‘Sustainability must be a requirement for tourism’

René van der Duim, page 30
LIVESTOCK SECTOR THINKS AGAIN

There is persistent criticism of intensive livestock farming, which is said to harm the environment, carry public health risks and score badly on animal welfare. Sustainable livestock farming may be in sight, though.

TOMATO CALLS FOR INNOVATION

The German market has been conquered by the Dutch tomato. Yet Dutch tomato growers are suffering from stiff foreign competition. The fruit and veg sector is therefore crying out for knowledge and innovation.

SUSTAINABLE TOURISM GAINS GROUND

Tour operators and travel agents are increasingly aware of the side effects of tourism. Research projects have shown that it is possible for nature and local populations to benefit from this multi-million-dollar industry.
Fishers can help set catch quotas

By long-established tradition, it has always been biologists who create the models used for managing fish stocks. Nobody else had a say in it, as that was thought to compromise their scientific objectivity. We are seeing a change now, however. Fisheries biologists really can benefit from the knowledge of other stakeholders such as fishers and the environmental movement. Moreover, less secrecy leads to more support for policy.

Since 2008 we have therefore been working in the EU project JAKFISH to develop fisheries models for the longer term, about ten years. In the project, various scenarios are worked out and discussed with stakeholders. What happens if quotas are changed, or if areas are closed to fishers? What do you do if stocks fluctuate? Do you adjust the quotas? In our first case study, on the herring catch in the Skagerrak, it turned out that fishers were against that. They preferred to have a fixed, slightly lower quota to give them more security.

With herrings we can estimate stocks fairly accurately, but we also have a pilot project on langoustines, or Norway lobsters – which are being fished by increasing numbers of Dutch fishers. We know much less about the population prognosis of langoustines; the question is then: how can you develop long-term plans in the face of high levels of uncertainty? In JAKFISH we also take a good look at social-scientific aspects of the issue: what is going on and how are we working together? We want to learn from what we are doing. I hope that our models will make negotiations about catch quotas easier. In effect, what we deliver are action plans endorsed by the stakeholders. They outline the steps to take if the fish stocks change one way or another.’

Martin Pastoor, director of the Wageningen UR Centre for Marine Policy, researcher at IMARES and chair of the project team Judgement and knowledge in fisheries involving stakeholders (JAKFISH). He is one of the speakers at the opening of the academic year at Wageningen University on 6 September 2010.
**LIVESTOCK**

Rondeel egg on the shelves

In June this year, the Dutch supermarket chain Albert Heijn started selling animal-friendly eggs produced in the new rondeel (round shed) barn. This design was developed by researchers at Wageningen UR Livestock Research six years ago to meet the needs of laying hens, poultry farmers and the environment. A group of entrepreneurs put the design into production and the first rondeel barn opened in Barneveld near Wageningen this spring. The eggs – marketed in a round box – get three stars from the Dutch ‘Better Life’ animal welfare label.

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**LANDSCAPE ARCHITECTURE**

Modern city square too bare

Bare city squares are either swept by chilly winds or turn into furnaces when the sun is hot. Urban designers should pay more attention to microclimates in cities, says Sanda Lenzholzer of the Landscape Architecture chair group at Wageningen University.

For the research for which she got her PhD in June she talked to thousands of passers-by on city squares in the Netherlands. The most modern, usually bare squares are not very inviting for people to sit around on. So they attract teenagers who come to ‘hang out’, and even vandals. The PhD researcher looked for designs for a more comfortable city. A tree canopy creates a nice atmosphere, for example, besides giving people a choice between sun and shade. Trees also seem to provide more cooling than a fountain. Lenzholzer is among the pioneers in this field in the Netherlands. She also analysed the city climates of Arnhem and Nijmegen, and she is involved in European projects on climate readiness.

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**ECONOMICS**

Farmers’ income lowest for 20 years

Economically, 2009 was a bad year for agriculture in the Netherlands, reports the Agricultural-economic Report for 2010 from the agricultural economics institute LEI, part of Wageningen UR. Production went up slightly but most product prices went down. The average Dutch farming income is lower than it has been for twenty years: it dropped by an average of 5,500 euros per farm. Land prices appear to be rising faster than the added value in land-dependent agriculture. Just when agriculture needs to up profits to cover costs of complying with future legislation on the environment and animal welfare, says the LEI.

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Aid shortens civil war

Development aid does not reduce corruption in African countries by much. But it does increase the chances of civil wars ending. This conclusion was drawn by Eleonora Nillesen, who got her PhD in the Development Economics chair group at Wageningen University on 15 June.

Critics claim that development aid aggravates conflicts because the funds are interesting spoils of war for rebels. But there does not appear to be any relation between aid and the incidence of conflict or wars, says Nillesen. ‘In fact, more aid increases the chances of ending long-drawn-out wars.’ That is probably because aid enables governments to spend more on their armies and bring the war to a swifter end, she thinks. ‘And that of course makes this result less positive, because it means that a regime stays in power through force.’

In view of the complexity of the processes involved, Nillesen prefers not to emphasize precise figures. ‘The main thing I want to show is how the causal relations work.’ To this end she studied data from thirty African countries and researched the causal relations between aid, governance and civil war.

Nillesen also looked at the theory that aid paves the way for corruption. ‘My research shows that donor funding has a positive impact on the quality of governance. In particular, corruption goes down.’ The impact is only small, Nillesen thinks. ‘But on the other hand, I have found no empirical evidence at all for the opposite claim, that corruption is worsened by aid.’ She thinks the main reason for the positive relation between aid and good governance is that aid means civil servants get higher salaries, making them less inclined to resort to corruption.

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Environment stronger than gene technology

Environmental influences have more impact on the maize plant that genetic modification, says RIKILT, part of Wageningen UR. Together with European partner institutions, RIKILT scientists compared the gene expression and protein production of two transgene maize breeds on one location, on different locations, and over three growing seasons. The environmental influences led to a much larger variation in gene expression and proteins than the different genotypes. ‘This is an indication that the side-effects of genetic modification are no more drastic than those of conventional breeding methods’, says researcher Jeroen van Dijk.

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Knowledge lab at Schiphol airport

In May Wageningen UR board chairman Aalt Dijkhuizen and other executives opened a research laboratory for creating a sustainable airport at Schiphol. The Dutch airport wants to switch from fossil fuels to bio-energy, reduce its carbon dioxide emissions, solve the water problems around the airport and recycle waste. Together with the Technical University of Delft, research body TNO, Imtech and Schiphol airport, Wageningen UR is going to work on generating the knowledge to do these things. The researchers will spend part of their time working at the lab at Schiphol.

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A soldiers guards refugees who have returned to Burundi after a civil war.
Plaice shrinking

Intensive fishing of the North Sea is causing evolutionary changes in fish. They are staying smaller, growing more slowly and reaching sexual maturity earlier. So claims Fabian Mollet, a researcher at IMARES, part of Wageningen UR. For his PhD research Mollet developed models to simulate the effects of fishing on populations of plaice and sole. There are big advantages for the fish in staying small and reproducing early. These genetic changes can take place within a few decades. It is still possible to reverse them though, says Mollet, who received his PhD in May. Info: fabian.mollet@wur.nl

Local cattle breeds under pressure

Wageningen UR’s Centre for Genetic Resources (CGN) is doing research under the European EURECA project on what it takes to safeguard the survival of local cattle breeds. Increasingly often, these breeds are being replace by the highly productive Holstein-Friesian dairy breed. The motivation of farmers is crucial to maintaining breeds and, with them, biodiversity. Breed organizations should focus more on strategic planning for the medium to long term, says the CGN.
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Malaria mosquito likes sweat

Malaria mosquitoes can be lured into a trap with a mixture of ammonia, lactic acid and twelve fatty acids. But given a choice they prefer the smell of human sweat. Wageningen entomologists reported this finding in the May issue of *Journal of Medical Entomology*.

Postdoc Renate Smallegange did research at Wageningen University’s Laboratory for Entomology on the Anopheles gambiae Giles sensu stricto, one of Africa’s main malaria carriers. ‘This mosquito has a preference for human blood and mainly hunts for its victims by night.’

Previous research had already shown that a scent trap could catch a mosquito. The best formula is a mix of synthetic aromas such as ammonia, lactic acid and certain fatty acids. Smallegange has now compared the performance of this mixture with that of sweaty socks. The mosquitoes clearly preferred the smell of sweaty feet to that of the synthetic mixture, she concluded. ‘There is still an essential element missing from our scent mix. Humans seem to have something very specific in their scent profile.’ What that specific scent might be, Smallegange does not know yet. ‘Our sweat consists of more than three hundred scents. We want to start selecting now to find out which scent in our sweat the mosquito can smell.’

The aim is to create an effective scent mix for luring the malaria mosquito into traps. The Wageningen entomologists are conducting field tests with colleagues in Kenya, Tanzania and the Gambia to identify the best scent mixtures and the best places to locate the scent traps. ‘Those experiments indicate that you can also hang the traps outside the house to lure the mosquitoes away’, says Smallegange. But she thinks other measures besides scent traps are needed to reduce the number of malaria victims in Africa. These include vaccination against malaria, the use of bed nets and of organic fungus-based pesticides.
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**POULTRY**

**Improved chicken for Ethiopia**

Villagers in Ethiopia want chickens with a bit of meat on their bones which are also good layers and resistant to local parasites. Nigussie Mullu has started a breeding programme to select chickens for these qualities.

Mullu is a researcher at the Ethiopian Institute of Agricultural Research and a PhD student with the Animal Breeding and Genetics chair group at Wageningen University. Chickens play a vital role in the food supply in Ethiopian villages. They are also often the only source of income for rural women. In the past, the Ethiopian government imported highly productive breeds, but with little success because the breeds were not adapted to local conditions. So Nigussie is basing his breeding programme on a knowledge of local diseases and of villagers’ preferences. He interviewed chicken keepers throughout the country and found that they did not want separate meat chickens and layers but an ‘all-purpose’ chicken. Nigussie used DNA analysis to determine the genetic diversity and isolate the genes with the desired characteristics. It will take about five years to develop the new breed.

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**NUTRITION**

**Genes make diet work – or not**

People do not all get the same benefits from a healthy diet. So researchers should pay more attention to the genetic profile of test subjects, says Edith Feskens, professor of Nutrition at Wageningen University.

Omega 3 and 6 fatty acids, in fish for example, do not lower cholesterol for everybody. This finding has emerged from research by Feskens and her team. They investigated the relation in 3,500 people between blood cholesterol levels and three variants of the FADS gene, which is involved in fat metabolism. There was only a correlation with a diet rich in Omega 3 and 6 fatty acids: test subjects with one particular variant of the FADS gene appeared to benefit from such a diet, and their cholesterol levels went down. In people with the other variants there was no cholesterol-lowering effect. So the presence of the gene determines whether the diet works. It is too early for nutritional recommendations based on the finding, says Feskens.

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**NATURE**

**Bumble bee zooms in on nectar**

In a field full of fritillaries, the bumble bee knows exactly which flower has the most nectar. It picks up the reflection of ultraviolet and infrared rays invisible to the human eye. ‘The level of reflection is informative for the bumble bee’, says Albert Corporaal, a researcher at Alterra, part of Wageningen UR. ‘The more intensely the flower reflects infrared, the more interesting it is to the bee. The brightness says: choose me.’ Bumble bees also get ‘landing information’ from the pattern on the sepals, which helps them find their way to the nectar. Corporaal is working on his thesis on the fritillary in the changing delta landscape in the Netherlands.

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Nematodes reveal aging process

Wageningen nematologists have brought to light the genetic basis of the aging process in the nematode Caenorhabditis elegans, often used as a model organism. These research results will be of considerable interest for research into the aging process in humans. The regulation of gene expression in aging nematodes appears to diminish in almost 10 percent of the genes. These are the genes that maintain and repair the body. But in certain other genes there is an increase in gene regulation in old age: these are the genes involved in extending the nematode’s lifespan.

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Fewer antibiotics possible

The 2010 white paper on antibiotics gives an overview of ‘research enabling an “antibiotic-free” animal husbandry’. It covers not just technical solutions but also the behaviour of livestock farmers, whose assumptions and management styles are decisive for the scope for change. We need more insight into the financial factors influencing antibiotic use, suggests the white paper. The paper includes input from animal researchers from Wageningen UR and economists at LEI, part of Wageningen UR.

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Test farm for breeding sole

An experimental farm for breeding sole was opened on 1 June in the village of Colijnsplaat in the Dutch province of Zeeland. The new company will concentrate on sustainable farming of sole, sandworms, shellfish, algae and silt crops.

‘The aim is to develop fish farming that is profitable, sustainable and acceptable to society’, says Willem Brandenburg of Plant Research International, part of Wageningen UR. The sole is farmed in ponds and fed on sandworms, which live in the soil. Algae are bred on the manure from the fishponds, and the residue nutrients are absorbed by silt crops such as seaweed.

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Producing energy and copper

Generating energy while at the same time extracting copper from waste water. This can be done with the new biofuel cell developed by the Environmental technology sub-department at Wageningen University. Bacteria in the cell break down organic waste in water, and the electrons they produce convert the copper solution in the water into solid copper. The prototype is highly efficient, but further research is needed to make the process applicable on a larger scale, for example in copper mines.

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Farm waste gives Kenya energy

Kenya could in theory generate 1,300 million cubic metres of methane per year from farm waste. Using no more than one third of its agricultural residues Kenya could replace the fossil fuels it currently imports.

This conclusion has been reported by environmental technologist Henri Spanjers and Belgian and Kenyan colleagues in the Renewable Energy journal. The researchers began by calculating the volume of waste products from the cultivation of maize, cotton and millet. Residues from these crops can easily be converted into methane through fermentation. Laboratory tests carried out at the Environmental Technology department at Wageningen University determined how much methane the crops would deliver. Altogether, it would come to 1,300 million cubic metres per year, which would generate 3,900 gigawatt hours of electricity, equivalent to three quarters of Kenya’s current electricity production. At the moment, agricultural residues are usually ploughed in, turned into compost or dumped at tips, where they ferment and release the greenhouse gas methane. In order to exploit the potential of methane from plant waste flows, organizational and political changes are called for, says Spanjers. ‘Individual farmers can’t do much with the waste. You have to set up cooperatives, for example, to collect it and process it.’ Spanjers has links with the Lettinga Associates Foundation (LeAF), co-financer of the follow-up phase of the research. Charles Nzila will be further scrutinizing the sustainability and feasibility of the ideas, and the research will be supervised by Wageningen UR and Ghent University. Info: henri.spanjers@wur.nl

Fewer flowers, fewer butterflies

The number of flowers in the Netherlands has gone down by 34 percent over the past decade. This figure has come out of research by Michael Wallis de Vries of the Laboratory for Entomology at Wageningen University and the Butterfly Foundation. The research links this reduction with the decline of butterflies and other pollinating insects. Both in 1994-1995 and in 2007-2008, volunteers counted flowers and butterflies along 388 butterfly routes. It is precisely those butterflies that are very responsive to the wealth of flowers available that are in decline. The researchers appeal for measures to increase the flower supply, for example by promoting nutrient-poor habitats. Info: michiel.wallisdevries@wur.nl

Elderly have different intestinal flora

When people reach old age, the composition of their gut flora changes – for the worse. Their intestinal wall harbours fewer bacteria with anti-inflammatory properties and more bacteria that can cause infections. The composition of our gut flora remains stable until roughly the age of 75. These conclusions are outlined in the online journal PloS by Wageningen professor of Microbiology Willem de Vos and Finnish and Italian colleagues. The researchers examined the gut flora of 84 subjects to see whether any changes are related to increased susceptibility to infections. That turned out to be the case in the oldest group, of 99- to 104-year-olds. On the other hand, remarkable numbers of Eubacterium limosum were found in the intestines of centenarians, and this bacterium is thought to have a protective effect. Info: willem.devos@wur.nl
Can intensive livestock farming be sustainable?
Intensive livestock farming, also known as factory farming, is quite common, in the Netherlands as elsewhere. It is coming under renewed fire from a public worried about animal welfare, the environment impact and the public health risks. Is it time for a change in the Dutch livestock farming system?
It is intensive livestock farming – rather than extensive farming on the land – that is under attack. One of the solutions being proposed in the public debate is to halve livestock numbers and give animals more space. ‘Of course livestock farming needs to become more sustainable but that does not necessarily mean you need to halve the number of animals’, is the response of Johan van Arendonk, professor of Animal Breeding and Genetics at Wageningen University. ‘The number of animals is an outcome, not a goal in its own right.’ He feels two things are being lumped together that are not necessarily related. You can make the system more sustainable and you can increase or reduce livestock numbers independently of each other, he says.

Van Arendonk thinks a lot has been achieved in livestock farming over the past few decades in the Netherlands. ‘There have been efficiency gains in the conversion of feed into milk, meat and eggs, animal welfare has improved and there is less damage to the environment. Although there is still room for improvement in terms of the environment and animal welfare.’

PROFESSORS’ PETITION

Intensive livestock farming is under attack. This public debate flared up in response to outbreaks of infectious diseases such as Q fever, caused by the increasingly intensive farming of dairy goats, and plans in the province of Noord-Brabant to build mega-barns housing tens of thousands of animals. A petition towards the end of April signed by about 150 professors in different disciplines put the proverbial cat among the pigeons. Their discussion paper is called ‘Plea for Sustainable Livestock Farming – an end to organized irresponsibility’; a summary in English can be found on the website www.duurzameveeteelt.nl.

The professors, including about a dozen from Wageningen University, feel that intensive livestock farming has turned into an industry with a technically perfected production system. Over the years, animals have had to adapt too much to the demands of this industry, say the critical professors. What is more, the soil and surface water are acidifying due to the manure being produced. And now germs from livestock, such as Q fever and ESBL bacteria, are claiming human victims. Over the past few months, 16 thousand people have expressed their support for a less intensive livestock farming system, while the number of professors signing the petition has nearly doubled since the end of April.

OUTDATED IMPRESSIONS

Martin Scholten, Managing director of the Animal Sciences Group (ASG) at Wageningen UR, acknowledges: ‘We agree with those critics on the essential point that there are problems with livestock farming’. One problem is the excessive preventive use of antibiotics in livestock farming, for instance in poultry farming. This must be cut drastically. And that is feasible, says Scholten. ‘We need to stop using antibiotics for prevention; only sick animals should be treated. To do that, you need to be able to track individual animals in a controlled barn environment where they are free to roam around. ICT and robotics can help here.’

However, Scholten thinks many of the points listed by the critics are behind the times. He says they often have an outdated image of the sector, based on the nineteen eighties and nineties and resembling the least innovative farmers rather than the sector’s front-runners. There are intensive livestock farms that put considerable effort into animal welfare and environmental emissions, and there are extensive, organic livestock farms where that does not happen. ‘Take antibiotics. There are livestock farms using 90 per cent less antibiotics than the average. The livestock farming sector should concentrate on the best farms and not on the worst, as is so often the case now. Wageningen University researchers should be doing that too. That is what happened in the past in the fishing sector. Half the fishermen have given up since then, while the rest

JOHAN VAN AREndonK,
professor of Animal Breeding and Genetics at Wageningen University

‘With an ecologically responsible form of livestock farming in place, the Netherlands can help solve the problem of feeding the world’
have joined their sector’s front-runners. If the current front-runners in livestock farming were to become the norm, that would reduce the burden on the environment by a factor of three to five while antibiotic usage levels would fall by a factor of ten. If you show farmers what’s possible, they’ll make the switch."

**FRONT-RUNNERS AND STRAGGLERS**

Front-runners and stragglers – that tallies with the experience of Peter Smeets, a landscape ecologist at Alterra, part of Wageningen UR. ‘There are front-runners and stragglers in dairy farming and you can see that reflected in the landscape. In a subsidized sector like this the stragglers get too much incentive to carry on too long. They would have been gone long ago if they were subject to market mechanisms, and the Netherlands would have far more large-scale farms.’

Johan van Arendonk thinks change is needed but he does not agree with the analysis of the petitioners. ‘I don’t think you can still claim nothing has changed. That analysis is not right. There is still a lot to be done though. The negative impact on the air, soil and water must be reduced further as it is still too big. We produce more meat, milk and eggs than the Netherlands needs. We export a lot. All economic activities have to meet certain criteria and livestock farming is no exception. I have no problem with the scale of livestock farming if you can produce for export in line with such criteria. With an ecologically responsible form of livestock farming in place, the Netherlands can help solve the problem of feeding the world.’

Arendonk sees progress on the animal welfare front too. ‘An example is the development of open barns for cows. The ‘comfort’ barn has been developed for pigs; a show comfort barn has been built in Raalte. Everything is geared to allowing the animals to roam freely. The pigs can root around. And in Barneveld there is a new housing system for laying hens, the Rondeel system, with plenty of room for the hens to range freely. These are show barns for applying knowledge and demonstrating how that knowledge can be implemented. You might ask whether things are moving quickly enough. At present, there is a small group of livestock farmers who are adapting rapidly but there is also a large group lagging behind. This is the group that is coming under fire in the public debate. Van Arendonk draws a comparison with the electric car. ‘It is cleaner and no-one is questioning that. However, it is taking time to catch on as not everyone is able and willing to get rid of their old car. It’s the same with livestock housing systems. Farmers have invested in them and that money needs to be recouped; there’s a depreciation period of 25 years. What we must do is establish where we want to be in the future and then set up research to tackle the obstacles.’

**NATURAL BEHAVIOUR**

Scholten admits mistakes were made when going over to intensive livestock farming. ‘Animals were adapted to the system and the method of production, in ways ranging from cutting off pigs’ tails to genetic selection. However, there is a change taking place and farms are gradually being adapted to meet the needs of the animals. In the past, everything was geared to improving production rather than giving due regard to the situation of animals in large groups. Farm animals are herd animals; your starting point should be their natural behaviour’, says Scholten.

This means adapting the environment to the animals’ requirements. You need to select animals for desirable social behaviour in groups. This is already being done with hens, for instance. Until recently they were kept in small cages, but that is changing, Scholten: ‘They will increasingly be kept in larger groups, with some areas where they can range freely. Cannibalism occurs among laying hens kept in groups. So their beaks are trimmed to limit the risk of this happening.’ Van Arendonk: ‘We are looking into whether it is possible to take existing poultry breeds and select hens that keep their feathers without having to have their beaks trimmed and that aren’t so prone to cannibalism. We are onto the third generation and we’re seeing improvements. This is research we are doing in partnership with a Dutch company, Hendrix Genetics, and it’s unique in the world. It is an innovation that could be applied in the poultry sector all over the world.’

More animal-friendly group systems are being introduced in other livestock sectors as well. For example, open barns for cows and comfort barns for pigs. The idea behind them is always the same: the open area means the animals no longer have to...
Scholten calls these modern housing systems Smart Farming. ‘Innovative dairy barns with everything thought out down to the last detail: feed supply, manure production, low levels of antibiotic usage, open areas for the animals and a biogas plant for processing the manure. A modern barn. It’s true that this is a long way from the romantic image of livestock farming in days gone by.’

Open barns with soft compost floors: Elsbeth Stassen, professor of Animals and Society at Wageningen University, agrees that is a good thing to aim for, but big changes will have to be made before such a system can be implemented in practice. Upscaling, or intensification, means for example that dairy cows spend more time indoors, with all that that entails. Stassen cites hoof diseases as the biggest welfare problem among cows. What is more, milk production has become so high that the cows cannot get enough food from grazing and have to be given supplementary feed in the cubicles. The walkways in the free-stall barns have a concrete floor, which is often wet from manure and urine. Stassen: ‘That causes hoof diseases and eventually lameness. A quarter of all dairy cows go lame at least once a year. We know a lot about hoof diseases and this information has been passed on to livestock farmers. However, there has been no improvement over the years. Open barns with soft floors could be a solution. We are carrying out research into the economic impact of hoof diseases. We believe if we can get that across we can reduce the problems further.’

VEAL CALVES AND BUCK GOATS

‘It really depends on how you look at things’, says Stassen. ‘I feel there have been improvements in animal welfare in the past ten years, particularly in farms where group housing has been introduced. But some things have got worse, precisely because of the shift to more intensive farming, and there has been virtually no discussion about these changes.’ The professor gives two examples: veal calves and buck goats. ‘The Netherlands is
the biggest producer of veal calves in Europe’, she says. ‘Calves are transported huge distances to the Netherlands from Ireland, Eastern Europe, Poland... They are kept here for six months and then they are slaughtered. There have been improvements as they are kept in groups and their feed has been adapted, so they are more content. But that long-distance transport is stressful for the animals. What is more, animals from different farms are being housed together, which poses a health risk.’

There are developments in goat farming that are going unnoticed too. There are an estimated 350 thousand goats in the Netherlands that kid every two years. That means tens of thousands of buck kids every year. ‘The buck kids are taken from the goat farm after two weeks and reared elsewhere for five to six weeks. Then they are taken by long-distance transport to Spain, where they are slaughtered. That is intensive livestock farming too. Of course the livestock farmers do all they can to give the best possible care within the context of the current system. But the question is whether that system is the right one. There is not enough discussion about that.’

PUBLIC CONCERN
Public concern arises when the sector fails to question the status quo. ‘As a result, the agricultural sector is becoming alienated from the rest of society, and public support for intensive livestock farming is falling’, warns Professor Stassen. Martin Scholten at ASG is worried too. ‘There is increasing public concern about intensive livestock farming. That is putting our researchers on the defensive as well, which is unnecessary as we have an independent role.’

Livestock transport is one specific focus of criticism that is also mentioned by the professors in their petition. Peter Smeets, a landscape ecologist at Alterra, explains that livestock transport has a historical background. ‘Each step in the production and distribution chain has become a specialized business: sow breeding, pig breeding, finishing and slaughtering. Trucks go back and forth between the different businesses. Meanwhile, the rural land use planning is still based on the early stages of land consolidation in 1850 in which farms were spread over the land so as to give them as large an area as possible for the farm buildings. These days, livestock farmers get half or more of their feed delivered by truck rather than from their own land. The logistics sector has become extremely important, not just for feed but for taking away animal manure as well.’

Eventually, agro parks will provide the ultimate solution: crop farming, waste disposal, livestock farming and even abattoirs all concentrated in one location. That is what Smeets wrote in his PhD thesis last year. ‘Agro parks at forty locations around the Netherlands, each with one to two thousand hectares, preferably close to ports for the supply of feed and other things by ship. The entire Dutch intensive livestock farming industry, both meat and dairy, as well as all the greenhouse horticulture could be accommodated at those locations. Industry was concentrated in a similar way with the creation of industrial estates on the outskirts of towns.’

The plea for agro parks is a move away from the fiercely debated and criticized plans to build mega-barns. Smeets: ‘Those mega-barns were too much ‘more of the same’, and they are an undesirable consequence of the old spatial planning system. Farmers stay put and the only step they take is to increase in size. There is nothing wrong with a larger barn but you need to build it somewhere else.’

The Netherlands has the technology to do that, says Smeets. ‘The problem is that it is not yet being applied throughout the sector. We are subsidizing old, badly-run farms that ought to go. Productivity is high here and environmental problems have largely been solved, or are solvable at any rate. Dutch agriculture is among the best in the world. If production in the rest of the world was at the same level, we would be able to feed the world with some to spare at current levels of meat consumption.’

Professor of Breeding Van Arendonk agrees. ‘The Netherlands has a unique location, in a delta with fertile soil close to major population centres for the supply of fresh produce. What is more, our climate is suitable for both plant and animal production. We have ideal conditions here for sustainable livestock farming, livestock farming that meets the requirements of animal welfare and environmental impact.’

PETER SMEETS,
landscape ecologist with the Rural Dynamics research group at Alterra, part of Wageningen UR

'Mega-barns are an undesirable consequence of the old spatial planning system'
Wageningen UR and Agri-ProFocus are working together to try to create more economic opportunities for small farmers in Uganda. ‘As development workers you often get swept along with the tide, so it is nice to have a scientist take a helicopter view of things.’

The livelihoods of farmers who grow sunflowers or other oil seed crops in Uganda are precarious. The prices of their products fluctuate wildly and imports of cheap palm oil mean that farmers can never be sure of being able to sell their products.

Since 2007, Sietze Vellema of Wageningen University’s Technology and Agricultural Development chair group has been working together with Agri-ProFocus on a project aiming to bring stability to the oil seed chain. Farmers and processors hope to reach agreements through a platform, and thereby to give farmers a more certain livelihood. Vellema supports the project as a researcher; he and his team are observing the negotiations between farmers and processors and analyzing the consultations between the sector and the government. ‘For example, we show that negotiating is not the same thing as throwing a wish list over the fence. You cannot simply expect to hand in your list to a civil servant and wait for him to solve everything for you. You have to set priorities yourself: what really matters?’ says Vellema. ‘In the end, the most important result is that producers and processors join forces. That generates mutual trust. There’ll be no trying to take advantage of each other.’ Because the farmers and processors could show that they were collaborating, they were able to persuade the UN organization IFAD to invest millions in the Ugandan oil seed sector.

COALITIONS
Vellema got involved in the project at the request of Agri-ProFocus, a network organization of Dutch institutions and companies involved in agricultural entrepreneurship in developing countries. The network’s members include Wageningen UR, the Royal Tropical Institute (KIT), development organizations SNV, ICCO, Agriterra and Cordaid, and a Dutch bank, the Rabobank. ‘We try to forge coalitions so that people are not just all doing their own thing alongside each other, but organizations reinforce and complement each other instead’, says Hedwig Bruggeman, director of Agri-ProFocus.

In the Ugandan project, for example, Wageningen UR is working with development organizations SNV and Agriterra, Makerere University in Kampala, the Ugandan Oilseed Subsector Platform (OSSUP) and the Uganda Oilseed Producers and Processors Association. ‘For us, working in a network is very nice’, says Vellema. ‘It means I don’t have to be a jack-of-all-trades. There is often an expectation that as a researcher you will just quickly solve the
problems. This collaboration makes it possible for us to concentrate on our role as researchers. For instance, we search the academic literature for examples from other countries, to look at what works and what doesn’t, and we try to extract general lessons from this sort of project. We are not at the steering wheel; that is done by the platform. But we are fellow passengers and as such we do try as we go along to understand how the engine works.’

**BENEFITTING FROM SCIENCE**

Uganda provides Vellema with a good field for testing his academic theories. According to Agri-ProFocus director Hedwig Bruggeman, development organizations stand to gain from the involvement of scientists too. ‘A scientist brings in a helicopter perspective, whereas as a development worker you often get swept along with the tide. So it is very good to have a scientist look on from a distance and analyse things. The good thing about Sietze and his team is that they can do that, but at the same time they are able to join in discussions at a practical level in the platform of oil seed producers.’ Although she is very positive about the Wageningen researchers’ wish to belong to the network – ‘they always try to create time to be involved’ – she is a bit worried about the long-term prospects. ‘Wageningen UR now has the opportunity to participate in Uganda and in other countries; space has been created for that within a big research programme, Pro-poor value chains. But that is on a temporary basis. Once that project ends, there is no more money left to fund their participation. We hope that scope will be found to include the collaboration in the network in other grant applications to LNV and DGIS (the Dutch ministry of Agriculture, Nature and Food quality and the Directorate General of Development Cooperation).’
Insects are savoured as a nutritious snack in many parts of the world. Not in Europe though. There they are considered at best a nuisance and at worst scary. Wageningen University aims to find out which insect species are suitable for breeding and as a food ingredient in everyday foods such as pizzas.

‘These are real beauties.’ Marian Peters, secretary of the insect breeders’ association Venik, takes a large dried locust out of a pot and examines its head. ‘This is pure design.’ She pulls the brownish wings off in a practiced manner and pops the plucked insect in her mouth. The ‘beauty’ meets its final destination with a crunch. ‘Delicious, a slightly nutty flavour, a perfect addition to a salad’, says Peters. The Venik secretary is enthusiastic about the idea of insects as a food for both humans and animals. Breeders are working with Wageningen University to try and get insects onto Dutch dining tables. Pots of freeze-dried locusts and various kinds of beetle larvae can be found in limited quantities at one or two supermarkets. But most of the insects being produced go to wholesalers to be sold as animal feed. That will change if Peters has anything to do with it, and human consumption of six-legged creatures will give a boost to the insect breeding sector. ‘There is no market for it at the moment’, says Peters. ‘Current supply levels are sufficient to satisfy the demand for insects as animal feed. We need to gain people’s confidence gradually and build up the sector step by step.’ Peters started doing this two years ago when she presented her freeze-dried insects at the Dutch catering trade fair Horecava. But the time was not ripe for this new product. ‘Cooks didn’t know what to do with it and didn’t want to be associated with it either’, says Peters. ‘That is changing in a big way now, thanks to all the publicity.’

CRICKET NUGGETS
Peters is not alone in her enthusiasm for insects as food. Arnold van Huis, professor of Entomology at Wageningen University,
An image of a future in which many food products contain insect protein
thinks that Westerners should take this promising food source more seriously. If it is up to him, the Dutch will soon be tucking into cricket nuggets, caterpillar steaks and mealworm burgers. ‘About 80 per cent of the world’s population eats insects. In the tropics in particular, they are a standard part of the daily diet’, says Van Huis. ‘And insects are even considered a treat, not just something you eat because there’s nothing else.’ Caterpillars and locusts are popular in Africa, wasps are a delicacy in Japan, and crickets are eaten in Thailand. In China they do not even baulk at eating scorpions, close relatives of insects. One reason for the popularity of insects is that these countries have a tradition of food gathering. Van Huis says the reason insects are not actually bred in these countries is because their natural food is not available all year round. Insects often eat specific plants only. That could be a problem, for example during a dry period. Van Huis feels it is a missed opportunity that insects have never been considered in development cooperation as a means of solving Africa’s food problems. He is a consultant to the United Nations Food and Agriculture Organization (FAO), with the aim of promoting the use of insects to help ensure global food security.

FEEDING THE WORLD
The experts say insects are not just tasty, they are also more sustainable than traditional livestock. At present, 70 per cent of agricultural land is required for meat production. What is more, says Van Huis, beef production needs a vast amounts of water: between 20 thousand and 40 thousand litres per kilo. And further big increases are expected in meat consumption because of rising prosperity and the growing world population. In China alone, consumption has doubled in recent decades; it now stands at 50 kilos per person per year. Eventually there will simply not be enough meat to go round. Van Huis thinks insect meat would be a good solution to this problem.

BADLY WASHED VEGETABLES
Insects have other advantages over cows, chickens and pigs. They do not need antibiotics and any diseases they might carry cannot be transferred to humans. Also, they like to live at close quarters in the dark. That makes them very efficient in the use of space, but Van Huis says this also makes animal welfare much less of an issue than it is for traditional farm animals. What is more, insects grow efficiently. ‘They are cold-blooded and so they don’t need to use up energy maintaining their body temperature’, says Van Huis. ‘As a consequence they are very efficient in converting food into meat.’ Insects also have a high nutritional value and are a rich source of protein, healthy fatty acids, and important vitamins and minerals. Adults only need 100 grams of insect meat to meet their daily requirements for protein, iron and vitamin B. And yet the Western diet barely includes any insects – not counting the quarter kilo we swallow every year without noticing in our peanut butter or badly washed vegetables, or the red food colouring in pink icing, which is made from ground cochineals. According to Van Huis, the reason insects do not feature more prominently on the menu in North America and Western Europe is that there are relatively few insects available in large quantities there. So they have not become part of the standard food package. Which is a pity, thinks Van Huis. ‘Large-scale consumption of insects is a sustainable, environmentally friendly solution to the problem of providing the growing world population with enough protein-rich food. You can breed insects using waste or even manure, which would help reduce the Dutch manure surplus (Dutch livestock farming produces far more manure than can be used on the land and dealing with this manure surplus...
‘Eating insects is a solution to the problem of providing the growing world population with enough protein-rich food.’

has become quite a challenge).’ Over the next few years Wageningen University will be investigating which insects you can breed on these kinds of waste products, and which species offer most potential in terms of protein composition. ‘It is very important that this doesn’t turn into a hobby for a clique of scientists, but that results are applied and are relevant to society’, says Van Huis. ‘That is why Dutch insect breeders are closely involved in the research as well. Plus we will need to breed insects if we are all going to be eating them’, Van Huis says. ‘Harvesting from the countryside would put too much pressure on wild populations.’

FIVE TONNES OF BEETLE LARVAE

At present there are only a few insect breeders in the Netherlands. Some of them have joined forces in the Dutch Insect Breeders Association (Venik). Roland and Michel van de Ven in Deurne, for example, have been breeding insects for fifteen years. It started as a hobby to supply food for aviary birds, but the insect farm soon turned professional. They now mainly breed mealworms, about five tonnes a month. These beetle larvae are undemanding and are perfectly at home in the dark in stacks of crates. They are fed primarily on waste roots and bran. They produce relatively little manure and the two breeders have found a fruit grower and several gardeners who are eager to have the light-brown, virtually odourless granules. The larvae are ready to be sold after about ten weeks. ‘At the moment we are mainly supplying animal feed wholesalers; a small part of what we produce is for human consumption’, says Michel van de Ven. He works to the same food safety standards as livestock farmers. He also uses trace and trace, a system used in intensive livestock farming to determine where a product comes from.

DIFFERENT MINDSET

But are the Dutch really ready to tuck into a plate of dried locusts? Wouldn’t they rather have a juicy beefsteak? ‘It is quite a challenge to get the Dutch to bite into a locust head. It’s difficult to break down that cultural and psychological barrier’, thinks Van Huis. ‘People have to get into a different mindset; a positive experience of eating insects can help them overcome their reluctance.’ Van Huis thinks it may be possible to win consumers over by putting ground insects in appealing products so that the bugs cannot be recognized as such. He also sees the extraction of insect proteins and their inclusion as an ingredient in other food products as a means of helping them to become more acceptable. For instance, you could add insect proteins to pizzas with meat product toppings. Deep-fried snacks are also well suited to having insect proteins mixed in with the chicken or pork. The Dutch Ministry of Agriculture, Nature and Food Quality takes insects as food so seriously that it
INSECTS AS FOOD

Most commonly eaten insects worldwide

<table>
<thead>
<tr>
<th>Insect</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termites</td>
<td>22%</td>
</tr>
<tr>
<td>Other</td>
<td>17%</td>
</tr>
<tr>
<td>Caterpillars</td>
<td>18%</td>
</tr>
<tr>
<td>Lice</td>
<td>24%</td>
</tr>
<tr>
<td>Grasshoppers</td>
<td>19%</td>
</tr>
</tbody>
</table>

Conversion of animal feed into body mass and processed meat.

Marcel Dicke, professor of Entomology at Wageningen University

‘There will be plenty of insects in the shops in ten years’ time’

Has given Wageningen University a grant of one million euros to carry out research on the sustainable production of insect proteins for human consumption. This means there is a chance that even the conservative Dutch will eventually be eating insect burgers. ‘We haven’t been taken seriously in the past - “oh, those chaps with their hobby”- but I’d like to talk to those critics again in five years’ time’, says a confident Van Huis.

FEAR FACTOR

Professor of Entomology Marcel Dicke is another passionate advocate of insects as an alternative to steak. ‘We have been working since 1996 to get the general public to see the positive side of insect food’, he says. ‘Eating insects was very much a fear-factor thing at first but there was a gradual change around 2000.’ In 2006 Dicke and his team won the Academic Annual Prize, which enabled them to organize the City of Insects festival at which tens of thousands of visitors were initiated into the lives – and the flavours – of insects. According to Dicke, the City of Insects marked a turning point in people’s attitudes to insects as food. ‘These days, 95 per cent of the people attending our talks will try the insects and 80 per cent find them tasty’, he says.

Yet there is still no demand among consumers for insects on the supermarket shelves, says Anoesjka Aspeslagh, spokesperson for the Albert Heijn chain of supermarkets. ‘Insects are very exclusive and only a very small group of consumers is interested in them. Most consumers are not remotely ready for this. We will only put a new product
on the shelves if we feel that people are really prepared to try it.’ So for the time being, Albert Heijn is focussing on other meat substitutes such as soya. Insects may be almost impossible to get hold of in supermarkets (with the exception of wholesaler Sligro), but Dicke is still optimistic. ‘After all, we eat oysters and snails, which are none too popular in other cultures’, he says. ‘I think that there’ll be plenty of insects in the shops in ten years’ time and you will easily be able to buy a hundred grams of locusts or beetle larvae.’ He feels acceptance is already increasing. ‘There were insects on the menu when Gerda Verburg, the Minister for Agriculture, entertained foreign guests. Verburg has given the new insect sector an important boost with her grants, putting insects on the agenda and even on the menu. That is a breakthrough.’ Dicke says if you want to get large-scale insect consumption off the ground you have to present them tempting. Restaurants have an essential role to play here. ‘You need to present insects as a delicacy, and you can charge accordingly. People will always be keen to try out something special’, says Dicke. ‘An exquisitely decorated strawberry with chocolate and topped with mealworms or a locust sounds exclusive. People see that as a challenge’. If there is one person capable of presenting insects in an unusual manner, it is Robert van Beckhoven, a trendsetter in the world of patisserie. You won’t find this top pastry chef’s creations in the average high-street bakery. For example he developed a line of erotic confectionary – ‘adult pastry’. And he has recently started adding insects to his products. Last spring, his mealworm muesli bar was voted the tastiest insect snack by the audience at a talk by Marcel Dicke. ‘I like experimenting and insects have a good flavour’, says Van Beckhoven. ‘I like to do new things and get people to change their attitudes. Insects in patisserie fit in with that philosophy. You do need to be refined and subtle when putting insects in a product so as to keep it a positive experience’, says Van Beckhoven. ‘No-one will buy your product if it has tree-hugging, knit-your-own-yoghurt overtones.’ So he advocates a strategy of disguising and seducing: a fantastic-looking product in which insects have been subtly incorporated.

Van Huis and Dicke may see a rosy future for insect foods, but there is still a lot of work to be done on product development. What breeding methods are best and which species are most suitable? Ascertaining this takes time but, as both professors point out, the current livestock farming system was not built in a day either. The possibilities are endless, given the more than one thousand insect species eaten around the world. With meat from livestock you do not have more than a couple of dozen possible variations on a theme.
DUTCH TOMATO PRODUCTION DEPENDS ON TECHNOLOGY

‘Horticulture sector is crying out for innovation’

Dutch horticulturalists have conquered the German market with a juicy aromatic tomato called Tasty Tom. But in spite of this success, the fruit and vegetable sector is in trouble: prices are low and competition is stiff. For this reason, horticulturalists in the Netherlands are eager for cutting-edge innovative research.

In the early 1990s, German consumers went right off Dutch tomatoes, which they described as ‘water bombs’. Dutch tomatoes were being harvested young and green, kept cool for ten days and sold when they had a bit of colour but not much taste. They were not a patch on their Mediterranean competitors. Dutch growers learned their lesson from this period, and their tomatoes are now every bit as sweet as those from Spain, and much less pesticide is being used on them too. And so Dutch tomato growers have won back their biggest export market: of the 657 million kilos of tomatoes imported into Germany last year, 358 million kilos came from the Netherlands. They owed their tastiness to an optimal combination of variety selection, feed, light and temperature. Spain provided no more than a quarter of Germany’s tomatoes in 2009.

According to researcher Nico de Groot of the agricultural economics institute LEI, part of Wageningen UR, Dutch greenhouse horticulture has expanded thanks to a massive focus on technology. ‘How do we get more cucumbers or tomatoes out of a square metre? The use of substratum, screens, lighting and heating – every avenue has been explored in order to maximize harvests. In the 1980s and 90s this happened at the expense of the quality experienced by the consumer. And they could get away with that in a period when demand outstripped supply. It was only when Spain and Morocco became serious competitors that the market came under pressure.’

There are also emotional factors, says De Groot. ‘If German consumers taking part in tasting sessions were offered a tomato with a Dutch flag on it, they thought it was awful, but if you left the flag off it, it would come out as the best. In any case, within three or four years the growers had gone over to a very wide range of breeds.’

FANCY NAMES

Plant breeders already had some interesting varieties to offer. But whereas the old-fashioned round tomato
produced 60 kilos per square metre, tomatoes on the vine only produced fifty. Quality went up at the expense of quantity. De Groot: ‘But horticulturists went on experimenting with new varieties. They did some clever marketing, and tomato varieties got fancy names such as Tasty Tom. With this kind of smart branding of a tasty product, with smaller quantities per package, your profits do not have to suffer. You can even earn a premium on them.’ What is more, adds LEI researcher Michiel van Galen, ‘the growers soon got the hang of the new varieties. More vine tomatoes are grown in the Netherlands now than any other variety, and the harvest per square metre is equal to that of the round tomato.’

During the difficult years the area devoted to tomatoes in the Netherlands shrank from about 2,200 hectares in 1982 to 1,100 hectares in 1996. Since then it has grown, reaching 1,630 hectares in 2009. But it is still not all plain sailing for Dutch tomato growers.

**LOW PROFITS**

At the request of the Ministry of Agriculture, Nature and Food Quality, the LEI surveyed the competition for Dutch vegetable growers. Besides traditional competitors such as Spain, emerging producers such as Turkey and Morocco seem to be marketing more and more horticultural products internationally. And this is affecting the profits made by Dutch horticulturists, Van Galen says. ‘The prices of cucumbers and peppers in particular had not been as low as they were in 2009 for fifteen years.’

The sector’s problems in the Netherlands can mainly be blamed on falling prices and growing competition, says Van Galen. ‘That is why Dutch horticulture is so eager for innovative research at the moment. On topics like new varieties, healthy, cholesterol-lowering vegetables, energy saving, ICT and chain research.’

Together with businesses, Wageningen plant scientists and the top institute TTI Green Genetics are conducting a lot of valuable ‘precompetitive’ research in fields such as DNA and gene technology. ‘This secures a basis for breeding research’, says De Groot. ‘Wageningen’s strength lies precisely in this collaboration with the business world.’ For example, there is close collaboration on research on the ‘closed greenhouse’, a highly energy-efficient closed-cycle climate and energy system, as well as on the development of sustainable new production methods in the Het Nieuwe Telen project on innovations in horticulture.

In order to raise production without diminishing quality, Wageningen UR is also doing a lot of research on storage methods. ‘There are unavoidable problems with coordination’, explains De Groot. ‘We have also done research on faster transportation by train or more sustainable transportation by waterways, as an alternative to the truck.’

A lot of logistical research has been done too. When should the grower pick, and how does he coordinate that with his buyer so that he can make use of peak production times to launch attractive special offers. A tomato used to take a week to get from the grower to the consumer via the auction, the trader, the exporter and the shop. Now the same tomato is on the supermarket shelf within one or two days. ‘Another important logistical development is tracking and tracing’, explains Van Galen. Large retailers demand this so that the transport history of a product is transparent. And packaging provides consumers with information about the sustainability of the product.

**GAS PRICES GO ON RISING**

The horticulture sector used 70 percent less energy in 2009 than it did in 1980. Currently a tomato grower can produce 60 to 100 kilos of tomatoes per square metre with 20 cubic metres of gas. Ten to twenty years ago he would have used twice as much gas to produce 50 to 60 kilos.

Better and better use is being made of combined heat and power generation, and geothermal and solar heating. A gas-fired generator can produce both heat and electricity. Horticulturists use the heat and some of the electricity, supplying the surplus to the grid. This way modern horticulture produces as much electricity as two medium-sized power stations.
But in spite of all the improvements, further research into ways of saving energy is still needed, as gas prices continue to rise. Energy accounts on average for 31 percent of a Dutch horticulturalist’s production costs, and most of that is the gas bill. In 2002 this was only 22 percent. Spanish tomatoes, by contrast, are largely produced in cheap, unheated plastic greenhouses, or in the open air.

**NO MORE AUCTIONS**

The marketing system has changed radically over the past ten years, too. Tomatoes are hardly ever sold on auction floors any more, but via intermediary organizations or by direct sales. This has sharpened the competition between growers’ associations. De Groot: ‘There is a considerable need for a new working model for the market chain. Growers want to organize and promote their production better and secure their market position. Thanks to growers’ associations, they can now provide large market players with uniform quality and build up more long-term relationships with buyers. And that puts them in a stronger position.’

On the research agenda for the coming years – drawn up with the help of growers’ associations – are both technical and organizational issues. Technical subjects include new robotized growing systems and further energy savings, through the use of LED lights for example. Van Galen: ‘Great strides have been made on this one, but a lot more can be done. So this research should definitely go ahead, and there should be no economizing here.’

De Groot: ‘We used to talk about the trio of ‘research, extension and education’. Now the focus is on discovery, exploration and research, with the business world much more at the helm and Wageningen collaborating more with other knowledge centres. Markets are becoming ever more competitive and energy more expensive. The logistical challenges are getting bigger all the time. Should you send a truckload of tomatoes down the congested road to Munich every day, or should you move nearer to your market? There are already 100 hectares of Dutch greenhouse horticulture in Greater London. Our horticulturists are a competitive and critical lot, and they will go where the market is. There’s a role for good research there. There is no doubt about it: the sector is crying out for knowledge and innovation.’
NEW PROFESSOR OF SOCIAL LEARNING

A better environment starts between the ears

Arjen Wals gave his inaugural lecture as professor of Social Learning and Sustainable Development at Wageningen University in May. He hopes to use a new educational method to inspire people to adopt a sustainable lifestyle.

TEXT ASTRID SMIT PHOTOGRAPHY JOSJE DEEEKENS

Environmental education has been part of Professor Arjen Wals’s life since early childhood. Both his parents devoted their careers to it, his father as director of school gardens and recreational farms in The Hague, and his mother as environmental education and international training officer with an educational organization. Yet he never planned to go in this direction himself. ‘You can’t save the world like that’, he thought. The environmental problems of the day, such as fish dying in the Rhine, acid rain and the mass poisoning disaster at Bhopal in India, had to be tackled by other means. They required laws, new technology and a strong environmental policy. So Wals went to Wageningen to study environmental hygiene. But during the course of his studies his views changed. Rules and regulations, policies and innovations can go some way towards solving environmental problems, but do not get to the heart of the matter. ‘The cause of environmental problems is between our ears’, says Wals. ‘We have got to make sure that companies are less preoccupied with maximizing profits and more concerned about people and the environment. As citizens we must not let ourselves get swept along by the idea that we should be consuming all the time.’

Behaviour and lifestyle are the key to change, according to Wals. And so he is following in his parents’ footsteps after all. First with his PhD research and now as professor of Social Learning and Sustainable Development in the Education and Competency Studies chair group at Wageningen University. His inaugural lecture was held mid-May, entitled: A message in a bottle – learning our way out of unsustainability.

But Wals is not going to follow his parents all the way. Because, he says, the old approach to environmental education – inducting a feeling for nature and the environment – does not deliver the goods. Research has shown that consciousness raising and providing information are not enough to change behaviour. Wals puts his faith in social learning. This is an approach to education which stimulates critical thinking and gets people to look for sustainable alternatives themselves. Collaborating with people with other points of view is essential to this, says Wals. ‘The chances of coming up with something new are much higher than with likeminded people.’ He illustrates what is meant by social learning with an assignment he often gives to students. They have to buy a Happy Meal from a hamburger chain and analyse in groups what has gone into their meal. This means finding out what the ingredients of the hamburger, fries, soft drink and toy are and where they come from.

HAPPY MEAL

They discover that rain forest has been cut down for the hamburger, to grow the soya for the cattle feed. Or that the toy – at least in the past – was made by child labour, and that the battery inside it can only be removed using a hammer and chisel, ensuring that the toy will end up on the rubbish dump.

After presenting their findings, the students get the next assignment: design a sustainable Happy Meal. Wals: ‘A commercial perspective is important, otherwise consciousness-raising just leads to a feeling of powerlessness and apathy.’

ARJEN WALDS (1964)
- 1982 to 1987: studied Environmental Hygiene in Wageningen
- 1991: PhD at University of Michigan, Ann Arbor, on environmental psychology and environmental education
- April 2009: appointed as extraordinary professor of Social Learning and Sustainable Development at Wageningen University
Students think up their sustainable version of the Happy Meal in groups. Should it contain a vegiburger instead of a hamburger? Is it possible to make toys out of sustainable materials? And how much do these alternatives cost? ‘Throughout the process they discover that an alternative meal is much more expensive. That raises the question: how much are we willing to pay for our food?’ The entire sustainability issue is summed up in this meal, says Wals: ‘the fact that the local is bound up with the global, and that this meal has a lot to do with biodiversity and climate, as well as with ethical and socio-economic issues.’

According to Wals, this approach to education makes a big impression on participants. ‘Being active and finding out for yourself provides a profound learning experience. No newspaper, website or television programme can compete with that. You also notice that groups consisting of students from different cultural backgrounds come up with more creative solutions than homogeneous groups do.’

The new professor sees his task as the further development of social learning for sustainability issues. For primary, secondary and higher education, but also for hybrid forms of education such as collaborative projects between companies, knowledge institutes and schools. ‘There are hundreds of initiatives in the Netherlands making use of social learning. We want to research which forms work best. Which competencies do teachers need? Which competencies do learners acquire? There are countless indications that social learning has an impact on behaviour, but we want to know much more about that.’
In Bwindi National Park in Uganda, groups of tourists venture into the misty forests to see gorillas. Local people work as guides on these excursions – which are not without risk. The tourists, for whom this is usually part of a tour of this poverty-plagued country, stay in hotels or expensive lodges near the park. This is a setup that René van der Duim thoroughly applauds. ‘This generates income that shows Uganda that it is worthwhile to conserve the nature reserves for the gorillas’, says Van der Duim, extraordinary professor of Tourism and Sustainable Development at Wageningen University. ‘And the income benefits the local population, so tourism contributes to combating poverty too.’

Van der Duim is supervising a PhD student from Uganda who is researching how the local population can benefit most effectively from this new kind of tourism. A total of twelve young African researchers are working on similar projects, three of them in Wageningen. Besides Uganda there are projects in other countries including Kenya and Namibia. On this project Wageningen University is working together with three European and six African universities.

Sustainable tourism is no longer the preserve of low-budget backpackers in the furthest reaches of the rainforest. But before the natural environment and local populations really share the benefits, there is work to be done. Wageningen expertise has a lot to offer.

**Travelling towards a better world**

Sustainable tourism is no longer the preserve of low-budget backpackers in the furthest reaches of the rainforest. But before the natural environment and local populations really share the benefits, there is work to be done. Wageningen expertise has a lot to offer. TEXT RENÉ DIDDE  ILLUSTRATIONS YVONNE KROESE
‘alternative’ tours run by small tour operators for environmentally aware Westerners who enjoy roughing it for three weeks in basic little huts. ‘Almost all the main tour operators and travel agents are increasingly aware that tourism has a big impact’, notes Van der Duim, whose extraordinary chair is funded by the Worldwide Fund for Nature, Dutch development organization Cordaid, the Dutch branch of the International Union for Conservation and Nature (IUCN) and the Dutch airline KLM.

Tourism certainly has quite an impact. A few examples: long-haul tourist flights contribute to 3 percent of CO2 emissions; intensive diving around Australia’s Great Barrier Reef is damaging coral, to say nothing of the ecological and social impact of changed land use resulting from tourism. You don’t have to go to developing countries to see that: ski slopes in the Alps have caused erosion.

On the other hand, tourism is the biggest source of employment worldwide, claims Van de Duim. ‘To give you a bit of an impression: one job in twelve is related to tourism, and more than 240 million people make their living from it. In 46 out of the 50 least developed countries, tourism is the main source of income. And 40 percent of tourists come from rich countries to developing countries’. More importantly, even in the face of the global recession tourism remains a growth sector. And it is precisely for this reason that there is growing interest in making the sector sustainable. ‘Sustainability can no longer be optional; it must be a requirement’, Van der Duim asserts. ‘Attention must be paid to climate change, water scarcity, vulnerable nature areas, and also to the human side of things, such as labour conditions, child labour, sex tourism (including child abuse). For all these reasons the sector must concern itself with people and planet, if it wants to go on making profits in the future’, he says, referring to the three Ps of the UN sustainable development slogan.

TOUR OPERATORS ARE KEY
This kind of thinking is catching on in the Dutch tourism sector, where the Dutch Association of Travel Agents and Tour Operators ANVR is shot through with it. Mirjam Dresmé, head of communication and sustainable tourism at the ANVR explains: ‘We have a policy of sustainable tourist enterprise. We have launched a website together with our European partners (www.travelife.eu), and one of the things we offer is a training programme for tour operators’. All two hundred member tour operators have appointed sustainability coordinators who have already followed the training. ‘The aim in the sector is to pay more attention when buying tours to the sustainability side of the transport, the accommodation and the entertainment’, Dresmé says. ‘Tour operators are key there: after all, they buy the tours.’ The training consists of information and best practices and ends with a compulsory exam. ‘The sustainability coordinators submit a business report to the ANVR, and after it has been approved they receive an ANVR-DTO certificate for sustainable tourism entrepreneurship.’ Later this year the 1,500 travel agencies belonging to the ANVR will follow a similar training course.

NO RHINO OR CORAL
Certified tour operators must steer clear of child labour and child sex tourism, must not offer hunting, and must reject unethical souvenirs such as parts of rhinos, elephant tusks or coral. Besides these compulsory points, there is a list of 150 points for action on which tour operators are invited to work on an optional basis, explains Dresmé. ‘Examples of these are offering CO2 compensation for flights, and stimulating local production and local transport.’ The ANVR and the tour operators are also working on encouraging accommodation providers worldwide to make their business more sustainable in terms of water use, labour conditions, waste disposal and purchasing policies. Pilot projects are running in Brazil, Thailand, Kenya, Tanzania, Turkey and Egypt.
Combating poverty and conserving nature in developing countries is very important of course, but Dresmé points out that in fact the vast majority of European tourists go for beach holidays in the Mediterranean. ‘Small steps forward there in saving water or making transport and accommodation more sustainable make more difference than improving the handful of safaris in Kenya or Uganda’, says Dresmé, who stresses the need to work on both fronts at the same time.

GIVE ME A BREAK

There is work to be done on the mentality of the modern tourist, the Dutch included, notes Dresmé. ‘The Dutch have to recycle their glass and their plastic all year, so they often have the attitude, ‘I’m on holiday now; give me a break from all that environmental awareness.’

Besides, particularly in these times of economic crisis, what matters most to the Dutch is the price of a holiday. ‘There is a lot of awareness-raising needed to make tourists aware of the environmental impact of their trip. We are going to provide more information on that in the near future’, says Dresmé. ‘Our aim is for awareness of sustainability to play a bigger and bigger role in the choice of tours offered by tour operators and for the ANVR logo to be the mark of more sustainable tourism. That certainly doesn’t have to make travelling more expensive; in fact, it can even lead to savings. Sustainable coffee is no more expensive than ordinary coffee either.’

A very good ambition, says Willem Ferwerda, who appreciates the ANVR’s mission. ‘It is high time the sector stopped being so laissez-faire about this’, asserts the director of the Dutch branch of the IUCN, an international umbrella organization for nature and environmental organizations, governments and scientists. One of the goals of the Dutch branch is to reduce the global ecological footprint of Dutch business. Ferwerda knows the travel world well.

Before becoming director of IUCN, he worked in tourism for more than ten years.

A LITTLE GOES A LONG WAY

According to the IUCN, a tax of a mere 50 eurocents per booking would be enough to create a substan-
‘nature fund’ to set up pilot projects on nature conservation, sustainability and poverty alleviation.

‘There are currently ten million bookings a year in the Netherlands, so you could have a fund of over five million euros. At the IUCN, we know enough projects in which local partners can get inspiring results with relatively small levels of funding. One hundred thousand often goes a long way. Which means the tourism sector could start fifty of these sorts of project per year’, says Ferwerda.

One such project is the purchase of 132 hectares of former agricultural land in Costa Rica. The land forms a corridor between two important national parks at the edge of the rainforest near Carara. Ferwerda: ‘By buying the land for only 80 thousand euros, an ecological corridor has been created. A similar project has been carried out in India, enabling elephants to migrate freely again.’

According to IUCN Netherlands, half of the supported projects could be directly related to tourism, ‘but the sector should also have the grace to use some of the funds outside its own tourist destinations, for example for nature projects in Kyrgyzstan.’ Ferwerda sees an important task for Wageningen University in the area of monitoring and steering the projects of an ANVR nature fund of this type.

MASSIVE TURNOVER

‘A tax like that is a good idea’, says Joke Luttik, leader of the Human Factor research group at the Landscape Centre at Alterra, part of Wageningen UR. ‘There are already a lot of small funds of that sort and many small ones add up to one large one. There is a massive turnover in tourism, and up to now too little of that money has been spent on nature in any systematic way.’ She would like to see a little of the new fund proposed by the IUCN being used for three projects in Indonesia, Malaysia and Vietnam. ‘In those countries there is a lot of tree felling going on in wetlands. By offering the local population microcredit in return for a contract in which they promise to leave the trees alone, you could generate new sources of income. For example, by establishing tourism projects’, explains Luttik, who collaborates on this with Wetlands International and the Dutch development organization SNV. She envisages Wageningen UR providing
training for new local entrepreneurs. Luttik does not think that sustainable tourism is a contradiction in terms. ‘On the contrary, it offers plenty of opportunities to restore damage to nature and to combat poverty.’ It is clear that Wageningen has its characteristic expertise to offer: ‘We have knowledge about ecology and biodiversity, we know a lot about the preferences and behaviour of tourists, and we have long experience with regional economic development in Third World countries.’

**SHOWERS HEADS AND TAPS**  
In the Dutch city of Nijmegen, Ruud Klep runs the Dutch branch of the Travel Foundation, whose head office is in England. The Travel Foundation works to make tourist destinations more sustainable. ‘We are looking for local experts in Cyprus and in Morocco to set up water-saving programmes for the hotels, lodges and resorts’, says Klep. ‘There is much to be gained there. To start with, water-saving shower heads, taps and washing machines. And you can’t imagine how many leaks could be plugged. There is a lot of awareness-raising work to be done in the top tourist destinations’.

‘For the last fifteen years, competition has mainly been about prices’, says Klep. ‘So it is high time now to make a coup for sustainability. And wherever possible it should be local people who reap most of the profits. That is already working brilliantly in Namibia, where local population groups take over the management of certain nature areas, in some cases under a legal agreement. The entire spectrum of wildlife is present, from elephants to black rhinos. Agreements are made with investors about the distribution of jobs among the local population and the sharing of profits or turnover.’

In Gambia the Travel Foundation has set up projects to give farmers in the vicinity of luxury all-inclusive resorts the opportunity to supply fresh food and fruit all year round. Something similar has been done in the Caribbean and projects are in the pipeline in Turkey. Klep: ‘These are the examples we must keep in mind when we think about making tourism sustainable.’

Sustainable tourism is one of the themes at the Opening of the Academic Year at Wageningen University on 6 September 2010. www.openingacademischjaar.wur.nl/UK
MOST ENTERPRISING SCIENTIST

‘I want to see something come out of research’
Willem de Vos, professor of Microbiology at Wageningen University, does a big line in scientific publications and prestigious prizes. He has also been declared the most enterprising scientist in the Netherlands. He is a firm believer in applying scientific knowledge commercially. That way more people benefit from it. TEXT HANS WOLKERS PHOTOGRAFHY JOSJE DEEKEENS

Microorganisms are everywhere, key players in the ecosystem. Life is not possible without them.’ This is Professor De Vos’s explanation for his passion for ‘tiny creatures’. What is more, he says, you can manipulate microorganisms so that they make useful things. ‘You can get microorganisms to do tricks in test tubes that they couldn’t do in their natural environment. The pharmaceutical and food industries are based on microorganisms. They are used in fermentation processes in foodstuffs, for example, and they can be used in the mass production of chemicals, in medicines and as water purifiers.’

De Vos is a high-powered scientist who not only publishes prolifically, but also knows how to apply science practically. ‘I am results-oriented by nature; I want to see something come out of research’, he says. And one of the ways he does that is to patent discoveries and participate via his holding in start-up companies such as GI-Health, MicroDish and AAK. This entrepreneurial spirit has earned him the title ‘most enterprising scientists in the Netherlands’, conferred by the Science Alliance.

The commercialization of science makes it accessible to a broader public, De Vos believes. For this reason, he established Applying Academic Knowledge (AAK), a company specializing in applying scientific knowledge and making it more broadly usable. ‘As a professor you have a social responsibility. I think it is important to add economic value to your research, because that accelerates and increases public acceptance of it’, he says. Of course, he also has scientific motives, but De Vos sees the university as a knowledge generator for society and for business. ‘Innovation is circulating money to make more money. We receive money, spend it, generate knowledge and use it to earn more money, and then generate more knowledge.’

MILLIONS OF PETRI DISHES
Two years ago, De Vos set up MicroDish, a company based on the discovery that you could grow microorganisms on a layer of aluminium oxide. De Vos and his colleagues developed a tiny plate, just a few square centimeters in size, which holds millions of microscopic Petri dishes for breeding bacteria. The traditional Agar dishes, which have been in use for more than a century, only hold a few hundred. ‘With a microdish you can analyse the growth of bacteria much faster and more efficiently’, says De Vos. The microdish is not only more efficient, but also more sustainable. ‘You don’t want to know how many Petri dishes a hospital gets through in one day. With the microdish that mountain of waste can be reduced considerably.’

TRANSLATING IDEAS
Innovation is not something you do alone, De Vos is convinced. It demands a certain mindset and you have to be able to collaborate. ‘I have learned a lot from my colleagues in the business world. The thing is to translate knowledge and ideas into a product.’

Another essential factor is a good overview. ‘You need a kind of helicopter perspective. It is important both to make discoveries and to know how you can apply them in practice. I can do both to some extent and I am learning more every day.’

To be successful, De Vos says you must not be afraid of failure, or of hands-on work. ‘You have to stand with both feet on the ground. And you can’t say ‘industry is dirty’. Even idealists cannot close their eyes to the fact that innovation and research have to make money in the end, seen from the point of view of society and industry. So the social relevance of my work is partly economic.’

De Vos keeps a look out for developments in the world of microbiological research. ‘In my advisory role I steer these trends to the best of my ability. If it works, you are in business’, he says. ‘I have put a lot of effort into advising the EU on the setting up of research programmes in the field of microbiology. The agenda for the next ten years is clear. Now we can sign up for those programmes ourselves.’

WILLEM DE VOS (1954)
- 1987: Appointed part-time professor of Bacterial Genetics at Wageningen University; became Professor of Microbiology in 1994.
- 2007: also appointed Distinguished Professor at the University of Helsinki, Finland.
- More than 25 patents to his name, including several related to the microdish (www.microdish.nl).
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Fred Bulk and his wife have been living in Vijfhuizen, near Haarlem in the west of the Netherlands for twenty years. He chairs conferences, workshops, information evenings and debates about governments, organizations and companies. He also conducts weddings – a total of five hundred before this year is out. ‘This work gives me energy. I applied for it ten years ago, because I thought it would suit me.’

After completing High School, Bulk did not really know what he liked. After three months studying law in Rotterdam – ‘where I wondered every day what I was doing there’ – he got a job in the agricultural department at Unilever. Together with four colleagues, all Wageningen graduates, he compiled data for policy papers. ‘Until after five years I realized that I didn’t want to fill in figures for the rest of my life.’ He could see himself making a go of the then agricultural college, so off he went to Wageningen in his collar and tie. ‘I just wore out my office clothes’, he laughs, running a hand over his balding, suntanned head. He looks back on carefree student days, during which he became a father. ‘I had a grant and a job on the side as a taxi driver, and my wife was working.’

Bulk specialized in environmental studies. ‘That was the era of the Club of Rome.’ This body issued its famous report Limits to Growth in 1972. Bulk followed courses on environmental law and policy and general agricultural economics. ‘For practical reasons too: at least I would be able to get a job in the Netherlands with that.’

LONG HAIR AND BEARD

Bulk’s Wageningen classmate Frank Bakx, by contrast, had no interest at all in a job in the Netherlands. He lives in the Rwandan capital Kigali – ‘a city with pavements, working traffic lights and a pleasant climate’ – where he helps microcredit organizations with improving their companies and their products. The long hair and beard he sported in his student days have disappeared, but his drive to work towards a fairer distribution of wealth has not. It is still what motivates Bakx’s work. ‘I love to do work which you know will be of some use or value to other people.’ The agricultural economics graduate and his wife have been living in Kigali since last year, and he works with microcredit organizations in Rwanda, Burundi and Eastern Congo. He advises primarily on how to improve internal organization, product development, business planning and monitoring. ‘I am quite often on the road, and I do a lot of coaching in the field.’

As a student he already focused on the tropics, and followed courses on extension, tropical livestock and development economics. ‘The big student protests in Europe were just behind us. Students were rebelling against the established order and their parents. You were looking around for what else the world had to offer. For me it was important to try to do some good overseas.’ His first job was with an American volunteer organization, working in southern Sudan where he wanted to get farmers organized around a grain mill. This posting came to an unexpected end when Bakx’s car skidded out of control. His right arm had to be ampu-
LIFE AFTER WAGENINGEN

FRED BULK

Age: 66
Studied: Agricultural economics, 1970-1978
Works: chairing meetings and conducting weddings
‘The facilities there were so basic that there was no alternative. My passenger had a broken ankle; his foot was taken off. Anyway, I had such a complicated fracture that even in the Netherlands there would have been no certainty of getting full function back.’ After rehabilitation and being fitted for a prosthesis in the Netherlands, Bakx found a job with development organization SNV. ‘I did not want to let myself be put off by the accident. You can do this work with one arm too. And the director of SNV had a prosthetic forearm himself, which created a bond.’ Bakx’s job was managing volunteers in Burkina Faso and later in Cameroon, after which he went to Zambia for four years with the Directorate General of International Cooperation (DGIS). ‘After ten years in the tropics, my wife and I looked for work in the Netherlands so as not to become totally alienated from our own country and culture. I then learned banking with the Rabobank.’ By so doing, he trod in his father’s footsteps – his father was an economist with a bank. Bakx did not have children himself; he did not want them. Because his economics course included a number of technical modules, and through meeting students doing many other subjects, Bakx gained a broader education. ‘I know a bit about cattle feeds and fertilizer, technology and biology.’

**RESTLESS NO MORE**

Bakx’s fellow student Bulk’s first job was closer to home in Twente, in the eastern Netherlands, where he became environmental policy officer. ‘In those days garbage was just collected and dumped, but my boss wanted to do something with it. So a recycling shop and glass collection points were set up.’ But Bulk did not stay long. ‘After Unilever I had decided I never wanted to stay anywhere longer than one thousand days.’ And so as a young civil servant he trailed his family around the country, to Zoetermeer, Maastricht and Vijfhuizen. ‘I felt a sense of urgency, because of being five years behind.’ He only lost his restlessness after settling in Vijfhuizen. As office head at the provincial headquarters, he was always being faced with new issues to tackle. Having worked on waste separation and recycling in Zoetermeer and on the cleaning up of used car dumps in Limburg, he was now responsible for supervising trainees and enforcing the regulations. Waste was still the recurring theme of his work. ‘That is nice and concrete. I’m not so keen on the general overview.’ Nor is he a fan of the ‘makeable society’ philosophy espoused by the Dutch left wing in the nineteen seventies. ‘Society is not makeable’, he says. As the ‘garbage expert’ in the province, in the nineteen nineties Bulk began to be asked to give talks and then to chair discussions. ‘That was so enjoyable that I said they could ask me more often.’ And that’s how it went. ‘It keeps you on your toes, but it’s nice work. At the end of a public consultation meeting I want people to go away feeling they were really listened to. With me as chair, you don’t get away with an answer like ‘that is just what is in the policy plan.’ For the past five years Bulk has been working freelance. ‘Even though I believe that you should never get worked up about things you can’t do anything about yourself, all the reorganizations at the province did get on my nerves. I took early retirement and decided there were two things I wanted to do: chair meetings and marry people.’

**PAYING OFF DEBTS**

People in Rwanda are very receptive to advice and support, Bakx has noticed – even if not all his advice is followed. ‘Rwandans want to move forward after the genocide of sixteen years ago. The government is also beginning to see the importance of microcredit for the development of agriculture. It is just that the credit providers are not yet geared to it. Loans are still usually provided for ten to twelve months, and you have to start paying back straightaway. But a farmer prefers short-term loans and wants to pay them off in one go when he sells his harvest. The sector is still young though and they need to develop new products and visit farmers more to get an impression of their creditworthiness.’ Bakx wants to stay two more years in Rwanda. ‘I’m far from ready to retire, but I do want to cut down gradually. I’d like to do that by doing shorter missions and some longer-term advisory work with larger institutions overseas, but more from a distance.’ Bulk wants to carry on working for a while too. Looking back, he says he should have taken things into his own hands earlier. ‘I was always looking for what fitted me. The fact that I’ve been able to do so much just shows that with a Wageningen degree you can go in many different directions. Whereas at other universities you learn what a pan is and what butter and eggs are, at Wageningen you learn to fry an egg.’ If his father had got hold of him when he was twelve and started teaching him his own trade – he grew conifers – no doubt he would have become absorbed in that, says Bulk. ‘But he was broad-minded and thought that children should decide on their future themselves.’

**WHERE DO AGRICULTURAL ECONOMISTS END UP?**

The seventeen graduates who started in 1970 have worked in private services, government and education. The statistics up to 2008 show that many economists and consumer scientists work as policymakers, project leaders and managers, researchers and teachers. Among more recent graduates, one third work in business.

*This year for the first time alumni celebrating their fortieth anniversary are being invited for a reunion at Wageningen University on Saturday 6 November. www.alumniportal.nl*
FRANK BAKX

Age: 58

Studied: Agricultural economics, 1970-1977

Works: Advising on microcredit at the Rabobank Foundation
‘In Togo we have a profound respect for the dead’
Anoma Lokossou feels privileged. Her PhD research on the pathogen phytophthora was funded by a legacy from an anonymous donor. Text Astrid Smit  Photography Guy Ackermans

Anoma Lokossou obtained her PhD at the beginning of June for her research on genes that can protect potatoes against the pathogen phytophthora. The research was made possible by a legacy from an anonymous donor who gave well over three hundred thousand euros to the Wageningen University Fund in 2004 for research on ‘genetic modification and plant protection.’ Lokossou: ‘I come from Togo, where we have a profound respect for the dead. To me, the legacy gave my research a spiritual dimension. As if the donor had set me on the right path and said, ‘it will all work out’.

Phytophthora is a pest affecting potato cultivation. The only way to control it is by spraying crops and cultivating resistant potato varieties. These are obtained through traditional breeding, but that is a long-term process and far from ideal. Which is why the Laboratory for Plant Breeding at Wageningen University is investigating whether genetically modified potato varieties could be the way to defeat this pest.

SPRAYING SUPERFLUOUS
By taking resistant genes from wild potato varieties and building them into existing cultivars, researchers hope eventually to render spraying superfluous. The research focuses above all on cigenesis: only genes which are closely related to those of the existing cultivar are built in. The expectation is that cigenesis will meet with less resistance than traditional genetic modification with DNA that originated in a different species.

MAMMOTH TASK
Lokossou was assigned to work on the identification of five resistance genes which belong to one cluster and are therefore very similar. ‘Other PhD researchers before me had traced these resistance genes in a number of wild potato varieties in South and Central America’, she explains. It fell to her to extract them from these varieties, to clone them and to build them into existing cultivars. A mammoth task, but Lokossou managed it. She went on to research whether these five resistance genes do what they are supposed to do: defend the potato plant against its chief attacker. That turned out to be the case, but not for all the sixteen tested types of phytophthora that are found in the field these days. The genes can cope with some of them but not with others. This means that just one resistance gene is not enough to make a plant fully resistant. It needs three to five of the genes, preferably from different clusters. Only then is the plant safe from all types of phytophthora. ‘Our dream is that farmers will soon be able to choose from potato varieties with various spectra of resistance. They can check which types of phytophthora are present in a field and take the appropriate cultivar from the shelf’, says Lokossou.

She is proud of her research results, which have given her more insight into the arms race between potato and phytophthora, and make a contribution to sustainable potato farming. Lokossou: ‘I hope that spraying will no longer be necessary in the future.’ Graduating with her PhD was important to her personally too. ‘My career is important to me. I have learned here to solve complex problems. At the start I saw a huge mountain in front of me, but if you divide the problem into smaller pieces, step by step you arrive at a solution.’

This experience has also helped her with providing clean drinking water in the village of her great grandfather in Togo. ‘Over the past year, together with my husband, my family, friends and local residents, I have managed to get two water pumps installed there’.

She is not going back to Togo yet; she thinks she can do more for her homeland from the Netherlands. And she has already landed her next job at the Laboratory for Plant Breeding: a postdoc position for two and a half years. Her task is to further decode the genetics of phytophthora. This time without any patronage from beyond the grave. • www.wuf.wur.nl
The Wageningen student residence Hoevestein celebrates its 40th year this year. Ex-occupant Roelof Kleis (47) revisits ‘his’ old room in flat number 2c. In his day you and your flatmates ate together like a family; the 2010 occupants ‘sometimes have a chat in the kitchen’.

‘We were like a family’

The first surprise is that room 7 is not my room! After renovations to convert one of the bedsits into a kitchen, my room 7 became room 6. What was our kitchen is now a laundry room. And what about the phone? My hostess Geeske Heringa, the current occupant of room 6, bursts out laughing. Phone? I can see her wondering which planet I am from. ‘There are still a few flats in Wageningen with a communal land line,’ she says, ‘but not here.’

So Heringa (22) lives in ‘my’ room, and has done for well over a year. She is not a Wageningen student but a qualified nurse, trained in Ede. That’s possible these days, she explains: ‘Wageningen student accommodation is available to students from Ede too.’ She is now doing temp nursing at the hospital in Ede, which makes her the only working resident of her flat. There are four Wageningen University students and two from Van Hall Larenstein: three guys and four girls in total. Even the gender ratio is up-to-date.

The room itself is changed out of all recognition. My lime-green walls – that was really hip at the time – are
now a neutral cream colour. In the place of my blue armchair – bought for 25 guilders at the Emmaus second-hand shop – stands a pale pink sofa. My carpeting has been replaced by parquet, although on closer inspection it turns out to be printed linoleum. A small table and a bed complete the furnishings: tasteful enough, I must say. Geeske Heringa pays 245 euros and 53 cents per month. That is about the same as I paid, only that was in Dutch guilders. On top of that came a contribution to ‘communal shopping’.

And that turns out to be one of the major differences between then and now. ‘We rarely eat together’, Heringa tells me. ‘Everybody has their own programme. You do sometimes have a chat in the kitchen if you happen to be cooking at the same time. Since I’ve been living here I think we have eaten together three times. Yes, we live rather individualistically in this flat.’

**SLEEPING TOGETHER**

In my day we did almost everything together. Eating, drinking, playing Risk. Even sleeping in some cases. What is more, the student from room 4 is still sleeping in my bed. But now in Bennekom and officially married. Actually, we were just like a real family, with the kitchen as living room and lively focal point.

I recall the practical jokes we used to play. On Marc, who was kept awake night after night with an LP of birdsong played under his window. He only began to suspect something on the third night. And Kees, who was given an outsize liver for a Sinterklaas surprise at the traditional 5 December celebration when the Dutch play practical jokes on each other. Kees drank a bit too much, you see. And Frank, whose smart new suit suddenly disappeared. On his graduation day! I can still see him standing on the stage at the Aula in his everyday clothes. He was handed his suit with his degree certificate.

But I also remember Polish Grace, with her dreadful perfume. How she was found one Sunday morning with slit wrists. And the refugees Aklilu and Mohammed, who joined our little family temporarily. I wonder what became of them?

Relationships in the flat may not be as close these days, but Geeske Heringa is quite happy at number 2c. ‘I was in a private house in Wageningen Hoog before this. There’s more contact here. And it is ideal that you can get to Ede and the town centre so easily. I think I’ll live here for another year. But I am on the waiting list for rental housing. What I’d really like is a little house with a garden not too far from here. And a nice permanent job of course.’

Which is just what I have now. ■
Business People for Business People

The alumni portal is offering a new tool for graduates wanting to start their own business: Business People for Business People.

Starting entrepreneurs among Wageningen alumni can benefit from the expertise of the many experienced business people among Wageningen University’s alumni network, both in the Netherlands and in other countries. People starting their own business can submit their questions through the portal and make contact with alumni through the ‘business people’s inquiry service’.

www.wageningenalumniportal.nl/en/Mycontributions/Alumniforalumni.

Wageningen Alumni Portal
Digital meeting point for 36,500 Wageningen graduates and members of KLV

► Find old university friends and people in your year
► Extend your network
► Exchange information and experiences
► Read news for and by alumni

Science Shop celebrates 25th anniversary

The Wageningen Science Shop celebrated its 25th birthday on 17 June. Science Shops are university-based organizations that do scientific research for and with civil society organizations and citizens.

Since 1985, the Wageningen Science Shop has carried out around 250 projects for community organizations without the resources to do their own research. The former Dutch Minister of Housing, Spatial Planning and the Environment Jacqueline Cramer handed out the international Science Shop prize for the best project in the past two years in the Netherlands and Belgium.

Antwerp won with its research on reading aloud and attitudes to reading.

The Wageningen students Andries Middag and Matthijs Timmermans came second with their investigation into the widening of the N340 provincial road. In their presentation the two, who had graduated by then, showed how this project boosted their careers. Info: Gerard Straver, wetenschapswinkel@wur.nl

Wageningen in the world!

Wageningen World reaches the four corners of the globe, as this photo taken at the World Expo in Shanghai shows. Are you reading this magazine a long way from Wageningen too? Send your photographic evidence to wageningen.world@wur.nl.
Developing countries are scattered with ‘white elephants’: the sorry remains of expensive failed western development projects. Why did they fail? Usually because the specialists involved paid too little attention to local conditions and ignored knowledge from fields outside their own. Result: the inappropriate innovation lies rotting – one more white elephant.

Time to change all that, thought a group of Wageningen researchers ten years ago. And their chosen line of attack was a new international research programme INREF, based on the belief that collaboration with local people would provide a solution. In a booklet published this year, the Wageningen and local researchers report on ten years of interactive research. INREF stands for the Interdisciplinary Research and Education Fund of Wageningen University, part of Wageningen UR. All the programmes that INREF has been running since 2000 consist of a collaboration between local partner institutes and Wageningen University. Young doctoral students from poor countries who are working in the partner institute in their region come to Wageningen for some PhD courses and to write their research proposal. They then implement their plans in their own country before returning to Wageningen to write up their theses. This construction maximizes the interaction between professionals in Wageningen and local partners. After graduating, the researchers go back to their institute to put what they have learned into practice. The idea is that their research and what they do with it should improve the quality of life in local communities.

Twelve major programmes are financed within INREF, with activities in 23 countries in Asia, Africa and Latin America. Fifty three PhD students have successfully completed their theses so far, and 65 more are still working on ongoing projects. Research funding has been reserved for the programmes from Wageningen University’s own budget up until 2017. Further information at www.inref.wur.nl, also for a PDF version of the booklet Journey into Interdisciplinarity – Ten years of INREF experience.
Join the Alumni Chapter in Shanghai

The Wageningen Alumni Shanghai Chapter WASC aims to provide a forum for all Wageningen University graduates and students in Shanghai: a space for exchanging ideas on environmental sustainability, city planning, agricultural development and other subjects through which we can contribute to creating a green world and a harmonious society. WASC is a voluntary network, with the goals of supporting all Wageningen graduates and students in Shanghai and fostering relations and activities among its members. WASC organizes regular events, workshops and other activities in Shanghai, focusing on alumni networking, information sharing and social events. WASC is looking forward to meeting all alumni in Shanghai. Would you like to join? Please send an e-mail to the coordinator of this chapter, Liu Si. si.liu@live.cn

WAGENINGEN UNIVERSITY

Wageningen makes lipdub

Wageningen University has its own lipdub, a music video clip in which a big crowd of people mouth the words of the song. Lipdubs are all the rage among universities internationally as a way of getting students to promote their university creatively. In the Wageningen lipdub, more than one hundred students are filmed in a single take as they each perform part of Tik Tok by Keisha, with mime, dance and acrobatics. The results can be viewed on http://www.youtube.com/watch?v=tuX-vrOrZWk
Artificial life: how far should we go?

Last spring, an American institute proudly presented ‘the first artificial life form’, a synthetic cell. It was major news, but also raises a lot of questions. What prospects are there with this new discovery, and what are the risks? The World Lecture on synthetic biology on 25 October will look at this issue in more detail.

Synthetic biologists work on the redesign of existing cells and the construction of new, artificial cells. They hope in this way to create microorganisms that can get rid of waste materials, for example, or produce biofuel, make drugs or even create new DNA material to order. The American J. Craig Venter Institute managed to be the first to successfully place an artificial genome in an empty cell. But there are potential risks attached to this development. For example, it could lead to new pathogens. This ‘tinkering with life’ also prompts social and ethical questions. When are such activities appropriate and when are they crossing a line? Can you patent a new organism? Two experts will present their views during the World Lecture: Vitor Martins dos Santos, professor of Systems and Synthetic Biology at Wageningen University, and Frans Brom, head of Technology at the Rathenau Instituut, a Dutch institute for research and debate about science and technology, and professor of the Ethics of Technology Assessment at Utrecht University. www.wereldlezingen.nl (in Dutch)
Dr. Raoul Bino, PhD WU 1986, has been appointed Managing Director of the Agrotechnology & Food Sciences Group (AFSG) at Wageningen UR by the Wageningen UR Executive Board. 1 July 2010.

Prof. Ton Bisseling, PhD WU 1980, professor of Molecular Biology at Wageningen University, has been appointed a member of the Royal Netherlands Academy of Arts and Sciences (KNAW). 13 September 2010.

Prof. Tiny van Boekel, MSc WU in Food Technology 1977; PhD WU 1980, has been appointed vice-chairman of KLV Wageningen Alumni Network. Van Boekel is a professor in the Product Design and Quality Management Chair Group and is Scientific Director of the Food Technology, Agrobiotechnology, Nutrition and Health Sciences Graduate School (VLAG). 8 June 2010.

Pieter Gooren, MSc WU in Tropical Irrigation and Soil and Water Management 1979, has been appointed a Dutch Ministry of Agriculture adviser with the Permanent Mission of the Kingdom of the Netherlands in Geneva. His field of work covers the WTO and other international organizations in Geneva. August 2010.

Dr. Anton Haverkort, MSc WU in Agricultural Plant Breeding 1978; PhD University of Reading UK 1985, has been appointed Extraordinary Professor at the University of Pretoria, South Africa, working in the Plant Production and Soil Science department of the Natural and Agricultural Sciences faculty. Haverkort's main activities will be supervising research on more sustainable potato cultivation and giving several lectures a year. 1 May 2010.

Prof. Wilco Hazeleger, MSc WU in Meteorology 1994; PhD Utrecht University 1999, has been appointed Professor by Special Appointment in Wageningen University’s new Climate Dynamics chair group. 1 June 2010.

Dr. Martijn van der Heide, MSc WU in Economics of Agriculture and the Environment 1997; PhD VU University Amsterdam 2003, has been appointed Green Plus lecturer on Integrated Countryside Stewardship in the Forestry and Nature Management programme at Van Hall Larenstein University of Applied Sciences. 1 June 2010.

John Janssen, MSc WU in Horticulture 1974, has been appointed Green Plus lecturer on Integrated Countryside Stewardship in the Forestry and Nature Management programme at Van Hall Larenstein University of Applied Sciences. 1 June 2010.

Dr. Rien Komen, MSc WU in Economics of Agriculture and the Environment 1995, PhD WU 2000, has been appointed Director of Teaching Quality and Operations at Van Hall Larenstein University of Applied Sciences. He is also Director of the Wageningen Business School. 1 September 2010.

Prof. Joop van Lenteren, PhD Leiden University 1976, has been awarded a Lifetime Achievement Award for his research on new options for biological pesticides. 9 June 2010.

Prof. Erik van der Linden, PhD Leiden University 1990, professor of Food Physics at Wageningen University, has been appointed Programme Director of the Sensory & Structure projects at the Top Institute for Food and Nutrition (TIFN) in Wageningen. 1 September 2010.

Prof. Joop Luten, PhD Utrecht University 1980, professor of Molecular Biology at Wageningen University, has been appointed a member of the Royal Netherlands Academy of Arts and Sciences (KNAW). August 2010.

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professor of Toxicology at Wageningen University, has been appointed a member of the Royal Netherlands Academy of Arts and Sciences (KNAW). 13 September 2010.

Dr. Jeroen Saeij, MSc WU in Bioprocess Technology 1997; PhD WU 2002, has been named Pew Scholar in the Biomedical Sciences by The Pew Charitable Trusts. This programme gives 21 talented scientists the opportunity to extend their research.

13 September 2010.

dr. Jeroen Saeij, MSc WU in Bioprocess Technology 1997; Phd WU 2002, has been named Pew Scholar in the Biomedical Sciences by The Pew Charitable Trusts. This programme gives 21 talented scientists the opportunity to extend their research.

18 June 2010.

Dr. Gitte Schober. MSc WU in Phytopathology 1993; PhD WU 1998, has become a board member of the KLV Wageningen Alumni Network. Schober is programme coordinator at Wageningen University for the DAFNE project (Dutch Agro-Food Network of Entrepreneurship), soft landing coordinator for USA & Canada at Technopartner, set up by the Dutch Ministry of Economic Affairs, and programme coordinator at the Wageningen Pre-Seed Foundation for the SKE grants for the commercial exploitation of knowledge.

8 June 2010.

Dr. Derk Jan Stobbelaar, MSc WU in Environmental Protection 1990, PhD WU 2003, has been appointed Green Plus lecturer on Integrated Countryside Stewardship in the Forestry and Nature Management programme at the Van Hall Larenstein University of Applied Sciences. 1 June 2010.

Albert Vermuë, MSc WU in Agricultural Plant Breeding 1992, former Director of Fisheries at the Dutch Ministry of Agriculture, Nature and Food Quality, has been appointed Managing Director of the Dutch Association of Water Management Authorities. 7 June 2010.

Prof. Willem de Vos, PhD University of Groningen 1983, professor of Microbiology at Wageningen University, has been awarded the prize for the ‘Most Entrepreneurial Scientist’. 8 June 2010.

Prof. Berend Wierenga, MSc WU in Rural Economics 1968; PhD WU 1974, was made an Officer in the Order of Orange-Nassau on his retirement as professor of Marketing at the Rotterdam School of Management, Erasmus University Rotterdam. Earlier this year Wierenga was awarded the Ad Fontes Medal by Erasmus University as well as receiving the Inaugural EMAC Distinguished Marketing Scholar Award from the European Marketing Academy (EMAC). 15 June 2010.

TRACING ALUMNI

Wageningen University and KLV Wageningen Alumni Network, strive to remain in contact with all Wageningen UR graduates. Unfortunately, we lack some addresses. Do you know the address of any of the alumni mentioned below with year of graduation? If so, please send this information to alumni@wur.nl

Dr. I.M. Buizer, 2008
J.R. Caicedo MSc PhD, 2005
S. de Caratt PhD, 2007
V.C. de Carvalho Acacio PhD, 2009
Catalin Constantin Tanase PhD, 2004
B.C. Celis Gamboa PhD MSc, 2002
Celso Von Randow PhD, 2007
E.J. Chaggu PhD, 2004
T. Chaidamsari PhD, 2005
T. Chaimdamsari PhD, 2005
S.M. Chalak Haghighi PhD, 2009
M. Charlaganov PhD, 2009
D.S. Charleston PhD, 2004
O. Chavalparit PhD, 2006
Dr. K.Y. Chen, 2003
Dr. L. Chengwei, 2005
Dr. E.E. Chidenga, 2003
R. Chikowo PhD, 2004
Dr. J.M.M. Chin a Paw, 1999
Dr. L.G. Chitarra, 2001
M.L. Cocks PhD, 2006
T.L.P. Couvreur PhD, 2008
N.P. Creusot PhD, 2006
Dr. N. Danalatos MSc, 1993
M. Derrien PhD, 2007
Dr. S. Devir, 1995
Dr. A.A. Dhal PhD, 2007
Dr. R.A. Dimitrov, 1999
M.D. Dominquez Garcia PhD, 2007
A. Dosio PhD, 2005
R.A.M. Dossa PhD MSc, 2001
M.M.M. Duqquah PhD MSc, 2002
Dr. J.F.L. Duval, 2003
O.V. Eliseeva PhD, 2006
Er Ah Choy PhD, 2007
A.W. Eshefte PhD, 2007
Esi Awah Asare PhD, 2006
E.S.E. Ewis Omran PhD, 2007
Dr. G. Fangyou, 1998
M. Fischer MSc PhD, 2006
M. Forlenza PhD, 2009
R.A. Fort Mayer PhD, 2007
L.J. Fox PhD, 2009
G.N. Francesconi PhD, 2009
Dr. P. Frassinetti Feitosa Cavalcanti, 2003
Dr. A.B. Galindo, 2004
Xiaopeng Gao PhD, 2007
M. Gas PhD, 2006
Dr. Z. Gebreegziabher Debessai, 2007
Gebremedhiin Woldewalid Teklu PhD MSc

New Director Wageningen UR China Office

As of 1 May 2010, Dr. Hu Dinghuan was appointed Director of the Wageningen UR office in China. Dr. Hu Dinghuan succeeds Dr. Tan Shuhao. Dr. Hu was born in Shanghai and gained a BSc at the Shanghai Foreign Studies University, an MSc in Management Science in Japan and a PhD in Agronomy at Gifu National University in Japan. In 2000 he came to Wageningen to study agro-food supply chains. Currently, Dr. Hu is professor at the Institute of Agricultural Economics and Development at the Chinese Academy of Agricultural Sciences. He has a long track record of research and publications on Agri-food Supply Chains. His latest involvement was with an Asia Facility project: Linking Science and Business to Enhance Chinese Agri-Food Chain Development.
Chinese horticulturalists have green fingers just like their Dutch counterparts, but it takes more than that to grow good quality lilies. Practical skills related to soil tillage and irrigation are useful too. To help lily growers refine their skills, six staff members at Van Hall Larenstein (VHL), part of Wageningen UR, made regular trips over the past two years to Yunnan province, the centre of the Chinese flower trade. They worked there together with Dutch bulb supplier Van den Bos Flowerbulbs, the horticulture department of Dutch training centre PTC+, and two Chinese partners to set up a ‘train the trainers programme’. Twenty participants were given practical training on growing lilies, but the main focus was on how to pass on this knowledge to local farmers. According to Steven Starmans and Jos Leeters of VHL, most Chinese education is primarily focused on theory, and hands-on vocational education is in its infancy. An agreement is due to be signed in September with a Chinese partner who will take over the practical training and develop it further.