calculations of various processes in the plant, such as photosynthesis and the distribution of the sugars that are formed through this. But they do not take account of the plant's shape, even though this has all kinds of consequences for how the plant functions. Newer models that do take this 'architecture' into account are often static: they look at the effect of a measure at one particular point in time. In the newest dynamic 3D models, you can simulate the plant's growth yourself and also allow for





Prof. Leo Marcelis and PhD candidate Maarten Verhoog

the fact that plants influence one another. These models look like a lively 3D animation film. 'Ideally you would want leaves to catch a lot of light everywhere as that's best for yields,' explains Marcelis. 'You can influence the plant's architecture by pruning, but also through the atmospheric humidity, colour of the light and positioning of the plants relative to one another. In dynamic models, you can constantly adjust these factors.'

#### TIPS FOR GROWERS

Verhoog hopes eventually to be able to use his research to give growers practical tips. The research is also important for plant breeders and companies that develop climate control technologies and lighting systems for greenhouse horticulture.

Verhoog graduated as a plant scientist in Wageningen in 2015. In his Master's, he focused on data analysis in greenhouse horticulture. 'Formulas are fun,' says

Verhoog. He finds the modelling the most exciting part of his research: getting a good simulation of plant growth under different circumstances. But he still spends many hours in the greenhouse. That is because you never develop a model without doing field trials, as Verhoog explains: 'You can use your model to calculate 100 scenarios and try to identify the trends. You then test those outcomes in a number of focused trials. So simulation models both save time and allow new avenues to be explored that can then potentially be studied in practice.' So he measures and weighs numerous aspects of tomato plants, observing his subject matter as closely as an artist does

so as to capture the plant as efficiently as possible in his computer model. For Verhoog it is something special that he is now able to carry out his doctoral research thanks to Wellensiek. 'I read up about Wellensiek and that gave me an insight into how horticulture developed. It is a nice feeling that I'm able to contribute to future developments.' Marcelis took on three more PhD candidates this year for projects in this area. The way their projects tie in so well with Verhoog's ongoing research probably helped the group get funding, thinks Marcelis. Wellensiek would be proud of him. ■

#### UNIVERSITY FUND WAGENINGEN

The Wellensiek Fund is managed by the University Fund Wageningen. More information: [www.universityfundwageningen.eu/wellensiekkfund](http://www.universityfundwageningen.eu/wellensiekkfund) and [www.universityfundwageningen.eu/howtodonate](http://www.universityfundwageningen.eu/howtodonate)

## Experience Wageningen Campus online

**On 17 November, everyone can take a virtual walk around Wageningen Campus during the online open day for prospective Master's students.**

Wageningen University & Research is organizing the open day online to give potential Master's students from all over the world the opportunity to find out about studying in Wageningen leaving home. 'We are the only university in the Netherlands to organize online open days,' says Renske van Dijk, who is responsible for international recruitment.

The focus of this third open day is on experiencing Wageningen with the help of an interactive map of the campus, and live videos on Facebook of student rooms, the sports centre and lunchtime in the Forum, among other things. There will also be talk shows in which students and study advisers discuss the Master's programmes. The online open day will be in English, like the Master's programmes themselves. The visual material will remain available after the event.

Info: [www.wur.eu/masteronlineopenday](http://www.wur.eu/masteronlineopenday)

### ALUMNI MEETING

## Reunion for alumni from 1966 and 1991

This autumn, alumni who started their degrees in Wageningen in 1966 or 1991 are invited to attend the reunion. The 50-year reunion is on Saturday, 22 October and the 25-year reunion is on Saturday, 5 November. You can still register, via [www.universityfundwageningen.eu/50yearreunion2016](http://www.universityfundwageningen.eu/50yearreunion2016) [www.universityfundwageningen.eu/25yearreunion2016](http://www.universityfundwageningen.eu/25yearreunion2016)  
Info: [alumni@wur.nl](mailto:alumni@wur.nl)

## Fund supports tick research in tropical Panama

**The De Vos Fund helped make it possible for Helen Esser of Wageningen University & Research to carry out her doctoral research on the role of biodiversity in the transmission of diseases by ticks. 'Ticks transmit more pathogenic microorganisms than mosquitoes,' says Esser.**

Esser went looking for a location where she could compare unspoiled areas that have high levels of biodiversity against areas disrupted by human activity with little biodiversity; she found what she wanted in tropical Panama.

'People there suffer from ticks that cause allergies to beef and pork. Some tick-borne diseases can even be fatal. Ticks also cause skin conditions and deaths in cows.'

She collected data in 20 forest sites on the local wildlife, the ticks and the pathogens they were carrying. The wildlife was observed using camera traps. Some animals, such as rats and opossums, that can transmit ticks were also caught.

'The research shows that most tick species carry several different pathogens,' says Esser. 'Adult ticks have a preference for specific larger hosts but the tick larvae and nymphs take what they can get. That affects the spread of disease.'

'Differences were found between the sites with high biodiversity and those with low biodiversity, but the incidence of the diseases can vary widely from one pathogen to the other.'

The contribution from the De Vos Fund was



Helen Esser

crucial for the research. Esser: 'It became apparent during the project that my research budget wouldn't be enough for identifying the ticks. You need advanced molecular techniques for that. I am grateful to Mr and Mrs De Vos for enabling me to carry out the final, indispensable analyses thanks to their fund.'

[www.universityfundwageningen.eu/devosfund](http://www.universityfundwageningen.eu/devosfund)

Info: [helen.esser@wur.nl](mailto:helen.esser@wur.nl), [mark.rietveld@wur.nl](mailto:mark.rietveld@wur.nl)

### NETWORKING

## Alumni on the Maas

Alumni from the southern Netherlands attended a regional meeting on 18 May in which they heard about the Grensmaas project in Limburg and how it was creating more room for the River Maas. Over 30 alumni gathered in the ground of Castle Hartelstein and visited Itteren and Borgharen for a look at the work being done on widening the river, developing the local nature and extracting gravel. The first results can be seen in the form of reinforced

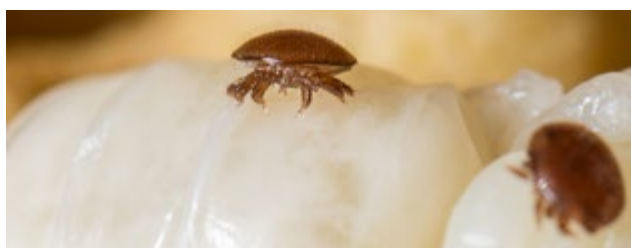


dykes and a nature area of approximately 1000 hectares.

Info: [www.wur.eu/alumni](http://www.wur.eu/alumni)



## CROWDFUNDING



Varroa mites on bee larvae.

## Students combatting varroa mite

**A team of students from Wageningen University & Research wants to tackle the varroa mite that causes bee deaths by deploying a bacterium that produces toxins. The students are still trying to raise the funds to present this idea at the iGEM competition for synthetic biology, at the end of October in Boston (USA).**

In this iGEM competition, students modify bacteria for use in applications to solve societal problems. The Wageningen students discovered information in the scientific literature about a bacterium that secretes toxins, one of which is fatal to mites. 'We will be giving the model bacterium *Escherichia coli* genes that produce this mite poison. The idea is to add the bacterium to the sugar water fed to bees so that the bees themselves transmit the poi-

son to the mites,' explains the team captain Thomas Swartjes. Varroa mites live in the cells of the honeycomb. The toxin is said not to be harmful to bees or humans and it would not end up in the honey.

The 12 students are aiming to raise 30,000 euros via the Wageningen University & Research crowdfunding platform for research materials, equipment and travel expenses. <http://crowdfunding.wur.nl/project/igem2016>

## FELLOW STUDENTS

## Former flatmates are inseparable

You can make friends for life while at university, as demonstrated by one group of about 40 young international alumni from South America and Europe. As students, they lived together in the Fire House (Haarweg 10a) and graduated between 2011 and 2016. 'We developed a special bond,' says Markéta Hanzlíková (MSc Environmental Studies, 2013). 'We were one big family; all in the same situation,

far from home. Because we did a lot of things together and became good friends, we still look out for one another, wherever we are in the world. We stay in contact via social media and occasionally meet up thanks to a few particularly active members. Last year we had a reunion in Prague; this year it was in Rome. Next time we'll rent a huge house where we can enjoy one another's company, just like we used to.'



## FACEBOOK

## Humans of Wageningen: Yan Jie

'I would describe Wageningen alumni as efficient, innovative, receptive, communicative and team players,' says Yan Jie (Environmental Sciences 2006) on the Wageningen University Facebook page Humans of Wageningen. Jie manages the Wageningen University & Research office in China. 'I facilitate collabora-

tion in research and projects in partnership with the business sector. My mission is to help the Chinese agricultural sector. It is tricky coordinating contacts between two different cultures but that's what makes the work so nice.' Jie is also secretary of the Wageningen Alumni Chapter in China. 'We organize three to five events

a year. Our alumni also keep in contact with one another via WeChat, a popular app in China.' [www.universityfundwageningen.eu/china](http://www.universityfundwageningen.eu/china)

If you also want to talk about your link with the university on Humans of Wageningen, send an email to [spreadthewurd@wur.nl](mailto:spreadthewurd@wur.nl).



Yan Jie



## PERSONALIA

**Jakob Bartelds MSc**, WU Farming Technology 1983, has been appointed chair of the Northern branch of the Dutch Federation of Agriculture and Horticulture (LTO Noord). 30 June 2016.

**Prof. Rutgerd Boelens**, WU Tropical Land Development 1990, assistant professor at Wageningen University & Research and professor holding an endowed chair in Political Ecology of Water in Latin America at the University of Amsterdam, has been appointed a professor holding a personal chair in the Water Resources Management group. 1 June 2016.

**Fedde Boersma MSc**, WU Biology 1996, has been appointed director of Scouting Nederland. 13 May 2016.



Fedde Boersma

**Meeuwes Brouwer MSc**, WU Economics of Agriculture and the Environment 1993, has been appointed Agricultural Counsellor in Moscow, Russia. February 2016.

**Eugène Bruins MSc**, WU Phytopathology 1993, has been appointed director of Hoyerswerda Zoo, Germany. 1 July 2016.



Eugène Bruins

**Wilma van Esse PhD**, WU Biotechnology 2007, has been awarded a Veni grant as a promising researcher by the Netherlands Organisation for Scientific Research (NWO) for her research on cereals at the Laboratory of Molecular Biology at Wageningen University & Research. 15 July 2016.

**Martijn Hackmann PhD**, University of Twente Chemical Technology 1994, has been appointed Director of Operations at SSG. Hackmann was previously working at LEI. 1 July 2016.

**Frederik Heijink MSc**, WU Zootechnics 1984, has been appointed Agricultural Counsellor in Myanmar. February 2016.

**Hans Hoogeveen PhD**, WU PhD 2010, has been appointed ambassador and permanent representative of the FAO, the Food and Agriculture Organization of the UN, in Rome. 1 September 2016.



Hans Hoogeveen

**Prof. Jan Kammenga**, WU Environmental Protection 1989, associate professor in the Laboratory of Nematology at Wageningen University & Research, has been appointed professor holding a personal chair in the Nematology chair group. 1 June 2016.

**Coenraad Krijger PhD**, WU Biology 1995, has been appointed director of the International Union for Conservation of Nature in the Netherlands (IUCN NL). 1 October 2016.

**Nico van Opstal MSc**, WU Horticulture 1979, has been appointed Agricultural Counsellor for the Permanent Representation to the European Union (PVEU) and for Belgium and Luxembourg. He was previously Agricultural Counsellor in Paris, where he was appointed *Chevalier de l'Ordre du Mérite Agricole* on 22 June. February 2016.

**Krijn Poppe MSc**, Erasmus University Rotterdam Economics 1981, economist at Wageningen Economic Research (formerly LEI), has joined the Council for the Environment and Infrastructure. 1 August 2016.

**Ruben Smit PhD**, WU Forestry 1996, won the National Nature Quiz organized by BNNVARA and Natuurmonumenten. 9 March 2015.

**Nora Sutton PhD**, Utrecht University Environmental Geochemistry 2008, WU PhD 2013, has been awarded a Veni grant as a promising researcher by the NWO for her research on the biological degradation of groundwater contamination. 15 July 2016.

**Prof. Michel Wedel**, WU PhD 1990, professor of Consumer Sciences at the Robert H. Smith School of Business, also professor at the University of Maryland, has received the Charles Coolidge Parlin Marketing Research Award from the American Marketing Association Foundation. 2 August 2016.

**Prof. Ernst Woltering**, WU PhD 1990, researcher at Wageningen Food & Biobased Research, has been appointed professor by special appointment in Product Physiology and Product Quality in the Horticulture and Product Physiology chair group. 1 July 2016.

**Prof. Sjoerd van der Zee**, WU Soil and Fertilization Sciences 1981, professor holding a personal chair in Ecohydrology at Wageningen University & Research, has been appointed adjunct professor at the School of Chemistry at Monash University in Melbourne, Australia. 1 February 2016.

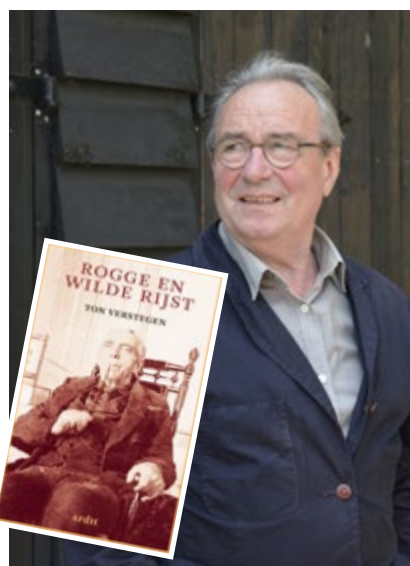
## BOOK

# Rye and wild rice

**Ton Verstegen (Rural Sociology 1972), explores his family's history in his historical non-fiction book *Rye and wild rice*, published this summer. His university days in Wageningen also feature in the book.**

Verstegen recounts the story of the emigrants who left the North-Brabant village of his birth, called Zeeland, in 1850 to travel to Wisconsin in the US. The Dutch emigrants bought land in former Native American territory, built a flourmill powered by water and set swift developments in motion. Verstegen also describes what happened to the Native Americans.

In addition, Verstegen shows the changes in the North-Brabant village from 1950. His father had a mixed farm, as was normal in those days. 'But when I went to Wageningen to study, they were working on the rapid transformation of farms into modern, specialized businesses.' He saw the effects of this in his village, where farmers relocated to the agricultural development area of Peelhorst. In his book, Verstegen describes how different people dealt with the new opportunities in different ways and how, as in the case of the emigrants, some of the developments are now being reversed.



Ton Verstegen with his novel

*Rye and wild rice* (Dutch only),  
ISBN 9789072603524

## IN MEMORIAM

Alumni of Wageningen University, KLV members, staff and former employees of Wageningen UR who have recently passed away.

*If you wish to inform us of the death of a fellow former student or relative, you can email [alumni@wur.nl](mailto:alumni@wur.nl) or call +31 (0)317-485191.*

**Mr M.A. van der Beek MSc**,  
WU Agricultural Plant Breeding 1957.  
6 April 2016.

**Mr A.J. van den Briel MSc**, WU Food Technology 1975. 5 August 2016.

**Mr J.P. Cornelissen MSc**, WU Agricultural Plant Breeding 1952. 10 May 2016.

**Mr B. Faber MSc**, WU Forestry 1966.  
13 May 2016.

**Mr D.C. Faber PhD**, 4 January 2016.  
**Prof. B.F. Galjart**, WU Rural Sociology of the Non-Western Regions 1961.  
10 February 2016.

**Mr W. Gerritsma MSc**, WU Tropical Plant Breeding 1988. 22 June 2016.

**Mr C.J.J. Hooijman MSc**,  
WU Horticulture 1958. 27 April 2016.

**Mr A. Kiestra MSc**, WU Forestry 1969.  
2 March 2016.

**Mr F.K. van der Kley PhD**, WU Agricultural Plant Breeding 1954. 4 June 2016.

**Prof. P. Kooij**, WU emeritus professor of Rural History. 9 August 2016.

**Prof. C.F.M. De Lange**, WU Zootechnics 1985. 1 August 2016.

**Mr L.J.T. Lumen MSc**, WU Forestry 1957. 21 July 2016.

**Mr D. van der Meulen MSc**,  
WU Zootechnics 1968. 4 May 2016.

**Mr P. Michelis MSc**, WU Soil and Water 1975. 25 August 2015.

**Mr R.G. Middel MSc**, WU Farming Technology 1969. 25 April 2016.

**Mr H. Minderhoud MSc**, WU Dairy Science 1972. 22 June 2016.

**Prof. C.C. Oosterlee**, WU former rector magnificus. 9 June 2016.

**Mr B. Poppens MSc**, WU Agricultural Plant Breeding 1960. 28 March 2016.

**Mr F. Simons**, WU student. 20 June 2016.

**Mr E.J.M. Temminghoff PhD**,  
WU Environmental Protection (Water Purification) 1992. 8 June 2016.

**Mr G.G.M. van der Valk MSc**, WU Rural Economics 1956. 12 July 2016.

**Mr F.R. Veeneklaas PhD**, WU Alterra employee. 28 June 2016.

**Mr A.W. van Weperen MSc**, WU Agricultural Plant Breeding 1960. 2 June 2016.

## OLYMPIC GAMES

## 'I now look back with pride'

The Olympic Games in Rio de Janeiro ended in disaster for cyclist Annemiek van Vleuten (Animal Sciences 2007). Ten kilometres from the finish, she was comfortably in the lead when she had a bad fall. Several nerve-racking hours later, her injuries turned out not to be too serious: fractured vertebrae and severe concussion. But mentally it was a severe blow: 'You only get an opportunity to

win gold once every four years and I was so close.' But one month after Rio, Van Vleuten rode the Lotto Belgium Tour. 'I've accepted what happened. I can now look back with pride on that race in Rio.'

### FOUR STUDENTS IN RIO

In addition to alumna Van Vleuten, no fewer than four students made their Olympic debut in Rio. Jan-Willem van Schip (Soil, Water and Atmosphere) took part in the track cycling team pursuit; Nadine Visser (Health and Society) competed in the heptathlon and the 100 metres hurdles; Eva Hovenkamp (Health and Society) ran in the 4x400 metres relay; Isheau Wong (Marketing and Consumer Behaviour) competed in the showjumping.



PHOTO: HOLLANDE HOOGTE

**KLV**WAGENINGEN  
ALUMNI NETWORK

Photo: Shutterstock

# Exploring opportunities in an uncertain world

## Uncertainty takes centre stage at KLV's large conference

When nothing is certain, everything is possible. It is an old nugget of wisdom but nevertheless extremely relevant in a rapidly changing world in which a growing number of things can no longer be taken for granted. Uncertainty as an opportunity is the theme of the large conference that KLV is organising next spring. It is a theme with many facets and perspectives, which is being organised by the study groups and networks of KLV, as they are the experts that represent all those perspectives of the Wageningen domain.

### Why uncertainty as a theme?

"Uncertainty is everywhere," says board member Jannemarie de Jonge. "Everybody has to deal with it. Even just at the personal level of choosing your study programme, your career perspective and your career. Or take, for example, your health: how well can we estimate the risks? Uncertainty plays a role at every level. Science, business and government

must all increasingly deal with uncertainty. Technological developments are now taking place so fast that we have no idea whatsoever about what will be possible in several years time. Whether or not society will accept such developments is also an unpredictable element and that is extremely interesting. For researchers the challenge is exploring the boundaries of uncertainty. Every field in the Wageningen

domain is involved in this with its own challenges and opportunities. Because uncertainty is positive: chaos provides the space for new developments. Uncertainty is a springboard to change. That is what this conference is about!"

### Think tank

A think tank made up of KLV's study groups, networks and Young KLV will con-



tribute ideas to the conference programme. Last spring this think tank came together on two occasions to brainstorm. That yielded a wide range of great ideas. "Of course uncertainty also means surprise," says Caroline Bijkerk, project leader and the point of contact at KLV. "For example, a roving furious reporter, the use of video reports that cut across the programme, speed dates or a buddy system as a fun way of connecting people. Because such meetings between alumni from different generations and different disciplines can be very surprising even though such individuals might not initiate such connections themselves. Therefore we also want to set up a sort of Air B&B formula in which Wageningen students and alumni can offer people from outside a place to stay. That could lead to some fascinating conversations at the breakfast table!"

#### Exciting combinations

KLV is also aiming for surprising meetings between disciplines and perspectives when it comes to the content of the programme. "This autumn we will need to take some decisions," says Caroline Bijkerk. "The study groups and networks will take the initiative, as they represent all Wageningen domains. The idea is that the study groups will organise workshops and sessions with each other in less than obvious collaborations. In these collaborations we will also look for 'uncertain'

and therefore exciting matches because that can lead to interesting perspectives. I am also really curious about what this will lead to!"

#### Cutting across disciplines

The two-day programme will consist of plenary sessions as well as a wide range of workshops and lectures. These will be provided in parallel sessions with many options and when you put together your own programme you will be gently challenged to leave your comfort zone. And of course you will have plenty of opportunity to network, as ultimately that is what KLV is here for. There will be a competitive element that links the two days. However, for people who cannot make both days attending just one of the days is also an option.

The conference will take place on Friday 23 and Saturday 24 June 2017. All alumni, employees of Wageningen UR, and other professionals who work in the Wageningen domain are warmly invited to participate. KLV members will receive a discount on the entry price.

More information will follow shortly on a separate webpage. We will keep you informed!

Would you like to know more?  
Please contact Caroline Bijkerk via [caroline.bijkerk@wur.nl](mailto:caroline.bijkerk@wur.nl)

## INVITATION

If you check our KLV Facebook page on a regularly base, you will be informed what KLV has been up to and what we are working on. This way you will keep in touch with the alumni association of your Wageningen University. Of course you are welcome to post your own interesting status updates too.

Join KLVNetwork! 

[www.facebook.com/klvnetwork](http://www.facebook.com/klvnetwork)

## ACTIVITIES

Info: [klv.nl/en](http://klv.nl/en) (unless indicated otherwise)

**11 October**

SKOV seminar - Population Boom in Africa; bloom or doom for agriculture?

**22 October**

Reunion graduates 50 years ago - start year 1966

**5 November**

Reunion graduates 25 years ago - start year 1991

**5 November**

VWI - Annual symposium Explore & Connect

## YOUNG KLV PROGRAMME

**22 September**

Scientific English

**31 October**

CV writing course

**25 November**

CV writing course

**1 December**

To do a PhD, pleasure or burden

### And the title is...?

*The title of the conference has yet to be confirmed. That fits in well with the theme. The think tank has already made many suggestions. Some of the possible titles are:*

*Inspiring uncertainties*

*Nothing is certain, everything is possible*

*Up for grabs*

*Wheel of fortune*

*Doubt or perspective*

*Balancing*

*Choices are chances*

*The benefit of the doubt*

*Change, game and expectations*

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PHOTO VICTOR OTENO, SNV

## A boost for the Kenyan dairy sector

Budget cuts at the end of the 20th century spelled the end for Kenyan government extension services for dairy farmers. Now dairy companies and farmers' cooperatives are trying to set up a private form of agricultural extension, explains Jan van der Lee of Wageningen Livestock Research. 'We are helping with this, in collaboration with the CDI at Wageningen University & Research, the development organization SNV, Dutch dairy companies and Kenyan partners. Together we reach many thousands of farm-

ers in the Kenyan highlands. With funding from the Dutch embassy we support extension centres where farmers can obtain training. We also coach farmers as peer trainers: these are enterprising dairy farmers who set an example with their efficient production.' Efforts are also made within the project to reach agreements between parties in the dairy chain on various points such as the delivery of artificial insemination, veterinary consultations and feed. The farmers are looking to reduce their cost

price, says Van der Lee, while the dairy companies' aim is to collect more milk with less fluctuation over the year, and the suppliers of inputs such as feed want a stable client base. 'Wageningen bears everyone's interests in mind in our research and advice. Can everyone earn a living, can the environmental impact be reduced, is there a future for young farmers? Our contribution draws on Dutch knowledge and experience on such issues.'

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