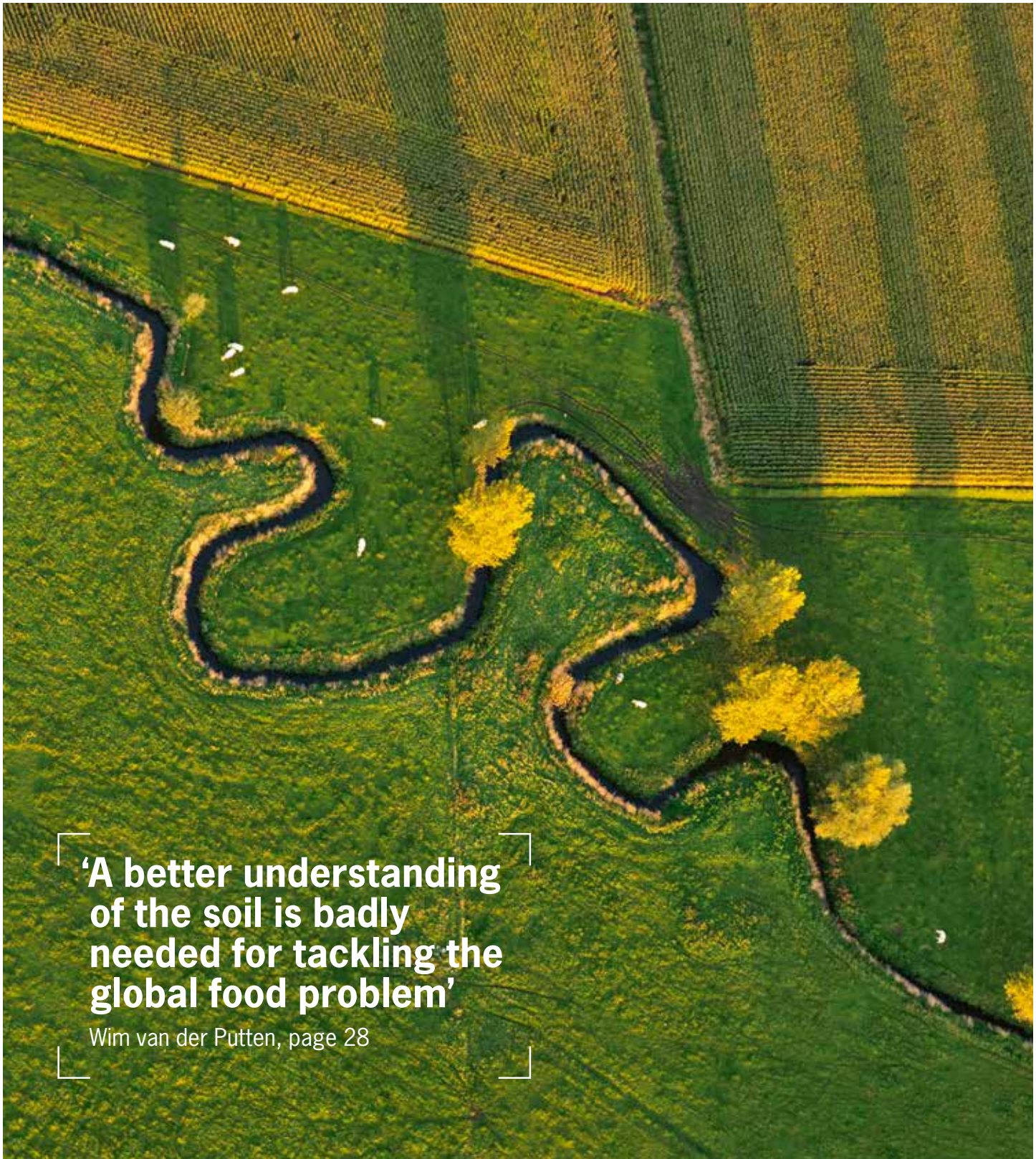
WAGENINGEN WORLD
MAGAZINE OF WAGENINGEN UR ABOUT CONTRIBUTING TO THE QUALITY OF LIFE
no.2 2015



‘A better understanding of the soil is badly needed for tackling the global food problem’

Wim van der Putten, page 28

Herbs oust **antibiotics** | **Farewell Martin Kropff** after 10 years | Key role for **giant trees**
Citizens’ initiatives for nature | Powder against **vision loss** | **spotted-wing fruit fly threat**

WAGENINGEN UR
For quality of life

COLOPHON Wageningen World is the quarterly magazine for associates and alumni of Wageningen UR (University and Research centre) and members of KLV, the Wageningen Alumni Network. A PDF version of the magazine can be found at www.wageningenUR.nl/en/wageningen-world **Publisher** Wageningen UR, Marc Lamers, **Editorial Board** Hans Bothe, Yvonne Fernhout, Ben Geerlings, Francine Loos, Jeanette Leenders, Jac Niessen, Irene Salverda, Erik Toussaint, Delia de Vreeze **Editor-in-chief** Pauline Greuell (Corporate Communications Wageningen UR) **Magazine editor** Miranda Bettonville **Copy editor** Rik Nijland **Alumni news** Yvonne de Hilster **Translation** Clare McGregor, Clare Wilkinson **Language editor** Clare McGregor **Art direction and design** gloed*communicatie*, Nijmegen **Cover picture** Vildaphoto **Overall design** Hemels Publishers **Printer** Tuijtel Hardinxveld-Giessendam **ISSN** 2212-9928 **Address** Wageningen Campus, Akkermaalsbos 14, 6708 WB Wageningen, PO Box 409, 6700 AK Wageningen, telephone +31 317 48 40 20, wageningen.world@wur.nl **Change of address alumni** www.wageningenUR.nl/en/alumni.htm **Change of address associates** (mention code on address label) wageningen.world@wur.nl **Change of career details** alumni@wur.nl

The mission of Wageningen UR (University & Research centre) is 'to explore the potential of nature to improve the quality of life'. Wageningen UR includes nine specialist applied research institutes 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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FEATURES

PHOTO IVAR PEL

Neonicotinoids under fire

'There is growing evidence that neonicotinoids are harmful to countless species of insects even in very low concentrations. Using these pesticides therefore undermines the EU objective of restoring biodiversity in agricultural areas. These are important conclusions from a scientific review done by a broad working group of the EASAC (the umbrella organization of European Academies of Science) which I took part in.
Neonicotinoids are pesticides which work from within the plant. They are generally not sprayed but applied via a coating on the seed or, in the case of ornamental plants, injected. Only insects which attack the plant are affected by them. At least, that is the theory, but that idyllic picture is not correct. In reality, these pesticides end up in pollinating insects too, through the pollen and nectar. What is more, these substances do not stay inside the plant. Within two months 95 percent of the neonicotinoids are in the soil.
Even in very low concentrations these substances interfere with the transmission of stimuli in the central nervous system, causing increasing harm to insects. The initial focus of concern was the honeybee, but that has been misleading; in the case of the honeybee the research results are actually contradictory. Large colonies provide this species with extra resilience. But for wild insects the consequences are very serious indeed. And they account for 50 percent of the pollination of crops and fruit trees. We have to conclude that using neonicotinoids is not a step forward, but a definite step backwards. They are being used preventively, which goes against the EU policy in favour of integrated pest control: only using insecticides if they are really necessary, when a certain threshold level of damage has been passed. Partly thanks to research in Wageningen there is now a lot of knowledge and technology available for doing this in a very advanced way.'

Frank Berendse was a member of the EASAC committee which subjected neonicotinoids to close scrutiny. He is professor of Nature Management and Plant Ecology at Wageningen University

WAGENINGEN UR

Wageningen climbs the rankings

Wageningen UR is back in the Times Higher Education rankings of the 100 best-rated established knowledge institutions in the world. Last year the institution fell out of this top 100; now it is listed among the best 60 to 70 'brands'. The ranking is based on the subjective assessments of experienced researchers from 142 countries. The return may reflect the increased response from Europe this year.*Info: jac.niessen@wur.nl*

EDUCATION

Wageningen has best Master's courses

Wageningen University is the best university in the Netherlands for a fulltime Master's programme, says the Dutch guide *Keuzegids Masters 2015*, produced by the Centre for Higher Education on the basis of evaluations of about 600 programmes by students and by accreditation organization NVAO. Small-scale Master's programmes score particularly highly. In Wageningen, however, Plant Sciences proves that even with more than 200 students, it is possible to deliver a quality programme.
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PLANT DISEASES

PHOTO STEFAN TEN TELJE

Warm blanket cures chestnut disease

More than half of the estimated 200,000 horse chestnut trees in the Netherlands are diseased. They are affected by a Pseudomonas bacterium which causes the trees to 'bleed' and eventually die. Wageningen UR is now testing the effect of a warm blanket on 50 chestnut trees spread around the country. For several days the tree trunk has a hosepipe wrapped around it containing water at over 40 degrees Celsius and covered with insulation foil. Lab tests show that this temperature treatment kills the bacterium. 'The question now is whether that works in the field and how long the bacterium stays away from the treated tree,' says researcher Fons van Kuik. For practical reasons only the lower part of the tree is wrapped up, so bacteria can remain ina the crown. But that is not a disaster. 'The treatment improves the tree's immunity and hopefully that helps it win the fight against the bacterium. Trees can heal spontaneously.'
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INTERNATIONAL

Wageningen on trade mission in China

PHOTO WAGENINGEN UR

Representatives of Wageningen UR joined Prime Minister Rutte's trade mission to China in March. In China, Wageningen UR signed contracts with dairy company Yili for research on mothers' milk and a monitoring system for food safety. A deal was also made with the Sino-Dutch Dairy Development Centre and a declaration of intent was agreed with the state-run China Animal Husbandry Group. The trip included a seminar in Shenzhen on sustainable urban growth in combination with the modernization of agriculture. This was attended by premier Rutte as well. And training centre Wageningen Academy signed two agreements with the Holland Centre in Shanghai.
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FOOD TECHNOLOGY

Aromameter reveals loss of taste in fruit and veg

A tomato in the fridge loses its flavour, fast and for good. This is shown by measurements taken with a new piece of equipment developed by Wageningen UR to identify aromas quickly and precisely.

The instrument resembles a jam jar containing what looks like a set of false teeth which can automatically chew on a fruit sample. As the chewing progresses, aromas are released which are immediately captured and measured with analysing equipment (the PTR-MS). 'You can track the release of the aromas from one second to the next,' says project coordinator Ernst Woltering of Wageningen UR. The results tie in with aroma measurements coming straight from the mouths of chewing human beings.

One of the things the equipment shows up is the effect of storing tomatoes in the fridge – something many people still do. After only a couple of hours in the cold, the flavour profile of the tomato is irreversibly changed. 'The number of aromas goes down and the ratio between them changes.' Flavour is important in products such as tomatoes, cucumbers, apples and strawberries. And there is a lot more to flavour than just sweet or sour. 'Taste is 50 to 80 percent determined by aromatic substances,' explains Woltering. 'This equipment identifies changes in aromas. The principle was already known but we are the first to make this technique suitable for use in measurements in fresh horticultural produce.'

Companies can use the information gained to improve the handling of those products. The equipment could be of interest to plant breeding research as well. For example, it is known which varieties of strawberry are the tastiest. Those varieties have a particular aroma profile, which shows which aroma substances they contain and in what quantities. Woltering: 'In hybrid populations you can use our system to look for strawberries which fit that profile.'

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EDUCATION

First online Master's programmes start

PHOTO JORIS SCHAAP

September will see the start of the first two online MSc programmes at Wageningen University: Nutritional Epidemiology and Public Health, and Plant Breeding.

The Master's programmes can be followed almost entirely off-campus and part-time. Students will be sent assignments and material weekly and will have contact with each other and with their supervisors through an online platform. They will come to Wageningen twice for a few weeks to gain practical skills in the lab, for example. Altogether the programme takes four years.

Wageningen UR is offering distance education to enable more people to gain a Wageningen Master's degree. At the beginning of May, a total of 36 people had already been admitted to the programme. Registration is open until the end of July.

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WAGENINGEN ACADEMY

Summer School for professionals

Wageningen Academy will be running four Summer Schools for professionals this year. These courses distinguish themselves for their combination of theory and practice, in the form for example of excursions and case studies, as well as for the plentiful opportunities they offer for networking.

The Summer School Food Law Academy (9-12 June) takes place in Brussels and deals with food quality and food safety; Summer Course Dutch Dairy Chain (25-28 August) addresses milk production and developments in the international dairy market; Summer Course Novel Developments in Food Allergy (24-27 August) offers insights on allergic reactions and their influence on food processes; Summer School Greenhouse Horticulture (24 August-4 September) deals with greenhouse horticulture.

For further information and other courses, seewww.wageningenacademy.nl

AGRICULTURAL TECHNOLOGY

Robot assesses fruit and vegetables

Researchers at Wageningen UR have built a robot which can evaluate the quality of fresh fruit and vegetables per crate. To do this the robot makes use of the light spectrum to scan the contents of the crate for shape, colour and levels of sugar and dry matter. It then determines the quality using calculation models, which have to be developed for each fresh product.
Companies can use the robot to determine the quality of incoming products quickly, objectively and without any squeezing or cutting. 'The quality determines the price, the shelf life and further steps to be taken,' explains researcher Rick van de Zedde. 'The robot quickly makes it clear what the company can do with the batch of produce: sell it fresh, process it quickly or perhaps discard it straightaway.'
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PHOTO AART-JAN VAN DE GLIND

ANIMAL DISEASES

New gnat

There are not 24 species of gnat in the Netherlands, but 25. During field research on the Veluwe, the Central Veterinary Institute (CVI) found a new species of gnat. The little creature is probably a hitherto unknown sub-species related to *Culicoides obsoletus*, reports the CVI in the January issue of *Veterinary Parasitology*.
The new gnat has relatives that can transmit the Schmallenberg and Bluetongue viruses. Whether the newcomer can do that too will be the subject of further research. *Info: armin.elbers@wur.nl*

NUTRITION

No extra crisps after low-salt meal

Putting less salt in food really does ensure people consume less salt; they do not compensate at other times of day.

This finding came out of research at Wageningen UR Food & Biobased Research, TNO and RIVM, carried out at the behest of the ministries of Economic Affairs and of Health, Welfare and Sport. The research results came out in March in the *Journal of the Academy of Nutrition and Dietetics*.
The researchers provided lunch in a normal setting in Wageningen UR's Restaurant of the Future for two groups of people for five weeks. 'They could choose what they ate themselves, and who they sat with or whether they preferred to read the paper,' says research leader Anke Janssen of Food & Biobased Research. For the intervention group, after two weeks almost all the products on offer were replaced with alternatives specially produced by food companies and containing between 29 and 61 percent less table salt. Meanwhile the control group continued to be offered standard products. The data from the till showed that the low-salt diners continued to eat the same amounts. Afterwards they said almost all the lunch dishes tasted good. Thanks to the low-salt lunch, the intervention group consumed an average of 2.5 grams less salt than the control group. This constitutes a quarter of what the average Dutch man consumes daily (10 grams), and a third of what women consume (7.5 grams). The subjects' salt excretion in urine collected over 24 hours was measured too, to establish their daily salt intake. The urine samples showed that their daily intake of salt dropped in proportion to the reduction of salt in the lunches. Janssen: 'That means that test subjects on the low-salt lunch did not compensate with salty snacks such as crisps or salty liquorice at other times of day.'
So reduced salt in foods can have a big impact on the amount of salt people consume on a daily basis. 'Some companies have already taken steps but there is much more scope,' says Janssen. At present the average Dutch person eats too much salt, which can lead to high blood pressure and raised risks of cardiovascular diseases.
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ANIMAL BEHAVIOUR

Radio and colourful overalls help against feather pecking

Wageningen University, Utrecht University and the University of Groningen have found a way of combatting feather-pecking among layer hens. The method could be helpful when the ban on beak-trimming comes into effect in 2018.

The way chickens peck at each other causes baldness, pain, wounds and deaths. The most common cause of the behaviour is stress. Reducing stress, research has shown, starts with providing good conditions for the parent birds, as the chicks of stressed mothers are quicker to start feather pecking. Another point is that chickens of all ages need to be able to free-range in litter every day. Fear of noise and movement can be reduced by playing the radio and using varied colours in the barn. The problem also seems to occur less in an aviary-type coop in which chickens can free-range and can nest and find food and water on shelves, than in a regular free-range barn.

Research on the brains of chickens which feather-peck a lot and those that don't revealed differences in serotonin and dopamine profiles. These two substances play a role in a lot of behaviour. 'If you know that profile for a particular line of chickens, you can adjust your breeding programme to it,' says research leader Bas Rodenburg of Wageningen University.

In the conventional sector the tip of the beak is removed to prevent feather-pecking, but from September 2018 this practice will be banned because of the stress and pain it causes.

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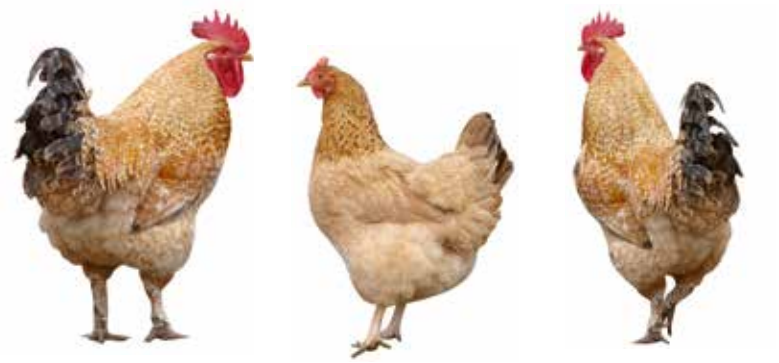

CLIMATE

Global warming is self-reinforcing

The warming up of the earth is a self-reinforcing effect. An international research team including Egbert van Nes and Marten Scheffer of Wageningen University has at last been able to prove this.

The researchers applied a new mathematical insight from the American George Sugihara to data on ice cores. These ice cores contain gas bubbles dating back to the ice ages which prove that the proportion of the greenhouse gas CO_2 in the atmosphere is higher during warm periods than during cool ones. They published their findings in *Nature Climate Change* at the end of March.

Earlier studies only looked at peaks in greenhouse gas concentrations and temperatures and left room for doubt. 'But in a complex system the rise in CO_2 in some periods may sometimes precede and sometimes follow the temperature changes,' explains Van Nes. 'With the Sugihara method we could look at the whole course of events. That showed that the temperature and the CO_2 concentration influence and reinforce each other.'

The good news for the current climate problem is that the feedback effect works both ways: when the CO_2 concentration in the air goes down it gets colder, causing in turn a drop in the CO_2 concentration.

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BUSINESS STUDIES

Solar field an opportunity for farmer

A hectare of solar panels can be more profitable for a crop farmer than a hectare of grain or potatoes. This conclusion was drawn by researcher Joanneke Spruijt of Wageningen UR from trials at the Application Centre for Renewable Resources (ACRRES) in Lelystad. Solar panels do however require an investment of 650,000 euros per hectare, plus the cost of security and maintenance.

This investment can only be recouped if the electricity price is above 10 cents per kWh, whereas the current rate is 4.5 cents. Even subsidies do not always bring it up to 10 cents. So solar panels are currently only an option for plots of poorer land and for the sake of spreading your income over different products, says Spruijt.

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CLIMATE

‘Ecosystem’s resilience can be increased’

Local deforestation, water pollution and overfishing worsen the effects of climate change in key ecosystems such as the Amazon forest, the coral reefs of Australia and Spanish wetlands. If no environmental measures are put in places locally, the ecosystem struggles to cope with the effects of climate change and is threatened with collapse. These warning words come from an article by Professor Marten Scheffer and international colleagues in *Science* in March. Reducing local pressure gives an ecosystem a ‘breathing space’ and the resilience to go on functioning.
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AGRIFOOD

Sharpening thinking at European agribusiness seminar

Between 18 and 21 October, the sixth edition of the European Food & Agribusiness Seminar (EFAS) will take place in Rome. This biennial gathering is an initiative of the Wageningen Ambassadors and is organized by Wageningen Academy.

The meeting brings together about 75 directors of companies and organizations from Europe and elsewhere to talk about experiences and innovations related to the world food supply, and about their projections for the future. The Chatham House Rules apply: what is said is kept strictly between the participants.
The discussions focus partly on cases brought in by companies. This year, for instance, Unilever wants to discuss its business model: will it reduce the tension between growth and sustainability? Speakers from the World Bank and the Food Standards Agency will be among those present too.
The value of EFAS is that the seminar helps you to sharpen up your thinking,’ says Peter Poortinga, director of chicken company Plukon. ‘There is so much experience in the room. In 2013 we outlined our expansion ambitions in Europe. Our ideas were endorsed and we got input for our new business plan. People who are open to change can find a lot of inspiration there.’
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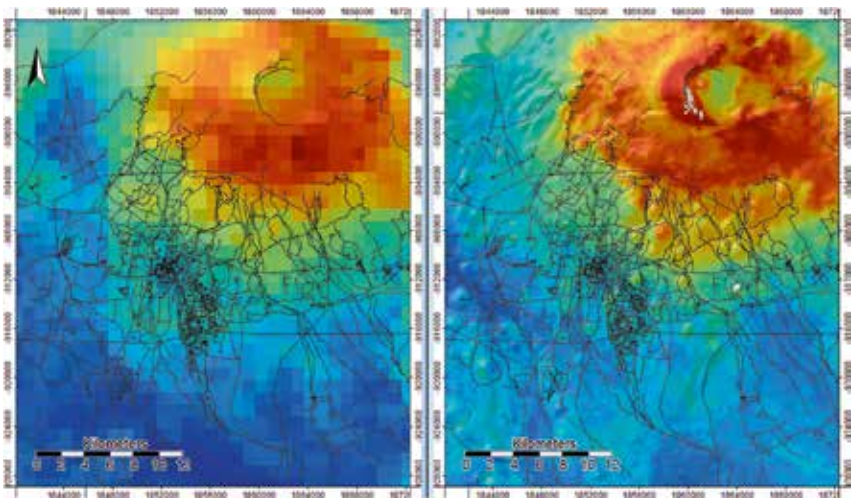
SOIL

Detailed maps of African soils

ISRIC World Soil Information in Wageningen has created a new soil information system for Africa with a spatial resolution of 250 by 250 metres. The digital maps provide information about more than 24 soil characteristics in six layers, going to two metres deep. And they are easy to upload.

The maps are important for studies on agricultural development and food security. ‘They provide insight into the agricultural potential of the soil,’ says researcher Tom Hengl. ‘Previous soil maps only included soil types, but that does not tell you enough about rooting depths, for example, or nutrient status.’ It took over three years to create the maps.
The chief users of the maps are expected to be governments, researchers and agricultural extensionists. Hengl: ‘They will also get the chance to refine the maps with local soil data.’



Indication of levels of organic carbon in the soil near Arusha, Tanzania; resolution 1km (left) and 250m (right).

The AfSoilGrids250 maps are part of AfSIS, a big project, funded by the Bill & Melinda Gates Foundation, for making useful soil information available in Africa. The academic article about the maps appeared in *PlosOne* in May. *Info: tom.hengl@wur.nl*

PLANT BREEDING

New weapon against potato disease

After 10 years of research on wild potato species, researchers at Wageningen University and their British colleagues have found a new defense mechanism against the dreaded potato disease phytophthora.

The pathogen Phytophthora infestans occurs all over the world and damages both the foliage and the roots of the plant. Entire harvests can be lost to the disease, which is fought with many chemical pesticides.
The research team studied wild members of the potato family for genes which react to proteins in Phytophthora called elicitins. The Elicitin Response gene (ELR) was found in the wild potato species Solanum microdontum. The presence of the ELT gene ensures that at the spot where elicitin enters the plant from Phytophthora, the plant cell dies, restricting the spread of the pathogen.

Introducing the ELR gene into cultivated potato plants could make the plants less vulnerable to some strains of the potato disease.
Because of their important function in the life cycle of Phytophthora, elicitins are present in all strains of the pathogen. This makes it less likely that the pathogen can adapt in order to avoid the resistance response. 'In potato species with a gene which tackles these kinds of protein, the chances of the pathogen breaking down the resistance are smaller,' says plant breeder and research coordinator Vivianne Vleeshouwers of Wageningen University.
The research results were published at the beginning of April in Nature Plants.
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ZOOLOGY

Giraffe benefits from its long tongue

PHOTO CORBIS

A giraffe's mouth is actually too small to enable an animal its size to get enough food inside it. But thanks to its long tongue with which it can also put soft, nutritious leaves into its mouth, it can get enough nutrients per mouthful. The same goes for elephants and their trunks, and for other large herbivores with large lips on the South African savannahs. This has been shown by ecologist Fred de Boer of Wageningen University and colleagues in an article in *Acta Zoologica*. With this knowledge about eating behaviour and bite volume, ecologists gain a better understanding of why species live in particular densities at particular places.
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AGRICULTURE AND CLIMATE

PHOTO HOLLANDSE HOOGTE

Soil benefits from intercropping

Intercropping is good for the soil. After eight years the topsoil contains 4 percent more organic carbon than a field with a standard cropping system. Growing rows of different crops alongside each other, a system mainly used by farmers in developing countries, can therefore contribute to fixing the greenhouse gas CO_2 as well as to raising production and improving soils. This claim is made by researcher of Wageningen University and China Agricultural University in the April issue of *Global Change Biology*. The improved carbon fixation is probably related to greater root formation.
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CLIMATE

Amazon forest absorbs less and less carbon

The Amazon forest fixes carbon in biomass, thus helping to mitigate climate change. But this storage function is weakening, wrote a large international team, including researchers from Wageningen UR, in Nature in March. Their statements are based on data on trees collected over the past 30 years at more than 300 locations in the Amazon. Over the past 10 years the forest absorbed one third less carbon than it did during the nineteen nineties. This is because the growth rate of the trees has gone down, while the death rate has gone up. This reduces the length of time that the carbon is stored in the forest. The researchers predict that the downward trend will continue. In 2030 the Amazon forest will no longer be a net carbon sink.
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N2
+30%
CO2
PO4 3-
NO3

SOIL LIFE INFLUENCES PLANT GROWTH

Unearthing the secrets of the soil

Every square metre of a layer of soil is inhabited by a community of worms and insects, kilometres of fungal hyphae and millions of nematodes and bacteria. Research is producing more and more insight into the precarious balance under the ground, and the extent to which it is influenced by life above ground. This is leading to new strategies for crop protection.

TEXT NIENKE BEINTEMA **ILLUSTRATION** YVONNE KROESE

It is no news to farmers, horticulturalists and gardeners: worms are good for the soil. They recycle dead matter and keep the soil aerated so that water can drain away better and the soil can 'breathe'. Plants grow much better when there are worms present in the soil. But there is a flip side to this. 'Soils full of earthworms emit at least 30 percent more greenhouse gases that soils without worms,' says Jan-Willem van Groenigen, associate professor in the Soil Quality department at Wageningen UR. 'This is partly because carbon dioxide is released when that dead plant matter is broken down. And another explanation is the use of artificial fertilizer containing a lot of nitrogen. Soil bacteria convert that nitrogen into laughing gas, which is a greenhouse gas. The worms create conditions in which that happens faster.'
Worms also change the phosphate balance in the soil. This is of interest in view of the increasing global scarcity of phosphate fertilizer. The problem, says Van Groenigen, is that phosphate accumulates in the soil in a chemical form which is of little use to plants. 'Earthworms make that phosphate available to plants again. It would be tremendous if we could stimulate that through soil management that benefits earthworms. Using organic fertilizer, for instance.'

MITES AND SPRINGTAILS

Worms are by no means the only underground organisms to influence life above ground. They share the upper stratum of soil with an astonishing variety of nematodes, mites and springtails, ants, beetles and millipedes. Not to speak of the life forms that are invisible to the naked eye: countless fungi and bacteria. Some of these are useful for the growth of plants: earthworms and fungi improve the soil structure while many 'good' nematodes, fungi and bacteria keep pathogens under control. Others, however, can cause plant diseases. All these organisms benefit directly or indirectly from substances excreted by the plants. This is a delicate balance on which little research has been done yet.
'The Wageningen Centre for Soil Ecology is changing that,' says Wim van der Putten, head of Terrestrial Ecology at the Netherlands Institute for Ecology (NIOO-KNAW) and professor of Functional Biodiversity at Wageningen University. In 2010 he helped set up this centre, a collaboration between Wageningen UR and NIOO-KNAW. It was the first institute in the world to bring together ecologists, agronomists, chemists and hydrologists to study how the soil functions and how that influences plant growth. 'It is becoming clearer and clearer how important that soil is,' says Van der Putten, 'but what we know is still only the tip of the iceberg.' This is why the United Nations designated 2015 the Year of the Soil. A great initiative, says the professor. 'A better understanding of the soil is badly needed to help us tackle both the global food problem and the environmental problem in agriculture, as well as to restore nature areas.'

FIFTY SHEEP

First a few dry facts. The top decimetres of each square meter of soil harbours about 400 earthworms as well as about 20 million nematodes. One teaspoon of soil contains hundreds of metres of fungal filaments and as many as 10 billion bacteria of perhaps 10,000 different strains. 'Imagine a hectare of land with five sheep grazing on it,' says Wietse de Boer, senior researcher of microbial ecology at NIOO-KNAW and special professor of Soil Quality at Wageningen UR. 'That is a standard sheep density. Under the ground the density of micro-organisms is equivalent to 30 or 40 sheep.'
How scientists see that soil life traditionally very much depends on the context: agriculture or nature. 'Nature managers see

pathogens as useful in principle,' says Van der Putten. 'They prevent certain fast-growing species from getting the upper hand, thus increasing biodiversity. But in agriculture we see pathogens as a negative factor because they are a threat to crops.'
Currently the perspectives of scientists from these two fields are coming closer, says Van der Putten. 'This cross-fertilization is delivering important new insights.'
The example he gives is the phenomenon of invasive exotic species in the Netherlands: the infiltration of plant and animal species that did not originally belong here, such as the wild black cherry. In America this bush is nicely distributed through the forest, kept under control by the fungal pathogen Pythium, an oomycete which causes root rot. Pythium is not found in the Netherlands, so the fast-growing shrub can spread unchecked. 'This illustrates the important of a natural soil life for the balance above the ground,' says Van der Putten. 'In a natural environment those defences are well arranged, but in our intensive agriculture it is disrupted by ploughing, fertilization, drainage and pesticides. It seems as though the natural defences stay more intact on organic farms. We would very much like to know why that is.'
At the same time, experimental soil management practices from agriculture are now being tried in the context of nature management too. One example is the 'grafting' of soil from elsewhere in order to introduce a complete community, including soil life. One of the places where this has been done is Reijerscamp nature area near Wolfheze, not far from Wageningen. Once a heath, this land was then used for many years for crop farming. Turf from heath elsewhere was placed on the now abandoned field, with all its soil fauna, micro-organisms and plant seeds. Within five years the area had returned to heath-land. Van der Putten: 'Our research showed that the soil life in 'new nature' is far more developed after these kinds of transplants than it is if you don't do anything. We had already demonstrated with greenhouse experiments that that soil life promotes the development of the vegetation.'

NEMATODES DROWN

The less soil life there is, the more vulnerable the soil is to opportunistic pathogens. That is a fact affecting farmers in the flower bulb-growing region of the Netherlands. Besides using pesticides as a strategy for combatting nematodes that damage bulbs, they have recently started flooding their bulb fields every so often,

> 'What we know is still only the tip of the iceberg'

in order to drown the pathogens. Soil micro-biologist Wietse de Boer: 'The disadvantage of that is that the useful soil organisms are wiped out too.' These include the bacteria and fungi which promote a natural immunity, or which make nutrients available to the plants. 'Over time, the original composition of micro-organisms is restored and the natural immunity comes back too. So the soil has a self-renewing capacity. But three months after flooding the fields, the useful organisms have not usually returned yet. It would be nice if we could speed up this process, and if we could slow down the establishment of opportunistic pathogens by introducing useful organisms.' This is not happening yet, but according to De Boer it is a serious possibility. >

In fact, farmers have been using 'ecological' methods of combatting pathogens for centuries. The best-known example is crop rotation: farmers do not grow the same crop on a plot of land year in year out. This is because many pathogens are species-specific so they will disappear from the soil if 'their' crop is not grown there for a while. But this is not a panacea, notes De Boer. After asparagus has been harvested, for instance, pieces of root often stay in the soil for 20 years, complete with harmful fungi. 'So you need pesticides as well as crop rotation in order to stay on top of the pathogens,' says De Boer. Up to now these are mainly chemical, but the EU guidelines for the use of chemical pesticides are getting stricter and stricter. That is why we are looking for organic alternatives.'

There are already some microbiological pesticides on the market, says De Boer. One of these is Mycostop, which contains an actinomycete, a fungus-like bacterium which produces antibiotics with which it suppresses pathogenic fungi. This substance is applied to the roots of young cucumber, tomato and bell pepper plants, for instance, when they are potted. De Boer: 'But in the long run, these kinds of products often do not work well. The micro-organisms which are introduced do not seem able to fend for themselves in that underground battlefield.'

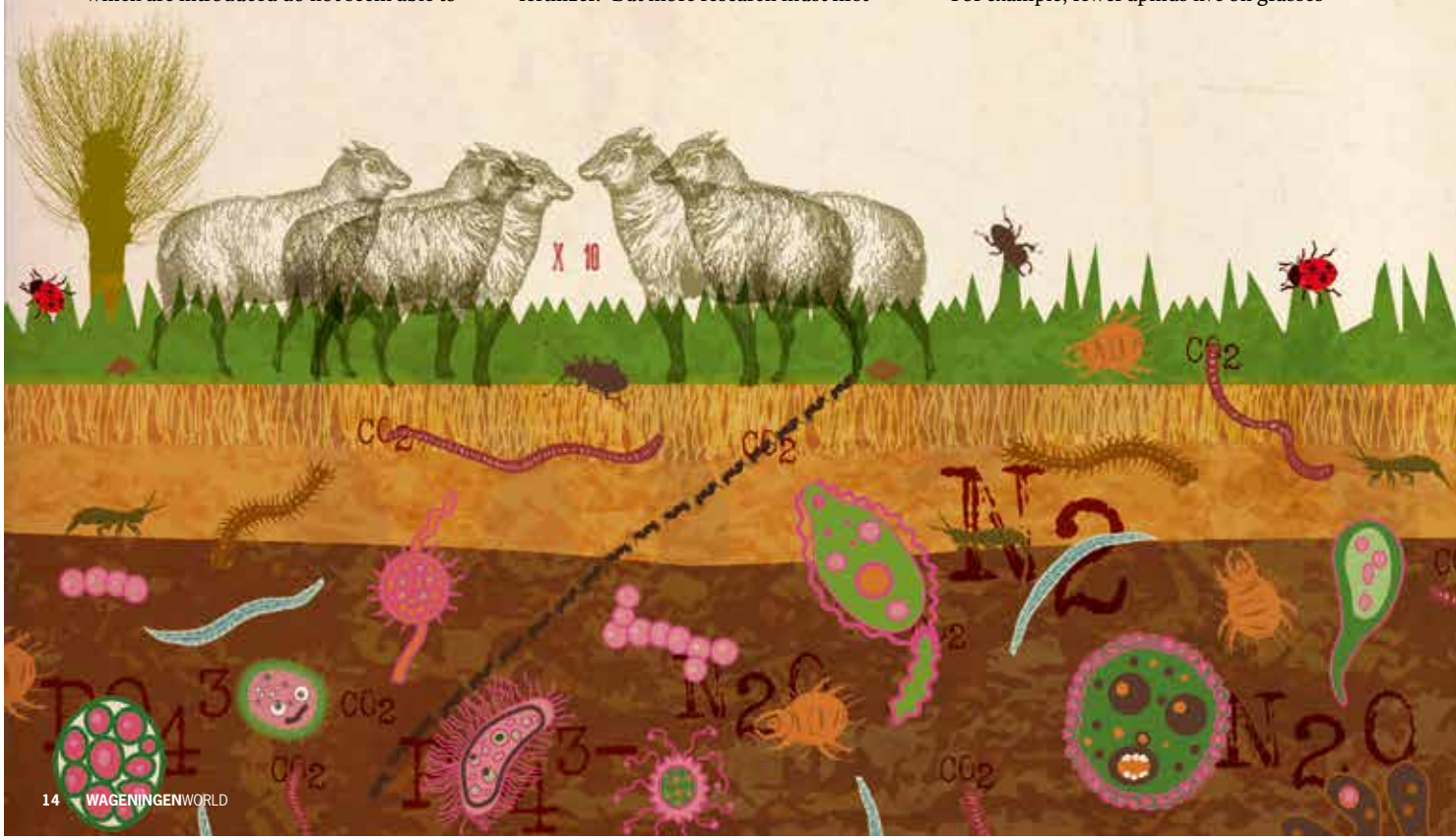
> **'The crux is that organisms have their effect in interrelation to one another'**

He thinks there is a more promising approach: stimulating the useful micro-organisms already present on the soil. 'You could do that through very targeted fertilizer application, for instance,' he says. 'That makes it possible to create a kind of natural shield of useful bacteria and fungi around the crop's roots.' This principle was successfully tested recently by Applied Plant Research (PPO), part of Wageningen UR in Lelystad. Fertilizer containing ground shrimp waste, which contains a lot of chitin, proved to stimulate bacteria which break down chitin. Chitin is present in many damaging fungi as well. And this worked: the pathogenic soil fungus *Verticillium* was successfully suppressed by the chitin fertilizer. 'But more research must first be done on this approach before it can be applied in practice,' says De Boer.

Van der Putten too talks about new methods of organic pest control. His own research, for instance, has recently shown that growing willow shoots in a field is good for the wheat crop in the following year. 'Exactly why that is, is not entirely clear,' he says. 'It might have something to do with the salicylic acid willows exude. That suppresses certain pathogens, so there are more worms, good nematodes, springtails and bacteria.'

FEWER APHIDS

Unexpected relations sometimes emerge between what happens underground and above ground. Agriculture can make use of this too in future, guesses Van der Putten. For example, fewer aphids live on grasses



that are eaten by soil nematodes than on healthy grasses. This is because the damaged plants make less of a particular amino acid which is essential for aphids. Remarkably, the aphids in this smaller group are larger than those of their species living on grasses without nematodes, because they are less hampered by competition. In turn, these larger aphids are more attractive prey for ichneumon wasps, which therefore visit the affected plant more often and keep it more aphid-free. 'In this case, then, nematodes increase the plants' defence system against aphids on two fronts,' says Van de Putten. 'Firstly through the substances in the plant itself, and secondly by attracting the aphid's natural enemies. But these defences get broken if all the nematodes are destroyed by spraying.'
Wietse de Boer mentions another surprising new finding: micro-organisms influence each other from a distance by producing certain volatile substances. 'They use these substances in their competition with each other,' he explains. 'That way they suppress each other and the pathogens as well. The next step is to find out which volatile substances particular pathogens are sensitive to, and then to stimulate the micro-organisms which produce them.'
This is still far off. But other new insights about soil are already being applied in the field. In the context of the greening of European agricultural policy, for example, farmers are expected to plant nitrogen-fixing plants and plants which lure harmful nematodes away from the main crop. 'With this in mind we are now looking for multifunctional crops,' says Van der Putten, 'which have beneficial effects on several fronts: nutrient availability, soil structure, plant resistance and pest control.'

REMOVING SPECIES

The soil, conclude both experts, is one big black box in which hundreds of different biological and non-biological factors combine to determine how well plants grow. How do you separate these factors? 'You can of course isolate individual species and study them in the lab,' says Van der Putten, 'but the crux is really that organisms often have their effect in interrelation to one another. So what we are also doing is removing species selectively, or trying to divide them into functional groups. By doing this we try at least to isolate a few factors from this big jumble of elements.'
Jan-Willem van Groenigen opts for the same approach in his earthworm research. He studies pots of soil containing not just earthworms but also hundreds of springtails, mites and other organisms. The researchers build up their experiments systematically from a simple collection of tiny creatures to an increasingly complex ecosystem. Then they exclude species in turn so as to see what changes. 'An enormous logistical challenge,' says Van Groenigen. 'We not only measure the emission of gases but also make 3D images using x-ray tomography so as to see how these worms change the soil structure. Ultimately this allows us to model how gases get diffused through the soil under different conditions.' ■

www.internationalyearofsoils.com

10 YEARS OF MARTIN KROPFF

‘With enough support you can fly’

For 10 years Martin Kropff was the face of a rapidly expanding Wageningen University. On 1 June he left for Mexico to lead the international agricultural research centre CIMMYT. ‘It is a dream job, but I am leaving a lot behind in Wageningen.’

TEXT ALEXANDRA BRANDERHORST **PHOTOGRAPHY** FREEK VAN DEN BERGH

'When I became rector in 2005, this was still grassland,' indicates Martin Kropff, walking across the campus. The former fields are now dominated by the huge teaching buildings Forum and Orion and the campus is a hive of activity. Many students and staff members greet Kropff as the walk or cycle past. A German student stops him to ask for an appointment to talk about a meeting he is organizing on the biobased economy. The rector responds with enthusiasm and reserves time for this in his already overfull diary.

Students describe you as approachable and sympathetic. Where does that strong affinity come from?
'I always enjoyed teaching and I love working with young people. As rector you are not just responsible for research and education but also for student affairs, which means students' welfare. When I do the rounds of the student organizations I meet young people who are full of enthusiasm. You usually have interesting discussions and sometimes they ask for your advice as well. Young people look at things with fresh eyes and ask good questions.'

Student numbers have grown tremendously in the last 10 years. How come?
'Once in 2001 I was giving a lecture for five first-years. That was dramatic. In 2005 we only had 450 new Bachelor's students. We had a good organization and were doing very good things, but it continued to go unnoticed. In our new strategy and in student recruitment we then placed the emphasis on the themes of food production and the environment in relation to human beings. There was increasing public interest in subjects such as climate change, food security, nutrition and health and water. More and more people started realizing that we in Wageningen are working on solving all those big issues in the world, in a coherent domain made up of social and technological sciences.'

> 'Young people ask good questions'

Did Wageningen have the wind in its back or is the growth in student numbers down to its own efforts?
'Both. Since 2005 we have been number one in the Dutch Higher Education Guide, because of the quality and small scale of our programmes. We have managed to maintain that quality in spite of the massive growth. At the same time, we are doing extremely well in the international rankings which are based on the number of publications and citations. Wageningen's good reputation abroad attracts a lot of international students as well. In 2007 the Forum was opened and that gave our campus allure. Student numbers grew by a steady 10 percent per year. Last year we had over 1500 new first-years and 1000 new Master's students.'

Is it possible to keep up educational standards with growth like that?
'Up until last year we received government funding for the expansion, so we could appoint more teachers and build Orion. We have a good system of annual education evaluations and we work with teaching bonuses. As of last year, sadly, we no longer get funding for all the growth, but hopefully we can find a solution to that. Also, in 2009 we introduced our own form of tenure track. That is a career trajectory which gives talented young academics the chance to become professors, as long as they meet tough requirements. That is a way of avoiding ending up with teachers who have lost touch with research in their field.'

You are known for your positive attitude. Do you never have an off day?
'Of course I do, everyone does. In the period when I was teaching a handful of students I sometimes worried at home in the evening. If something really isn't going well, I don't hesitate to raise the issue. But there are usually enough people to point out the downsides. Fine, criticism is very good too, but to compensate for one negative person you need 10 positive people. Negative feelings are very catching; I prefer to provide a bit of inspiration.'

Do you ever bang your fists on the table?
'If it's really called for, I do. For example when an Advisory Appointment Committee for new professors came up with poor proposals, in my view. Then there was a delay and people were not happy, but we did make better appointments in the end. As an executive, and as a teacher too, it is important to be able to be very clear when you have to be. But I always try first to look for a solution by finding out why someone else thinks the way they do. In such a large organization you can easily run the risk of the board losing touch with people. To prevent that you have to be able to talk openly and informally with professors, staff and students. In the past 10 years as rector I have often played a linking role between people. By having a lot of contact at all levels, you can make sure a lot of issues don't get blown up and can be settled quickly. At a university you have to make decisions that are supported. Then you can fly. Without support there are so many brakes in operation, you will never get off the ground.'

At the University of Amsterdam teachers and students demonstrated this year because they wanted more say. Is that discussion reflected in Wageningen?
'Of course we have discussions here too about the management of the university, but we have them in the regular consultations with our international student council and the works council. Recently I held some extra meetings with students and staff about this. What came out of that was that students and staff in Wageningen are satisfied and feel they are listened to. The growth in student numbers has made big demands on staff, though. We are in continuous consultations about that.'

PHOTO MARCEL VAN DEN BERGH

MARTIN KROPFF

1957	Born in Asperen
1976-1984	Degree in Biology at Utrecht University (graduated cum laude)
1984-1990	Assistant professor of Theoretical Production Ecology, Wageningen UR
1989	PhD cum laude in Theoretical Production Ecology
1990-1995	Programme leader and project leader, International Rice Research Institute (IRRI), the Philippines
1995-2005	Professor of Crop and Weed Ecology, Wageningen University
2001-2005	Directeur Plant Sciences Group, Wageningen UR
2005-2015	Rector magnificus and vice-chair of the Executive Board, Wageningen UR
From 1 June 2015	Director general Centro Internacional de Mejoramiente de Maíz y Trigo (CIMMYT), Mexico

Wageningen UR has come under fire in recent years about the independence of its research and the too close links with the business world.
'That is not a fair accusation, but such criticisms should be discussed openly. Because of the social relevance of our research we work together with government bodies, companies and NGOs. All those parties have their interests and they need a knowledge institution which is independent. We work with competing companies together in programmes. Those companies want reliable scientific results. We have a solid code of conduct for scientists. It states that independence is a must in research. That is very important. At the university everything gets published.'

Why didn't you complete your third term as rector?
'I couldn't turn down this job at CIMMYT. It is a wonderful opportunity. The Centro Internacional de Mejoramiente de Maíz y Trigo does research on maize and wheat and is part of the CGIAR consortium. At the start of my career I worked in the Philippines at the International Rice Research Institute. We thoroughly enjoyed living and working with people with the same interest and passion. We came back then because we wanted our two daughters to put down roots in the Netherlands as well. Now my wife Nynke and I are going to have one more adventure.
'The CIMMYT does research on the two biggest food crops in the world. One billion people do not have enough to eat and the world population is growing precisely in the countries where the food supply is already problematic. Food production must go up, become more sustainable at the same time and be able to cope with climate change. That is a massive challenge, and from now on I shall be directly involved with it, together with 1400 staff in 50 countries and in collaboration with Wageningen, among other partners.
The nice thing is that the institute works both internationally and locally. At the end of March I was at the branch in Obregon in Mexico. The farmers there are crazy about the institute, and they consider the work so important that they fund sizeable research programmes.'

Where will Wageningen UR be in 10 years' time, do you think?
'We shall be playing an even more prominent role in the Netherlands and internationally. I hope too that we shall have formed even stronger international alliances with large institutions such as CGIAR and stronger links with the American universities Cornell and UC Davis, and with the China Agricultural University and the other top Chinese universities. The growth in student numbers, and in virtual student numbers, will continue. Forty thousand students registered for the first two MOOCs (Massive Open Online Courses) which started in January. Most of them come from Canada, the US and Australia. By no means all those who start a MOOC will finish it. But it is likely to lead to bigger intakes of fulltime students. The Wageningen community is growing incredibly fast. In the long term it is crucial that we manage to keep our unique small-scale atmosphere.'

What will you miss most about Wageningen?
'The students, for sure. But I will still be part of the university, as a professor, and I hope we shall have some PhD candidates, student interns and alumni at CIMMYT. I will be in Wageningen regularly. I am going to a dream job, but I am leaving a lot behind here too. That makes for difficult moments.' ■

CARBON CONCENTRATED IN A FEW SPECIES

Giant trees are crucial

A fraction of the tree species in the Amazon region contain more than half the biomass. This makes the rainforest more vulnerable to climate change than was hitherto assumed.

TEXT ROB RAMAKER **PHOTOGRAPHY** MAXIME RÉJOU-MÉCHAIN, WAGENINGEN UR

When he wants to make clear how extremely diverse the Amazon forest is, Lourens Poorter, personal professor of Forest Ecology and Forest Management at Wageningen University, likes to compare the region with the woods near Wageningen. During their field studies there, the professor's students come across about eight tree species per hectare. In his Brazilian research plot there are about 280 different species on the same surface area. So Poorter was 'struck dumb' by the finding of a study he worked on that this diversity does not play a major role in the carbon balance of the forest.

Only somewhat more than 1 percent of the tree species in the Amazon region – at least 200 species – account for half the biomass there. These are the tree species which tend to be tall and plentiful. The density of their wood, their relative weight, turns out not to play a big role. Poorter co-authored an article publishing this conclusion in Nature communications on 28 April, together with 100 international colleagues, including some from Naturalis natural history museum in Leiden. Many local experts and residents were involved in the research too.

TREE-FELLERS

The dominance of a few species makes the tropical rainforest more vulnerable to disturbance in the short term, Poorter assumes, compared with a situation in which the biomass is more evenly distributed. 'That 1 percent is largely made up of real giants of the forest which tower over all the other trees,' he says. 'And they turn out to be extra sensitive to climate change – to extreme drought, for example.' What is more, the tallest trees are popular with tree-fellers. Disturbances due to climate change and selective felling of the tallest trees lead in the short term to the forest fixing less carbon.

Poorter expects the insight that biomass is concentrated in a few species to be of use to nature conservationists as well. Given that the Amazon forest fixes large quantities of carbon on the form of wood and other biomass, which therefore does not enter the atmosphere in the form of CO_2, the forest is crucial for the climate. The latest study shows that it is probably a good idea to do more to protect the Brazil nut tree, for example. This species fixes a lot of carbon, besides forming an important source of income for the local population, who sell the nuts.

This study offers important information for climate scientists too. They now know that even simple computer models which only include some of the tree species can give a fair impression of the carbon balance in the Amazon. This makes it easier to forecast the impact of climate change on the forest.

CIRCUMFERENCE

The mega-team of scientists reached these conclusions by monitoring 530 tracts of forest like Poorter's. In a research plot of this kind, the circumference of every tree was measured at 1.30 metres high. It is impossible to measure the height of trees in a dense forest, so an estimate of the

‘We had to go at the identification hammer and tongs’

volume – and indirectly of the mass – of the trees is based solely on the circumference. Moreover, botanists tried to identify the species of every tree.

This is a fiendishly difficult task. According to a conservative estimate by Dutch scientist Hans ter Steege of Naturals, there are about 16,000 species of tree in the Amazon region. ‘So we had to go at the identification hammer and tongs,’ says Poorter. It can happen that two trees are classified as the same species for years and then when they are in bloom suddenly display different flowers.

CUTTING BARK

At another research plot in Bolivia, Poorter is working with local residents who collect the plentiful Brazil nuts there. They identify many different tree species using practical tricks – such as cutting into the bark to see whether latex runs out of it and what the structure of the wood looks like.

That 99 percent of the species – especially small and rare trees – play a limited role in the carbon balance does not render this wealth of species unimportant. Many species, thinks Poorter, probably excel in other processes such as circulating water or producing fruits for species of monkey in periods of food scarcity. The production and storage of biomass, which that 1 percent does so well, is just one of the processes in the ecosystem. And the enormous biodiversity of the Amazon also works as a form of ‘insurance’. However conditions change, among the innumerable species there are always a few that will flourish, says Poorter. This ensures that the forest can change and is in fact very resilient in the long run. ■

Finding the chink in the fruit fly's armour

The spotted-wing drosophila fruit fly (*Drosophila suzukii*), an exotic species from Asia, is fast developing into a threat for Dutch fruit growers. Researchers at Wageningen UR are examining every last detail of the fly to find its weak spot. **TEXT** RIK NIJLAND

INFOGRAPHIC ANKE NOBEL **PHOTOGRAPHY** MICHAEL DURHAM

In between a row of kiwi berry trees on Wageningen UR's experimental farm in Randwijk hangs a trap containing a nice-smelling fruit drink. Herman Helsen uses it to snare gullible flies – small, fragile but not nearly as harmless as they look. 'The spotted-wing drosophila fruit fly is the most significant new insect pest for fruit growers in 50, maybe a 100 years,' explains Helsen. 'It is creating havoc in the fruit-growing sector. Last year we didn't have a single kiwi berry that wasn't affected.' The prospects for 2015 don't look much better as many spotted-wing fruit flies have survived the mild winter.

The Southeast Asian fruit fly officially arrived in the Netherlands in 2012. That was the year when the Netherlands Food and Consumer Product Safety Authority hung up its first traps and immediately got a hit. But Helsen suspects the fruit fly has been in the Netherlands for much longer. 'The first signs of damage in southern Europe were seen in 2008. There was no stopping them after that. So much fruit is imported with eggs that the spotted-wing drosophila fruit fly must have got a foothold here before 2012.'

The newcomer may well have been overlooked as the spotted-wing drosophila does not look that different from the ordinary fruit flies we see gathering around the bins in the summer or on rotting fruit in the fruit bowl. In fact, there is one important difference. The native fruit flies lay their eggs in fruit that is already rotting and therefore worthless. The female spotted-wing drosophila fruit flies, on the other hand, use their ovipositor to penetrate the skin of fruit that is ripening or ripe. The larvae then munch their way through the pulp, causing the fruit to become soft, collapse and start to go mouldy and rot. Many commercially grown fruit crops are affected by the fly, especially those with thin skins such as currants, blueberries, cranberries, strawberries, cherries, plums, blackberries, raspberries, loganberries, kiwi berries, grapes, elderberries and rose hips.

Fruit growers with long harvest periods and fruit crops that ripen slowly are particularly vulnerable. Helsen says that there were many cherry orchards last year where the final crop was not harvested. 'The growers have different cultivars that ripen at different times. They do this so that they can supply cherries continuously from June onwards for two months. The fruit fly population increases enormously during that period whereas the number of cherries in the orchard decreases. So more and more fruit flies are targeting fewer and fewer cherries. Blueberry growers also stopped early because of the spotted-wing drosophila.'

DAMAGE IN VINEYARDS

Wageningen UR is currently carrying out research on how the fly lives to identify the new enemy's weak spots. 'We are trying to pool all the expertise,' explains the Randwijk researcher. 'One of our tasks is to figure out what implications new insights have for the Dutch situation and for fruit growers in practice.' What happens in the lab is not always the same as what happens in practice. Vineyard owners, for instance, complained they suffered major damage last autumn whereas it cost a great deal of effort to get the spotted-wing drosophila to reproduce on grapes in the laboratory.

Helsen is trying to find out more about the new insect pest and its weak spots by studying the spotted-wing drosophila fruit fly's annual cycle in the Netherlands. The population peaks in the summer and autumn. Most of the flies do not make it through the winter but there are a few that hide away and survive to see the spring. It is not clear where they go. 'In the spring we mainly see them around the edge of woods and in rough growth. We've wrapped fine-mesh netting around bushes and the grass under fruit trees to see whether flies emerge.' The flies that survive the winter form the base for the next year's plague.

The females that emerge in the spring do not need much. Just some sap or nectar from plants to build up their strength and some yeast for the necessary proteins. The ovaries are full by April but where do they lay their eggs? 'We are trying to find out whether they can use the berries of wild plants or garden plants, such as holly and cotoneaster, to bridge the two months until the first

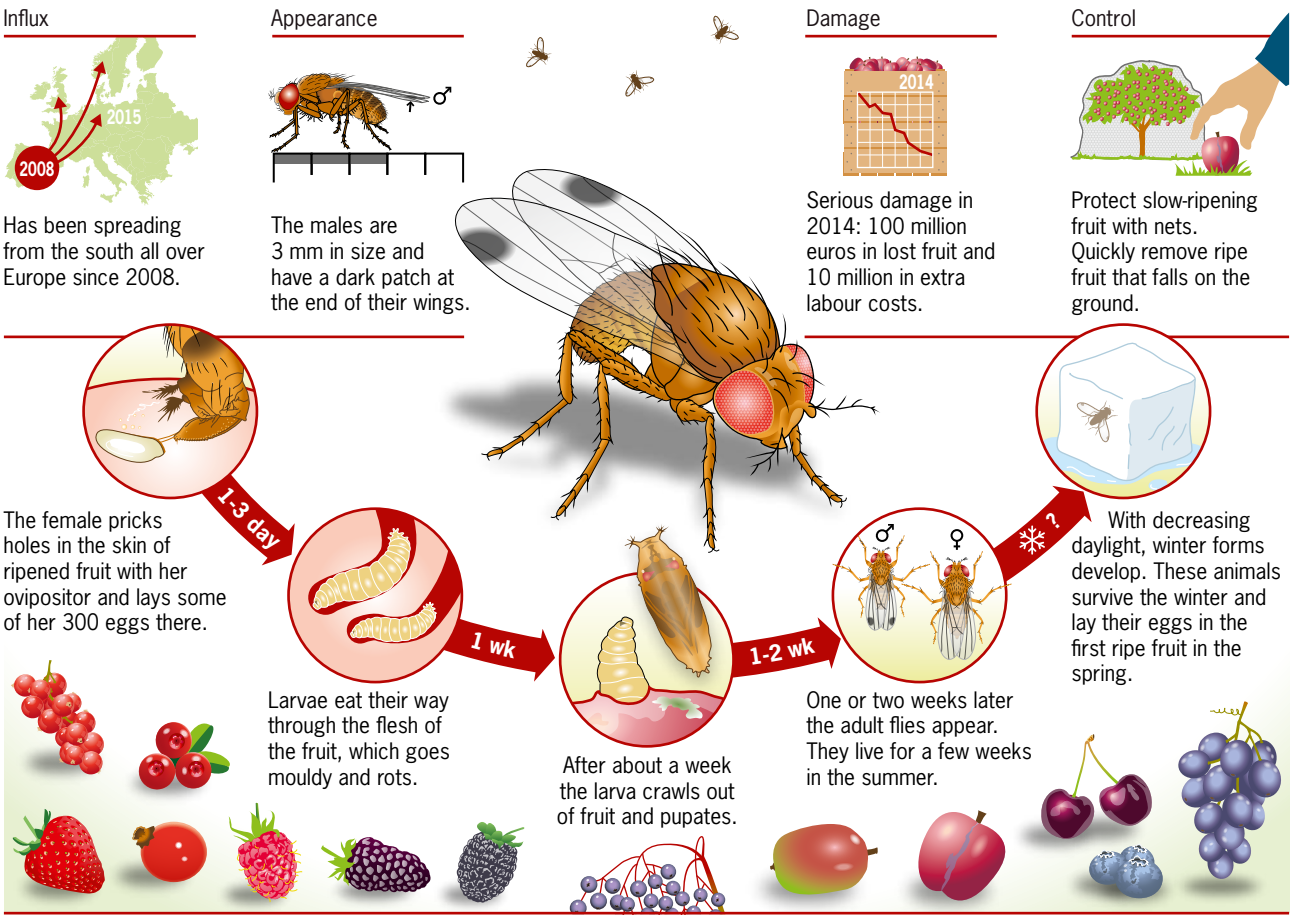
PHOTO GUY ACKERMANS

HERMAN HELSEN,
Researcher Applied Plant Research (PPO)

'The flies often prefer the real fruit to the bait in the traps'

The story of the spotted wing drosophila fruit fly

Drosophila suzukii, commonly known as the spotted-wing drosophila fruit fly, first appeared in the Netherlands in 2012. This exotic species, which originates from south-east Asia, poses a threat to fruit farming because the females lay their eggs in ripe and ripening fruit. The fruit is unmarketable within days. Every effort is now being made to find out more about the newcomer's life cycle and weak points.



cherries start to ripen. If so, we could break the cycle by removing all bushes of that kind from the area around fruit farms.'

The ultimate aim of the research is to outwit the spotted-wing fruit fly. For the moment, the emphasis is on hygiene measures. For example, growers should avoid leaving ripe fruit lying around on the ground in their fruit-growing plots. This is easier said than done. In the case of blueberries for example, 10 to 15 percent of the crop falls on the ground. 'It's really difficult to pick up all that fruit,' says Helsen. 'The challenge is to work out how we can avoid that fruit becoming the source of the next generation of flies.'

LOSS OF 10 MILLION EUROS

Jaco van Bruchem, a policy officer at NFO, the Dutch fruit growers' association, suspects the spotted-wing drosophila fruit fly was causing damage even in 2013. >

PHOTOS HOLLANDSE HOOGTE

The spotted-wing fruit fly is a growing problem in vineyards. The females lay their eggs in ripening fruit, and the larvae (top right) eat their way through the flesh, causing it to rot. Affected fruit has to be cut out whenever possible.

'But it got completely out of hand last year. We estimate the loss in damaged fruit at 10 million euros plus additional labour costs of another 10 million due to hygiene measures and having to take more care when picking and sorting the fruit.' Van Bruchem expects losses to reach a similar figure in 2015. 'A positive aspect is that the growers are much more aware now. They will probably be much stricter in clearing away the fallen fruit. We also hope that the Ministry of Economic Affairs will authorize more pesticides for use.' With strict restrictions, the use of organic insecticide Tracer is permitted on blackberries, raspberries, strawberries and smaller berries. For cherries and plums no effective pesticides were authorized last year.

Organic pest control can also play a part. On Wageningen Campus, Gerrie Wiegers from Plant Research International, part of Wageningen UR, demonstrates a culture medium that has turned dark green from the spores of the fungus *Metarhizium*; another agar plate is completely white with *Beauveria* spores. They may be future weapons in the war on the spotted-wing drosophila. Spores of the two fungi have successfully been tested on cockchafer larvae and crane-fly larvae respectively. But there is a much bigger arsenal of insect-killing fungi available, as researcher Rob van Tol explains. 'There will undoubtedly be one that can take on *Drosophila*. But that's not the end of the matter. In what phase of the life cycle are the flies susceptible? Are we talking about the adult animals or the larvae? The larvae are inside the fruits – can the fungal spores even reach them?' Wiegers and Van Tol will be carrying out an infection experiment with fruit flies in cages. If they release a few flies infected with a fungus, will they quickly transmit the spores to the other flies? Or is it better to lure the flies to a trap with ripe fruit and infect them with the fungus there? 'It's still debatable even then whether that would be enough,' says Van Tol. 'Will the female stop laying eggs as the fungal spores spread or will she keep going until she drops dead? If the latter, it's a useless pesticide. If this doesn't work, we still have parasitic nematodes in reserve.'

COVERED WITH NETTING

The growers will have to manage on their own for the time being. That is why large-scale cherry growers are thinking about covering their trees with netting, says Helsen. A number of years ago, growers switched from the traditional trees with long trunks to higher yielding trees with short trunks. They are often kept under plastic to keep out the rain and wrapped in netting to stop the birds getting at them. 'Then it's not such a big step to use nets with a finer mesh,' says Helsen, 'but that has disadvantages too, such as less light and less air circulation.' He doesn't expect such protection to keep all the flies out. 'Tractors are being driven in and out and the fruit gets picked so some fruit flies are bound to get in then. That's why I think they need to have segregation as well. If you grow the early cherries and the late cherries in different compartments, you can avoid the situation where the early cherries are a source of infection for the late harvest.'

'The spotted-wing drosophila fruit fly is the first new insect pest for fruit growers in maybe a 100 years'

There are recommendations everywhere, including on the Internet, for traps as a way of dealing with the fruit flies. Helsen has serious doubts about their effectiveness. 'Of course every creature you catch is one less. But in general the flies prefer the real fruit to the bait that's in the traps, and there's always lots more real fruit on offer. If you catch a female, it's highly likely to have already laid eggs. Until we can come up with much more enticing bait, I don't think investing thousands of euros in traps and labour is justified.'

Despite all the uncertainties, the researcher is optimistic. 'In five years' time, the spotted-wing drosophila fruit fly will be a run-of-the-mill pest for fruit growers, one you can keep under control with a strategy tailored to the specific crop using a set of instruments that are gradually being developed and refined.' He also expects there to be solutions for organic farms. 'They are even more vulnerable because of the mix of different crops, which means there is ripe fruit available all year round. Ideal for this fly. But eventually we'll find solutions for organic farms too.' ■

www.wageningenur.nl/suzuki-fruit-fly

CITIZENS' INITIATIVES IN NATURE MANAGEMENT

DIY nature conservation

The growing number of nature-related citizens' initiatives requires a change of culture among civil servants, says researcher Rosalie van Dam. They need to learn to hand over the reigns. Citizens want to decide for themselves what they are aiming at and how they can get there. Too much interference kills creativity.

TEXT RIK NIJLAND **PHOTOGRAPHY** VILDAPHOTO

FOTO NATIONAALE BEELDBANK

It took nerve to take on such a major financial commitment. But early this year, after eighteen months of saving, lobbying and begging, Sylvia van Gulik, Joost van Liebergen and Toine Cooijmans had cause to celebrate. These three residents of Boxtel, a small town in the Dutch province of Brabant, had raised the 300,000 euros they needed to buy, landscape and manage 6.5 hectares of meadow between their neighbourhood and the Dommel river. 'It is an old tract of farmland which the owner hasn't invested in for a very long time,' says Cooijmans. 'With uneven pastures, an ancient treed dyke and a couple of hectares of hayfields with kingcups and snipe. With a bit of maintenance work we think they can compete with the loveliest meadows elsewhere along the river.'

The area, known as the Dommelbimd in the local dialect, is not part of the national Ecological Main Structure (EMS) network of nature reserves. And that is what attracts the attention of nature conservation organizations and government funding. When the Dommelbimd was put up for sale in 2013, it seemed likely that a farmer would buy the land, says Cooijmans. 'A farmer would level the land, drain it and plant maize. That was a horrifying thought. So should you then just let an area like this, which has nobody to stand up for it, slowly deteriorate?' Cooijmans and his fellow residents did not have enough money to make an offer for the land. So they bought time by asking for help from the provincial nature conservation organization Brabants Landschap, which bought the land in 2013 on condition that the local residents' committee would raise the funds for it within eighteen months. 'After agreeing to that deal all three of us lost sleep wondering if we would manage that.' In the end most of the money came from private funds and grants but the initiators also raised 90,000 euros from individual donors, mainly through crowdfunding and the sale of certificates for 1000 euros. 'What people get for that is above all the good feeling that they have secured a beautiful piece of natural scenery for their children and grandchildren.'

Local residents standing up for their natural environment is nothing new in itself. In 1906 a select group of notables raised 155,000 guilders to prevent the Naardermeer from being turned into a rubbish dump. More than a century later, there is a more widespread willingness to invest in nature. 'Nature policy has become a civil society issue,' says Rosalie van Dam, sociologist and governance expert at Alterra Wageningen UR. 'Civil society has become more vocal. There are more and more different claims on scarce land in the Netherlands: nature, recreation, housing, business. It is logical that citizens mobilize to defend their interests. They don't necessarily wait to see what the government wants, but take things into their own hands. And they are quite proud of it too, the fact that they are the ones doing it and not the unwieldy government or those civil servants sitting in their offices,' continues Van Dam. Practice and policy are coming together, she concludes. Because what is happening is exactly what cabinets since the Balkenende government (2010) have been aiming it: leaving more to market forces and individual citizens.

WHAT INSPIRES THEM?

Together with Irini Salverda and Roel During of Alterra's Biodiversity and Policy team and Martijn Duineveld of the Cultural

'There is much more chance of success if some priority is given to the social side of things'

Geography chair group at Wageningen University, Van Dam wrote a book called *Citizens and their Landscape*. This volume gives an overview of 10 years of research into citizens' participation and civil society initiatives, most of it carried out at the behest of the ministry of Agriculture, later Economic Affairs. 'Traditionally, governance researchers focus mainly on the government's position in the interaction with citizens,' says Van Dam. 'We were among the first to look at it from the other side. What inspires these committed citizens, what are their drivers and which strategies do they use to book success?'

Several years down the line these studies are still much in demand, both by government and by engaged citizens. 'The latter group likes to be well-prepared. People actively look for information, emailing, phoning and asking questions. Our research, we have noticed, gives them a kind of legitimacy. They see it as confirmation of what they are doing, as well as a stimulus to carry on with it.'

People who launch citizens' initiatives are often good at inspiring and involving other people, says van Dam. 'What is more they are aware of the social side of things. The issue is the bonding factor but there is much more chance of success if some priority is given to the social side of things – by celebrating a success with a party, for example.' Van Dam describes the group as positive people with an eye for opportunities who do not give up easily – they are resolute even to the point of obstinacy. 'They are often highly capable people, which can be problematic as well because they can sometimes overshadow the bureaucrats.'

A wide range of examples are described in *Citizens and their Landscape*. From local citizens pollarding willows, tending an urban garden or creating or maintaining a nature reserve to farmers building windmills. Running through the book is the theme of the changing and often tricky relations between enthusiastic citizens and municipalities, provincial governments and water boards. These governance organs and their bureaucrats are traditionally used to being at the helm. That can cause difficulties and aggravation, says Van Dam.

'Citizens like to set the goal they are working towards themselves, and they want to set their own course towards that goal. If bureaucrats try to do that for them, their energy ebbs away. Too much interference is deadly, it kills off creativity.'

LETTING GO

Government bodies often have every intention of taking citizens' initiatives seriously, explains Van Dam, but on the other hand they find it hard to let go of their own policy and their control. 'For a very long time the government stood for continuity. Can citizens guarantee that? Will they deliver quality? Will nothing go wrong that the municipal council will later be held responsible for? Those are the sorts of things civil servants worry about. And then they also have questions about how representative a citizen's initiative is. Who does it actually represent? Experience shows, says Van Dam, that a citizen's initiative is not a panacea. 'It is not the be-all and end-all. For creating and maintaining green space, collaboration is often not an easy road to take. It is always more time-consuming than you think it will be. If as a government you are determined to create a particular type of vegetation, you certainly shouldn't start working with a citizens' initiative. You should just spend money on it and hire a nature management professional. If it doesn't matter so much what kind of vegetation you end up with, then it can be fine to work together with citizens. Then you can invite citizens' initiatives or even stimulate them through competitions or grants. But it is also possible for the government or a large nature organization to participate in ideas citizens come up with. A new kind of collaboration is gradually coming into existence,' says Van Dam.

Alterra provides support to get this process running more smoothly. 'We have set up a learning network and we organize meetings for knowledge exchange between municipalities, provinces, ministries, water boards and nature organizations,' explains Van Dam. 'Working with citizens' initiatives demands a change of culture, not just for the enthusiastic individual civil servant but also in the organization as a whole, which needs to learn to play a service role and hand over the reigns. We bring stakeholders together and provide coaching.'

Such guidance is no longer needed in Boxtel. Cooijmans himself gives talks to inspire other citizens' initiatives; state secretary Sharon Dijksma waxed lyrical about Dommelbimd at the Nature summit on 5 February. And now the real work begins for the local residents. Last winter a big group of volunteers made a start on restoring the neglected area. They are laying a path and doing up a shed as a workplace for the local schools. Cooijmans: 'The area has been closed to the public for decades; soon everyone will be able to enjoy it.' ■

EDIBLE MAZE

In the ministry of Economic Affairs' 2014 policy paper on nature, citizens are urged to put their shoulders to the wheel and come up with ideas for the conservation and management of nature. That should increase the level of public involvement, expects State Secretary Sharon Dijksma. The provincial governments are aiming at private initiatives too. Last year, for instance, the province of Flevoland appealed for new ideas for public green spaces, making 100 million euros available for realizing them. This bottom-up approach produced some novel proposals such as a 'diaper park' where families could celebrate the birth of a baby by planting a tree, an edible maze, and a variation on the allotment theme where people could establish and manage their own mini-nature reserve.

Powder against vision

The company Newtricious has developed a drink called MacuView, which can slow down a form of vision loss. Wageningen UR has developed a long-lasting powdered form of the drink and has optimized its production, flavour and quality.

TEXT AND PHOTOGRAPHY HANS WOLKERS

The main cause of vision loss among the over 55 age group is the deterioration of the retina in the central yellow spot called the macula. This age-related macular degeneration (AMD) reduces vision in the central area of the field of vision. It has become clear that diet plays a key role in preventing AMD. So Newtricious R&D in Oirlo developed a drink based on eggs, enriched with carotenoids (lutein and zeaxanthin) and omega 3 fatty acids, which slows the development of AMD.
Wageningen UR Food & Biobased Research was asked to develop a soluble powder based on this drink. Powder has advantages for both the producer and the consumer: it keeps longer, is easy to use and the dosage can easily be standardized.

AVAILABLE WORLDWIDE

'We first experimented with different drying technologies,' says Miriam Quataert, expertise leader in Food Design and Structuring at Food & Biobased Research. The company added the requirement that the technology chosen should be available worldwide, making production overseas feasible. The spray-drying technique proved the most suitable. This entails forcing the liquid under pressure through small apertures into a heated drying chamber where it forms a mist. The moisture then evaporates, leaving powder behind.

Quataert: 'Tests carried out by Human Nutrition at Wageningen University showed that the absorption of useful nutrients from the spray-dried powder was just as good as that from the original drink.'
In the next phase of product development, the Wageningen researchers optimized the production of the powder in the factory of Adriaan Goede BV. They also worked with AromaUden on improving the recipe for the drink with added flavours. The end product was a new patented powder product, MacuView, which was on the shelves at opticians and pharmacies within four years. 'That is extremely fast,' says Quataert.

SHIPPING

Paul Jonker, director of strategic research at Newtricious, is enthusiastic too. 'The powder has all the good characteristics of the original drink,' he says. 'Its long shelf life is a big advantage: one year instead of two weeks.' This enables the company to produce it on a larger scale, which cuts costs. The powder is also easier to ship, making it possible to reach foreign markets effectively. 'We would never have managed that so quickly with a liquid product,' says Jonker. 'In the long run this will mean millions of euros in turnover and cost-saving.'

www.wageningenur.nl/en/macuview

loss

‘Its long shelf life is a big advantage’

Herbs oust antibiotics

Because of restrictions on the use of antibiotics, livestock farmers are increasingly resorting to herbal remedies, bacterial drinks and other natural products to make and keep their animals healthy. Although there might not always be hard medical evidence, farmers sometimes get spectacular results from natural remedies.

TEXT HANS WOLKERS **INFOGRAPHIC** REMY JON-MING **ILLUSTRATION** IEN VAN LAANEN

The news was all over the Dutch papers in April when British scientists at the University of Nottingham used instructions found in a ninth century medical textbook to brew a natural remedy that kills bacteria. The mixture of leek, garlic, wine and ox gall was intended to cure inflammations of the eyelid but it had an unexpected effect: it even killed MRSA bacteria, which are resistant to antibiotics. The researchers now think such methods from over a thousand years ago can help tackle the problem of the increasing resistance of bacteria to antibiotics.

Maria Groot, a vet and researcher at RIKILT Wageningen UR, is not surprised by the British microbiologists' results. 'There are numerous examples in the literature of herbal remedies having an effect on bacterial or viral infections,' she says. 'More and more people are becoming interested in them; herbal medicine is no longer seen as old wives' tales.' Although there are no statistics, she reckons that farmers and vets are increasingly using natural therapies, especially now that government policy is focused on a dramatic reduction in the use of antibiotics in order to stop bacteria from becoming ever more resistant to those antibiotics.

But knowledge of herbal medicine is still limited and Groot says that much 'traditional knowledge' has been lost. Even so, the shelves of specialized garden centres such as Welkoop and Boerenbond are full of animal health products based on natural ingre- >

dients. Some products are even registered as animal medicines, such as udder ointment with eucalyptus oil for inflammation of the udder, or Colosan, a mixture based on the oils of linseed, cinnamon, aniseed, fennel and caraway seeds that livestock farmers use to treat gastro-enteritis in cattle. According to Groot, both experience in the field and clinical studies show that natural products can make a significant contribution to keeping animals healthy. For example, she says garlic has an effect on worms in the intestines of chickens while urinary tract infections in pigs can often be dealt with using bearberries, cranberries and stinging nettles. A mixture of garlic and oregano prevents diarrhoea in calves. Research has shown that this mixture has an antibacterial, antiviral and antifungal effect.

‘More and more people are becoming interested in herbal medicine’

SNIFFLING PIGS

Pig farmer Harry Bloemenkamp’s farm in Lettele is a textbook example of natural products being used as a replacement for antibiotics. For a number of years there were problems in the transition from piglet to adult pig, despite the use of antibiotics. ‘They didn’t grow that well and we had a lot of losses due to lung problems,’ says Bloemenkamp. On the recommendation of his vet, he started using Bio-Even, a product containing formic acid, citric acid and herbal extracts of camomile, plantain, thyme and sundew. ‘If pigs start sniffling, I spray this product in the barn,’ says Bloemenkamp. ‘It reduces infection levels and encourages the secretion of mucus.’
He also added a herbal mixture that included oregano to the feed. The results were ‘astonishing’. The use of antibiotics fell from an average of 12 grams per animal per day to virtually nothing. What is more, losses due to disease halved, from 3 per cent to 1.4 per cent. The pigs also grew about 15 per cent faster. ‘We are now achieving excellent results,’ says Bloemenkamp enthusiastically. ‘It costs about one euro in natural products per pig but that gets us increased yields worth nearly six euros per pig.’

SAVING LIVES

Even so, cutting antibiotics completely out of livestock farming is not an option, thinks Gerdien Kleijer, a vet and project manager at Projecten LTO Noord. ‘Antibiotics remain necessary for urgent situations; they save lives,’ says Kleijer. ‘However the unthinking application of antibiotics of recent years was not a good thing,’ she argues. ‘They were used so that animals could be kept packed together in greater numbers and in less hygienic conditions. They were even a standard ingredient in feed until 2006.’
Then the national government banned the preventive use of antibiotics and research programmes were set up to enable further reductions. Since then, livestock farmers have been looking for ways of keeping their animals healthy and robust. Livestock farmers who adjust their barn systems and management methods by improving hygiene in the barn and keeping fewer animals per square metre turn out to be able to manage with less antibiotics or even none at all. ‘If you work on the basis of what each animal needs and adjust the way you manage things accordingly rather than just focusing on production levels, you can reduce the use of antibiotics to a minimum,’ says Kleijer. According to her, the preventive use of natural products such as bacterial drinks and herbal remedies can also keep livestock healthy and robust. Livestock farmers can use them during times of stress for the animals, for example, such as a change in feed or a move to a different location.
Although Kleijer knows of plenty of examples from actual practice where natural remedies have helped keep animals healthy or recover more quickly, there is often insufficient scientific research or evidence. That is because a natural product cannot be patented unless it is based on a genetically modified crop. What is more, studies that meet the strict clinical research conditions that allow a product to be registered as an animal medicine are extremely expensive. Scientific proof is particularly difficult to obtain for herbal remedies as they are a complex mixture of various compounds.

That makes it tricky to identify the active ingredient or combination of active ingredients. Kleijer thinks such rigorous scientific evidence is not actually necessary in many cases: 'Practical experience shows that many natural products improve health. It would cost a huge amount of money to demonstrate this scientifically sufficiently to enable the manufacturer to make a medical claim.'
That is why manufacturers of natural products often carry out practical tests and studies, then file away the results internally rather than publishing them. 'That is a real problem as it is a major obstacle to the dissemination of knowledge,' says Maria Groot at RIKILT.

SUCCESS OF PROBIOTICS

Michiel Kleerebezem, professor holding a personal chair in Host Microbe Interactomics at Wageningen UR, confirms what Groot and Kleijer say: 'There are a lot of signs pointing to the success of relatively simple products in livestock farming such as probiotics – mixtures of good bacteria – and herbal remedies,' he says. 'But it's not easy to provide irrefutable scientific proof.' Indeed, health claims for probiotics have not been approved by the European Food Safety Authority (EFSA). But he is in no doubt that these bacterial drinks have a positive effect on some people and animals. Kleerebezem thinks that the EFSA's approach to evaluating study results is too geared to the demonstration of powerful short-term medicine-like effects. There is also an idea that these products should have a positive effect on everyone. He thinks this is a misconception. 'Probiotics have a relatively mild effect that may only become apparent in the longer term,' explains the professor. 'Also, much more attention should be given to the differences between individuals; what doesn't work for one person may well work for someone else.'

Kleerebezem sees the bacterial populations in the intestines as an ecosystem that you can influence and control in order to boost the health of animals and people. Probiotics can play a role, for example by competing with pathogens and preventing them from getting a foothold in the intestines. Kleerebezem: 'You may be able to prevent animals from becoming sick or help them recover by using a diet or microbial therapy to change the intestinal ecosystem. Such approaches can help reduce the use of antibiotics in livestock farming.'
The Central Veterinary Institute at Wageningen UR is also carrying out research into the effect of natural products on infections. 'In test tubes, garlic extract inhibits some pathogenic bacteria,' says Annemarie Rebel, head of the Infection Biology department, to illustrate the >

PATTERN BOOKS

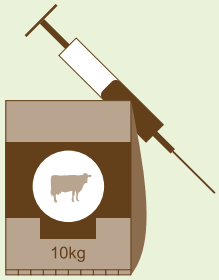
Both farmers and vets need more knowledge and awareness of natural products if these products are to be used effectively on a larger scale, says Maria Groot from RIKILT Wageningen UR. That is why she took the initiative in 2009 to collate the knowledge of diseases and natural remedies in what are termed 'pattern books' for poultry, pigs, veal calves and cattle, with financial support from the Ministry of Economic Affairs. For each disease, the booklets describe the natural products that can be used to keep the animals healthy or help them recover. Grazix for example, a product based on pomegranates and green tea, improves the intestines' immune function and is effective in treating diarrhoea in piglets. Cryptosporidium is a parasite that is causes severe diarrhoea and is difficult to treat. In calves, it can be treated or prevented using Solucox, a vegetable product based in part on goldenrod and thyme. The pattern books also consider the scientific and clinical evidence, especially for vets, for the effects of the different natural products. The pattern books were originally intended for organic farmers but the Ministry of Economic Affairs is now promoting and subsidizing their dissemination in the conventional sector including the necessary modifications and updates. This will let knowledge of natural products be shared with livestock farmers and vets.

THE USE OF ANTIBIOTICS IN LIVESTOCK FARMING AND THE RESISTANCE PROBLEM

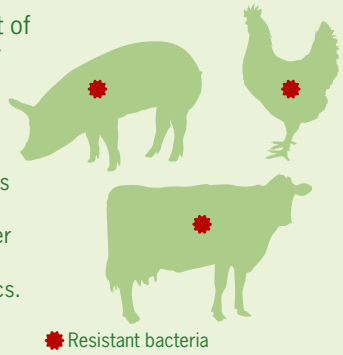
By cutting down on antibiotics in livestock farming it is hoped that the development of antibiotic-resistant bacteria can be stopped. Such bacteria are often dangerous for humans as well as livestock.

Development of resistant bacteria

Until 2008, antibiotics were often added to feeds as a preventive measure, as well as being prescribed by vets when diseases were diagnosed.



Due to years of high levels of antibiotic use in the livestock sector, a number of bacteria have become unresponsive to antibiotics.



From animals to humans

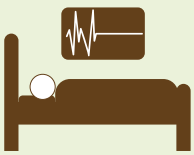
Some resistant bacteria from livestock farms are dangerous to humans as well. Examples are MRSA and ESBL.

MRSA bacteria can be transmitted from animals to humans through direct contact with the livestock.

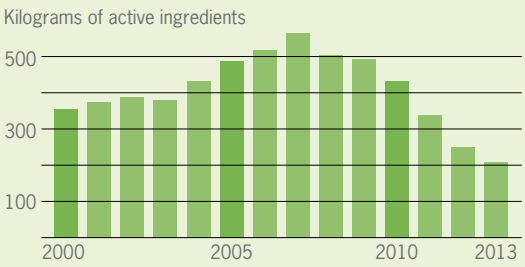
ESBL bacteria are probably transmitted through contact with infected poultry meat.

Reduced immunity

When humans are infected with antibiotic-resistant bacteria, treatment with antibiotics is impossible. Patients with reduced immunity are at risk of death; estimates suggest that this happens to many thousands of patients in Europe every year.



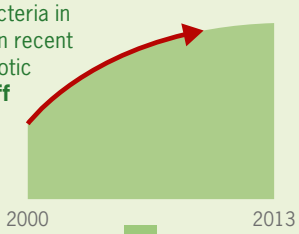
Antibiotic use in livestock



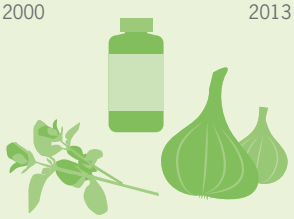
The sale of antibiotics for livestock rose to almost **600 tonnes** in the Netherlands in 2007. Since then the use of antibiotics in the country has fallen as a result of government policy. In 2013, **209 tonnes** of antibiotics were sold. By the end of 2015 the use should have been cut further, to **70%** of 2009 levels.

Preventing antibiotic-resistant bacteria

Numbers of antibiotic-resistant bacteria in the Netherlands went on growing in recent years, in spite of the drop in antibiotic use. This growth began to **level off** for the first time in 2013.



To curtail the growth of antibiotic-resistant bacteria even more, the use of antibiotics in livestock farming needs to be reduced **further still**. Changes to how farms are run and the application of **herbs and probiotics** can help here.



research. 'It turned out that garlic in feed also inhibited the bacterium *Actinobacillus pleuropneumoniae* (APP), which causes infections in the lungs and pleura of pigs. The animals became sick less often, suffered less damage in the lungs and there was a decrease in the number of pathogens in the animals.' Even so, a good result like that does not mean you are finished: the quantity of garlic needed to achieve that effect in the animals was far more than is usually used in clinical studies. Animals are also not fond of garlic, which can make it difficult to administer the remedy.

LEARNING FROM INDIA

The European Commission and Oxfam Novib and some provinces such as Overijssel and Friesland are subsidizing exchange programmes between various countries in an effort to promote knowledge about the use of natural remedies and reduce the use of antibiotics. For example, Dutch vets and farmers paid a visit to farmers in India in 2014 to learn about the use of natural products, especially herbal remedies. 'Dairy farmers in India use far more herbal formulations than Dutch farmers,' says Kleijer. 'For example, a mixture of aloe vera, turmeric and calcium carbonate is a tried and tested recipe for treating inflammation of the udder in India.'

The Dutch government would also like to see a broader application of natural products in livestock farming. The Ministry of Economic Affairs, for instance, is investigating the possibility of making farming more sustainable with less antibiotics through the application of natural products such as herbal remedies and nutritional supplements. Wageningen UR Livestock Research and the Animal Nutrition group are collaborating with the private sector in research into the relationship between nutrition, intestinal health and immunity. This has resulted in the development of the nutritional supplement Presan, for piglets and broiler chicks, that improves the diversity of the bacteria in the intestines.

REGISTERING PRODUCTS

Groot and Kleijer expect that herbal remedies and other natural products will play an increasingly important role in modern livestock farming now that there has been a big fall in the use of antibiotics. Hard scientific evidence is not always available but practical experiments show that many apparently esoteric mixtures of natural ingredients lead to improvements on the farm. Animals become ill less often and production increases. As the surprising result with the Anglo-Saxon herbal formulation that killed bacteria showed, humans and animals could benefit from more knowledge about the natural approach to treating sickness, or preferably avoiding sickness through the prophylactic application of herbal remedies. Groot advocates special rules for natural products such as herbal formulations to prevent quackery and uncontrolled proliferation in the production and development of such treatments: 'I would prefer to see a separate register for this kind of natural products: if the quality is good, it has a clinical effect and it's safe, that should be it.' ■

MARIA GROOT,
vet and researcher at RIKILT Wageningen UR

'Herbal medicine is not so often seen as old wives' tales'

WAGENINGEN ACADEMY

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For more information go to www.wageningenacademy.nl

COMPANY EXTRACTS PECTIN FROM COFFEE PULP

The technologist and the optimist make a good team

One is the inventor, and the other runs the business and finds investors. Andres Belalcazar from Columbia and Rudi Dieleman from The Netherlands met as students in Wageningen and founded a promising startup together. Their goal is to extract useful ingredients from coffee cherry waste.

TEXT ALEXANDRA BRANDERHORST **PHOTOGRAPHY** GRAHAM MORGAN AND HARMEN DE JONG

'Only half of the coffee crop is used. Coffee cherries consist of 45 percent pulp, which is left behind after the green coffee beans are extracted. The pulp is considered waste. Farmers dump it, and it harms the environment. But I have found a solution', says Andres Belalcazar from Colombia. He finished his Master's in Food Technology at Wageningen University in 2012. While he was following this programme he developed the idea of extracting pectin from coffee cherry pulp. Pectin is used as an emulsion stabilizer in soft drinks, sweets, desserts and sauces. 'Without emulsion stabilizer, drinks and foods would be rather disgusting. It allows different ingredients, colours and flavours to mingle', explains Rudi Dieleman, who recently graduated from his Master's in Management, Economics and Consumer Studies at Wageningen. Together Rudi and Andres founded Pectcof in 2012, a startup that focusses on the biorefinery of coffee pulp.

The two entrepreneurs are hopeful that their pectin can fill a gap in the market. The food industry often uses gum arabic, hardened acacia tree sap, as an emulsion stabilizer. But the supply of this gum is not reliable. Nomads collect it from the trees while herding their cows, mainly in politically unstable regions of South Sudan and Chad. The gum is then shipped to Europe and refined. The quantities are diminishing and it is an expensive ingredient.

SUITS

Andres' family run a food lab in Bogota which performs tests for the food industry. Before he came to Wageningen Andres worked there for a few years. 'One day a coffee farmer came to us with some coffee pulp. He said he was drowning in it and wanted to know if it could be used somehow. That idea lodged in the back of my mind', says Andres. Years later, in Wageningen, he discussed it with a researcher 'who knew more about pectin than anyone else in the world' and told him about its potential.

Andres pitched his idea of extracting pectin from coffee pulp in a 2 minute video clip in the MSc course 'New venture creation' in 2011. Inspired by what he heard, his coursemate Rudi joined Andres' team. 'Even if only some of his projections are right, it is a viable business idea, I thought', says Rudi. With their business plan they won the course competition. 'We won a

‘Technology can help protect the environment’

microloan of 6000 euro. We spent the first 600 euro on suits’, Rudi laughs. ‘We decided to find out whether the idea really would be commercially attractive and feasible.’ They founded Pectcof and Rudi set about building the business and attracting the first investors, while Andres focused on completing his degree. Their company generated lots of interest and got support from organizations such as Start Life, PPM Oost, Climate KIC and the Centre for Biobased Economy. They won several prizes, including the ‘Ondernemen zonder grenzen’ [entrepreneurship across borders] award in 2014 and the Dutch Venture Competition in 2013. In 2014 Rudi gave a TEDx talk in The Hague about the biorefinery of coffee pulp. >

ANDRES BELALCAZAR

Age: 32
Studied: MSc Food Technology 2010-2012
Works: Chief scientific officer and Co-Founder of Pectcof since 2012

RUDI DIELEMAN

Age: 27
Studied: MSc Management, Economics and Consumer Studies 2008-2015
Works: Director and Co-Founder of Pectcof since 2012

‘We spent the first 600 euros on suits’

GREENER AND CHEAPER

Once he had graduated, Andres developed the technical processes for preserving the coffee pulp and extracting the pectin. Since then he has patented both processes for the company. The preservation process was tested on coffee farms in Colombia, where the pulp was preserved with a special solution in plastic tanks. Then it was dried and shipped to Wageningen. There, in the Food Solution Center lab, Andres found a way of extracting pectin. That took a lot of time: he started working on it in October 2012 and was only done last February. 'We use green chemistry and very little energy. The gum that we produce is dry, ready-to-use and solvent free. The apple and citrus pectins which are on the market are produced using solvents, which is very expensive. Solvents also pollute the environment', states Andres.

Rudi adds: 'The gum that we make out of coffee pulp is competitively priced and is a sustainable and natural product. The quality is better than that of gum arabic, the supply will be constant and it will be much cheaper too. That makes it an appealing alternative for the food industry. Food corporations like DSM, BASF, Tate & Lyle and Döhler are all queueing up to test the gum. However, Pectcof is not yet able to produce larger quantities. 'The lab results are promising, but now the technology has to be tested on a bigger scale. In order to do that, we need machines. Upscaling is very expensive and a high risk for investors. But recently we have attracted an experienced senior partner with a good network, who is willing to invest in the first steps', Rudi says.

PILOT

As a child Rudi wanted to be a pilot. To understand the science behind aircrafts he studied Electrical Engineering at Windesheim university of applied science in Zwolle. While on this degree programme, Rudi failed the test for the pilot academy because he is slightly dyslectic. In 2008 he went to Wageningen to do a transitional year to prepare for the Master's programme in Management, Economics and Consumer Studies. 'I was more interested in the people and the companies that make use of technology than in technology itself', Rudi explains. During his Master's course he joined student society KSV, and took part in many student activities and sports. For a year he was fulltime board member of Integrand, an organization that connects companies and students. He was also chairman of the board of Studentenwintersport, organizing a skiing holiday for 1000 Dutch students. In April 2015 Rudi finally finished his Master's degree, just in time before the validity of his grades expired.

Andres, by contrast, finished his Master's within two years. Before obtaining his Bachelor's degree in Biotechnology in Bogota, he had taking cookery courses in Montreal, Canada. 'I am a foodie and there are two top universities for food technology: Cornell in the US and Wageningen. I wanted to experience life in Europe.' Unfortunately he arrived at a time when there was not enough student housing. 'For the first few months we lived in office space next to the hotel Hof van Wageningen', he recalls.

He thoroughly enjoyed the international student life in Wageningen, though. 'I went to many parties and we held big dinners for foodies and techies at the student house in Droevendaalsesteeg where I lived. I love cooking and molecular gastronomy. Sometimes I cooked pork loin, froze it and then cooked it again to make it super tender.'

HARDEST DECISION

Andres did an internship at Nestlé, which resulted in a job offer. 'It was one of the hardest decisions I ever made. I still had to write my thesis on developing the Pectcof concept. I chose for Pectcof. It was life-changing.'

In addition to their studies and work, Wageningen also brought the Pectcof team love. Rudi's heart was stolen by Joy Leegwater, who graduated in Food Technology in 2012 and works on improving puff pastry products at Smilde Bakery in Edam. Andres got together with Irina Hotkevica from Latvia. She finished her Master's in Landscape Architecture in 2014 and has a job in Bath in the UK. Andres has joined her there and they plan to get married on 23 June.

'I expect to be travelling back and forth a lot in the coming years, before deciding where to settle down.'

Pectcof provided an income for Rudi for one year, and for Andres for a year and a half, which was a requirement for getting his Dutch working permit. Now new funding is needed, and in the meantime they are supported by their families and girlfriends.

PROFITABLE

The production of pectin is just the start. Besides pectin, coffee pulp also contains cellulose, which can be used as biofuel, and sugars, which can be used in the food industry. And it is rich in anti-oxidants, which are valued highly in the food industry nowadays. Biorefinery is one of the technologies of the future, predicts Andres. 'Technology can help to protect the environment, make agricultural waste profitable and help coffee farmers who sometimes struggle to survive. I also have other ideas about the use of waste, like the residues of palm oil for example.'

Andres is a true innovator, emphasizes Rudi. In turn, Andres admires Rudi's ability to communicate with people and explain technical things in a simple way. 'Rudi exudes trustworthiness. And he is optimistic. I am a technical-minded person; I need to see evidence. Rudi's positive thinking really gets us through difficult times.'

They have spent a lot of time together over the past four years. 'Sometimes we even slept in the lab and ordered pizza there, just to make sure we could restart a software programme if it ran down', Rudi remembers. Andres: 'Having a startup is like doing a pressure cooker MBA. You have to learn how to build a company and how to deal with investors and customer expectations. Food innovation is not like developing Facebook; it takes a long time. Permits are needed and there are a lot of regulations to protect consumers. But this is the way we conquer the world.' Rudi adds: 'One coffee cherry at the time.' ■

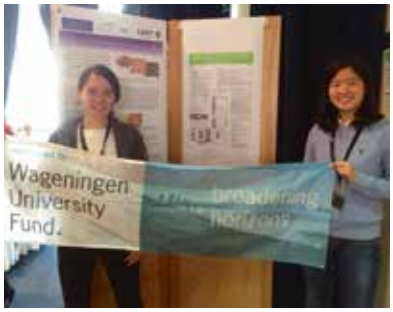
www.pectcof.com

Our first conference

Master's students Liu Shuang and Angela Anastasiou presented the results of their research on the use of organic waste in urban agriculture at an international conference – thanks to Wageningen University Fund's incentive scheme. 'We were given the opportunity to broaden our horizons.'

TEXT YVONNE DE HILSTER **PHOTOGRAPHY** GUY ACKERMANS

Shuang and Angela got to know one another last year when they both did the compulsory Academic Consultancy Training (ACT) module. Shuang comes from China and is studying Organic Agriculture in Wageningen. Angela is Greek and is doing a Master's in Forest and Nature Conservation. The ACT module involves students working in a multi-disciplinary group for eight weeks on a real-life case. Their team consisted of seven students from six countries in four continents studying four subjects: Wageningen in a nutshell. The team looked at the potential benefits for the city of The Hague from recycling organic waste and using it in urban agriculture. Shuang: 'That lets you reuse the nutrients that have been brought into the city.' In addition to positive effects on health (because the inhabitants have a more varied diet with more fresh food), the economy and ecology, they also found a significant learning effect. When people see how food is produced and become aware of the advantages of composting organic waste, they may start to separate out their waste more. After the students had presented their report, their supervisor suggested writing a paper and submitting it for the international conference on the theme of urban agriculture organized by the Association of European School of Planning (AESOP) in Leeuwarden last November. It would be a good learning experience for them and an opportunity for Wageningen University to demonstrate the value of the ACT module to its AESOP partners. It turned out that only Shuang and Angela would be in the Netherlands then because the others were on foreign internships. Shuang: 'But we thought the subject was really interesting and the conference was an opportunity to get new experience, knowledge and contacts; there are a lot of innovative initiatives for urban agriculture in the Netherlands and other European countries.' Angela: 'It was a good opportunity for us to broaden our horizons. But we would never have gone for it if our supervisor hadn't encouraged us.'



PHOTOS LIU SHUANG

When the paper was accepted – to their amazement – Shuang and Angela started doing some calculations. It cost 200 euros per person to register for the conference. And because it was a three-day conference they would also have to pay for accommodation for two nights, breakfast and dinner. Plus train and bus costs. However low-budget they tried to go, it still came to far more than a month's rent per person in total. 'We didn't have that kind of money, so we applied for a grant from the University Fund. Fortunately we were accepted. They refunded half the costs of the conference and the travel and accommodation expenses.'

INCREASINGLY NERVOUS

They worked on their presentation in their free time. As they went through their talk one last time in the train to the conference, they got increasingly nervous. The conference started with a meeting for everyone who would be giving a talk; they were the youngest

'It was an opportunity to get new experience, knowledge and contacts'

Master's students Angela Anastasiou and Liu Shuang

there. The girls didn't know what they were supposed to do or what to expect, and they didn't know anyone. Angela: 'So then we just went up to people and talked to them.' That was the right approach. 'We turned out all to be in the same boat.'

Shuang and Angela had to laugh as they recalled a conversation Shuang had with one woman. Until the woman discovered Shuang was not a PhD candidate after all, 'merely' a Master's student, at which point she made a quick getaway. 'But lots of other people made us feel at ease and told us all about their work and their careers,' said Angela. 'That's why I now know that it's more important for your future career to study something that interests you rather than a particular subject, and that a lot of research is interdisciplinary.'

The conference made Angela more aware of her interest in green roofs and cities. 'I had already though about this area of work before but I saw the practical applications at the conference, with case studies from Berlin, Italy and the Netherlands.' Shuang collected material for her graduation module during the conference. 'The real-life examples of urban agriculture also made me feel confident about my future. I would like to continue working on growing food in the city as a way of connecting up people, food and the environment they live in. I met lots of people: architects, start-up entrepreneurs and a Chinese lady working in China. That gave me hope that I too will be able to continue with this subject matter. I've become a bit detached from my home country since I've been living and studying here.' Attending the conference taught them more than just academic expertise. Shuang: 'Creating a poster was a learning process too, for example: what do you put in it and what not?' Angela: 'The first thing they asked me to do in my internship was create a conference poster. I was really pleased I'd already done that once.' ■

SUPPORTING THE INCENTIVE SCHEME

The Wageningen University Fund gives grants to students through the incentive scheme for study trips abroad, exchange projects, the organization of English-language symposiums or attending conferences. You can boost collaboration between Dutch and international students with a gift, regular donations or a legacy pledge.
Info: www.wageningenuniversityfund.nl/studentactivities

NETWORKING

Colombian alumni to collaborate

Colombian alumni, researchers and students at Wageningen University have set up a new group: the Wageningen Association of Colombian Alumni (WASCA).
'We Colombians already used to meet up informally on a regular basis,' says chair Carolina Urrea (Organic Agriculture, 2011). 'We decided to give our group a more solid framework because we see growing interest in Colombia from the Netherlands. Wageningen UR has a good reputation in areas that are important to Colombia, such as agriculture, horticulture and biodiversity. As alumni, we would like to work together to promote sustainable development in our country. We now plan to make sure that the business community and the research sector are aware of our knowledge and contacts.'
The kick-off reception in Café Loburg in Wageningen on 21 March was a lively afternoon with more than 30 people attending. The group is in contact with about 15 alumni in Colombia. Dutch people with Colombian connections are also welcome.
Info: caroline.bijkerk@wur.nl, Facebook: WASCA Netherlands

REUNION

Calling class of 1990

There will be a reunion on Saturday 31 October for all former students who started their degree 25 years ago. If you started in 1990 and would like to help think up the programme for the 25-years reunion, the Alumni Office would love to hear from you (email: alumni@wur.nl).

ALUMNI MEETING

Alumni networking in Groningen

The North alumni group met up in Groningen on 30 April. The topic was the link between the UN's International Year of Soils and the northern Netherlands' AgroAgenda, the aims of which include clean, efficient production in the food and agriculture sector.

About 60 people turned up to the meeting. 'It was a nice mix of young and old,' says Saskia van Gend (Human Nutrition, 1994), one of the organizers. First the group was treated to an extensive, interesting guided tour of the Groningen company Bioclear, which works on organic soil decontamination and water purification, applications for closed resource cycles and problems with microorganisms.
Next, the alumni paid a visit to the Investment and Development Agency for the Northern Netherlands (NOM). One of the speakers was Eisse Lute (Agricultural Plant Breeding, 1971), who is involved in the AgroAgenda. He described soil as a crucial production factor. 'Dairy farming in the northern Netherlands can improve its production capacity if more of the minerals in the farm's own manure is used on the farm to improve raw feed production in terms of quality and volume. They should preferably use fresh cattle manure that is processed to give mineral concentrates,' said Luitjens.
The alumni spent the gaps between company visits and talks networking intensively. Some remained behind afterwards to chat to acquaintances or new people they had met.

PHOTO'S REYER BOXEM

EDUCATION

Education Desk for real-life problems

Wageningen University has set up an Education Project Services Desk. Companies, governmental authorities and other organizations can contact the desk with scientific questions that could be used as teaching material.

Education Project Services could for example arrange a group of students for a client who then spend eight weeks collating the latest scientific knowledge. But it also acts as an intermediary for internships and graduation projects. Sometimes the university will ask the client to pay a fee to cover expenses. 'The university thinks it is important for students to gain research experience by working on real, topical problems. That is also what the new vision document on education says,' explains Ilse Markensteijn, one of the coordinators. 'We get these questions through the networks we are involved in, such as Food Valley NL or regional cooperatives, and through direct requests from companies and government authorities.'

A lecturer supervises the students working on the projects. The assignments let them try out their academic knowledge on real-life cases and also experience a working environment. Markensteijn says clients like working with students because they contribute innovative ideas. 'It's a win-win situation; they help the students and at the same time learn something themselves.'

If non-profit organizations approach them with a problem that requires more long-term research and the involvement of a researcher, they collaborate with the Science Shop. *Info: onderwijsloket@wur.nl*

ALUMNI MEETING

Wageningen atmosphere in Mexico

Mexico has just had its first official alumni meeting. Francisco Martinez Lozano (Organic Agriculture, 2013), Wageningen UR's representative in Mexico and Central America, organized the event. 'There were three reasons: the number of Mexicans graduating from Wageningen is growing, Wageningen UR is becoming better known now that it is active here in various areas, and some alumni are considering setting up a consultancy firm.'

Nine alumni met up in Guanajuato on 28 March. Five people followed the meeting online via the WebEx platform; this meant the meeting could be recorded and made available for sharing with others at a later date. The atmosphere was 'great - typically Wageningen', says Francisco. 'A mix of everyone getting involved and taking initiatives, interesting stories, great ideas, enthusiasm and a family atmosphere.'

Info: caroline.bijkerk@wur.nl

FUNDS

First Aalt Dijkhuizen Fund scholarships

The Aalt Dijkhuizen Fund has awarded its first scholarships. Willeke Geurts, an MSc student in Landscape Architect and Planning, was given a scholarship for a one-year Master's in Ecosystems Services in Edinburgh, Scotland. Lieke Melsen, a PhD student in the Hydrology and Quantitative Water Management group, will be doing two months of research at the National Center for Atmospheric Research in the US. Both were given 2500 euros.

The named fund, which currently has 5000 euros to spend each year, was established by the Wageningen Ambassadors as a gift to Dijkhuizen when he stepped down as chair of the Executive Board in 2014. It gives support to talented MSc and PhD students and postdocs who want to spend time abroad at a leading institution in order to acquire new, high-tech knowledge.

Info: www.wageningenur.nl/aaltdijkhuizenfund

FUNDS

New: De Vos Fund for Vector-borne Diseases

The De Vos Fund was established in March. The new named fund provides support for research into diseases that are transmitted by mammals and insects. 'Unfortunately we don't have any children, so that's why we've decided to make donations to selected good causes during our lifetime,' explains Ditsy de Vos-Thijssen, who set up the fund together with her husband Clemens de Vos. 'As we live in Wageningen, we chose the university as one of the causes.'

The first grant from the new fund has gone to a PhD candidate who is researching ticks in Panama. This grant means she now has the money for crucial DNA analysis, which also makes it more likely that she will be able to publish her findings in a leading scientific journal.

Info: www.wageningenur.nl/devosfund

Duur Aanen PhD, WU PhD 1999, assistant professor at the Laboratory of Genetics at Wageningen University, has received a Vici grant of 1.5 million euros from the Dutch Organization for Scientific Research (NWO), which he will use for research on how to increase yields from crops and livestock. 12 February 2015.

Noëlle Aarts, WU PhD 1998 and professor holding a personal chair in Strategic Communications at Wageningen University, has won the Teacher of the Year Award. 15 January 2015.

Prof. Johan van Arendonk, WU Zootechnics 1982, head of the Animal Breeding and Genomics Centre at Wageningen University, is leaving to become Chief Innovation & Technology Officer at Hendrix Genetics and a member of the company's executive board. 1 January 2016.

PHOTO GUY ACKERMANS

Prof. Johan van Arendonk

Gijs van den Boomen MSc, WU Landscape Architecture 1988, director at KuiperCompagnons, has won the prize awarded by the public in the Engineer of the Year poll organized by the Royal Netherlands Society of Engineers (KIVI) and NLingenieurs, the Dutch association of consulting engineers. Van den Boomen works internationally in the fields of urban planning, landscape design and architecture. 18 March 2015.

PHOTO GIJS VAN OUWERKERK

Gijs van den Boomen MSc

Uroš Cerkvenik MSc, WU Biology 2013, was awarded the overall thesis prize of 1000 euros by the Wageningen University Fund on Foundation Day on 9 March for his thesis on how insects determine where a sound is coming from.

Evelien Donkers BSc, WU MSc student Food Technology and judoka, was awarded the eighth sports grant, of 1000 euros, by the Niels Smit Fund for students who combine a study with top-level sporting achievements. 15 April 2015.

Prof. Michel Eppink, WU PhD 1999, has been appointed professor by special appointment in Bioprocess Engineering by Wageningen University. Synthon Biopharmaceuticals BV is funding the chair. 23 April 2015.

Prof. Edith Feskens, WU Human Nutrition 1987, professor holding a personal chair in the Human Nutrition department at Wageningen University, has been appointed professor of Nutrition in the Life Cycle within the Human Nutrition department by Wageningen University. 1 June 2015.

Prof. Ludo Hellebrekers, Utrecht University Veterinary Science 1980, professor of Veterinary Anaesthesiology at Utrecht University and member of the Council on Animal Affairs (RDA), has been appointed Director of the Central Veterinary Institute (CVI), part of Wageningen UR. 1 June 2015.

Ria Hulsman, WU Ecological Agriculture 1998-2000, VHL Rural Development 1992, employed in the Alumni Relations and Funds department at Wageningen UR, has been appointed Wageningen International Account Manager for Latin America. 1 April 2015.

Prof. Ellen Kampman, WU Human Nutrition 1988, professor holding a personal chair in the Human Nutrition department at Wageningen University, professor by special appointment in Nutrition and Cancer at the VU University Amsterdam on behalf of Alpe D'HuZes, and a senior researcher at Radboud university medical centre in Nijmegen, has been appointed professor of Nutrition and Chronic Diseases at Wageningen University with nutrition and cancer as a priority area.

Koen Kramer PhD, University of Groningen Biology 1986 and WU PhD 1996, has been appointed professor by special appointment in Quantitative Forest Genetics within the Forest Ecology and Forest Management group at Wageningen University. 1 March 2015.

Prof. Daan Kromhout, WU Human Nutrition 1974, has been appointed Knight of the Order of the Netherlands Lion. The professor of Public Health Research received the honour after his farewell address to Wageningen University. 16 April 2015.

PHOTO GUY ACKERMANS

Prof. Daan Kromhout

Prof. Martin Kropff, WU PhD 1989, rector magnificus at Wageningen University, has been appointed director-general of the international research centre CIMMYT in Mexico. 1 June 2015.

Frits Mattijssen PhD, WU Nutrition and Health 2009, has been awarded a Rubicon grant by the Dutch Organization for Scientific Research (NWO) to enable him to acquire research experience at a leading institute abroad. Mattijssen will be conducting his research at the Helmholtz Centre in Munich. 8 April 2015.

PERSONALIA

Olawole Obeme PhD, WU PhD 2006, has been appointed professor of Plant Biotechnology at Covenant University, Nigeria. 1 September 2014.

Ronald Roepman PhD, WU Biology 1993, has been appointed professor of Molecular Biology of Ciliopathies in the Faculty of Medical Sciences at the Radboud University/Radboud university medical centre. 1 January 2015.

Lieuwe Roosenschoon MSc, WU Farming Technology 1984, Sector Manager for Cattle at the GD Animal Health Service, has been appointed managing director of Schothorst Feed Research. 8 April 2015.

Heleen van Soest MSc, WU Climate Studies 2013, has been appointed a board member of VVM, the network for environmental professionals. 20 November 2014.

Daan Swarts MSc, WU Molecular Life Sciences 2011, PhD researcher at the Laboratory of Microbiology at Wageningen University, received the research award for the best scientific publication, awarded every three years by the Wageningen University Fund, on Wageningen University's Foundation Day. Swarts published a paper in Nature about his discovery of an immune system in microorganisms, which offers new prospects for the targeted modification of DNA. The prize consisted of a certificate and the sum of 2500 euros. 9 March 2015.

PHOTO BART DE GOUW

Daan Swarts MSc

Prof. Dolf Weijers, PhD University of Leiden, professor holding a personal chair at the Laboratory of Biochemistry at Wageningen University, has received a Vici grant of 1.5 million euros from the Dutch Organization for Scientific Research (NWO) for his research on the hormone auxin.

Romke Wustman MSc, WU Agricultural Plant Breeding 1976, has been appointed an honorary member of the European Association for Potato Research (EAPR). 8 July 2014.

Prof. Akke van der Zijpp, WU Zootechnics 1971, emeritus professor of Animal Sciences at Wageningen University, has been appointed Knight of the Order of Orange-Nassau for her work on behalf of sustainable livestock farming and global food provision. 24 April 2015.

Prof. Peter Zuurbier, WU PhD 1984, working until 1 January 2015 for Wageningen International, part of Wageningen UR, has been appointed Director of Agriculture at Dutch Agricultural Technology, a company focusing on sustainable food production in South America. 24 February 2015.

IN MEMORIAM

J. Benus MSc, WU Zootechnics 1951, passed away at the age of 89. 6 March 2015.
F.G.M. Bertels MSc, WU Land Development A 1978, passed away at the age of 65. 8 February 2015.
W.A. Blokhuis PhD, WU Forestry 1956, passed away at the age of 88. 6 February 2015.
Prof. G.H. Bolt, WU Land Development 1950, passed away at the age of 89. 12 January 2015.
L.M. Bouten MSc, WU Horticulture 1952, passed away at the age of 91. 31 January 2015.
H. Bults MSc, WU Agricultural Plant Breeding 1954, passed away at the age of 84. 4 March 2015.
W.J.M. Duyvestijn MSc, WU Dairy Science 1968, passed away at the age of 76. 30 January 2015.
C.J. Gude MSc, WU Tropical Livestock Farming 1951, passed away at the age of 89. 25 January 2015.
J. Helder MSc, WU Forestry 1964, passed away at the age of 77. 27 January 2015.
Ms E.V. Kambewa PhD, WU PhD 2007, passed away at the age of 48. 12 February 2014.
A.P. Kole PhD, WU PhD 1954, passed away at the age of 94. 22 October 2014.
H. Lolkema MSc, WU Tropical Rural Economics 1946, passed away at the age of 94. 24 January 2015.
W. van Nieuwenhuyzen MSc, WU Food Technology 1974, passed away at the age of 70. 8 March 2015.
H.M.R. Noor MSc, WU Rural Sociology of the Western Regions 1971, passed away at the age of 72. 12 December 2014.
Ms J.H. Purperhart MSc, WU Domestic Science 1988, passed away at the age of 54. 23 February 2015.
R. Sol MSc, WU Forestry 1957, passed away at the age of 85. 31 December 2014.
L.J. Suverein MSc, WU Farming Technology 1984, passed away at the age of 60. 3 May 2014.
J.T.N. Venekamp MSc, WU Agricultural Plant Breeding 1946, passed away at the age of 96. 3 March 2015.
P.L.H. Welles MSc, WU Plant Breeding 1968, passed away at the age of 81. 12 February 2015.
A.C.M. van Zundert MSc, WU Horticulture 1966, passed away at the age of 75. 30 January 2015.

The Wageningen employee of the future

Professional Match: “Soft skills are becoming more important for employers and employees”

KLV has worked for many years with KLV Professional Match, an expert in secondment and recruitment & selection of professionals in the Wageningen work domain and the professionalised relaunch of the previous KLV Career Centre. A strong combination: as an intermediary Professional Match knows what employers need, whereas KLV has a good picture of how Wageningen graduates fare in this labour market thanks to labour market survey. What factors play a role in the labour market and what can KLV and KLV Professional Match offer in this market to both the employer and employee of the future?

Anneke de Vries and Vanessa Beekman.

In the white paper ‘The employee of the future’ StartPeople, joint shareholder of KLV Professional Match, describes a hybrid society with an labour market that is becoming increasingly flexible. The traditional employee will become rarer and we will instead see a growing number of ‘knowmads’ or independent professionals, networkers who hop from assignment to assignment in varying contexts. As a large organisation you can better ask the question what your added value is, states the paper, and what added benefits you can offer compared to such a group of collaborating professionals. With the imminent exit wave of old employees, companies need to ensure that they remain interesting and retain a loyal group of highly deployable employees.

Aware of change

A recognisable picture? Certainly, thinks Anneke de Vries, manager of KLV Professional Match. “In recent years we have seen that soft skills are growing in importance. In our role as an intermediary we try to make both employees and employers aware of this change and we also think this through with our clients: how can you pay more attention to these soft skills and talents of an employee? We also see that employees are no longer looking for long-term contracts, but for variety. That can also occur within a company but then it is vitally important that a person fits within the company’s DNA: the core values, the style of working. We try to talk with companies about this. What can you offer your employees, also in the longer term? Are there options to expand the current job description? For example, we have good contacts with Driscoll’s, a growing, international company that covers the entire

chain in soft fruit (strawberries, raspberries, blackberries, blueberries). They are already a long way down this path."

Fitting in the DNA

"That's right", says Vanessa Beekman, HR Business Partner at Driscoll's. "We are a young and rapidly growing company and many of the positions we have to fill are completely new. That means we are looking for people with experience but in turn they will have a lot of freedom to define their role. Three core values are particularly important for us: passion, humility and trustworthiness. The passion to jointly achieve the best results, the humility to learn from each other and our competitors, and the trustworthiness to be able to count on each other and therefore to ensure that dependency is one of our greatest strengths. We are dynamic and ambitious as well as collegial and friendly. With an assessment we specifically look for people who fit within this profile. Of course each position requires different competencies but all potential employees must have five specific competencies of the twelve assessed, as these are directly related to our core values.

Continual career planning

As an actual or potential employee you need to be aware that competencies and talents are becoming increasingly important for finding a job. KLV and KLV Professional Match are also developing opportunities in this area, such as a day about traineeships and a career day for people aged 40 years and over. Other example is the diverse range of Young KLV meetings, for instance about an elevator pitch, social media, personal branding or how to write a good CV. KLV and KLV Professional Match are continuously looking for new relevant subjects. For example, they have joined forces to develop a programme around the theme of career planning. De Vries: "We are also trying to make future employees aware of the fact that they must profile their competencies and talents more. From the start of a study at Wageningen University we want to give students every possibility to actively prepare for the labour market. After their graduation, the programme continues and alumni can make use of targeted activities that are appropriate to their further career development." KLV members receive extra advantages in this respect as part of their member service. De Vries concludes: "Do you have any ideas? Then we would like to talk with you about how we can facilitate employers and employees even more."

KLV PROFESSIONAL MATCH

KLV Professional Match

KLV Professional Match is an expert in secondment and recruitment & selection of professionals in the Wageningen domain (agriculture, nutrition, nature, green space and environment). KLV Professional Match arose from a joint initiative of KLV, Wageningen UR and Start People. This alliance ensures a unique input of knowledge, network and experience within the Wageningen work domain. Employers and employees can approach KLV Professional Match for recruitment and selection, secondment, training courses and workshops, career guidance, outplacement and reintegration trajectories. www.klvprofessionalmatch.nl

INVITATION

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

Join KLVNetwork!

www.facebook.com/klvnetwork

ACTIVITIES

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

6 June
Wageningen Debating - Debating tournament - Wageningen Open 2015

11 June
Young KLV - Training - Speed reading

15 June
Young KLV - Course - CV Writing

15-17 June
European Grassland Federation - International Symposium - Grassland and forages in high output dairy farming systems
www.egf2015.nl

16 June
SKOV - Seminar - Agricultural Extension in Sub Saharan Africa: a comeback with impact?

19 August
AID - Annual information market in Belmonte Arboretum
KLV will be present with a stand.

14 September
Young KLV - Course - CV writing

17 September
Young KLV - Training - Speed reading

13 October
Young KLV - Course - CV writing

15 October
KNM - Afternoon symposium - Ecosystem accounting

PHOTO WAGENINGEN UR

Farmers in Burundi teach each other better farming

'Burundi is scarred by civil war. So it would have been no good our launching straight in and offering farmers technical agricultural knowledge. We needed to prepare the ground first, and convince them that there is a future in it,' says Niek van Duivenbooden of Alterra Wageningen UR. He is supervising a project aiming at raising food production in this African country while strengthening social cohesion at the same time. Alterra provide agricultural expertise; Achmea foundation provides microcredit and insurance and HealthNetTPO works on health issues. In 2013, staff from a local partner NGO visited 80 dynamic farmers, all eager to learn, to help them make plans for the next five years. 'In people's homes, with the whole family involved, you lay the foundation for the future,' says Van Duivenbooden. 'First the vision. Only then do we start talking about seed, fertilizer, a pig, erosion control or microcredit'.

These pioneers subsequently hand on to others the knowledge they acquire about making a business plan. 'They teach their fellow villagers that there is more to food security than just sowing your seed and hoping for a good harvest. We are already working with 2000 farmers. In two years' time we should have reached 24,000.'

Info: niek.vanduivenbooden@wur.nl
www.wageningenur.nl/en/farmers-in-Africa