Relief or worry?

Bachelor's student numbers fall for the first time | **p.6** |

Wind turbine impact study

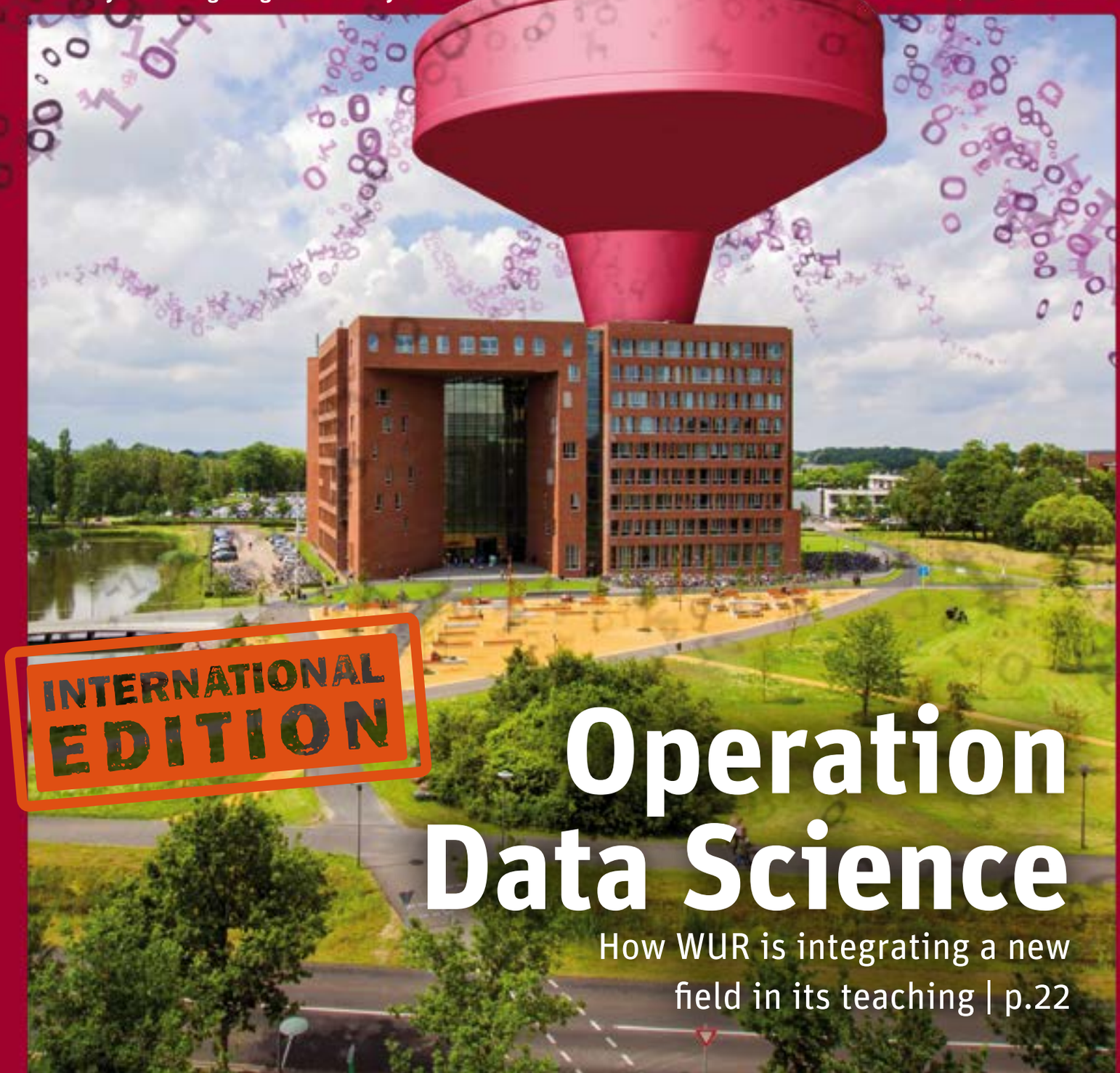
Looking for tiny pipistrelle bats | **p.12** |

High tech in the orchard

Pluk-o-Track counts apples and records harvest spot | **p.16** |

RESOURCE [EN]

For everyone at Wageningen University & Research **September 2019 – 14th Volume**



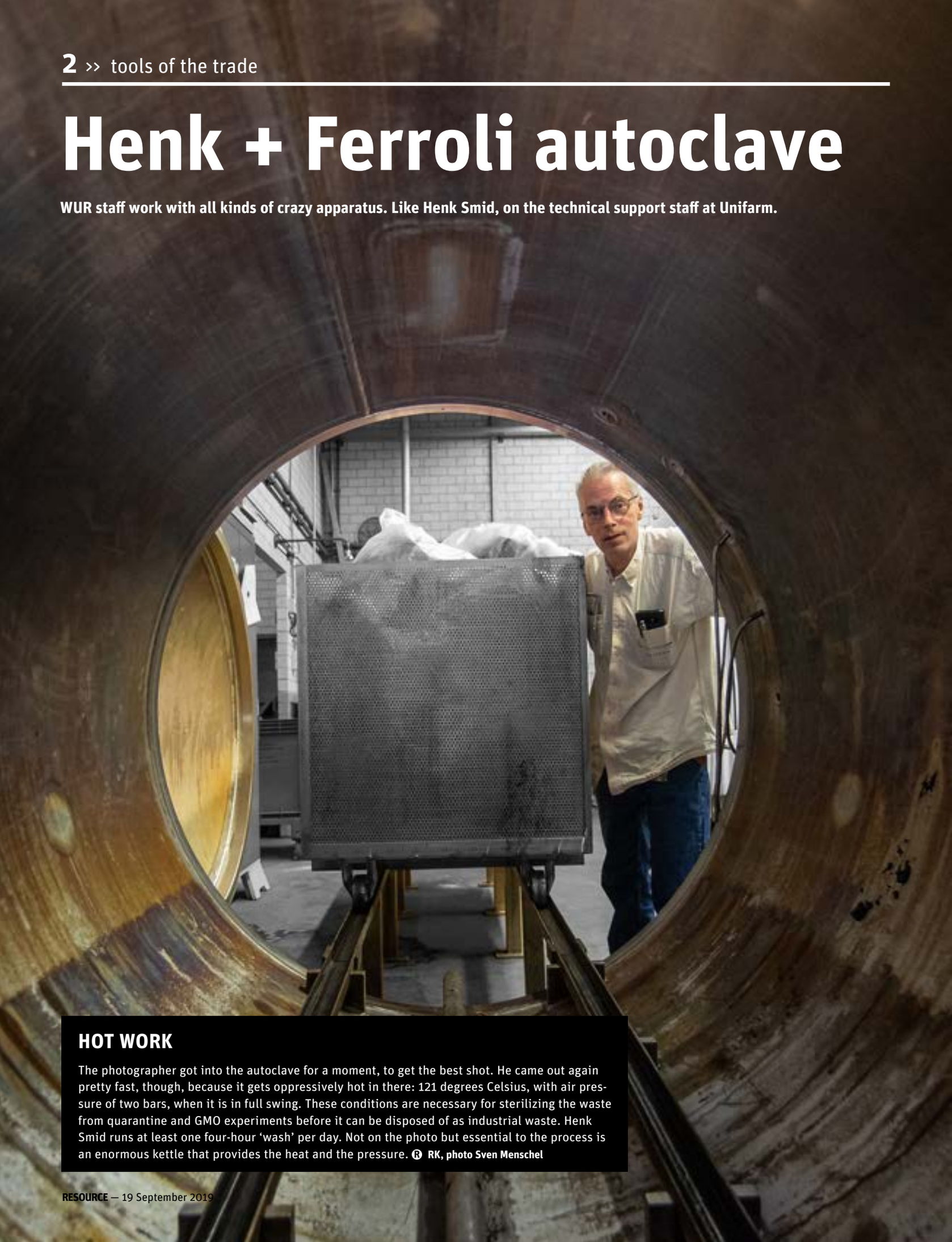
INTERNATIONAL EDITION

Operation Data Science

How WUR is integrating a new field in its teaching | p.22

Henk + Ferroli autoclave

WUR staff work with all kinds of crazy apparatus. Like Henk Smid, on the technical support staff at Unifarm.



HOT WORK

The photographer got into the autoclave for a moment, to get the best shot. He came out again pretty fast, though, because it gets oppressively hot in there: 121 degrees Celsius, with air pressure of two bars, when it is in full swing. These conditions are necessary for sterilizing the waste from quarantine and GMO experiments before it can be disposed of as industrial waste. Henk Smid runs at least one four-hour 'wash' per day. Not on the photo but essential to the process is an enormous kettle that provides the heat and the pressure. Ⓡ **RK, photo Sven Menschel**

ILLUSTRATION COVER: PASCAL TIEMAN

>>CONTENTS

no 2 – 14th volume

UNBROKEN

For Wageningen, Operation Market Garden began 75 years ago with a bombardment of the Sahara residential district. An error. The bombs were intended for German artillery stationed close by. Forty civilians were killed. Last Tuesday, a monument was unveiled in the district on Wageningen Hill. The names of the victims were read out during the ceremony. The names of 40 arbitrary victims, including 11 children. Followed by two minutes' silence. I was there and I thought of former WUR employee Co de Bruijn, who had just recounted his story as a surviving relative. He lost his mother; he was only eight (see p. 18). I thought of professor of Organic Chemistry Simon Olivier. The Resistance fighter lost his wife and 19-year-old son. Just like that, because some bombs had been dropped carelessly. A stupid twist of fate. So sad. Olivier became the first post-war rector magnificus of the Agricultural College. He remarried and lived in the Sahara district up to his death. The war did not break him. Co de Bruijn, too, was not prepared to just give up so he made something of his life. Wonderful people. Wonderful examples, too.

Roelof Kleis, editor

AND MORE...

>> All science and technology groups at Wageningen University will be able to hire an additional academic over the next few years. The Executive Board took this decision, but what does it mean exactly? p.4

SEVENTY MORE STAFF FOR WAGENINGEN NATURAL SCIENCES

PHOTO: SCHUTTERSTOCK

All Wageningen University's natural sciences and technological chair groups can appoint an additional academic in the coming years, says the Executive Board. The university is lifting the recruitment cap on two of its Bachelor's programmes.

The investment was prompted by the Van Rijn Commission, which advised the minister of Education to invest more in science and technology.
True to the spirit of the Van Rijn Commission, the social sciences at WUR will not be getting any additional staff, explains rector Arthur Mol. 'But we are not taking money away from the social sciences, as the commission recommended.'

8.8 MILLION

The Van Rijn Commission recommended that the minister allocate extra funding this year to science degree programmes at the universities, at the expense of the social sciences and the humanities. The minister adopted the recommendations and translated them into the education budget on Prinsjesdag, when the Dutch cabinet's budget is presented. This will give Wageningen University an extra 4.5 million euros next year for its natural sciences degrees, and that will increase steadily to 8.8 million in 2024. The Executive Board has decided to pass the money straight on to the science groups.

> **'But we are not taking money away from the social sciences, as the commission recommended'**

PHD STUDENTS

Besides the 70 additional lecturers, the chair groups will be able to take on 70 more PhD and postdoc researchers between them in the next few years. And this investment is for the social sciences too. The Executive Board intends it to be used to offer talented Master's students a PhD position, and to invest more in the investment themes, the AMS and One Planet institutes, grants for African PhD students and the Gerrit Grijns Initiative. The first 35 PhD and postdoc researchers will be appointed in 2020, and the second batch will follow in 2022.

DATA SCIENCE

Finally, the Board also plans to invest specifically in the research areas of data science and artificial intelligence. In the next few years, 800,000 euros per year will be spent on these research topics. Thanks to the new appointments, the Board expects a systematic reduction in the work pressure for the chair groups. Another result of the Van Rijn funding is that the university will lift the recruitment limit on two of its Bachelor's programmes. The degree in Biotechnology, which still had a selection procedure for this academic year, will admit all qualified applicants next year. The Nutrition and Health programme will start doing so in 2021. **AS**

There wasn't much news for WUR on Prinsjesdag, the Dutch Budget Day, this year. The ministry of Education had informed the Executive Board before the summer vacation about the extra funding for the university's natural sciences groups. And the ministry of Agriculture, Nature and Food Quality, which funds Wageningen Research, didn't announce any changes to its budget. Government funding for both parts of WUR will grow slightly in the coming years. Wageningen Research will get more climate research assignments, but those were allocated earlier this year too.

MONUMENT FOR A FORGOTTEN BOMBARDMENT

A bombardment on Wageningen Hill on 17 September 1944 left death and destruction in its wake. Last Tuesday, precisely 75 years after the event, a monument was unveiled for the victims.

A mistaken bombardment of the Sahara residential district by the US air force cost the lives of 40 people. Among them was the mother of former WUR employee Co de Bruijn (83). He told his story at the ceremony (see also the interview on p. 18).
The bombs that landed on the district were intended for the anti-aircraft guns near the Lexkes ferry, to eliminate them as part of Operation Market Garden. The large number of casualties was because the air-raid siren was not working.
A bombardment of the power station in Nijmegen led to a power cut 10 minutes before the attack.
The mistaken bombing had long been forgotten. It is thanks to Bart van Aller and Jola Gerritsen that Wageningen now has a monument, a boulder weighing over 6000 kilos with an inscription. The two were born and brought up in the district. The ceremony was attended by numerous relatives of the victims and current and former residents.
The text on the boulder is an anonymous poem that was published in local newspaper the *Wageningsche Courant* after the war. **RK**

Page 18: 'My mother shouted just that morning: the Tommies are coming!'

PHOTO: WAGENINGEN MUNICIPALITY

▲ Former WUR employee Co de Bruijn and his wife laying flowers at the monument for the victims of the bombardment on Wageningen Hill.

CONFERENCE ON WUR AND CIRCULAR AGRICULTURE

Various Wageningen student organizations have joined forces in the Circular Farming Platform Wageningen. They want to reform teaching and research at the university in order to achieve a better fit with the goal of making agriculture circular. They will be kicking off the debate with a conference on 10 October.

'We want to bring the current discussions about circular agriculture and farming practice into the university and introduce students to the innovative solutions out there,' says Yanina Willet, a student of Plant Sciences and Development & Rural Innovation who is one of the organizers of the Circular Farming Platform conference. 'By bringing the thinkers and the doers together, we hope to create a new vision for teaching in Wageningen.'
Professor of Animal Production Systems Imke de Boer will open the conference at 12:00 in Orion with an introduction. Then Saskia Visser, the head of the Circular and Climate-Neutral Society programme at WUR, and Frank Verhoeven, a consultant for circular agriculture farmers, will discuss the paradigm shifts that are needed in the education at Wageningen. The political implications of minister of Agriculture Carola Schouten's vision for circular farming will be discussed by Alex Datema, chair of farmers' organization BoerenNatuur, Keimpe van der Heide of the Dutch Arable Farming Union and provincial executive member Annemarie Spierings of Noord-Brabant province. A third panel will look at best practices in circular agriculture. **AS**

IN BRIEF

>> THE RANKINGS

Wageningen the best Dutch university

At 59th place, Wageningen University is the highest ranked Dutch university in the latest Times Higher Education rankings. WUR was in the same position last year. The Technical University of Delft was one place higher then but has now dropped by a few places. The highest ranking Dutch universities are not far apart. The THE rankings are amongst the most influential global rankings for universities. Education, research and citations each count for 30 per cent of the score, with international outlook and the amount of contract research accounting for the last 10 per cent. **AS**

>> AMANDA KRIJGSMAN

To New York for the climate

Amanda Krijgsman (26) of Wageningen Environmental Research won a nice prize this week. The WUR researcher is in New York to talk about natural solutions to climate problems at an international youth gathering. Krijgsman is representing Western Europe and Wageningen at the New York Climate Week as youth leader on nature-based solutions. This young organization wants more emphasis on making use of nature in solving climate problems. Being a delegate is the prize Krijgsman won in a story competition run by Youth4Nature. 'I told the story of the redesigning of the Eendragstpolder in the Rottermeren recreation area. To cope with excess water from the Rotte, a large reservoir was created with a recreation area and a rowing route.' **RK**

>> AUTONOMOUS GREENHOUSE CHALLENGE

Two WUR teams in finale

From December, five teams will take part in the Autonomous Greenhouse Challenge, using artificial intelligence to grow tomatoes in a real WUR greenhouse in Bleiswijk. Two of the teams come from Wageningen, and will be competing with teams from China, Korea and the Netherlands. An international jury selected these teams out of 21 contenders, partly based on their performance in a game in which players grow virtual tomatoes. Team AiCU is made up of staff and students from Wageningen University and eight companies, including Evertill, NXP, Semconductors and Ibeo Automotive. The Automators team is made up of Wageningen researchers and students and the knowledge companies Delphy and 3OMhz. **AS**

ILLUSTRATION: PASCAL TIEMAN

COLUMN | GUIDO

Supertick

The opening of the academic year in Wageningen on Monday 2 September was all about dialogue, with an emphasis on the role of framing. Good framing can lend a news story just that extra little bit of drama. You could see that this summer in the many articles about the new 'supertick'. Not only does this tick transmit the potentially deadly Crimean-Congo virus, but it can also 'spot a potential host from a distance through vibrations [...] and goes after it at a speed of one metre per minute!' (*Trouw* newspaper, July 2019). In short: a monster that chases you at great speed and kills you instantly with a terrifying disease.

> **'It is a monster that chases you at great speed and kills you instantly with a terrifying disease'**

Outside this frame, however, it's a different prospect. After some searching I found only one recent report of outbreaks of Crimean-Congo fever, and that concerned six cases in 2016. And then, I have never used the unit of metres per minute. But using conventional units of speed it would sound so silly: 'the giant tick moves at a speed of 0.06 kilometres an hour, just 83 times slower than the average walker'.
Take our 'common or garden' tick. One million Dutch people are bitten every year, there are 27,000 infections with Lyme's disease and 1000 to 2500 people have serious long-term symptoms. The incidence of Lyme's disease has risen every year since 1994. I myself contracted Lyme's disease at the age of 18 – luckily I was treated successfully. But I don't mind giving some thought to a juicy new frame for putting Lyme in the spotlight again. **R**

Guido Camps (35) is a vet and a postdoc at the Human Nutrition department. He enjoys baking, beekeeping and unusual animals.

WUR AND ELSEVIER EXPOSE CITATION FRAUD

Scientists who commit citation fraud as reviewers, be warned. Elsevier and WUR have developed a method that exposes such fraud.

The method is geared to tracking down the 'pushing' of references. This is when reviewers of scientific articles insist on authors referring to their work. These added citations are out of order as they are superfluous. But they do boost reviewers' citation scores and therefore their status. WUR encountered a case like this two years ago. Thanks to WUR, citation fraud has since been included in the Dutch Universities Association VSNU's Code of Conduct for Research Integrity. Elsevier, the biggest publisher in the scientific world, took up the cudgels to tackle citation fraud, working with information specialists and WUR scientists to design a method of tracking down suspect self-citations.

433 SUSPECTS

Elsevier's data analysts scrutinized over 69,000 scientists who publish themselves and also regularly review articles in the publisher's journals. A small proportion of them (433 reviewers) were suspect. At least half of the additional citations they proposed referred to their own work. This puts them in the danger zone. One of the 433 suspects is a Dutch academic, says Professor Jan-Willem van Groenigen, who is closely involved in the study. Van Groenigen is editor of the Elsevier journal *Geoderma*. He points out emphatically that referring to your own work is not wrong by definition. 'Hopefully, reviewers are experts in the field the article is about. Sometimes it is obviously relevant to cite your own work.'

FIRST STEP

But there was probably a bit more to it in the case of the 433 suspect reviewers. The editors of the journals in question have been informed. 'They have to find out whether there's anything wrong with a particular citation pattern. That has to be done by a human being. An algorithm cannot determine whether someone has suggested references with the best of intentions.' His own journal was not involved. Van Groenigen sees the method as 'a nice first step'. 'But as an editor, you don't want things to get that far, you want to be able to intervene during the review process. For that you need tools. In practice, it seems as though editors cannot detect this kind of fraud very easily. A lot of them are not alert to it. And the pattern is not always obvious straightaway. What is more, there is more than one kind of citation fraud. You could also unjustifiably push articles by your colleagues or from journals that you edit. That is a lot more difficult to tackle. That is what makes collaboration between the big publishers necessary.' **RK**

PHOTO: SCHUTTERSTOCK

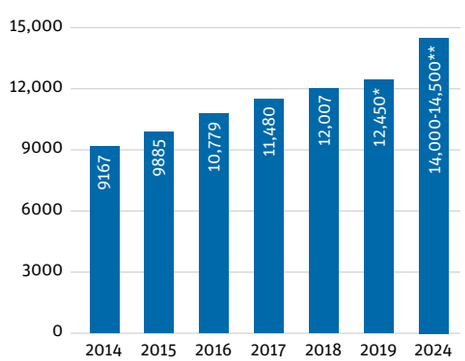
ANALYSIS

FEWER FIRST-YEARS BUT STILL GROWING

The publication of WUR's intake figures at the start of this month caused a minor shock. The number of first-year Bachelor's students fell by 6 per cent compared with last year and the total intake was down by 1 per cent. Does that mean WUR has stopped growing? Will we have an empty third teaching building when it is completed? 'No' is the short answer.

The growth in Wageningen's student population may have slowed slightly due to the fall in the number of first-years but it has not yet come to a standstill. That is because the university is still taking on far more new students than five years ago, so the number of students joining in a given year is greater than the number graduating.
The fall in the intake could affect the long-term forecast, particularly if that decline turns out to be the first sign of a trend. In that case, the number of students in 2024 may be closer to 14,000 or 14,500 rather than about 15,000 as had been predicted (see figure).
However, there are many uncertain factors in the predictions for the coming years. Firstly, it is not clear what the effect will be of the 'demographic dip'. The number of pupils at secondary schools that prepare for university will fall because there will be fewer teenagers. That could lead to fewer first-year students. On the other hand, an increasing proportion of pupils at those schools are going to university. That is why the Education minister still expects the number of Dutch first-year students to increase slightly in the next few years.
Secondly, it is difficult to predict numbers for international students. The ministry of Education expects numbers to continue to grow over the next few years, particularly from the EU. Wageningen should benefit from this given its strong international reputation. But it is not clear what effect Brexit will have, and the intake from outside the EU depends in part on the policy on scholarships in countries such as Indonesia and Mexico. The university has no control over that.
Thirdly, potential students' preferences change. Climate, the environment and anything bio-based are increasingly popular, for example, while health and the humanities are in decline. That is causing shifts between universities, but those trends are still developing. **AS**

Total number of students at Wageningen



* Forecast; final count is on 1 October ** Estimate

Fewer first-years – a relief or a worry? See p. 20.

Staff to decide how to allocate research cash

VOTE FOR THE BEST PROTEIN PROJECT

WUR staff will be given a say in funding research on the protein transition. Their votes will be the deciding factor in the allocation of research money to various projects.

The new initiative, which is called Community Funds, is intended to get the WUR community involved in the development of the research agenda. 'We want to ask staff which solutions are the most appealing, not just for scientists but also for the general public and consumers,' says Emely de Vet, professor of Consumption and Healthy Lifestyles and the Community Funds coordinator.

The protein transition is one of the three big investment themes at WUR. Over five million euros will be available for this over the next few years. About a third of that money will be for the Community Funds. There will be a number of rounds in which researchers can propose projects. In the first round of voting, 600,000 euros will be divided among innovative research projects looking at new ways of facilitating the protein transition. Examples are alternative sources of protein, more efficient utilization of proteins, changing consumption patterns or policy measures.

The evaluation committee has already made a preliminary selection of seven eligible research proposals from the submissions. The precise allocation of the money will now be up to WUR's staff. Each employee gets one vote. If everyone votes, each vote cast will be 'worth' 100 euros.

People can go to the Protein Transition Investment Theme group page on the WUR intranet to vote. More information about the content of the projects can be found there, but the project leaders' names have been left out.

'We did that deliberately,' says De Vet. 'We want people to vote for the idea, not the person and their CV. The projects could come from anyone: professors, PhD candidates, groups or one individual with a wild idea.'

'The project leaders' names have been left out as we want people to vote for the idea'

The deadline for voting is 24 September. The results will be announced on Monday 30 September during Protein Community Day. More Community Funds rounds will follow. These will be announced later. TL

‘ACADEMICS CAN’T RELATE TO FOREST SPIRITS’

How do you make a success of research projects in other cultures? Philosopher David Ludwig is looking for answers to that question through his ethno-biological research. He got a grant of 1.5 million euros for it from the European Research Council (ERC) last week.

PHOTO: SHUTTERSTOCK

▲ Philosopher David Ludwig studies collaboration between Western researchers and local communities, such as a fishing village in the Brazilian mangrove forests.

Wageningen researchers have research projects all around the world, but their recommendations are not always a good fit with local practices. ‘It is difficult for Western ecologists to work with indigenous people who invoke forest spirits when making decisions,’ says Ludwig. The philosopher in the Knowledge, Technology and Innovation chair group researches such cultural differences and looks for a working framework which could help the academics and the local community learn more from each other.

Last year, too, Ludwig got a Vidi grant worth 800,000 euros from the Dutch Research Council (NWO). Ethno-biological or transdisciplinary research is hip. Ludwig: ‘It used to be called participatory research and a multi-stakeholder process. We want to understand the best way to approach finding answers together in a global context.’

‘Finding answers together is a complex business’

An example of Ludwig’s research is a study of the collaboration between a fishing community in Brazil and a group of ecologists, sociologists and policy researchers. Traditional fisheries in the mangroves are under pressure because mangrove forests are disappearing and fishermen are buying bigger boats. ‘We help the fishermen with their negotiations with local authorities,’ says Ludwig. This leads to misunderstandings, many of which stem from over-optimistic or unduly negative expectations, says the philosopher. ‘Natural scientists are particularly over-optimistic. They think: we have a problem, so they sit down and come up with a solution. The social scientists are often pessimistic. They see nothing but a clash of cultures.’

The important thing is for the participants to analyse their own assumptions and worldview, to get a grasp of the norms and values of the other parties, and thus to understand the situation, says Ludwig. ‘Good intentions are not enough. Finding answers together is a complex business.’ Ⓡ AS

MARTHA BAKKER WANTS TO REORGANIZE NORTH BRABANT

The Netherlands needs a complete makeover if it is to make a success of circular agriculture, climate plans and the recovery of biodiversity, says the new Wageningen professor Martha Bakker.

Space is increasingly scarce in the Netherlands, says Bakker, who was appointed professor of Land Use Planning in Wageningen from 1 June. Space has been neatly allocated to food production, residential purposes, industry and infrastructure, but now we have the additional tasks of realizing ecosystem services such as water storage and carbon sequestration. How are we going to manage that? ‘I think that to some extent we can combine functions, and also that we can save some space by distributing the services more efficiently. At the moment, for instance, intensive livestock farming and nature development often get in each other’s way. I think we should reorganize the regions with a lot of intensive livestock farming.’ Bakker wants her group to contribute to developing circular agriculture, nature-inclusive agriculture and the energy transition. She sees a need for coherent new policy recommendations. ‘They are often lacking at present. Both the central and the provincial governments have been afraid to implement top-down land use plans. Meanwhile, municipalities are competing to attract economic development, and as a result there is no sustainable perspective. I think the provinces should establish land use planning guidelines and enforce them.’

One of Bakker’s proposals is to organize the trade in phosphate rights zonally. ‘That way you can cluster Dutch intensive livestock farming, as well as create space for areas of extensive agriculture and nature. I would like to explore the options for restructuring the province of North Brabant.’

Bakker is thinking in terms of setting up animal-friendly high-tech agroparks where pigs and poultry, insect farms, fish farms and horticulturalists make use of each other’s waste streams. ‘I think there is scope in the Netherlands for sustainable intensive food production with a viable future.’ This would also leave space for a landscape with extensive livestock farms and organic arable farms which produce clean water and nature as well as food, Bakker thinks. ‘We could explore this, based on facts and figures and tied to support from farmers and to new business models for farmers.’ Ⓡ AS

MINERAL PLANT MAKES USEFUL PRODUCTS OUT OF MANURE

Oscar Schoumans of Wageningen Environmental Research is working on a method of extracting phosphate from manure. He is thereby contributing to the work of the Green Minerals Plant in Beltrum, which was opened by Queen Máxima on 4 September.

The new plant in the Achterhoek region in the eastern Netherlands is part of Groot Zevert Vergisting, a company that processes pig manure into biogas, phosphate fertilizer, nitrogen-potassium concentrate, low-phosphate organic matter and clean water. Groot Zevert has been producing biogas for years. The residue of that production – digestate – used to be sold as fertilizer in the Netherlands

> **The organic matter from the plant can be used to improve the soil and possibly as potting compost**

and Germany. The new mineral plant spells the end of that export.
WUR started laboratory tests on extracting phosphate from manure in 2013. First, pig manure is separated into a solid fraction (mainly phosphate and organic matter) and a liquid fraction (containing mainly nitrogen and potassium).
Then the solid fraction is treated chemically, with the phosphate being dissolved and then fixed using a calcium hydroxide or magnesium hydroxide solution. Not a complicated method, says Schoumans, but further testing, assessing and gradually upscaling the technique for large-scale application will take a few years.
Separating phosphate and organic matter ensures that the Green Mineral Plant not only recovers phosphate as a raw material for the artificial fertilizer industry, but also produces organic matter. Farmers can use that to improve the structure of the soil, and it might also be suitable as potting compost, reducing imports of peat from the Baltic states, says Schoumans.
The factory also extracts the water from the liquid fraction of the manure using membrane filtration. The clean water is discharged into local surface water, while the manure concentrate can be sold as 'green meadow compost'.
Opponents of this manure processing claimed around the time of the opening that the Green Mineral Plant had wrongly been given an environmental permit, and that it was dumping polluted water. Schoumans: 'WUR will be analysing the quality of all the end products in the years to come. People are welcome to come and have a look. It is important that we work on solutions.' **AS**

PHOTO: GROOT ZEVERT VERGISTING

▲ The company Groot Zevert Vergisting opened the Green Minerals Plant on 4 September.

VISION

'A new mindset is needed: drinking water really is finite'

Due to the drought, less water is flowing in the Maas River and the Netherlands could face a shortage of drinking water, the television news channel NOS reported last week. This is indeed cause for concern, responds Ryan Teuling of the Hydrology and Quantitative Water Management chair group. 'A new mindset is needed'.

How problematic is it that there is less water in the Maas?
'Water from the Maas is filtered in the dunes and nearly all the drinking water in the major cities and South Holland province comes from there. If the Maas transports less water, it is dirtier because the same quantities of waste are diluted in less water. It's hard to filter it more as the water purification plants do not currently have the capacity to do so.'

'Better water management for consumers is needed'

Will there soon be no water coming out of the tap?
'We should be seriously concerned about that. The drinking water companies could hardly keep up with demand, especially during the hot dry summer, and they had to reduce the pressure in the pipes. The demand for water is only increasing, while the supply is falling, due to climate change.'

The union of Maas water companies (RIWA) makes a case for European consultations on water distribution.
'I can understand that they are getting nervous. Agreements on water distribution have been made with Belgium but there is no integral plan. But I cannot imagine that we could agree that the Netherlands will get a certain amount of water. Other countries can't guarantee that: their own water supply comes first.'

What is the solution?
'Better water management. Not just in agriculture, but also for consumers. Everyone has the right to water, but the supply is finite. You could decide that everyone gets a certain amount of water for their basic needs, and has to pay extra for additional water. A new mindset is needed: we in the Netherlands are used to the idea that there is always water coming out of the tap.' **TL**

MALARIA MOSQUITO LIKES HUMANS *AND* APES

Most mosquitoes in areas with both humans and chimpanzees are attracted by the odour of both, according to research by PhD candidate Julian Bakker and WUR alumnus Niels Verhulst. This means those mosquitoes could play a role in the transmission of malaria from apes to humans.

'Many human diseases originate in primates,' explains PhD candidate Bakker of the Laboratory of Entomology. 'If we want to eradicate malaria one day, it is important to know which mosquito species can transmit malaria between humans and apes.' Bakker and his colleagues placed mosquito traps in a rehabilitation centre for chimpanzees in the Democratic Republic of the Congo. These traps released CO_2 and contained the odour of chimpanzees, humans or cows. Then the scientists looked at which mosquitoes they had caught. They also used DNA examinations to see whether the mosquitoes had malaria parasites.

The traps mainly contained mosquitoes of the genus *Anopheles*, which can transmit malaria parasites to humans. These mosquitoes did not have a particular preference for the odour of apes, humans or cows. 'That means this species of mosquito could form a bridge transmitting malaria from apes to people,' says Bakker.

Only a small percentage of the *Anopheles* mosquitoes, about 0.5 per cent, actually carried malaria parasites, but not the type that makes apes or humans sick. 'Blood tests showed that a small proportion of the apes had human malaria parasites,' says Bakker. 'That suggests there are mosquito species in this area that transmit malaria from humans to apes. But we can't say on the basis of this study which mosquito species these are or how big a risk there is in practice of malaria spreading between apes and humans.' TL

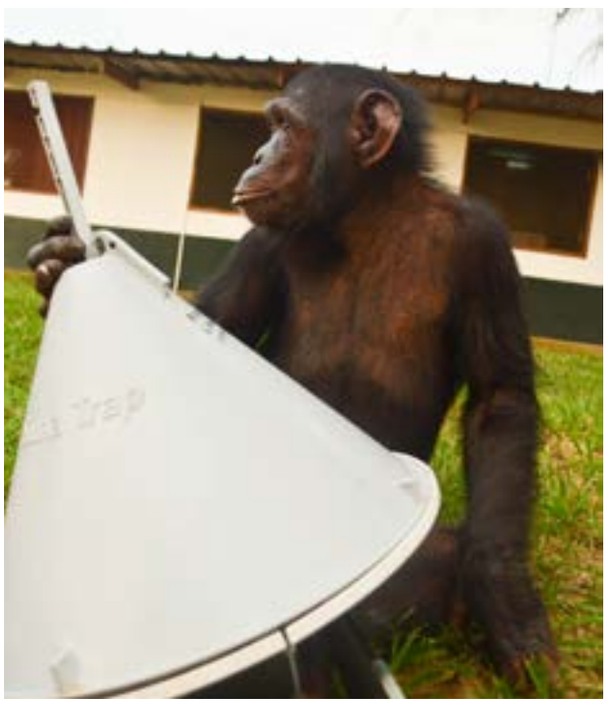


PHOTO: JULIAN BAKKER

▲ A chimpanzee investigates a mosquito trap used in PhD candidate Julian Bakker's study.

HOW DO YOU TRACK DOWN FOOD RISKS EFFICIENTLY?

NEW PROFESSORS

Ine van der Fels-Klerx became special professor of Food Safety Economics at WUR on 1 August. She does research on how the government and industry can detect risks in the food supply chain as thoroughly and efficiently as possible.

Van der Fels-Klerx works one day a week as special professor in the Business Economics chair group. She is also the Agrochains expertise group leader in the Toxicology & Agrochains business unit at Wageningen Food Safety Research (WFSR). The combination of contract research and university work is interesting for her. 'At WFSR we use computer models and literature study to identify the main food risks in the supply chain. There are so many food safety risks: dioxins, heavy metals, fungal toxins, pesticides or antibiotics. You can't keep track of everything. But the Netherlands Food and Consumer Product Safety Authority can use our analyses to set priorities.'

> **'We don't pay enough attention to the economics of food safety'**

At Business Economics, Van der Fels-Klerx focuses on the economics side of food safety. 'We use models to try to predict the most efficient way for the government or chains to use their budget so they have the best chance of detecting food safety risks in time.' Some of the issues are about sampling: what kinds of tests do you use, and how, where, and when? 'Dairy organizations test the milk in the tank, for instance. At the moment that means they test a mixture of milk from different farms. So then if you do find something, you've got to check each farm separately to find the source. Our analyses are not intended to cut costs but to see how we can improve the process on the existing budget, so that the government and the chains can make transparent and justifiable decisions.'

So far we have not paid enough attention to the economics of food safety, says Van der Fels-Klerx.

PHOTO: MIKE TEKST & BEELD

That surprises her. 'But it does make it interesting because there is so much uncharted territory. Then again, that's not great for my citation scores, since hardly anyone publishes on this topic,' she laughs. TL

READERS' LETTERS

Do you have your own views on a current issue at WUR? Send your contribution of 350 words max to resource@wur.nl, with 'Letter to the editor' in the subject line.

ACADEMIC YEAR OPENING SHOULD BE A TREAT FOR ALL

It's party time at WUR every year on the first Monday of September: the opening of the academic year. For everyone, that is, who doesn't have to be in class on that day. For those who have to teach or be taught, it's just a nuisance.
The academic year opening takes place in WUR's largest teaching space, the Waaierzaal in Orion.

PHOTO: JONNE SEIJDEL

▲ A musical intermezzo at the opening of the academic year 2019.

That affects classes, which also start on the first Monday in September. Scope for giving an introductory lecture in a large lecture room is limited because the Waaierzaal is occupied. This means splitting up groups and having several teachers cover the same ground at the same time. Sometimes fewer classes are timetabled, or the Chemistry Building on the Dreijen is used. First-year students who are not familiar with this deserted compound, some of whom don't have a room or a bike yet, are expected to turn up at 8:20 at a place that is hard to reach by public transport. Welcome to WUR.
There is a shortage of teaching accommodation at WUR. Until the third education building is finished, this requires us all to be flexible. We get that. But at the moment, it is primarily teachers and students who are forced to be flexible. What's happened to flexibility on the part of the management?
To our minds, moving the opening of the academic year is a simple way of solving the above-mentioned problems. Move the ceremony to the Friday before Week One. That would be unique in the Netherlands, so it would get more media attention, the Waaierzaal could be used for classes as usual on the Monday, teachers and students could attend – and the drinks after the event will even go down better on a Friday afternoon.

Maurice Franssen, Hendra Willemen and Tjerk Sminia, teachers of Organic Chemistry

PROPOSITION

'*Nature-based* is a marketing slogan'

PhD candidates are required to append a few propositions to their thesis. In this feature, they explain the thinking behind their most provocative proposition. This time it's the turn of Alexandre Wadoux, who obtained his doctorate for his research on optimization for geostatistical mapping of environmental variables, such as rainfall.

The green ideas WUR stands for appeal to PhD candidate Alexandre Wadoux. But he does sometimes wonder how deep they go. Hence his proposition: 'WUR promotes nature-based solutions only if this bring high profits in the future.'

'I think WUR is a very market-oriented uUniversity and that nature-based solutions is a marketing slogan meant to attract external funding, rather than a genuine goal. For me a university should be a non-profit organization and the main focus should be on education and research for the benefit of society. I'm from France, where universities are still mainly funded with public money. I question the influence of the agricultural lobby on the research developed at WUR. Can nature-based solutions be implemented if the research is funded by parties with specific interests? One example is the recent appointment of Louise Fresco, chair of the Executive Board of WUR, to the board of Syngenta, a multinational that produces seeds and agrochemicals. Can a nature-based solution be implemented at WUR if it goes against the profit of this company?
I don't know the answer but I do think we must ask ourselves these questions.
It is important to find a balance.
When I first wrote my proposition I focused mainly on financial profit but I decided later to leave it open. It provoked discussions with my colleagues, who argued that some nature-based solutions don't always deliver financial profits, but they do profit society.
I liked this discussion, because the whole idea of a proposition is to provoke debate.'

'I question the influence of the agricultural lobby on WUR research'

TL

Study aims to reveal impact of offshore wind turbines

In search of pipistrelle bats

Wind turbines on the North Sea are hazardous obstacles for migrating bats. By equipping 500 of the animals with transmitters, WUR is trying to assess the consequences of this. *Resource* spent a morning with researcher Sander Lagerveld's bat team.

text Roelof Kleis *photos* Bram Belloni

Tuesday is bat day for biologist Sander Lagerveld of Wageningen Marine Research and his bat team. In the late summer, a peak moment for bat migration, they go out every Tuesday to tag bats with transmitters. A tiny gadget is glued to the little animals' backs, enabling researchers to track their movements precisely for a few weeks (see inset).

The venue this Tuesday is the grounds of the Noorderhaven care institution in Julianadorp, at the northern tip of North Holland province. Other members of Lagerveld's team are Anne-Jifke Haarsma of Batweter consultancy and volunteer Jan Boshamer. His colleague Bart Noort hasn't joined them today.

MIGRATING BATS

We are not so lucky with the weather. It is pouring with rain and the only umbrella we've taken along has to keep the equipment dry. In no time, everyone is drenched. All part of the deal with fieldwork.

In the car on the way to Julianadorp, Lagerveld has explained the aim of the bat project. 'It is part of WOZEP, which stands for the Wind Turbines At Sea Ecological Programme. In the past, it was the responsibility of the turbine operator to do research on the effects of offshore wind energy. Since 2016, the government has taken over that research, to answer ecological questions. Another change is that the research doesn't just look at birds and marine life, but places a big emphasis on bats as well. We particularly want to find out what impact offshore turbines have on migrating bats. But local, non-migrating bats sometimes go out to sea too.'

'Popular males sometimes have up to 10 females hanging in their boxes'

EIGHT-GRAM BAT

The focus of the bat study lies on Nathusius's pipistrelle (*Pipistrellus nathusii*), a miniscule creature that is barely five centimetres in length when folded, a pitifully vulnerable sight. The bat has thick fur and a wing span of over 20 centimetres. An adult specimen weighs an average of eight grams. But tiny as it is, the performance of this 'microbat' is impressive. 'It is a long-distance migrator,' says Lagerveld. 'It travels 2000 kilometres from its breeding places in North-

east Europe and the Baltic states to its overwintering spots in West and Southern Europe.' Actually, the females do this more than the males. 'The females live in the east in breeding colonies, have one or two babies in the summer and migrate with their young in the autumn to West and Southern Europe.' So the young males only make the long journey once. 'Yes, the females do most of the work,' laughs Lagerveld. 'They are the really tough ones.'

'Even one victim per offshore turbine per year has a negative impact on the population'

DANGEROUS CROSSING

The pipistrelle bats' migration only takes a couple of weeks. The main migration route follows the coast of the Baltic and North Sea. At Den Helder, that route abruptly veers south. 'But some of the bats go straight on, over the North Sea in the direction of England,' says Lagerveld. 'What proportion of them do that, we don't know. This project aims to find that out, amongst other things. And they sometimes cross further south too.' That crossing can be dangerous. Bats collide with rotating wind turbines or die of 'barotrauma': the impact of the wave of pressure set off by the turbine blades.

On their way south, the bats pave the way for a new generation. 'When the females come by, the males start courting,' continues Lagerveld. Nathusius's pipistrelle is not monogamous. 'Popular males sometimes have up to 10 females hanging in their nesting boxes. But I don't think we shall see very many today. There's been too strong a westerly wind for the past few days. Nathasius's pipistrelles prefer to migrate when there is not much wind, or with a light wind in their backs and at fairly high temperatures. We'll mainly see lone males hanging in their boxes.'

THE BAT MAN OF NORTH HOLLAND

To do the tagging, Lagerman makes grateful use of the many bat nesting boxes installed around the tip of North Holland. This is the epicentre of bat research in the country, and volunteer Jan Boshamer is the lynchpin. This former teacher is the bat man of North Holland. The popular flat box in which bats can spend the night even bears his name: the Boshamer box. 'But I didn't design it. That box has been around for ages. I just simplified it so that it can be opened and is easier to clean.' Boshamer is a volunteer with North Holland Landscape and nature management organization Staatsbosbeheer. He put up the first box in 1987. 'A duck run had to be dismantled and it turned out there were lots of bats in it. What to do? We put up boxes.' And then one thing led to another. His collection now runs to about 250 boxes, which he visits on a very regular basis, as he has been doing for over 30 years. 'And I want to make it to 50,' he says. 'Bats are unbelievably fascinating animals. Back when I started, hardly anyone was working on bats. A whole new world opened up for me.'

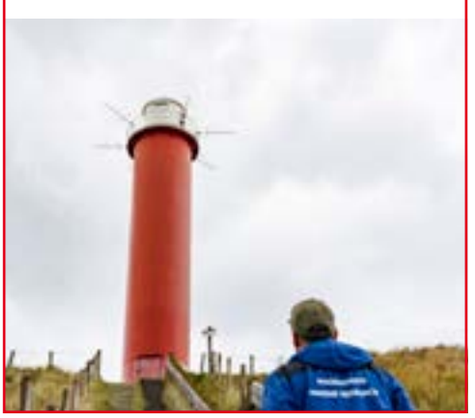
SURGICAL GLUE

Today's round of checking up on bat boxes in the woods at Noorderhaven only reveals six Nathusius's pipistrelles, which are weighed, measured and sexed. They are then fitted with a tiny transmitter weighing 0.3 grams, stuck to their backs with surgical glue. Attached to the transmitter is a wafer-thin, roughly 10-centimetre long antenna.

Boshamer and Haarsma do the practical work. 'They are certified bat catchers,' explains Lagerveld. 'That entails quite an intensive training course. Bats are fragile little creatures and this is an animal experiment.

MINI-TRANSMITTER SIGNALS MORSE CODE

For mapping the movements of bats, researcher Sander Lagerveld of Wageningen Marine Research uses a telemetry system called Motus (Latin for movement). This system is used all around the world to detect the flight movements of small birds, bats and dragonflies – animals that are too small to lug GPS transmitters around with them. They are fitted with a mini-transmitter that sends out a Morse code-like radio signal of short pulses every five to eight seconds. Each transmitter has a unique code. The signals reach receivers placed on tall buildings, radio masts or lampposts. Lagerveld has 35 receivers along the North Sea coast, four of them across the sea on the English coast. Each receiver has four to six antennae installed at fixed angles. Lagerveld: 'By getting locations from two stations you can locate the bat at any given moment, and from that data you can deduce its flight path.'
The showpiece of the collection of receivers is the one on the Grote Kaap lighthouse at Julianadorp, where six antennae monitor the surroundings.



◀ Sander Lagerveld, Jan Boshamer and Anne-Jifke Haarsma

Those transmitters bother them.' But not for long: the transmitters stay on for a couple of weeks at the most and then fall off. Lagerveld comes across one now and then. It happens today: a transmitter is stuck to the flat plank at the entrance to box 21. Lagerveld has already received the signal on his mobile phone. Using a unique code he can trace exactly which bat had it on its back. The transmitter falling off is unfortunate for the study, but finding it is a lucky break, as they cost 150 euros apiece.

'This is an expensive project,' agrees Lagerveld. He wants to tag a total of 500 bats, which brings the cost of the transmitters to 75,000 euros. But the biggest expense is the 35 receivers, which cost up to 9000 euros apiece, and the cost of installing them comes on top of that. 'This study is unique. Nowhere else in the world is bat migration being studied on this scale.'

TURBINES AT A STANDSTILL

Lagerveld expects to present the results of the research next year. Whatever comes out of it, it certainly won't lead to fewer wind turbines or to changing the planned location of new ones. 'Those locations have already been decided on,' says Lagerveld. 'That is a gigantic puzzle, what with all the other users of the North Sea. But this study will make it possible to predict the conditions under which migration takes place. On those days you could bring the turbines to a temporary standstill.'

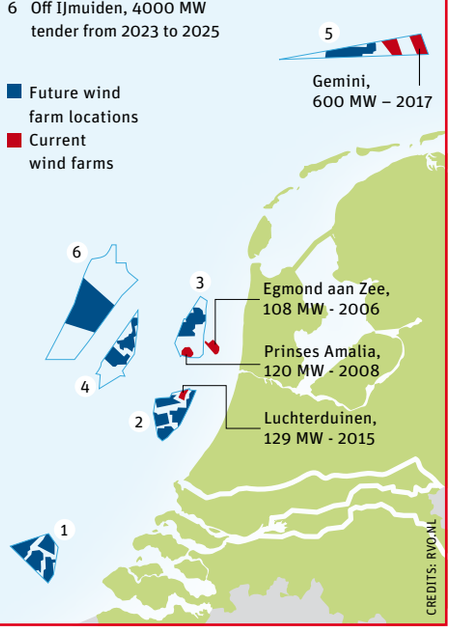
There is no doubt that bats fall victim to the wind turbines. 'The guestimate for the number of victims on land is between five and ten migrating bats per turbine per year,' says Lagerveld. How many victims are claimed each year by an offshore turbine is not known, and this study should clarify that. 'The hypothesis is that if the Netherlands realizes its ambitions for offshore wind energy, even one victim per turbine will have a negative impact on the population of Nathusius's pipistrelles,' says Lagerveld. Which underlines the importance of this wet day of fieldwork. Ⓡ

OFFSHORE WIND

The number of wind turbines on the North Sea is growing fast. According to an overview on Wikipedia, there are currently 3240 turbines, which generate nearly 15 gigawatts (GW). With its 289 turbines, the Netherlands only accounts for a small proportion, but the number of turbines is set to grow considerably in the coming decades. Offshore wind turbines play a key role in the transition to sustainable energy. The government has decided that offshore turbines must generate 4.3 GW by 2023 and 11 GW by 2030. Other countries around the North Sea have big plans for expansion too.

Offshore wind energy in the Netherlands

1 Borssele, 1500 MW - under construction
2 Dutch coast (south), 1500 MW - under construction
3 Dutch coast (north), 700 MW - tender in 2019
4 Dutch coast (west), 1400 MW - tender in 2021
5 North of the Wadden islands, 700 MW - tender in 2022
6 Off IJmuiden, 4000 MW tender from 2023 to 2025



HIGH TECH IN THE ORCHARD

Apple-picking has always been manual labour. But with the Pluk-o-Trak, high tech has now arrived at the Wageningen Plant Research location in Randwijk. The machine not only counts the apples, but also locates with its built-in GPS exactly where they were harvested. Linking that data with the sorting data provides the grower with a detailed analysis of the harvest. Leading to colourful pictures showing which trees produce the most, the biggest, the reddest or the healthiest apples. But the machine doesn't do the picking yet. That will still be manual labour for the foreseeable future. Ⓡ **RK, photo Guy Ackermans**


MUNCKHOF
Fruit Tech Innovators

‘My mother shouted just that morning: the Tommies are coming!’

Bombs in Wageningen

A mistaken bombardment of the Sahara neighbourhood on 17 September 1944 cost the lives of 40 Wageningen residents. Eye witness and former WUR employee Co de Bruijn lost his mother that day. This week a monument was erected.

text Roelof Kleis *photo* Aldo Allessie

‘It was a lovely autumnal day. The kind with mist between the trees and a beautiful blue sky.’ Co de Bruijn (83) talks as if it were yesterday. But the day he is describing was 75 years ago. ‘There were a lot of planes in the air,’ he recalls. It was on that Sunday, 17 September 1944 that the Battle of Arnhem began. After four years of German occupation, the prospect of liberation was in the air. ‘I can still remember my mother calling out excitedly that morning: boys, boys, the Tommies (British soldiers, ed.) are coming!’

Co de Bruijn was eight years old at the time. He was the second of the four sons of Evert de Bruijn (then 44), clerk at the sub-district court in Wageningen, and Didy Vonk. Evert was at church that morning with his eldest son Jan (10). Because of the commotion, Didy stayed at home that morning with Co and his little brothers Rudy (7) and Dicky (4). But the weather was far too nice to stay indoors. ‘It was my idea,’ says De Bruijn, ‘to go with Rudy to gather chestnuts on the main road (now the Generaal Foulkesweg, ed.). My little brother Dicky wanted to come along too. And he was allowed to! I can still hear my mother saying, “And take good care, won’t you?’ It probably saved his life.’

The boys were gathering chestnuts when suddenly all hell broke loose. ‘Bombs whining, shell fragments and broken branches flying through the air, houses on fire all around us, and the sound of screaming and wailing,’ was how De Bruijn described the inferno in the story he read out at the unveiling of the monument for the victims of the bombardment on the Ericaplein (see the news report on p.4). The boys took cover in a ditch on the Westbergweg.

WALL BLASTED AWAY

Co de Bruijn never saw his mother again. Her badly wounded body was found outside the door of the utility room. The wall had been blasted away, but the washing up stood

▼ The Sahara neighbourhood in Wageningen was bombed in error by the Allies in September 1944. The aerial photo shows destroyed houses and countless bomb craters.

PHOTO: REIN HEIJ

‘That he was allowed to go chestnut-gathering probably saved my little brother’s life’

Ex-WUR employee Co de Bruijn was eight when his home was hit by a bomb.

undamaged on the drying rack, writes Reinder Elders in his little book *Bommen en Bouwen op de Wageningse Berg* (Bombs and Building on Wageningen Hill). The book came out 25 years ago, 50 years after the bombardment, which had all but been forgotten by then.

The De Bruijn family were evacuated and put up at a farm in Voorthuizen. There Co discovered farm life. ‘I loved it. The farmer told my father: that boy should become a farmer, he’s got it in him.’ For years after the war, De Bruijn spent his school holidays on the farm, but it quickly became clear that going into farming was not an option. ‘You need capital for that, and we didn’t have that.’

ANXIOUS TIMES

Co’s father Evert got married again after the war and got a job at the district court in Arnhem. Two more children were born. Then came the next blow, when Evert died suddenly of a heart attack at the age of 49. ‘They were anxious times. My stepmother was on her own with six children and no funds to fall back on.’

Co de Bruijn didn’t go into farming, but he was always drawn towards nature. After secondary school, vocational training in horticulture and the Dutch Wood Academy, he got a job in Wageningen as manager of the then Agricultural College’s Herbarium. He ended up working for WUR for nearly 40 years. The plant collection grew tremendously in that time. ‘From fewer than 100,000 plants when I started to between 500,000 and 600,000 when I left.’ There is no Wageningen Herbarium now: the collection has been moved to Naturalis in Leiden.

A MONUMENT AT LAST

The untimely loss of his mother and father left its mark, of course, but Co de Bruijn does not look back in bitterness. In fact, the events made him all the more determined to take a positive attitude in life. ‘What happened, happened. You can’t change the past. You can give up in despair but that doesn’t solve anything. You have to have initiative and make something of it yourself. And I have done that. I am a self-made man. My life has had its ups and downs but there have been far more ups than downs.’

Last Tuesday, De Bruijn was at the unveiling of the new monument in the Sahara. ‘It’s not difficult for me to be back in the neighbourhood. I can enjoy walking around it. But I do feel that it has a big effect on me. I am pleased there is a monument at last.’

PROFESSOR IN HIDING LOSES WIFE AND CHILD

The Sahara neighbourhood on the Wageningen Hill bordering the Belmonte Arboretum was still relatively new in 1944. Several professors at the Agricultural College had moved in there. At 11:37 on Sunday 17 December of that year, 160 bombs fell on the neighbourhood. This was an error: the bombs were intended for the German guns that were positioned 500 metres away at the Lexkes ferry.
All the professors who lived in the neighbourhood survived the bombardment, but professor of Organic Chemistry Simon Olivier lost his wife Maria Haitsma and their 19-year-old son Tim. They were killed in front of their house at number 14 Bergstraat, now 14 Boeslaan. Olivier himself was living in hiding in the Betuwe area at the time. He had been arrested in July 1941 for having German posters removed from the windows of the main building of the Agricultural College. He was detained for 11 months, part of the time in the concentration camp in Amersfoort, and went into hiding after his release. Olivier was the first post-war rector of the Agricultural College. He lived in the house on the Bergstraat until he died in 1961.

For the first time in years, the number of Bachelor's students in Wageningen has gone down. Are these lower recruitment figures a relief, as the rapid growth brought a lot of stress and work pressure with it? Or does WUR's waning popularity give cause for concern?

text Albert Sikkema *illustration* Henk van Ruitenbeek

FEWER FIRST-YEARS: A RELIEF OR A WORRY?

'We need to recruit more proactively instead of reactively'

Ralf Hartemink

Food Programme Director (does not want his photo in *Resource* for privacy reasons)

'**I coordinate four degree programmes, one at Bachelor's level and three at Master's level, which have attracted 100 fewer students this year altogether. We don't see a problem with that.** Food Technology is still the biggest programme at WUR, both at Bachelor's and at Master's level. The BSc in Food Technology recruited 45 fewer students, including fewer Dutch students, but we've got enough to meet the demand for graduates on the Dutch job market. The three MSc programmes have shrunk from 280 to 225 first-years, but that is mainly due to more stringent admission criteria for Chinese students, the postponement of Brexit and fewer scholarships in countries like Mexico and Indonesia. All in all, we are happy with the number of new students. The reasons for the drop are clear: due to demographic developments, fewer young Dutch are going to university. And also, the hype around nutrition has died down a bit. More young people are opting for climate-related degrees now.'

Marjo Lexmond

Environmental Sciences programme director

'I coordinate four programmes, which are growing. The number of first-years on the international Bachelor's in Environmental Sciences has more than doubled in the past two years: we are now at 130 first-years. Not only because international students have started coming here, but also because the number of Dutch students went up in that period. **It is obvious that there is a lot of interest in the environment and climate as topics. I think perhaps we've got a few of the people who skipped school to demonstrate about the climate in the class now!** And the MSc in Environmental Sciences, which was big already, has grown to a record number of 130 first-years. The MSc in Climate Studies has doubled to 55 first-years, and the MSc in Urban Environmental Management has grown by 30 per cent to 60. We are pleased that they find their way to us. Luckily, we saw the growth of the BSc coming in the spring, and hopefully the teachers could prepare for it in good time.'

Maria Koelen

Professor of Health and Society

'There is concern about first-year recruitment in our group. **Recruitment for the BSc in Health and Society has gone down by 28 per cent, to 40-plus first-years. We don't quite understand why that is.** Our programme gets high ratings. I have heard that fewer Dutch high school graduates are going to university. Also, Wageningen has changed the approach to the open days, with a smaller role for students. I think that affects recruitment, because high school students and their parents always enjoy talking to students at open days very much. So we are certainly taking note of the falling numbers. We wonder whether it is a one-off incident or a trend.'

Lieke van Bokhoven

Marketing and Publicity officer at WUR

'WUR as a whole has pursued a reactive policy towards student recruitment in recent years, because most of the degree programmes already had such big intakes. Now we need to switch from that reactive policy to a proactive one. Dutch students no longer just turn up at our door. That is related to the aging population: there are fewer and fewer young people so we've got to work harder to keep up student numbers. **We are working hard with several degree programmes to see how we can attract more students to them.** But some of the bigger programmes are pleased about the drop. In those cases we need to look at how we

can prevent a further drop, because we want to maintain our current strong position. And recruitment at Master's level has gone up. We will try to maintain that upward curve.'

Bart Pierik

Spokesperson for the Dutch Universities Association (VSNU)

'At the VSNU we base our calculations on the ministry of Education, Culture and Science's 2018 estimate, which indicates that the number of first-year university students will go on growing for the next five years. There are three reasons for that. Firstly, there are slightly more high school students who might go to university; secondly, a growing number of students are transferring from applied science universities into academic university programmes; and thirdly, the number of foreign students from the EU is growing. **The 'green' sector, which is Wageningen really, will go on growing in the coming years, according to the ministry.** Maybe not as much as other sectors, but according to this estimate, recruitment in Wageningen will only go down in nine years' time. I should add that the ministry's estimates haven't been right for years. In the past, the ministry underestimated the growth, which is why it has adjusted its previous estimate.'

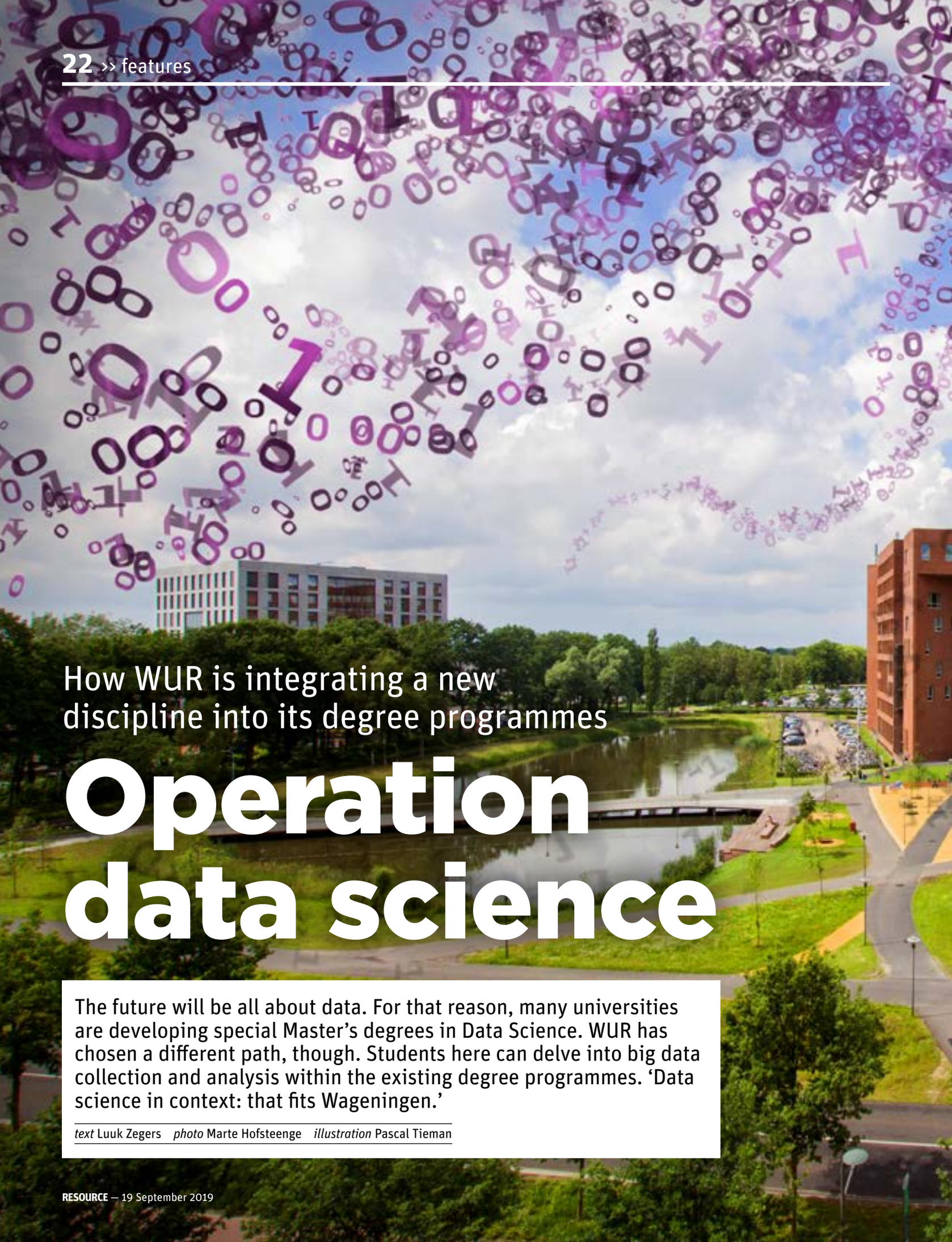
Arnold Bregt

Dean of Education

'We have grown a lot in recent years, of course. The fact that that is now levelling out or even falling off a bit in some programmes is not a problem. I was at a meeting of the vice-deans of all science faculties in the Netherlands recently. They are all seeing the same development. There is no need for us to worry unduly about this development. **There is no numbers crisis, even in the smaller programmes that shrank this year.** We always look at the average over three years, so a drop in recruitment in a single year doesn't have immediate consequences. In the near future we are going to see which degree programmes need us to invest more energy in recruitment and selection.'

'There is no need to worry unduly about this development'

What implications does the lower intake have for WUR's overall growth? See p. 6.



How WUR is integrating a new discipline into its degree programmes

Operation data science

The future will be all about data. For that reason, many universities are developing special Master's degrees in Data Science. WUR has chosen a different path, though. Students here can delve into big data collection and analysis within the existing degree programmes. 'Data science in context: that fits Wageningen.'

text Luuk Zegers *photo* Marte Hofsteenge *illustration* Pascal Tieman

High-tech innovations, robots and artificial intelligence are going to play a bigger and bigger role in food systems, agriculture, health and environmental interventions. And they largely revolve around data. To prepare its students better for this, Wageningen University has launched a major expansion of the range of courses related to data science. A Data Science Minor was started last year, 10 new Data Science courses have been developed, and more and more Master's programmes are adding a Data Science track.

New skills

Data science? But surely all science makes use of data? That's right, says Dean of Education Arnold Bregt. 'Data is as old as science itself. You have a question, you collect data, you analyse it and then draw a conclusion. But increasing digitalization has made it easier to collect and analyse ever larger quantities of data. This means data sets are getting larger and more complex. That offers wonderful new possibilities for research but also means new skills are needed to conduct that research in the right way.'

Data is used on an ever-growing scale these days to optimize processes, make predictions, identify objects in photos with the aid of artificial intelligence, and so on. An example is the Global Detector developed by Arjen Daane and his colleagues at Wageningen Economic Research. This tool combines several data sources and algorithms to answer questions such as: which location in the world is the most suitable for growing tomatoes, or how much demand will there be for milk in Asia in 2022?

Digital twins

Another example of data science in which WUR is investing is 'digital

Counting animals with data

How do you go about a game count in an African national park hundreds of square kilometres in size? 'In the old days, you and your team took a helicopter flight over the park and you all counted animals,' says Lukasz Grus, Data Science coordinator at WUR. 'The plus side: fun to do. The downside: expensive and not very accurate. Devis Tuia and Benjamin Kellenberger at Geo-Information Science and Remote Sensing came up with a method that is both more accurate and cheaper. They flew a drone over the land, which shot over 150 aerial photos per square kilometre. Then they used a form of artificial intelligence known as deep learning. In simplified terms, they taught a computer programme to recognize animals in aerial photos.'

The computer program got some human support with this task. First, hundreds of volunteers identified animals on the aerial photos. The scientists then fed those photos into the programme to show it which pixels were animals and which ones were rocks or bushes. The programme analysed that input and then started identifying animals itself. The output was then checked by people. A points system was used, and if the programme had mistaken a bush for an animal, it dropped one point. If it had missed animals on the photo entirely, it dropped 80 points. This taught the algorithm to distinguish animals from bushes, and especially not to miss any animals. 'Now the programme might say: these pixels are 90 per cent certain to be a wildebeest, or those pixels there are 80 per cent certain to be an antelope,' says Grus. Using this program, just one person can now count all the game in the park in a week.

'In conventional science, data are the means; in data science, you study that means'

Lukasz Grus, Data Science education coordinator

twins': the making of a digital copy of a system or organism, such as a cow. Modern cowsheds measure precisely how much a cow eats, how much milk she produces, the temperature in the shed etc. By making a digital copy of this data, you can try and get a better grip on the actual situation as well as make models for predicting the future, regarding the impact of a change of diet on milk production, for instance. Scientists can make digital twins of cells, plants, animals, humans and ecosystems, as well as of more abstract things like food chains.

'In a nutshell, data science is getting the knowledge out of data,' says Lukasz Grus, data science education coordinator at WUR. 'A data scientist researches the various methods of collecting, analysing, processing and visualizing data. In conventional science, data are the means of answering questions. In data science, you study this means in itself, exploring what you can get out of data and trying to solve problems by identifying patterns in data.'

The role of Wageningen

In his role as education coordinator, last year Grus took stock of what Wageningen University already had to offer in the field of data science. 'I saw that we were already doing quite a bit, but all of it applied within our academic fields. We don't have a separate Data Science Master's here, but we do teach students applied data science.' He gives examples such as the degree programmes in Geo-Information Science, Biosystems Engineering and Bioinformatics. 'These are pretty much Data Science Master's programmes within particular fields.'

That approach suits Wageningen, says Bregt. 'Master's degrees in Data Science are springing up all over the place in the Netherlands, but we prefer to leave the training of hard-core data scientists and the development of new algorithms to universities like Delft and Eindhoven. By training data scientists within our domain, we at Wageningen play a bridging role. Data science in context. Because it's one thing to combine incredible amounts of data and calculate something with them, but you've also got to be able to assess whether the links you find actually make sense. I think that's a great role to play, and it also gives you added value on the market.'

New courses

For the university to fulfil that role satisfactorily, it needs to expand what it offers in the way of Data Science courses. The subject involves a range of skills, explains Bregt. 'You need to know a bit about statistics, artificial intelligence and data collection. And visualization is important too: how do you present your results? The ethics of it is another important aspect of it, in terms of privacy for example. And there's your choice of working method. Some methods tend to push you towards certain answers. You've got to think about that.'

A range of skills, then, which require a range of courses. Some of those courses were already up and running, and some still needed developing. Bregt: 'In one year, we have developed 10 new courses that are already being taught this year. Technical and methodological courses about how you should analyse data, a number of advanced courses on data science in context, such as Data Science for Health, Data Science for Ecology and Smart Environment, and a course on data and ethics.' Master's programmes can offer a combination of these courses as a track. Bregt: 'Students who opt for a track like that become data scientists in their chosen field. So we are educating students with data skills plus substantial knowledge of their subject area, who also think about their ethical responsibilities as scientists.'

If data science is so important, shouldn't it be made a compulsory component of every degree

programme? Bregt: 'Wageningen University's core task is to teach students to do good research within a discipline. Being able to handle data well is an essential skill for good research: everyone who graduates from Wageningen should be capable of that. But that doesn't mean every student should become a data scientist as such. If you do want to do that, though, it is our duty as a university to facilitate that.' Ten new courses and nine new Master's tracks constitute a big step towards that objective, thinks Bregt. 'We've got the building blocks. So now we can expand and look at how we can also develop Master's tracks for the degree programmes that do not yet have Data Science tracks. That move towards optimization is starting now.'

'You've got to be able to assess whether the links you find actually make sense'

Arnold Bregt, Dean of Education

Subject specialists with data skills

Maartje Holtslag (25) did the WUR Master's in Geo-Information Science. 'That is actually a Data Science Master's that focuses on spatial data.' In short, training to become a subject specialist with data skills. During her Master's internship at the Environmental Systems Research Institute (ESRI), Holtslag did an assignment for the Dutch Society for the Blind. 'They want to create routes for blind people so they need to know where the zebra crossings are. It might sound odd, but there is no overview of them anywhere in the Netherlands. So I trained a computer model to detect zebra crossings automatically in aerial photos.' To do that, Holtslag first had to make training data. 'I drew around zebra crossings on photos, which the model could use as examples. Then I put new photos into the model to see if it recognized zebra crossings on those.'

After graduating with her degree, Holtslag got a job as a programmer at ESRI. 'I find out things like which roofs have solar panels on them. Or I use data from cameras at junctions to see how many cars and cyclists cross them. That enables you to work out whether the cycle path is safe or how the coordination of the traffic lights could be improved.

As a programmer, you focus on the technical side of it. So it's not my job to analyse the results, it's more about obtaining the results.' Holtslag thinks WUR has made the right choice with its strategy of educating subject specialists with data skills. 'With data science you can end up in lots of different jobs, but most of them are within a specific subject area. So you want to know the subject area well and to be able to handle data.'

'I trained a computer model to detect zebra crossings in aerial photos'

Maartje Holtslag, Geo-Information Science graduate

Interested in data science? These are the options

Bachelor's: You can take Data Science courses as electives. They include Data Management, Programming in Python, Big Data, and Biological Data Analysis and Visualization. You can also do a Data Science Minor which combines several Data Science courses.

Master's: The Master's programmes in Geo-Information Science, Biosystems Engineering and Bioinformatics are so data-oriented that in practice they are subject-related Data Science Master's programmes. Six other Master's programmes offer Data Science tracks or clusters of Data Science courses. These are: Biology, Earth and Environment, Forest and Nature Conservation, Nutrition and Health, Plant Biotechnology and Plant Sciences. Every Master's programme gives you the option of taking Data Science courses as electives.

You can find a complete overview of the Data Science courses at www.wur.eu/data/courses

IN OTHER NEWS

TUMMY

The elderly don't get fatter because they eat too much but because their fat cells slow down, shows a study by the Swedish Karolinska Institute. The fat we eat is then converted into fuel for the body at a slower rate. The fat cells get a bit lazy, as it were. Eating less helps but there is a more enjoyable solution: more exercise helps to speed up the fat cells.

GIANT CARNIVORE

Researchers at Queen Mary University of London have discovered a new pterosaurus: the *Cryodrakon boreas*. With a wing span of about 10 metres (!) it is one of the biggest flying reptiles. The gigantic creature was a meat-eater. Not to worry, though. It became extinct 77 million years ago.

DARK BLACK

Black is only truly black if it reflects no light at all. Like a black hole. Scientists at Massachusetts Institute of Technology have developed a material that comes close. It consists of little carbon nanotubes grafted onto aluminium foil, and it absorbs 99.96 per cent of the light that falls on it. That makes it 10 times blacker than the blackest material to date. Useful for your bedroom window.

LEFT

Left-handers may be naturally better at languages. This remarkable conclusion has been reached by researchers at the University of Oxford. They studied thousands of brain scans of right- and left-handers. The language centres of the two halves of the brain proved to be better connected in left-handers. A small compensation from nature perhaps?

Being left-handed is not always very handy. But expressing yourself fluently is.

'I sleep on a couch in Droevendaal'

The room shortage in Wageningen may have decreased but there are still a few unlucky students with no fixed abode. They have to stay with someone, camp or commute for hours every day. Three of the 'homeless' tell us about it.

Alon Rapaport (26), a Plant Sciences exchange student from Israel.

'I came here one month ago and I don't have a room yet. First I stayed with a friend in Ede for a week and a half. After that I subrented a room in Droevendaal for five days. Even though a room became available there, I couldn't stay because they were looking for a girl. For a little while, I could share the room with the girl I was subrenting from. Now I am sleeping on the couch at another house in Droevendaal.

People tell me not to worry, and I know I will find something in the end. The only question is when, where and how. The worst thing about it is the uncertainty. I would rather know I've got to camp in a tent for a month than have no idea where I will end up.'

Julia Löhr (18), first-year Bachelor's student of Environmental Sciences

'I am still living with my parents in Deventer, but I am working hard on finding a room. I really want to live in Wageningen because otherwise I spend four hours a day travelling. I've already been to five 'selection visits' in student houses, and I've got two more this evening. Luckily I don't have to go up and down by train every day. I joined Nji-Sri student society and if there's a party or event I can always stay with someone. And sometimes I can get a lift from Deventer with two other students who go by car now and then. That only takes three quarters of an hour. I've just passed my driving test myself and I think I'll be able to borrow my parents' car occasionally. But mainly, I hope I find a room soon.'

Ruben Knevelbaard (18), first-year Bachelor's student of Biology

PHOTO: SVEN MENSCHEL

'As soon as I knew I would be coming to Wageningen, I said so on room.nl and started looking. Sometimes I was number 100 or 200 in the queue. Nowadays I'm usually about number 20. That's better but there are still 19 others with a better chance. During the AID, I wanted to camp at the AID campsite. My parents said, maybe you can stay at a real campsite and stay there longer. So now I've got my family's caravan at the Wielerbaan in Wageningen-Hoog. Having a shower or going to the loo is not very comfortable as you have to go outside. But otherwise it's very doable: I have a comfortable bed and a heater. And I'm not the only student here so it's quite sociable. But I do hope to have a room before the winter.' **AdH, LZ**

MOOC on beer could win title

Two of WUR's massive open online courses (MOOC) have been nominated for the title 'MOOC of the year' at edX, the second biggest MOOC platform in the world.

The MOOCs in question are The Science of Beer, developed by honours students, and Sustainable Tourism: Rethinking the Future, developed by lecturer in cultural geography Arjaan Pellis. A total of 10 MOOCs have a chance of winning the title. The winner will be announced in Hong Kong in November.
Nico van der Veen is one of the four honours students behind the beer MOOC. 'I was on holiday with my year club when I got an email with the news. It was quite a surprise. I think one of the main reasons for the nomination is that our MOOC really was entirely created by students. As far as I know, WUR is the only university that is experimenting with that. As well as that, there is a nice assignment in our MOOC every week, for example to think up a marketing campaign for beer, to brew beer yourself, or to print and play a board game.'
Wageningen is not the only university with two nominations; Massachusetts Institute of Technology has two contenders as well. There are also MOOCS from universities in Bombay, Dartmouth and Hong Kong in the top 10.
WUR's marketing coordinator for online education Wendy Jansen is very pleased with the double nomination. 'EdX has over 2600 MOOCs and over 22 million participants. For two of our MOOCs to be in the top 10 this year is very exceptional.'
An edX panel will give all the nominated MOOCs scores, looking at how innovative the MOOC is, how clear the communication with students is, what students think of it and how many of them actually complete the course. LZ

'There's a nice assignment in our MOOC every week, like brewing beer yourself'

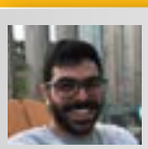
MEANWHILE IN... BRAZIL

'We inherited the Amazon from the world'

Fires in the Amazon forest have seen an increase of over 75 per cent since Bolsonaro was elected president of Brazil in January 2019. The president has now announced a 60-day ban on setting fire to cleared land, but he refuses any foreign aid. Master's student Lucas Meirelles dos Santos hopes the president will realize just how precious the Amazon is.

'We've had 16 years of leadership by the Workers' Party, which became associated with corruption scandals over the years. I think Bolsonaro got elected despite who he is because he was running against the Workers' Party in the second round, and people wanted "something different". So now it seems like if you're not a Bolsonaro supporter, then you must be a leftist, and this division stifles healthy discussion.
The current government is promoting a sense of Brazilian nationalism, which is why it doesn't go down well when foreign countries, especially European ones, point fingers at Brazil's management of the Amazon forest. Although European countries historically also destroyed natural resources of their own and of others, this doesn't give us licence to do the same nowadays, when we already know so much more about the environment.
It's upsetting how much impact Bolsonaro has had on the environment, but of course it was not only because of him. All the ministers that he appointed had views similar to his, and laws have to pass through various organs in the political system. But an elected president is theoretically the voice of the people, and if he goes on TV to say that we need to return the Amazon to the people so they can profit from it, that emboldens the farmers, miners and loggers who indeed want to do just that. I don't like the current narrative in Brazil that "the Amazon is ours", as it simply isn't. Instead, it is a natural and cultural treasure which is truly, truly amazing, and Brazilians just happened to inherit it from the world.' GH

PHOTO: SHUTTERSTOCK



Lucas Meirelles dos Santos, an MSc student of Environmental Science, reflects on the current political situation in his home country.

YOU ON CAMPUS

Ali Tafazoli Yazdi, a Master's student of Biotechnology, is starting the new academic year with a thesis at the Microbiology lab. He is excited to finally get his hands on some practical experience, a chance he never had back home in Iran.

Throughout his biology education, Ali became more and more eager about the prospect of doing scientific projects in the lab. 'I was constantly hearing about research and high-tech experiments that people were performing, but never got the opportunity to actually do it myself.'
Ali grew up in Iran, where he also did his Bachelor's. 'A Bachelor's thesis wasn't part of the curriculum, but even if it was, it's very hard for Iranian universities to gather the proper research equipment,' Ali explains. Because most materials come from abroad, US sanctions affect their accessibility and price dramatically. Iran is currently under huge economic pressure, so universities have limited financial resources. 'Even if you do get access to the materials needed, they're most probably too expensive.' For Ali, Wageningen is therefore a research paradise. 'Money and equipment seem to be limitless here.'

> **'Money and equipment seem to be limitless here compared to Iran'**

The project that Ali will work on is a risky endeavor, as the team is starting from zero without any assurance that they'll succeed. Luckily, he describes himself as a risk-taker, so this feels like a perfect fit. 'It's a fundamental part of me,' he exclaims. As a teenager, Ali already had the ambition to do great things and improve the world. Even though everyone kept telling him to limit his expectations and be satisfied with a simpler life, he never grew out of that phase. Just like his role models, he's willing to take risks to achieve his dreams. 'Elon Musk risked everything. Everyone knows him now, but at one point he didn't even have enough money to pay the rent,' Ali grins. 'Before you accomplish something, you will probably fail 1000 times. But the 1001st time you might succeed and win the Nobel Prize.' IC

'Conferences are badly in need of an update'

BLOG

Donatella Gasparro is a Master's student of Organic Agriculture, from Italy. You can read all het blogs at resource-online.nl.

According to blogger Donatella Gasparro, most scientific conferences are boring. Very boring. But at the Wageningen Soil Conference, she witnessed some good attempts to reform the art of conferencing.

'No PowerPoint allowed. That's what the Wageningen Soil Conference board told the masterclass organizers for the 4th edition of the soil conference, which was held at the end of August. I haven't attended many, but we can probably all agree: conferences are usually boring. Very boring. At the WSC 2019, though, they really made an effort to bring in some innovation and interactivity.

ESCAPE ROOM

As well as the morning presentations, keynote speeches and orals, the afternoons were reserved for interactive masterclasses that ranged from field excursions to virtual reality sessions. I was lucky enough to be involved in co-facilitating one of the masterclasses – maybe one of the coolest. A colleague and friend, Mariana, designed an escape room based on the European CAP (Common Agricultural Policy) post-2020 reform and asked me to facilitate the escaping process with the group of participants in one of the three escape rooms. Each group, representing an imaginary EU member state, had to put together their own strategic plan through a series of challenging puzzles. The engaging one-hour game was followed by an explanatory debriefing.

MAKE LEARNING EXCITING

These kinds of session end up being way more informative and effective than simple slides in a passive presentation. Playing a game or doing something hands-on triggers memory and thinking and makes learning and discussing important topics fun and exciting. It's great to see that science is slowly picking up on this. Conferences are badly in need of an update.
One more fun fact about the innovation at the WSC: the name badges were made of biodegradable papery material filled with wildflower seeds. Brilliant idea. Except that by day two, the badges were already falling apart. By the end of the conference, I laughed so much looking at the shredded pieces of paper hanging from people's necks...'

Wageningen Master's students do internships and thesis research all around the world, getting to know their field and other cultures. Here they talk about their adventures.

Next level hospitality in Mexico

THE WORKS

Who? Lei van Haperen (24), MSc student of International Land and Water Management
What? Thesis research on farmers' appreciation of nature
Where? Marqués de Comillas, Chiapas, Mexico

'When I arrived in a village, I had no idea where I would sleep. You couldn't arrange that in advance, because there is hardly any internet or telephone coverage in that part of Mexico. Every village has a mayor who is elected every four years. The mayors are responsible for the reception of guests. So as soon as I arrived I called on the mayor to ask where I could sleep, as well as to ask permission to do my research.

INSULTED BY MONEY

It happened several times that the people who put me up and fed me wouldn't take any money for it. That really bothered me, and once I secretly put some money under my plate. Later a boy told me his mother had seen that as an insult. She had given me the food out of love, but giving her money for it turned her hospitality from a favour to a service. That was a valuable insight for me. The Dutch don't like being indebted to anyone, whereas society there is built to a far greater extent on favours. I learned just to say thank you. Now I try it the other way round too: doing someone a favour even if it doesn't pay off.

NATURE'S BOUNTY

People in that region mainly live off local produce. Most of them only buy salt, sugar and oil at the shop. I ate maize tortillas with beans every day, actually. There, the tortilla is like the potato in the Netherlands. Just as we see a big difference between boiled, roast or deep-fried potatoes, they think burritos, quesadillas and tacos are totally different things.

For my thesis I looked at how local farmers appreciate their land, or to be more precise, 'Nature's Contributions to People' (NCP). Nature provides a lot of benefits such as clean water, food and a place for animals to live. Those are all examples of NCP. I looked at whether there is a link between appreciation of NCP and the choices those farmers make.

> **'I ate tortillas and beans every day, actually'**

DEFORESTATION

I visited 40 farmers in six villages who moved to this part of the jungle about 60 years ago. Sixty per cent of the forest in the region has disappeared over that period. That has made the local climate much drier, because forests retain water. The residents of one of the villages have already experienced the detrimental effects of deforestation on the local climate. And they have preserved more forest than the other villages. They saw a clear connection between the importance of NCP and the choices they make.' FJ

Do you too have a nice story about your internship or thesis research abroad? Email lieke.dekwant@wur.nl.

WAGENINGEN
UNIVERSITY & RESEARCH

Invitation: 50th Anniversary, Division of Human Nutrition & Health and Nutrition & Health Programme, WUR

50 YEARS Human Nutrition and Health

As alumnus of the Nutrition and Health programme, we'd like to invite you for this special anniversary.

Fifty years ago the Division of Human Nutrition was established at Wageningen University, and the first academic program in Human Nutrition in the Netherlands was offered with now almost 3000 alumni.

To celebrate this event, we will organize a scientific symposium and an alumni day.

Friday 18 October Pioneering Nutrition Symposium

Top keynote speakers:

- **Kevin Hall**, Section Chief: Integrative Physiology Section, Laboratory of Biological Modelling, National Institute of Health, Bethesda, USA
- **Kathryn Dewey**, Distinguished Professor Maternal and Child Nutrition, Department of Nutrition, University of Davis, USA
- **Boyd Swinburn,** Professor of Population Nutrition and Global Health, University of Auckland, New Zealand
- **David Nabarro**, Professor of Global Health, Imperial College London, United Kingdom.

The day will include pitches by rising stars of our Division, presenting cutting-edge results from our own Division. Moreover, we will challenge you to discuss hot topics in nutrition, and test whether you can discern fake nutrition news from real nutrition news.

The day will be closed by Rector Magnificus Arthur Mol, together with our special guest, the State Secretary for Health, Welfare and Sport, Paul Blokhuis.

www.wur.eu/pioneering-nutrition

Saturday 19 October 'Connect and Celebrate' Alumni day

On Saturday afternoon our alumni and other guests will have the opportunity to see the campus, experience the new facilities of the Division of Human Nutrition and Health, and attend lectures.

All day there will be the possibility to connect with other alumni and take group pictures with your old class mates.

At the end of the day we will bring Nutrition into practice, and conclude the celebration with a dinner.

www.wur.eu/alumni-day-2019

Announcements

Het Andere Koor rehearsals start 12 October
The choir Het Andere Koor (Wageningen) will start practising an interesting programme of works by Verdi and Puccini for its anniversary concert with Wageningen's symphony orchestra HWSO. There is room for more singers. Interested? Send a message to info@hwsohak.nl by 5 October, stating your voice type.
HWSOHAK.NL

Introduction course on Zen meditation
The introductory course on Zen meditation will start on 25 September with 12 lessons on Wednesdays, 19:00–20:15. Posture, concentration techniques and how to bring more focus in your daily life. Open day: 18 September. Venue: KenKon, centre for meditation, yoga and martial arts.
KENKON.ORG

Agenda

19 and 20 September (19:00), 21 September (15:00, 19:00)
***EINDGEBRUIKER*, PERFORMANCE BY ARTISTS' COLLECTIVE WATERLANDERS FROM WAGENINGEN**
Waterlanders has a national and international reputation for theatrical and artistic spectacle. *Eindgebruiker* (end user) was a success at Oeral and will open the Junushoff theatre season in September on Wageningen campus. The performance will start in the Forum and then follow an exciting route across campus. There will be four performances for 150 spectators a time. Tickets €15/€10.
JUNUSHOFF.NL

Saturday 21 September, 10:00-17:00
WAGENINGEN UNIVERSITY TEDX: 'GROW WITH THE FLOW!'
This event will cast a spotlight on three key areas: technology, nature and personal development. With eight inspiring speakers and some amazing performances, this will surely be a day to excite and inspire you. Location: Orion building. More info on speakers/tickets on the website.
TEDXWAGENINGENUNIVERSITY.COM

Tuesday 24 September, 12:30-13:20
WAGENINGEN WRITING LAB LUNCH WORKSHOP: 'OPTIMIZE YOUR PERSONAL WRITING STYLE'
In this workshop, you will discover your personal writing style (how you approach the writing process). You will find out about typical pitfalls and how to avoid them. We will get to work, practising some techniques that will help you to make the most of your writing style in current and future writing assignments. Admission free. Be on time, as participant numbers are limited to 20. Venue: Forum Library, room 259. Info: info.wageningenwritingLab@wur.nl.

Thursday 3 October, 14:00
BIOLOGY BATTLE OF THE UNIVERSITIES
Come along on Thursday 3 October to support your university in the Battle of the Universities! Biology teams from Dutch universities will compete in a light-hearted battle for the title of Best Biologists in the Netherlands. The battle will take place during the celebrations to mark the centenary of Dutch biology magazine *Vakblad voor Biologen* – the forerunner of *Bionieuws* – in the Jaarbeurs in Utrecht. The event starts at 14:00 and concludes with a drinks reception from 17:00. Use the form on the website to register.
BIOLOGY-BATTLE.NL

In memoriam

Emeritus professor Meto J. Vroom

Emeritus professor Meto J. Vroom passed away on 28 August 2019. During his 28 years as a professor (1966 to 1994), he laid the foundations for the success of Wageningen's landscape architecture. It is partly thanks to him that dozens of skilled landscape architects graduate every year, who go on to play a crucial role in the great transitional tasks of the 21st century.
As well as his Wageningen MSc, Meto Vroom obtained a Master's degree in Landscape Architecture at the School of Fine Arts at the University of Pennsylvania in Philadelphia. This American influence was unmistakably apparent in the way he set up the Landscape Architecture programme here in Wageningen. Under his leadership, the first Master's level theses were completed at the end of the 1970s, and the first PhDs at the end of the 1980s.
Vroom was on many boards, including the Water Board and the Boertien Commission. In his position at the Vallei en Eem Water Board, he prevented urban expansion into the Wageningen water meadows along the Rhine. He was also actively involved in the International Federation of Landscape Architecture and was a founder member of the European Council of Landscape Architecture Schools (ECLAS).
Professor Vroom retired in 1994, and then wrote *Leren Kijken* (Learning to See) and a Dutch lexicon for garden and landscape architecture. He also supervised a number of publications by the Landscape Architecture Europe Foundation, and was an honorary member of the Dutch Association for Garden and Landscape Architecture, and of the International Federation of Landscape Architecture.
In 2012, he received a Lifetime Achievement Award from ECLAS and in 2014 the Bijhouwer Prize.

On behalf of the Landscape Architecture and Spatial Planning, and Het Atelier, Wageningen Environmental Research, Ingrid Duchhart, Michaël van Buuren, Martha Bakker and Adriaan Geuze

Colophon

Resource is the independent medium for students and staff at Wageningen University & Research. *Resource* reports and interprets the news and gives the background. New articles are posted daily on resource-online.nl. The magazine is published every fortnight on Thursday.

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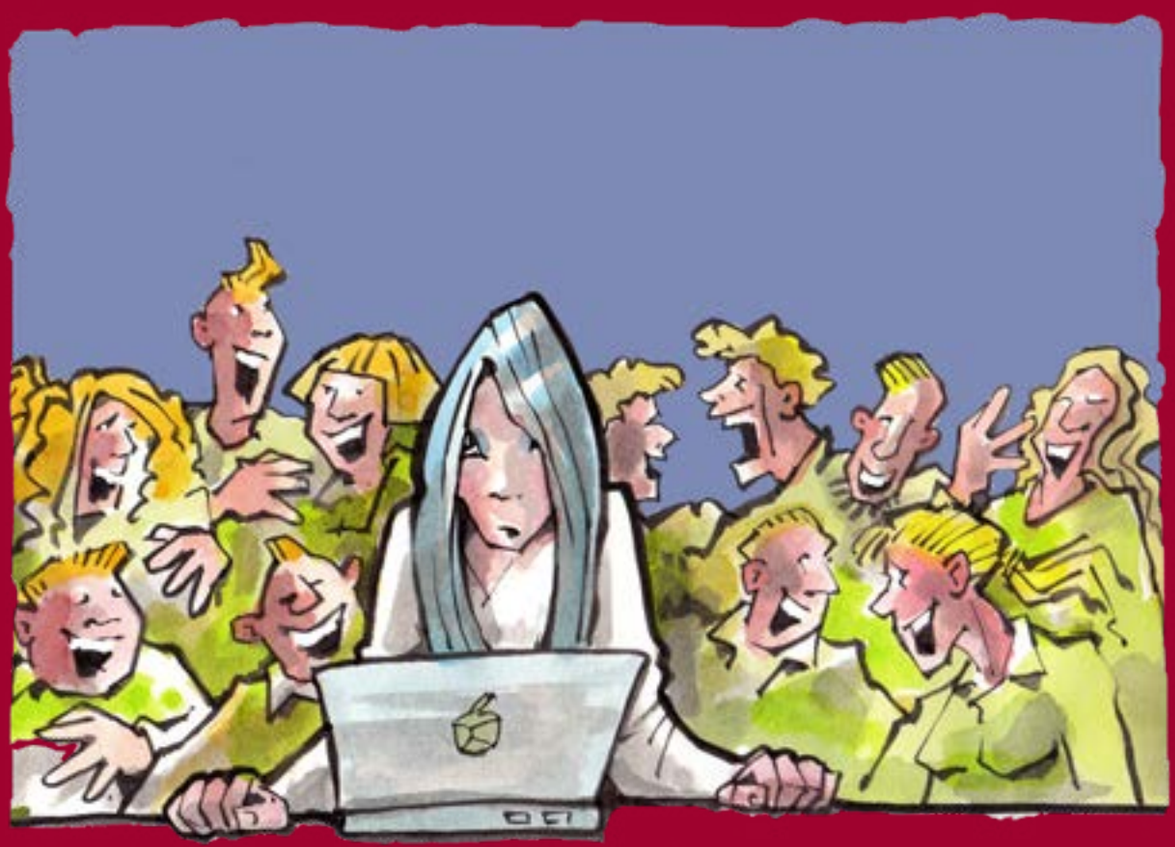

ILLUSTRATION: HENK VAN RUITENBEEK

Are we working or chatting?

I thought the Dutch were hard workers. But as I found out, the Dutch spend just as much time talking as working.

So our group assignment deadline was getting close. We decided to meet up at one of my group mates' house to have dinner and then finish the assignment. The majority of my group were Dutch whilst I was the foreign Aussie. Everything was going fine that evening; we made and then ate our dinner, whilst having a good chat. Then it was time to work on our assignment.

We all sat around the table and started typing away. When I work I usually do so in silence, to focus on what needs to be done, although within a group I'm happy to talk about different aspects of the assignment. But I must say, the Dutch really love talking! Even I was a bit shocked to find myself chatting about the most random things whilst working with my group. Every now and then one of my group mates would say, 'OK, back to the assignment', but five minutes later we'd be back into full discussion mode on something completely unrelated to our assignment. Somehow our topics ranged from English translation of Dutch words to what we wanted to be when we grew up. Our assignment deadline was a couple of days away and yet here we were talking about how superfoods are just a marketing ploy, and how curly hair bands don't even keep your hair up when doing exercise.

Dear Dutch, please get your priorities in order. If you're wondering, we didn't finish the assignment that night. But I can't deny it, we did have a good time! Ⓡ **Ruby Sutherland, a former student at WUR, from Australia**

The Dutch love talking about the most random things whilst working

Do you have a nice anecdote about your experience of going Dutch? Send it in! Describe an encounter with Dutch culture in detail and comment on it briefly. 300 words max. Send it to resource@wur.nl and earn twenty-five euros and Dutch candy.