

# WAGENINGEN WORLD

MAGAZINE OF WAGENINGEN UR ABOUT CONTRIBUTING TO THE QUALITY OF LIFE

no.3 2012



## Manure policy fails to improve water sufficiently

Frank van der Bolt, page 32

Electricity from the **Afsluitdijk** | Juice stays **fresh for three weeks** | Sow less rice to **harvest more?**  
Zeppelin measures **air pollution** | **Tomato genes** are valuable | Detecting **food fraud** with **isotopes**



# 10

## ELECTRICITY FROM THE AFSLUITDIJK

Work has started on the construction of a test power plant for blue energy: power generated by making use of the transition from salt to fresh water. A perfect source of energy for a delta zone such as the Netherlands.

# 26

## TOMATO GENES ARE VALUABLE

After nine years of work by hundreds of scientists, it is ready: a comprehensive description of the tomato's genes. Breeders can make use of it to find the most desirable characteristics.



# 32

## MANURE AND THE WATER SUPPLY

The targets of the European Nitrate Directive are not being reached in all regions of the Netherlands. All hopes of further reducing the runoff of minerals from manure are now pinned on a new approach: manure processing.



**COLOPHON** Wageningen World is the quarterly magazine for associates and alumni of Wageningen UR (University and Research centre) and members of KLV, the Wageningen Alumni Network. A PDF version of the magazine can be found at [www.wur.nl/UK/publications/Periodicals](http://www.wur.nl/UK/publications/Periodicals) **Publisher** Wageningen UR, Marc Lamers, **Editorial Board** Paul den Besten, Hans Bothe, Yvonne Fernhout, Ben Geerlings, Bert Jansen, Jeanette Leenders, Jac Niessen, Judith Pierik, Helene Stafleu, Erik Toussaint, Sil Traas **Editors-in-chief** Gaby van Caulil (Editor-in-chief Resource), Pauline Greuell (Corporate Communications Wageningen UR) **Magazine editor** Miranda Bettonville **Copy editor** Rik Nijland **Alumni news** Alexandra Branderhorst **Translation** Clare Wilkinson, Clare McGregor, **Language editor** Clare McGregor **Art direction and design** Jenny van Driel (Wageningen UR, Communication Services) **Cover picture** Foto Natura **Overall design** Hemels Publishers **Printer** Mediacenter Rotterdam **ISSN** 2212-9928 **Address** Wageningen Campus, Akkermaalsbos 12, 6708 WB Wageningen, PO Box 409, 6700 AK Wageningen, telephone +31 31 7 48 40 20, [wageningen.world@wur.nl](http://wageningen.world@wur.nl) **Change of address alumni** [www.wageningenalumniportal.nl](http://www.wageningenalumniportal.nl) **Change of address associates** (mention code on address label) [wageningen.world@wur.nl](mailto:wageningen.world@wur.nl) **Change of career details** [alumni@wur.nl](mailto:alumni@wur.nl)

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



**4 UPDATE**

News in brief about research and developments in Wageningen UR.

**16 IMPACT: JUICE THAT STAYS FRESH FOR THREE WEEKS**

Thanks to a new technology, fruit juice company Hoogesteger's freshly squeezed juices will now stay fresh for three weeks. This increases the scope for marketing them outside the Netherlands.

**18 DEBATE: FOOD SCIENCE SOWS CONFUSION**

Food scientists should be less eager to seek publicity, says researcher Sander Kersten. That way they would cause less confusion among consumers. Not everyone agrees with him.

**22 SOW LESS RICE TO HARVEST MORE?**

An alternative method of rice cultivation has become very popular. There is little scientific evidence of its effectiveness, however.

**30 ZEPPELIN MEASURES AIR POLLUTION**

Measurements taken from a zeppelin in European air space should increase our understanding of the relationship between air pollution and weather.

**38 DETECTING FOOD FRAUD**

Increasingly often, isotopes can help us pinpoint where food products really come from.

## FEATURES

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**40 LIFE AFTER WAGENINGEN**

Hanneke Kijne and Camiel van Drimmelen both embarked on a degree in Garden and Landscape Architecture in 1987. Fifteen years on they look back on their studies and their careers.

**44 WAGENINGEN UNIVERSITY FUND**

The number of donors to the Anne van den Ban Fund is growing apace. Last year the fund had 866 donors who raised almost 150,000 euros between them.

**46 ALUMNI**

News for alumni of Wageningen University, part of Wageningen UR.

**48 PERSONALIA**

Information about the lives and fortunes of alumni of Wageningen University.

**50 KLV**

News from the KLV alumni network.



PHOTO BART DE GOUW

## Wind turbines at sea

'The construction of wind farms has really taken off around the world. Next year, the Netherlands will be building two or three new wind farms in the North Sea, and Germany and the UK are also busy. If all the plans are implemented, about five percent of the North Sea will consist of offshore wind farms by 2025. We now have a reasonable idea of the impact of such farms.

'For example, driving the piles underwater makes a lot of noise so seals and porpoises will avoid the area while that is going on. In Germany they use a bubble curtain – a ring of air bubbles – to muffle the sound. That is a good idea, and one you could apply anywhere.

'Once the wind turbines have been erected, you get greater biodiversity underwater. The piles and surrounding boulders form a hard surface that attracts creatures with a preference for rocky surfaces, such as mussels, sea anemones and crabs. Also, because the wind farms are closed to the fishing industry, they become a refuge for fish such as cod and whiting. You could permit specific forms of fishing there such as angling for cod. There is also potential for aquaculture – algae, lobsters or flat oysters, for instance.

'Looking above water, wind turbines attract cormorants. On the other hand the lack of fishing boats means seagulls avoid the area as these birds find their food in the wake of the boats. The wind turbines' rotating blades scare off gannets. The same applies to scoters and divers, but they will probably get used to the turbines in time. Birds appear to be more likely to avoid a wind farm if the turbines are placed close together. On the other hand, if they are placed further apart, the total area covered by the farm is greater. So we still need to determine the optimum setup. The sea is changing constantly, for better or for worse, and I am not against offshore wind farms as long as they are built with due regard for their potential impact on the environment.'

Han Lindeboom, professor of Marine Ecology at Wageningen University and science director at IMARES, Wageningen UR.



## Treat bees for varroa in July



July is the best month for treating swarms of bees for varroa mites as the swarms then have a better chance of surviving the winter. These are the findings of researchers at Plant Research International and Wageningen University, both part of Wageningen UR, published in the scientific journal *PLoS One* at the end of April. July is the best time as the end of the summer sees a switch from summer bees to winter bees, which restart the colony in the spring. Swarms treated for varroa mites early in the season were less susceptible to infection during the period in which the winter bees were developing, and this led to lower mortality levels in winter. Info: [coby.vandooremalen@wur.nl](mailto:coby.vandooremalen@wur.nl)

### FOOD TECHNOLOGY

## Mexico to use Wageningen algae expertise

Mexican food companies in the Mexican state of Aguascalientes are going to be using algae to purify waste water. The algae will then be processed to produce protein-rich fish and animal feed. This sustainable development is possible thanks to Wageningen UR's algae-related expertise. Info: [madeleine.vanmansfeld@wur.nl](mailto:madeleine.vanmansfeld@wur.nl)

## Does lighting confuse moths?

**Ecologist Koert van Geffen has set up a study in Wageningen's Binnenveld to investigate the effect of artificial light on moths.**

Not much is known about the impact street lighting has on caterpillars, moths and vegetation. Moths are attracted to light, which makes them easy prey for bats, and artificial light also disrupts their feeding and mating behaviour. The question is whether that leads to fewer caterpillars, whether all species are equally affected and whether this then has an impact on the vegetation – after all, caterpillars are important herbivores.

For his doctoral research, Van Geffen put cabbage moths, feathered ear moths or a combination of the two in cages one cubic metre in size. These moths are typical examples of the more than 1200 species to be found in the Netherlands. In addition, he had four grasses and four herbs growing in the cages, including velvet grass, sorrel, knapweed and daisies. 'The standard plants you would find on a well-developed roadside verge', explains Van Geffen. The caterpillars (and ultimately the moths) are

really being kept in a kind of luxury prison, with plenty of food and mating partners but no enemies. The only thing harassing them is the light. For each cage contains a green, red or white LED lamp specially designed for this purpose by Philips. The lights simulate the street lighting along the average Dutch rural road. Van Geffen will spend the next few years monitoring the moth population, counting caterpillars and snipping the vegetation in the autumn, all in order to measure the effect of the artificial lights. Van Geffen's experiment is part of the STW Spotlight on Nature project, comprising various studies of the effect of artificial lighting on flora and fauna. An experiment with lights in the Veluwe nature reserve started earlier this year. There, Wageningen researchers are looking at the impact of artificial light on the entire range of flora and fauna. The idea is that the project will result in lighting that is more nature friendly. Info: [koen.vangeffen@wur.nl](mailto:koen.vangeffen@wur.nl)



The moth research station

PHOTO GUY ACKERMANS

## CLIMATE



## Shortages of cooling water threaten energy production

Rising water temperatures and falling water levels in rivers pose a threat of shortages of cooling water in the summer. As a result, the production capacity of both nuclear power plants and fossil-fuel power stations could fall between 2031 and 2060 by 6 to 19 percent in Europe and 4 to 16 percent in the US. There will also be a far greater risk of power plants having to shut down for a while. These are the conclusions presented in the scientific journal *Nature Climate Change* by researchers in the

Earth System Science group at Wageningen University, part of Wageningen UR, together with American and German colleagues.

The researchers say that in view of the long lifespan these plants have and the huge investments involved, the energy sector should already be taking measures to cope with future climate changes. One potential measure is to build power plants by the sea and use seawater for cooling.

Info: [michelle.vanvliet@wur.nl](mailto:michelle.vanvliet@wur.nl)

## FOOD PRODUCTION

## Food expertise centre opens in Chile

The International Center of Excellence WageningenUR/Chile opened in the Chilean capital, Santiago, in July. Chilean companies and science institutes and the Chilean national government will be using it for research on healthy, appetizing food and sustainable production methods.

Wageningen UR is heading the consortium. The first projects will deal with the development of functional ingredients, product and process development for cereals, fruit and fish, the redesign of the avocado supply chain and the reduction of losses in the export of grapes. Info: [marian.geluk@wur.nl](mailto:marian.geluk@wur.nl)

## CLIMATE

## Water know-how for Bangladesh

Alterra, part of Wageningen UR, is contributing to a major Delta programme for Bangladesh. The aim is to protect this country from floods and drought due to climate change over the next 50 to 100 years. An integrated plan is being developed for all the relevant sectors, such as agriculture, fishing, industry, forestry, water management and healthcare. Catharien Terwisscha van Scheltinga from Alterra says the major challenge is to make sure the adaptation and protection measures fit in with other changes the country is undergoing, such as population growth and migration to the cities.

Info: [catharien.terwisscha@wur.nl](mailto:catharien.terwisscha@wur.nl)

## GENETICS



## Possible to trace potato cultivation method

Jeroen van Dijk of RIKILT, part of Wageningen UR, has shown that it is possible to determine whether artificial fertilizers and chemical pesticides have been used in the cultivation of a potato. His study appeared in the *Journal of Agricultural and Food Chemistry* in March. Van Dijk: 'We measured which genes are switched on and to what extent. Then you see significant differences between conventionally and organically grown Santé potatoes', says Van Dijk. He thinks this type of test could be useful in safety studies for transgenic plants as it is possible to trace tiny differences in the gene expression. That would remove the need for experiments with mice.

Info: [jeroen.vandijk@wur.nl](mailto:jeroen.vandijk@wur.nl)

## ENVIRONMENT

## Big rivers getting dirtier

The world's big rivers are becoming more and more polluted. More nitrogen and phosphate than they can handle flows into two thirds of the thousand biggest rivers in the world, leading to eutrophication. The Indian Ganges is the most polluted river; other problematic rivers run through China, India and Europe. The Rhine receives more nitrogen than it can discharge too. These findings were published by Wageningen University researchers and their colleagues in *Ecological Indicators* in July.

Info: [cheng.liu@wur.nl](mailto:cheng.liu@wur.nl)

## AGRICULTURE

## Better seed potatoes for East Africa

Small-scale potato farmers in East Africa could raise production levels by 30 percent if they only use seed potatoes from healthy parent plants; disease levels would drop by 35 to 40 percent. Peter Gildemacher made these claims when he received his doctorate from Wageningen University, part of Wageningen UR, on 20 June. At present farmers cut costs by using their own or neighbours' seed potatoes. Info: [paul.struik@wur.nl](mailto:paul.struik@wur.nl)

## NATURE POLICY



PHOTO FOTO NATURA

## Effective investment in butterflies

**Researchers at Wageningen University, part of Wageningen UR, have developed a model in partnership with Belgian colleagues that helps determine the best measures for restoring nature.**

Many plant and animal species that typify the Dutch countryside are under threat due to the fragmentation and decreasing quality of their habitats. The question then is what would make the most effective investment given fixed financial resources: expanding the current habitat, improving its quality, creating strips linking populations

or introducing more animals.

In the scientific journal *PlosOne* in June, the researchers published some calculations for the Large Blue, a typical wet heathland butterfly, which suggest that expanding the habitat is the most cost-effective investment.

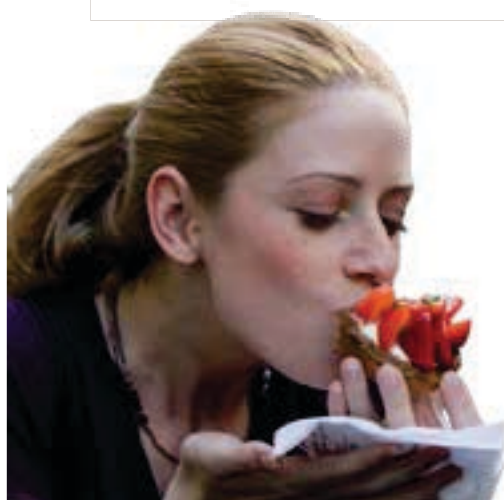
Info: [michiel.wallisdevries@wur.nl](mailto:michiel.wallisdevries@wur.nl)

## Measuring food-related emotions

Researchers at Wageningen UR and Radboud University Nijmegen have developed a way of measuring someone's emotions on seeing, smelling and tasting food. They measure the heart rate, finger temperature and skin resistance. The temperature of the fingers falls while the heart rate and electrical resistance of the skin rise, for instance, when people are frightened or angry. When people feel happy,

their heart rate falls and their finger temperature increases. Whether you buy or eat a product partly depends on your emotional state at that point in time. The failure rate for new products launched in supermarkets is currently 80 percent, despite extensive consumer testing. The research was published in *Food Quality and Preference* in June.

Info: [rene.dewijk@wur.nl](mailto:rene.dewijk@wur.nl)





## LIVESTOCK FARMING

# Cows that low are lonely, not scared

**Dairy cows react in different ways to stimuli in their environment. These differences could be used as an additional selection criterion to breed cows that stay healthy and productive over a long period.**

Dairy farmers need cows that can withstand a problem or two. This robustness is generally defined in terms of high fertility and low susceptibility to hoof complaints and udder inflammation.

However, temperament can also have an effect on the animal's health and welfare. Temperament determines how an animal responds to stressful situations and whether it is able to adapt to the conditions in which it is being held. An advantage of such behavioural characteristics is that they are easy to observe. That is why Kees van Reenen of Wageningen UR Livestock Research decided to look at whether temperament is a consistent characteristic in dairy cows, as part of his doctoral research. He concludes that this is indeed the case, based on behavioural tests and physiological studies of black-and-white Holstein-Frisian dairy cows. He studied them at various points in the period from three weeks after their birth to six months after they first gave milk.

Van Reenen subjected the cows to external

stimuli and noted whether they reacted with shock, by lowing or by stamping. He also measured heart rates and production of the stress hormone cortisol. The cows reacted in different ways. For instance, one animal would soon make contact with an unfamiliar object that suddenly appeared close to it while another would wait apprehensively, with an increased heart rate and more stress hormones in its blood.

Lowing a great deal turned out not to be a fear reaction. 'It's probably a sign that they like to be in the company of other cows', says Van Reenen. Consequently, calves that low a lot if kept apart from the herd would benefit later on in other stressful situations from social contact.

A cow's temperament does not change as it matures. 'If temperament really does affect the health and welfare of dairy cows, the breeding sector could start including temperament as one of the criteria for a robust cow', says Van Reenen.

Info: [kees.vanreenen@wur.nl](mailto:kees.vanreenen@wur.nl)



PHOTO NATIONALE BEELDBANK

## NATURE MANAGEMENT

# Hunters no match for greylag geese

Shooting greylag geese does not reduce their numbers, and pricking and draining eggs does not have much effect either. The only way to substantially shrink the geese population is to catch moulting geese and then gas them with CO<sub>2</sub>. These are the conclusions of researchers at Alterra, part of Wageningen UR, following a study on the Dutch island of Texel. Greylag geese are a nuisance on Dutch farms all year round.

Info: [david.kleijn@wur.nl](mailto:david.kleijn@wur.nl)

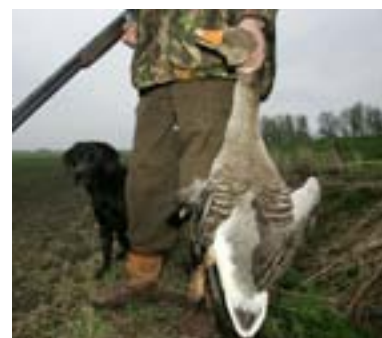


PHOTO HOLLANDESE HOOGTE

## PLANT DEVELOPMENT

# You can learn how to fix nitrogen

A study by Wageningen University, part of Wageningen UR, which was published in the scientific journal PNAS in May shows that nearly all plants have the equipment for extracting nitrogen from the air rather than from the soil. The way mycorrhizal fungi help plants to take up phosphates from the soil is very similar to the way rhizobium bacteria enable papilionaceous plants to fix nitrogen in the air. If this principle can be adapted for use with other crops, cultivation could become more sustainable and less dependent on artificial fertilizers. Info: [ton.bisseling@wur.nl](mailto:ton.bisseling@wur.nl)

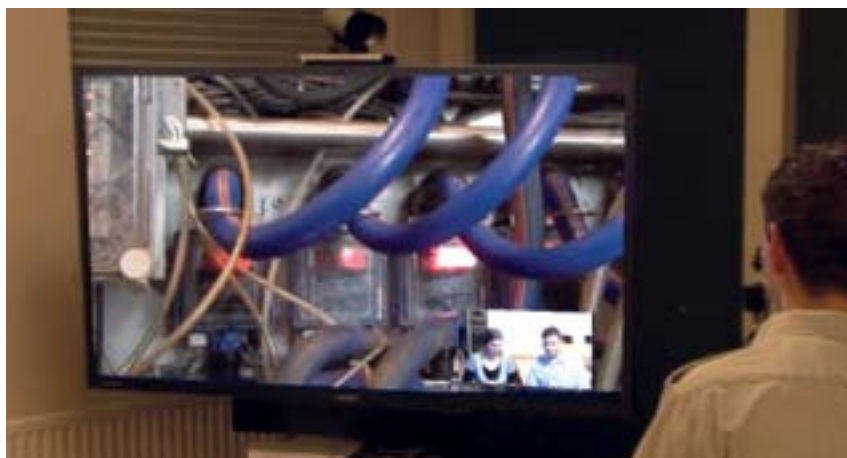
## Sea levels will continue to rise

Sea levels will rise by 25 centimetres between now and mid-century, whatever we do about carbon dioxide emissions. Environmental measures will only take effect after then, but even with a successful climate policy restricting global warming to less than two degrees Celsius, sea levels will still rise in the course of the century by 75 to 80 centimetres compared with 2000. Michiel Schaeffer at Wageningen University, part of Wageningen UR, published these estimates together with international colleagues in a paper in the scientific journal *Nature Climate Change* in June. They base their conclusions on calculations of increases in sea levels over the past 1000 years and on policy scenarios for the emission of greenhouse gases. The researchers say sea level rises can be minimized by large-scale reductions in CO<sub>2</sub> emissions and by ultimately removing CO<sub>2</sub> from the atmosphere. Schaeffer says our current CO<sub>2</sub> emissions will determine sea levels for centuries as it takes a long time before ice and water masses respond to the planet warming up.

Info: [michiel.schaeffer@wur.nl](mailto:michiel.schaeffer@wur.nl)



PHOTO: HOLLANDESE HOOGTE



## Skyping with the barn

**Since May it has been possible to pay virtual visits via the Internet to the research centre for sustainable pig farming, VIC Sterksel, and the Dairy Campus, both part of Wageningen UR.**

The barns are equipped with a wireless network, which lets staff give tours to anyone with an Internet connection with the help of cameras and microphones. Just as with Skype, visitors can talk back or ask the tour guide to zoom in on a certain part of the barn. The direct connection means the same level of interaction is possible as in a conventional visit to the centre. The technique is ideal for study groups or schools.

The two centres have a case full of equipment that can easily be set up in any of the barns. Anyone can reserve it for use. These days, many farmers avoid visiting other farms, both to save time and to prevent the spread of diseases, but this form of knowledge exchange is actually very important for the development of their own farm.

Info: [jolanda.jansen@wur.nl](mailto:jolanda.jansen@wur.nl)

## Hot coffee from a bio-cup

It is now possible for industrial companies to manufacture disposable coffee cups from bioplastics. The polylactic acid (PLA) in bioplastics melts at temperatures above 60 degrees Celsius. There have been no widely applicable methods of making PLA heat resistant because it is very difficult to combine plastics containing left-rotating and right-rotating lactic acids under the right conditions and in the right ratio. Researchers at Wageningen UR Food & Biobased Research have now found the right mix for commercial application. Production of the biobased coffee cups will start soon.

Info: [christiaan.bolck@wur.nl](mailto:christiaan.bolck@wur.nl)





## NUTRITION AND HEALTH

# Fruit for health at the playing field

**Fruit trees and bushes have been planted around the Amsterdam Middenmeer-Voorland playing fields to encourage healthy eating among the sportspeople. This is the first pilot of the Fruit4Sport project.**

Many Dutch people play organized sports, which makes sports facilities an excellent place for encouraging healthy eating habits and lifestyles. Managing a mini-orchard next to the pitch and harvesting the fruit can be a way of engaging sportspeople, spectators and local businesses more with fruit cultivation and healthy eating. If the harvest then ends up in sports canteens and becomes popular, this may persuade clubs and canteen staff to offer fruit as an option all year round.

The idea is being tested in Middenmeer-Voorland in East Amsterdam, 40 hectares of sports grounds set in a park with football, hockey and baseball pitches, tennis courts and an athletics track. 'We have found space for fruit trees and bushes at 11 different sites', says project manager Marc Ravesloot from Applied Plant Research (PPO), which set up the Fruit4Sport project together with the innovation network of the Ministry of Economic Affairs, Agriculture Innovation.

Most of the trees and bushes were planted this

spring. Varieties were chosen that were likely to produce a reasonable crop even with low-intensity care. Other factors determining the choice of variety were the soil type and the available space.

The crops will include cooking pears, apples, walnuts, hazelnuts, cranberries, gooseberries, currants, raspberries and blackberries. There is already a path with blackberries on either side that you can pick and eat, and orchards with apple trees that will eventually form a two-metre high hedge. Firms, local residents and sports teams can apply to care for the plants, on condition that the crops end up in the sports canteen. A group has already offered its services for the first three orchards. The Amsterdam pilot is aimed at getting a better idea of the most effective type of participation and production system, and at seeing how the concept can help improve eating habits. Various provinces and municipalities have already shown an interest in this new community concept. Info: [marc.ravesloot@wur.nl](mailto:marc.ravesloot@wur.nl)

## LAND USE PLANNING



## Mosquito bites can be avoided

Alterra, Wageningen UR, has developed an application that can help predict the likelihood of problems from mosquitoes, midges and horseflies affecting future residents of a redevelopment plan. The tool is intended for land-use planners, developers and land managers involved in projects that include plans to inundate an area, which entails a risk of mosquitoes. The evaluation tool also gives advice on measures to reduce the problems.

Info: [piet.verdonschot@wur.nl](mailto:piet.verdonschot@wur.nl)

## NUTRITION AND HEALTH

## Less appetite after lengthy chewing

A study by PhD student Anne Wijlens at Wageningen University shows that chewing affects your appetite. Trial subjects were given liquid food to make them feel full, then asked to chew a piece of cake. Their appetite fell by 10 percent after one minute of chewing without swallowing, and by nearly 20 percent after eight minutes. So stimuli in the mouth do affect how hungry you feel. The results appeared online in July in the scientific journal *Obesity*.

Info: [anne.wijlens@wur.nl](mailto:anne.wijlens@wur.nl)



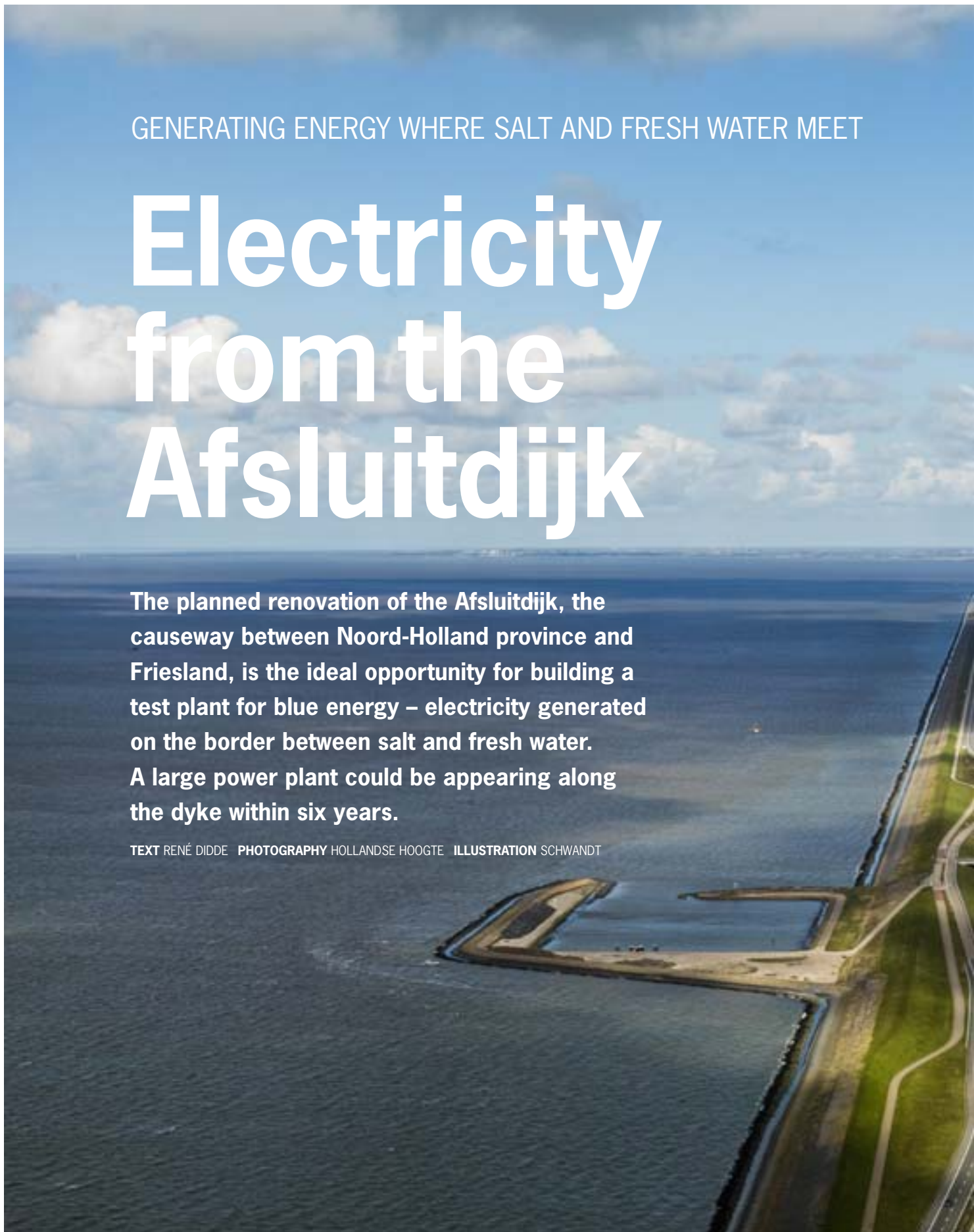
PHOTO: HOLLANDESE HOOGTE

GENERATING ENERGY WHERE SALT AND FRESH WATER MEET

# Electricity from the Afsluitdijk

**The planned renovation of the Afsluitdijk, the causeway between Noord-Holland province and Friesland, is the ideal opportunity for building a test plant for blue energy – electricity generated on the border between salt and fresh water. A large power plant could be appearing along the dyke within six years.**

TEXT RENÉ DIDDE PHOTOGRAPHY HOLLANDSE HOOGTE ILLUSTRATION SCHWANDT







The first blue energy plant came into operation in Wageningen in 2006. It was on the lab scale – think ‘shoebox’ – and produced about enough electricity to run a modest fan. In 2009, the power it generated (0.1 watts) was increased fourteen thousand-fold to 1 kilowatt (1 kW) in the Frisia Zout salt factory. Sounds impressive – which it was, but this was still no more than the level of energy required to power a vacuum cleaner. Nevertheless, the underlying principle offers the prospect of an attractive new source of electricity, one that is particularly well suited to people living in a delta. Blue energy is based on the difference in the salt content of salt and fresh water. Electricity can be generated by separating narrow compartments containing salt and fresh water by two kinds of membranes, explain Bert Hamelers and Cees Buisman. They are water technology experts at the Environmental Technology subdepartment of Wageningen UR and the specialist institute Wetsus in Leeuwarden. They have been involved from the very beginning in the scientific development of this environmentally friendly form of energy. Every second, energy is flowing from the river into the sea with the water. ‘That’s electrical energy we currently do nothing with’, says Buisman. ‘If we could bring the fresh water and salt water into contact in the right way, that would give you one or two power plants straight off.’ The preparations for this full-scale implementation are due to start in 2013. The site is the Afsluitdijk, the eighty-year-old ‘grand old lady’ of the Dutch waterworks (built in 1932) and precursor to the Delta Works. A small blue energy demonstration plant will start operating on the former construction site island of Breezanddijk. The plant will have several modules supplying a total of 50 kW, the equivalent of a Volkswagen Golf. If this plant is working properly after four years of research and the costs are not too high, a basic 200 kW module will be built.

### ONE KILOMETRE LONG

‘Then we can stack that module’, says Pieter Hack. ‘If we have about one thousand

200 kW units, we can build a power plant supplying 200 thousand kW, i.e. 200 megawatts (200 MW). So in six years’ time we could erect a large power plant a kilometre long and four sea containers high’, says Hack. An environmental protection engineer and Wageningen graduate, Hack is taking part in the blue energy experiments on behalf of Magneto Special Anodes. In his view, ‘200 megawatts is enough to satisfy the electricity requirements of all 500 thousand households in the northern Netherlands.’

### SPIN-OFF

Wetsus has set up a spin-off company for the further development of the plant. It is called Redstack – ‘Red’ stands for *reverse electro-dialysis* (reverse osmosis) and a ‘stack’ is a module of closely packed membranes. Redstack is a joint venture involving Magneto Special Anodes (where Pieter Hack works), the power grid company Alliander and A. Hak (manufacturer of pipes, cabling and high-voltage masts). Older partners are fibre manufacturer Landustrie and Hubert Stavoren (maker of microsieves among other things).

The construction of the 50 kW test plant on the Afsluitdijk and the research due to be carried out there will cost an estimated seven million euros. Half will come from the collaborative association of northern provinces (SNN) while Redstack will provide the other half. The consortium is collaborating with Wetsus in Leeuwarden and Fuji in Tilburg. Fuji is known mainly as the company that produced rolls of film but it saw the digital revolution in photography coming in plenty of time and switched to the development of wafer-thin membranes.

Their quality will be a decisive factor in the

venture’s success. The easier it is for the sodium and chloride ions to pass through, the greater a stack’s efficiency. The so-called spacers – plastic netting used to maintain the distance between the membranes – also play a key role, according to Pieter Hack. ‘They let the water flow more easily along the membranes and prevent contamination of the membranes.’

This is known as ‘fouling’ and is a cause of concern. Hack: ‘If the membranes clog up like a coffee filter, the production of electricity will fall. We filter all microplankton and mud particles down to fifty micrometres out of the water but the really fine stuff still gets through.’ Hamelers thinks it will be possible to flush the membranes clean by reversing the stacks so that the salt and fresh water flow in the opposite direction for a short while. ‘Air bubbles may be able to help, or otherwise we could apply a small dose of chlorine to the stack every now and again.’ The question is how that will fit in with the other plans for the dyke.

### AFSLUITDIJK TO GET AN OVERHAUL

Outgoing state secretary for the Environment Joop Atsma (of the Christian Democrat party) says the dyke needs to be blue energy-proof. The Afsluitdijk will be getting an overhaul in about 2015 and the state secretary thinks space should be reserved for blue energy.

There is no doubt that the causeway is in need of major maintenance. ‘After eighty years, the concrete in the two floodgate complexes at Den Oever and Kornwerderzand is showing signs of wear and tear’, explains Yolande van der Meulen of the Directorate-General for Public Works and Water ➤

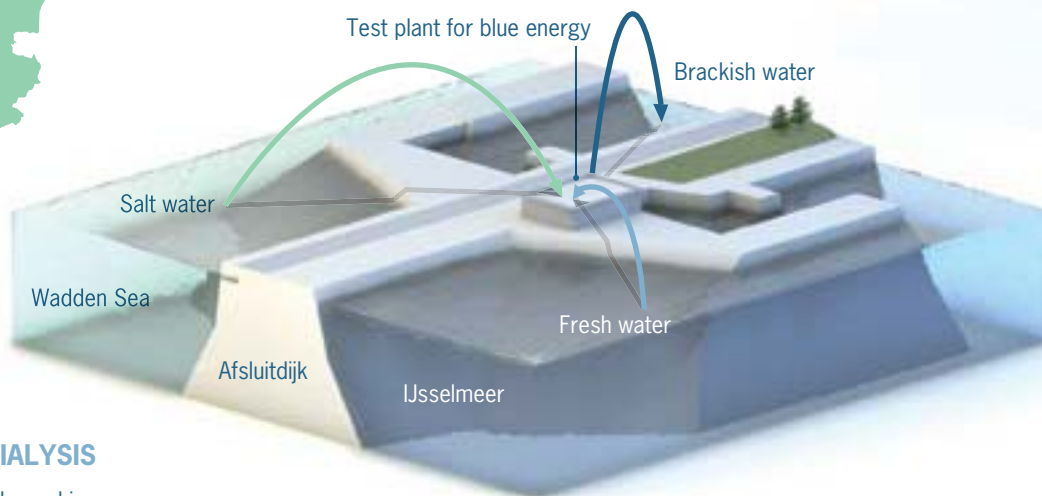
‘If the membranes  
clog up, electricity  
production falls’

## BLUE ENERGY



An electricity plant will be built on the Afsluitdijk to generate electricity from salt and fresh water.

The plant is supplied by fresh water from the IJsselmeer lake and salt water from the Wadden Sea. Brackish water is discharged.



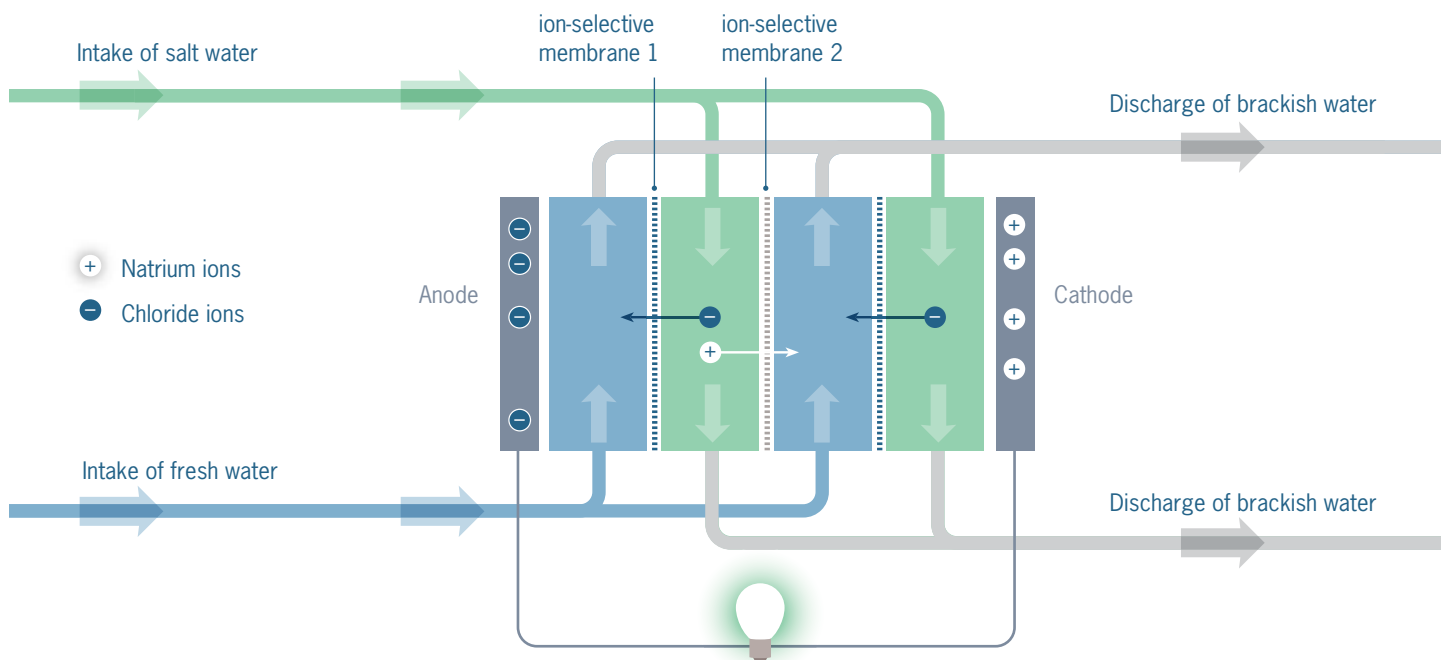
## REVERSE ELECTRODIALYSIS

Blue energy is generated by making use of reverse electro dialysis.

Salt water (containing sodium chloride) and fresh water flow through small, alternating segregated compartments past two different, ion-selective membranes.

One membrane only lets through positively charged particles (natrium ions), the other only negatively charged particles (chloride ions).


The ions collect in the outer two compartments. One compartment now has a shortage of positive ions while the other has a shortage of negative ones. Wiring the two up together sets an electric current in motion.



## MASSIVE POTENTIAL

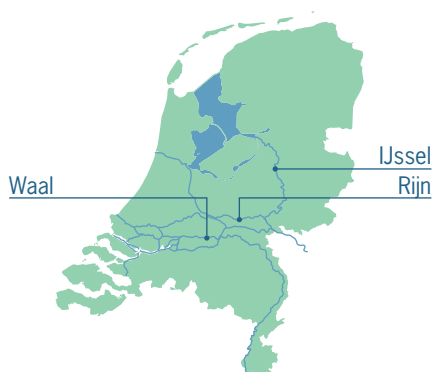
Blue energy makes use of the difference in ion concentrations between fresh and salt water, and this makes it an interesting new source of electricity for the Netherlands.

Electrical power of river water that flows into the sea:

 **1 m³** = **1**  
river water                      megawatt

Water flowing from the Rhine, Waal and IJssel rivers per second:

**2700 m³**



Energy potential of blue energy for these Dutch rivers:

**3000**  
megawatt

If the experimental results showing efficiency levels of 70 percent can be achieved in practice, blue energy could supply:

**2000**  
megawatt

By comparison: a modern coal-fired power plant supplies:

**900-1200**  
megawatt

By comparison: the Princess Amalia wind farm in the North Sea supplies:

**120**  
megawatt

That would mean blue energy could eventually meet 12 per cent of the Dutch demand for electricity.



Blue energy is also suited to smaller plants. Industrial companies or large organizations such as port firms could use blue energy to meet their own energy requirements.



Future energy potential of afsluitdijk power plant:

**200**  
kilowatt

If results are good a module for about 200 kilowatts will be built. One thousand units supply 200 megawatt (MW): enough to provide electricity for all the households in the northern Netherlands.



Management, who is responsible for the safety of the Afsluitdijk. With rising sea levels, both the flood gates and the dyke will need reinforcing. 'The sluice capacity also needs to be increased given the expected rise in water levels in the IJssel Lake', explains Van der Meulen.

Blue energy is one of the ambitious schemes explicitly trying to take advantage of the dyke reinforcement project. Initially, four consortia came up with spectacular plans that focused on nature, recreation, transport and housing in addition to safety. For example, mudflats on the Waddenzee side could be used to break the worst of the waves while at the same time serving exceptionally ambitious objectives for nature. All four plans also incorporated a blue energy power plant, but because of the cut-backs none of the plans got further than a few sketches and artists' impressions.

Van der Meulen says 600 million euros have been reserved for safety improvements. 'Half of that will go on making the IJssel Lake side of the dyke resistant to water washing over and we will be spending the other half on reinforcing the civil engineering structures such as the sluices.' There are also 20 million euros available for 'regional ambitions'. The region itself will be contributing another 20 million.

## ENERGY-NEUTRAL DYKE

Van der Meulen sees potential here for implementing the best bits of the earlier plans. 'That certainly includes blue energy, but first the researchers will have to show that everything functions properly in practice. One area for further research is the proportion of very fine particles of sediment being carried into the plant by the fresh IJssel Lake water', she says. Like another project involving solar panels, blue energy fits in with the goal of an 'energy-neutral dyke', according to the project manager. A scaled-up version of the test plant could supply the electricity for the lighting along the causeway and for the sluices and buildings.

The blue energy power plant also fits in with another interesting idea: combining the renovation of the Afsluitdijk with the construction

of a so-called fish migration river. After the membranes have exploited the difference between salt water and fresh water in salt concentration, a substantial volume of mixed water, i.e. brackish water, will have to be discharged, and this could play a role in the transition between the salty Waddenzee water and fresh IJssel Lake water.

At present, there is a brief window twice a day, just before the sluice gates open and just before they close, when fish can migrate from the Waddenzee to the IJssel Lake. They then have to undergo a salt-water or fresh-water 'shock' in one go. A permanent opening would make things easier – for example, in the form of an estuary lane straight through the dyke with a gradual transition from salt to fresh water. The idea is that this would connect up to a deep channel in the Waddenzee, the Doove Balg. It also needs to be constructed in such a way that no salt water enters the IJssel Lake.

The suggestion by Wetsus scientists Hamelers and Buisman is that the brackish water produced by the blue energy power plant could be used to attract the fish and serve as a transitional phase for fish swimming from salt to fresh water. The Waddenzee seems the most logical site for this but a location in the fish migration river could be another option.

## 'SMELLING' THE RIVER

That sounds appealing but some important questions still need to be answered, say scientists at the marine research institute IMARES Wageningen UR on the island of Texel. IMARES is one of the initiators of the fish migration river. 'First we would need to know more about the brackish water being discharged', says researcher Martin Baptist, who is also a lecturer at Van Hall Larenstein, part

**'Fish have to be able to  
smell the river from the sea'**

of Wageningen UR. It is important not to filter all the life out of the water if it is to attract spawning fish. 'Fish like the salmon and the Atlantic sturgeon, which need the major rivers for mating, have to be able to 'smell' the river while still in the sea', says Baptist. 'I am in favour of blue energy, but the project requires considerable preliminary purification. Will there still be animal and vegetable plankton and nutrients in the brackish water? And when I hear they may be using chlorine to flush the membranes clean, I want more information first.'

Furthermore, the IMARES researcher points to the massive flow of 400 cubic metres of water being discharged every second by a 200 MW power plant. Such a huge volume of water may not fit with the 'building for nature' concept that the designers of the fish migration river have in mind.

Cees Buisman and Bert Hamelers at Wetsus acknowledge that questions still need to be answered in terms of the ecological effects. 'We may need to mix the brackish water first with untreated salt water and fresh water, so that there are more sediment particles and minerals being discharged into the Waddenzee', says Buisman. Pieter Hack at Redstack agrees that further research is required on both the positive and negative effects on nature. Smart synergy effects between blue energy and nature could prove advantageous for future export opportunities. 'In South Korea, they are looking at the options for building a whole series of Afsluitdijk-like causeways', says Hack. 'What could be better than building blue energy power plants, improving safety and benefiting nature all at the same time? There are huge opportunities there for Dutch universities, engineering consultancy firms and dredging companies.' ■

# Juice keeps two weeks longer

**Hoogesteger is using pulsed electric field technology for its fresh fruit juices. Now this Dutch company can deliver to the wider European market.**

TEXT ASTRID SMIT PHOTOGRAPHY HOOGESTEGER



If people ask me what I do, I always say 'I squeeze oranges', says Michiel van 't Hek, director of juice company Hoogesteger. 'It's really no more than that. Only the scale on which we do our squeezing makes our job more complex.'

Every year, the Zwanenburg company produces 17 million litres of juice, 60 percent of which is orange juice and 40 percent other juices. Many producers have the fruit pressed in the country where it is harvested, ship the concentrate to the Netherlands and add water there. Not Hoogesteger though. This company ships the fruit to the Netherlands and makes juice from it without adding anything or pasteurizing it. 'That's why our fruit juices taste much more lively', says Van 't Hek. But there is a downside to this approach – the fresh juice has a shelf life of only eight days. That's enough for the Dutch market but not if you want to deliver to other countries. 'Hardly any supermarkets sell fresh juice in the countries around us so there is a real gap in the market for us to exploit', says Van 't Hek. But that would require Hoogesteger to extend the shelf life of its juices. So the company approached Wageningen UR

Food & Biobased Research, which already had experience with the application of pulsed electric field (PEF) technology. PEF involves exposing food to brief electric pulses. The pulses do not kill the microbes but they do knock them out for a while. 'We wanted to know whether this technology was suitable for fresh juice. Are the bacteria "switched off" for long enough and do the nutritional value, vitamins, flavour and aroma remain reasonably intact?' explains Van 't Hek. The researchers were able to demonstrate that this is indeed the case: the processed juice has a shelf life of 21 days.

The researchers also helped Hoogesteger incorporate the technology into its production process. 'We worked out how to scale it up from lab to factory and coordinated the exercise', says Marjolein van der Glas, business development manager at Food & Biobased Research.

Hoogesteger has been using the PEF technology since November 2011. Van 't Hek: 'We mainly use PEF for fruit juices destined for the Dutch catering sector but we also now supply several supermarkets in Germany and Belgium.' ■



**‘We now supply  
several supermarkets  
in Germany’**







# Food science confuses general public

**Food scientists should only publicize results showing a relationship between nutrition and health if they are able to come up with a plausible biological mechanism, said Sander Kersten in his inaugural lecture on 10 May.**

**Otherwise, thinks the professor of Molecular Nutrition, scientists only confuse the general public and undermine the credibility of food science. The Dutch consumers' association agrees, but others think this is going too far.**

TEXT ASTRID SMIT ILLUSTRATION IEN VAN LAANEN PHOTOGRAPHY GUY ACKERMANS



**SANDER KERSTEN**  
Professor of Molecular Nutrition at  
Wageningen University

**I** put forward this proposition because I'm concerned about the reputation of food science. We are being inundated with conflicting reports about nutrition and health; this confuses the general public and reflects poorly on food science. First they say vitamin E is good for you, then a few years later it isn't, or only in certain cases. That's what happened with folic acid and beta-carotene too, so which compounds will be next? We are constantly revising earlier conclusions about links between nutrition and health. As food scientists we are fine with this – such revisions are part and parcel of “new insights” – but the general public doesn't see it that way. It also irritates scientists in other fields and science journalists. Sometimes I even suspect a degree of con-

tempt. You can hear them thinking, “There they go again with their quick and dirty studies”. An American university recently made the news with a report that people who eat loads of chocolate are thinner on average than people who eat little chocolate. The story was picked up by a lot of media companies but there was no explanation at all of why you might get that result. Personally, I don't think they should seek publicity for a story like that. I think food scientists should only approach the media if multiple studies demonstrate a specific relationship between nutrition and health and if they have a clear idea of the biological mechanism causing it. That takes time, but only then do you have genuine news to report, news that will prove lasting.’ >





**SANDRA DE JONG**  
Consumers' Association  
information officer

**‘W**e agree. We are currently working on a campaign about salt because people consume too much of it in their daily diet. Scientists agree that you shouldn’t consume more than six grams of salt as more than that is bad for your cardiovascular system. At least, that’s what we thought. But recently Belgian scientists published a paper in the *Journal of the American Medical Association* saying a reduction in salt doesn’t help prevent health problems. This is very confusing for consumers and leaves us having to put in a huge amount of effort to maintain the credibility of our “eat less salt” message. It turned out afterwards that the study had a lot of holes and that the scientists had given the impression their conclusions were much firmer than was actually the case. But it’s not just scientists who create confusion by seeking publicity too soon whenever they find a relationship; journalists, press spokesmen and the food industry are also guilty. The industry is constantly making claims for links between food and health. Fortunately, as of two years ago the European Commission has been scrupulously testing the basis for these claims. Last spring, they only approved 222 of the more than 4000 nutritional claims. We don’t know who is responsible for most confusion among consumers but it would be good if scientists could set an example by only publicizing links between nutrition and health if there is sound supporting evidence.’

‘The credibility of food science has fallen virtually to zero’







### PHILIP DEN OUDEN

Director of the FNLI (Federation of the Dutch food industry)



### HANS VAN MAANEN

Science journalist and the man who writes the *Twijfel* (doubt) column in the *Volkskrant* newspaper



### DAAN KROMHOUT

Professor of Public Health Research, Wageningen University

**I** agree with Kersten that food scientists shouldn't publicize any old correlation between nutrition and health. They should have a kind of disclaimer with accountability information about the relationship: the possible causes and what exactly the research results mean for consumers. But I think it's going too far to say that food scientists need to wait first until they have found a biological explanation for a link between food and health. Incidentally, it should be noted that food scientists are not the only people who need to be more careful in broadcasting research results. The same also applies to information officers, the media and the food industry. Manufacturers are bound by strict rules set by the European Commission. Those rules are so stringent that they have less freedom than scientists in what they can say about links between food and health. A company that has interesting research results for its consumers can hardly report anything on its website or its products, which is a pity. But it is true that in the past manufacturers did sometimes test the permissible limits in the health claims on their products.'

**W**ith Kersten's diagnosis I agree; the credibility of food science has fallen virtually to zero. But I disagree with the treatment he is prescribing. His solution – only publicizing robust results – sounds good but I don't think it's feasible. Once a science journal has published a paper, that information is out in the open. And who is going to decide what is a provisional result and when we can report the definitive outcome? I think the problem really lies more in the poor quality of a lot of research. Food scientists sometimes try and get in the news by going on "fishing expeditions": they take a big database and look for relationships between X and Y without having an initial hypothesis or ideas about an underlying biological mechanism. I think they can stop now with such random searches. I also feel food scientists – and information officers – should be more open about the size of the risk or health benefit for consumers. For instance, red meat has been linked to cancer and mortality and the newspaper headlines told us the risk of dying early is 13 percent, echoing the researchers. But if you look at the absolute numbers, they are talking about a tiny increase in the individual risk, from 11 per 1000 to 14 per 1000 in a given year for men. If you present the findings that way, everyone will soon see how futile it all is – and then perhaps it won't make the news anyway.'

**I**'m sympathetic to Kersten's point of view but I find his solution impracticable. It often takes years before you can find reliable proof of a biological mechanism explaining a link between food and health. Should food scientists wait all that time before publicizing their research results? If so, they'll be waiting till the cows come home. It is an epidemiologist's task to find links – on the basis of a hypothesis – and then look for the underlying biological mechanism. Sometimes you end up qualifying a link you found earlier or having to revise it completely, but that's inherent in the dynamic scientific process. I don't think this is damaging the reputation of food science. We have to learn to live with the fact that our research results will always be in the spotlight and the subject of debates as that is in the nature of nutrition – it's a topic everyone reckons they know something about, just like football. What we food scientists need to do more is place our research results in a broader context and put them in perspective. Often people zoom in on specific results and we get a hype around a single product or ingredient. One moment it's tomatoes, the next it's raspberries, chocolate or green tea. This might be a boring message but people will be fine as long as they keep to the general dietary guidelines. You won't get any healthier by eating kilos of raspberries or tomatoes a week.' ■

SYSTEM OF RICE INTENSIFICATION

# Sowing less to reap more?

**An alternative cultivation method said to result in spectacular increases in rice yields is enjoying great popularity, but some people have their doubts about this miracle method. ‘Scientific studies of the actual effects are lagging far behind the spread in its application’, concludes a Wageningen researcher. TEXT LEX VELDHOEN PHOTOGRAPHY HARRO MAAT**



A Wageningen University PhD researcher studies rice cultivation methods in Uttarakhand, India.



**S**hankaran Pillai, standing in his paddy field in Kerala, one of India's largest states, is quite happy to give a quick demo of his cono weeder. 'It's a simple machine for getting rid of weeds', explains Pillai as he pushes the weeder between the rows of rice plants like some kind of slim lawnmower. 'I can use the weeder here because there's a lot of space between the plants. The flat metal piece at the front keeps the weeder on course and stops it sinking into the wet soil. The two conical rotors behind it uproot the weeds and bury them under the ground.'

Pillai grows his rice according to the SRI method: *Système de Riziculture Intensive* or *System of Rice Intensification*. In his farmyard, located higher up, he shows a roller made from reinforced metal with a handle – a simple device manufactured using local materials. Pillai uses the roller to map out a pattern of squares with holes in the damp soil. This enables him to plant the fresh, green seedlings at just the right distance

from each other as prescribed by the SRI method. The effectiveness of the SRI method of cultivation is disputed. While spectacular claims are made about the rise in rice yields, in practice it is almost impossible to get a clear-cut picture of its impact because of the confounding effect of numerous local cultivation and agro-sociological factors. Assistant professor Harro Maat of the Technology and Agrarian Development group at Wageningen University, part of Wageningen UR, coordinates a research programme aimed at studying the variation in factors playing a role in different parts of India.

He says SRI is still seen as contentious, both internationally in academic circles and locally: 'Scientific studies of the actual effects are lagging far behind the spread in its application; there has been hardly any investigation of the claims, which are mostly based on observation and hearsay', says Maat.

He says that many rice experts are sceptical, includ- ➤





ing the people at the International Rice Research Institute in Manila. The driving force behind the global promotion of SRI is Professor Norman Uphoff at Cornell University. He has been spreading the SRI gospel around the world. Uphoff claims that there are research results showing 50 to 100 percent higher yields, substantial reductions in the number of seeds required and a halving in the amount of water needed.

### DELAY IN SOWING

SRI was developed in the 1980s by the French Jesuit missionary and agricultural specialist Henri de Laulanie. In 1982 he set up a training centre in rural Madagascar. The late arrival of the monsoon led to the ‘chance discovery’ of SRI as sowing was delayed. De Laulanie and his students still wanted to harvest on time so they transplanted the seedlings earlier, after 15

‘There are so many SRI variants that it’s not easy to decide what you can still call SRI’

days rather than the customary 25 to 30 days. Those plants grew much better and gave bigger yields. De Laulanie had already noticed that some farmers planted their seedlings out as separate plants rather than in clumps together. Moreover, it turned out that seedlings planted at a fixed distance of 25 centimetres from each other formed more side shoots so that they still filled the field. There were positive side effects too as this approach enabled mechanical weeding, prevented moulds and other diseases taking hold and let the roots get more oxygen, while the hoed crop could be turned into humus. De Laulanie also advised adding more compost to the soil.

One of the most far-reaching changes in SRI is the reduced use of irrigation. De Laulanie was convinced rice plants were not actually water plants at all. He thought that while they could cope with being submerged in water, it also had negative consequences for produc-

tion levels. De Laulanie saw how some farmers in Madagascar got good results by letting their paddy fields dry out at regular intervals during the growing season.

After De Laulanie’s death in 1995, SRI was refined further by his successors. From 2000 onwards this method of cultivation spread to other rice-producing countries, including India.

Harro Maat says it is not easy to assess the performance of the SRI method. He heads the four-year research programme *The System of Rice Intensification (SRI)* as a socio-economic and technical movement in India. The interdisciplinary programme is funded by the Netherlands Organization for Scientific Research and is due to run until 2014. The participants wish to consider SRI in India from a range of different perspectives, looking at the social and economic processes that play a role in SRI, the relevant cultivation techniques and how these different factors interrelate. An underlying objective is to get a better understanding of grassroots innovation, i.e. innovation that is driven by practice.

‘The aim is to survey the different versions of SRI used by farmers and its application in different regions. Four Wageningen PhD students from India are working in these regions on the research programme. A partner at the Xavier Institute of Management in Bhubaneswar is responsible for the coordination in India.

It is difficult to get unambiguous confirmation of SRI’s positive impact on yields, says Maat. ‘SRI reports often only consider one season so yields could just be higher then due to random chance. Lots of factors play a part, such as nutrients, water or soil conditions, but things like an extra round of weeding, greater distance between the plants or transplanting earlier can also increase yields.’

### MANY VARIANTS

One problem the study is encountering according to Maat is the huge geographical variation in the way SRI is applied. ‘For instance, farmers in southern India often plant in rows rather than squares because they are used to that and find it easier. Another local aspect is how they alternate between wet and dry. You can only do that if you have well-irrigated fields and a sufficient supply of water.’ Furthermore, farmers in India and China often skip the weeding process because of the high labour costs, says the researcher. ‘There are so many variants in how SRI is applied that it’s not easy to decide when you can still call a particular cultivation method SRI.’

Besides technical aspects of cultivation, socio-cultural

## THE FIVE BASIC ELEMENTS OF SRI



Earlier transplantation



Lattice planting pattern



Less irrigation



Weeding



Composting

factors play a part in the introduction of SRI as well. Maat: 'Farmers are not a clean slate; they are already experts in their subject. So any improvements have to fit with their options in terms of the environment, soil conditions, labour conditions and innovation risks. One of our doctoral students in India is studying the role of changes in working practices. For instance, the weeders are quite heavy to operate. As a result, it is increasingly the men who do the weeding instead of the women, as in the past. This leads to shifts in the distribution of tasks, gender roles and the organization of work.'

The political context can also have an effect. 'It's not unusual in India for the state to give farmers grants for promoting innovations like SRI. But they hardly ever check whether the farmers are actually using the SRI method', says Maat. 'On top of that, bureaucracy and corruption are widespread problems in India. Farmers in some areas have an aversion to state interference because of bad experiences in the past, for example where they have been promised grants but not been paid.' International donors are often interested in specific aspects such as saving on water consumption, explains the Wageningen researcher. 'That then becomes the basis for funding a particular project rather the general aim of generating bigger yields. We are seeing an inter-

national trend towards lower consumption of water and artificial fertilizer because of climate problems, and SRI scores well on these counts. At present an estimated 5 to 10 percent of paddy fields are farmed according to the SRI method, mainly in Asia.'

### INNOVATION AT FIELD LEVEL

Maat sees SRI's key benefit as the fact that more attention is being given to innovation at the field level and that more tailored solutions are being introduced. 'For instance, I saw in China how farmers are focusing on planting machines to save on labour. Those machines work better with young, smaller plants, and this fits with the SRI approach. If the resulting yield is higher, that aspect of SRI has helped achieve a harvest they would not otherwise have got.'

Maat does not believe in simple solutions: 'The Green Revolution was another one of those generic approaches. It did have some effect but it didn't bring an end to poverty or hunger. If you look at all the statistics, you can't conclude that SRI produces higher yields. Claims made by researchers like Uphoff of massive increases in yields only apply, for instance, to farmers who put a lot of effort into their crops. We can't yet see SRI as a blanket solution, profitable under any conditions. We need much more research first.' ■

# Tomato genes are valuable

**The tomato genome has now been mapped. Plant breeders can use that gene map as a guide in their search for genes that will make tomatoes tastier, more attractive and less susceptible to disease.**

**TEXT** NIENKE BEINTEMA **PHOTOGRAPHY** AGE







**T**hree hundred researchers in fourteen different countries have been working on it for nine years – but now they have it: a detailed description of the tomato's DNA. Last May, the tomato genome was published in the scientific journal *Nature*.

Tomatoes are not the first vegetable to be sequenced, as scientists had already mapped the sequence of genes for Chinese cabbage, cucumbers and soya. But René Klein Lankhorst of Plant Research International, part of Wageningen UR, says the sequencing of the tomato genome is the most important result so far. 'Tomatoes are one of the major vegetable crops around the world: they constitute a key source of vitamin C in people's diet. Tomatoes also constitute the biggest vegetable export in the Netherlands. The export of tomatoes and tomato

seed is worth hundreds of millions of euros every year.'

There is another reason why the tomato genome is so special, continues Klein Lankhorst. 'I am prepared to claim that this is one of the three best plant genome descriptions so far in terms of quality. Many sequenced genomes still have gaps but the tomato has far fewer of these than the average genome.' Several Dutch partners worked on this endeavour, including biotech company Keygene, Plant Research International and two groups at Wageningen University (part of Wageningen UR) – the Genetics Laboratory and the Plant Breeding group. Klein Lankhorst says that Wageningen UR as a whole played a relatively major role. 'We provided the information technology required to fit the genome pieces together', he explains. 'The tomato genome consists >

of about 35,000 genes and a total of more than 800 million base pairs. Sequencing produces fragments, each of which contains 50 to 2000 base pairs. These fragments may be repeated a thousand times. Putting the fragments in the right order is like trying to do a jigsaw puzzle with billions of pieces.'

So how do you fit the pieces of the puzzle together? Klein Lankhorst explains that the fragments overlap to a certain extent. The Wageningen bioinformatics scientists developed software that lets you identify the overlapping bits and then slot the fragments together like roof tiles. That is no easy task, says the researcher. 'This is highly sophisticated information technology. And you need pretty heavy-duty computers for this with enormous computational power.'

### MASS OF LETTERS FOR GENETICISTS

Once you have the sequence of base pairs, the geneticists can get down to work. They want to know which genes are behind the mass of letters. But how do you know where one gene ends and the next begins? 'We have known for a while more or less what genes look like', explains Klein Lankhorst. 'They all have the same setup, broadly speaking. For example, they all start with exactly the same three-letter code. If you use a computer to search for that, then you know which genes are in the genome.' But of course you still don't know what the genes mean, or in other words what characteristics they encode. 'Fortunately we didn't have to start from scratch', says the Wageningen researcher. 'We could build on existing knowledge about the genes of plants, animals and micro-organisms. They often have very similar or identical genes for a lot of processes. That knowledge has been collected in databases that are easy to search.'

This enabled the consortium find out the function of no less than 70 percent of the tomato's genes – roughly speaking, that is. In many cases, the researchers still have to check that gene X does indeed have the same function in tomatoes as in other organisms with the

same gene. And of course they also want to find out what purpose is served by the remaining 30 percent of tomato genes (which is still about 10 thousand genes). Both tasks involve them donning their lab coats.

'Finding out what function genes have requires a large amount of meticulous work', says Klein Lankhorst. 'You have to remove genes, or add them, or introduce them into another plant, and see what effect that has.'

Fortunately the researchers often know where to start, thanks the gene databases. 'For example, genes in different plants relating to resistance to diseases have a lot in common. If you come across one of those resistance genes, it is simply a question of figuring out which disease the gene protects the plant from.'

Plant breeding companies can also work in the reverse direction, taking the deciphered tomato genome and looking specifically for genes that code for resistance to a certain disease, or indeed a wide range of other properties such as colour, aroma, flavour and size. Because that is ultimately what this project is about, says Klein Lankhorst. 'Of course, as geneticists and biologists we are very curious to see how the genome is composed but the idea in the end is obviously to put that knowledge to practical use. It is up to the plant breeders now. They can decide which properties they want to start working on. They understand how markets are changing and what consumers want.'

### LARGE AND SWEET

The average tomato on display in supermarkets is the result of years of sophisticated breeding programmes, but there is still plenty of room for improvement. 'Plant breeders are particularly interested in the relationship between size and taste', says Klein Lankhorst. 'Larger tomatoes are generally not so sweet. Companies want to develop tomatoes that are large but still as sweet as a cherry tomato, preferably in a variety of colours such as bright red and bright yellow. Because that is what consumers want.' Another priority for consumers is to have tomatoes that are as healthy as possible. That is why plant breeders are also experimenting with properties such as the amount of vitamin C and anti-oxidants.

There are also properties that are interesting for the market gardeners who grow the tomatoes; they want



**'Finding out what functions genes have, is meticulous work'**

varieties that need less water and energy and can cope with hot weather and disease. Finally, there are the properties retailers focus on, such as how tomatoes behave during transportation. Do they stay nice and smooth or do they end up bruised and wrinkled in the supermarket? And how long does it take before they go mouldy? All in all, plant breeding is a question of looking for the best compromise between all those competing requirements.

The breeding process is essentially the same today as it was centuries ago. You cross promising varieties in countless different combinations, then select the offspring that have the best results in terms of the desired properties. You then selectively cross the offspring until you are satisfied with the outcome. That sounds easier than it is: each cross also produces unwanted properties that you need to eliminate by means of more crosses. All in all, it takes generations of plants before you have a tomato variety that really is that little bit better.

Having the gene map will make this work a lot easier.

From now on, plant breeding companies will be able to zoom in on the genes they want to keep – or eliminate – much more quickly. It will be simpler for them to determine which bit of DNA was passed on in a particular cross and to select specific parts of the genome where several desirable properties are encoded close together. Klein Lankhorst: 'I am expecting the development of new tomato varieties to take just a few years now instead of decades. If you compare the DNA with Europe's road

network, it's as if plant breeders now have a sophisticated satnav that knows every single street, whereas they used to have to work from a map left over from the Roman Empire.'

### OLD VARIETIES

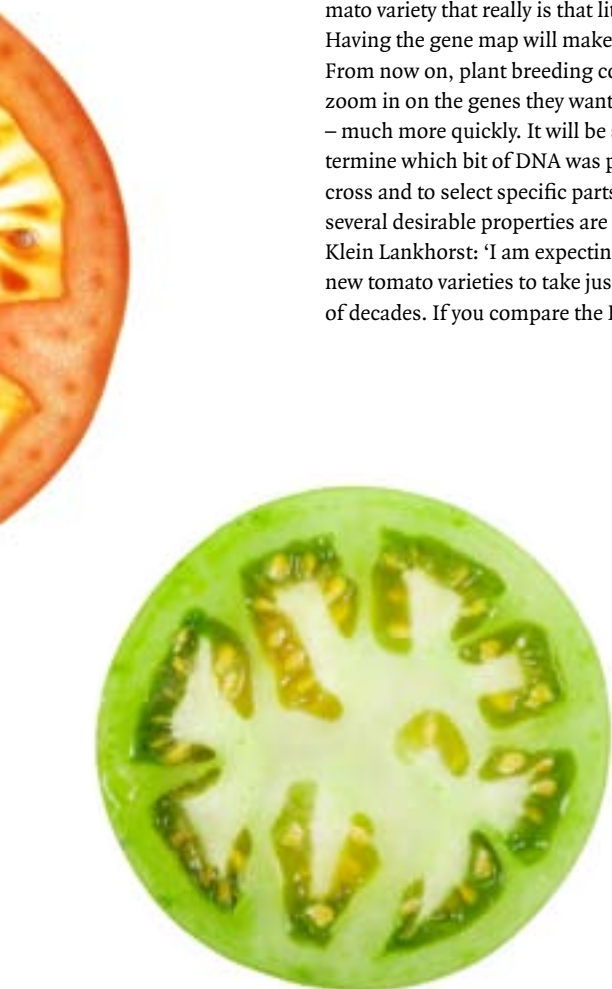
According to Klein Lankhorst, plant breeding companies will now also be able to work further on vegetables closely related to the tomato such as potatoes, bell peppers and aubergines. The Wageningen scientists have plans too. The Plant Breeding science group and the Bioinformatics cluster at Plant Research International will be playing a leading part in the follow-up project over the next few years, together with partners in China. The institutes will be collaborating on mapping the genome of 150 other tomato varieties, including a number of old varieties. They may well have useful properties that have been lost in the breeding process over the past few centuries. 'If you know what genes these are and what properties they represent', says Klein Lankhorst, 'then it is a relatively simple task to cross those useful properties back into modern tomato varieties.' Unravelling the first tomato genome took nearly a decade, so is it not rather overambitious to try and sequence 150 tomato varieties? 'No', says Klein Lankhorst firmly. 'Most of the work has been done now that we have sequenced the first tomato; we just have to focus on relatively minor differences in certain gene areas. Besides, there have been spectacular improvements in the technology over the past few years. What used to take a couple of years can now be done in a month.' ■



PHOTO BART DE GOUW

### RENÉ KLEIN LANKHORST, Plant Research International

'The ball is in the breeders' court now. They can decide which characteristics they want to work on.'





# Going with the flow of the air pollution

**Last spring, a zeppelin crossed Europe loaded with measurement equipment. Environmental scientists were using it to track chemical reactions in the polluted air.** TEXT RENÉ DIDDE PHOTOGRAPHY ANP

Professor Maarten Krol normally suffers from vertigo but he had no problems at all on board the zeppelin being used for environmental science studies over the past few months. 'It was very relaxed, you feel safe and you can even open a window if you want. Of course the views are fantastic', says the professor of Air Quality and Atmospheric Chemistry at Wageningen University, part of Wageningen UR.

The helium-filled zeppelin spent the late spring and summer flying over Germany, the Netherlands and Italy to measure air samples for the PEGASOS measurement campaign. The name is more than just the original Greek form of Pegasus, the mythological winged horse: it is also a rather complicated acronym for the Pan-European Gas-AeroSOL-climate interaction Study, a collaborative venture involving 26 partners in 15 European countries.

'The aim of this long-term European research programme is to get a better understanding of the complex interactions between air pollution and climate change', explains Krol, who is taking part in the measurement campaign on behalf of Wageningen University. Also taking part in the study are researchers from the Royal Netherlands Meteorological Institute, the National Institute of Public Health and the Environment, ECN (the Dutch

institute for energy innovation), TNO (the Dutch organization for applied scientific research) and Utrecht University. Scientists wanting to unravel the relationship between the climate and air pollution need a better understanding of the chemical processes taking place in polluted air. What happens, for example, when the west wind blows it from the Rhine mouth region around Rotterdam across the rest of the Netherlands?

## BLOWING UP METHANE

'The problem is that polluting compounds are involved in a variety of reactions, some of which are damaging and some of which have a positive effect on the climate', says Krol. For example, ozone in the air can lead to complex reactions in which very short-lived free radicals are created that blow up the very strong greenhouse gas methane.

Ammonia, which is released into the air from the manure of pigs and poultry, has a highly acidifying effect. 'But it also creates fine particles if it reacts with nitrogen oxides in the atmosphere', says Maarten Krol. 'Then you get ammonium nitrate particles that reflect sunlight. That means they have a cooling effect and could counteract global warming.' Usually studies of air pollution in the atmosphere involve measurements close to ground level or from the Dutch Meteorological

Institute's two-hundred-metre mast in Cabauw. Satellite measurements from space are also becoming increasingly important. 'This all gives us a good picture but it is rather static', says Krol. 'The great thing about the zeppelin is that it helps us fill the "gaps"'. The zeppelin flies at a nice slow pace at any height you like up to about 2,000 metres. You can also fit an awful lot of measuring equipment into it. 'We can use the zeppelin to follow the air pollution on its travels, as it were, and track the various reactions', explains Krol.

## OVER LAND AND SEA

Those travels can be in both the vertical direction and the horizontal direction, as Krol recalls from the perfect Saturday in the Whitsun weekend. 'We started in the zeppelin in the early morning, with hardly any wind, monitoring reactions at a height of fifty metres. Then we climbed to a height of five hundred metres within fifteen minutes to see how the particles behaved in this much colder stratum. After that measurement, we went back down to a height of fifty metres to look at the effect the air was having on the chemical reactions now that it had warmed up a bit.' Earlier that week the scientists had followed a plume of pollution being blown from the Rhine mouth region out to sea by a calm easterly wind. 'We

were able to follow the chemical reactions above land first and then above the much colder surface of the sea.' The researchers were also able to track the pollution caused by a large ship by flying directly above it and mapping the emissions in real time. Thanks to the zeppelin, the researchers expect to be able to fill many gaps in their knowledge about the complex interplay between air pollution and weather conditions.


They hope this new knowledge will let them improve climate and air pollution models so that policymakers and politicians will eventually have a more secure basis for choosing which measures to take.

Next year, the zeppelin will be put to work for another purpose. 'In 2013 we are going to be flying over the forests of Finland', says Krol, 'as we want to gain a better understanding of reactions in clean air.' ■

**'The zeppelin flies at a nice slow pace at any height you like'**



The PEGASOS project zeppelin flying over Rotterdam.



PLAN TO IMPROVE WATER QUALITY BY PROCESSING MANURE

# Manure and the water supply



The quality of the water in the Netherlands needs improving, says the EU. The country has been working for decades on reducing the runoff of minerals from manure into the groundwater. With too little effect in recent years. It is time to change course: farmers are being asked to process more of their manure.

TEXT GEERT VAN DUINHOVEN PHOTOGRAPHY RUBEN SMIT

ILLUSTRATION KAY COENEN

**T**his year the Netherlands will be resuming consultations with the European Commission about the Nitrate Directive. This set of EU guidelines was drawn up in an attempt to reduce water pollution from nitrates. Every four years the member states are required to present a plan of action outlining what they are going to do to bring down the nitrate concentrations in their water.

Pollution with nitrate can have a serious negative impact on the quality of drinking water. The main source of nitrates in drinking water is the runoff of nitrogen compounds from manure or artificial fertilizer. Phosphate ends up in the water from the same source. Both substances disturb the organic balance of the water.

The problem is that nitrogen and phosphate are both indispensable nutrients for agricultural crops. They only become problem substances when applied to the land in the form of fertilizer in larger quantities than the crop can absorb. Because the Netherlands adds more of these minerals to the land, through animal feeds and artificial fertilizers, than it extracts in the form of crops and animal products, the country has suffered from an overload of manure and minerals ever since the 1960s. With runoff of nitrogen and phosphates into the groundwater and the soil as a result. The government has been working on the problem since the 1980s.

A key question on the agenda for the coming talks in Brussels concerns the approach taken in recent years: has the Netherlands made enough progress?

### EFFECTS OF THE MANURE POLICY

Researchers at Alterra Wageningen UR, Deltares, LEI Wageningen UR, RIVM and the Spatial Planning Bureau completed a number of studies this year on the effects of the manure policy in the Netherlands for the Evaluation of the Manure Law 2012 by the Ministry of Economic Affairs, Agriculture and Innovation (EL&I). These studies indicated that the water quality had improved over the last few decades but that the rate of improvement has slackened since 2006, whereas the targets have not been achieved everywhere. For instance, concentrations in about half the locations assessed in the Netherlands were still above the norm, and there are big differences between the various regions (see infographic) and between different types of farm.

Among the scientists from Alterra investigating water quality in relation to the manure policy were Frank van der Bolt and Piet Groenendijk. Van der Bolt: 'The manure policy contributed to improving water quality in the period 1990 to 2006 especially. This is mainly because farmers started spreading manure more evenly over the country. Intensive livestock farmers brought their ex-

cess manure to arable areas in the north and west of the Netherlands. In the preceding years, the manure was simply spread on their own fields or other local ones, leading to massive environmental pollution in areas which produced a lot of manure.'

Groenendijk: 'The fact that water quality has hardly improved since 2006 is related to the build-up of phosphate and nitrogen compounds in the soils as a result of past fertilization. These build-ups affect the quality of the surface water of the surface water due to run-off, and they will go on doing so for the decades ahead of us too. But the fact remains that peak pollution levels of the surface water have come down considerably. And those are critical junctures for the ecosystem.'

### LOWER CROP YIELDS

A lay person could be forgiven for thinking that all you have to do to achieve the environmental objectives is to apply less fertilizer, at least in areas where there are already a lot of minerals in the soils making their way towards the groundwater. Groenendijk: 'But at some point you will end up with fertilization levels that give you lower crop yields. Up to now, the manure policy has not affected crop yields but there is a real risk that it will if you move towards a level of fertilization that does not harm the environment at all.'

Wageningen UR was asked by the former



Frank van der Bolt,  
researcher at Alterra  
Wageningen UR



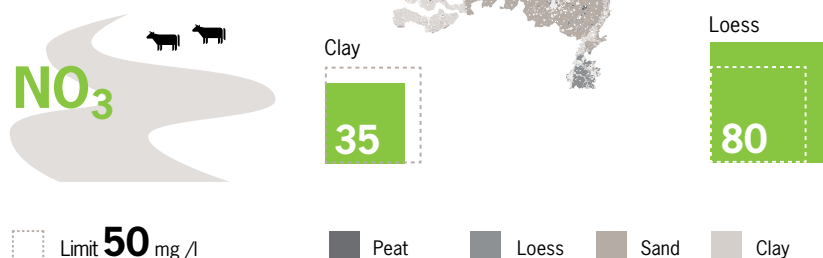
Fridtjof de Buissonjé,  
researcher at Wageningen UR  
Livestock Research

**'Build-ups in  
the soil go on  
affecting the  
water quality'**

## NITRATE STANDARDS

Groundwater is allowed to contain a maximum of 50 milligrams of nitrate per litre.

In clay and peaty soil areas average nitrate levels are within this limit; in sandy and loess soil areas they exceed it.



ministry of Agriculture in 2009 to research the technical options for solving the manure surplus. Research topics include the scope for optimizing the composition of feeds so that the animals can absorb nitrogen and phosphate much more efficiently, and smaller amounts of these minerals go to waste, ending up in the manure. Another focus is the possibilities for using the manure more sparingly and efficiently, for example by separating the solids from the liquids so that farmers can dose the fertilizer better. A third avenue of enquiry is the manure processing, forming it into pellets for export for example, or extracting minerals such as phosphate from it. Technically speaking, there seems to be plenty of scope here, but it is not always clear what should be done with the end product. Van der Bolt: 'Sorting manure into solids and liquids seems promising, for example, but we do not know whether and how you can go about this on a farm, not what the environmental impact will be.'

## GLASS HALF FULL

A key question is how livestock farmers themselves see the manure issue. Is the cur-

rent situation, with targets reached at half the locations where measurements are taken, a half-full or a half-empty glass? Mark Heijmans of farmers' organization LTO Nederland is quite clear about it. As far as he's concerned, the glass is half full and the last few decades have proven that efforts in the sector have borne fruit. 'Of course we are not there yet, but at some point you have to ask yourself whether a sector can do any more. Perhaps we should now talk about the question of how much crop farming contributes to nitrate pollution of the highest groundwater, and the question of whether the right measures are being put in place. Apparently these measures are less effective than expected; otherwise we would be a lot further with limiting the environmental damage. Perhaps the talks in Brussels should address the question of whether you should have the same nitrate standards throughout Europe.'

LTO has drawn up a seven-point plan for the minister to take into the negotiations about implementing the Nitrate Directive. Some of the LTO's points for action come down to giving individual arable farmers more space

and more responsibility, and some of them call for a different way of looking at the issue of manure.

The price of fertilizer ingredients is going up all the time, which will cause farmers to use them more sparingly. 'What is more, scientific knowledge will enable them to dose the fertilizer better and better according to the specific needs of plants on a particular type of soil. That, together with new codes of practice for agriculture, should make it possible to cut eutrophication further and improve water quality to the maximum possible.', says Heijmans.

## COMPULSORY MANURE PROCESSING

A second line of attack that the LTO considers promising is manure processing. This is entirely in line with the new manure policy proposed by outgoing state secretary Henk Bleker of EL&I, which he presented on 13 June. The crucial element of this policy is compulsory manure processing: from now on crop farmers are obliged to process a certain percentage of manure – which varies per region – into new products such as mineral concentrates. Research going on for some years in Wageningen UR has revealed that technically sound products can be made that contain either concentrated phosphate or concentrated nitrogen. As an example, Kumac, a company in Deurne that is participating in the Mineral Concentrate Pilot Project supported by the ministry of >



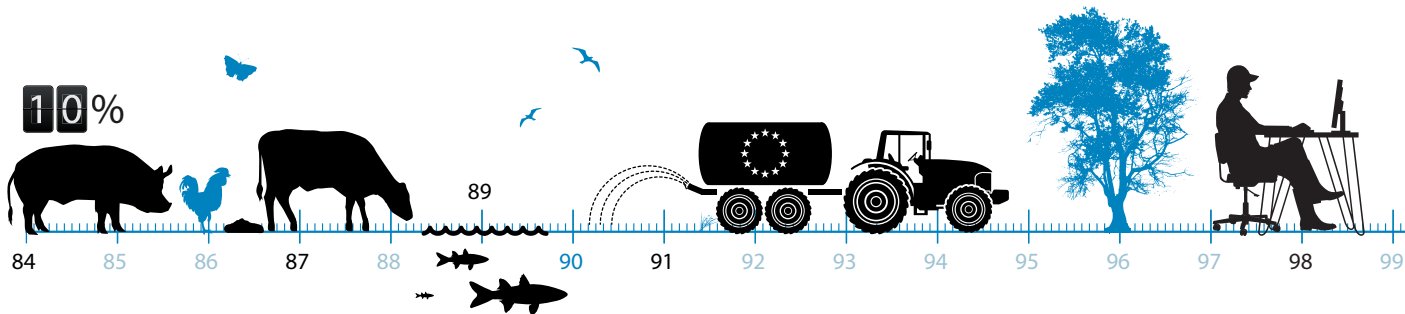
Piet Groenendijk, researcher at Alterra Wageningen UR

PHOTOS GUY ACKERMANS



## MANURE POLICY SINCE THE NINETEEN EIGHTIES

The Dutch manure policy goes back to the nineteen eighties, when the falling quality of surface water and groundwater and pressure from the nature and environmental movements forced the government to take steps.



### 1984

An **interim law limiting pig and poultry farms** prohibits the establishment of new pig or poultry farms. Existing farms in high concentration areas are not allowed to expand production by more than 10 percent. The milk quota is also introduced in 1984, imposing limits on the growth of dairy herds.

### 1987-1997

The **Soil Protection Law**, the **Manure Law** and the **Resolution on the Use of Animal Manure** aim at regulating the production of manure as well as its use on arable land.

### 1989

When the first **Environment Policy Plan** comes out, the debate gets tougher. It is increasingly clear that water quality is worsening.

### 1991

The **European Nitrate Standard** is introduced, based on a nitrate level of maximum 50 mg per litre.

### 1998

The **MINAS book-keeping system** comes into play, and gives prominence to standards for run-off: only so much phosphate and nitrate is to be allowed to leave the farm through the soil. Farmers are now required to measure exactly how much phosphate and nitrogen comes in and out of the farm. A fine is imposed on anyone exceeding the norms.



Mark Heijmans,  
LTO Netherlands

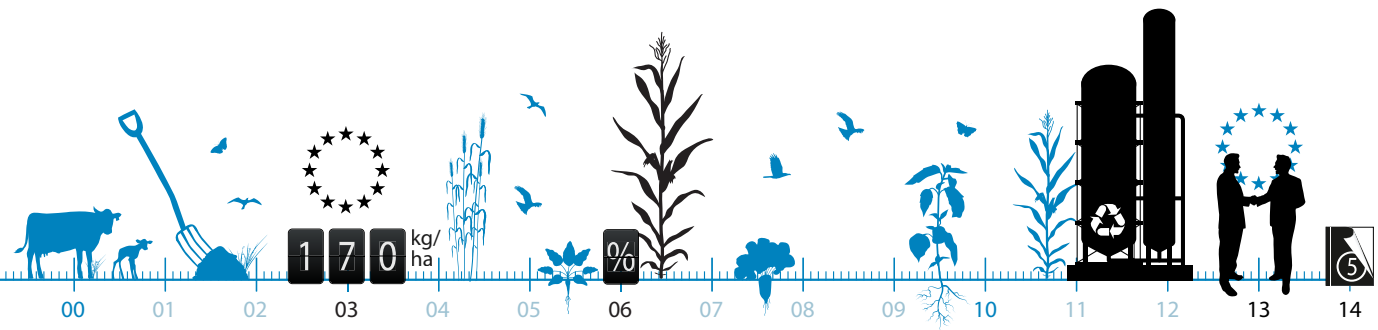
EL&I, is already making three products from animal manure, one of them being Fertex, made from the solids, which contain a lot of organic matter and phosphate and can be sold to crop farmers or exported. The liquids are purified by reverse osmosis into water pure enough to be discharged. This reverse osmosis also produces the mineral concentrate Fertraat, made up largely of nitrogen and potash. This concentrate has been provisionally accepted by the European Commission for use as artificial fertilizer.

### PRICE OF FERTILIZER

The question is, however, whether there is a market for the products of manure processing on a large scale. And will farmers really

deliver their manure to the processors or is it cheaper for them just to supply it directly to the crop farmers? Bleker is quite clear on this point in his letter to the Lower House of the Dutch parliament: 'We expect the demand for food to go up in the coming decades, with the result that the demand for and price of fertilizers will rise sharply too. Under these circumstances, farmers will be forced to use nutrients more efficiently. The same goes for animal manure. And if farmers are not stimulated by scarcity and higher prizes to use fertilizers more efficiently, they will increasingly often be asked by parties in the chain to adopt a more sustainable approach to manure and manure processing. The higher prices we are expecting will stimulate

## ‘Apparently the measures are less effective than expected’



### 2003

The European Court condemns the Netherlands for failing to comply with the nitrate directive, particularly for not meeting the hard **maximum load** of 170 mg of nitrogen per hectare.

### 2006

The Netherlands introduces a new **standards system** in which the norm is no longer fixed according to the runoff but according to the amount of nitrogen and phosphate in fertilizer needed for the crops. If a crop can absorb a large amount of nitrogen and phosphate, the farmer is allowed to spread larger amounts on that plot of land.

### 2013

The European Commission and the Netherlands will **negotiate** on the steps taken by the Netherlands and the plans for the near future aimed at meeting the targets of the Nitrate Directive. The permissible doses for the various crops will also be established.

### 2014

The **Fifth Nitrate Directive Action Programme** comes into force and runs until 2017.

investments in technology that will make it possible to meet a widespread demand for fertilizer ingredients. And then animal manure will be nothing but a valuable resource, as a byproduct of animal husbandry.'

#### MARKET FOR FERTILIZER

Yet this optimism about manure processing has yet to catch on at present. LEI Wageningen UR showed in its contribution to the evaluation of the Manure Law 2012 that exports of both processed and unprocessed manure products to Germany have shrunk over recent years due to stricter import regulations. Having monitored the fertilizer market, the LEI has expressed the view that the market for fertilizer from the

Netherlands is not likely to grow for the time being. Is there any future, then, in looking for good manure processing techniques? According to Fridtjof de Buissonjé, a technical researcher at Wageningen UR Livestock Research who is involved in the manure processing project, the success of the processing technique depends on other factors as well: 'Of course we have learned from the past and we know that success is not just a matter of technique. Whether the technique is a success in practice depends on a number of factors. An important one is energy prices. Manure processing always requires energy so if the prices keep on going up, there are fewer options right from the start. As well as that, success depends on the quality of the

products and the scope for using them in the Netherlands or exporting them.'

Mark Heijmans of LTO: 'Precisely by making it compulsory for the sector to process a proportion of the manure, Bleker is creating a guaranteed supply of manure for processing. That is exactly what is needed before you start investing in it. Of course there is still much to be done because there is still far too little processing capacity for pig manure, for example. We are going to stimulate crop farmers, both individually and as a group, to invest in manure processing. So now the crop farmers are also going to be responsible for making sure they have a distribution channel for their manure.'

[www.mestverwerken.wur.nl](http://www.mestverwerken.wur.nl) ■

# Locating foods on the isotope map

**The origin of any food product can now be traced thanks to the isotopic composition of the elements in it. This is turning out to be an innovative, valuable aid to detecting food fraud. TEXT ROB RAMAKER**





**D**oes that pack of orange juice really come from Greece? And is that batch of palm oil actually from a sustainable plantation? Increasingly, isotopes are able to reveal the answer to such questions. Many chemical elements have 'heavy' and 'light' versions, depending on the number of neutrons in the atoms' nuclei. For example, the element chlorine has two stable versions: roughly three-quarters of the atoms have 18 neutrons and the rest have 20 neutrons. These versions of an element, known as isotopes, are present in varying proportions in nature and that fact is now being used to determine where a product comes from, since the isotope ratios in food products often differ per location. At the same time, work is going on to determine the isotope ratios occurring in different parts of the world. This information is recorded in isotopic landscapes, or *isoscapes*. These isoscapes are a hot topic; the police, food authorities and ecologists are all enthusing about the potential applications. For instance, food authorities will be able to compare the ratio of isotopes in a product with the information on the isoscape and thus determine whether that exorbitantly priced olive oil really was made in that photogenic village in Tuscany. In the past, tracking down food origin fraud involved ploughing through the accounts and other paperwork; now, isotopes and isoscapes are increasingly being used instead.

### FINDING THE SOURCE

Compiling an isotope map is no easy task, explains Grishja van der Veer, researcher at RIKILT Wageningen UR. He was involved in the TRACE European project, which ended in 2010. It involved more than sixty European partners developing methods of tracing food products back to the source. They had to decide, for instance, which elements and isotopes were best suited to finding that source. Then an isoscape had to be available, or cre-

ated, for that element. Determining the ratio for every element in every square metre would be an impossible task so scientists look instead at patterns in the incidence of different isotope ratios. 'You are looking for natural variations associated with the isotope ratios', explains Van der Veer. This approach was used to create one isotope map for hydrogen and one for oxygen for use in tracing the origin of mineral water (H<sub>2</sub>O). The isoscapes make use of the fact that the ratios between lighter and heavier versions of hydrogen and oxygen are related to the average temperature. A lower average temperature also means lower proportions of heavy hydrogen and oxygen isotopes.

Van der Veer helped map the isotope ratios for European mineral water. This involved analysing and summarizing the isotope ratios for more than six hundred spring waters. The measurements for these six hundred plus locations could be used to make a rough isoscape for Europe, but there is not enough variation in the isotope ratios to enable detection of the exact source of an unknown mineral water. To do that, you would need to analyse the isotope ratios in

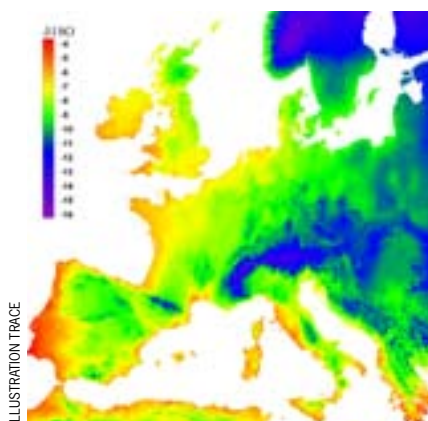
the trace elements in addition to the hydrogen and oxygen. The accuracy of such source calculations is now being improved by combining different isoscapes, and that makes it possible to trace a product to that picturesque Tuscan village.

### PALM OIL

Isoscapes are currently very much in the ascendant. Van der Veer says TRACE has demonstrated how useful they are. Furthermore, the analytical techniques are getting faster and more user-friendly, can be used in a wider range of settings and require less material. And more geographical data on isotope ratios is being added to databases. In fact, isoscapes could not be compiled without such databases.

Food regulatory authorities in particular are interested in the potential for determining the geographical origin of food products. For example, Van der Veer developed isoscapes that can be used for palm oil. It is possible to detect whether the oil comes from Brazil, West Africa or Southeast Asia using a combination of several isotope ratios. That is good to know because Africa does not have any sustainable palm oil production. But RIKILT would really like to be able to locate the source much more precisely. Van der Veer says this would require isotope ratios for a number of elements and for more data to be available for different areas. They are now working on this in partnership with the private sector.

Van der Veer is also looking at the options for using nitrogen isotopes to distinguish between organic products – where the use of artificial fertilizer is not permitted – and conventional food products. The RIKILT researcher is also expecting more projects in the pipeline, including non-food applications. 'We are talking to the Wood Research Foundation about the possibility of using isoscapes to check the origin of sustainable tropical wood.' ■



Isoscape of the isotope ratios for oxygen

## The isotope ratios of more than 600 mineral waters were analysed

## LANDSCAPE ARCHITECTS 25 YEARS ON

# Designing and connecting

**Hanneke Kijne is a born designer, while Camiel van Drimmelen was drawn more towards decisionmaking in governance and our common interests. Both landscape architects' careers went through a dip which they had to work their way out of.**

TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY JOSJE DEEKENS

**Y**our work is never done in this profession; it is very dynamic', says designer Hanneke Kijne of HOSPER, a design bureau for landscape architecture and urban development based in Haarlem. Just after graduating she worked for Velsen municipal council for a year. Velsen: 'That involved a lot of meetings and there was a rather embittered atmosphere. People there had done the same job for a long time. We commissioned design bureaus to work out the details, but that was something I would rather have done myself.' So Kijne took action and set to work as a designer. In 2006 she became the co-owner of HOSPER, a bureau set up by landscape architect Alle Hosper, who died in 1997. The bureau was taken over by some of the staff and at one point there were 11 owners. Now there are four. 'It is very nice to run the bureau together and develop its future potential.' The economic crisis and the slump in the

construction industry are taking their toll, however. There has been a big drop in the number of commissions and people were laid off last year. 'That was a difficult decision, as the social bonding is strong among us', sighs Kijne. She is currently engaged in a large-scale project in China, drawing up an urban plan for a large new suburb in Fuxin and a park on the banks of the river. 'You are dreaming up something while you have no idea at all whether it is really going to be implemented the way you envisage it. That makes the

work full of surprises', says Kijne with obvious enthusiasm. A large-scale project of this sort also calls on her abilities as a manager. But she often works on a much smaller scale at the same time.

Kijne won a design competition, for instance, with a design for a cultural square at a former mine in Genk, in Belgium – which has now been created. Among the materials she used there was dark grey slate for paving, with stainless steel furniture on it and small fountains producing mist. 'At HOSPER we work with the location in mind. A design should express the significance and the nature of the location in a timeless way.'

### BUILDING HIGHER

By contrast, former classmate Camiel van Drimmelen, who started his degree in Landscape Architecture in 1987 along with Kijne, feels quite at home in a government

**'A passion for the subject can be a pitfall too'**



context. He works as senior planning advisor at the Physical Planning Department of the City of Amsterdam. 'I thoroughly enjoy working for the government because you get to work on lots of social issues. What is more, in government you are involved in all sorts of things and you are in charge.' It is Van Drimmelen's job to get the impact of climate change on Amsterdam on the agenda, together with colleagues from the water board. 'We are now developing a vision. We are looking at questions such as whether we need to raise the dykes, to adapt regulations

or to start building on higher ground.' Van Drimmelen also coordinates consultations between spatial planning councillors in the metropolitan region of Amsterdam, which covers an area from IJmuiden to Lelystad and from Purmerend to Aalsmeer. 'We try to facilitate optimal decisionmaking by the governing bodies. I find the relation between the issues and the governance game absolutely fascinating. It is also quite a job to get so many interest groups to rise above their own interests and reinforce common interests.' >

## HANNEKE KIJNE

**Age:** 43

**Studied:** Garden and Landscape Architecture 1987 – 1995

**Works:** as designer, project manager and co-owner of HOSPER landscape architecture and urban design



## ‘Design was presented as something mystical’

Up until 2008, Van Drimmelen worked for the National Water Board’s Institute for Integral Fresh Water Management and Waste Water Treatment (RIZA). During that period he got into the role of link between various different fields, people and interests. Together with his colleagues, he established the concept of integral design within the organization. ‘The focus was not just on safety but also on spatial quality. In the end we played a key role in the whole landscape planning process.’

Van Drimmelen does not have a strong urge to do the designing himself. ‘I don’t consider myself a top designer. Other people are better at drawing. My strength lies in analysing and organizing and arriving at joint solutions in collaboration with those concerned. In the field of landscape architecture you are expected to have a nice park or square to your name. I don’t have that but what I have done is to ensure the river region will be a lot more attractive in the future by introducing an element of design into the work on the rivers.’

### PASSION AS PITFALL

Kijne’s boundless ambition was almost her downfall. About five years after graduating, when she had been working for the

Utrecht-based landscape architects’ bureau OKRA for three and a half years, she went through a burnout. ‘I got lost in my ambitions. Both the bureau and I were very ambitious and I am quite a perfectionist. A passion for the subject can make us very happy but it can also be a pitfall.’

Kijne took a year to recover and she wondered whether she should switch professions. During her convalescence period she taught at Van Hall Larenstein, part of Wageningen UR, and at the Art School in Utrecht. ‘Then I started to want to design again myself’, she says. It just so happened that there was scope at HOSPER to pick up her work again at her own pace. She learned a lot from the burnout, she says. ‘I have learned to gauge my own limits realistically. From other people I have also learned to improvise more.’

Kijne still works as a guest lecturer, since 2005 at the Academy of Architecture in Amsterdam. ‘Designing is hard to explain. It is a challenge to help a student gain insight into what he or she should do, while it really needs to come from them. If it works and a student comes up with a brilliant idea, it is very rewarding.’

Van Drimmelen has had tricky moments in his work too. During his last year with

the National Water Board, the organization turned against his core work, which was water management and safety. ‘People wanted to stick to the core business, but that was nonsense of course. With big projects you are responsible for the landscape and you have to leave it behind in a decent condition’, says Van Drimmelen. Conflicts blew up and the atmosphere grew more and more unpleasant. Fortunately he quickly found his current job with Amsterdam City Council.

In the course of his career, he has always benefitted from his broad Wageningen background. ‘I use the knowledge and skills I gained there to make connections and to tell stories. I often use pictures too – a quick sketch to show what I mean.’ Standards were high on the degree course, Van Drimmelen recalls. ‘It was competitive and the teachers, who could be extremely blunt, were sometimes very critical about designs. Design was presented as something mystical. There were ‘hidden’ rules that you had to find out for yourself. Once you had grasped them you could then ignore them.’

Classmate Hanneke Kijne still takes an integrated approach too, tackling the landscape from the angles of geology, soil science, water systems, history and a combination of all these aspects. But she really learned how to design on the job, she says. ‘During our studies you had to make a real effort if you wanted to get an idea of what the work entailed in practice. We were not fully prepared for it after the degree.’

### FLEXIBLE PLANNING

These are tense times in her field, thinks Kijne. There is much more demand now for flexible planning. ‘In the old days the

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### WHERE DO LANDSCAPE ARCHITECTS END UP?

Between 1970 and August 2011, 1955 people have graduated with a master’s in Landscape Architecture and Planning or the predecessors of this degree. Of these graduates, 61 percent are men and 39 percent women. In the early stages of their careers most alumni tend to work for commercial bureaus but later on many of them end up working for government bodies in management and executive roles. One third of all the graduates work in the private sector for a consultancy firm. Another one third work for a government body at local or national level. About 10 percent work at a university or research institute. Source: KLV Wageningen Alumni Network.



size of the plot and the type of house were laid down in the urban development plan. Now the size and the type have to be adapted to the demands of the market. We also intend to take into account what we already have in the way of existing buildings and vegetation and how we can make better use of that.' HOSPER had undertaken 'guerilla gardening' campaigns, planting trees on disused land. 'The regulations allow no scope for temporary nature, actually, but it is interesting to see what you can do with it.'

The Physical Planning Department of the City of Amsterdam is looking for effective planning approaches for uncertain times too, confirms Van Drimmelen. 'Urban architecture has been turned upside down. We think more in terms of contours and the main lines rather than in detailed pictures of the end result. With the development of IJburg 2, we start with a small island and then we'll see how the market develops. As a result of the changing financial flows and the fast rate of social change, you have manoeuvre much more flexibly.' ■

### CAMIEL VAN DRIMMELEN

**Age:** 43

**Studied:** Garden and Landscape Architecture 1987 – 1994

**Works:** as Senior Planning Advisor for the Physical Planning Department of the City of Amsterdam

# 'Sometimes a little support is enough'

**There is an economic crisis in Europe but it is not affecting the Anne van den Ban Fund. Last year more donors than ever gave almost 150,000 euros between them. More than was raised by other Wageningen funds.**

TEKST ALEXANDRA BRANDERHORST PHOTOGRAPHY GUY ACKERMANS

There has been a steady rise in the number of donors to the Anne van den Ban Scholarship Fund – from 2 in 1992 to 866 in 2011. And this has meant a steady increase in the financial support the Fund can offer to promising students from the poorest developing countries to enable them to complete a Master's degree at Wageningen University, part of Wageningen UR. The aim is to turn out highly educated experts who can tackle the agricultural, environmental and rural development problems in their

home countries. They are therefore selected not only on their academic merit but also on their motivation to return after gaining their qualification. Last year a few tens of students received financial support ranging from a modest supplement to a full scholarship. The university contributes too by waiving tuition fees for many Anne van den Ban students.

The Fund's approach and ideals appeal to more and more people, including Annemie Douwes Dekker, who donated a substantial sum after selling her house. She herself studied Agricultural Economics in Wageningen between 1953 and 1962. 'Money donated to the Anne van den Ban Fund benefits both scientific research and developing countries. If you educate your own population, there is hope for a sustainable impact', says Douwes Dekker to explain her decision.

The majority of donors are alumni, staff and ex-staff of Wageningen University. 'But increasingly its fame is spreading beyond these circles', says Arianne van Ballegooij, who works at Wageningen University's Alumni Office. Twenty years ago, Professor of Agricultural Extension Anne van den Ban sowed the seed for the foundation by sponsoring one student. Friends and colleagues began to get involved and the Fund slowly grew.

'Nowadays other scholarship funds start

from the social network of the founder', says Van Ballegooij. Examples are the Niels Smith Fund and the Paul Speijer Fund. The former fund aims to stimulate talented sportsmen and women studying at Van Hall Larenstein, part of Wageningen UR, or Wageningen University, by helping to cover the costs of materials and training. The fund manages the money that founder Marianne Remmers had saved for the higher education of her son, who died young. The fund has been added to meanwhile by Remmers' family and friends. The same thing happened for the Paul Speijer Fund, which enables one African student to embark on the Plant Sciences Master's every year.

## LOW OVERHEADS

The first fundraising letter for the Anne van den Ban Fund went out to alumni in 2005. The number of donors increased that year from 140 to 400. Money also comes in from inheritances and from other foundations which are closed down. People are doing more and more fundraising themselves, says Van Ballegooij. For example, this year two outgoing professors asked for donations to the Anne van den Ban Fund instead of a present.

Sometimes it is a question of a one-off individual donation such as the spontaneous donation made last year by Aart van 't Oever,



ANNEMIE DOUWES DEKKER

'I hope for a lasting impact'




**AART VAN 'T OEVER**

'The fund supports highly motivated people'


**IES RISSEEUW**

'An excellent way to use my relative health'

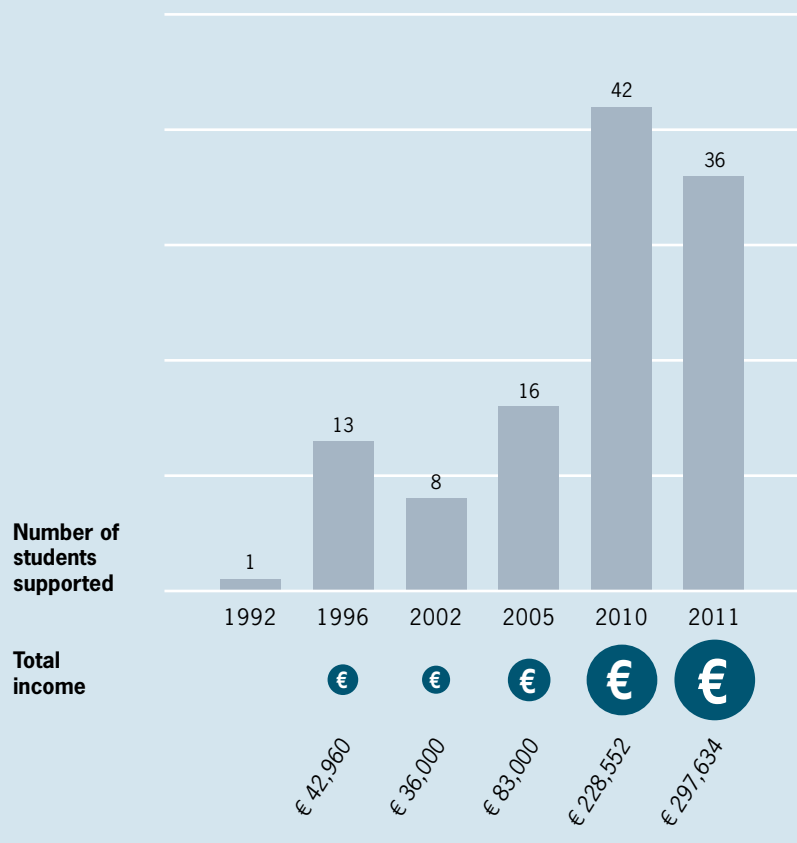
who obtained his International Master's in Biotechnology at Wageningen University in 2002. He chose the Anne van den Ban Fund because of its low overheads. 'It is nice that the money goes where it is intended to go. The fund supports highly motivated people with the right skills. Sometimes a little financial support is enough. What is more, the knowledge that is passed on does not get lost. It is taken back straightaway and passed on again', explains Van 't Oever.

### GETTING YOUR HANDS DIRTY

The Fund relies largely on people who commit to it in the longer term, with a direct debit or notarial deed for example. One such donor is Ies Risseeuw, who was also touched by the dedication of the selected students. 'It is a big commitment for them to come and study in the Netherlands. If I can help them do that, it is an excellent way for me to use my relative wealth.'

Risseeuw completed his Wageningen degree in Irrigation and Soil and Water Technology in 1967 and spent 25 years of his career living and working in developing countries such as Peru, Egypt and Pakistan. 'In those countries there is often a lack of people who are willing to roll up their sleeves and apply their knowledge in practice', says Risseeuw. He hopes that the students who are supported by the Fund will change all that. ■

### 20 YEARS OF THE ANNE VAN DEN BAN FUND IN FIGURES



## All theses online

A total of 5200 Wageningen theses have been made available online this summer. Over the past few years, the library of Wageningen University, part of Wageningen UR, has scanned its entire collected of theses, from 1920 to the present. Initially this was done page by page, but later the pages were cut out and processed automatically. This meant more than 100 theses could be digitalized per day.

The thickest thesis was 1100 pages long and the thinnest – a summary of various publications – just 11 pages. The vast majority of the theses are in English but there are also 569 in Dutch, 27 in French, 12 in German and 13 in Spanish. Not to forget one in Frisian. The library will be keeping the printed theses too. Meanwhile, the librarians are now working on another job. In 2018 the library wants to publish an inventory of everything published by Wageningen UR and the institutions it succeeded.

The theses can be accessed via the Wageningen Dissertation Abstracts at <http://library.wur.nl/wda>



PHOTO KLV WAGENINGEN ALUMNI NETWORK

Rudy Rabbinge, second from the right, describes the area where he lives.

## At home with Professor Rabbinge

**At the end of May, emeritus professor Rudy Rabbinge invited 60 Wageningen graduates to his home. 'It was packed out; we had to disappoint people', says Anne Hulst of the northern alumni network.**

The assembled company started by exploring the immediate area, the Reestdal in the eastern Dutch province of Drenthe, where Rudy Rabbinge – until the end of 2011 professor of Sustainable Development and Food Security at Wageningen University, part of Wageningen UR – lives in a farmhouse. 'In the course of a lovely walk Rabbinge told us all sorts of interesting facts: how the landscape developed and how people have worked the land. He pointed out details we would otherwise have missed', says Hulst.

In the presentation that Rabbinge gave back at the house, he touched on themes such as major global trends, the challenges and

prospects facing agriculture, the growth of the biobased economy and the role of the Netherlands. 'That had a big appeal. There were quite a lot of questions from the audience and lively discussions developed', says Hulst, who graduated in Food Technology from Wageningen in 1987. 'Rabbinge wants to do something for developing countries. Given his international standing, he is in a position to get things done.'

There are four regional alumni networks in the Netherlands: North, South, The Hague and Utrecht. Each network organizes several meetings per year which are open to Wageningen alumni free of charge.

Info: [www.wageningenalumniportal.nl](http://www.wageningenalumniportal.nl)

## FUNDS

### Alumni give generously for Belmonte arboretum

Alumni of Wageningen University have donated almost 22,000 euros to the Belmonte Arboretum. About 600 alumni responded to an appeal for support for the arboretum made by the Wageningen University Fund.

The arboretum will use the money to maintain the collection of crab apple and pear trees and to provide visitors with information they can access via mobile internet.

## CAREER

## Alumni at work on YouTube

'Hello. I am Marije Broekhuijsen. I am an advisor on disaster prevention and climate adaptation for Care Netherlands. I live and work in the Philippines.' So begins a YouTube film of less than five minutes long. The noisy streets of Manila form the backdrop. The viewer goes on to accompany Marije to her office and on a field trip. This is one of 36 short films on YouTube in which Wageningen Alumni give future students an idea of the work they do. The short films are used for student recruitment and are funded by Wageningen Ambassadors, a group of influential alumni. See: [www.youtube.nl: search for 'Wageningen Alumni'](http://www.youtube.nl: search for 'Wageningen Alumni').

## UNIVERSITY

## International accreditation awarded

Wageningen University (part of Wageningen UR) is the first Dutch University to be officially accredited as 'international' by the Dutch-Flemish Accreditation Organization (NVAO). This rubberstamp offers international students a guarantee that Master's programmes and general communication are in English, that facilities are adequate and that the degree programmes tie in with the relevant professional field internationally. Rector magnificus Martin Kropff is proud of this mark of recognition. 'It is no coincidence that we have students from more than 100 countries. Internationalization is second nature to Wageningen University. This accreditation is an acknowledgment of the focus on this that we have had for years.'

## WAGENINGEN WORLD



## Wageningen in the world!

**Berihu Gebremedhin took this photo in Axum, the oldest city in Ethiopia. The girl posing here with Wageningen World is his neighbour. Axum lies in the far north of Ethiopia and is famous for its giant granite stelae field. 'Axum is seen as the possible location of the Ark of the Covenant and is the cradle of Ethiopian culture', writes the Wageningen alumnus from the campus of Mekelle University. Gebremedhin graduated in 2009 with a Master's degree in Animal Sciences. Are you reading this magazine far from Wageningen too? Email the photographic evidence to [Wageningen.world@wur.nl](mailto:Wageningen.world@wur.nl)**

## COURSES



## Antibiotics in food

Antibiotics are frequently used in animal husbandry for the treatment and prevention of diseases. To avoid undesirable residues, food produced or imported in the EU has to fulfill residue requirements. Self-monitoring is an important tool for the food industry, farmers and retailers, and the competent authorities have to safeguard the process. RIKILT Wageningen UR and Wageningen Business School (WBS) are organizing a two day workshop, Antibiotic analysis for food and feed. The workshop cov-

ers use of antibiotics, legislation, control programmes and methods of analysis. The course will be held on 12 and 13 November 2012 and is intended for professionals from the industry or in governmental or academic positions in the area of food and feed safety. Directly after the workshop two additional in-depth training courses will be organized. WBS provides post-graduate and 'post-experience' programmes and courses. Info: [www.wbs.wur.nl/UK/](http://www.wbs.wur.nl/UK/)

## CENTENARY

## Contribute to Argo centenary book

The Wageningen Student Rowing Club Argo celebrates its 100<sup>th</sup> year in 2013. A special book is being produced to mark the centenary. A working group of Argonauts (and ex-Argonauts) is working on the contents of the book and is looking for nice, interesting photos, items and typical Argo posters. Do you have something that should be included? Contact: [eeuwboek.argo@gmail.com](mailto:eeuwboek.argo@gmail.com)



## PERSONALIA

**Stan Brouns PhD**, WU Molecular Sciences 2001, working at the Laboratory for Microbiology, has been awarded a Vidi grant by the Dutch research organization NWO for research on a kind of 'flu jab' for bacteria. 3 July 2012.

**Gerlinde de Deyn PhD**, WU Environmental Sciences, soil science department, was awarded a Vidi grant by the Dutch research organization NWO for research on the legacy of plant roots. 3 July 2012.

**Hans Derksen PhD**, RUG Biology 1983, external staff member of the Animal Sciences chair group at Wageningen University, has been installed as associate professor of Biobased Economics at Van Hall Larenstein. 10 May 2012.

**Prof. Ewout Frankema**, Agricultural History department at Wageningen University, has been awarded a Vidi grant by the Dutch research organization NWO for research on poverty alleviation and wealth distribution in Africa 1880-2010. 3 July 2012.

**Ellis Hoffland PhD**, UU Biology 1987, PhD WU 1991, currently researcher in Soil Quality, has been appointed personal professor of Soil Quality at Wageningen University. 1 May 2012.

**Prof. Evert Jacobsen**, WU Plant Breeding 1974, professor of Plant Breeding in Genetic Variation and Genetic Modification, has retired from Wageningen University. 14 June 2012.



PHOTO MANON BRUININGA

Evert Jacobsen

**Inge Kersten MSc** and **Jorrit Noordhuizen MSc**, both WU Landscape Architecture and Planning 2011, won the Archiprix 2012 for their graduation project 'Vibrant Land'. 23 June 2012.

**Emil Kuijs**, VHL Animal Management 2009, researcher at IMARES Wageningen UR, won the Delta Water Award 2012 with his team for a method of combatting the silting up of the Haringvliet estuary. The 'Balance Island' project was awarded a money prize of 15,000 euros. 18 April 2012.

**Gert Meijer PhD**, WU Nutrition 1987, has been appointed visiting professor in the Faculty of Life and Health Sciences,

School of Biomedical Sciences, at the University of Ulster. 1 June 2012.

**Prof. Jos Metz**, WU Zootechnics 1969, emeritus professor of Livestock Systems at Wageningen University, has won the Award of Merit – Scientific Understanding of the European Society of Agricultural Engineers (EurAgEng). 10 June 2012.

**Prof. Martin Verstegen**, WU Zootechnics 1966, emeritus professor of Animal Nutrition at Wageningen University, was awarded a Massey University medal together with his wife for their services to agriculture and nutrition. The award was bestowed by the New Zealand ambassador. 15 June 2012.

## PRIZE



PHOTO RADBOUD UNIVERSITY, DICK VAN AALST

## Jetten received Spinoza grant

**The Wageningen alumnus Mike Jetten has won an NWO Spinoza prize 2012.**

The Nijmegen professor of Ecological Microbiology won the prize, a research budget of 2.5 million euros, for his groundbreaking research on bacteria. Jetten's research topics include the anammox bacterium, which can convert ammonium and nitrite into nitrogen gas and water without the use of oxygen. 'To do this

the bacterium makes a highly reactive intermediate product, hydrazine, which is also used as rocket fuel', explains Jetten. For years scientists considered this reaction impossible. 'Those anammox bacteria are everywhere and we have overlooked them all those years', says Jetten. Now the bacteria are being used in water purification plants all over the world. Mike Jetten studied Molecular Sciences at Wageningen University, where he received his PhD cum laude in 1991.

## PERSONALIA

**Vivianne Vleeshouwers PhD**, WU Biology 1992, of the Laboratory for Plant Breeding, was awarded a Vidi grant by the Dutch research organization NWO for research on potatoes. 3 July 2012.

**Annemiek van Vleuten MSc**, WU Animal Sciences 2007, became the 2012 Dutch national cycling champion. 23 June 2012.



FOTO ANP

Annemiek van Vleuten

## IN MEMORIAM

**F.P.W. Aerts MSc**, WU Zootechnics 1979, passed away at the age of 58. 12 March 2012.

**J.C. Cavelaars MSc**, WU Forestry 1959, passed away on 10 mei 2012.

**H.U. Dijksterhuis MSc**, WU agrotechnology 1975, passed away at the age of 72. 29 April 2012.

**H. van der Eb MSc**, WU Horticulture 1949, passed away at the age of 88. 19 June 2012.

**R. Folkertsma MSc**, WU Zootechnics 1981, passed away at the age of 58. 8 May 2012.

**J.C. Gehrels MSc**, WU Crop Plant Breeding 1958, passed away at the age of 83. 26 April 2012.

**C.J. Gerritsen MSc**, WU Horticulture 1947, passed away at the age of 89. 20 April 2012.

**F.M.A. Geurts MSc**, WU Tropical Agricultural Economics 1955, passed away at the age of 81. 10 June 2012.

**J.E.M. van den Hengel MSc**, WU Soil Sciences 1987, passed away at the age of 53. 18 June 2012.

**Machteld Kok BSc**, WU Food Technology 2009, passed away at

the age of 23. 12 June 2012.

**P.A.M. Kromwijk MSc**, WU Crop Plant Breeding 1959, passed away at the age of 93. 13 April 2012.

**Prof. J.A.M. Leunissen**, passed away at the age of 57. 14 May 2012.

**A.J.G. van der Maarel MSc**, WU Forestry 1974, passed away at the age of 63. 2 July 2012.

**E. Munyanzia MSc PhD**, WU Tropical Forestry 1990, passed away at the age of 54. 18 June 2012.

**B.G. Oude Ophuis MSc**, WU Crop Plant Breeding 1952, passed away at the age of 85. 27 April 2012.

**J.Th.A. Pouwels MSc**, WU Agrotechnology 1973, passed away at the age of 66. 6 May 2012.

**Th.A.J. Vette MSc**, WU Irrigation Science 1973, passed away at the age of 64. 27 January 2012.

**Prof. P. Walstra**, WU Dairy Processing 1955, passed away at the age of 81. 29 May 2012.

*Death announcements can be submitted through secretariaat.klv@wur.nl.*

## KEEPING TRACK

Wageningen University and the Wageningen Alumni network KLV like to keep in touch with all alumni. Unfortunately, we are missing a few addresses. Do you know the addresses of any of these people? If so, please forward them to [alumni@wur.nl](mailto:alumni@wur.nl). Many thanks!

Y. Benitez-Gomez, MSc, 1991, S17  
I. Benyes, MSc, 2006, MES  
J. Bernacka, MSc, 2002, S22  
G.P.A. Berthomieu, MSc, 1999, S21  
A.R. Bertuso, MSc, 2000, S12  
F. Blanco Gomez, MSc, 2002, S17  
Jiang Bo, MSc PhD, 2000, S22  
G. Bogdanovich Valentinova, MSc, 1998, S21  
E. Boinot, MSc, 2004, S26  
J.B. Bolarinwa, MSc, 1996, S20  
M. Bonilla Moya, MSc, 2000, S24  
Y. Borodenkova, MSc, 1999, S21  
N. Bouchez, MSc, 2001, S21  
A. Briend, MSc, 2004, S26  
Brook Abate Getahun, MSc, 1998, S18  
P.F.D. Camacho, MSc, 1997, S16  
A.H. Cambule, MSc, 1994, S10

C.A. Campbell, MSc, 1994, S11  
N. Cantagrel, MSc, 2003, S15  
Lei Cao, MSc, 2005, MUE  
Jing Cao, MSc, 2006, MME  
U.E.F. Capmany, MSc, 1991, S12  
C.M. Capmany Ulacia, MSc, 1999, S21  
M. Caprioli, MSc, 2003, S15  
F. Carre, MSc, 2000, S10  
D.J. Carrillo Perez, MSc, 1997, S17  
C. de Castonguay, MSc, 2002, S26  
S.F. Cavalcanti Arrais, MSc, 2000, S23  
A. Celik, MSc, 2003, MES  
R.T.M. Chakanda, MSc PhD, 2000, S12  
J. Champagne, MSc, 2002, S15  
Chang Soo Park, MSc, 1975, S10  
A. Chatzistavrou, MSc, 2001, S22  
Chau Thi Tuyet Hanh, MSc, 2001, S20

C. Chauvin MSc, 2004, S26  
Nan Chen MSc, 2002, S23  
Z. Chidhakwa, MSc, 1999, S13  
A.T. Chipato, MSc, 1997, S17  
Y.P. Christopher, MSc, 2001, S22  
A. de Cicco, MSc, 2000, S21  
D. Ciobanu, MSc, 2004, S22  
J.A.E. Clarke, MSc, 1994, S16  
M.A.R. Conteh, MSc, 1983, S10  
I.K. Conteh, MSc, 1997, S10  
A. Conteh, MSc, 1997, S12  
O. Correa da Silva, MSc, 2002, S12  
B. Curkovic, MSc, 1973, S10  
D.M. d' Almeida, MSc, 2004, MFT  
Daba Geleta Jirata, MSc, 1997, S13  
G.D. Dadii, MSc, 2010, MMA  
El Tiraifi Dafalla, MSc, 1983, S10  
Dr N. Danalatos, MSc, 1985, S10

C. Dangbegnon, MSc PhD, 1995, S11  
S.I. De Castro Lopes, MSc, 2002, S22  
S. Decroocq, MSc, 1996, S12  
F. Deletombe, MSc, 2002, S21  
Dereje Assefa Abera, MSc, 2000, S12  
N.K. Devkota, MSc, 2000, S23  
L. Diaz Varona, MSc, 2000, S17  
A.M. Dicko, MSc, 1989, S10  
E. Diez Cebollero, MSc, 2004, MES  
L. Dikeni, MSc, 1996, S11  
Jianqi Ding, MSc, 2003, MES  
B. Djomamou, MSc, 2001, S12  
C. Dolci, MSc, 2001, S17  
E. Doyle, MSc, 1999, S23  
S. Drammeh, MSc, 1994, S12  
R. Duan, MSc, 2004, MBT  
M. Dubruque, MSc, 2005, MBT  
G. Ducos, MSc, 2002, S22



# CAREER GUIDANCE: LEARN TO MAKE YOUR ADDED VALUE COUNT

## KLV supports its graduates on the labour market

What can you offer an employer? It's something you have to formulate very precisely when you're looking for the right job. That's the principle that Geraldine Sinnema uses. She has been working for KLV as a careers counsellor and trainer since 1994.

"There are people who can write excellent application letters and are often asked to interviews, but always come second," explains Geraldine. "Practice interviews are useful for someone like that. I can quickly see what's going on in an interview and we practice tackling that aspect. You might for instance be so busy trying to be likeable that you do not express your own ideas enough, whereas you should use the interview actively to express what you want to say."

Geraldine Sinnema does a lot of work for KLV, which offers guidance to Wageningen alumni on the labour market both directly and via KLV Professional Match. Over nearly 20 years, she has seen a lot of Wageningen students go by, both Dutch and international. "These are people who have followed the standard career path, for example, but then realised that it doesn't really suit them," says Geraldine. "There are also a relatively large number of young researchers, who are starting to look beyond the academic world after a number of postdocs or a PhD."

As well as one-on-one discussions, KLV also offers workshops and training courses. Young KLV provides CV writing workshops in English, where a small group discusses the CVs with the coach, as well as workshops on how to find a job in the Netherlands. "International students and alumni want to know how the labour market in the Netherlands operates, how to apply for jobs in the



Netherlands and how their CV can be transposed to the Dutch context," says Geraldine. "Foreign universities often work using awards, for instance, which is something we aren't familiar with in the Netherlands. So you need to explain just what it means in your CV." There are also the careers cafés, where people work in groups with a coach to think about 'what I can do and what I want to do'. These are the same questions as in real careers counselling, but all bundled together and handled quickly. All very accessible, with something to eat and drink. There are several variants, in both English and Dutch, for starters and for experienced professionals.

Everyone is different. But the principle is ultimately the same, whether you're talking about a long-term project for a one-off workshop. Geraldine says, "The overall package of knowledge and experience that each person can offer is different. It is important that you are able to describe exactly what added value you have for a potential employer. Then you can focus your search on positions where you have exactly what they need, using your network and LinkedIn too. KLV is pleased to help at every stage in that process."

Geraldine Sinnema graduated in 1992 from Wageningen University in employment sociology. She has worked for KLV Professional Match since 1994 as a coach and careers counsellor (certified careers professional, CMI-B).



**Peter Oldenkamp:** "I thought it was time for something new, but with KLV's help I've been able to make my current job challenging and motivating again."



**Petra Hofs:** "The KLV careers guidance made clear to me where I was and where I want to go, both in my work and in my private life. An eye-opener."



**Katia Leber:** "In the careers guidance sessions, we extracted the elements from previous jobs that were important for the management function I was looking for. So I was able to say the right things."

Read their full stories on [bit.ly/P9GwUS](https://bit.ly/P9GwUS)

KLV members get a discount on career guidance. Interested? Please contact KLV or KLV Professional Match to find out more. You can find an overview of all the training courses and workshops on [klv.nl](https://klv.nl) under 'Activities' and on [klvprofessionalmatch.nl](https://klvprofessionalmatch.nl)



# HOW ARE WAGENINGEN ALUMNI DOING ON THE LABOUR MARKET?

Wageningen graduates are doing fine, as was shown by recent analyses of the alumni lists and the results of the 2011 *WO-monitor* (for science graduates). Silvia Blok, who works for KLV as an employment researcher, points out a number of striking results.

- **79% are working at science graduate level or higher**  
“That even gets up to 96% for people with doctorates. In addition, recent graduates often work in their own field of study. Alumni who graduated rather longer ago are more likely to be working outside Wageningen’s fields of interest.”
- **Wageningen graduates are getting doctorates more often**  
“An extra title looks good on your CV, particularly abroad. This means that international alumni often move on to a PhD if they get the chance.”

Another striking finding: Wageningen University is becoming increasingly international. “Wageningen University introduced

the English-language MSc programme in 2002 in order to attract more international students,” explains Silvia. “And it worked, which automatically meant that there have been more foreign alumni since 2005.”

*KLV believes it is important to know how Wageningen’s alumni are doing on the labour market. There is a lot of information in the alumni lists, and KLV also gathers and analyses data from employment market research such as the MSc-Afstudeerenquête, the WO-monitor and the five-yearly career monitor.*

*A lot of information can be found on [klv.nl](http://klv.nl) under ‘Careers service’ and in the news items. If you have a specific question, please contact [silvia.blok@wur.nl](mailto:silvia.blok@wur.nl)*



photo: Shutterstock

You can find more KLV news in KLV Update, which is also being published in English from now on. If you would like a sample copy, please send an e-mail to [secretariaat@klv.nl](mailto:secretariaat@klv.nl) (available while stocks last). You can also check out the online English version on our website [klv.nl/en](http://klv.nl/en)

## ACTIVITIES

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

### 20 september

Young KLV - Course - CV writing

Personal feedback on your CV with at most seven participants.

### 22 October

Young KLV - Course - CV writing

### 31 October

Young KLV - Workshop - How to find a job in the Netherlands

After graduation from Wageningen University, you might want to stay and look for a job in the Netherlands. However, you might be confused with complicated procedures and less assured of being transferred from a student to a jobseeker. You might still lack insight of Dutch culture and the Dutch way of working. So where and how do you start looking for the information about getting a job in the Netherlands?

### 13 November

Young KLV - Training - Speed reading

This training is particularly useful for new students and for everybody who wants to read faster, concentrate better & learn faster.

### 22 November

Young KLV - Course - CV writing

### 4 December

Young KLV - Training - Time management

So much to do, so little time... This short, yet highly effective workshop is intended for everyone who finally wants to do what really needs to be done.

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



PHOTO JOERG BOETHLING, LINEAR

## Big climate change impact along the Ganges

Climate change is going to have far-reaching consequences for millions of Indians and Bangladeshis living along the Ganges. They face temperature rises of 2 degrees by 2050, changing monsoon rainfall patterns and greater peaks and dips in the snowmelt runoff from the Himalaya. A team of international researchers led by Wageningen UR studied how the population can adapt to the new climatic conditions. The project ended

last spring with a course for young scientists and policymakers from India, Nepal and Bangladesh, in order to impress on them the seriousness of the situation, says project leader Eddy Moors of Alterra Wageningen UR. 'It is important to start working on ways of adapting now', says Moors. 'The projection is that farmers will have to deal with longer periods of drought, causing the rice and wheat harvests to suffer. Up to now this has

been compensated for by using groundwater reserves, but these are already diminishing at a worrying rate.' The researchers propose a thorough overhaul of the management of both irrigation systems and water reserves. They also advocate further exploration of the potential for growing alternative crop varieties in combination with better weather forecasting. Info: [eddy.moors@wur.nl](mailto:eddy.moors@wur.nl) or [www.eu-highnoon.org](http://www.eu-highnoon.org) ■