

'At a blow the seabed became a mass grave for its fauna'

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SOWING ON BARREN SOIL

In efforts to keep desertification at bay, there has been a lot of experimentation in recent years with land restoration methods and new forms of land use. This has generated a wealth of strategies.

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WANTED: PROTEINS

Wageningen researchers are looking for new sources of protein for both people and animals. They have high hopes for proteins from algae, grass, leaves and insects. The only question is: how to get them out?



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



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PHOTO GUY ACKERMANS

Too many geese

'Our grass is increasingly rich in protein. Geese love that. No wonder two to three million of them descend on the Netherlands every winter. Since the nineteen seventies, the total number of 'goose days' in the Netherlands has increased tenfold to between 250 and 300 million. Another contributing factor is the increasingly hospitable conditions for brooding in Siberia: the snow is thawing earlier, new brooding places are opening up and, just like here, there is less hunting going on in some areas.

'The geese do not just use the Netherlands as an overwintering area; they have also rediscovered it as a brooding place. The farmers are most bothered by the summer geese, especially the graylag geese. It is bad enough to have your winter grass eaten up, but the summer grass really is one of the farmers' most precious assets. And then there are the growing concerns about airport safety.

'In the nineteen seventies, when the first graylag geese started brooding here, we were rightly proud; now we watch the growth of their numbers with apprehension. There are currently about 300,000 and the population is increasing by 10 to 20 percent per year. There is no sign of that growth naturally levelling out. The Netherlands is the perfect place for the graylag goose: lots of new, wet swampy areas to brood in, surrounded by the best grass in the world.

'The measures proposed by various organizations in the 'G7' focus mainly on these summer geese. It has been agreed that their numbers should be brought back to 100,000 adult geese, a number which was not problematic in the past. There are various ways of achieving this: shaking the eggs, or culling, either by shooting or by catching and killing the birds during the moulting period. Collecting the eggs is seen as kinder, but our models show that you would have to remove so many eggs that it becomes an almost impossible task. If we want to reduce goose numbers significantly I am afraid we cannot avoid more drastic steps.'

Dick Melman is a researcher at Alterra Wageningen UR

Extracting road salt from green waste

Wageningen UR Food & Biobased Research is working with several companies, the Dutch water board *Rijkswaterstaat* and the province of Gelderland on a more eco-friendly road salt made of verge cuttings and kitchen waste.

The tons of road salt that are sprayed on Dutch roads in icy weather do roadside plants and animals no good at all. Food & Biobased Research is now working on an alternative. According to researcher Pieter Claassen, it should be possible to produce 'green road salt' on a large scale by 2020. The alternative road salt is based on green ingredients such as verge cuttings and discarded food. These contain many sugars which bacteria can convert to hydrogen and acetate. The hydrogen can be used for energy or chemicals, while acetate can be used to make calcium magnesium acetate (CMA), a de-icing agent.

In lab trials the bacteria successfully produced hydrogen and acetate. Now work is going on to upscale that fermentation process.



PHOTO HOLLANDSE HOOGTE

This is not easy, however. Acetate and hydrogen are actually waste products of bacteria and if the micro-organisms have to keep on swimming around in them, they suffocate. Claassen and her colleagues at Food & Biobased Research are therefore working with technology companies to find methods of harvesting these two substances without interrupting the fermentation process. But it is not certain that CMA will be used

on Dutch roads on a large scale. Organically produced CMA is not likely to be any cheaper than petrochemical CMA, which is itself many times more expensive than standard road salt. It is sometimes used at airports because it causes less rusting than standard road salt. In areas with unique life forms CMA could also be a good choice due to its more ecofriendly nature.

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FOOD TECHNOLOGY

Wageningen UR starts up in Singapore



During a state visit to Singapore at the end of January, Wageningen UR board chair Aalt Dijkhuizen and Bertil Andersson, president of the Nanyang Technological University in Singapore, signed a letter of intent for collaboration on joint teaching and research in the fields of nutrition and food technology. The signing took place in the presence of Queen Beatrix, Prince Willem Alexander, Princess Maxima and ministers Frans Timmermans and Lilanne Ploumen.

In setting up the joint degree programme, the universities want to take advantage of the growing Asian market. The aim of the research programme is to generate new insights and products targeting optimal health, taste and sustainability.

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MICROBIOLOGY

Colicky baby has different gut flora

The gut floras of contented babies are different to those of colicky babies who cry a lot. The bacteria in the poo of newborn babies are a predictor of the amount of crying they do one month later.

For this study by Wageningen University, part of Wageningen UR, and the Radboud University in Nijmegen, parents collected poo samples from their newborns in their first, third and fourth months. They also recorded the babies' crying bouts in a diary in the infants' seventh week, the week in which babies cry the most.

In the samples from the first week, there were fewer different types of bacteria in the poo of babies who later cried a lot than in that of other babies. The bacterial composition also developed more slowly. The

faeces of the 'crybabies' contained twice as many proteobacteria: the bacteria that cause pain and inflammation. They also had fewer or no bifidobacteria, some of which work like painkillers in adults. It is not clear how the differences come about in babies. In previous research, babies prone to crying were given probiotics, which helped reduce the amount of crying they did. The study was published online in January on the website of the scientific journal *Pediatrics*.

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EDUCATION

Wageningen still best university

'Many of Wageningen's degree programmes are among the best that Dutch universities have to offer,' wrote the annual Dutch degree course guide for 2013. This is the eighth year in a row that the guide has put Wageningen University in first place on the basis of student evaluations.

Wageningen's degree programme in Plant Sciences comes out as the best in the Netherlands. The Degree Guide is for secondary school students and their mentors who want to explore the options for higher education.

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NATURE CONSERVATION

Rescue plan for crayfish

Twenty organizations, among them Alterra Wageningen UR, have joined forces to save the European crayfish.

The only place in the Netherlands that still harbours specimens of *Astacus astacus* is the Warnsborn estate near Arnhem, which is managed by the conservation foundation Geldersch Landschap & Gelderse Kastelen. In an effort to prevent the extinction of the European crayfish in the Netherlands, Alterra Wageningen UR drew up a rescue plan at the end of last year, at the behest of the Dutch ministry of Economic Affairs. The plan includes monitoring, breeding and reintroducing the only indigenous Dutch crayfish. Alterra has already bred the first little crayfish, ready for release next summer. Ten suitable locations are being sought, in order to spread the risks.

The crayfish got into trouble halfway through the 20th century because of a decline in water quality and the loss of suitable habitats such as meandering streams. The remaining populations were then affected by the arrival of exotic crayfish and a fungal disease called crayfish plague that the exotic species brought with them.

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MICROBIOLOGY

Millions to track down bacteria

Professor of microbial physiology Fons Stams of Wageningen University has bagged one of the biggest research grants going: the Advanced Grant of 2.5 million euros from the European Research Council. Stams is studying anaerobic bacteria, which are important for processes such as water purification, soil decontamination and making products from organic waste. Stams wants to use the funding to isolate and study new and potentially useful micro-organisms.

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CLIMATE

Earthworm adds to greenhouse gas emissions

Earthworms improve soil fertility but their wriggling also has some negative effects. It causes the soil to emit 33 percent more carbon dioxide (CO₂) and as much as 42 percent more laughing gas (N₂O). This was reported by researchers from Wageningen University, part of Wageningen UR, together with international colleagues in the February edition of *Nature Climate Change*. They examined 57 studies of the influence of earthworms on the net production of greenhouse gases, and conducted their own experiments as well. Carbon dioxide and laughing gas are generated from the breakdown of organic material, with laughing gas forming from nitrate in manure and artificial fertilizer. This makes agricultural land far and away the biggest source of laughing gas.

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GENETICS

First DNA library

Now that geneticists have mapped many genomes, it is time to make this genetic information accessible. To this end, Wageningen geneticists have developed a DNA library about *C.elegans*, the most thoroughly researched little worm in the world. This is a first, says researcher Jan Kammenga. Until now researchers had to copy genetic data from each other and interpret it, in order to establish interconnections. The new analysis platform WormQTL will make the data freely available, and can automatically use results from several experiments to establish linkages between genes and characteristics in the worm. Info: jan.kammenga@wur.nl

COAST PROTECTION

Oysters keep Bangladesh dry

Creating oyster reefs along the coast of Bangladesh could offer protection from coastal erosion and flooding, as well as providing food and incomes.

IMARES Wageningen UR and LEI Wageningen UR are working with Royal HaskoningDHV and the University of Chittagong in Bangladesh to develop an alternative form of coastal protection that exploits the natural dynamics of the ecosystem. The concept is called *Building with Nature*. The planned oyster reefs will also ensure sustainable production of shellfish. Oysters naturally form reefs, but the reefs can also be created artificially. Trials in the Oosterschelde estuary in the Netherlands have shown that the shellfish reefs act as natural breakwaters, causing sand and sludge to be deposited behind them and thus reducing coastal erosion. They could therefore cut the maintenance costs of constructions such as breakwaters while

promoting biodiversity. The reefs in Bangladesh also stimulate the growth of mangroves, offering additional scope for coast protection.

It is important that the local population exploit the new oyster reefs in a sustainable manner, harvesting in a way that does not threaten the survival of the reefs. To this end, agreements need to be made as to the quantities of oysters to be harvested. The plans therefore include information campaigns in the local communities. Oyster reefs will be laid down this year as a pilot project along the coast at Kutubdia and Maheshkhali, in order to study the technical, ecological and socioeconomic feasibility of the approach.

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TOURISM

FARMING & BIODIVERSITY



Natural pest control quiz

Applied Plant Research (PPO), part of Wageningen UR, and AgriHolland have joined forces to create the Dutch-language Bugquest (www.bugquest.nl). This is a website for people looking for more information about natural enemies and crop protection. They can find out how natural pest control works through a series of practical questions and puzzles. There are also links to background information, and films in which agribusiness entrepreneurs, workers at agricultural organizations and researchers talk about their experiences. The interactive presentation method makes the quiz particularly suitable for use in schools. Info: gera-vanos@wur.nl



PHOTO HOLLANDE HOOGTE

Find the dream destination

If you are looking for the perfect holiday destination in Europe, the online place to be is myplacetobe.eu.

Every visitor to this website is provided with a personal map, created on the basis of preferences for holiday month, type of holiday, temperature and preferred landscape type. Colour coding indicates which areas the person should and shouldn't head for. Flags are also placed on their top five holiday destinations. This could save them time searching and coming up with unlikely suggestions. The website was developed by Alterra Wageningen UR and is the European cousin of the successful Dutch website [www.](http://www.daarmoetikzijn.nl)

daarmoetikzijn.nl, which helps prospective holidaymakers find the nicest spots in the Netherlands. The maps are based on geographical databases and are displayed using Google Maps. This makes it possible to go on to ask for further information – about accommodation options, for instance. You can use photos, videos and sometimes Street View to get a better idea of the recommended regions. The website is of interest to consumers, but it also provides the researchers with anonymous data about the wishes of tourists. These can be used in studies on tourism, recreation and the experience of landscape in Europe.

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PUBLIC HEALTH

Worrying rise in ESBLs in humans and animals

The ESBL bacteria that are resistant to antibiotics are spreading further through the food chain and between human beings. Just like the notorious MRSA bacteria, ESBL bacteria are particularly dangerous for people with lower immunity, such as small children, the elderly, pregnant women and the ill. Only one

antibiotic is available for fighting an infection.

ESBLs are common in the intestines of meat chickens, pigs, beef calves and dairy cows. But it has now been observed in healthy dogs, on vegetables and in the environment, show studies including one by the Central Veterinary Institute, part

of Wageningen UR, and the faculty of Veterinary Studies at Utrecht University. Some types of ESBL bacteria found in animals are also found in humans. Because people are exposed to many different potential sources of ESBL, it is not yet possible to estimate the contribution made by each source. Info: dorine.luikx@wur.nl

Elephant grass along the A4

This spring at least 60 hectares of elephant grass is due to be planted along the A4 highway south of Schiphol airport near Amsterdam. The biggest trial with elephant grass in the Netherlands is the outcome of a collaboration agreement between farmers from the Haarlemmermeer area (the Miscanthus group), Alterra Wageningen UR and joint operating company GEM A4 Zone West. Patches of elephant grass repel geese, which is good for safety at the airport. The crop can be also be used to generate energy and as raw material for many other materials, including bioplastics.

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LANDSCAPE



Reference book on landscapes

A reference-cum-textbook about the geology, soils and land use of the Netherlands was published at the end of December. In *Landscapes of the Netherlands*, the authors – Wageningen researchers, three of them retired – describe the climatological and tectonic processes that have contributed to the creation of the landscape, as well as the role played by people in its formation. The book contains almost 100 pages and as many illustrations.

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Almost possible to grow grain on saline soil

The development of salt-tolerant barley and other grains has come a step closer. A Wageningen PhD student has identified two regions of the genetic material of barley which make the plant less sensitive to salt. A first.

Globally more than 800 million hectares of agricultural land are too saline for agriculture. The salt disrupts water absorption and the moisture balance in the plant, with big harvest losses as a result.

For his PhD research, Nguyen Viet Long studied almost 200 different species of barley. After rice, wheat, maize and potatoes, barley is the fifth biggest food crop in the world, and is the most salt-tolerant of these top five. Nguyen received his PhD from Wageningen University, part of Wageningen UR, on 2 November 2012. Nguyen found two regions of the genome of barley that are key to its salt-tolerance. One of these regions has an effect on the way the plant deals with salt already in the plant. It employs a kind of ion pump to prevent the salt from reaching the leaves and disrupting photosynthesis there. A

similar system has recently been discovered in wheat.

The second interesting set of genes makes the plant less sensitive to 'osmotic stress', which comes about when the water in the soil is saltier than the moisture in the plant. Nguyen's discovery is a first, and is attracting international interest.

It will probably not take long now before the specific genes for salt tolerance are found. Nguyen: 'Examining the genetic makeup and salt tolerance of so many different types of barley enabled me to map the interesting areas quickly and accurately. I am therefore hopeful that we will have barley varieties that can be grown on saline soils within around five years.' Many results from breeding research on barley can also be used by researchers working on wheat or rice. Info: richard.visser@wur.nl

BEHAVIOURAL PSYCHOLOGY

Police do not make streets feel safer

In relatively safe neighbourhoods, people do not feel any safer if there is more police surveillance. Men, in particular, actually start to feel less safe. 'If people in that sort of neighbourhood see police, they are quick to think something irregular is going on,' explains social psychologist Evelien van de Veer of Wageningen University, part of Wageningen UR.

In unsafe neighbourhoods, however, a

police officer keeping an eye on things does reassure people. So to give residents a greater sense of security, police should be deployed on the streets of unsafe neighbourhoods, concluded Van de Veer. She did her research in 2008 when she was working for the police in Amsterdam. The results were published in December in the *Journal of Applied Social Psychology*.

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FOOD & ENVIRONMENT



Mealworms: the eco-friendly meat substitute

Researchers at Wageningen UR have looked at the environmental footprint of edible insects, prompted by the growing demand for animal protein and the problem of the environmental impact of livestock farming. A life cycle analysis of the earthworm and a comparison with the production of milk, chicken, pork and beef reveal mealworms to be a more sustainable source of protein. Per kilo of protein, the production of mealworms requires half as much land, at the most, and the resulting greenhouse gas emissions are far and away the lowest. For energy efficiency, the mealworm is in third place, just after chicken and milk. The livestock sector currently uses about 70 percent of the available agricultural land and is responsible for about 15 percent of greenhouse gas emissions. The study appeared in December in the online journal *PloS ONE*.

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PHOTO: HOLLANDESE HOOGTE

WAGENINGEN UR



Jubilee book on food security

Wageningen University, part of Wageningen UR, is celebrating its 95th anniversary with a symposium and a jubilee book on food security. Ever since its inception in 1918 as an agricultural college, Wageningen University has worked on the many facets of food production. All the more reason to put food security at the heart of the celebration of the university's 95th anniversary on 15 March. The occasion will be marked with the publication of a book expressing the university's vision on food security and describing its

research in this field. The book outlines the problems and the prospects for the future, dividing them into seven themes. The themes cover the effects of trade and climate, the closing of cycles, health, breeding, crop protection and the role of governance and of consumers.

The book, 'Food for all. Sustainable nutrition security', will be published in both Dutch and English in April. It can be ordered free of charge from info.cs@wur.nl



GLOBAL OFFENSIVE AGAINST DESERTIFICATION

Sowing on barren soil



In efforts to keep desertification at bay, there has been a lot of experimentation in recent years with land restoration methods and new forms of land use. This has generated a wealth of strategies which have benefited local populations as well. ‘The approach used by farmers in Cambodia is now available to policymakers in Peru.’

TEXT MARION DE BOO PHOTOGRAPHY LINEAIR ILLUSTRATION JENNY VAN DRIEL

Villagers in Ethiopia create terraces in order to prevent soil erosion.

A dry and dusty savannah, Emaciated cattle plodding dejectedly past the last remaining scraps of grass that have survived the merciless heat and sandstorms. Such images are all too familiar. Across the globe, soil degradation and desertification cost about 490 billion euros per year, according to expert estimates. 'About 12 million hectares of land are lost to this every year,' says Wageningen soil physicist Coen Ritsema of Alterra Wageningen UR. 'That is equivalent to half the land surface of the UK.'

Desertification takes hold for a number of reasons. Soils can be damaged by water and wind erosion, salinization, overgrazing, drought and forest fires. Forest fires alone send a surface area the size of India and Pakistan up in flames every year. Sometimes the forest comes back afterwards. But if forest fires and periods of drought follow close on each other's heels, the soils and the stock of seeds they harbour become exhausted. In the end nothing grows there anymore and the land is irretrievably lost.

The international project DESIRE is studying the options for more sustainable land use under dry conditions. DESIRE stands for Desertification Mitigation and Remediation of Land. An international team of scientists working in the project has tested all sorts of soil management measures from all around the earth. 'We wanted to identify the best approaches for various different parts of the world under constantly changing conditions,' says Ritsema. As project leader, he led the collaboration between 26 partners from 13 countries. Experiments with new forms of land use and restoration methods were carried out at 17 designated hotspots known for severe desertification and soil degradation. This cost almost 9 million euros, about 7 million of which came from European Union coffers, with the governments of France, Italy, Spain, Mexico and the Netherlands contributing the rest. The project's harvest consists of a book (*Desire for Greener Land*), the web portal www.desire-his.eu, dozens of scientific publications, several films, posters and pamphlets intended for local farmers, policymakers or the general public, and above all a large database with internationally validated methods and techniques for making life better for people living in arid zones. Globally, there

are 1.5 billion of them. 'Most of them are poor,' says Ritsema. 'Soil restoration means poverty alleviation. People need to be able to survive sustainably in arid zones. They might be able to carry on for another 20 years with bad irrigation systems, but after that you are left with a saline desert.'

DEEP PLOUGHING IN CHILE

One of DESIRE's hotspots is in the hot, dry Cauquenes district in the interior of Chile. Farmers here watched their harvests steadily diminish due to soil exhaustion and the loss of fertile soil to surface runoff. Alternative farming methods are therefore being studied. For example, a well-thought-out crop rotation of vegetables and grains, combined with grazing, leads to more organic nitrogen fixing. This has the added advantage of saving poor farmers 50 to 80 percent on their usual expenditure on nitrogen fertilizer.

Another revelation among the results is that a combination of deep ploughing followed by five years without ploughing creates the optimal moisture balance in the soil for grain cultivation, with minimal runoff of rainwater. One disadvantage of these alternative methods is that the farmers have to hire machines to do the deep ploughing, but their investment pays for itself with a better harvest. 'These experiments were extensively discussed by the farmer organizations involved,' explains Ritsema. 'On field days, about 600 farmers learned about the new methods and other projects coming out of DESIRE.' The fieldwork was done by one of the research centres of the Chilean ministry of agriculture's research institute INIA.

'Tragically enough, the area was then hit by a major earthquake and our partner's laboratory collapsed,' says Ritsema. 'After that the project was suspended, as the Chileans had other things on their minds. But eventually we were able to finish off the work properly.'

In the hotspot in the central Portuguese region of Leiria, about 50 forest owners are experimenting with better forest management measures, with the help of the University of Aveira. In Mediterranean areas with hot, dry summers, forest fires are a serious threat to the soils. Rural Portuguese communities are affected by this year in, year out. 'Portugal has to cope with about 50,000 forest fires a

year. They reach the suburbs of the big cities such as Coimbra,' says Ritsema.

The problem started in the nineteen sixties, when small farmers in dry, mountainous areas were driven out of business by large-scale, mechanized competitors elsewhere in Europe. They gave up their farms and moved away, and the abandoned farmland soon became overgrown with bush. 'If those vast expanses of scrub and other flammable material catch fire, you get big fires,' says Ritsema. A forest fire is not a bad thing in itself, as the forest can recover from it. But if there are repeated fires, the seed supply in the soil becomes depleted. Trees and shrubs no longer recover, the bare soil is exposed to erosion, fertile soil gets washed away down the slopes into the valleys and the whole ecosystem ends up degraded. Farmers can no longer work the land, and they cannot make a living from forestry either. What is more, people who have gone to live in the big cities are afraid to come back to their old villages on holiday for fear of forest fires. Like this, entire districts become depopulated and houses are left to go to ruins. Ritsema estimates that 90 to 95 percent of the forest fires are started by people, deliberately or otherwise. 'Preventive burning of strips of undergrowth in the spring can help to prevent summer fires.' Besides arguing for a change of approach in forest management, the researchers also propose some spatial planning measures. Villages should not be surrounded by thick forest, and there should be at least three escape routes for their residents.

GOING TO BED HUNGRY

There is an urgent need to combat desertification in order to improve food security. The United Nations expects the world population to increase from 7 to 9 billion people in the next decade or two. One in seven human beings still go to bed hungry. Nowadays, many developing countries have a growing middle class of eager consumers. It is estimated that world food production needs to increase by about 70 percent by 2050 if it is to keep pace with the growing demand. This growing demand makes the problem of soil degradation even more pressing.

According to UN figures, the land surface that is unusable due to desertification has

‘Soil restoration means poverty alleviation’



Working the land in a dry, erosion-prone part of Hanamerant, Ethiopia.

doubled in 25 years. Population growth is putting increasing pressure on ecosystems and the number of arid zones is also on the increase in some parts of the world, due to galloping climate change. There are now about 250 million people in more than 10 percent of all the arid zones suffering directly from the effects of desertification. If the problem worsens it will affect one billion people in more than 100 countries. And most of these people are from the poorest and most marginalized sectors of society.

FIREWOOD

The experiments carried out within DESIRE are tremendously varied. In Botswana, for instance, a biogas plant has been built in which cow dung and organic waste from schools is digested, as an alternative to chopping down trees for firewood. Because

the more people have a motor scooter or a car, the further into the bush they go to get firewood – a trend which aggravates deforestation. Trees and shrubs are important for curbing wind erosion and sandstorms and retaining moisture in the soil, all the more when the landscape is already prone to overgrazing. Biogas production is proving a good alternative to firewood.

Greek farmers face problems of a different nature. In the Greek Nestos Delta, close to the sea, the groundwater is highly salinated. Irrigation with that water brings so much salt into the topsoil that eventually nothing will grow anymore. Farmers there will have to switch to irrigation with fresh surface water.

In Mexico, soil fertility is deteriorating due to an inappropriate cultivation system. The standard practice of following a year of

growing maize with a year when the land lies fallow causes a lot of runoff and water erosion on the vulnerable slopes. Field tests showed the farmers that they should always keep the slopes covered in the rainy season. The traditional combination of maize, beans and courgettes appeared to be the best way of doing this.

GOATS IN SHEDS

An example of a pro-active, not to say authoritarian approach can be seen in China. Fifteen years ago, the loess regions of North China faced massive erosion problems. During heavy rain, the water surged down the steep slopes, carrying masses of fertile loess soil into the river below. Since then, the Chinese government issued a decree. Goats were no longer allowed to graze. The slopes are now amazingly green again. The goats are kept in sheds and the local people have a good income.

‘In some places the Chinese have even built concrete terraces on the slopes to hold back the water erosion,’ says DESIRE expert Godert van Lynden. ‘When we asked during an excursion what this approach had cost and what the farmers were expected to gain from it, our partners did some hasty calculations and got the shock of their lives. Because concrete terraces cost a fortune. They had never looked at it in that light.’

Van Lynden works for the Wageningen institute ISRIC (World Soil Information). Within DESIRE, ISRIC was responsible for

describing the environmental and socio-economic conditions at all the project locations. ISRIC also played a big role in the development of prevention and restoration methods. For example, Van Lynden did a lot of fieldwork at the hotspot in Morocco, where erosion is combatted by planting bushy crops along the slopes (*Atriplex*, also known as saltbush or desert holly). ‘During a downpour, raindrops do not hit the ground as hard and the roots hold the soil together so that less of it gets swept down the hill. It seems to work well. Another successful measure is to plant strips of grass along the contour lines to make sure the water does not run downhill and carry off the soil. ISRIC has explained the underlying causes of soil degradation and charted the conservation measures used. It is possible to measure exactly how much soil and ➤

water comes down both with and without these measures in place. A continuous strip of grass seems to work very well.'

BIOFUEL CROPS

According to ISRIC's director Prem Bindraban, it is very important to start using natural resources more sensibly and combatting soil degradation. 'The value of land and water is underestimated by many scientific calculation models and that leads to inappropriate use. You can see that in the calculations of the benefits of growing bio-fuel crops. In Brazil it seems to be lucrative to grow more and more soya, but economic calculation models do not take soil degradation and the loss of biodiversity into account.' Due to deteriorating soil fertility, global food production is slowing – according to some estimate by as much as one quarter. 'But these kinds of analysis are surrounded by uncertainties,' says Bindraban. 'That is why it is so important to document the soil degradation at the local level.' This is being done in the WOCAT (World Overview of Conservation Approaches and Technologies) database, the work of an international network of knowledge institutions – including ISRIC – and government bodies. The experiments at DESIRE's hot-spots are documented in line with the methodology adopted by WOCAT.

LESSONS LEARNED

DESIRE has learned a few important lessons, says Ritsema. Restoration measures for already degraded soil always work out as costlier than taking steps to prevent the degradation in the first place. 'The costs of rehabilitating a completely overexploited area and restoring ecosystem services such as rivers full of fish and clean drinking water, are usually so enormous that you are better off spending the money on preventing the problems somewhere else,' says Ritsema.

Once the degradation is under way, it is more sensible to spend the available budget on damage limitation around the edges of the area than on trying to restore the central zone. In this context it is vitally important to first establish the precise cause of the desertification. Is it water erosion, loss of vegetation or salination?

In view of all this, the newly published book *Desire for Greener Land* is certainly not a cook-

COMBATTING LAND DEGRADATION

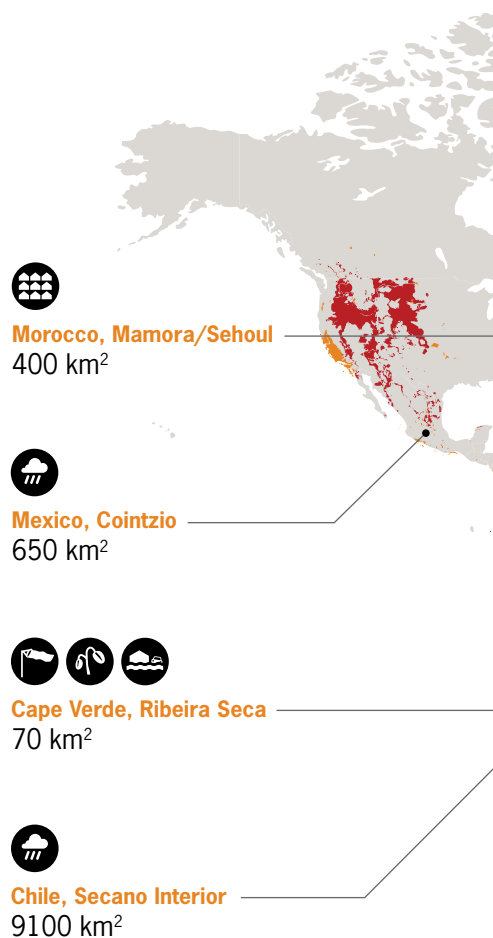
Worldwide, more than 1.2 billion hectares of cultivable land have fallen prey to desertification and degradation since 1945. In the DESIRE project, strategies have been developed for preventing further loss of land in 16 problem areas. These strategies can be used in comparable areas elsewhere.

Degradation-prone areas

-  Vulnerable
-  Highly vulnerable

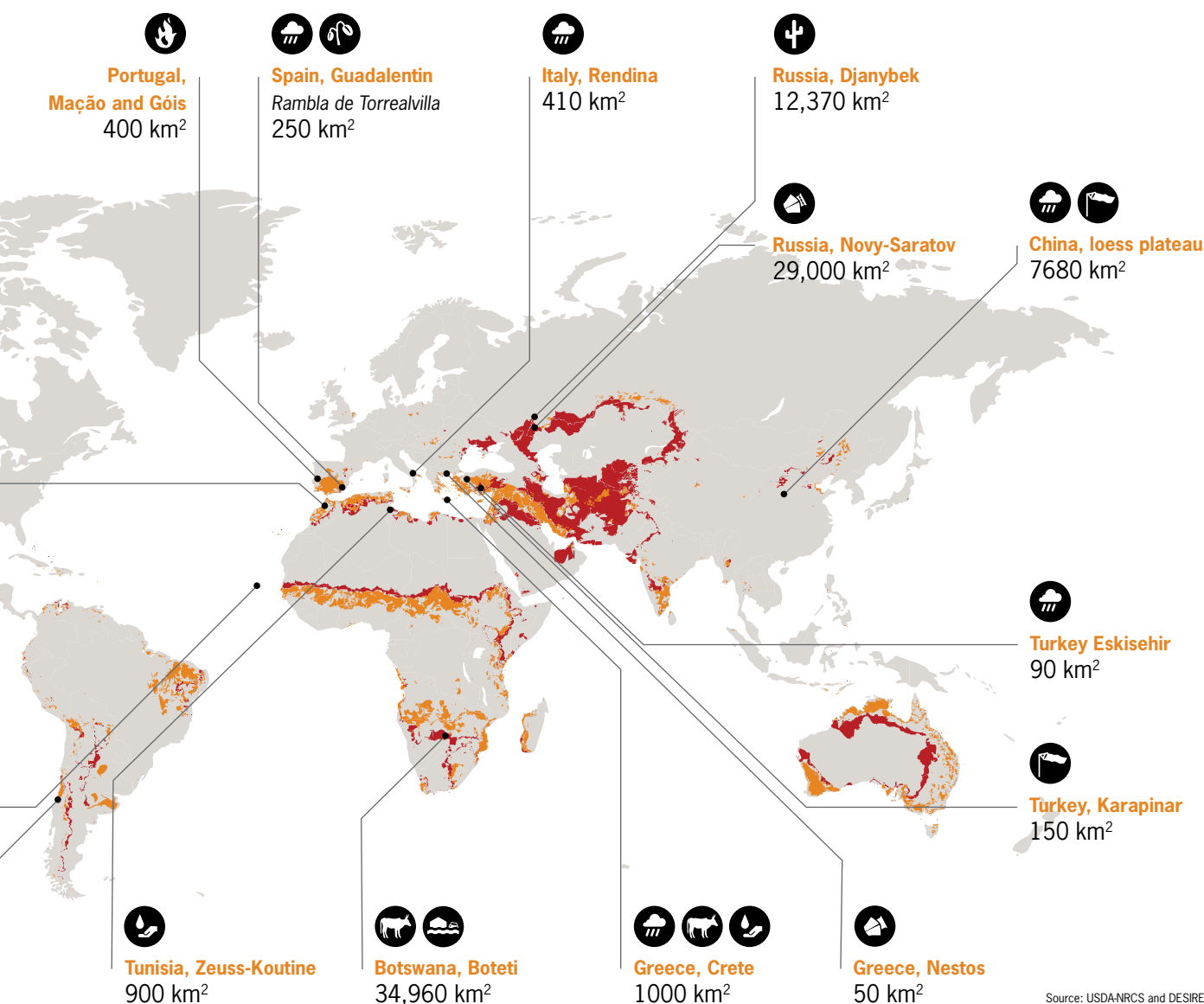
Main problems:

-  Soil erosion caused by water
-  Water stress
-  Floods
-  Limited vegetation growth
-  Drought
-  Salination
-  Soil erosion caused by wind
-  Forest fires
-  Overgrazing
-  Urbanization



book offering instant recipes for success. Ritsema: 'Our database now contains about 400 strategies from all around the world. The approach of farmers in Cambodia is now available to policymakers in Peru. The trick is to find the strategies which you can also use elsewhere. But the investments do need to deliver benefits both in the short and the long term. So we have done our best to figure out the costs of the measures and the

'Forest fires send a surface area the size of India and Pakistan up in flames every year'



Source: USDA-NRCS and DESIRE

expected revenues. Our models include soil and water processes as well as socio-economic aspects. Precisely that broad approach was a very important bit of Wageningen input into this international project.'

The studies offer policymakers wanting to 'green' an area insight into which kinds of intervention theoretically deliver which benefits, and under what conditions. Ritsema:

'In what condition is the area? What are the costs of interventions such as creating terraces on steep slopes? How do they benefit the farmers after five, ten or twenty five years? Is it worth the effort? Do you get better harvests, less salination, less erosion, or cleaner river water with larger fish stocks? Or would it be better to spend your money some other way? We tried to encapsulate all our knowledge in calculation rules. But

without dialogue with the local population, projects are doomed to failure.'

Info: www.desire-project.eu; www.isric.org and www.wocat.net.

Watch the film:
'The DESIRE project -
the challenge and the results'



A boost for the biodigester

Biogas installations for converting manure and green waste into energy have a low return on investment. Researchers in Lelystad are working on improving that situation. The novelty of their approach is their use of agricultural waste.

TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY AGE

A yellow shovel pours rejected maize, leftover feed and lily waste into a large barrel. The roots and bulbs of the lilies are hanging over the edge. Cylinders mash the mixture to a pulp, which is then carried off through a big tube at the bottom to the 'codigester', a dark green round silo underneath which can hold 500,000 litres of material. Iron steps lead to a window at the top of the digester. A glance inside reveals a dark brew reaching almost to the edge. At regular intervals, bubbles burst on the surface of this slurry. Biogas bubbles.

'The biogas is taken off to fuel the engine in that little building over there, to generate electricity,' explains Durk Durksz of Wageningen UR Livestock Research in Lelystad, the coordinator of the biogas installation. This installation is the hub of the EnergieRijk project run by Accres (Application Centre for Renewable RESources), a collaboration between Wageningen UR, energy company Eneco and the province of Flevoland. The idea is to opti-

mize the conversion of manure and agricultural waste into usable energy. Initially this is done in the codigester, in which a blend of manure and plant waste from farming is broken down by micro-organisms. The biogas that is generated, a mix of methane and carbon dioxide, is converted into electricity. The electricity from the EnergieRijk biogas plant goes into the net, just like electricity from a field full of solar panels. The heat and waste products from the fermentation process are used for the production of pure methane gas and bio-ethanol, as well as for breeding algae. Bio-ethanol is suitable for use as fuel and as raw material for the chemical and the pharmaceutical industries. The algae can be used as animal feeds and for algae oil and in cosmetics and medicines. The leftover algae then go back into the biodigester.

BIODIGESTERS RUN AT A LOSS

Optimizing the fermentation processes is crucial for professional digester companies. Of the original 150 companies run-

ning digesters in the Netherlands, there are now only 100 still in business, Durksz guesses. It is not an easy market, partly because the co-products needed, such as maize, are expensive. Durksz: 'In Germany there are 6000 digesters. They are paid extra for their electricity because it is sustainably produced. And in Germany they are allowed to put more agricultural waste products in the digesters, making the process cheaper. In the Netherlands, one fifth of the digesters are viable, while the rest are running at a loss. If you improved the return on investment by just a couple of percent, you would get a long way.'

In traditional digesters, a lot of energy goes to waste, says Durksz. 'About 38 percent of the energy from biogas is converted into electricity, and the rest disappears through heat loss. In our biogas plant we use the residual heat from the engine to produce bio-ethanol and algae. That means we make use of 65 to 70 percent of the total energy from the biogas.' The researchers



are also experimenting with preparatory treatments, such as chipping or pulverizing indigestible products like grass and maize straw.

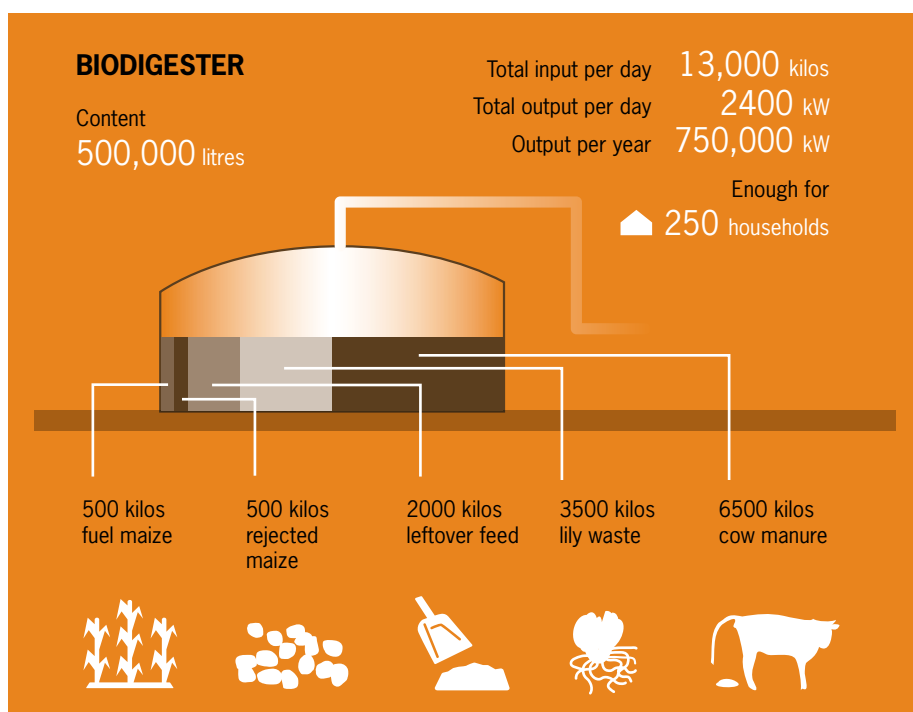
LILY WASTE SILAGE

About six years ago a discussion blew up around the issue of 'food for fuel', with critics questioning the use of food crops such as maize and soya as biofuels. 'We aim to use minimum amounts of food crops. We used to put 50 percent manure and 50 percent maize in the digester; now it is 10 percent maize and 40 percent other products such as grass, fodder waste from the cows and at the moment, lily waste.

Since November 2012, a trial has been running using waste from the flower bulb industry. Burger, a flower bulb firm in Espel in the North-East Polder by the IJsselmeer lake, was looking for a place to get rid of the waste from lilies and tulips. The company was given a grant of 122,000 euros by the province of Flevoland to run trials to see whether waste from bulb cultivation can be used in codigesters.

After the lily harvest in November, some of the waste was ensilaged. 'Ensilaged products can be used all year round. So that gives you a constant supply,' says Durksz. 'We don't have the figures yet, but I think the experiences have been positive. The first time we saw the product, we were afraid the long roots of the lilies would get wrapped around the pumps or mixers. Luckily that turned out not to be the case, as the roots rot quickly. You can only find that sort of thing out in a field trial – not under laboratory conditions.' Next summer, after the tulip harvest in July, the researchers are going to try working with tulip waste. ■

www.wageningenur.nl/nl/show/gaswinning-uit-bloembollenaafval.htm (in Dutch only)



LEARNING FROM THE DEEPWATER HORIZON OIL DISASTER

Oil in troubled waters

In an effort to limit the damage caused by the huge oil disaster in the Gulf of Mexico, the disaster response team resorted to desperate measures. It is now thought the remedy did more harm than the original problem, says Professor Tinka Murk. She is working on a model that predicts the impact of an oil disaster and suggests the best approach to damage control.

TEXT RENÉ DIDDE PHOTOGRAPHY ASSOCIATED PRESS ILLUSTRATION KAY COENEN

At the end of April 2010 there was a blowout under the Deepwater Horizon oil platform in the Gulf of Mexico not far from New Orleans. From the deepest oil field in the world – going nine kilometres below the seabed and only reached by the drills a few months earlier – gas and oil started leaking from 1200 metres below sea level through the pipe to the platform. An explosion followed and fire broke out, costing 11 rig workers their lives. The platform sank and the drill pipe broke, causing water to gush out of the well on the seabed.

Technicians were unable to stem the leak or close the numerous small holes. The blow out preventer, a sort of lid on the well, had not been functioning for weeks. For almost a month, 800,000 litres of oil poured into the sea every day. The spill response workers tried everything: injecting drilling fluid into the leak, covering it with a metal dome, and stuffing the hole with all kinds of debris such as cement-covered tennis and golf balls. Nothing worked. In the end they managed to put a funnel in place and mid-June – three months after the explosion – all the leaks were finally plugged.

As soon as the explosion happened, there were fears for an ecological disaster of unprecedented proportions. Transocean, the

owner hiring the platform to oil company British Petroleum (BP), decided to keep the oil below the surface using three million litres of dispersing agent. 'Beforehand, not much thought had been given to how to respond to an oil disaster,' says Tinka Murk, professor of Environmental Toxicology at Wageningen University, part of Wageningen UR. Almost three years down the line, her analysis is: 'The owner wanted to use this soapy substance to keep the oil not just off the beaches but literally out of sight. Just as washing up liquid dissolves the fat on the pans, dispersant mixes oil with water and creates a cloudy suspension.'

ASPHALTED SEABED

Sometimes this approach works and the dispersant prevents the oil from reaching the coast and harming birds and mammals.

'However, in this disaster the oil had already been dispersed mechanically because of the force with which it was spewed into the sea,' recalls Murk. 'There is still a debate about whether using the dispersant had any effect, with less oil coming ashore as a result. Supporters of the method say yes. But opponents say the dispersant released more toxic agents into the water and that great damage was done to the seabed.'

Whatever the case, after a few weeks oil

started surfacing and reaching the coasts of Florida and Louisiana. Tourist beaches were evacuated, fisheries brought to a standstill, and a number of pelicans got covered in oil. Photos of these birds and the polluted beaches soon went all around the world. The biggest tragedy remains hidden from view, however, says Murk. 'Many square kilometres of seabed – we don't know exactly how much yet – are covered in a tarry layer full of polycyclic aromatic hydrocarbons (PAHs), some of which are carcinogenic. Normally, in three months less than one millimetre of natural sludge is deposited on the seabed, but now it has been asphalted with a layer of gunk many centimetres thick. The disaster response team from BP and Transocean expected the dispersant to thin the oil sufficiently, but because of the interaction with floating material in the seawater, it just created a thick gunk,' explains Murk. 'At a blow, the seabed became a mass grave for its fauna.'

Three years on it appears there are some signs of recovery among the seabed fauna, particularly the foraminifera (single cell organisms with shells) as well as fish such as the blueline tilefish and a few species of snake eels. 'Under normal conditions this seabed life contributes a lot to the natural breakdown of organic substances such as ➤

An aerial photograph capturing a powerful volcanic eruption. A massive, dark, and billowing plume of ash and smoke rises from a jagged, lava-covered coastline, dominating the upper half of the frame. The lava flows are incandescent, glowing with bright orange and red light. In the lower foreground, a white fishing vessel with a blue stripe and multiple masts is seen on the dark, choppy water. The overall scene is dramatic and highlights the scale of the geological event compared to human-made structures.

‘Not much thought had
been given to how to
respond to an oil disaster’

OIL ON THE SEABED

After the Deepwater Horizon oil disaster in 2010, millions of litres of dispersant were used to dissolve the oil. With the result that many square kilometres of seabed are now covered in a centimetres-thick tarry layer full of polycyclic aromatic hydrocarbons (PAHs).

Number of days the leak continued

87

Litres of crude oil spilled per day

8,400,000

Litres of oil spilled

780,000,000

Litres of dispersant applied

7,600,000



Dispensing dispersant above and under water

Oil mixed with dispersant forms a cloudy suspension that continues to float

Tests at Wageningen UR show that when exposed to dispersant certain algae form a stringy network in which living material gets attached to oil particles and it all sinks to the seabed

On the seabed a centimetres-thick tarry layer forms, estimated at dozens of square kilometres in area, which kills seabed life

Vacuuming up the oil is effective but only works in calm seas

Burning the oil

Platform Deep water Horizon

Much of the oil still surfaces, reaching hundreds of kilometres of Florida and Louisiana coast and coating birds and turtles

Unmanned aircraft chart the underwater pollution

Two days after the explosion, the Deepwater Horizon platform sinks

Unmanned aircraft try to plug the leak at a depth of 1500 metres



Source: NOAA, EPA, Wikipedia

'At a blow, the seabed became a mass grave for its fauna'

oil, through its movement and rootling,' says Murk. If the layer is too thick and too toxic, bacteria and fungi are unable to carry out their job as the garbage workers of the sea, and the organic breakdown of the pollution caused by the Deepwater Horizon explosion cannot get going. These micro-organisms in the Gulf of Mexico are by nature 'programmed' to break down oil, small quantities of which have leaked from the seabed since time immemorial.

A human intervention to tackle the sludge on the seabed is not an option. 'It is impossible to do anything about it at a depth of 800 metres,' says Murk. 'That mess will just have to be broken down by natural processes. It is a matter of time.'

ALGAE NETWORK

Since the beginning of 2012, Murk has been project leader of the Dutch branch of a large-scale international study of the consequences of the Deepwater Horizon oil disaster. The study, called C-IMAGE, is funded by BP as a gesture to society. The contracts are in the hands of independent American organization Ocean Leadership. Nineteen institutes – most of them American – are doing the research. The Dutch project is being implemented by the Toxicology and Environmental Technology chair groups at the university together with IMARES Wageningen UR and NHL University of Applied Sciences in Leeuwarden. Murk: 'Three Wageningen PhD students are studying the effects of the dispersing agent, the breakdown of the oil and the ecotoxicological effects. We are focusing not only on the column of water but above all on the sea-

bed.' This research started in April last year and has already delivered one spectacular result. 'Tests on seawater showed that under the influence of the dispersant certain algae form a stringy network in which all kinds of living material such as zooplankton gets stuck to oil particles, after which the whole lot sink to the seabed together. This is a mysterious phenomenon that depends on local conditions, and which we would like to know more about.'

Another PhD scholar is working at NHL University on the impact of oil with and without dispersant, and is studying the effect of mixing the two. 'We want to know more about how sticky the dispersed oil particles are in reality. How long do they go on floating, do they stick to clay particles, do they sink or melt, and do they end up surfacing after all?' A third PhD student is looking at the breakdown of the oil and the toxic substances in it.

CAREFUL THOUGHT

Eventually all this research should lead to a well-founded decision support tool. The instrument is a model loaded with location-specific details about ecosystems, economic functions, currents and meteorology. If an oil spill occurs at sea, you fill in the data and the model calculates whether a vulnerable

turtle beach will be reached, whether the nearby coral reef that is a tourist attraction will be affected, whether the seabed will be polluted or the coast endangered. 'The model not only has to calculate the impact of the oil slick horizontally, but also what is happening in the vertical water column at six, sixty and six hundred metres down. There is no complete model like this yet,' says Murk. The model will also make it possible to calculate the impact of interventions such as applying dispersants, pumping out the oil or burning it. All on the basis of data about levels of vulnerability at the time of year when the accident takes place. 'Take for example the growth of fish larvae or the presence of migrating birds. You can use this aid to give careful thought in advance to disaster scenarios. An added advantage is that it makes it possible to train people before there is an actual problem. When a disaster actually happens, managers are paralysed by stress of course,' says Murk. 'The model provides you with a basis for the decision whether to use a dispersant, for example. In the case of the Deepwater Horizon disaster, that could have saved money and prevented environmental damage.' ■

www.wageningenUR.nl/en/show/learning-lessons-from-bp-oil-spill.htm

TRIPLEP@SEA

'The busy North Sea, with its many oil rigs and wind turbine parks, could be hit by an oil disaster too,' says Tinka Murk. 'Now that the Barents Sea is now longer free of ice and oil- and gas-drilling activities are increasing there, more oil tankers will be passing the Norwegian and Dutch coasts on their way to Rotterdam. Collisions and oil spills cannot be ruled out.'

So Murk has embarked on the development of a decision support model for responding to a disaster. The case being used is the relatively straightforward situation around Saint Eustatius island in the Caribbean. The Dutch water board Rijkswaterstaat has already expressed interest in Murk's approach. The study comes under a large Wageningen UR programme: TripleP@Sea, which is researching how to make responsible and sustainable use of marine ecosystems. Murk is leading this programme. Another branch of TripleP@Sea focuses on the potential for oil drilling in the Barents Sea in the Arctic Circle, for transporting the oil and for calculating in advance the impact on the marine environment. www.triplepatsea.wur.nl/UK

Nature at heart?

Dutch nature conservation policy has been turned upside down. Former secretary of state Henk Bleker was the personification of this change for a while, after he announced a two-thirds cut in the budget for nature management. He met with little public opposition – and according to some, that is because of a decline in public support for nature and policy related to it. And the blame for that is laid at the feet of nature conservationists themselves, who are accused of undermining their support base by not communicating adequately with the public and only talking about guidelines and species. Five responses to this accusation: have nature conservationists undermined their own public support?

TEXT ARNO VAN 'T HOOG **PHOTOGRAPHY** HARMEN DE JONG



Nature conservation: heath restoration near Amersfoort.



MATTHIJS SCHOUTEN

adviser and philosopher at Staatsbosbeheer (the State Forest Service) and professor of Restoration Ecology at Wageningen University, part of Wageningen UR:

'If people are not acknowledged, they will be slower to accept it'



I don't believe there is less support for nature. It is as important as ever, as various studies show, and that goes for young people too. But when it comes to the distance from the public, I do agree with the allegation. Many nature conservationists are just like medical professionals – they are more preoccupied with their profession than with communicating about what it involves. Whereas what you want from a surgeon is that he is very expert but can also explain what he is doing clearly. Often there are no problems if the local community is involved in a project from the word go. If people are ignored beforehand, especially, they will be slower to accept it. In the past, we at Staatsbosbeheer have not addressed that need properly.

'But it is not right that ecologists should get all the blame for this. The way we have been going about nature conservation in the last 20 years is a consequence of international treaties such as Natura 2000, and the wish to restore badly damaged natural features and areas. People wanted to do that as efficiently as possible and that makes targeting clearly stated habitats and species not a bad idea. A noble aim, in fact.

'We have legislation and treaties which are supposed to shape our nature management. That obligation remains. But we are going to place more emphasis on participation and citizen involvement. For Staatsbosbeheer staff, that means they will have to do more than just manage nature areas. They will have to enter into dialogue with the local community.' >

RAOUL BEUNEN

assistant professor in the Land Use Planning chair group at Wageningen University; at the end of 2012 he published work on the social dynamics underlying the criticism of nature policy

'The implementation of European treaties has had a negative impact on the image'



Too simple a link gets suggested between what ecologists do, nature policy and public support. There are many more developments that play a role here. Public support is a tricky concept and the sense that support is dwindling has to do with the image that is generated: critics get heard more in times of political and social change, whereas not everyone is so critical, by a long way.

The implementation of European treaties such as the Bird and Habitat Directives has had a negative impact on Dutch nature policy. Initially, that was because of legal battles related to plans for roads and business estates. According to the critics, it was all very tricky, problematic and slow. And at some point more and more people started thinking and acting that way. Then government bodies started living down to their reputation by asking for more research and advice, fearful as they were of further legal proceedings. And then procedures really did move slowly; it is partly a self-fulfilling prophecy. 'At the same time, the image people have that everything ground to a halt is not true. Just look at the facts: 70 to 80 percent of the construction projects went right ahead. Because of the focus on legal matters, the possibility of a concerted search for local solutions is now longer in the picture. The public criticism has made renewed discussion possible on the nature policy. Nature policymakers had created a little world of their own in which criticism was seen as a failure to understand. Now a lot more people are getting the chance to contribute their views.'

HARRIE VAN DER HAGEN

ecologist with co-responsibility for nature development at dune water company Dunea; doing a PhD on dune vegetation with the Nature Management chair group at Wageningen University

'You can get people on board by showing them what is growing'

If you ask me, public support for nature has not diminished at all. At Dunea we have witnessed discussions about projects where we remove dune vegetation in order to get loose sand back. Some of the public say: nice that we can see the bare tops of the dune again. And others say: this is my area; I don't want this intervention at all.

'I know from experience that people can relate more to ponds, swamps and forest than to dune grasslands with rare, but tiny, plants. Those grasslands – grey dunes – take 20 to 40 years to develop, but people don't find them as awe-inspiring as a tree of the same age.

'Yet on field trips I notice that you can get people on board by showing them what is growing – although there are always some opponents who stick stoically to their guns. There is more to telling stories about this sort of project than just putting across the facts. We have done too little of this in the past. 'The Netherlands has the largest continuous stretch of dunes in Europe. In terms of grey dunes, we have a special responsibility to conserve that surface area and extend it. There is no way we can just ignore that. But that doesn't mean we have to go for top scores everywhere. We take into account the area, the water supply, leisure facilities and cultural history. We always look for a compromise, without losing sight of the great importance of nature.'





ARJEN BUIJS

senior researcher at Wageningen University and Alterra Wageningen UR; at the end of 2012 he published a report on support for nature called *Draagvlak in de energieke samenleving*

‘Emotions are a sign of involvement’

In principle I agree with the suggestion that the support base for nature has diminished. It may be a bit of a generalization because there is a very big group of people who still stand behind the nature policy. It is a good thing Bleker didn’t stay in office too long, because his policy did a lot of damage, but his term in office did put the cat among the pigeons. That opened up the discussion about nature conservation and how people experience nature. Now more points of view can get a look-in, not just the traditional view that is based on ecological knowledge and the promotion of biodiversity, but pays too little attention to the way nature is experienced by local communities.

‘There was too much of a tendency in nature conservation circles to counter criticism and the feelings expressed by local people with ecological arguments. As a consequence, there was not enough differentiation in the discussion: it seemed as though a higher value was always placed on nature than on the local people’s experience. Ecologists and nature conservationists have therefore gradually made themselves vulnerable to criticism from the public and the business world. State secretary Bleker made eager use of that.

‘I think nature organizations should have realized better that not all natural features are of equal ecological significance. For example, felling exotic American oaks in an area does not constitute a big ecological gain, while it does have a massive impact on the experience of hikers. So in that case, make a conscious choice to leave the trees alone. Let us not forget that nature is not just a collective good, but also a local common good. So you should always weigh up the interests of society as a whole against the interests of the local community.

‘Emotions are too often seen as a negative thing in public discussions about nature. But they are a sign of involvement. Many ecologists have forgotten that they themselves once chose their profession on the basis of emotional commitment.’

JAAP DIRKMAAT

chair of nature conservation organizations Stichting Das & Boom and The Association of Dutch cultivated landscapes

‘I don’t see much use in a support base’



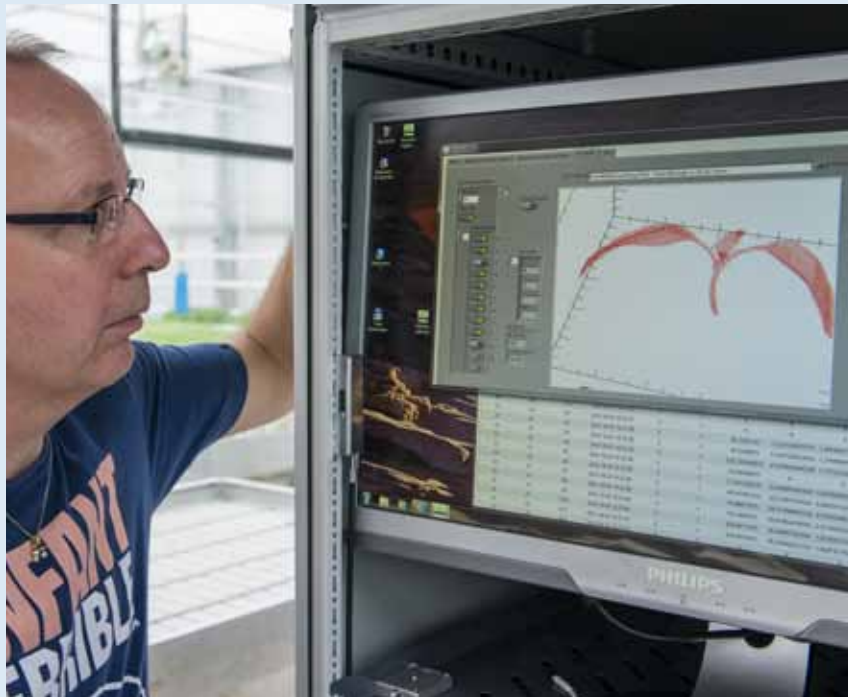
My main thought is: there we go again. A strange *idée fixe* has taken hold of people: defending nature in court because the Netherlands doesn’t stick to international

treaties is seen as bad for the support base. So we mustn’t do it. The Netherlands often takes the lead in drawing up and signing international treaties. But when the time came to translate European nature conservation treaties into laws, that was a bridge too far: that would bring the Netherlands to a standstill, people claimed.

‘The Rutte cabinet [the previous Dutch government until last summer] saw an opportunity to slash the nature budget. But Bleker’s standpoints were definitely not a reflection of public opinion. Yet many nature conservationists were so shocked that they started declaring in panic-stricken tones that the Dutch public had become alienated from nature. ‘People tend to forget that nature conservation is not a hobby, like cultural or sporting activities. Nature is the basis for human life and the only resource for our economy. The cuts that are coming now will speed up the extinction of species in the Netherlands because nature management will stop. Without mowing and digging over the soil, you will lose the orchid and the adder.

‘I don’t see much use in a support base. Some people don’t like new roads, but those roads will come anyway. Some people may have a preference for pink roads with a flowery pattern on them, but those roads are not going to be made. So is the Netherlands going to start worrying about the support base for asphalt? Decisions about the creation of infrastructure and the kind of asphalt to use are taken by specialists, by and large. So why, in the case of nature conservation – the very ground of our being – should we be required to listen to everyone’s individual wishes?’ ■

Fast *and* accurate



A sorting machine for seedlings developed by Wageningen UR works better than the naked human eye. The gains in quality and cost effectiveness are considerable.

TEXT AND PHOTOGRAPHY HANS WOLKERS



Assessing and sorting seedlings for size and quality is not an easy task. It requires a lot of expertise and a sharp eye. Highly trained assessors can see at a glance how a plant scores on quality criteria such as the thickness and length of the stem and the size and colour of the leaves. ‘Even though the assessors are highly expert, selection could be improved,’ says Rick van de Zedde, computer vision engineer at Food & Biobased Research Wageningen UR. ‘It came out that horticulturalists, nursery owners and plant breeders felt the need for a sorting machine that was better able to combine quality and standardization with a big capacity. A consortium of nursery and breeding companies and the branch organization Plantum initiated and funded the development of such a machine, with Van de Zedde as project leader.

3D IMAGE

The Marvin sorting machine from Flier systems Ltd meets all the criteria. The machine delivers the goods promptly and precisely, sorting almost 20,000 plants per hour. Food & Biobased Research developed the software for it. Ten cameras take photos of the plant, each one from a different angle. The software rapidly creates a 3D image of the plant. ‘This gives you a very good idea of the plant mass,’ says Van de Zedde. ‘For a plant breeder, that is a reliable characteristic to select for.’

‘With the Marvin we stand out for our better seed quality’

Vegetable breeding company Enza Zaden was the first company to purchase the Marvin six months ago. This company supplies plant breeders with high quality seeds. ‘With the Marvin we can assess seedlings better and faster,’ says Meindert Klooster, senior seed technology researcher at Enza Zaden. ‘This makes the seedlings more homogenous, which is very important to the client.’

MONITORING

Enza Zaden is also using the Marvin for breeding research purposes. The machine plays a role, for example, in the selection for seed and plant quality. Researchers can monitor the growth and development of individual seedlings over time, using the 3D image. The machine also very rapidly registers the observable characteristics of the plants, or phenotype. ‘We are now also using the machine to ascertain the relation between hereditary characteristics, the genotype, and the phenotype, in bell peppers and tomatoes,’ says Klooster. The Marvin does the work of at least 20 people. This means plant breeders recoup their investment of two to three hundred thousand euros within a couple of years. But the biggest gain for Enza Zaden is in quality. Klooster: ‘With the Marvin we stand out for our better seed quality.’ ■

A film about the machine can be seen at <http://greenvision.wur.nl/>

MARTIEN GROENEN ON 20 YEARS OF PIG GENES

‘I never despaired but there were some sleepless nights’

Martien Groenen’s name is in *Nature* as first author of an article about the pig genome. Followed by the names of 136 co-authors. This megaproject has taken more than 20 years. How do you coordinate something like that? And what is the aim? The chemist by training gives his down-to-earth view of things. ‘We really had to scrape together the funding for this project.’ TEXT RIK NIJLAND PHOTOGRAPHY JAN WILLEM SCHOUTEN

After a long search, Martien Groenen manages to locate the memorable photo from 2009 on his PC. It shows the Wageningen professor of Breeding and Genetics posing with his American colleagues Larry Schook and Greger Larson with a pig’s head. It is the head of TJ Tabasco, a pig of the Duroc breed, which hangs in pride of place on the wall of the lab at the University of Illinois, like a trophy. TJ is the main character in a story told in the scientific journal *Nature* in November, which lifts the veil on the pig genome. The American sow was the cornerstone of the research but the genome of a few dozen other pigs was unraveled as well, mainly thanks to Groenen. That is why he is the first author among the 136 scientists – coming from 54 research groups in 12 different countries – who worked on the publication.

The coordination of this extensive and long-haul study was in the hands of Larry Schook, Alan Archibald of the

Roslin Institute in Scotland, and you. How did you arrive at that particular trio?

‘In the early nineteen nineties we in Wageningen were involved in plans for genetic research on pigs, but in the early years we did not play a major role. In a small research group you have to stay focused: our priority was the chicken. In 2004 we were one of the main groups behind the publication of the chicken genome. After that, the pig was the next challenge, given the expertise we had acquired.

So people think: that Groenen would be a good person to have on board?

‘Yes, it does work a bit like that of course. It must click between you. Even on a personal level, I get on very well with the other two. That contact has developed into a friendship. In the summer of 2009 I even did a short sabbatical with Larry in Illinois.

But contents-wise, our experience with the chicken >



made us very welcome on the Swine Genome Sequencing Consortium which had been established by then. In 2008 Wageningen made its mark again when we came up with a chip that is used a lot both in the business world and by researchers to determine the genetic characteristics of pigs quickly. Our contribution to the consortium went into the fast lane after we obtained a grant from the European Research Council (ERC) at the end of 2009.'

An honour, a prominent role like that. But it must be no sinecure to keep all those researchers with totally different research questions on the right track?

'One works on meat production, the other on veterinary

problems, a third on the use of pigs as biomedical experimental subjects, but we all stood to gain by joining forces. So it wasn't that hard. Many of the 136 people mentioned in the publication I don't know personally, but there has always been a positive attitude. Once every couple of weeks fifteen of us, the main project leaders, held a Skype conference.'

Nevertheless, in the final phase of the project there was quite a delay. Did you never despair?

'I never despaired, though I did have some sleepless nights. The funding, for example, was quite a headache. The pig is a useful animal, but it doesn't appeal to people emotionally. That is why the genome of the horse was completed much earlier. We really had to scrape together the funding for this project. The delay in rounding it off can partly be blamed on a change of policy at the Sanger Institute, where the sequencing was done. That institute has gradually focused more and more on the functioning of the human genome, so our project got neglected. A new institute, The Genome Analysis Centre, offered to continue the work without extra funding, but they underestimated the amount of work in the last phase, when you have to put all the information together. Removing all the errors cost us at least a year. In 2009, the sequencing itself was as good as done, but it took until 2012 before the publication came out.'

'The pig is a useful animal, but it doesn't appeal to many people emotionally'



Martien Groenen (right) with his American colleagues Larry Schook and Greger Larson.

Never felt like throwing in the towel?

'Not as such. We were worried that *Nature* and *Science* would have lost interest because by now so many genomes have been published. As a scientist, of course your aim is to be published in the top journals. Along with the genome, there is more and more emphasis nowadays on having a good biological story to tell about it. Luckily we had that. Both journals were interested, but we sensed a bit more commitment from *Nature*. After the publication I got an email from *Science*. Yes, I think they were a bit jealous.'

What did you consider the most striking result of the genome study?

'It is funny that you can see so clearly that pigs have a very good sense of smell. They have many active genes for smell recognition. For taste, on the other hand, they have very few, which is why they are not very fussy. We also know that the European and the Asian wild boar

went their separate ways as long as one million years ago. The domestication of the pig happened in Europe and Asia independently of each other. In the 18th and 19th centuries, Asian pigs were used to improve European breeds. They had much more influence than we realized. One third of the genome of our commercial breeds can be traced back to those Asian breeds.'

That biological story largely comes out of your work. It is not only the genome of TJ Tabasco that has been sequenced, but also those of about 50 other domesticated and wild pigs. How was that possible? It took 20 years to map the genome of the first pig, and in no time you've got that of 50 others?

'Once we knew the global base sequence for TJ Tabasco, plus the place of quite a number of other genes, it was relatively easy to use this blueprint to identify the genome of other pigs. We are now at number 170.'

Where does all this interest in the pig genome come from?

'We want to know how the genome of this animal has changed through evolution and by domestication. We are also studying how species are formed. For that we are now also looking at other species of swine in Asia, such as the bearded pig and the Javanese warty pig. We expect to end up with about 400 sequenced animals from places ranging from the Dutch Veluwe district to parts of Asia. 'Apart from those purely biological issues, there is also a commercial side to our research. At TOPIGS, a big pig-breeding organization in the Netherlands, they have two bloodlines which came out of a single population 30 years ago, about 25 generations back. One of them was selected for fertility, the other for meatiness. We sequenced ten animals from each line to see what happens in the genome if you select for such different characteristics, and which genes are involved.'

Do I then end up with a tastier or cheaper pork chop on my plate? Or is the pig more resistant to disease?

'That of course is up to the breeding companies: it depends what they want to concentrate on. But in any case it will take years before we notice anything. First we need to find out more about which characteristics are linked with which genes. Of course there are many more applications besides improving pork chops or immunity to diseases. We are working with TOPIGS on finding out

why some boards produce boar taint, a bad smell given off by the meat of a small percentage of the animals, but which is the reason all males are castrated. If we can cut the proportion by half, the castration without anaesthetic that is done in many countries may no longer be necessary.'

After the publication, researchers were emphasizing in press releases and interviews the potential for biomedical research. Will the pig be the new lab rat?

'In the genome that has been described we can see variants of genes that are linked in humans with obesity, diabetes, Alzheimer's and Parkinson's. That offers scope for doing further research on the effect of these genes. Like humans, pigs are omnivores with a similar digestive system and physiology. Certainly, when it comes to the diseases of affluence such as diabetes and cardiovascular disease, the pig is an interesting research model. But in view of the costs of keeping pigs and their longer life cycles, I don't think the use of the pig as a lab animal is likely to take off. But the groups that do use pigs will now be able to go about it much more efficiently.'

What will be your next 'victim'?

'We have already got a long way with the coal tit, together with the Dutch Institute for Ecology, the NIOO here in Wageningen. We are studying differences in the timing of when tits start brooding. And we want to look at behavioural differences between the machos and the more timid animals, which you can trace back to the genome. That is very interesting too.' ■

FROM CHEMIST TO PIG GENES

Martien Groenen (1958) was born in Venray, the district with the biggest pig population in the Netherlands. He studied chemistry at Nijmegen University, got his PhD at Leiden and worked for food ingredients and medicine manufacturer Gist-brocades in Delft. 'The transfer to Wageningen happened by chance, really,' says Groenen. 'At a party in Leiden in 1987 I got chatting to Maruis Giphart, then special professor in the Livestock Breeding department. I was keen to go back to university work and be able to talk and write freely about my research. At that time I was able to contribute my expertise in molecular biology to the Breeding department. I didn't have any experience with farm animals, although as a student I was involved in a study on the genes responsible for bovine eye lens proteins.' Early in 2002 Groenen was appointed personal professor in the Breeding and Genetics chair group.



MAKING UNEXPLOITED PROTEIN SOURCES SUITABLE
FOR PEOPLE AND ANIMALS

Proteins wanted

Wageningen researchers are looking for new sources of protein with which to feed both people and animals. They have high hopes for proteins from algae, grass, leaves and insects. The only question is: how to get them out?

TEXT ASTRID SMIT ILLUSTRATIONS IEN VAN LAANEN INFOGRAPHIC JENNY VAN DRIEL

It is hard to imagine it now, but it is not unthinkable that in a few years time we shall no longer be getting cows, sheep or goats to manufacture protein for us from grass, but doing it ourselves instead. Well, not ourselves, exactly – factories will do the work for us. ‘The proteins in grass are nutritious and probably highly suitable for human consumption. Only we cannot extract them ourselves if we eat grass, because the cell wall of the grass are too tough,’ explains Johan Sanders, professor of the Valorization of Biomass Chains at Wageningen University, part of Wageningen UR. ‘Ruminants can do it, though. They have developed an extensive gastrointestinal tract for the purpose, in which the cell walls of grass are broken down by a process of chewing, releasing acids

and enzymes, and then chewing the cud.’ Sanders is now developing artificial and less energy-intensive methods of breaking down these cells. ‘With all due respect for the cow, it is actually a very inefficient protein manufacturer.’ Sanders’ research is one of Wageningen’s attempts to tap into new, sustainable sources of protein. This is something the world badly needs. The world population is growing apace, and what is more, people are consuming ever larger amounts of animal proteins. According to the World Food Organization, the consumption of protein in Asia between 1961 and 2007 grew by 225 percent. This puts enormous pressure on the plant protein sources because it takes many kilos of protein from grain, maize and soya to make one kilo of animal protein. >

The ministry of Economic Affairs and the Technological Foundations STW want to see the Netherlands at the forefront of the quest for new protein sources. They therefore called on researchers to come up with innovative ideas for projects and to look for ways of collaborating with business partners. Five projects, all stemming from Wageningen UR, have now been allocated a total of three million euros, 10 percent of which comes from companies such as DSM, Nutreco and Unilever. Wageningen UR also launched its own initiative to stimulate the search for new proteins. Together with the business world, it invested 6.5 million in the Customised Nutrition programme. The central question for all these research programmes is: which protein sources are going unexploited, and how could you make them suitable for people and animals? One protein that looks very promising is rubisco. Grass, leaves and algae are full of it, and it plays a key role in photosynthesis. We already consume small quantities of rubisco in leafy vegetables such as spinach, lettuce and broccoli. This protein contains all the essential amino acids – the building blocks of proteins that we need – and they are in quite appropriate proportions too. In terms of nutritional value, rubisco comes somewhere in between the protein in eggs and that in milk (casein) and soya. This makes it an interesting protein for us, if we can figure out how to extract it from grass, leaves or algae.

BREAKING DOWN CELLS

In an STW project called *Leap*, a PhD student of Sanders' is attempting this using two methods: by perforating the grass and leaves electrically, and by soaking them in a highly acidic bath. The electric perforation method – known as Pulsed Electric Field (PEF) – entails exposing the cells to a fluctuating electric field with a high field strength. This breaks down the cells and their contents –

the protein juices – flow out. In the bath, it is the high acidity that does the work. It is already clear that both methods work, says Sanders. The question that now needs to be answered is: can the methods be economically viable and what is the quality of the protein obtained by them? 'Both methods deliver a green protein juice,' says Sanders. 'Preferably, we would like to obtain dry, while protein extract from that, because no one is interested in green milk or a green veggie burger. So we are looking for methods of getting rid of the chlorophyll. It might be doable using membranes or active carbon such as Norit.' Another key issue is purity: are there any substances in the protein extract that are toxic for humans and animals? That aspect of the research is conducted by RIKILT Wageningen UR, an institute which specializes in food safety. 'Initially, we want to get rubisco out of grass clippings from road verges, and we are collaborating to that end with the state forest service. There can be poisonous plants in the grass on verges. We don't want their toxic substances to end up on the protein extract.' If *Leap*'s methods are successful and it proves easy to harvest rubisco from a waste product such as verge grass clippings, Sanders wants to try the method on tea and cassava leaves and on sorghum. 'Then farmers in tropical countries could extract this protein from their crops.' Wageningen researchers are applying the electro-perforation method to extract rubisco from algae. This is not as easy as it is with grass or leaves, however. The protein cannot just be fished out of the algae juice as soon as the cells have been perforated electrically. 'In algae, these proteins are wrapped in a sort of starch coating called pyrenoids,' explains Marian Vermue, senior researcher at the Bioprocess Technology chair group and project leader in the STW project *Algae4you*. 'We are looking for gentle methods of getting them out whole.' If they are successful, algae will form a very promising new protein source, since they are made up of approximately half protein and they are easy to grow. 'Now we only get 8 percent of the protein out of the algae in a soluble, colourless form. But we think we can raise this percentage to 30 percent,' says Vermue.

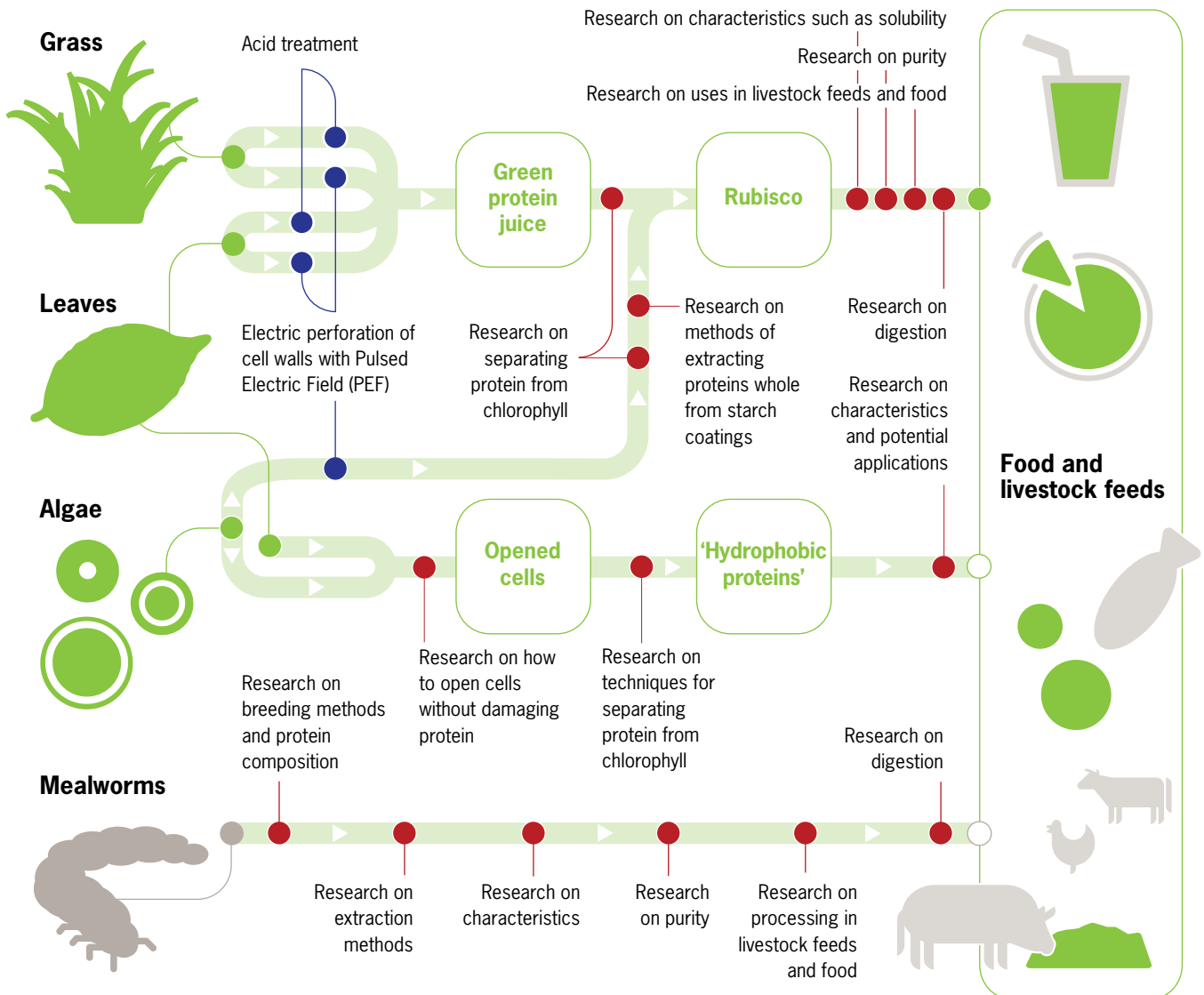
FISH AS MODEL

Not much is known about the characteristics of rubisco. It is not clear exactly how the protein behaves in a watery, acidic or salty environment – important knowledge if you

'Mealworms can easily be bred on industrial waste flows'

ALTERNATIVE PROTEIN SOURCES

Research on extraction methods and processing



KNOWLEDGE CENTRE FOR NEW PROTEINS

In order to ensure that the newly gained knowledge about proteins does not become scattered and that there is one focal point that companies and institutes can refer to, Wageningen UR wants to establish a knowledge centre on new proteins – the Protein Competence Centre (PCC). Also collaborat-

ing in the Centre will be the University of Groningen, NIZO Food Research and Dutch research organization TNO. The centre will be set up on the same lines as the Carbohydrate Competence Centre (CCC) in Groningen, which combines the knowledge and resources of six research institutes and

19 companies. 'We think it would be useful if protein research puts up a joint front too. It enables you to carry out research assignments – which require several different kinds of expertise – faster and better,' adds Petra Caessens, who is the initiator of the centre on Wageningen UR's behalf.

‘The cow is actually
a very inefficient
protein producer’



want to process it in foodstuffs or livestock feeds. This aspect is being studied by the group led by Harry Gruppen, professor of Food Chemistry at Wageningen University, in the STW project *Progress*. Along with the question of whether rubisco from algae has the same characteristics as that obtained from sugar beets or grass.

Progress is also studying the digestion process. ‘We assume that the digestive systems of humans and animals can easily absorb rubisco. But we want to know exactly what happens. Which part of the intestines absorbs what, and how fast or slowly does it go? We are using the fish as a model animal. Not because the fish resembles human beings, but because it is easy to use as a model and we want to start somewhere. What is more: if the protein goes down well with fish, the fish industry – which is very interested and is investing in this project too – stands to benefit,’ says Gruppen.

There are other interesting proteins in leaves and algae as well: these are known as hydrophobic proteins. They are attached to the membranes of the cells and probably have

some valuable characteristics. Chemists expect that they are heat-proof and stable. This would make them very well-suited for use in foods that need to be cooked and are intended to be solid. This is the domain of the STW project *Green Proteins*, in which professor of Food Process Engineering Remco Boom’s group and their TNO colleagues are studying the potential for extracting these proteins from leaves and algae too.

Extracting the hydrophobic proteins is difficult and requires an entirely new technique, says researcher Paul Bussman of TNO. ‘We must open the cells very carefully so that the proteins do not get damaged. And then we have to make sure the hydrophobic protein is separated from the chlorophyll. That won’t be easy because the chlorophyll is attached to the protein with thousands of tiny molecules.’

MEALWORM SANDWICHES

Wageningen researchers are not limiting their search to new proteins from the plant kingdom, however. They are also on the trail of new protein sources from insects.

POTENTIAL PROTEIN SOURCES IN THE NETHERLANDS

The population of the Netherlands – 17 million – requires about 250 tons of protein per year. The leaves of the sugar beets grown in the country contain about 75,000 tons of protein. This currently rots on the land, but has the potential to provide one third of the country's protein needs. The grass in the Netherlands contains 1,500,000 tons of protein: six times as much as the population requires. If all the grazing livestock were removed from the meadows and the grass was processed directly into protein in factories, there would be a surplus of protein. Algae are another good source of protein. They produce about 15 tons per hectare of breeding pond per year, of which three tons is suitable for the food industry. If tubes are used for breeding algae – and these can theoretically be located anywhere – the yield per hectare is twice as high. Insects such as mealworms are high in protein too. They produce 40 kilos of protein for every 11 kilos of feed. The food the Dutch throw away every year (40 kilos per person) could be used to produce 62,000 tons of protein.

Insect protein is not new in itself, of course. Mealworms (the larvae of the darkling or mealworm beetle) and locusts have long been eaten in African and Asian countries. But it is not expected to be easy to persuade Western Europeans to put such dishes on the menu in the near future, although more and more interest is being shown in the idea. It will probably take decades before you can get a mealworm or locust sandwich as the snack bar. So Tiny van Boekel professor of Product Design and Quality Management at Wageningen University, is studying whether insect proteins could be processed into food products such as hamburgers, meatballs or cookies. Then we could quietly get used to the idea that insects are edible.

A PhD researcher is going to figure out how to extract the proteins from the mealworms and process them in products. 'One big problem is that the protein turns black when we grind up the mealworms, a process caused by certain enzymes. So we shall have to find a solution to that first,' says Van Boekel. The researcher will also need to identify the characteristics of the proteins: are they water-soluble, can they bind fat, and do they flake?

BREEDING ON BREWERY WASTE

The advantage of using mealworms is that they are not demanding creatures. They will grow on almost any substratum. In a natural environment, these larvae grow on mouldy wood, but under artificial circumstances they can also grow on wheat flour or husks, or on residues from a biscuit factory, on brewers' spent grain, on compost or even on manure. 'Mealworms can easily be bred on industrial waste flows,' says Van Boekel. 'In this project we are going to find out what effect their food has on the quality of their protein. Does the mealworm contain more protein if it is grown on brewers' spent grain

than on biscuit waste or compost? And does the worm absorb heavy metals such as zinc and lead? We don't want that, of course. That is why we involved RIKILT in the project as well.'

Another programme in which Wageningen researchers are looking for new proteins is the Customised Nutrition programme. But whereas the emphasis in the STW projects lies on suitability for human consumption, that of Customised Nutrition lies on animal consumption, explains project leader Wouter Hendriks, professor of Animal Nutrition at Wageningen University. 'For instance, we want to know how we can process these insect proteins into feeds for pigs, chickens and domestic pets. And how these animals digest the proteins. What do their digestive systems get out of the feed, and how do their intestinal cells respond to these new proteins? A crucial part of the immune system is in the guts. Are the new proteins good or bad for the immune system?' The project will also look at consumer attitudes. How will consumers feel about chickens being fed on insects? And does it make insect products more acceptable for the consumers themselves, or do they suddenly become low-grade foods in their eyes? And will consumers be willing to feed their cats on food made from algae proteins?

There is some overlap between the STW projects and Customised Nutrition. There are a few scientists, including Van Boekel and Gruppen, working in both research programmes. Far from seeing that as a problem, Van Boekel sees only advantages to it. 'In our STW projects, only one PhD researcher is working on insect proteins. On his own, he can never answer all the questions we have about insect proteins. So the more researchers work on this subject, the better. Then we can learn from each other and reach the hoped-for breakthrough faster.' ■

From silver cutlery to communal kitchens



It is 95 years since the founding of Wageningen Agricultural College. In four short articles Wageningen World looks back at its foundation and how student life, teaching and research have changed since then. We start with the history of student accommodation; a tale of 'townies' and 'out-of-towners'.

TEXT LEO KLEP **PHOTO** SPAARNESTAD PHOTO

The number of students increased substantially just prior to the foundation of the Agricultural College in 1918, to around 200 a year. That made letting rooms to students a financially attractive proposition for Wageningen residents, all the more so because the students had to eat as well. The teaching staff led the way. They tended to live in the largest houses along streets such as the Bowlespark, the Lawickse Allee and the Generaal Foulkesweg. Being directly involved in the College, they would also have been the first to realize the importance of providing rooms if you were going to attract students. Up to then, most of the Royal Agricultural School students had had to rely on the boarding house at Duivendaal that the school had set up. A more expensive option was lodging with a teacher – lodgers were required to bring their own silver cutlery so that the meals could be eaten in the appropriate style.

DINING FACILITY

As student numbers rose, shopkeepers and widows followed the teachers' example and started to provide lodging for students. A

new profession emerged: that of landlady or boarding house keeper. In about 1913 Ceres, the only student society at the time, offered a 'dining facility', advertised as being more sociable, better and 'no more expensive'. Much later, in 1954, the introduction of subsidies for the societies' canteens spelled the end of board and lodging in private homes.

Prior to World War II, the steadily expanding student population was mainly housed in the town centre. The houses on the outskirts were generally too small and the families had too many children to take in lodgers. The centre was popular; the town centre was even affectionately known as the Quartier Latin and student slang differentiated between the 'townies' and 'out-of-towners'.

YOUNG COLLEGE MEN

Only twelve buildings in Wageningen survived the war without damage. Even so, the 16,000 inhabitants in 1946 were able to provide shelter for 1100 students – double the peak number before the war. The extra space had to be found in the suburbs as the houses

in the town centre had been particularly badly damaged. And the students were most welcome in a period when the Netherlands was struggling to recover from the war. There were many working-class homes – a front room, a back room and an attic – where letting the front room to 'young college men' was a way of covering most of your housing costs; the family moved to the back of the house where the kitchen and toilet were. As people became more prosperous, the supply of rooms to let dried up. That was what led SSHW (foundation for Wageningen student accommodation) to build the first student residences on the Nobelweg in 1959 – among the first in the Netherlands. These residences were divided into sections with 14 rooms (each with a floor area of 12 m²) plus a communal kitchen. Ceres protested vehemently against this development as it feared competition for the student societies if students were able to cook together at home. The protest met with some success but students' desire to be housed together won out in the end. In fact Ceres itself had set the example for this form of accommodation with the 'society pad' phenomenon:



A room in a 'student pad' in Wageningen, 1950.

buildings where students, in this case society members, occupied every floor.

FLATS ABOVE THE SHOP

Shared accommodation for groups of students was increasingly common from 1960 on. Not only were there the blocks of student flats, fast growing in number (but with fewer rooms per section than the Nobel blocks), there were also places becoming available through the private sector. After 1960 many shopkeepers vacated the flats above their shops while entire premises on the outskirts

of the town were refurbished for use by students. This development was bolstered by the fact that letting individual rooms became less popular due to tax changes, which particularly affected private individuals who received rent rebates.

Most of the student residences, now numbering 4500 rooms, were built on the edge of the town. SSHW, which goes by the name of Idealis these days, would like to build in the town centre as well but there is not much space. In fact there is so little space that Idealis currently houses several hundred stu-

dents in Ede. The university itself has also put up several hundred students, many of them international students, in Bennekom. All in all, most students these days are 'out-of-towners'. The national trend for students to go on living with their parents for longer is less apparent in Wageningen. Students are more likely than at other universities to come from all over the country and the transport connections are too poor to make commuting an appealing option. Besides, Wageningen remains a very popular student town. So nice, you want to live there. ■

TWO GENERATIONS OF THE MEESTER FAMILY ON WAGENINGEN THEN AND NOW

‘We made friends for life there’

Agricultural economist Gerrit Meester and environmental consultant Rianne Meester-Broertjes met as students in Wageningen. Their eldest daughter Hante followed in their footsteps. Sheer coincidence, according to her parents. But the young Hante certainly got a positive picture of Wageningen. ‘When I was little I used to sit in the Argo boats.’

TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY JÖRGEN CARIS

‘My father is quite famous. I didn’t notice that much during my studies but I do now. When I get in touch with people from the ministry of Economic Affairs or from the university, for instance.’ So says Hante Meester, who graduated in Nutrition and Health in 2003. She now works at Wageningen University, part of Wageningen UR, where she does extension work on food with primary school children. Hante’s father is Gerrit Meester, who graduated in Agricultural Economics at Wageningen in 1970, got his PhD in 1985 and went on, in his capacity as top civil servant in the ministry of Agriculture, to help shape European agricultural policy. He also became special professor at the University of Amsterdam. He has now retired. Hante’s mother made her mark too.

After studying Water Purification, Rianne Meester-Broertjes had a series of jobs in the field of environmental and spatial planning, back in the days when the environment was only just on the government agenda. That was not the only area in which her mother was a frontrunner, thinks Hante: ‘Most women of her generation stayed at home to look after the children. My mother had three children and worked four days a week. Now I have a daughter myself I sometimes wonder how she managed it.’

MILK MONEY

Hante’s parents were both the first in their families to go to university. Rianne wanted to study chemistry in Amsterdam but at 17 years of age, her parents thought her too young for the big city. A safer and more

familiar option was Wageningen, where Rianne’s father had some contacts as a fruit grower, with the then Agricultural College. After a short open day event, Rianne became enthusiastic about it too.

Gerrit, elder son of a dairy farmer, knew from the age of 10 that he wanted to study at Wageningen. ‘Once a fortnight the milk money came in; I wanted to know what lay behind that. I also often talked to my grandfather, who lived with us on the farm, about the emergence of the European Economic Community.’

In 1962, Gerrit went to Wageningen and chose to major in Agricultural Economics. ‘By chance I got the opportunity to do a six-month internship in Brussels in 1968. That was when the Mansholt Plan was being developed, with a view to reforming the



European agriculture sector. It was exciting. I had a sense of being exactly where it was all happening.'

In the course of her studies at Wageningen, Rianne's interests shifted to planning and environmental law. A three-month internship with an environmental services provider *avant la lettre* in the Rijnmond area gave her a foretaste of her later career. 'The Botlek, the port and industrial area of Rotterdam, had not been developed yet then. It stank and the local residents com-

plained. The air pollution problems were just beginning.'

Both Gerrit and Rianne were actively involved in Wageningen student life. 'In my second year the only cinema in Wageningen burned down and there was nothing else to do at all. Everyone joined a student society,' says Gerrit. He was a member of the Wageningen Student Corps and Rianne of the Wageningen Women Students Association. The two clubs merged to form Ceres in 1970. They were also both ➤

HANTE MEESTER

Age: 34

Studied: Nutrition and Health
1997–2003

Works: Leader of taste education programme *Smaaklessen en Schoolgruuten*; and science project *Wetenschapsknooppunt*, Wageningen University



GERRIT MEESTER

Age: 68 **Studied:** Agricultural Economics 1962–1970

Works: Now retired, various advisory positions including member of Council for the Living Environment and Infrastructure

RIANNE MEESTER-BROERTJES

Age: 64 jaar **Studied:** Water Purification 1965–1972

Works: Retired, various board and voluntary work

**‘There is more
theoretical depth at the
university now’**

active members of the Argos rowing club. Gerrit: 'It was all races in those days still. You trained for at least an hour five days a week.' Rianne adds: 'There was nothing at Argo then – not even a bench so you could sit in the sun, so you didn't hang around there. I steamed back up the hill with wet hair, not to be late for my practical.' She remembers Wageningen in the nineteen sixties as quite a poor town with the now long-closed brick factory, the Schimmelpenninck cigar factory and the Veenman and Vada printers' firms. 'The agricultural college played an important role in your life – not just on account of your studies but also because student activities were very important. Nowadays in Wageningen there are other research institutes besides the university, as well as other prominent businesses. And there is much more for students to do than the activities of student societies.'

In 1968 Rianne and Gerrit both took on positions on the boards of their student societies and met regularly as a result. Their relationship blossomed in 1969. One year later Gerrit got his first job in Rotterdam, teaching first-year students the basic principles of economics. The couple got married at the end of 1970. After graduating in 1972, Rianne got a job in environmental research at TNO. Hante was born in 1978, followed later by two sons.

FOR LIFE

The young Hante got a positive picture of Wageningen. 'My parents have always had a soft spot for Wageningen. When I was little I used to sit in the Argo boats. They still visit Wageningen regularly. Sometimes I ask them, are you going to come and visit me too?' Many of her parents' friends from their student days live in and around Wageningen. 'We spent an intensive period of our lives there and we made friends for life there. I still remember a discussion with Pim Brascamp at the student society about the mathematics of rowing,' says Gerrit. Pim Brascamp, former director of the Education Institute at Wageningen

University, and Arie Oskam, professor of Agricultural Economics and Rural Policy, are still among his best friends.

The Meesters have been faithful donors to the Wageningen University Fund for years. They also often help organize reunions and on their fortieth wedding anniversary they asked for donations for Argo's new boathouse instead of presents. Gerrit is also still professionally involved at Wageningen. He leads a course on European agricultural policy at the Wageningen Business School and he sometimes advises chair groups on their degree programmes.

Nevertheless, Gerrit and Rianne do not see themselves as a 'Wageningen family'. Hante's decision to go to Wageningen is sheer coincidence. After secondary school she wanted to do something related to the preventive side of health and nutrition – which made Wageningen an obvious choice. Like her parents, Hante wanted to join a student society, but not necessarily Ceres. Having grown up near Leiden, where a sister club has a reputation for wild behavior, she did not have a very positive idea of the Student Corps societies, so she opted for the KSV. 'My year group has become a sort of friendship group. We meet up regularly for a meal and sometimes we go away together for a weekend. That is the strength of a student society; you keep in touch. But those bonds are stronger for my parents. It had a tremendous influence on them and it's really part of their lives.'

PINK YOGHURT

Gerrit likes the fact that Hante chose Nutrition and Health. 'When Rianne delved into the topic of the environment, people were just starting to be aware of pollution. I was working on European agricultural policy just when that was urgently in need of an overhaul. And now Hante is working on nutrition and health, a theme which is very relevant at the moment, both nationally and internationally.'

In the course of her studies, Hante specialized in physiology and epidemiology. After graduating, she got involved in developing

a national primary education programme on nutrition and food. This formed the basis of the present-day Wageningen University organization which runs taste lessons in schools (*Steunpunt Smaaklessen en Schoolgruiten*), of which Hante is the manager. 'Gruiten, in the title, is a made-up word that combines vegetables (*groenten*) and fruit,' she explains. 'We want to put across to children how tasty food is, and to get them to think about food. We show them what your senses tell you about food, even before you have tasted it. Yoghurt tastes sweeter if you colour it pink, for instance. Children get to find that out for themselves by doing a test. And we also deal with animal welfare, health and food production, and the future of food.'

These education programmes are now running in more than 3000 of the 7500 primary schools in the Netherlands. The organization now faces the next task: becoming autonomous. 'The government wants private parties to start picking up the tab. But it's the same with nutrition as with nature: everyone thinks it's important but no one gives it real priority.'

Her degree has given her a broad basis, Hante thinks. Her mother, too, benefitted a lot in her career from the knowledge and approach she picked up in Wageningen. 'I learned to tackle a problem from various angles, which is the typically Wageningen approach,' says Rianne. Gerrit says one of the main things he took with him was a critical and liberal take on the protectionist European agricultural policy. Just like Rianne, he lauds the broad approach. 'When I studied there the Agricultural College focused mainly on training agricultural graduates who would work in the Netherlands or elsewhere. Most of the courses were pretty technical and practical. The modern university has a much broader set of degree programmes on offer, and on the whole there is much more theoretical depth to them,' says Gerrit. 'But we have all learned to combine the technical side with the related social issues. That is the strength of Wageningen.' ■

Recipe for top-class teaching

For years, Wageningen University has come out top for Bachelor's degree programmes in the Dutch higher education rankings. How do the lecturers manage that? The five leading lights of this year talk about their motives and methods.

TEXT EMMA DIEMONT AND ALEXANDRA BRANDERHORST **PHOTOGRAPHY** GUY ACKERMANS

In January, the Wageningen University Fund handed out the annual Teacher of the Year Award. This is a mark of honour for the best lecturer based on the students' own evaluations. The five nominees can be considered as the best lecturers at this point in time. This year the award went to Dolf Weijers, a professor holding a personal chair and lecturer within the Biochemistry group. Explaining his commitment to his subject, he says 'I think it is important to train the next generation of researchers. Sometimes research is driven primarily by a goal, by politics but I always stress the importance of the desire to understand things. That is the recipe for success,' he claims. 'I give basic biochemistry in the second year. We tackle such subjects as haemoglobin,



which absorbs oxygen from the lungs and then releases it into the muscles. That might sound pretty tedious but it is really interesting if you start to wonder how it could work at all.' But Weijers also points to the exceptional degree of interest among Wageningen students: I've been teaching in Wageningen since 2006; before that I worked for four years in Germany and I got my PhD in Leiden. If I compare these places, Wageningen stands out. I see a lot of enthusiasm and a genuine desire to learn among the students. They come here because they have a specific interest.'

LISTENING, READING AND SEEING

'These days students work very hard and are very dedicated,' says André van Lammeren, associate professor (personal chair) within the Cell Biology and Immunology Group. 'They have to make better use of their time than previous generations did.' Van Lammeren won the award in 2010 and was nominated again this year. Talking about his teaching methods, he says: 'Some people learn by listening, others by reading a text and others by looking at a drawing. I use different methods to present the material. People are better able to understand complex processes if you gradually build up a picture of a situation, process or principle. If you help a student to figure out a process, you can get much more into their heads than if you provide isolated snippets of information.'

Huib Savelkoul, a professor within the Cell Biology and Immunology Group, has been nominated five times before for the Teacher of the Year Award. 'I find it amazing that I consistently end up on the shortlist. On the other hand, the Dutch word for professor is literally "high teacher". Teaching should be the number one priority for a university.' Savelkoul gets the students fully involved in his lectures: 'Students listen best to other students. I like to make use of that. In the food allergy and



immunology course I ask who suffers from an allergy. A lot of hands always go up. If I then ask the students how they deal with that, the whole room listens, quiet as mice.'

DIALOGUE WITH STUDENTS

Ljiljana Rodic-Wiersma also tries to make contact with the students in her lectures. A lecturer in the Environmental Technology group, she was nominated last year as well. 'I get bored listening to myself talk for an hour – it sends me to sleep. That is why I always get a dialogue going with the students in the lecture. If we have decided to spend this time together learning something, we should make proper use of it. I don't give too many instructions in my assignments. Sometimes students get worried or frustrated by this but if I spell everything out for them there won't be much room for their creativity. I'm really interested in the students' development as human beings, not just in their intellectual knowledge.'

Ute Sass-Klaassen is an assistant professor with the Forest Ecology and Forest Management Group and has also been nominated for the title of best lecturer once before. 'Good teaching depends crucially on preparation and being committed to the subject matter and the students. That may sound simple but in my opinion that's the key to success. When I'm giving a lecture, I always look first to find the latest news about the topic I'm discussing. That shows students that what they are learning really matters. I prefer to take my students on trips. Then you see gigantic tree trunks of tropical wood, two metres in diameter. Believe me, that brings home to you what it means for such an enormous tree to fall in a rain forest.' ■

'I get bored listening to myself talk for an hour – it sends me to sleep'



New website for alumni

The website for alumni has moved and been updated. The alumni portal used to be a separate website; now it is part of the Wageningen UR website.

The alumni website provides news and information about activities for graduates of Wageningen University as well as a meeting point for alumni.

The website puts successful alumni in the spotlight in the feature 'Alumni in the Picture'. 'Alumni in action' draws attention to graduates giving guest lectures, making donations or offering internships. The alumni website also showcases what is happening across Wageningen UR and in the KLV Wageningen Alumni Network. That is easier now that direct links can be made to other pages on the Wageningen UR website. See: www.wageningenur.nl/en/Alumni.htm

Alumni can also join the LinkedIn groups for Wageningen University Alumni, KLV and various country groups.

Soil samples and the Auzoux horse

Wageningen's scientific collections have been inventoried and partially rehoused.

The various moves and mergers that have taken place in Wageningen UR over the past few years prompted a review of all the Wageningen collections, says Simon Vink, member of the working party on the management of the collections.

The funding for managing the collections comes from a special foundation, and the funds are managed by the Wageningen University Fund.

The working party started an inventory of about 25 Wageningen collections three years ago. Among other things, they

looked at which ones are still relevant to Wageningen courses and research. Some of the collections were deemed to be of more use somewhere else. The insect collection, for instance, has been moved to the Naturalis natural history museum in Leiden, while the miniature farm machinery has gone to a museum in Wageningen, says Vink. Wageningen UR continues to house soil samples from all over the Netherlands, all the mushroom varieties since 1950, and the outdoor art collection. The 19th century articulated papier mâché horse by Auzoux has been restored. Vink: 'The horse was used in anatomy classes; now it will be put in a display cabinet in the Forum library.'



Mansholt Foundation to Wageningen

The Mansholt Foundation has been brought under the Wageningen University Fund (WUF). From now on the Mansholt Business Award for Sustainable Entrepreneurship (M-BASE) will be conferred once every two years.

The prize, an amalgamation of the Mansholt Prize and the WUF Entrepreneurship Prize,

is intended to cast the spotlight on innovative entrepreneurs, explains Harm Evert Waalkens, ex-chair of the Mansholt Prize foundation. 'I am proud that we could bring the foundation and the prize under the auspices of the university fund. That anchors it in the Wageningen knowledge powerhouse, which focuses on agriculture, rural development and food security,' says Waalkens. The management of

the prize and the capital, about 100,000 euros, has already been handed over to the Fund. The new prize, M-BASE, was awarded for the first time at the end of last year.

The Mansholt Prize was named after Sicco Mansholt, a former Dutch minister of Agriculture and European commissioner, who was in at the birth of the European agricultural policy.

WAGENINGEN IN THE WORLD

ACTIVITIES



Greetings from South Sudan

'A rare tropical disease, Guinea Worm disease, has come one step closer to global eradication,' emails Nynke Brunner, who graduated in Nutrition and Health from Wageningen University in 2008. Brunner is a technical advisor at the Carter Centre, which is running a successful programme to eradicate Guinea Worm Disease. In 1986 there were about 3.5 million cases of this incurable parasitic disease in Africa and Asia. In 2012, thanks to education and the filtering of drinking water, there were 542, most of them in South Sudan. Wageningen World has been there, in Naliakujuk, Kapoeta East County. Brunner: 'These Toposa women are grinding sorghum, dressed in their traditional goatskin clothing.'

Are you reading this magazine somewhere far from Wageningen too?

Send the photographic evidence to wageningen.world@wur.nl

Reunion for first-years of 1988 and 1963

Reunions for the graduates of 25 and 50 years ago will be held in the autumn on the Wageningen campus. The alumni who started their studies in 1963 are welcome on Friday 11 October, and those who started in 1988 on Saturday 2 November. There is an extensive programme for the reunions, including lectures, a guided tour of the campus and one of the town, followed by drinks and a dinner.

Graduates will receive an invitation soon. You can update your personal details and address at www.wageningenur.nl/en/alumni.htm. Or send an email to: alumni@wur.nl



ANNIVERSARY

University's 95th birthday

Wageningen University has been in existence 95 years on 9 March. Throughout the jubilee year there are activities for alumni, including a grand reunion on 14 June.

The university's birthday party coincides with that of Wageningen, which has had city rights for 750 years this year. On Friday 14 June, in the middle of the festivities in the town, there will be a reunion for graduates, with activities on campus in the afternoon

that will showcase what Wageningen UR is doing these days, followed by an alumni dinner in the town centre, with musical entertainment.

Spread throughout the year there will also be a series of debates in the Netherlands and elsewhere in the world. The debates will be on topics related to food security and the role that Wageningen UR can play in it. They will be held at regional alumni meetings in China, the US, Chile, Ethiopia and Brussels, among other places. And there is yet an-

Wageningen
University



1918
2013

other anniversary coming up: Wageningen Ambassadors was established 10 years ago and will mark the occasion by sharing success stories with prospective students at open days and tag along days. Keep in touch through the LinkedIn group: Wageningen University Alumni. Or visit the website: <http://www.wageningenur.nl/en/Alumni/Areas-of-expertise/Anniversary.htm>

PERSONALIA

Prof. Paul van den Brink, WU Environmental Protection (water purification) 1992, has been appointed Honorary Visiting Professor in the Environment Department by the Senate at York University (UK). 21 December 2012.

Ernst van den Ende PhD, WU Phytopathology 1988, director of the Plant Sciences Group Wageningen UR, has been appointed chair of StartLife Wageningen. 23 January 2013.

Kees de Gooijer PhD, WU Food Technology 1985, director of Food & Nutrition Delta, has been appointed board member for Chemistry and Work at the Royal Netherlands Chemical Society and chair of the board of directors of the Top Consortium Foundation for Knowledge and Innovation in the Biobased Economy (TKI-BBE). May and June 2012.

Ab Groen PhD, WU Animal Breeding 1986, director of Education and Research at Wageningen University, gave his farewell address on 24 January 2013. Groen has become chair of the board of directors of the education provider Helicon Opleidingen. 1 February 2013.

Rinus Jaarsma PhD, WU Land Development 1970, former associate professor (personal chair) with the Land Use Planning Group, will be lecturing as visiting professor at Mendel University in Brno, the Czech Republic. 1 January 2013.

Han Joosten PhD, Radboud University Nijmegen Biology 1983, PhD WU 1988, has been appointed professor by special appointment in Food Safety Microbiology. 1 November 2012.

Marleen Kamperman PhD, Utrecht University Chemistry 2003, working in the Physical Chemistry & Colloid Sciences Group at Wageningen University, has been awarded the Dutch Organization for Scientific Research (NWO) Athena grant of 100 thousand euros, under the Chemical Sciences programme for talented female researchers. 31 October 2012.

Mieke Muijres MSc, WU Earth System Science 2010, has won third prize in the Dutch and Flemish 2012 Science Shop competition for 'Welcome to Rotterdam', her study of intercultural encounters. 14 December 2012.



PHOTO SJAAK VERBOOM

Harry Paul

Harry Paul PhD, WU Phytopathology 1985, has been appointed the inspector general of the Netherlands Food and Consumer Product Safety Authority, part of the Ministry of Economic Affairs. 15 January 2013.

Prof. Joost Pennings, WU Economics of Agriculture and the Environment 1994, Professor of Agricultural Marketing in the Marketing and Consumer Behaviour Group, has been appointed by the European Commission as a member of the EC Expert Group on Agricultural Commodity Derivatives and Spot Markets. 4 December 2012.

Saskia van Ruth PhD, WU Food Technology 1990, has been appointed professor by special appointment of Food Authenticity and Integrity at Wageningen University. 1 October 2012.

Prof. Fons Stams, WU Molecular Sciences 1979, professor holding a personal chair at the Laboratory of Microbiology at Wageningen University, has received an ERC Advanced Grant worth 2.5 million euros for research into new anaerobic micro-organisms and their application in the recycling of materials in waste flows. 26 November 2012.

Henk Udo PhD, WU Animal Breeding 1974, Animal Sciences Department at Wageningen University, gave his farewell lecture as he has reached retirement age. 8 January 2013.

Annie de Veer MSc, WU Economics of Agriculture and the Environment 1989, acting director of Management Development Consultancy in the Senior Civil Service department of the Ministry of the Interior and Kingdom Relations, has been appointed director of Wageningen UR Livestock Research. 1 January 2013.



Annie de Veer

Prof. Leontine Visser, Leiden University Cultural Anthropology 1976, professor of Rural Development Sociology at Wageningen University, gave her farewell address on the occasion of her retirement. 22 November 2012.

NEMATOLOGY AWARD

Uyttenboogaart-Eliassen Foundation Thesis Award

Francine Pacilly BSc, WU Biology 2012, **Esther Stam MSc**, WU Biology 2012, **Arisca Visser BSc**, WU Biology 2012, and **Emma van der Woude MSc**, WU Biology 2012, have won the Uyttenboogaart-Eliassen Foundation Thesis Award for their thesis *Parasitoids in paradise: parasitism, phoresy, color preference and runt fertility in Trichogrammatid wasps on Oahu, Hawaii*. December 2012

IN MEMORIAM

Prof. F. von Benda-Beckmann

passed away at the age of 71.
7 January 2013.

J. Berghoef PhD, WU Horticulture
1974, passed away at the age of 67.
20 November 2012.

B.H.M. Boerrigter MSc, WU Tropical
Land Development 1982, passed away
at the age of 60. 30 November 2012.

L.L.A. Brouns MSc, WU Rural
Sociology of the Non-Western Regions
1980, passed away at the age of 66.
13 November 2012.

H. ten Dam MSc, WU Economics
1949, passed away at the age of 91.
24 December 2012.

T. van Dongen, WU student of
Molecular Life Sciences, passed away
at the age of 32. 4 December 2012.

A.J.M. Gillis MSc, WU Agricultural
Plant Breeding 1960, passed away at
the age of 88. 26 October 2012.

T. Goldhoorn MSc, WU Agricultural
Plant Breeding 1945, passed away at
the age of 93. 5 November 2012.

J. Groenendijk MSc, WU Rural
Economics 1951, passed away at the
age of 87. 22 January 2013.

J.B.A. Hakvoort MSc, WU Forestry
1967, passed away at the age of 73.

G.J. Hegemans MSc, WU Horticulture
1957, passed away at the age of 83.
31 October 2012.

Prof. L. Horst passed away at the age
of 82.5 February 2013.

B. Huizinga MSc, WU Rural Sociology
of the Non-Western Regions 1968,
passed away at the age of 72.
10 November 2012.

J.K. Jansen MSc, WU Forestry 1985,
passed away at the age of 60.
14 November 2012.

Ms M. Kaboord MSc, WU Plant
Breeding 1974, passed away at the age
of 65. June 2012.

J.H. van Kampen PhD, WU Agricultural
Plant Breeding 1951, passed away at
the age of 87. 2 February 2013.

W.A. Mijlief MSc, WU Forestry 1962,
passed away at the age of 81.
4 December 2012.

A. Murangi, WU student of Plant
Sciences, passed away at the age of
45. 28 December 2012.

J. van Noort MSc, WU Farming
Technology 1995, passed away

at the age of 51.

T. Prins MSc, WU Tropical Plant
Breeding 1959, passed away at the
age of 80. 18 January 2013.

J.B. Rauwerdink MSc, WU Biology
1984, passed away at the age of 53.
22 November 2012.

C.G. Roelands MSc, WU Horticulture
1955, passed away at the age of 83.
14 October 2012.

H.J. Scholten PhD, WU Biology 1977,
passed away at the age of 61.
13 January 2013.

Ms M.E. van der Staaij-Pot MSc, WU
Plant Breeding 1976, passed away at
the age of 63. 2 December 2012.

W.H. van der Veen MSc, WU Rural
Sociology of the Non-Western Regions
1977, passed away at the age of 73.
22 November 2012.

J.L. Verhoeven MSc, WU Agricultural
Plant Breeding 1958, passed away at
the age of 87. 15 November 2012.

H. Vos MSc, WU Agricultural Plant
Breeding 1953, passed away at the age
of 87. 20 October 2012.

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

THESIS PRIZE

Best thesis by Hanna Rövenich

Hanna Rövenich, a Plant Biotechnology student, produced the best Master's thesis of 2012, according to the Wageningen University Fund. The fund handed out four thesis prizes on 7 February, one for each educational domain. The overall thesis prize went to Hanna Rövenich in the Life Sciences domain.

Her Master's thesis dealt with the identification of proteins that play a key role in a fungus common in tomato plants. 'If we can decipher the mechanism that leads to infections in tomatoes, we can make tomatoes resistant,' explains Rövenich. The jury was impressed by the quality of her research, the new methodology and the prospect of an article in a leading scientific journal. 'I was very surprised to hear I'd

won the overall prize,' says Rövenich, who is from Germany. She graduated in August 2012 and is now doing PhD research on another fungal disease that affects tomato plants.

Anna Wegner, an Environmental Sciences Master's student, won in the Environmental Sciences category, while **Sebastian Hoenen**, a Master's student of Management, Economics and Consumer Sciences, won in the Social Sciences category. Master's student of Agricultural and Bioresource Engineering **Frans Boogaard** won in the Agro Technology and Food Sciences category.

The overall winner received 1000 euros and the others 500 euros, along with a replica of the 'Wageningen tree', a certificate and

a jury report. KLV Wageningen Alumni Network donated the prize money.



Hanna Rövenich (left) and Janine Quist (WUF)

PHOTO BART DE GOUW



STRATEGIC NETWORKING PAYS OFF!

About the origins of TTI Green Genetics

As a network organisation par excellence, KLV facilitates contacts among alumni and between alumni and Wageningen UR. Technology Top Institute (TTI) Green Genetics demonstrates that a strong network can lead to fantastic results. The institute was set up in 2007 following a shrewdly planned study afternoon organised by KLV and it put plant sciences research in Wageningen on the policy agenda at a strategic point in time.

TTI Green Genetics, a platform for research institutes and companies in the area of plant propagation material, supports research aimed at developing knowledge and making this suitable for the plant breeding industry. Orlando de Ponti, Wageningen Ambassador and at that time R&D director of seed breeding company Nunhems, was closely involved in the establishment of the TTI. "KLV had the vision to bring the right people together at exactly the right time."

What exactly was happening in 2004? "Many developments were taking place with respect to plant biotechnology but the knowledge generated was not automatically being picked up by the market," says De Ponti. "During the second cabinet under Prime Minister Balkenende, in 2003, an Innovation Platform was established to close that gap so that the Netherlands could continue to be a world leader in several as yet to be determined key areas. And of course Wageningen wanted to be involved in that." In response to these developments KLV organised the study afternoon 'Knowledge economy and innovation: New impulses for the agrofood sector' in June 2004. Opinion leaders, policy makers, scientists and experts from

Orlando de Ponti

industry came together to exchange their visions, to put agriculture and food more clearly on the agenda, and to examine what each sector could do to boost its innovative strength.

De Ponti was one of the speakers. "My message was: if you want to be a knowledge economy then that will cost you money. Industry must contribute but the government also has a role to play." Ate Oostra, who spoke on behalf of the then Ministry of Agriculture, Nature and Food Quality, was delayed and entered the room at exactly the moment I showed some figures about how little the Netherlands invests in plant sciences research compared with other countries. His immediate response was: 'Don't expect too much from the government'. That instantly influenced the mood in the room where many repre-



photo: Guy Ackermans

sentatives from industry were present. During the break I spoke to Aalt Dijkhuizen, who at the time was also chair of the Executive Board of Wageningen UR. 'The key area food is already under development,' he said. In the workshop 'Innovation in the plant sector' we vented our dissatisfaction about that and stated: food is inextricably linked to agro! Without seeds there are no pork chops. How can Wageningen fail to give recognition to the plant breeding sector, which lies at the basis of the world's food supply? Following the conference a basic plan was drafted in just a few hours together with the two workshop leaders, Aad van Elsen and Jaap de Vries. It was already June and so effectively a mission impossible, but in September a business plan for TTI Green Genetics was on the table at the Innovation Platform. The research themes included increased

HOW DOES NETWORKING TAKE PLACE WITHIN KLV?

Back in 1886 the founding members of KLV saw the importance of graduates staying in contact so that they could exchange knowledge and help each other in their further careers. Now, in 2013, that interest is just as strong.

Under the umbrella of KLV several study groups and networks have operated for many years. These operate independently and are facilitated by KLV at their request. They exist in all shapes and sizes, ranging from 25 members to 650 members, and are organised on the basis of either a discipline (for example, plant breeding) or a theme or target group (such as starting entrepreneurs). Every network organises several meetings each year where members can meet each other and

exchange knowledge: ideal opportunities to network.

KLV also organises a wide range of activities where members can meet each other. These events are aimed at different segments of the membership and are often organised together with other parties. Examples are world lectures, public debates and business cafes.

In addition to these more classical forms of networking, social media are also gaining ground. A growing number of KLV members make use of LinkedIn, Facebook and Twitter and know how to find each other there. In the LinkedIn groups the emphasis is on subject-specific questions and information about jobs and positions. On Facebook more attention is given to meetings and activities. Yet just like traditional networks, the virtual networks are about knowledge circulation and contact.

An overview of the networks and activities can be found on the website: www.klv.nl

resistance against pests and diseases and molecular breeding. We also proposed that 50% of the funding should come from new sources. In the same month we successfully defended the proposal. The key area *food* became *flowers & food*, in which *flowers* represented the agrosector."

TTI Green Genetics has attracted many research proposals and has ultimately resulted in 80 projects, increased collaboration with industry, and annual symposia. And that is not all. "I think that this step has helped to keep the plant sciences sector on the agenda for the later top sector policy," says De Ponti. "KLV definitely deserves the credit for this as it had the foresight to organise this day at the right moment in time because it was thinking far ahead. I also consider this to be an important role for KLV: facilitating the

discussion at the strategic and subject-specific levels in order to build up and strengthen networks."



photo: Rob Bakker

ACTIVITIES

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

13 March

Young KLV - Training - Elevator Pitch
Development of entrepreneurial competences & pitching qualities in a creative way.

5 April

Study group Plant breeding - Lecture - Problems and challenges with introgressing traits from wild species into cultivated material.

9 April

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

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

18 April

Young KLV - Course - CV writing

16 May

KLV & StartLife - Wageningen Business Café
Informal networking meeting for all who are interested in entrepreneurship.

3 June

KLV - General Assembly
Yearly general assembly of KLV Wageningen Alumni Network for all members.

Monday 17

Young KLV - Course - CV Writing

You can read more KLV news in KLV Update, the journal for KLV members. From now on, KLV update will also be appearing in English. If you would like a sample copy, send an e mail to secretariaat.klv@wur.nl (while stocks last).

WANT TO BECOME A MEMBER?
Go to bit.ly/membershipKLV



PHOTO: HOLLANDESE HOOGTE

Safer pesticide use in Ethiopia

'Like many other African countries, Ethiopia has problems due to unsafe use of pesticides. People fall ill or drinking water becomes polluted,' says Floor Peeters of Alterra Wageningen UR. 'Yet the demand for those products is increasing because of expanding agricultural production.'

In order to limit the risks, Peeters started a project in 2010 to provide the Ethiopian government with methods of evaluating pesticides.

Wageningen researchers and local colleagues are developing guidelines for pinpointing the effect a substance has on the environment and on the people doing the spraying, as well as which residues are deposited on the harvested products. Three Ethiopian PhD students are doing research in this project. Peeters: 'After graduating they will work for the body responsible for authorizing the use of pesticides, in order to preserve the knowledge they build up.'

The FAO is contributing half a million dollars, while the lion's share of the project costs – more than two million dollars – comes out of the Dutch budget for development cooperation. This aid has to do with the presence of Dutch flower growers in Ethiopia who find it hard to get hold of modern, usually less polluting pesticides. One of the reasons is that they have not yet been authorized for use.

Info: floor.peeters@wur.nl or www.prrp-ethiopia.