

# WAGENINGEN WORLD

MAGAZINE OF WAGENINGEN UR AND KLV ABOUT CONTRIBUTING TO THE QUALITY OF LIFE

nr.2 2010



‘Biodiversity on our  
agricultural land is  
already dead, in fact’

Frank Berendse, page 28

Many questions about **Q fever** | The **Dutch polder model** in China | Will just **one logo** work better?  
Wageningen UR **optimizes algae cultivation** | **David Lentink** wants to know how the world works



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## MANY QUESTIONS ABOUT Q FEVER

The Q fever outbreak in the Netherlands may have been caused by a bacterial strain that is unique to the Netherlands, says the Central Veterinary Institute (CVI), part of Wageningen UR. The answer to one of many questions surrounding Q fever.

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## TACKLING THE YELLOW WATERS

The Yellow and Yangtze rivers in China cause floods, water shortages and pollution. The Chinese have all the technical expertise they need. Wageningen UR is concentrating on stakeholder processes.



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## BIODIVERSITY: CAN THE TIDE BE TURNED?

Biodiversity in the Netherlands is still in decline. So how can we put a bit of spark into International Biodiversity Year? Four Wageningen experts explain how the tide could be turned – with or without the farmers.



**COLOPHON** Wageningen World is the quarterly magazine for associates and alumni of Wageningen UR (University & Research centre) and members of KLV, the Wageningen Alumni Network **Publisher** Wageningen UR, Viola Peulen, with KLV, Paul den Besten **Editors** Igor Bennik, Paul den Besten, Hans Bothe, Ben Geerlings, Wilbert Houweling, Lotte Kerkhoven, Jeannette Leenders, Francine Loos, Jac Niessen, Nicolette Meerstadt, Erik Toussaint, Hans Wolkers **Editor-in-chief** Pauline Greuell (Corporate Communication Wageningen UR) **Magazine manager & editor** Miranda Bettonville, Maaïke Breedveld (proof reading) **News editor** Maaïke Breedveld **Translators** Clare McGregor and Karen Maters **Language editor** Clare McGregor **Cover picture** Corbis **Creative director** Rupert van Woerkom (Hemels Publishers) **Art direction & Design** Wageningen UR, Communication Services (Jenny van Driel), Hemels Publishers, Hilversum (Evelien Dijkman, Doriene Koot) **Printer** Thieme Grafimedia Groep **Address** Wageningen Campus, Akkermaalsbos 12, 6708 WB Wageningen, P.O. Box 409, 6700 AK Wageningen, building 116, internal mail 31, 0317 48 40 20, [wageningen.world@wur.nl](mailto:wageningen.world@wur.nl) **Change of address Alumni** [www.wageningenalumniportal.nl](http://www.wageningenalumniportal.nl) **Change of address associates** [wageningen.world@wur.nl](mailto:wageningen.world@wur.nl) **Personal details** [alumni@wur.nl](mailto:alumni@wur.nl)





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PHOTO GUY ACKERMANS

## 'The oil disaster has dire invisible consequences'

'The oil disaster in the Gulf of Mexico is not like other oil disasters. Because although the floating oil slick is the first thing that meets the eye, and the birds smeared with oil are doomed, the invisible environmental impact could well be as bad as the visible damage. This is because the oil we are talking about here contains relatively large numbers of soluble compounds such as the notorious PAHs. The oil flows from the leak on the ocean floor one and a half kilometres to the surface of the sea, causing the PAHs to dissolve in the seawater and then, via plankton, end up in shellfish and fish. And because fish convert these substances, breakdown products are formed that can cause tumours in their livers. I think the Americans are tackling the problem the right way. They are putting up shields along the coast to keep the floating oil slick away from the vulnerable swamps. They are also trying to dissolve the oil using soap-like materials. That is good for the birds, but the down side is that you are shifting the problem to the fish and shellfish. The resulting oil emulsion has major consequences for water filterers like mussels and oysters. Oyster beds may be affected, and I would predict that the government will ban shellfish catches for a while. It will take a good six years for marine life to recover.

A society that allows drilling close to the coast accepts that things can go wrong once in a while. But the impact of an accident in certain vulnerable areas can be horrendously big. The Mississippi delta is now threatened by oil, and this is an area of great ecological value. If you drill within fifty to eighty kilometres of such an area you are taking a great risk. You should really think through your risk analyses, and you should also consider possible alternatives to drilling at that particular spot. For sustainable offshore oil drilling, it is essential to make strict rules and then to keep them.'

John Schobben, ecotoxicologist and head of the environment department at IMARES, part of Wageningen UR

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 a healthy diet and living environment. Wageningen UR has a staff of 6,500, 10,000 students, 35,000 alumni and 40 sites, with a turnover of 662 million euros.

Institutes of Wageningen UR: Alterra, LEI, Plant Research International, PPO, Wageningen UR Livestock Research, Central Veterinary Institute, Wageningen UR Food & Biobased Research, IMARES, and RIKILT. KLV is the largest Wageningen alumni network, with over 7,000 members. The association dates back to 1886, and provides a network for Wageningen graduates and other professionals with a link with Wageningen. The aim is to promote contact between members and with the university, and to establish an online network that provides a lively, virtual meeting place.

## ENVIRONMENT

## MICROBIOLOGY

### Gut bacteria make you fat too

It is not just diet, exercise or genes that determine whether a person becomes obese. The combination of bacteria in our intestines is thought to have something to do with it too, according to an article by Wageningen microbiologists and colleagues from the University of Amsterdam in the journal *Diabetologia*.

Dozens of experiments, most of them on lab animals, have shown that, compared to those of slim mice, the intestines of obese mice are home to more bacteria species that efficiently convert indigestible food into digestible fatty acids. So the researchers suspect that obese people may have more efficient intestinal bacteria too. This would cause them to extract more energy from their food and to get fat faster. A human study would be complicated by the fact that everyone has a unique set of gut flora, says Professor Willem de Vos. 'Our aim was to take the first step with this overview article.' Info: [willem.devos@wur.nl](mailto:willem.devos@wur.nl)

## CLIMATE



### Shrubs protect permafrost

Tundra shrubs can help prevent the thawing of the permafrost due to climate change, according to researchers from Wageningen University. They found that in the Siberian tundra, a higher density of dwarf birch created shade that slowed down the thaw in the ground around the shrubs. They had expected the opposite, thinking that the shrubs would create warmer conditions. Vast amounts of carbon are stored in the largely frozen permafrost ground. If it thaws, it could have a major impact on the climate. Info: [daan.blok@wur.nl](mailto:daan.blok@wur.nl)



PHOTO JAN VAN FRANKEKER

## North sea still a plastic soup

**Legislation passed in 2000 requires ships in Europe to dump their waste in port, to prevent the crew from polluting the seas with their rubbish. But that is not yet delivering a noticeably cleaner North Sea, judging from the contents of the stomachs of sea birds.**

IMARES, part of Wageningen UR, is researching plastic pollution at sea.

The contents of the stomachs of North Sea petrels washed ashore serve as a yardstick for the cleanliness of the sea. These birds forage on the sea, and often swallow rubbish that they mistake for small fish, causing indigestible material such as plastic to collect in their stomachs.

Jan Andries van Franeker of IMARES is doing the research for the Ministry of Transport, Public Works and Water Management. Almost all the birds he has studied have had plastic in their stomachs. On average as much as 45 pieces, amounting to 0.31 grams per bird. Van Franeker talks in terms of a 'Dutch soup', with a nod to the 'plastic continent'

that Charles Moore discovered in the Pacific Ocean.

A benchmark adopted for a clean North Sea is that no more than one in ten birds should have more than 0.1 grams of plastic 'on board'. A norm that is far from being reached: in the past five years, it has been exceeded in six out of ten birds.

In any case, the amount of plastic in the North Sea has not decreased significantly since European legislation about bringing waste into port was tightened up. The composition of the rubbish is changing, however. The amount of industrial plastic is going down, while the amount of domestic plastic from household waste is rising alarmingly. Info: [jan.vanfraneker@wur.nl](mailto:jan.vanfraneker@wur.nl)

## NUTRITION

## HEALTH

## Tracing nanoparticles in food

Nanoparticles are used in food for their specific physiochemical properties. Not without possible health risks though. In the EU project NanoLyse, Wageningen UR is developing methods of tracing nanoparticles in food. There are no reliable methods of doing this to date. NanoLyse is a collaboration between RIKILT, part of Wageningen UR, and partners from Europe and Canada. Info: [info.rikilt@wur.nl](mailto:info.rikilt@wur.nl)

## CONSUMER BEHAVIOUR

## Buying eggs: the feelgood factor

When consumers buy eggs, it is not just the price that influences their choice. They want to feel good about their purchase as well. And that means a 'fair' egg without additives, laid by chickens that have had a good life. This has come out of research conducted by the LEI among fifty women in the Netherlands and Germany. The organic poultry sector is using the results of the research to improve the marketing of its products. Info: [Gemma.tacken@wur.nl](mailto:Gemma.tacken@wur.nl)



## ENVIRONMENT

## Biomass from Ukraine for Europe

A consortium led by Wageningen UR has received 1.2 million euros from the Ministry of Economic Affairs for the research project Pellets for Power. The project will investigate the scope for using biomass from the Ukraine to meet the big demand in Europe. In the Ukraine, at least one million hectares of land is unused or underused. By-products such as straw and reeds, and new crops could provide a source of local fuel as well as a biomass export crop. Info: [wolter.elbersen@wur.nl](mailto:wolter.elbersen@wur.nl)

PHOTO GUY ACKERMANS



# Insects as food

Eighty percent of the world population regularly tuck in to a portion of caterpillars, locusts or termites. Strange habits to western consumers' eyes, although insects are a highly valuable and sustainable source of protein. That is why Wageningen UR is researching how insects could be processed into various foods. The four-year research project 'Sustainable production of insects as food' is funded by the Ministry of Agriculture, Nature and Food to the tune of one million euros. The researchers are starting by looking into which waste flows from the food industry would make suitable food supplies for insects. They will also study the properties of insect proteins, such as the balance of amino acids, and the food safety aspects.

## SOCIETY

## First BSc programme in tourism

In September 2010 the Netherlands' first Bachelor of Science programme in Tourism will start up. The programme will look at tourism from a broad perspective, taking in the economy, society and the environment. For the first two years, students will study at the NHTV International University of Applied Sciences in Breda, and their third year will be done at Wageningen University. Students can then go on to do the MSc in Leisure, Tourism and Environment, for example. Info: [jan.philipsen@wur.nl](mailto:jan.philipsen@wur.nl)



## AGRICULTURE

## Crops can thrive on less phosphate

Crops can thrive on less phosphate-based fertilizer than previously believed, says Debby van Rotterdam, who got her PhD on the subject with the Soil Chemistry and Chemical Soil Quality chair group. She developed a better method of predicting the availability of soil nutrients, including phosphate attached to soil particles, which ends up in the soil moisture in the course of the season. 'When you give advice, you have to bear in mind this later addition, which varies with the soil type', says Van Rotterdam. BLGG, a laboratory for soil and crop research, has lowered the amount of fertilizer that it advises farmers and horticulturists to apply. Info: PhD supervisor [willem.vanriemsdijk@wur.nl](mailto:willem.vanriemsdijk@wur.nl)



PHOTO HOLLANDE HOOGTE



## Wageningen pleads for continued agrifood innovation

**The agrifood sector is of great economic importance and should therefore be spared from cuts. The Netherlands is ahead of the field and should protect its position by continuing to do innovative research. That is how the executive board of Wageningen UR sees the matter. And its appeal seems to meet with support from opinion makers.**

The executive board appealed in April to the political parties, top civil servants and the CEOs of big agrifood companies to exempt basic and applied research on agriculture and food from the coming round of government spending cuts.

A position paper has been distributed and an informal lobby launched in agrifood management circles. In the paper, the board writes: 'The Netherlands is in second place internationally as an exporter of agricultural and horticultural products, food and drink. With 600 thousand employees in about 96 thousand companies, the sector is a significant presence on the Dutch job market.' The sector's success lies in its continuous practical application of scientific findings. The board's appeal seems to be meeting with support. SER chair Alexander Rinnooy Kan, employers' spokesman Bernaard Wientjes and DSM director Fijke Sijbesma have appealed for extra investments in the agrifood sector in *Buitenhof*, *de Volkskrant* and *Het Financieel Dagblad*.

The position paper was a response to the 'Review report' commissioned by the cabinet to address the predicted budget shortfall of 29 billion euros. One of the themes touched on by the report is 'Innovation and applied research', and it outlines scenarios in this area that go to the heart of what Wageningen UR does. One possible consequence of the budget cuts could be the splitting up of the Ministry of Agriculture, Nature and Food Quality. The Wageningen directors do not think that is a good idea: 'When a new government agreement is drawn up, it is vital that we safeguard the socio-economic value of the agrifood sector for The Netherlands Ltd. Investing in theoretical and applied knowledge is a structural necessity if we are to maintain and improve our global position. And to do that we should avoid splitting up interrelated themes such as nature, food and agriculture and dispersing them across several departments.'

## Green waste as biofuel

During her PhD research, environmental technologist Kirsten Steinbusch found a new method of converting organic waste into energy using long-chain fatty acids which she discovered in large quantities in the waste. For producing biofuel, Steinbusch says organic waste has many advantages over the production of alcohol from sugars. It is cheap, energy-efficient and makes no demands on valuable agricultural land. Wageningen UR has applied for a patent on the main conversion process. Meanwhile, Dr. Steinbusch is going to explore the commercial potential of the process in the spin-off company Waste2Chemical. Info: [kirsten.steinbusch.nl](mailto:kirsten.steinbusch.nl)



PHOTO HOLLANDE HOOGTE

## LIVESTOCK

### Manure surplus solved by less livestock

The excess manure produced on Dutch livestock farms is piling up because environmental laws restrict the amounts of phosphate and nitrogen that farmers may spread on the land. In the absence of manure exports or technical innovations, livestock numbers will have to be cut by 20 percent by 2020, says the LEI, part of Wageningen UR. From 2015 the mineral surplus will reach 50 million kilos of nitrogen and 21 million kilos of phosphate. The sector hopes to solve the problem by adjusting the processing of manure, but another option is to reduce livestock numbers. All the scenarios are being studied for the Ministry of Housing, Spatial Planning and the Environment (VROM). Info: [hans.vrolijk@wur.nl](mailto:hans.vrolijk@wur.nl)

## NUTRITION AND HEALTH

## CLIMATE

## Lakes reinforce climate change

Lakes that warm up due to climate change give off considerable amounts of CO<sub>2</sub>. And those emissions speed up climate change in turn, says Wageningen researcher Sarian Kosten in Global Biochemical Cycles. Kosten received her PhD on 6 April for her research on the influence of climate on the ecosystems of shallow lakes in South America. One of the things that Kosten measured was the amounts of dissolved CO<sub>2</sub> in these lakes. She found to her surprise that most of the lakes appeared to be overloaded with CO<sub>2</sub>. This could have significant consequences because when cold lakes warm up they are likely to emit more carbon, and these emissions will increase global warming. This effect has not yet been integrated into the IPCC's climate models. According to Kosten, this is the first time that this correlation with temperature has been revealed.

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## PLANT

## Genetic switch for flowering

Wageningen geneticists and their Irish, Spanish and American counterparts have unravelled the workings of a key genetic switch for flowering in plants. This switch, the AP1 gene, can switch at least a thousand other genes on and off, setting off the flowering process in plants, reported the researchers in *Science*.

Together with her supervisor Gerco Angenent, first author Kerstin Kaufman did research on a variant of Arabidopsis that is related to the cauliflower. The AP1 switch is not present in the cauliflower and as a consequence the plant develops no flowers but a large number of buds. The knowledge gained on the workings of this switch has the potential to help plant breeders in developing new crops, perhaps with whole new kinds of flowers.

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PHOTO GUY ACKERMANS

## Tea and vegetables prevent stroke

**If you consume plenty of tea, raw vegetables and fresh fruit, you can reduce your risk of having a stroke. Wageningen PhD researcher Linda Oude Griep showed the effect of eating raw vegetables and fresh fruit, and Peter Hollman discovered which substances in tea are responsible for the protective effect.**

Consuming plenty of raw vegetables and fresh fruit cuts the risk of stroke. This does not apply to cooked vegetables and processed fruit, it appeared from PhD research results obtained by Linda Oude Griep of the Agrotechnology and Food Sciences chair group. Oude Griep studied data from over 20 thousand men and women whose eating habits and health status had been monitored for over ten years. The risk of stroke seemed to be 36 percent lower in people who ate plenty of unprocessed vegetables and fruit - more than 262 grams a day - than in those who ate very little - less than 92 grams a day.

It has been known for some time that tea is good for the cardiovascular system, and scientists guessed that this had something

to do with flavonoids. But Peter Hollman, a Wageningen UR researcher at both the Human Nutrition department and RIKILT, showed which of the flavonoids are responsible for this effect: the flavonols. He analysed the relationship between the intake of various types of flavonoid and the incidence of stroke in a meta-analysis of data from over 100 thousand test subjects from previous studies. 'With an intake of flavonols that is equivalent to the amount in three cups of tea, you can cut the risk of stroke by 20 percent', says Hollman. The results have been published in *The Journal of Nutrition*.

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# What did bees eat?

**Researchers from Alterra, part of Wageningen UR, and the European Invertebrate Survey in Leiden are going to dust off museum collections in search of old pollen. They want to get an impression of the food that was available to wild bees over the past few centuries. The study is part of a larger research on the alarming fall in bee numbers.**

Among the possible causes for the decline of the honey bee in recent years are changes in vegetation and landscapes. It is known, for example, that clover, which is important for bumble bees, is much scarcer than it used to be.

Last year the Ministry of Agriculture, Nature and Food Quality allocated one million euros to a research programme on the reasons for declining bee populations. The Dutch Centre for Bee Research (NCB) is going to measure the losses among beekeepers, while ecologists will try to quantify the decline in wild bee populations. Plant Research International (PRI), part of Wageningen UR, is conducting in-depth research on the vitality of bee populations, disease levels, food and beekeeping. This will include research on the impact of

the Varroa mite.

The cause of the high death rate in bee populations is still far from clear. One explanation points the finger at the Varroa mite as the chief disease carrier, while the other blames high environmental concentrations of pesticides. Sijf van der Steen of PRI: 'European bee researchers stick to the theory that the Varroa mite and wrong beekeeping techniques are the main reasons for the bee death rate. On the other hand, there is a group of researchers who are convinced that pesticides play a role. That has been researched in French and German studies. Ninety percent of the bees have been found to carry pesticide residues, but no link with the death rate has been proven.' Info: [sjef.vandersteen@wur.nl](mailto:sjef.vandersteen@wur.nl)



## Sustainable biofuels come from the tropics

Palm oil from South-east Asia, sugar cane from Brazil and sorghum from China are the most sustainable energy crops at the moment. The environmental impact of maize or wheat as energy crops is much greater. The Plant Production Systems chair group at Wageningen University tested nine energy crops against sustainability criteria. Oil palms, sugar cane and sorghum make the most efficient use of land, water, nitrogen and pesticides relative to the amount of energy they produce. If no forest is cut down for them, they produce far smaller quantities of greenhouse gases than fossil fuels do, say the researchers. Major energy crops such as maize in the US and wheat in Europe score much lower on nearly all the sustainability criteria. Sugar beet and oil seed rape (Europe), cassava (Thailand) and soya (Brazil) scored in the middle range. The Wageningen researchers' findings are published in *Biomass and Bioenergy*. Info: [sander.devries@wur.nl](mailto:sander.devries@wur.nl)

## Surinamese women want to enjoy their food

For women from Suriname or the Antilles, the advantages of healthy eating are outweighed by the disadvantages. This finding has come out of research done by the LEI, part of Wageningen UR, on what stops these women from adopting healthier eating habits.

Overweight is more common among people from Suriname and the Antilles than among 'indigenous' Dutch people. Along with age, sex and socio-economic status, ethnicity plays a significant role in this. The women interviewed told researchers that healthy food didn't taste as good. Their ideal figure is also larger and they are not convinced of the link between healthy eating and losing weight, or of the health risks of overweight. Info: [elvi.vanwijk@wur.nl](mailto:elvi.vanwijk@wur.nl)



## HORTICULTURE

## RURAL LIFE

## Café on the farm

A little café where passers-by can rest their weary feet a while over a cup of coffee: an example of the kind of small-scale catering venture that can quite easily be started up on a farm. Councils can include this kind of catering outlet in their land use plans without changing designations and often without any procedures. This opens up opportunities for agricultural entrepreneurs and adds to the attractions of the countryside. Wageningen UR researched policies in a number of councils. Part of the report is a 'checklist for supplementary catering outlets', intended to help councils and agricultural entrepreneurs to get an idea of the possibilities. Info: [www.lei.wur.nl](http://www.lei.wur.nl)

## NUTRITION

## Fatty snacks do not always make you fat

Snacking doesn't have to make you fat – at least, not if you are young and slim. This was implied by results from Mirre Viskaal-van Dongen's PhD research comparing the effects of high-energy snacks such as peanuts with those of low-energy ones such as fruit.

According to popular belief, snacking makes you fat. The results suggest otherwise: there was no significant difference in the weights of test subjects who ate fatty snacks and those who ate light ones. Viskaal-van Dongen's supervisor, Kees de Graaf, professor of Human Nutrition at Wageningen University, was surprised by the results. The test subjects probably compensated for the snack by eating less other foods. Their youth – their average age was 22 years – may also have been a factor.

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PHOTO LINEAIR

## Herbal cure for malnutrition

The herbal plant Amaranth could help reduce malnutrition in Kenya, concluded Cecilia Moraa Onyango from the research with which she got her PhD from the Horticultural Production Chains chair group on 29 April.

Onyango researched the cultivation, nutritional content and fertilizer needs of *Amaranthus hypochondriacus*. The green amaranth proved to be rich in crude proteins,

vitamins, fibres, minerals such as iron and zinc, and antioxidants such as flavonoids and glucosinolates. Because it is fast-growing and easy to cultivate, it is a practical crop for small farmers in the Nairobi area, and especially for women. A small amount of artificial fertilizer, possibly combined with manure, provides the ideal input for amaranth.

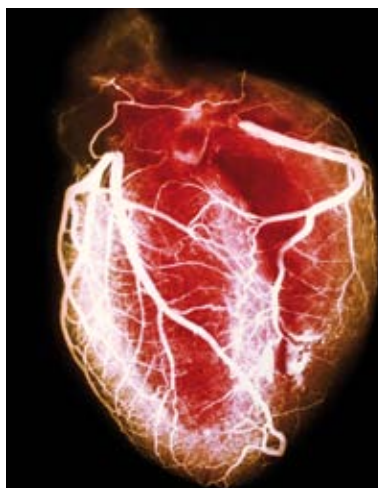
Info: supervisor [olaf.vankooten@wur.nl](mailto:olaf.vankooten@wur.nl)

## NUTRITION AND HEALTH

## The heart protects itself

After a fatty meal, a specific protein goes into action in the heart and prevents harmful substances from accumulating in the heart muscle. This emerged from research conducted on mice by Sander Kersten and colleagues at the department of Human Nutrition at Wageningen University. It is thought that this protective mechanism works less efficiently in people with too much body fat. Follow-up research on human subjects should shed more light on the matter.

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## PATHOGENIC STRAIN OF BACTERIUM UNIQUE TO THE NETHERLANDS

# Q fever raises many questions

**The outbreak of Q fever in the Netherlands may stem from a strain of bacteria that is unique to the country, according to a research by the Central Veterinary Institute (CVI), part of Wageningen UR. The CVI is avidly looking for answers to the many questions surrounding Q fever.**

TEXT BROER SCHOLTENS ILLUSTRATIONS SEBASTIAAN DONDERS

**T**he Q fever bacterium *Coxiella burnetii* has been around for years in the sheep and goat sector without affecting humans much. That has changed: this animal disease is now causing big problems. The Central Veterinary Institute (CVI), part of Wageningen UR, has significantly expanded its basic research on Q fever in the past year, in response to the explosive nature of the disease outbreak. This explosion seems to be affecting the Netherlands alone – nowhere else, not even Australia, the ultimate sheep and goat country. To explain this, new research points to a unique and virulent bacterial strain that is only circulating in the Dutch goat sector. But how did this strain get here? The outbreak is also being put down to the massive rise in the number of goats

in the Netherlands in the past 25 years. Research into the origins and distribution of the disease is in full swing, and should provide answers about the best strategy for halting the disease and preventing further infections. Will vaccinating all goats, for example, spare human beings from infection?

### FROM GOAT TO HUMAN

Veterinarian Fred van Zijderveld is head of the bacteriology department at the CVI in Lelystad. Besides Q fever, he is interested in rare diseases such as ‘mad cow disease’ and scrapie, a disease which affects the central nervous system in sheep. Van Zijderveld is a busy man. And he is on duty, so his mobile phone rings quite frequently. ‘Fine, send in the samples, we will have a look at them’,

he tells a caller. ‘That was the zoo’, he then explains.

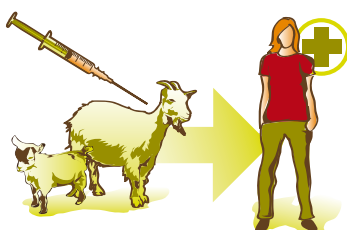
The origin of this infectious disease has long been a mystery, which is why it is called ‘Query fever’. It is now clear that humans catch the disease from dairy goats and sheep. The Q fever bacterium is seldom transferred from person to person; it mainly affects people who come into contact with infected animals, or who live near goat farms. Eighty percent of vets and livestock holders and their families have been infected by the bacterium; this can be seen from antibodies in their blood. ‘They have been sick without having any symptoms; most of them did not notice that they were infected’, says Van Zijderveld. The same research, conducted two years ago by the CVI and the National Institute for Public Health and the Environment (RIVM), >



What is the best strategy for controlling the disease and preventing infection?



Will vaccinating all goats protect people from infection?



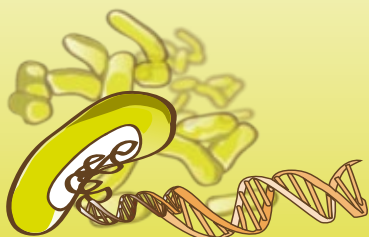
Does it help to vaccinate people?



What is the genetic make-up of the Q fever bacterium?



What information can it provide on the spread and virulence of the disease, the infection process and building up immunity?



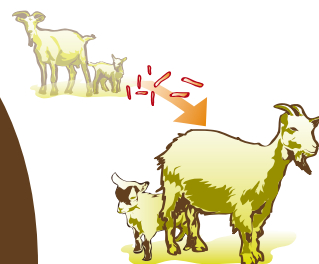
## Q fever



How does the infection spread among goats?



How is immunity built up?



What causes the high abortion rate among infected goats?



Infected cattle and pigs have very few symptoms. Why is that?



Q fever is only spreading rapidly among goats in the Netherlands. How come?



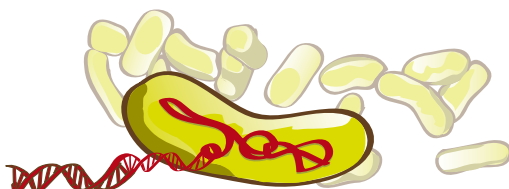
Is it partly to do with the massive increase in the numbers of goats in the Netherlands?







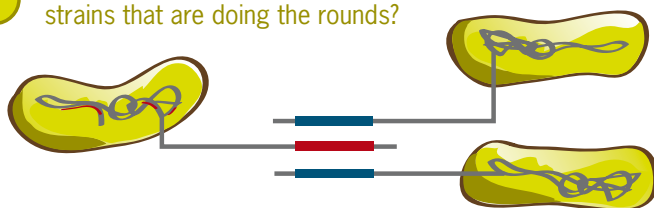
The outbreak of Q fever in the Netherlands may be due to a unique bacterial strain that only occurs on Dutch goat farms.



How did the strain get here?



How does this strain differ from the other strains that are doing the rounds?



## SHOULD PEOPLE BE VACCINATED?

To halt the spread of Q fever, all sheep and goats are being vaccinated and culls are being carried out on dairy sheep farms. The Health Council is researching the usefulness of human vaccination. There is only one human vaccine, which was developed from an Australian bacterial strain and only registered on the Australian market. This vaccine protects 83 to 100 percent of those given it for at

least five years. The Health Council is examining whether high risk groups such as heart patients should be vaccinated. The problem is that very little is known about the possible side-effects of vaccines for these high-risk groups. In Australia it is mainly young, healthy people who are vaccinated. Extensive human vaccination does not seem a viable option at present, due to possible side-effects – some of them serious.

showed that 30 percent of veterinary science students have at some point been in contact with the bacterium. The more often you walk around goat farms, the bigger your chance of infection, concludes Van Zijderveld.

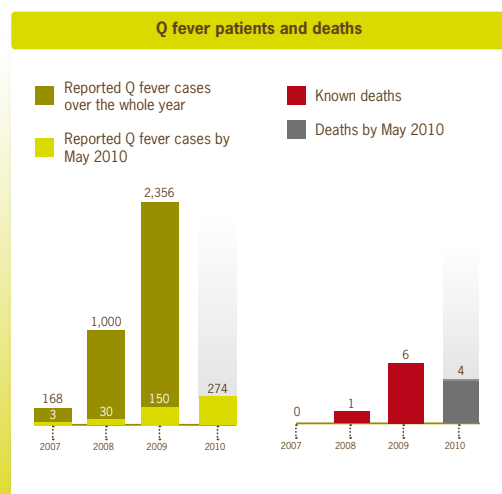
## CONDENSED LAYER OF MANURE

Many experts think that the rapid rise in the number of Q fever patients in the Netherlands can be traced to its intensive livestock farming practices, with large numbers of animals per square metre. In 1984 there were 3,300 dairy goats in the Netherlands, most of them on small farms. By 2008 there were 355,000 dairy goats on 400 farms, according to CBS statistics. Most of these farms are in North Brabant between Den Bosch and Eindhoven; the second biggest goat-farming region in the Netherlands is Gelderland.

The most common goat breed is the white Saanen goat, the best dairy goat in the world, with a milk production of over 1,000 litres per year. The animals are kept in deep litter stalls, considered in the goat sector to be relatively animal-friendly. Goat farmers do not use the sorts of animal-unfriendly metal grid flooring common in pig and cow sheds. A deep litter stall is a bit like a swimming pool filled up with straw and goat manure. The animals, on average one goat per ten square metres, walk around and excrete the whole day on straw that is added to daily. At lambing time, they also leave behind amniotic fluid, placentas and aborted fetuses. The doors of a deep litter stall are left open for ventilation so that wet straw dries fast. Once or twice a year, when the condensed layer of manure reaches the top of the stall - by which time it is often 60 to 80 centimetres deep - it is shovelled out. Until recently, it was then spread over the land as fertilizer. Once on the fields, the manure dries out even more, and the bacteria, baked onto clods of manure and soil, are blown with the wind. They can spread over great distances, sometimes up to several kilometres

## Farms affected by Q fever

- Farms declared infected in 2009
- Farms declared infected in 2010
- Farms declared free of Q fever in 2010



Sources: OSIRIS/RIVM • CBS • Food & Consumer product Safety Authority

from a goat barn. People living in the immediate vicinity of such barns therefore regularly breathe in Q fever germs which can make them ill.

### GERMS TRAVEL

Most cases of Q fever occur in central Brabant, where the most goat farms are located. 'Our guess is therefore that in the Netherlands, Q fever is spread by the wind carrying manure and dust', says Van Zijderveld. 'There is a broad consensus on this.' In wet areas with lush vegetation, the germs will not travel as far as in dry areas with sparse vegetation, such as arable fields. This is probably because vegetation retains dust and germs better. Fewer people will therefore be infected in wetter areas, according to recent calculations by researchers at the RIVM and FutureWater, a Wageningen-based advisory bureau. FutureWater, set up

**'If we vaccinate over the next three years, dairy goats will no longer pose a risk to public health'**

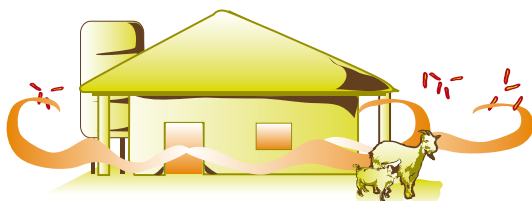
by researchers at Wageningen University, has also found correlations between the number of Q fever patients and the number of spontaneous abortions in goat barns in the neighbourhood.

The reason for this is that the most bacteria get into the manure in the stalls during lambing season, and from there into the air. Spontaneous abortions, which are common in goat barns, are the biggest source of bacteria: when a dairy goat miscarries, billions of bacteria are released into the straw. Even during a normal birth, many bacteria end up

in the deep litter stalls – several million, according to research.

Moreover, it is precisely the *Coxiella burnetii* bacterium that causes spontaneous abortions among dairy goats. Since the Q fever bacterium began to spread faster, the number of such abortions has risen: a vicious circle. There are now barns in which 30 to 60 percent of the infected, pregnant dairy goats miscarry. Van Zijderveld: 'Cattle that are infected with the Q fever bacterium also have the occasional spontaneous abortion, but far fewer than the dairy goats.' ➤

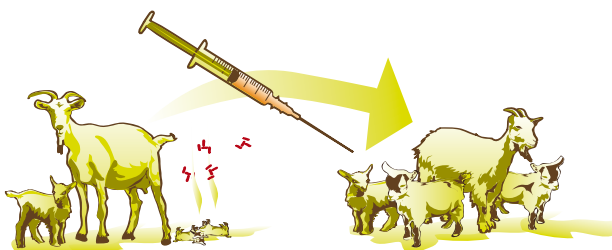
- i** Most bacterial germs get into the manure during the lambing season, and spread into the air from there.



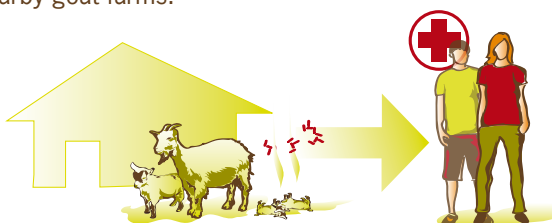
- i** Goats get infected through nose and lungs.



- i** Vaccinating goats cuts the number of abortions almost to zero.



- i** A link has been found between the number of Q fever patients and the number of abortions on nearby goat farms.



The Q fever bacterium is in circulation in the pig sector too, but without many symptoms. The theory goes that these are other, less virulent strains which do not affect the animal so badly.

### STORING MANURE AND VACCINATING

Measures currently being taken against the Q fever explosion are primarily intended to reduce the production and airborne distribution of pathogens. For the first time this year, for instance, all sheep and goats are being vaccinated. There were vaccination campaigns during the past two years too, but they often did too little too late. Recent research has shown that vaccination reduces the number of abortions almost to zero. Van Zijdeveld: 'If we vaccinate for the next three years, there will no longer be any dairy goats in the population that pose a major risk to public health.'

Hygiene measures are being introduced to reduce the airborne spreading of dust from manure. For example, a rule that requires manure to be composted for three months before being spread on the fields. During composting, the temperature of the manure rises above 70°C, killing off the bacteria. Research is ongoing to determine exactly how fast the temperature rises in a dung heap, and where in the heap it rises. A further measure being taken is to cull the herds at infected dairy goat farms until June this year, in order to prevent germs from spreading in the short term. With all these measures, the expectation is that the Q fever outbreak will die down. 'There are no other short-term measures', says Van Zijdeveld.

### A REMARKABLE FINDING

In the long term we shall have to rely on knowledge generated by new basic research that has been set in motion over recent months, says Van Zijdeveld. For instance, researchers are studying in the laboratory how the infection process works in goats, from contamination to the subsequent building up of immunity. Research is also being done



into the genetic make up of the Q fever bacterium. Several specimens from infected humans and animals have already been analysed genetically, and the initial results are very informative. Fifteen different strains of the Q fever bacterium have been found in the Netherlands to date. Thirteen of these occur in goat barns. But genetic research has now revealed that one type is dominant and, what is more, this type is found hardly anywhere else in the world. 'A remarkable finding, which must mean something', says Van Zijdeveld. 'This might explain the remarkable explosion of Q fever in the Netherlands, and its pathogenic potential among humans.'

The same genetic analysis has been made on blood samples from dairy goats after a spontaneous abortion. In 238 of the 251 samples analysed, the same bacterium type was found: a type that was not found in cattle or sheep, and which does not occur in other countries.

### GOATS ARE LIKE TOP ATHLETES

The bacterial strain circulating among Dutch dairy goats seems to be different from those affecting other animals. 'We are trying to find out whether the Q fever bacterium has changed over the years, and whether any change has anything to do with intensive livestock farming. These goats are like top athletes. They have been bred for higher milk production, and this subjects them to a lot of stress and brings them close to their physiological limits', says Van Zijdeveld. 'It could be that this genetic change in the bacterium is responsible for the rising number of abortions among dairy goats in the Netherlands. It is a change that could also have influenced the virulent nature of the disease, and its capacity to make people ill.' The CBI now has eight recent bacterial samples from people, goats and sheep at its disposal. More samples will be added over the coming months, including some from other animal species. The plan is to map the whole genome of all these various Q fever bacteria, and then use bioinformatics tech-

niques to look for genetic differences that could explain the differences in virulence, for example.

### BUILDING UP IMMUNITY

The CBI is also conducting tests to identify the infection route. These have included tests over the past few months to find out by which route dairy goats become infected. Twelve dairy goats have been brought into contact with the dominant type by various routes: via the mouth, the nose and the lungs, and by injecting bacteria into the skin. 'Results from this research suggest that inhalation through the nose and lungs is the most likely infection route', says Van Zijdeveld.

'Taking this as our starting point, we are going to scale up the testing this year to include dozens of goats. We shall look again at the infection route via nose and lungs, so as to verify our hypothesis. We shall also look at how the body responds to infection, in order to find out how a goat gradually builds up immunity to the Q fever bacterium. The CBI is also researching how vaccines protect against abortions. 'This sort of information makes it possible to put better measures in place for preventing infections among goats', says Van Zijdeveld. ■



**FRED VAN ZIJDERVELD,**  
deputy director of the  
Central Veterinary Institute,  
part of Wageningen UR, in  
Lelystad.

*'It could be that a genetic change in the bacterium has influenced the virulent nature of the disease'*

### EPIDEMIC PROPORTIONS

The outbreak of Q fever has reached epidemic proportions in the Netherlands. Until 2007, GPs were reporting an average of 20 cases per year to the regional health services (GGDs). In 2009, 2,365 cases were registered. In the first months of this year, this rise seems to have continued, albeit on a more limited scale. Up until mid April, there were 243 reports of Q fever. Over half of these patients contracted the disease this year; the others contracted it last year. The figures are distorted, thinks the RIVM (National Institute of Public Health and Environment), because both doc-

tors and the public are now more aware of Q fever. As a consequence, more blood samples of people with symptoms such as fever, coughs and headaches are being sent to the lab for analysis. It is probable that many people were infected with Q fever in the past, but that most of them hardly noticed it. This is because more than half of the people infected with Q fever show no clinical symptoms. At the other end of the spectrum, a tiny percentage of those infected suffer chronic symptoms over many years.

## EXPERIMENTAL ZOOLOGIST DAVID LENTINK

# ‘I want to know how the world works’

**He made it onto the covers of *Science* and *Nature* with his research on flight movements, and numerous camera crews have come to film his flying robots. David Lentink realizes that his research work is made possible by other people's interest in it.**

TEXT YVONNE DE HILSTER PHOTO SAM RENTMEESTER

Lentink got his doctorate – with distinction – in 2008. It was all about the vortices, in the form of mini tornados, that are a feature of swimming and flight movements and play a role in aerodynamics. In the course of his research, Lentink constructed several small robots, together with his Bachelor's students. The Delfly flaps its wings like a dragonfly, while the Roboswift swoops through the air like a swift. He has also made robot models of plant seeds that rotate on their axes, a robot based on the movements of the zebra fish larva and testing equipment for quantifying air flow patterns. And he still has a whole hard disc full of research ideas. ‘If I come across something interesting that could be relevant for my work, I want to delve right into it, and to find out what is known about it and what isn't. That way I am always coming across new things that inspire me to ask new questions. Take the maple seed for example. It has recently been shown that these little seeds are just occasionally carried great distances by the wind, and that this is

crucial to their successful dispersal. Between 1910 and 1920, someone apparently built a steam-powered helicopter along the lines of the maple seed, and there are also smart bombs that fly like this. It is fun to connect up these things, and you get new insights from it. Plus, you have a nice story to tell at a conference.’ Lentink believes this kind of attention to communication and storytelling ability is important for reaching people and advancing the cause of science. ‘Otherwise my research is pointless.’

### SPARE TIME PROJECTS

‘One piece of testing equipment, like the soap film and the wind tunnel, represents the ingenuity of three people’, Lentink stresses. ‘Me, the instrument maker and a student. As a researcher you are always dependent on finding the right people and the right moment, and on getting the opportunity.’ Lentink feels that freedom is vital to creative research. And he was given it by his professor, Johan van Leeuwen, who also organized an ‘excellent supervision team’ of two supervisors. Lentink

is keen to have all the practical support he can get too. ‘There are always people who can do things better than I can. When I noticed that there was a good precision engineer in the department, Eric Karruppannan, and found we got on well too, I was eager to make use of his expertise.’

As a Delft University graduate in Aerospace Engineering, Lentink was able to provide the basic idea for his studies on vortices himself. Although, he says, these were really spare time projects. ‘At the university, the amount of creative freedom is still limited because otherwise you can't function as a group.’

It taught him to think strategically, though. ‘My swift research piggybacked on another experiment that required a wind tunnel balance.’

He is a workaholic, Lentink admits – but what else can you be if you really give priority to helping the people around you to make progress? He has supervised six MSc students and more than thirty BSc students over the past few years. ‘My supervisor al-



David Lentink at work on his swift research in the wind tunnel.

ways had time for me as well, so I know how important it is. And if you are approachable, many students are motivated to do more than the minimum that is required of them.'

'I could do something more lucrative of course – a job as a scientist may be financially attractive for a biologist, but it isn't for an aerospace engineer. But biology interested me: I want to know how the world works and being able to apply knowledge is what makes my work interesting. I can also enjoy cooking, design, art and theatre, and I like it when you can see that people have spent far too much time on something. Sure, I get a kick out of those publications, but the best bit about it was working with people.'

Once of the things still on Lentink's wish list is to have red-tailed grey parrots fly in the wind tunnel and get a detailed film of them doing so. He is now training parrots so that they do not land on the ground or get caught in the netting. This was done successfully last year with the smaller lovebird (*agapornis*). To learn to do it even better, Lentink went to Sweden in May for a course on animal training in which chickens were used as subjects. 'The biggest problem in training animals is yourself. It is also scientifically important to be aware of your own behaviour, because what you do can influence the animals' behaviour.' ■

## CV

David Lentink (1975) obtained his doctorate at Wageningen University in 2008 on the vortices that accompany the movements of fish and birds. He published his findings in journals including *Science* (2004, 2009), *Nature* (2007) and *Biology Letters* (2010), and has won several research prizes, both individually and as part of a team. Lentink is assistant professor at the Experimental Zoology chair group at Wageningen University.



# Will a new logo work

**By early 2011 there should be one new health logo for food products, says the Dutch government. The current range of logos are a hit with producers, but consumers don't seem to take much notice of them. Will that change if there is just one logo?** TEXT KORNE VERSLUIS PHOTOS GUY ACKERMANS

**FRANS KOK,**  
professor of Nutrition and Health  
at Wageningen UR

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**'As far as I'm concerned only staple foods should be allowed to carry the logo'**



'I am not very impressed with the current logos. The thinking is that items in any product category, from staple foods to extras such as sauces and snacks, can carry a logo if they are healthier than other similar items. I don't think that that is the way forward. You're giving people an alibi to eat unhealthy foods: it's OK, because it says on the package that it is healthier.'

As far as I'm concerned only staple foods should be allowed to carry such a logo. With these products you can put together a healthy menu that provides 100 percent of the required nutrients. That would give you about 75 percent of your daily intake of calories, leaving you enough leeway for the odd ice-cream, drink or snack, for instance.

The standards required for a logo are not strict enough at the moment, and that is surely because the initiative comes from within the industry. I would favour one logo taking two forms: a 'gold brand' and a 'silver brand'. The 'gold brand' logo would indicate that a product is fully in line with the nutritional guidelines, and the silver one that it is on the right track but hasn't yet ticked all the right boxes. This would give companies something to work towards without excluding them from the start. Working to achieve one single logo is a good thing, but I am concerned about whether it will happen. Albert Heijn and Unilever have a long history of differing opinions about these logos. It remains to be seen whether they can settle their differences. And if they can, the question remains what other food manufacturers will do. It's high time the Dutch government took over the reins in establishing a uniform logo to which all parties have to conform.'

# better?

## MARIEKE MEEUSEN,

researcher at LEI, part of Wageningen UR, published – together with Marcel Kornelis – a study on the effects of the ‘Conscious Choice’ logo on consumers

### ‘I doubt whether the new logo will make much impact’

‘We measured whether the ‘Conscious Choice’ logo makes people buy more of a product, but this hardly seems to be the case. We singled out four product groups to see if the introduction of a new product with the logo on it influenced the sales figures: custard, yoghurt, instant soup and fruit drinks. Given the producers’ eagerness to carry the logo, we expected some market cannibalism from other brands and products, but we didn’t see this happen. It seems that the impact is negligible. The introduction of new products seems to create a stir on the market, whether or not they carry a logo. We can’t directly attribute the effect to the logo; it’s more the fact that a product is new that makes consumers buy it. We have just done a study on how people without higher education view the logo. We noticed that people by no means always trust the logo. These companies just put a stash of money on the table and then they get permission to use the logo.’ Something else that doesn’t do much for confidence is that the ‘Conscious Choice’ logo appears on unhealthy products such as liquorice and chips. It doesn’t seem to me such a difficult message that products carrying a logo are relatively healthy compared to other products of the same type, but then people already have so many logos to look at. Animal welfare ratings with two or three stars, the ‘eko’ logo, to name but two. So that message is quite complicated after all. Which is why it seems to me a sensible idea – for the consumer anyway – to have just the one logo instead of two. But whether it will make a great impact on the consumer, I have my doubts.’



### FROM TWO TO ONE

The ‘Conscious Choice’ logo was introduced by Unilever and dairy company FrieslandCampina in 2006. Albert Heijn supermarket had just launched its own health logo, the ‘Healthy Choice’ cloverleaf, which is on the staple products of the supermarket’s own brand.

On the basis of an advisory report by the Health Council of the Netherlands, minister Klink has demanded that Albert Heijn and ‘Conscious Choice’ introduce one single logo by 1 January 2011. Both parties recently said they were confident that they would succeed in this.

‘People do not always trust the logo’

## ‘One logo is easier to grasp for the consumer’

### HANS DAGEVOS,

researcher with LEI, part of Wageningen UR,  
who compiled the book *Health Logos on Food*

**‘It could be that the logo invites compensation behaviour. Something like: you can allow yourself one more of a product with the logo on it’**

‘The ‘Conscious Choice’ logo has three aims: making it easier for the consumer to choose healthy food; encouraging manufacturers to produce healthier food; and promoting public health. It isn’t clear yet whether this logo achieves these aims. The first one, facilitating a healthy choice, has not been properly researched yet. The VU University Amsterdam has looked in people’s shopping baskets and concluded that those who are well informed about the logo also tend to buy more products carrying the symbol. But whether it makes them live more healthily, we don’t know. It could be that the logo invites compensation behaviour. Something like: you can allow yourself one more of a product with the logo on it. It’s a known fact, for instance, that people leave low-energy light bulbs switched on for longer. That sort of compensation behaviour could also occur with food. These logos are an important attempt to get people to eat more healthily, but there is much more to food than that. What you eat is related to your environment, to culture, to psychology. One tiny little logo can’t be expected to encompass all that.

Producers seem to take a good deal of trouble over product innovation. At any rate they produce impressive statistics about the tons of trans fats, sugar and salt they have cut out of their products. But there are sure to be companies amongst them who see that they can meet the criteria without much trouble and who join the scheme for that reason. One of the chapters in the book was written by marketing people, by the way. They have a different outlook on this. If there are several logos, they can compete and that makes them sharpen up their criteria. That would be lost if there only was one logo. And a logo is more than just a list of criteria. Chiquita, for example, is working very hard to build a positive image by cooperating with the Rain Forest Alliance. There you can see how a company and a logo organization can work together. If there are several logos you stand more chance of building up something like that. But that advantage may be smaller than the disadvantage of consumer confusion. From a health angle one logo will be better – easier to grasp for the consumer.’





**DICK VEERMAN,**

initiator of foodlog.nl, presented his own logo  
at the end of April: [kijkofhetklopt.nl](http://kijkofhetklopt.nl)

**'The philosophy behind these logos starts from a negative premise: we have gone wrong in the past, and now we are planning to go a little less wrong'**

'The 'Conscious Choice' logo makes people stupid. It's stuck on junk food that has been made a little less junky. If it said 'Conscious Less Unhealthy Choice' I wouldn't be making a fuss, but as it is, it's just a lot of nonsense. For example, there is a product called 'Vitaminwater' on the market now, water with sugar and vitamin C in it. The vitamin C you don't need and everyone knows that sugar is bad for you. Unhealthy water, in other words, and yet it has the 'Conscious Choice' logo on it. Because Sourcy describes it as a soft drink with less sugar in it. It's a con, and people know it is.

Another hilarious example is the ice-cream gateau with the 'Conscious Choice' logo on it. According to Ola you could eat their gateau every day. Up till now nobody needed telling that it's not a brilliant plan to eat ice-cream gateau on a daily basis. Meanwhile the logo is also on apples and spinach. Which everyone already knew to be fine. So where does this leave us? Do we need another new idea to protect us against this sort of daft practice which labels spinach and ice-cream gateau as equally healthy? The philosophy behind these logos starts from a negative premise: we have gone wrong in the past, and now we are planning to go a little less wrong. We start from a positive principle: transparency. People want to know what they are eating, although they don't want all the information in one go. They are very capable of finding out for themselves what they want to know. No one reads the newspaper from cover to cover either - we each read what interests us most. We would like a wiki website where everyone can find information about food products and discuss them. Let people work out for themselves what they really want to buy.' ■

**CONSCIOUS CHOICE**

The number of products featuring a 'Conscious Choice' logo is growing fast. By the end of 2009, 4,750 products from 118 producers were permitted to carry the logo. To qualify, products must fulfill certain requirements such as not containing too much sugar, salt or the wrong kind of fats. Comparisons are made with products within one category. In this way it is possible for unhealthy products such as sweets and snacks to carry the logo because they compare favourably with the competition.

**'It's a con, and people know it is'**





THE DUTCH POLDER MODEL IN CHINA

# Tackling the yellow waters

**The people living in the catchment areas of China's Yangtze and Yellow rivers have to deal with floods, water shortages, pollution and erosion. Technically, there is not much you can teach the Chinese about the measures to be taken. Wageningen UR's main input here is to stimulate the various stakeholders to work together towards integral solutions: the Dutch Polder Model in China.**

TEXT RENÉ DIDDE PHOTO HOLLANDSE HOOGTE ILLUSTRATION SCHWANDT INFOGRAPHIC



**W**hen the water experts of Alterra, part of Wageningen UR, are in China on a working visit, they sometimes feel as though a time machine is taking them back to the 1970s, when Europe faced heavy pollution of the Rhine with salinity and metals, when dead fish floated on their backs, and the countries connected by the Rhine barely cooperated. 'There is this incredible faith in China that any problem can be solved by technical measures', says Alterra's Bert Harms. Technically there isn't much you can tell the Chinese, but we can teach them how to implement decisions taken centrally by all the stakeholders', Koen Roest reports. 'There is a steadily increasing interest in taking an integral approach to water resources management', Eric Arets adds.

Harms, Roest and Arets of Alterra are working on a longstanding EU water management project, carried out by a consortium of European consultancy firms. DHV China consultancy is in charge of the project and one of Alterra's responsibilities is to provide scientific input and to assure scientific quality. Harms is project leader, Arets is an ecologist, and Roest is the water expert. Development is going ahead at breakneck speed, say Harms, Roest and Arets. The decades that Europe needed for awareness raising are being skipped by China. A good thing, too, as China is home to a fifth of the world's population and commands only one twentieth of world water resources. The people living in the catchment areas of China's Yangtze and Yellow rivers in particular have to cope with floods in one place and water shortages in another, and with deteriorating water quality through pollution and severe erosion. The problems are exacerbated and accelerated by China's economic development which, in spite of the global recession, has been going at top speed for years.

### PESTICIDES IN AGRICULTURE

'After an Alterra researcher noted that the concentration of agricultural pesticides in the water was a hundred times higher than amounts in Europe, it came home to people that pollution with agricultural pesticides must be reduced. We have since been working for the Chinese Ministry of Agriculture on import policies on plant protection products', says Bert Harms.

The key aim is for Europe, and in particular the Netherlands, to guide China through the finer points of the Polder Model. And a crucial element in this is the European Water Framework Directive, a legislative feat that offers guidelines for integrated management of ground water, surface water, flooding, soil and land use, with an ecosystems approach.

The focus is on China's two enormous rivers, the Yellow river and the Yangtze, the fourth longest river in the world. The Yangtze has water shortages in the north and a water surplus in the delta, where it also

has to provide sufficient clean drinking water to the city of Shanghai with its millions of citizens. 'The Three Gorges Dam, which is a technical monster of a project, has a hydroelectric power plant that is aimed at eliminating flooding downstream', says Roest. 'But a lot of the flooding is due to the erosion of agricultural land', says Arets, who has just returned from the area.

By the time the Yellow river – yellow because the river carries large quantities of sediment from the colossal loess clay plateau which it traverses – flows into the Yellow Sea it has so little water left that it is dry for more than a hundred days a year. This is partly caused by the draining of water for agriculture in the bone-dry Gobi Desert. Another worry is the quality of the water, due to some extent to the degradation of the soil at various points along the river. To determine the impact of erosion on the water, Alterra could make use of a model that was developed for the loess clay areas of South Limburg in the Netherlands. 'It turns out to be beautifully applicable to China', says Harms proudly. As a result of agriculture on the slopes there, the topsoil has become so badly degraded that the first shower of rain flushes away a great deal of soil. 'Farmers are now being encouraged to plant fruit trees and make use of terracing in their agriculture', says Arets. 'This improves water retention through the seasons, and also captures carbon in the vegetation.' China awards subsidies as an incentive for farmers to change their habits in these ways.

### THE EMPEROR IS FAR AWAY

However convinced the central authorities in Beijing are of the value of the integrated approach to water management for the big rivers of China, they still have to reckon with the powerful government bodies in the city councils and provinces. And many of the latter are as big as France. 'There's good reason for the Chinese proverb "The mountains are high and the emperor is far away"', says Harms. 'What is more, at the local level we often need to work with stubborn officials, who may also happen to be the director of a local factory with certain interests that are covered by the committee they sit on', he adds.

There is also the fact that the Chinese hierarchies have different committees serving the interests of the environment, agriculture and water. 'And these committees often don't cooperate well', say the Alterra team. In short, there is a place for the stakeholder consultation process known in the Netherlands as 'poldering', getting all the stakeholders round the table in this immense and fast-growing country. This is already getting results. 'Once the Chinese have come to a decision, they really stand by it and then things move very fast', Harms finds. 'For example, there is often

## CHINA'S BIG RIVERS

### Number of people dependent on the river for their water supply

Yellow river

140 million

Yangtze river

400 million

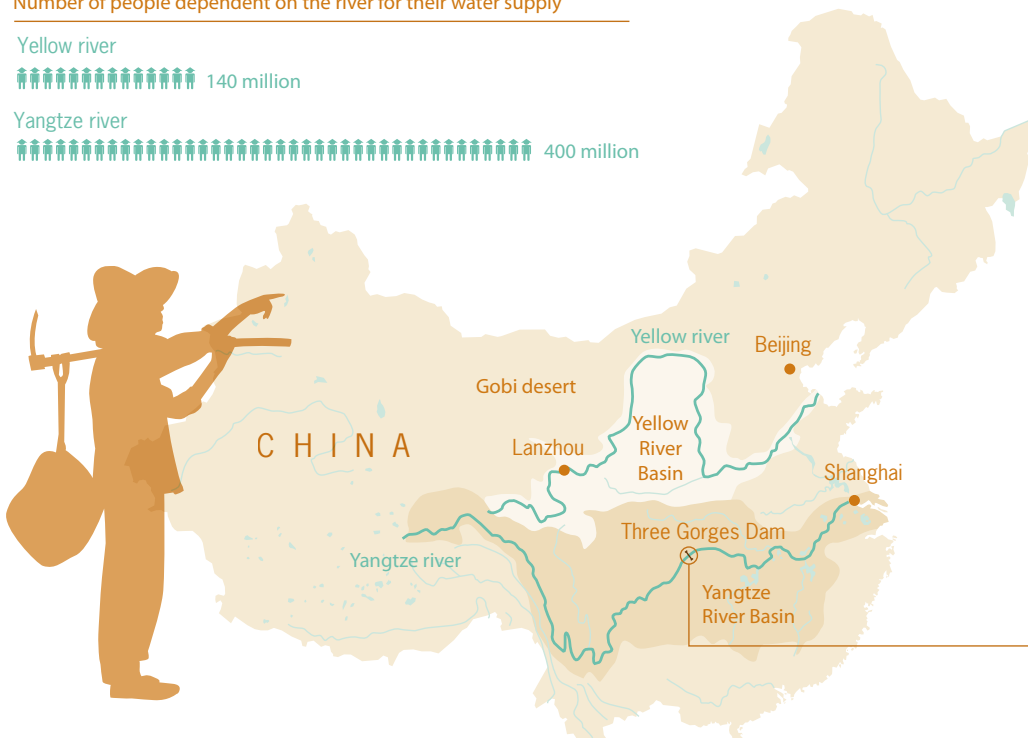
### River catchment areas

Yangtze river  
1,800,000 km<sup>2</sup>

Yellow river  
944,970 km<sup>2</sup>

### Irrigated surface

Yellow river  
74,000 km<sup>2</sup>



The Three Gorges Dam is the biggest irrigation project in the world. It is intended to protect people from flooding and supply them with electricity and water.

just one counter for issuing all licenses. And once they opt for reforestation, dozens of hectares are planted with young trees within two years.' Harms has seen this for himself. Arets adds: 'And then they set up a monitoring system straight away, with which they can measure and monitor carbon levels, as climate is also an issue recognized by the Chinese.'

### MILESTONES

This drive and the real will to act fast when there are problems are things that Dutch 'poldering' professionals can learn from. 'It's quite true that it isn't one way traffic, but a real exchange of ideas.' According to Alterra it is not acceptable for the Netherlands or Europe to simply export blueprints designed for Holland or Europe to China. Harms: 'It will always come down to plans that are made to measure.' Another European way of thinking which appeals to the Chinese is the exchange of memoranda of understanding or other agreements between two or more parties, whereby concrete targets and time schedules are set up like milestones. In doing this, the Wageningen institute makes use of environmental psychologists, sociologists, and especially of people who understand the process architecture at work in Chinese culture.

Alterra has actually been involved with water management in China for years, and in 2006 had already set up an affiliate office, the Alterra Representation Office, in Beijing. 'Two of our Chinese alumni were working there', says Bert Harms. 'They spoke the language, understood the Dutch way of thinking, knew their way about China and, most importantly, had relevant expertise in the fields of water and the environment. The office was so successful that from 2008 onwards it began to serve all of Wageningen.' [bert.harms@wur.nl](mailto:bert.harms@wur.nl) ■

### CHINA RIVER BASIN MANAGEMENT PROGRAMME

The China River Basin Management Programme RBMP – an EU programme – supports China in the development of a sustainable water management that also takes account of socio-economic developments and climate change. The five-year programme has been running since 2007 and has a budget of 187 million euros. The EU has put 25 million euros into the project, while the World Bank has given an 83 million euro loan. The main focus is on the Yangtze and the Yellow rivers. Besides technical exchange, specifically European expertise is brought in to help engage local and regional stakeholders in the implementation of water policy. On the European side DHV China leads a consortium of British, Danish and Swedish consultancies, while Alterra provides knowledge support and ensures scientific quality. [www.alterra.wur.nl/UK/research/China](http://www.alterra.wur.nl/UK/research/China)

# And now machines do the selecting

**Selecting the best specimens in agriculture and horticulture has traditionally been labour-intensive manual work. With increasing success, machines are being developed to do the assessing, the selecting and the sorting.**

**TEXT** YVONNE DE HILSTER **PHOTOS** BUREAU VOOR BEELD AND GREENVISION

**A**t Australian Palm, a palm tree cultivation business in Naaldwijk, the selection of saleable palm trees has recently been fully automated. Formerly the owner would pick out the suitable specimens himself, trudging through the greenhouse with three plants in each hand. Wageningen researchers and logistics systems manufacturer Logiqs Agro BV have developed a machine to do this. The remarkable thing about the machine is that the expert selector's knowledge is programmed into it and made usable. This is one of the latest examples of the new applications in this field on the market.

The automatic detection of saleable plants followed by the automatic grouping of these small palm trees enables the company to deliver homogenous batches, says Rick van de Zedde of GreenVision, the expertise centre of Wageningen UR for image processing in the agro- and food industry. 'What is more, plants can be sorted non-stop, and larger and smaller specimens can be easily grouped. In this way each plant is constantly given the optimum growth conditions.'

When you develop a system to replace the product expert, you must understand how someone sorts: what does he mean when he labels a plant as 'saleable' or 'frail'; and what is his assessment based on? Once you know exactly what the important features and

the underlying decision-making model are, then it's a question of choosing sensors that can pick out the information you need. For example, if a feature can be seen with the eyes then a standard camera can be used. But there are lots of possibilities for using cameras that use black-and-white, red-green-blue, ultraviolet, infrared, fluorescence, or combinations of light waves from the spectrum. 'If you use near-infrared spectroscopy you can see moisture build-up, for instance', says Van de Zedde. 'In cucumbers that would indicate internal rot.' Finally, a calculation model for the deciding factors in sorting decisions is developed, based on the photographic image(s) taken. In the case of palm trees things that are looked at include fullness at the top, height and width. 'You can make a specific decision-making model for every enterprise: plant growers don't necessarily always agree about these things.'

For automatic quality selection, this deciding factor is always crucial: it's a matter of black or white, explains Van de Zedde. 'But when people do the selecting there are no absolutes.' There is always the chance that people select plants from a bad batch as 'good', which in different circumstances might have been judged as mediocre. 'Computers enable you to standardize assessment, and there's a demand for that.'

Glasshouse horticulture in the Netherlands already





# 1933

Manual selection of tulips in the greenhouse of the Laboratory for Plant Physiology at the Schip van Blaauw in Wageningen.

**‘The system only sees what you teach it to see’**

makes full use of colour cameras and two dimensional imaging. New possibilities are emerging all the time. Techniques used in the medical sciences – MRI and CT scanners, X-ray apparatus – will be introduced in the agrifood sector too, Van de Zedde expects. ‘X-rays can already show us how many buds there are under the foliage of alstroemerias, or where the buds of tulips are positioned, making it possible to bunch flowers that will be of equal height in a vase.’

An upcoming trend is the robot-harvesting of fruit. ‘We have started an initiative together with the Dutch Fruit Producers Organization to make it possible to harvest apples and pears automatically; and a project has been started with Jentjens Machinetechniek to develop a robot harvester for products like sweet peppers.’

‘We are mainly working on problems for which there is no system on the market yet. It is challenging, risky research with specific objectives coming from the industry. Our advantage is that we work with lots of different products and properties and this often allows us to combine experiences’, adds Van de Zedde.

The use of automatic systems can take away people’s jobs, he admits. But labour is not just expensive; there could also be a shortage of it in future, partly because of the ageing population. ‘Already last year we had apples and pears left on the trees. By using these systems we can safeguard the Netherlands as a production location.’

Another advantage of the new development is that the experts’ knowledge gets analyzed and can thereby be passed on to others. It also makes it possible to adjust the production process in the light of the automatic assessment. And yet a horticultural producer will never blindly trust the selection system. ‘After all, it only sees what you have taught it to see.’

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



# 2010

Automatized selection and grouping of plants that meet previously established criteria.



#### THE MUSHROOM RED LIST

The mushroom Red List includes 1,619 species, which constitutes 62 percent of the total number of species in the Netherlands that were considered.

Of the 1,619 species on the Red List, 293 are under serious threat, including the **yellow coral mushroom**, *Clavulinopsis fusiformis*.



Frank Berendse,  
professor of Nature Management  
and Plant Ecology



Geert de Snoo,  
endowed professor of Agricultural  
Nature and Landscape Management



Paul Opdam,  
extraordinary professor of  
Landscape in Spatial Planning



Leon Braat,  
Alterra researcher studying  
Ecosystem services

# We don't protect what we don't value

**Nature everywhere is under pressure and biodiversity is still in decline. So how can we put a bit of spark into International Biodiversity Year? Four Wageningen experts explain how the tide could be turned – with or without the farmers.**

TEXT RIK NIJLAND PHOTOS FOTO NATURA

**'A**s I was walking through the Arkemheen polder a while ago, I felt there was something missing. And it was an almost suffocating feeling', says Frank Berendse, professor of Nature Conservation and Plant Ecology at Wageningen University. 'I couldn't put my finger on it at first, but after an hour I heard a skylark and I thought, oh yes! That's what was missing. Until some years ago, no matter where you went in the countryside in spring, you would always hear the skylark singing high up in the air. By now 90 per cent of the skylarks have disappeared. To me

that feels like more than the decline of one bird species; it is a fundamental change in the atmosphere.'

Berendse's feeling of suffocation cannot be seen in the statistics, and doesn't come into the Netherlands Environmental Assessment Agency's annual figures on the state of the Dutch countryside. They don't describe feelings, just the decline of nature in the Netherlands, or rather, the measurable component of that decline: the biological biodiversity, usually referred to as biodiversity, a somewhat vague term that came into fashion after the UN conference in Rio de Janeiro in

1992, which is now used both as a synonym for nature and to mean the sum total of wild species of plants and animals.

The statistics show clearly that all is not well with Dutch biodiversity. At the turn of this century, one memo after another came out of The Hague, all promising that the decline in biodiversity would be halted by 2010. But we cannot really hold our heads high and celebrate the UN's International Biodiversity Year with pride. Sure, nature is deteriorating a little more slowly, but the battle is far from won. Since 1700, biodiversity in the Netherlands has been slashed to less than ➤





The tiger lily, *Lilium bulbiferum*



The fly orchid, *Ophrys insectifera*



The green snaketail, *Ophiogomphus cecilia*

#### THE PLANT RED LIST

Since 1950, nearly 500 of the 1,536 indigenous wild plant species in the Netherlands have dwindled in numbers and more than 40 have died out. There were 499 species on the Red List of 2004. Of these, 97 are under serious threat of extinction, including: The **tiger lily**, *Lilium bulbiferum* and the **fly orchid**, *Ophrys insectifera*.

#### THE DRAGON FLY RED LIST

The Netherlands has 60 species of indigenous dragon flies, 27 of which are on the Red List. Five species are categorized as 'seriously threatened', among them the **green snaketail**, *Ophiogomphus cecilia*.

#### THE BUTTERFLY RED LIST

Forty eight of the 71 indigenous butterflies in the Netherlands are on the Red List. That is 68 percent of the total. Of these, 13 are under serious threat of extinction, including: The **heath fritillary butterfly**, *Melitica athalia* and the **purple emperor**, *Apatura iris*.

15 percent of what it then was, according to the agency.

#### MUCH ACHIEVED

Geert de Snoo, endowed professor of Agricultural Nature and Landscape Management at Wageningen University and also working at the Leiden Institute of Environmental Sciences, thinks that is too pessimistic a picture. 'I wonder whether it is very meaningful to make comparisons with 1700 or 1900. It is only in the past thirty years that we have made nature and environmental policy a reality. And in that time a lot of things have started going in the right direction. If you look at wild species of plants and animals, particularly in nature reserves, much has been achieved. That is not the case in agricultural areas, where nature is still under considerable pressure. But both the surface vegetation and the quality of the reserves are improving – slowly perhaps, but it is still a real sign that we can do something.' And about time too, says De Snoo. 'We eat biodiversity, and in a manner of speaking we breathe biodiversity: biodiversity is literally a matter of life and death. And that includes human beings. Just think what the disappearance of the honey bee would mean for agriculture.'

#### FIELD BIRDS

Frank Berendse agrees with his colleague that you cannot really generalize about bio-

diversity. 'There are big differences between groups of plants and animals. In 1973 I inventoried birds in a section of the Gelderse Vallei region. The count was repeated a couple of years later and what came out was that of the fifteen true field species, twelve had declined by more than fifty percent. On the other hand, though, you see that forest birds are doing fine in the Netherlands, partly because the trees in our forests are getting taller and older. We are seeing more and more blackcaps, chiffchaffs and tree creepers.' Still, Berendse sometimes sees the last thirty years as a tragedy, especially when he considers the decimation of many critical species that inhabit unusual environments such as bogs or nutrient-poor grasslands – 'species that I have lost my heart to.' Berendse: 'There are two main reasons why we have not managed to halt the loss of biodiversity in spite of all the policy measures: we have reserved too little land for nature in the Netherlands. And there is still a lot wrong with the environmental conditions here, mainly through atmospheric deposition of nitrogen compounds, our water management and the use of pesticides.' An all-too-familiar litany, and yet one that has lost little of its relevance. In January a group of international experts, including Berendse, published a study in *Basic and Applied Ecology* on the variation in the field birds, ground beetles and plants in winter wheat fields throughout Europe. Wild ani-



The heath fritillary butterfly, *Mellicta athalia*



The purple emperor, *Apatura iris*

mal species were directly correlated with the amounts of fungicides and insecticides that farmers sprayed on the fields.

#### REPORTS IN THE BOTTOM DRAWER

The biggest culprit, however, is intensive livestock farming, says Berendse. Since the 1960s, this sector has been spraying the Netherlands with layers of manure containing nitrogen compounds which it is impossible to keep out of nature areas. 'That has led to an incredible botanical impoverishment, especially among plant species in poorer environments such as bluegrass landscapes, fens, moors and bogs.' The government was dozing at the time, thinks Berendse. 'Minister Braks prioritized giving

pig farmers freedom, critical researchers were called on the carpet and reports disappeared into the bottom drawer. That was a real disaster. Okay, things have improved a bit since then, but there is only one systematic solution: livestock numbers have to be reduced considerably. Putting in extra filters and all that kind of thing is just fiddling while Rome burns.'

Even if Berendse's wish comes true, there is still a long way to go. 'Nitrogen accumulates in the ecosystem; it takes decades before you get rid of the harmful effects unless you go for expensive interventions such as digging up and replacing soil. It is much easier to protect than to restore, actually, but sadly we have not managed this. I sometimes really

have to force myself to see that the glass is still half full, but it depends a lot on which ecosystem or group of species you look at.'

#### SEA EAGLE AND EGRET

Paul Opdam is much more positive. He is extraordinary professor of Landscape Architecture and Planning at Wageningen University and a researcher at Alterra, part of Wageningen UR. 'There have been successes too. Species which had disappeared a long time ago are coming back – like the sea eagle and the great egret. The recovery of the badger is a great cause for celebration too. All three are species that spring to mind which are thriving thanks to our investments in nature conservation. But not everything is >

### EHS IMPLEMENTATION STAGNATES

Dutch nature policy targets the preservation of biodiversity. The main cornerstone of the policy is protecting nature areas. To this end, the country has undertaken international commitments. For example, the main nature areas have been registered in the European Natura 2000 network. The Netherlands has also been working independently on its Ecological Main Structure (EHS) since 1990, with the aim of expanding and connecting nature areas. Over 620 thousand hectares of EHS are

already under the management of nature conservation organizations and individuals, but it is clear that the target of 730 thousand hectares by 2018 (half of which would be Natura 2000 areas) will not be reached. Without the other 110 thousand hectares, the EHS is an incoherent patchwork. One reason for the stagnation is the costs. From the interdepartmental policy research on nature that came out in March, it is clear that up to 2018 the government faces a shortfall of €2 billion for buying land for the EHS. There is also

a threat of shortfalls for the management of EHS areas and for the planned environmental improvements. Three different scenarios are doing the rounds in the Hague for a more modest nature network that is within the budget. Besides area-based nature management, the Netherlands is also trying to pursue nature values and preserve biodiversity on agricultural land by subsidizing farmers who look after landscape elements, field birds or wild plants.





The great crested newt, *Triturus cristatus*



The yellow-bellied toad, *Bombina variegata*

#### THE AMPHIBIAN RED LIST

Of the 16 amphibians found in the Netherlands, nine are on the Red List, and two are under serious threat of extinction: the **great crested newt**, *Triturus cristatus* and the **yellow-bellied toad**, *Bombina variegata*.

visible. When conservation organization Natuurmonumenten buys up a plot of land for the Ecological Main Structure, it is not going to be in full bloom the next year. It might take twenty years before the soil has recovered and another twenty before the species that you would expect there have established themselves. We create the conditions and nature follows.'

Opdam believes that the Netherlands should continue to invest in a network of interconnected nature reserves in the interests of biodiversity. The corridors connecting nature areas compensate for some of the loss of habitat that animals in particular suffer from and they offer both plants and animals a chance to find new habitats or recolonize old ones. 'Perhaps some new policies will be adopted for the Ecological Main Structure, and there is some delay in the final stages, but there is still enough support for it in the community', claims Opdam. 'That is hopeful. Particularly in a period of climate change, it is extremely

important to have a coherent network of nature areas.' And that goes for Europe too. It is inevitable, thinks Opdam, that certain target species such as moorland dwellers will disappear from the Netherlands in the long term. 'Not because there's anything wrong with our nature management, but because of climate change. When species are threatened it is even more important for Europe to set up a coherent chain of robust nature areas. And that means making choices. In any case, each country should focus on its strong points. The Netherlands could invest more in its delta areas, for example. The nature there contributes a lot to biodiversity in Europe; there are still bitterns in England because our country is a source of migrants that go there.' Biodiversity is also needed for maintaining ecosystems, Opdam argues. 'And they are indispensable to what we call our ecosystem services. A healthy biodiversity means that farmers are not troubled by as many diseases and pests, for example. And European involvement is important for that.' As for the disappearance of species due to climate change: 'That makes ecosystem services less reliable. You just have to hope that new species will come in to take the place of those that are gone, but to do that they have to be able to get here. We might have to intervene to make that happen.'

#### ECOSYSTEM SERVICES ARE DIVERSE

Leon Braat, a researcher at Alterra who spe-

cializes in ecosystem services, agrees that they are of key importance. 'A good ecosystem does a lot more jobs than a stripped-down one. For example, a maize field exists for one purpose alone: food production. A rainforest, by contrast, produces a hundred useful things. But only a couple of them reach the market; the rest are not recognized in the economy and no price is put on them. And that is why nature and biodiversity are badly undervalued in the economy.' Ecosystem services are highly diverse, explains Braat. They range from the production of wood, fish and other food to providing a buffer against climatic extremes, water storage, absorption of urban pollution, new medicines, recreation and a pleasant living environment. Economists and ecologists at the cutting edge between their disciplines have provided a number of ways of expressing these functions in money terms, says Braat. 'And if you can measure it, you can also value it. That is essential because we do not protect what we do not value. When you intervene in nature you should look not just at what happens to the deer and the flowers, but also at the bigger picture, including the sum total of ecosystem services.'

The EU has taken a step in the right direction, Braat explains. Partly on the basis of research by Alterra: it was agreed in March that the community wants to tackle not only the loss of biodiversity but also the loss of ➤





#### THE MAMMAL RED LIST

Of the 57 species of mammals that regularly breed in the Netherlands, 24 are on the Red List of 2006: forty two percent. Two species on the Red List come under the category 'seriously threatened', one of them the **garden dormouse**, *Eliomys quercinus*.



The ruff, *Philomachus pugnax*



The short-eared owl, *Asio flammeus*



The black grouse, *Tetrao Tetrix*

### THE BIRD RED LIST

Forty three percent of the Netherlands' summer birds (78 out of 183) are on the Red List. Of these, 12 are categorized as under serious threat of extinction, including:

the **ruff**, *Philomachus pugnax*, the **short-eared owl**, *Asio flammeus* and the **black grouse**, *Tetrao Tetrix*.

### THE REPTILE RED LIST

There are six species on the reptile Red List: the adder, the smooth snake, the slow worm, the common wall lizard, the grass snake and the sand lizard.

Apart from these species there is one other indigenous reptile in the Netherlands: the viviparous lizard. The most threatened of the species is the **wall lizard**, *Podarcis muralis ssp. brogniardii*.

### THE FISH RED LIST

Thirty five of the 95 indigenous fish species in the Netherlands are on the Red List. Of these, three are under serious threat of extinction, including the **sea stickleback**, *Spinachia spinachia*.

ecosystem services. 'Only if you take these into account in your decision-making processes as well, can you make sound social cost-benefit analyses', says Braat. 'In the long term I think that is the only way to protect biodiversity. Otherwise I take a pessimistic view. We might have to send our grandchildren on a school trip to Poland to give them an appreciation of nature and biodiversity.'

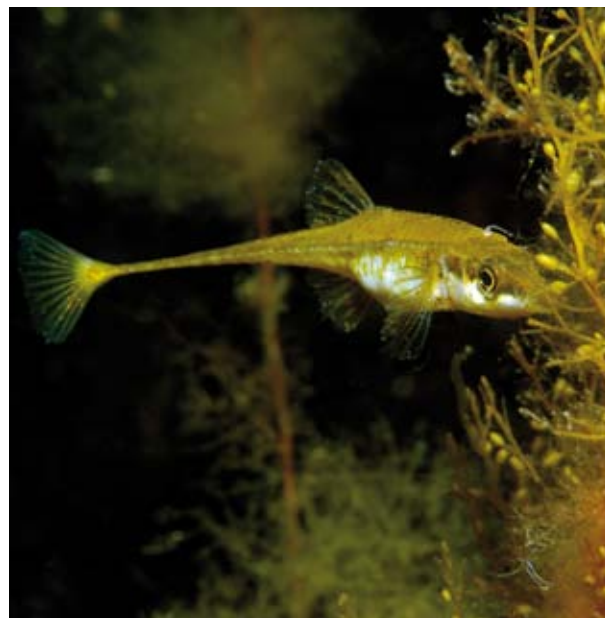
Opdam shares the belief in the importance of ecosystem services for drawing attention to biodiversity and protecting it. 'Nowadays, farmers are often contrasted with nature, but producing food, however it is done, is always a way of utilizing the natural world. We have perfected this to an extreme, but with the same nature you can also store and purify water, develop recreational facilities or provide care services. The more urbanized our country becomes, the bigger the demand for nature services will be, I would expect. We do not want a degraded landscape with massive pig sheds and farmers producing food for the world market. In the short term I expect that on at least half of our farmland there will be a shift to a more extensive agriculture. That is very good for biodiversity too.'

### CIVILIZED BEHAVIOUR

Frank Berendse does not think ecosystem services are the most important motive. 'Of course biodiversity is important for human

beings. A striking example is our research that showed that the more plant species grow on a dyke, the better it can withstand erosion. But I am afraid that there will be insufficient reason to save a rare plant species if there does not happen to be an ecosystem service at stake. To me, another important motive for conserving wild plants and animals is our ethical responsibility. Just as we are responsible for the survival of South American Indian tribes, so we are for the survival of populations of wild plants and animals. It is a question of civilized behaviour. It is only 100 years ago that we banned child labour, but now no one would think of putting children to work.' Berendse has little faith as yet in the idea that farmers will make a real contribution to conserving biodiversity. 'Research has shown time and again that agricultural nature management makes very little difference. There is only any point in it if key factors such as the groundwater level and the use of pesticides are really tackled, but those are precisely the factors that are very difficult for a farmer to fit into a profitable business. I am pessimistic: our agricultural land is already dead, in fact. I think the focus should be on buying up as much land as possible for nature reserves and optimizing conditions in them. Whether they attract the common snipe, the black-tailed godwit or the bluethroat does not really matter much. Devoting a large area to na-



The wall lizard, *Podarcis muralis ssp. brogniardii*The sea stickleback, *Spinachia spinachia*

ture is crucial to being able to resist negative influences from outside, such as drainage of water and excess nitrogen, and to giving species that need a lot of space a chance.'

### MORE SPACE FOR NATURE

Geert de Snoo takes a different line. 'I think we do nature a great disservice if we bank on nature reserves to the exclusion of anything else. It is not only that what happens on agricultural land affects the reserves, but this land is also home to very many species that we consider worth conserving.' It is therefore crucial, thinks De Snoo, to create the right conditions there, such as clean soils, water and air. 'That is really important, but it is not enough for nature to thrive. I argue that farmers should make more space for nature. Currently only two to three percent of the land is not allocated to production, the banks of ditches and road verges for example. That is very little; there should be a place for biodiversity somewhere of course. My question is therefore: perhaps we should raise that to five percent, like in other countries?' We are justifiably proud of our productive agriculture, says De Snoo. 'But society does not only want good products. People also want responsible production, and attractive countryside and nature conservation. It is time for that extra care to be seen as part of a farmer's normal business operations.'

So De Snoo thinks that every farm should undertake agricultural nature management, with things like flowering green verges, ditch banks and field edges. 'In Groningen, improving the field edges led to a spectacular recovery by the hen harrier', he notes. Together with Berendse, De Snoo is supervising three PhD students who are going to examine how a green mosaic of this kind works in arable farming and livestock farming. 'In future you could give farmers a subsidy if they manage perhaps five percent of their farm extensively. But then you

should not set all kinds of conditions beforehand. The current regulations about target species for agricultural nature management have gone too far', thinks De Snoo. 'They only lead to disappointment and they ignore the dynamics of nature itself. I say: let us be open to surprises. Whether a lapwing comes or a godwit doesn't matter. Make sure the conditions are right, make sure there are worms in the ground, then we'll see which bird comes to eat them. Nature should be given back its future.' ■

### ONLY 15 PERCENT LEFT

Biodiversity is more than the sum of the 35,000 species of plants and animals in the Netherlands, says the Environmental Assessment Agency. It is the measure of the variety in nature, not just in terms of the number of species, but also in the variety of ecosystems and the genetic variation, in agricultural crops for example. According to the agency's calculations, only 40 percent of the country's original biodiversity was left by 1900; in 2000 that was down to 15 percent. The reason lies in the way habitats have been chopped up, and in poor environmental conditions and intensive land use. But it is not just a tale of woe. Since the late

1990s, the loss of biodiversity has been going more slowly even though the loss of variety is still going on: opportunists are increasing and the number of choosy species is going down. So the Red Lists of threatened species keep on getting longer. And there is a clear difference between two kinds of landscape. In nature areas, the numbers of the nature policy's target species are generally rising, with the exception of moorland areas and other nutrient-poor environments. In agricultural areas, however, the numbers of these species are still going down. Green is getting greener, the rest is getting greyer.

## FOOD TECHNOLOGY SIX YEARS DOWN THE LINE

# Beer-brewing and the healing power of tempeh

**'I'll never do a PhD', Petra Roubos always said. But she'll be getting her PhD on healing substances in tempeh this year. Her contemporary Lonneke Brouns is a beer brewer. She's had a feel for brewing since her student days.**

TEXT HANS WOLKERS PHOTOS JOSJE DEEKENS

**B**eer brewer Lonneke Brouns subjects the reddish-brown beer in her glass to careful scrutiny. 'The colour is nice and dark', she says, and takes a sip. 'Refreshing, with a lovely touch of bitterness that lingers in the mouth... A chirpy little beer', is the beer connoisseur's verdict. 'We talk about a beer as if it was a person', she laughs. 'We use our gut feeling when we taste. We don't divide the taste up into umpteen component parts; we describe its overall character.' 'Thirst of Maastricht' is the name of this brew, a particularly popular one, according to Brouns, and developed in collaboration with a historian. 'He dug up a number of old typically Maastricht beer recipes, which we adapted to modern times. That is why the beer is dark, like most beers were in the old days. Another difference is that it's got oats in it. They used to do that for the simple reason that oats were cheaper than barley.' This thirst quencher is just one of the dozens of beers produced by the brewery, which uses only one kettle and brewing process. Brouns: 'You can vary the

flavours of beer endlessly. There's so much you can do with beer and that's what makes it so fantastic to develop new tastes and brew them.'

### TEMPEH HELPS AGAINST DIARRHOEA

PhD researcher Petra Roubos works with more solid foodstuffs. She has been studying the way bioactive components in tempeh, a soya product, can help stop diarrhoea. Substances described as 'bioactive' are those that have health benefits for humans. 'In pigs, tempeh works well against diarrhoea', says Roubos. 'I look mainly at the mechanism responsible for this.' Before pathogenic bacteria can make a host ill, they attach themselves to the intestinal wall. Roubos discovered that they do not do so in the presence of tempeh, which binds bacteria. 'We are now working on identifying the chemistry of the binding component', says Roubos, who already has five publications to her name, and several more in the pipeline.

Beer brewer Brouns' fascination with beer

goes back a long way. She was already a competent amateur brewer as a student, and she perfected the art by getting work experience at various breweries. 'I am a dreamer, but also a doer', she says. Her dream was to have a brewery with a tasting room. The tasting room takes the form of a cosy pub offering ten or so draft beers and numerous bottled ones. Brouns is in her element. 'I have a tremendous interest in food and drink; I am a foodie to the bone', she says. 'All I really want to do is to brew traditional beer. I am a real purist when it comes to beer.' So the Food Technology BSc at the HAS University of Applied Sciences in Den Bosch was an obvious choice for Brouns. And following that with the Wageningen Master's in Food technology was the icing on the cake. 'It was the Wageningen influence that set me thinking in much more green terms and wanting to put people in touch with nature', she says. 'Nowadays you can get everything all year round, but I would like to teach people a bit about the seasons. Brewing beer organically and on ➤





### LONNEKE BROUNS

**Age:** 33

**Studied:** Food Technology 1999 – 2004

**Werk:** Joint proprietor of De Fontein brewery in Limburg



## PETRA ROUBOS

**Age:** 30

**Studied:** Food Technology and Nutrition  
and Health 1998 – 2004

**Work:** PPhD research at the Food  
Technology chair group



a small scale, with a few seasonal beers, fits the bill perfectly.' Bruins developed her own *euleteul* beer based on the elder bush. 'Euleteul is an old local word for the elder bush. We brew a summer beer from the elderflowers and a winter one from the elderberries.'

### THE MAIN THING IS THE MONEY

Researcher Roubos has long been interested in biology and chemistry. 'I wanted to do something broadly related to biology and chemistry. At the time I chose Food Technology. I soon found out that in the industry the main thing is the money', she says. 'That's why I opted for lots of elective courses on nutrition and health. It was also because I wanted to know more about the impact of food on health.' Eventually she graduated as a food technologist and as a nutritionist, with two Masters' degrees. Wageningen's green image did not play a significant role for Roubos, although she did make a conscious choice for Wageningen because of the flexibility it offered her to put together her own programme: 'You can try out lots of different things.' After her study, Roubos did not know what she wanted straightaway. 'I have always said I would never do a PhD. You end up overqualified for a lot of jobs, which just makes things harder for yourself. And in the end you are still a starter after four or five years of research.' So she applied to a variety of institutions, companies and – after all – for some PhD research positions. 'I was only invited for interview for the PhD posts, and I found many of the research topics very interesting. And in the end, they appealed to me more than a job as a product developer.' In her current job at the Food Microbiology chair group at Wageningen University she finds herself at the cutting edge between food technology and health, a logical progression from her studies. 'In the end, research suits me better as a person, I think.'

Each new beer starts life at the office where

Brouns and her husband - both born and bred in Limburg – concoct a new recipe step by step. Once the idea is clear, they make a trial brew. 'I am the one who tastes it, because women generally have a better sense of taste than men', says Lonneke with a broad grin. Any flavour is possible, and that makes it viable to produce customized beers too: the couple can create a unique beer to go with a company's image. 'We have to enquire then and find out what the client wants and what fits the company', says Brouns. One example was a special beer they developed for a conference centre. Seventy percent of the drinkers were men between the ages of twenty and fifty. 'For these drinkers you need quite a strong tasty brew', says Brouns. 'But then again, it shouldn't be too strong, because they have meetings to go to.' What came out was a deep red, powerful beer with a slight whiff of blackberry that hints at the forest setting of the conference centre.

### HARD TO GET PUBLISHED

Petra Roubos has to work creatively and independently to achieve a good result, too. 'The nice thing about research is that you have a lot of freedom to try out your own idea and to see if it all makes sense', she says. 'The results are the high point.' She also enjoys organizing and structuring those results in the form of a publication: 'I can get the broad lines of my story on paper very quickly. It's nice, thinking up a story line. But then comes the most tedious part, writing it all up, and in nice correct sentences.' Roubos does have other reservations about the life of a researcher too, though. 'As a PhD researcher, publications seem to be all that matters. I sometimes get the idea that publication is really just a game played by colleagues. Whether your article gets accepted or not depends a lot on the people whose desk it lands on', she says. 'Your research might be very good, and yet very hard to get published. I also think it's a pity that negative results are sel-

### WHERE DO FOOD TECHNOLOGISTS END UP?

Just about three quarters of Wageningen Food Technology graduates end up in the commercial sector. The food industry is the most popular, and this is where half of all the graduates find jobs. Others work in government services, while at least ten percent find work in universities and research institutes, and seven percent end up in education or elsewhere in the public sector.

dom published.' Something else she does not enjoy so much is the routine, but necessary, repetition of an experiment. 'Then you are working as an analyst more than as a researcher.' Nevertheless, Roubos clearly does see a future for herself as a researcher. 'I have been going for interviews at companies with a research and development department. I want to do research, but applied research, so that you see your results being used.'

### A FEEL FOR IT

It is important to Brouns, too, that her beer creations have a function. Brewing beer is fun, but getting people to taste beer is great fun too. The catering side of the company was the biggest leap in the dark for Brouns, but it seems to be working out well. 'You come in close contact with people', she explains. 'We both work over a hundred hours a week, but because you are building everything yourself, you get a lot of energy out of it too.' Large-scale brewing is not up Brouns' street at all. 'I just want to make lots of different beers', she says. 'For me it's all about the spirit of brewing.' And her beers are 100 percent natural. She is not secretive about her recipes. 'The recipe is just one part of the whole process', she says. 'It is not sacred and having a feel for it is at least as important.' ■



WAGENINGEN UR BUILDS LARGE-SCALE ALGAE TESTING LAB

# Prospect of green gold?

**Algae have been hailed as the fuel of the future, and as a source of valuable nutritional supplements. Yet although algae cultivation companies are starting up one after the other, it is too soon to talk of an algae revolution. To optimize algae cultivation, Wageningen UR is building a large-scale research facility.**

TEXT HANS WOLKERS ILLUSTRATIONS MIESJEL VAN GERWEN AND WAGENINGEN UR

Look, pure algae oil!’ Proudly, Carel Callenbach, director of Europe’s largest algae nursery Ingrepro, holds up a small bottle full of light orange fluid against the light. ‘This contains lots of omega-3 and -6 fatty acids, making it a valuable supplement in fish feeds.’ Algae oil for the fish feed industry is just one of many lucrative products supplied by his company. The range also includes nutritional supplements for sport horses, food colourings and raw materials for bio plastics. According to Callenbach, algae production can be economically viable, even on a limited scale. ‘Although we are the biggest company in Europe, we produce on a relatively small scale’, he says. Callenbach advocates an approach which sees algae production more as a means than as an end in itself: ‘You can make the whole water purification system cheaper and better by using algae which turn nutrients in wastewater into biomass. Those nutrients would otherwise be lost. You can close cycles by breeding algae at strategic

places’, he explains.

Algae production company LGem in Made in Brabant is doing good business too. LGem concentrates on producing high-quality ingredients for the nutritional supplement industry and for the production of fish larvae. Production costs are admittedly extremely high, particularly those of the purified ingredients for nutritional supplements, but the market pays high prices for the products. ‘We can be happy if we manage to produce for forty euros per kilo. And there are additional costs on top of that, such as for freeze-drying and vacuum packing the algae paste’, says director Eugène Roebroek. ‘On the other hand, the nutritional supplement market does pay four to six hundred euros per kilo of the dry material.’

## GROWING ON SALTWATER

The hype started two and a half years ago: algae seem to be the ideal biodiesel producers. But this outbreak of green gold fever ➤

‘Production companies have often  
been started by biologists who did  
not understand the technology’





**RENE WIJFFELS,**  
**Professor of Bioprocess**  
**Technology**

'Interest from industry was limited to start with'

### STRESSED ALGAE PRODUCE USEFUL SUBSTANCES

If you subject algae to stress, they produce some useful substances. For instance, too much light puts the plants under stress because damaging free radicals are produced in their cells. Algae react to this by producing carotenes, antioxidants which mop up the free radicals and limit the damage. These carotenes turn green algae orange. It is quite easy to extract them from the algae slurry for use as colourants, antioxidants or nutritional supplements. Another form of stress is to put the algae on a diet. Algae like plenty of nitrogen, and if you do not give them enough of it, they cannot produce so much protein and resort to making fat, which is stored in the algae cells as small droplets. This fat is particularly valuable as it forms the basis of biodiesel as well as having uses as an animal feed supplement and in the chemical industry.

was of short duration. As it turned out, it did not seem possible to breed the plants at a profit. Slowly but surely it is now becoming clear that producing algae on a large scale can be profitable, as long as other products are extracted from the green soup as well. It was professor Rene Wijffels from the Bioprocess Technology chair group who came up with the idea of extracting valuable substances from algae. Twelve years ago, Wijffels hit on the plan of breeding algae in special reactors. 'I was not finding enough of a challenge in my job as lecturer. All sorts of promising finds were being made at sea, and I delved into this subject', says Wijffels. 'I was particularly fascinated by the fact that you could breed algae with the help of an interesting substrate, namely light.' Wijffels is convinced that algae have tremendous advantages over food crops. Many species of algae grow on saltwater, so that you do not have to draw on scarce freshwater supplies. Nor do you need any agricultural land, so that algae production neither competes with food production, nor encroaches on the rainforest. 'But it was still a real battle to get this subject on the map', says Wijffels. 'Interest from industry was limited to start with. That changed completely when biodiesel started becoming popular.' Suddenly there was a lot of interest in algae cultivation, something on which Wijffels' chair group had by then built up considerable expertise. So when a market suddenly began to emerge, they were ready for it.

### ALGAE CULTIVATION AS A SCIENCE

Meanwhile, algae cultivation has grown into a real science, and both universities and the business world have thrown themselves into the subject. The success of small-scale Dutch algae producers, whose companies are running well, is not going to stop Wageningen UR from building a research facility for algae: AlgaePARC. According to Wijffels, such a facility is needed. 'Current algae cultivation is relatively small-scale and inefficient', he says. 'The companies cater for a small niche market, so there is very little experience with mass production of algae.' In AlgaePARC, universities and com-

panies will do research on how to optimize algae cultivation. The government and the business world have such confidence in the future of large-scale algae cultivation that they have dug deep into their pockets to set up AlgaePARC. The testing facility will be ready in November. 'Companies are very eager to join in', says Wijffels. 'I think it is going to be a success.'

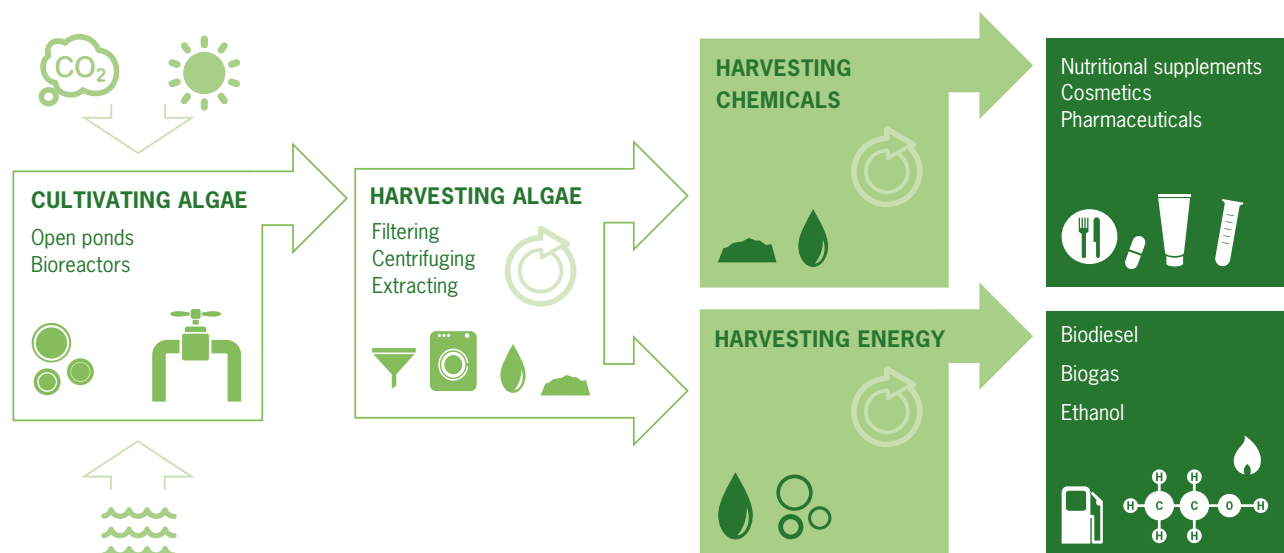
### LOW COSTS

According to project leader Maria Barbosa, AlgaePARC will bridge the gap between small-scale laboratory research and large-scale industrial production. The Bioprocess Technology chair group at Wageningen University has been conducting lab-based basic research for some years. Its achievements include establishing the efficiency of photosynthesis at different amounts of light and for different species of algae. AlgaePARC is going to conduct tests on a rather larger scale. 'There is a big market for products such as biodiesel or for ingredients required by the chemical and food industries', says Barbosa. 'But little is known about the best way to cultivate algae for low-cost production.' So at the moment there is not a single production system capable of producing biofuels – which all the hype was about – at a profit. 'If you use all the constituents of algae biomass, such as valuable nutrients for the food and chemical industries, as well as biofuels, you will be able to run a viable business in the future', according to Barbosa.

The planned pilot plant is on a relatively modest scale. Four algae cultivation systems currently on the market will be tested. 'An open pond will serve as a benchmark, because this is what is already being used by companies', explains Barbosa. 'We want to compare it with two types of tubular system with different numbers of layers of horizontal tubes containing algae, and with a system which uses vertical plastic double membranes with the algae in between them.' Each system has its own limitations. For example, the gas exchange in tubes can be limiting: excess oxygen builds up while there is too little CO<sub>2</sub> available for the algae.



## CULTIVATING ALGAE FOR ENERGY AND RAW MATERIALS



It is also easy for the algae to be exposed to too much light. 'A single layer of horizontal tubes captures a large amount of light, but that can hamper the growth of the algae', explains Barbosa. If you place several layers of tubes on top of each other, you reduce the light intensity by thinning out the light, as it were, and that is good for the algae. It also means you can fit in more tubes per square metre. And in the membrane system, gas exchange goes better.' Running the testing systems throughout the year makes it possible to gauge the amount of biomass that algae can supply on a yearly basis. Barbosa: 'This gives researchers more insight into the various parameters influencing algae growth, and helps us arrive at an objective norm.'

### PUMPING AND AERATION

The launching of the AlgaePARC will give algae research a real boost. With a cost price of at least four euros per kilo, producing algae is still an expensive business. 'Costs will have to go down by a factor of ten.' Cost savings on this scale can only be reached if you are able to work more cheaply and efficiently in several areas. Wijffels: 'Pumping

and aeration use up quite a bit of energy, and that can probably be brought down. You can also achieve something by automating the system and using cheaper materials – foil instead of glass, for example.' Wijffels thinks he can do this by making good use of technical experts. 'Production companies have often been started by biologists who did not understand the technology', he explains. 'From the start, we have had technicians to

develop and optimize the system, and that is something we are certainly going to go on doing.'

Project leader Barbosa sees a rosy future for Wageningen algae research. 'AlgaePARC is just the start. We aim to grow and to establish optimal algae cultivation systems elsewhere in Europe too. In so doing, we hope to become the European centre for algae cultivation.' ■

### ALGAEPARC

Building only starts this summer, but Wageningen University's planned research facility for algae cultivation is to be up and running within six months. The complex, covering about 700 square metres, will be near the Wageningen campus. The Process Technology chair group at Wageningen University will collaborate closely with Food and Biobased Research, part of Wageningen UR, as well as with the business world. The partners will experiment with four different systems

of algae cultivation to gain a solid knowledge of efficient, large-scale and economically viable algae production. The building costs for AlgaePARC, more than two million euros, will be covered by the province and the Ministry of Agriculture, Nature and Food Quality. Research costs for the first five years, amounting to at least four million euros, will be paid out of the Dutch government's profits from natural gas and contributions from the business world.

# ‘Investing in people is the most sustainable way’

**The Anne van den Ban Fund wants to give more foreign students a chance to study at Wageningen University, and is looking for new donors. Three faithful donors talk about their motives.**

TEXT MAAIKE BREEDVELD PHOTO GUY ACKERMANS

**G**ert Jan Hofstede, senior lecturer in Logistics, Decision & Information Sciences at Wageningen University, has been a regular donor for years. ‘I wanted to give to a charity with which you know for sure that the money will get into the right hands. And I am sure of it, because many of my foreign students have received a contribution from the fund. People with the calibre needed to help their country to

make progress. It is also in my own interests, because they are very nice students to have in the class. With their life experience and their attitude to work, they form a good mix with the younger Dutch students.’

Hedwig Bruggeman, director of Agri Pro Focus, has had similar experiences. She herself did the first international Master’s course in Wageningen, in Tropical Livestock. ‘It was a great experience. Our group included all

sorts of nationalities, and they were all talented, intelligent people who don’t give up easily. After my studies I worked in Africa for twenty years. I saw in Africa how important it is to have people in the field who have had a sound education. My motive for donating to the fund is to give people from the South the chance to take a course like the one I did. That gives me energy: working with young enthusiastic people who want to do their best

## ANNE VAN DEN BAN FONDS

The initiator of the Anne van den Ban Fund was Anne van den Ban, former professor of Extension at Wageningen University.

The fund gives talented students, mainly from African and Asian countries, the chance to study at Wageningen University. Twice a year the board selects motivated students who qualify for financial support.

Since it was started in 1992, about 180 students have received funding amounting to a total of over a million euros. The number of applications goes up every year. The fund has already received 170 applications for the academic year 2010 – 2011. The Anne van den Ban fund is linked to the Wageningen University Fund.

Info: [www.fondsen.wur.nl/uk/](http://www.fondsen.wur.nl/uk/)



## NEW TRUST



for agriculture and development. If I can contribute to that, I am happy to do so.'

'I have always been a strong supporter of the idea', says Henk van de Plas, former rector of Wageningen University, one of the fund's first donors. 'Investing in people is the most sustainable way. There are many examples of graduates who make a valuable contribution in their own country. People with a good education are still thin on the ground. Studying in Wageningen can make all the difference.' 'You get a high return on investment', adds Hofstede. 'Other forms of aid often make people dependent. But the money from this fund goes to people who do want to roll up their sleeves and get to work. What is more, it is trustworthy. At other charities, a lot of money goes on administration.'

The majority of the donors studied in Wageningen themselves. Not a bad thing, says Van de Plas. 'They have seen for themselves that their education opened up opportunities that they would not have had otherwise. By supporting the fund, they give others that opportunity too. If every alumnus did this – giving even just a tenner a year – we could easily enable another two or three people to study here.' ■

Anne van den Ban (second from right), co-founder of the fund named after him, with three of 'his' students. From left to right: Kondwani Khonje, MSc student of Organic Agriculture from Malawi, Steisianasari Mileiva, MSc student of Management of Agricultural Knowledge Systems from Indonesia, Krisztian Kovacs, MSc student of Marketing and Management Economics from Hungary.

## 'I'm glad to continue Paul's work'

Paul Speijer, a nematologist (Plant Pathology, 1985), had been working in Africa for many years when he died in an air crash in 2000 at the age of 42. 'Paul was highly motivated to help African farmers move on', his wife Nicole Smit recounts. 'By training local researchers he was able to contribute to this development'. She decided to start a trust in his name to support African students in their studies at Wageningen University. 'I'm glad to be able to continue Paul's work in this way. He supervised a lot of MSc and PhD students in Africa himself. When the aeroplane came down he was actually on his way to two of his students in Nigeria.' The compensation money eventually paid to the relatives by the airline forms the basis of the trust.

African students can apply for assistance from the trust for a degree programme in Plant Sciences. Preference is given to candidates who want to work on improving the cultivation of food crops after completing their studies. Speijer himself researched nematodes in banana cultivation. He studied Plant Pathology at Wageningen UR and gained his PhD in 1993 at the University of Bonn. After that he worked for the IITA (Agricultural Research for Development in Africa) in Uganda. Nicole Smit wants to offer at least one or two students a year the chance to study at Wageningen UR.

In selecting candidates she works with the university and the Anne van den Ban Fund. Information about special donations from [monique.montenaria@wur.nl](mailto:monique.montenaria@wur.nl)

## FUND-RAISING

## The chance of a life time

'Give fifty talented students the chance of a life time!' This is the Anne van den Ban Scholarship Fund's appeal to international alumni this month. About 2,300 Wageningen graduates overseas will receive a brochure through the post asking for a donation to help give students from developing countries the opportunity they had themselves: to study at Wageningen University.

The number of applications for support from the Anne van den Ban Fund is rising rapidly. The global recession is making it harder and harder for students and their families to fund their studies. The fund receives over 100 applications per year. In 2009, 47 students received support. In the coming years, the fund hopes to support fifty students per year, including full scholarships for a few students from the poorest countries.



## Wageningen, a flying start

A degree from Wageningen University provides a good basis for getting launched on the job market, say Wageningen alumni who graduated in 2007 and 2008. Nearly eighty percent of them had landed a job within three months. This came out of the University Education monitor of 2009, a survey of graduates from all the Dutch universities asking them about their position on the job market and the quality of their degree course. Over three quarters of the Wageningen respondents are 'satisfied' or 'very satisfied' with the job they've got. Compared with the national average, more of them are doing doctoral research and fewer of them are independent entrepreneurs. Another thing that distinguishes Wageningen University from other universities is its international character: Wageningen students come from 61 different countries and after graduating many of them go abroad.

Info: [www.klv.nl/en/careerservice](http://www.klv.nl/en/careerservice) or [silvia.blok@wur.nl](mailto:silvia.blok@wur.nl)



PHOTO GUY ACKERMANS

## Proposition lessons for PhD candidates

**When you read a PhD thesis, you begin with the propositions. But they are coming under fire and there is a proposition doing the rounds that they should be scrapped. Don't do it, is the message from a survey among professors and PhD researchers. But some remedial teaching wouldn't go amiss.**

The standard of the propositions in Wageningen theses is low. So candidates should follow a course, says Professor Paul Struik of the Doctoral Board. Other professors share his critical standpoint. It is particularly the last two propositions – which have to address socially relevant issues – that are often no more than 'the funniest oneliners the candidate can come up with', whereas they are supposed to express broad academic reflection. The idea of abolishing the propositions

entirely goes too far for most of the professors and PhD researchers surveyed by Resource, the magazine for staff and students of Wageningen UR. But the standard could do with raising. Responsibility for this lies with the professors, but providing a course would also send a message to supervisors that they should take the propositions seriously, says Struik.

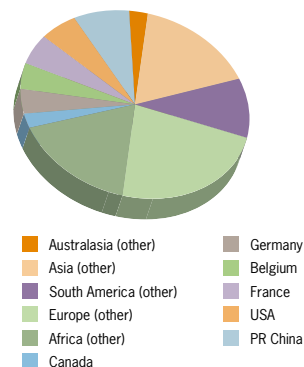
Wageningen graduate Paul ten Hove has collected more than 6,500 propositions at [www.hora-est.nl](http://www.hora-est.nl)

## KLV directory

A useful tool for networking: the KLV Directory. This book lists names, addresses and work details of about 34,000 graduates of Wageningen University, approximately 5,000 of whom live and work outside the Netherlands. The directory also contains an overview of Wageningen graduates per country. KLV members receive the book free of charge. [www.klv.nl](http://www.klv.nl)

## Where do our alumni live?

You can find Wageningen University alumni in at least 147 countries all around the globe. So you really can describe it as a world university. More than 5,000 alumni are living outside the Netherlands. The largest number are in China, followed by the United States, France, Belgium, Germany, Indonesia and Ethiopia.



## DIES NATALIS

## DEVELOPMENT ORGANIZATION

# A strong hand at 92 years

Things change fast in the sciences. And what that means for Wageningen University was the theme of the 92nd Dies Natalis (Founders' Day) on 9 March. He said in his speech entitled Holism 2.0 that scientists increasingly have a good understanding of how the small subsections work but are unable to see the whole picture.

In his speech on the day, Scheffer, professor of Aquatic Ecology and a Spinoza Prize winner, warned against the dangers of 'fragmentation' in science. Scientists are gaining ever more insight into the workings of small parts of the whole, said Scheffer. 'But I think that bringing together all that knowledge through systems thinking will be the central theme of science for the coming decade.' With its cultural diversity and mix of social and natural sciences,

Wageningen has a strong hand, but we are not making the most of it. The university's structure and the exclusive focus on excellent researchers are getting in the way of progress, Scheffer believes. He would rather see a flourishing diversity. Scheffer was also critical when it came to the number of female professors. 'Less than ten per cent of professors are women. That does not reflect the diversity we have.'

<http://wurtv.wur.nl>



## Agromisa keeps going

**Last year development organization Agromisa celebrated its 75th birthday. For a while there was some doubt as to whether it would reach its 76th birthday. But in spite of the lack of financial support, the organization is still in full swing, and its practical booklets about farming are still popular all over the world.**

The Agrodok series is particularly in demand: handbooks about such topics ranging from goat husbandry, bee-keeping and organic crop protection to Aids or farmer cooperatives. 'More than a quarter of a million Agrodoks are read around the world, in many languages', says Roy Keijzer of Agromisa. Keijzer and a few paid staff and volunteers make up the core team of the organization, and he also calls on a network of experts to address particular questions from the field.

It is getting harder to find funding for Agromisa's work of making practical agricultural knowledge accessible to farmers in the tropics. The Ministry of Development Cooperation stopped funding Agromisa back in 2005. It is thanks to cooperation with the Centre Technique Agricole (CTA) that the distribution of the publications is guaranteed.

There are about fifty volunteers involved in Agromisa, many of them retired agricultural experts with years of experience in the tropics. Keijzer: 'Alumni who would like to contribute their expertise to benefit developing countries are most welcome.'

Info: [www.agromisa.org](http://www.agromisa.org)



Marten Scheffer

## RECRUITMENT

PHOTO ANP



# At the foot of the Acropolis

On 19 March, prospective Greek students and Wageningen alumni met for an informal drink in Athens. There was great enthusiasm from both sides. 'It was a very nice meeting, the atmosphere was great and lots of contacts were made from all sides', says International Recruitment Manager Delia de Vreeze. She organized the drinks party at a beautiful location near the Acropolis: the Netherlands Institute in Athens. It was attended by over fifty students and alumni, most of them Greek.

'I have noticed that potential students really like to meet and talk to graduates in this kind of informal setting. After all, graduates know what it is like to study in Wageningen and

what you gain from it afterwards. But the alumni really enjoy a meeting like this too. It feels like a sort of reunion.'

De Vreeze has established many contacts with Greek universities for recruiting Masters students for Wageningen University. And whenever she goes abroad for education fairs, she also organizes meetings for ex-'Wageningers'. They feel a sense of connection with Wageningen University, and they like to talk about the added value their studies have had in their work. Wherever you go in the world, the Wageningen feeling is strong.' Every year a big group of 25 to 30 Greek students comes to Wageningen to follow a Master's programme.

## ACTIVITIES [www.klv.nl](http://www.klv.nl)

### ► 29 June 2010

International Career Café (English)  
Young KLV Programma

### ► 16-18 September 2010

EurSafe 2010 Congress  
Global Food Security: Ethical and  
Legal Challenges  
Info: [www.eursafe.org](http://www.eursafe.org)

### ► 20 September 2010

Course CV writing (English)  
Young KLV Programme

## COURSES

### WAGENINGEN BUSINESS SCHOOL

[www.wbs.wur.nl](http://www.wbs.wur.nl)

### ► 23 and 24 June

#### **Risk Management in Commodity Markets for Policy Makers**

Two-day course focusing on how  
commodity futures and options can  
be used by farmers and the  
commodity industry to effectively  
manage risk.

## NEW CENTRE

# International centre for sustainability

On 20 May, Minister Verburg of LNV opened the Centre for Sustainable Development and Food Security at Wageningen UR. This is the first time in the Netherlands that the three domains of sustainable development (people, society and nature) are brought under one roof in a research institute. The centre's aim is to bring together pure and applied scientific research and, as a 'centre of excellence', to raise them to a higher level. In order to achieve this, the centre conducts research both independently and in collaboration

with other institutions, companies and civil society organizations. It also pays a lot of attention to sharing research results (especially internationally) and to education for international students. The centre fits well into the Dutch government's policy of giving sustainable agriculture a key role in development cooperation. Sustainable agriculture can stimulate economic growth, especially in Africa, putting people in a better position to feed themselves and adapt to climate change.

Info: [bram.huijsman@wur.nl](mailto:bram.huijsman@wur.nl)





## DEBATE



PHOTOS HARMEN DE JONG



Renger Witkamp (left) was among the speakers at the lively debate in The Hague.

## Hot debate on healthy food

**How do we make healthy eating the norm? This was the million-dollar question posed during the debate on innovative nutrition concepts that was held on 27 April in The Hague. It provoke some heated discussions between scientists, product developers and communication experts.**

Kees de Gooijer, food technologist and director of the Food & Nutrition Delta, argued that standard food products should be made healthier. This could be done by reducing amounts of salt or saturated fat without sacrificing the flavour. Others believe our best hope for the future lies in advanced nutritional research, in functional foods, or in better communication with consumers. According to De Gooijer, the debate was 'a very good thermometer for seeing how stakeholders see each other.' This 'Social Café' was the third in a series called 'A fresh look at healthy', organized by communication consultancy firm

Schuttelaar & Partners together with other organizations including Wageningen UR and alumni network KLV.

One of the speakers, Renger Witkamp, professor of Nutrition at Wageningen University, called for new research methods to study the subtle processes in the body. 'We need to look at health in a new way. The key thing is our capacity as humans to adapt to changing conditions.' Philip Rijken of DSM Nutritional Products wondered: 'With all the current knowledge about healthy nutrition, we are sitting on a gold mine. But how do we get all this information across to people?' No

conclusive answer to this question was forthcoming – views were too diverse for that. What did become clear was that it would be a good idea to increase the collaboration between nutrition studies and the social sciences.

At the end of the debate the jury voted Valérie Klostermann of the Nutrition centre the best debater. 'New nutrition research is interesting,' she claimed, 'but we shouldn't go over to functional foods lock, stock and barrel. The staple foods that we already have are all we need for a healthy diet.'

Info: [www.schuttelaar.nl/maatschappelijk\\_cafe/2010](http://www.schuttelaar.nl/maatschappelijk_cafe/2010)

## DEGREE GUIDE

PHOTO LIJUK KRAMER



## Wageningen: 'a green highflyer'

A newly published University Master's programme guide puts Wageningen top of the class. The authors describe the university as 'a green highflyer'.

Almost all Wageningen University's MSc programmes are high quality, says the Keuzegids Masters, a guide to Master's programmes in the Netherlands which came out in February this year. Eighteen of the nineteen Wageningen programmes assessed were rated well above average. Only Landscape Architecture and Planning came out as middle-of-the-road. Students on other programmes – in Environmental sciences and Business studies – were very positive. The authors put the top scores down to the intensive and small-scale teaching and the practical slant at Wageningen.

Besides Wageningen, Nyenrode Business School scores above average too. This is mainly due to the extremely high score of the school's Master's in Management, with fees of 24,000 Euros. None of the larger universities are above average overall, according to the Guide. They all have both strong and weak programmes.

The Keuzegids Masters is a new publication based on independent, extensive research. It shows which Master's programmes are available in part-time variants, which specialisms are possible, and what both students and experts think of the quality of the programmes. A similar Keuzegids on Bachelor's programmes came out in December. For the fifth year running, it hailed Wageningen University as the best in the Netherlands.

## PERSONALIA

**Dr. Marian Bos-Boers** (Western Agricultural Sociology 1972), who worked for the KLV from 1979 to 2008, has been made Knight of the Order of Oranje Nassau in recognition of her services to research in the social sciences, particularly on the subjects of the position of Wageningen graduates on the job market and the emancipation of Wageningen's women graduates. It is thanks to Bos-Boers that Wageningen University has extensive knowledge about the position of its graduates.



PHOTO RITA VAN BIESBERGEN

**Dr. Aalt Dijkhuizen**, WU Agricultural Economics 1977, PhD University of Utrecht 1983, has been reappointed as chair of the Executive Board of Wageningen UR for a third period of four years. 17 February 2010.

**H.J.W. van Duijn**, WU Tropical Irrigation Technology 1992, has been appointed Agricultural Counsellor at the Netherlands Embassy in New Delhi, covering India, Nepal and Sri Lanka. Summer 2010.

**Pieter Gooren**, WU Tropical Irrigation Technology 1979, has been appointed Agricultural Counsellor at the Permanent Representation of the Netherlands in Geneva. 1 September 2010.

**Martijn Homan**, WU Agricultural and Environmental Economics 1998, has been appointed Agricultural Counsellor at the Netherlands Embassy in Budapest, covering Hungary, Austria and Slovenia. Summer 2010.

**Dr. Corné Kempenaar**, WU Plant Pathology 1998, Plant Research International, received the KIZ Innovation Prize 2010 on 26 March, together with Johannes de Boer, of Homburg Machinehandel, for a prototype of SensiSpray. With this advanced technology pesticides can be applied variably, in specific localities and in measured quantities.

**Dr. Lars Markesteijn**, WU Tropical Land Use 2005, has been awarded a Rubicon subsidy by the Netherlands Organization for Scientific Research (NWO). Markesteijn, who did his research at the Forest Ecology and Forest Management Group at Wageningen UR, received his PhD in February 2010.

The subsidy offers recent PhD graduates the chance to gain experience at prestigious foreign institutes. Markesteijn will go to the University of Wisconsin-Milwaukee (USA) and Panama for two years to conduct research on water management of tropical tree varieties.

**N.A. van Opstal**, WU Horticulture 1979, has been appointed Counsellor for Agriculture, Nature and Food Quality in Paris. Summer 2010.

**M. Overheul**, WU Agrarian Economy 1981, has been appointed Agricultural Counsellor at the Netherlands

Embassy in Beijing, covering the People's Republic of China (including Hong Kong) and Mongolia. Summer 2010.

### New director Wageningen International

**Dr. Huub Löffler** (VU Amsterdam and PhD from Utrecht University) has been appointed director of Wageningen International, part of Wageningen UR, with effect from 1 June 2010. Löffler will succeed Bram Huijsman, who took over the responsibility for international programmes in the Social Sciences Group early this year. Löffler has been working at Wageningen UR since 1998, first at the IVT and later at CPRO-DLO and PRI. A major achievement of his was to help develop the 42 million-euro research programme on photosynthesis, BioSolar Cells. 'I could have had the overall responsibility, but that is very much a management job. My heart lies more in the content in the international context.' Löffler has just returned from Indonesia, where he coordinates the Agriculture Beyond Food joint programme which explores the scope for a biobased economy with Indonesian partners.



PHOTO GUY ACKERMANS



Jonne Rodenburg receives CGIAR Award

### CGIAR Awards

Two Wageningen alumni were awarded prizes this year by the Consultative Group on International Agricultural Research (CGIAR).

**Jonne Rodenburg** (WU Tropical Land Use 1995, PhD WU 2005) received the 2009 CGIAR Award for Promising Young Scientists for his research on integrated weed management in rice cultivation in Africa. Rodenburg is a weed specialist at the African Rice Center in Tanzania. Also working there is

**Paul van Mele**, specialist in innovation and knowledge transfer. He was given the Award for Outstanding Communication for his initiative to introduce new technologies in rice cultivation using instruction films produced by farmers for farmers.

**Jean Rummenie**, WU Horticulture 1982, has been appointed Agricultural Counsellor at the Netherlands Embassy in Jakarta, covering Indonesia, as well as Malaysia and Singapore for the Association of South East Asian Nations (ASEAN). Summer 2010.

**Arjan van Zeijl**, Plant Sciences MSc student, won the Rijk Zwaan Plant Sciences Award 2010 with his thesis Regulation of auxin homeostasis by strigolactones, in which he describes the interaction between plant

## TRACING ALUMNI

Wageningen University and KLV, the alumni network, strive to remain in contact with all Wageningen UR graduates. Unfortunately, we lack some addresses. Do you know the address of any of the alumni mentioned below with year of PhD graduation? If so, please send this information to [alumni@wur.nl](mailto:alumni@wur.nl) or fax: +31 317 489276

Dr D. Abad Tiwi, 2004  
 Abbas Pakbel PhD, 2004  
 K.N. Abdel Khalik PhD MSc, 2002  
 R. Abdolrahim Mehrabi PhD, 2006  
 M.A. Abira PhD, 2008  
 L.N. Abu Ghunmi PhD, 2009  
 S. Adey PhD, 2007  
 Afaf Rahim MSc PhD, 2006  
 A.C.M.E. Agbicodo PhD, 2009  
 F.S. Ahrestani PhD, 2009  
 Dr I.M.F. Aidos MSc, 2002  
 Dr O.O. Akinbamijo, 1994  
 A. Albera PhD, 2006  
 P. Almazan Rueda PhD, 2004  
 Dr J.C. Altamirano-Cabrera, 2007  
 O.A. Alvarez PhD, 2006  
 T.P.F. Amaro PhD, 2005  
 Dr A.K. Amirkolaie, 2005  
 P.E.A. Andang'o PhD, 2007  
 Anjal Prakash PhD, 2005  
 Dr L.A.E.T. Arafat, 2005  
 M. J. Ardeh PhD, 2005  
 Areti Dilo MSc PhD, 2006  
 Dr L.N. Arnaudov, 2005  
 S. Arpaia PhD, 1999  
 M. Arzanlou PhD, 2008  
 Ashish Kumar PhD, 2003  
 Dr R. Auerbach, 1999  
 G.K. Ayenor PhD, 2006  
 C.M. Azong PhD, 2007  
 N.G.T. Azza PhD, 2006  
 H. Bachmann PhD, 2009  
 L.B. Badstue PhD, 2006  
 Dr J.S. Balirwa, 1998  
 B.B. Basnyat PhD, 1995  
 H. Bekele Haile PhD, 2010  
 Dr A. Bekele-Tesemma, 1997  
 J. Bemigisha PhD, 2008  
 H. Biaou PhD, 2009  
 Z.J. Bishaw PhD, 2004  
 Dr Y. Bishr, 1997  
 G.E. Blanco Wells PhD, 2009  
 Jiang Bo MSc PhD, 2006  
 Dr Ir S. Bogy, 1999  
 Dr E.C. Bucher, 2006





## Students design landscape of New Orleans

Over four years after hurricane Katrina, the low-lying areas of New Orleans are still a mess. Roads are potholed, thirty percent of the population has not returned and seven out of ten trees have disappeared.

Katrina was a one-off disaster, but even a little rain causes problems, as the old drainage system cannot cope and badly needs an overhaul. This was the challenge taken on by three Wageningen MSc students of landscape archi-

itecture, Peter Hermens, Jaap van der Salm and Chris van der Zwet. They designed 'the working landscape' which brings the water into full view. In their design a new system of waterways not only provides better storage and drainage, but makes a visual feature of the water.

A water neighbourhood of this kind is old hat to the Dutch. But it's a whole new concept for New Orleans: up to now the city's waterways have been hidden underground and behind concrete

walls – water was seen as something to get rid of as fast as possible.

Nevertheless, a few of the innovative ideas have made their mark and have been taken up in the Masterplan 2030 for New Orleans.

And the landscape architects – who have graduated meanwhile – got an exceptional 9 for the study A working landscape for New Orleans.

The report can be downloaded from <http://edepot.wur.nl/134866> ■