Flanders
is agriculture and fisheries

Annual report 2016

ILVO
Flanders Research Institute for Agriculture, Fisheries and Food

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Mission & Vision

ILVO's Mission
ILVO is an independent scientific research institution and service provider of the Government of Flanders. ILVO works collaboratively to promote sustainable agriculture, fisheries and agro-food production in Flanders, Belgium, Europe and the world.

ILVO's Vision
Working in a proactive, objective and ethical way, ILVO researches new and existing trajectories of optimisation and increased sustainability for the actors in agriculture, fisheries and the agro-food chain as well as for the broader rural environment.

In doing so, ILVO engages in dialogue with policymakers, its stakeholders, and society on a regular basis; this commitment is part of ILVO's intention to fulfil an exemplary role.

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Dear reader,

The 2016 ILVO Annual Report is a special one because this year, ILVO turned 10 years old. ILVO in its current legal form has existed for a whole decade. ILVO got its name after agriculture and fisheries research was transferred from the federal to regional level. Starting in 2017 we now add the word "food" to our research and changed our nickname slightly, now calling ourselves "Flanders Research Institute for Agriculture, Fisheries and Food."

The ILVO staff celebrated this birthday with a collective visit to the Ghent Floralies and invited our first artist to ILVO for to kick off the ILVO "Agri-culture" series. A big success. Our participation in the Open Businesses Day, when more than 5000 people visited our campus, was an excellent way to showcase ILVO's range of agriculture, fisheries and food research to a broad audience.

We are increasingly teaming up with research partners beyond our own campuses. Our ambition is to be one of the driving forces behind Agrolink Flanders. We made a concerted effort to support legal recognition of the partnership, which now counts no fewer than 18 agricultural research partners in Flanders.

In 2016 two new partnership agreements were signed. The first was with the Hooibeekhoeve, an extension research center focusing on dairy farming in the region of Antwerp. The second was with Flanders Institute of Biotechnology (VIB). When signing that agreement, the Minister of Science Policy, Mr Muyters, expressed his high expectations for translating VIB's fundamental biotech research into the more applied research done at ILVO.

2016 was a year with a tight focus on climate. ILVO moved quickly to make our knowledge available to the Flemish Government. At the Flanders Climate Meeting on 1 December 2016, Minister of Agriculture and Fisheries Schauvliege announced the creation of a special center of expertise for climate, staffed and housed at ILVO.

In 2016, still other Flemish Ministers have graced us with a visit. In April, Minister Vandeurzen (Minister of Public Health) came to the Food Pilot to admire our work around functional foods.

In August, Minister-President Bourgeois emphasized the importance of ILVO, a semi-governmental institute, as a motor for innovation within Flanders economy. The reason for his visit was an outstanding example of technology transfer: the ILVO-built "Dry-On-Water®" was transferred to a Flemish SME.

In these pages, you will see that 2016 was a well-filled and fruitful research year. I hope that the enthusiasm of all of the ILVO staff as reflected in this report will also inspire you to search further for research information within our research database or will encourage you to take the first step towards a rewarding research partnership.

Joris Relaes

Research 2016




Theme

PLANT PRODUCTION

A bumper crop for ILVO breeding

ILVO has invested more than 80 years in plant breeding with a focus on grasses, clovers and cover crops. The breeders aim to release new, production-ready cultivars nearly every year that perform better than existing varieties in terms of growth, disease resistance, persistence, or nutritional value.

2016 was a great year for ILVO breeding. The newest ILVO breeds of perennial ryegrass, Italian ryegrass and timothy all received "excellent" ratings in the most renowned variety lists of the Netherlands, Germany and Switzerland. A fodder radish cultivar with double resistance against sugarbeet nematodes and root knot nematodes took the top place of the comparative variety trials. And the very first Festulolium variety was included on the Belgian variety list.

The turnover of the "Seeds" Business Unit broke its own record producing the first year of a pure new variety.

www.ilvo.vlaanderen.be
-> Brochure_ILVO_Seeds.pdf

BRANCHING (OF CHRYSANTHEMUMS) CAN BE INFLUENCED WITH LED LIGHTS AND PLANT HORMONES

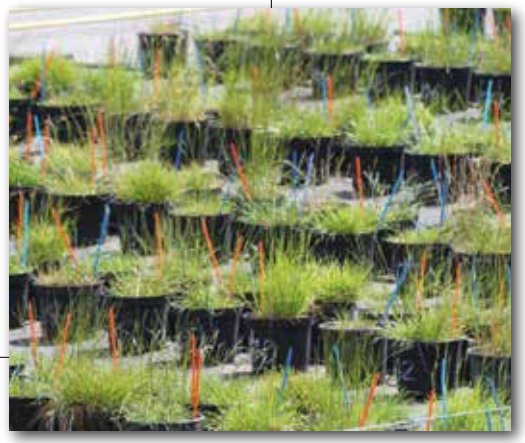
Recent doctoral research has shown that LED lights and plant growth regulators can be used to influence bud outgrowth. This doctoral study of ILVO – Ghent University researcher Robrecht Dierck has shown that branching (or the outgrowth of axillary buds), plays an important role in the determination of the plant's shape via a complex interaction between plant hormones and environmental factors such as light, temperature and availability of nutrients.

Using analysis of gene expression and plant hormones, Dierck gleaned fundamental knowledge about the mechanisms that plants use to control bud outgrowth. Experiments also revealed how plants react to different types of light and various growth regulators. Bud outgrowth can thus be stopped using a combination of blue and far-red light, or with an apical treatment with auxin, a plant hormone.

This knowledge may be useful for ornamental growers to influence plant shape without using the traditional growth inhibitors or labor-intensive pruning.

Less grass, more milk: Genetic research enables targeted breeding of perennial ryegrass with better cell wall digestibility

"By breeding perennial ryegrass, we can increase the amount of energy that cows get from the grass they eat", says Frederick Van Parijs, an ILVO-Ghent University researcher. From a genetic analysis of various types of ryegrass, he studied how best to target breeding of ryegrass to varieties that contain less of the difficult-to-digest lignin in their cell walls. By increasing cell wall digestibility, cows can get more energy out of the grass they eat, reducing their need for concentrates. This can increase their milk production by an estimated 2%, reduce rumen acidosis and also reduce nitrogen losses to the environment. Because grass is also much less expensive than concentrates, breeding a new elite cultivar with stable cell wall digestibility will improve farm profitability.



GOOD NEWS FOR VEGETABLE GROWERS: RISK OF SPREAD OF POSPIVIROIDS VIA WEEDS AND INSECTS ARE VERY LIMITED. VIROID INFECTION IS BEST AVOIDED BY DISINFECTION AND HYGIENE.

Pathogenic pospiviroids cannot spread to vegetable crops via weeds and insects, according to a recent doctoral study by ILVO-Ghent University researcher Noémi Van Bogaert.

Pospiviroids are miniscule pathogens that are very common in ornamental plants of the nightshade family. In those ornamentals, they do not cause any symptoms but if they spread to vegetable crops of the same family, such as tomato and potato, symptoms do appear and cause economic damage. Up to now, the manner in which the viroids spread to vegetable plants was completely unknown.

Therefore Noémi Van Bogaert studied the possible ways the viroids could spread, namely via weeds, insects or viruses. This knowledge can now be used for improved risk analysis and specific advice for growers.

Farm equipment for experimental fieldwork, experimental farm and research

No fewer than 6 items of farm equipment were purchased in 2016: a self-propelling manure cart with adjustable tire inflation, a compost wagon, a thresher, two tractors that had long been under lease, and a fully modernized sprayer.

To determine minerals and heavy metal concentrations, the Soil and Substrate lab has updated its ICP machine. The purchase of a powerful thermal camera that can be attached to the ILVO drone now supports the various precision agriculture research projects.

IN VEGETABLE GROWING, TILLAGE AND N FERTILIZATION CAN BE BETTER MATCHED TO SOIL QUALITY. RESULT: IMPROVED PRODUCTION POTENTIAL, HEALTHY SOIL AND FEWER N LOSSES

"Nitrogen fertilization in vegetable production can be matched better to the quality of the soil and the tillage system used," according to ILVO-Ghent University researcher Koen Willekens.

Using a series of field trials and measurements on farms, he refined the knowledge about N availability in the soil and uptake of N in vegetable growing. He used this information to study the effect of soil improvement measures such as no-till and the use of compost or green manures on the soil quality and N utilization. In organic vegetable growing, grass/clover has an important role as either cut-and-carry fertilizer or as a cover crop, but only with well-considered decisions about the method and timing of destruction.

new project 2016

COMPACT ORNAMENTALS WITHOUT GROWTH INHIBITORS

Co-cultivation with *Rhizobium rhizogenes*, a technique developed at ILVO - Ghent University, is a new way to achieve compact growth in a range of ornamental crop types. Not only is the technique being evaluated and optimized, a "learning network" is also being developed to quickly disseminate this new knowledge to Flemish growers and support the innovation within the ornamental sector.

VARIETY TESTING ON FORAGE MAIZE STUDIED IN-DEPTH WITH RESEARCH ON NUTRIONAL VALUE AND FUNCTIONALITY OF STAY-GREEN CHARACTERISTICS

Evaluation of forage (silage) maize during the official Belgian variety tests results in a stable variety ranking at a harvest window of 29-39% dry matter. The current procedure for variety testing therefore holds up to scrutiny, according to a study of ILVO-Ghent University researcher Jolien Swanckaert. The procedure for the evaluation of forage maize, where all varieties are harvested the same day and analyzed for nutritional value immediately after chopping, has been under fire for years. Varieties are not all ripe at the same time and cows don't eat freshly-chopped plant material.

During her doctoral study, Jolien Swanckaert thus examined the methods that are currently used in variety testing. She included the differences between varieties, the functionality of the stay-green characteristic, and the effect on nutritional value of the changes that happen during ensiling. She further examined the effects of plant type, harvest date and ensiling on the variety ranking.

Surprising soybeans: 5.1 tons/ha in 2016 field trial!

As part of ILVO's research into local soybean production, in 2016 a field trial with 16 early maturing soybean varieties was conducted in Merelbeke. Varieties were sown on the 5th of May. Favorable conditions during sowing were followed by heavy rainfall in the months May and particular June. The growing season continued with a normal July and August. September was exceptionally warm and dry. No lodging nor *Sclerotinia* damage was observed and soybean plants ripened well. Clear differences among varieties were observed.

Harvest took place on the 21st of September. Yields exceed all expectations: 5.1 ton/ha dry beans (moisture content of 15%) were harvested as the total mean of the trial.

Xylella fastidiosa, the newest enemy of crops and landscapes?

The plant pathogenic bacterium *Xylella fastidiosa* is native to the American continent. The organism was not diagnosed in the EU until 2013, when it was identified in desiccating olive trees in southern Italy. It was subsequently detected in other woody plants and elsewhere in the Mediterranean region. The pathogen resides in the water conducting vessels of plants en it is transmitted by plant sap feeding leafhoppers. The infection process is often erratic. It usually takes months for disease symptoms to appear, and *Xylella* can dwell in many plant species without infection.

ILVO explores the fitness of *Xylella* in model plant species under various environmental conditions. The research to assess the pertinence under our climatic conditions is financed by the Belgian federal government and the EU.

100,000 ha potato planted in Belgium? Not if, but when...

Belgium is a land of potatoes and French fries. On our plates, in the potato processing industry, and on the field. The question is not if, but when 100,000 hectares of potatoes will be planted in Belgium. Several ILVO research groups study this tuber and help the sector with their findings, which range from color and taste testing with freshly cut French fries (in the Food Pilot) to development of a *Phytophtora*-resistant Bintje (the Bintje+ project) to diseases and plagues that can threaten the crop. On 17 November the ILVO contact day for potato received a great deal of attention, in collaboration with the Extension Research Center for Potato Cultivation, PCA. Lectures on seed potato, soil, the most important nematode species, the nefarious *Meloidogyne chitwoodi,* bacterial rot, the exotic mold *Synchytrium*, the Y-WILGA virus and phytoplasmas, wireworms and Epitrix, and prevention using drones.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video
Wat is Agroforestry?

Diagnostic Center for Plants: 1/3 fewer analyses requested by FAVV

The Diagnostic Center for Plants (DCP) researches and identifies several types of plant diseases and pests. Approximately 30 ILVO plant health specialists are involved in many EU networks to expose and manage new threats. Another 30 technical specialized personnel help ensure successful development and support of the research findings. Effective detection methods must be worked out and immediately applied in the services performed by the DCP, benefiting growers, sellers of plant material, and governmental control bodies. Our analysis totals show that the budget cuts have led FAVV to request fewer controls, particularly on bacterial diseases on potato. In 2016, ILVO performed more than 18,000 analyses on a variety of plant pathogens.

	analyses FAVV	analyses for others	total analyses
bacteriology	2083	3683	5766
nematology	280	3637	3917
virology	290	3444	3734
entomology	409	223	632
mycology	328	3759	4087

Nematodes in Moroccan grain fields: detection and identification of the nematodes and resistance screening of wheat varieties benefit nematode management

Fast detection of various types of nematodes living on grain in Morocco and a major step forward for breeding of resistant wheat varieties. These are the results from the ILVO-UGent researcher Fouad Mokrini. That breeding step is more than welcome because grain cyst nematodes and root-knot nematodes are important causes of crop loss in grain-producing areas such as Morocco. By combining traditional and molecular methods, Fouad Mokrini was able to inventory nematodes in several Moroccan regions, identify them and determine their regional differences. The development of fast molecular identification tests for two *Praylenchus* species makes an important contribution to development of programs that can target and manage nematodes in grain.

Theme

ANIMAL PRODUCTION

CHOICE OF TYPE OF HEN AND RELATIVELY SIMPLE ADJUSTMENTS TO VOLIERE HEN HOUSES CAN GREATLY IMPROVE HEN WELFARE

The "volière" chicken house, or "perchery" in English, is growing in popularity because the different stories allow hens to express natural behaviors. Although this system has been proven to be a clear improvement for animal welfare over the now-outlawed cage systems, several problems still remain, such as painful picking behaviors, mortality, and breastbone and foot ailments.

Researcher Jasper Heerkens tested adjustments to the interior of percheries (e.g. ramps, grid material, width of openings, etc.) and the performance of various breeds. The results of the research offer possibilities to improve the welfare of hens in percheries, such as installation of ramps between stories. Different breeds show clear differences (metabolism, behavior, etc.) in how well they do in volière systems. A combination of adjustments to the interior of percheries, management, and breed will lead to a better match between the chicken and the housing system.

Final goal: to improve hen health and welfare in commercial percheries, better egg production and better farm profitability.

MEAT PIGS: SENSORS MONITOR THEIR WELFARE, HEALTH AND PRODUCTIVITY

Abnormal eating and drinking behavior in pigs can be discovered in early stages using a new sensor system developed by ILVO – KU Leuven researcher Jarissa Maselyne.

Unusual eating and drinking patterns can be a signal of underlying problems in terms of animal health and welfare, which can also signal production problems. With this system, problems such as fever or severe lameness can be discovered even after 1 day. "In the larger pig production systems, monitoring individual pigs just by looking at them is becoming more and more difficult. If you can add sensor monitoring then we think you get an important added value for the animal and for farm management.

The growing societal concern for animal welfare also points to a need for intensive individual follow-up of each animal, and this system answers that need."

Rabbit expert retires

Researcher Luc Maertens, an authority on rabbit husbandry, retired this year. His last symposium included an overview of the group housing system for meat rabbits which was optimized by the ILVO research team, demonstrated and communicated widely, and has now become the norm for Belgium. We are on the cutting edge of rabbit housing in Europe. Now ILVO will be reducing its rabbit research to a minimal level.

Three doctorates in small animal husbandry were achieved. From the study on perchery (volière) hen housing, welfare issues surfaced such as breast bone fractures, footpad problems and high dust levels. ILVO teamed up with the ag sector to look for solutions. This was also true for the study on animal-friendly transport of chickens, where the catching process was highlighted as a high-risk phase of transport. In the third doctoral study about smarter feeding, ILVO discovered that the enzyme xylanase could have a prebiotic effect in broilers.

CLEANING AND DISINFECTION OF ANIMAL HOUSING: PROBIOTIC CLEANSING IS NOT AN EFFECTIVE ALTERNATIVE FOR CLASSICAL METHODS. BEST STRATEGY AGAINST PATHOGENS IS STILL GOOD CLEANING FOLLOWED BY TRADITIONAL DISINFECTION

Probiotic cleansing is not as effective as traditional cleaning and disinfection. These are the results of the ILVO-Gent University doctoral study by Kaat Luyckx. In theory the "good bacteria" in probiotics should take over the place of unwanted bacteria, so that classical disinfectants would have to be used less frequently and would thus lower the risk of resistance. In practice, it appears that there is insufficient competition between the bacteria: the "good" and the "bad" bacteria both have enough room and food to continue to develop.

The best strategy is therefore still a thorough cleaning followed by a disinfection step. Development of bacterial resistance to the disinfectants was not apparent in this study. Survival of the unwanted bacteria appeared to be linked to either insufficient cleaning before disinfection or possibly insufficient concentrations of disinfectant.

It is essential to perform a thorough cleaning with warm or cold water, followed by a drying-out period and a classic disinfection. Longer unoccupied periods after disinfection did not result in decreases in bacterial counts.

Slaughtering takes skill fixation methods for non-anesthetized slaughter of cows

When performing non-anesthetized slaughter (required for production of halal and kosher beef), alternative methods are available to fix the animals but they do require training of the personnel.

This is the conclusion from a European study performed as an answer to concerns about the animal-friendly nature of rotating fixation systems.

According to the researchers, training and best practice guidelines can greatly reduce animal suffering when fixing animals for non-anesthetized slaughter.

In From antibiotics to vaccines and biosafety: average € 2.67 more profit per delivered meat pig

Antibiotic use can be substantially reduced on closed pig farms by substituting biosafety measures and targeted vaccines, without threatening the profit margin. Farm simulations even suggest the likelihood for more profit per delivered meat pig, according to a long-term empirical study at nearly 50 closed pig farms in Belgium performed by ILVO and Ghent University.

There are convincing indications on pig farms that measures to improve biosafety, together with vaccines, may increase productivity without the negative effects of antibiotics (such as resistance). Such strategies are usually seen as being expensive. Surprisingly, this publication revealed that these strategies are not expensive and may even increase farmer profit.

The research results show that the economic profit per delivered pig for each of the typical farms did not decrease and in most cases, profit even increased. On average this represented an improvement of € 2.67 per delivered fattening pig. This positive impact even remained when fluctuating prices for pigs, piglets and feed were counted. The average improvement in profit is the result of a combination of factors: the productivity remained stable while lower mortality rates more than compensated for the cost of biosafety measures and vaccines.

Cattle vs. environment

Dairy farming has received lots of attention regarding the climate problem. ILVO has been gathering extensive information about how to reduce methane emissions by cows. The trade press and *PlattelandsTV* (or "CountrysideTV") reported extensively on the scientific results presented in a seminar on 6 October. The very first agricultural life-cycle analysis was performed at ILVO using an adjusted methodology. To be precise, it was an exergy-based calculation of resource use within a sustainability analysis of Flanders dairying.

The research on how to increase the efficiency of the dairy farm by optimizing various ration aspects continued in 2016 (ureum content in milk, protein stability in the raw materials, stability of starch in maize, etc.).

In terms of the ammonia reduction plan ("PAS" in Dutch), ILVO continues to study potential reduction measures for dairy as well as beef cattle. The ILVO beef cattle barn has been transformed into a set of 4 large, mechanically ventilated deep litter boxes.

new project 2016

SENSOR TECHNOLOGY IN DAIRY CATTLE: BRIDGING THE GAP BETWEEN DEVELOPERS AND USERS

What is the current best practice in sensor technology, and how can dairy farmers implement it on their farm? That is the practical starting point of the European thematic network '4D4F', which stands for Data Driven Dairy Decision For Farmers. 4D4F unites 16 different businesses, organizations and research institutes, including ILVO, from across Europe. Their goal is to bridge the 'innovation gap' that exists between dairy farmers and technology developers, in order to improve the collection and implementation of data from animal- and environmental sensors. Dairy farmers should be able to make well-informed management decisions based on the dairy data that is currently available.

As part of the 4D4F network, we will create a 'community of practice' for dairy farmers, veterinarians, agricultural advisors, technology providers and researchers. Different approaches will be discussed within the community to reach a consensus on best practices for using sensor technology in dairy farming.

Claw problems and lameness of gestating sows improved by flooring and management

More movement and fewer claw lesions in sows can be achieved by improved flooring and management choices, according to a long-term study by Emilie-Julie Bos (ILVO/Ghent University).

Since 2013, pregnant sows are required to be housed in groups (European regulations). They do have more social contact and their greater activity is beneficial for their muscle and bone development, but on the other hand they have more claw lesions and lameness. These problems often start in the first 3 days of group housing. Adjustments to flooring and group management are potential solutions.

A comparison of stable and dynamic groups on 10 commercial pig farms did not show clear results of which type of management is better for claw and leg problems. A rubber top layer on a concrete floor did perform better than bare concrete.

Pigs on the rise

ILVO has been assigned the independent test-working for finishing boars. This was decided after lengthy negotiations in an inter-professional agreement between BB, ABS, FEBEV and IVB. Flanders also set aside € 2.5M for ILVO research to benefit the pig production sector.

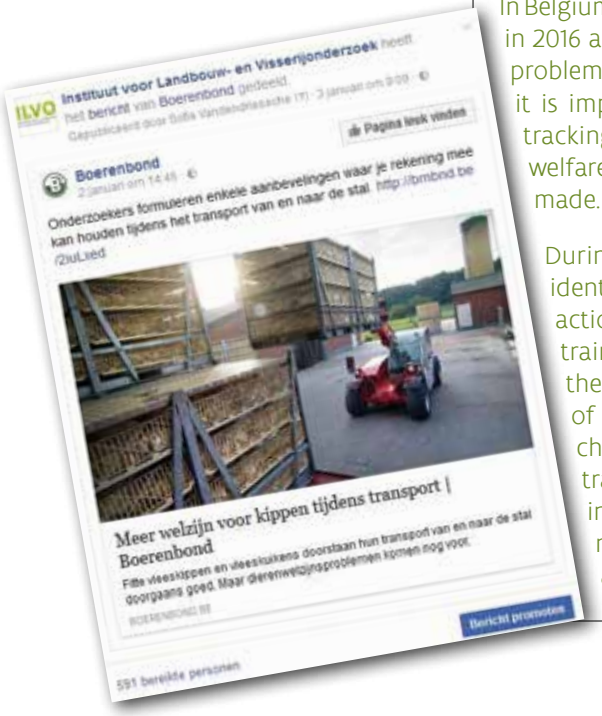
The first of 3 new research projects focuses on better taste and meat quality, a second aims for a sector-wide improvement in feed conversion, and the third examines the possibilities of depth drainage as an alternative water source for pigs.

2016 was also a year of interesting research results on claw problems and lameness in sows and related advice regarding stall installations (i.e., rubber-topped flooring) and management.

Chicken welfare during transport

In Belgium, about 300M slaughter-ready chickens were transported in 2016 alone. The transportation phase can cause some welfare problems. Because of the large numbers of chickens involved, it is important to identify opportunities for improvement. By tracking commercial trucks and performing experiments, welfare problems were identified and recommendations were made.

During the pre-slaughter phase, the welfare problems were identified and associated with risk factors, then potential actions for remediation were suggested. Solutions include training and selection of the catching crew, reducing thermal stress during transportation, and reducing length of transport. Risks for mortality appear to be linked to chicken fitness, which could be addressed by a fit-for-transport evaluation, although research is still needed in this area. ILVO has developed a protocol for efficient monitoring of pre-slaughter welfare. This protocol is available for use by the sector and the government.



Animalab annual results

In 2016 6,829 samples were received and a total of 21,559 analyses were performed. The number of analyses is lower than in 2015 (25,000) but higher than in 2014 (17,000). The most analyses were done on feed for cattle, pigs and poultry, for both project and contract research. The analyses were primarily chemical analyses of the nutrients as well as physical parameters such as particle size and buffer capacity. To determine the value of a feed per animal species, samples of feces must be analyzed from the nutrition experiments.

Another important matrix is milk from the individual animals in dairy experiments, currently done in the framework of reduction of methane emissions and N losses. To determine the breakdown kinetics of nutrients in the rumen and intestine, several analyses are done on the feed residues held in nylon bags after incubation inside cannulated cows.

Analyses on meat, specifically pig carcasses, were done for a project on ideal slaughter weight. Bone analyses were done primarily on tibias of chickens to adjust the levels of calcium and phosphorus in their diet. To study the effect of additives on the breakdown of protein, rumen fluid samples were analyzed. The urine analyses were useful to calculate the N use by dairy cattle.

matrix	samples (n)	%	analyses	%
animal feed	1374	20	6297	29
faces	875	13	5857	27
milk	2588	38	3083	14
incubation residue	441	6	1739	8
meat	163	2.4	1563	7
bone	320	5	1002	5
rumen fluid	459	7	933	4
urine	463	7	774	4
fish	27	0.4	81	0.4
egg	36	0.5	72	0.3
blood	9	0.1	9	0.1
other	74	1.1	149	0.7
TOTAL	6829	100	21559	100

new project 2016

BEETS: FODDER FOR MORE SUSTAINABLE CATTLE FARMING

Fodder beet is becoming more popular on cattle farms as a possible third crop after maize and grass.

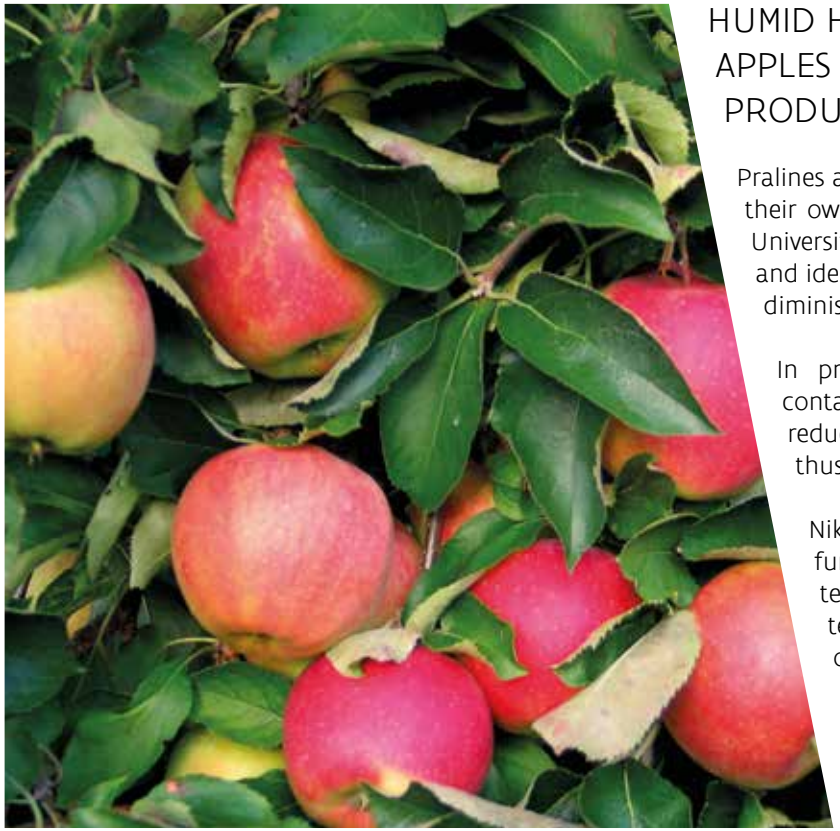
ILVO and Ghent University are studying the possibilities of re-introducing fodder beet into the rotation in terms of machinery, feed technical aspects and economics.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video

Braadkippenhouderij - Achter de schermen bij ILVO-kleinvee

Theme

Healthy & high-quality food



HUMID HEATING OF WALNUTS AND IMPROVED STORAGE OF APPLES HELP TO PREVENT MOLD GROWTH AND MYCOTOXIN PRODUCTION

Pralines and apples are two important Belgian food products, each characterized by their own fungal problems and related economic/health implications. ILVO-Ghent University researcher Nikki De Clercq has developed effective methods to detect and identify molds and mycotoxins. Further research was conducted to prevent or diminish fungal spoilage.

In pralines, walnuts were highlighted as an important source of mold contamination. Humid thermal treatment offers an interesting solution to reduce this initial contamination on walnuts, without changing the taste and thus extending shelf life of the pralines. In apples, more research is needed.

Nikki De Clercq has already noted a great variation in patulin-producing fungal strains. The researcher has confirmed that the combination of low temperatures and a low-oxygen atmosphere as long-term apple storage technique works well to strongly reduce patulin production. If molds develop on apples, accompanied in the worst case by patulin production, then this toxic substance may end up inby-products such as apple juice. Patulin can negatively affect the human immune system. If patulin concentrations above legal limits are detected in certain food products, the product is taken off the shelves which can have negative economic consequences for the industry.

SPECIAL FOODS FOR CHEWING, SWALLOWING AND TASTE TROUBLES

Flemish Minister for Welfare, Public Health and Family, Jo Vandeurzen, attended a special cooking demonstration in the Food Pilot on 14 April 2016 for people with limited taste or difficulty chewing or swallowing need special food preparations. Parki's Kookatelier and ILVO joined with Flanders' FOOD and FEVIA Flanders to innovate for this group of people, as showcased in this excellent demonstration. "The food industry can certainly start producing special products for this target group. This forms a tripartite bridge between the patient, the doctors and academics, and the food processing industry," said Vandeurzen. ILVO, Flanders' FOOD and the Food Pilot believe they can make meaningful contributions for small target groups with special food needs.

A multidisciplinary doctoral study (ILVO-KU Leuven researcher Florence Baert) has been started to develop foods for people with dysphagia and loss of smell and taste. The number of older people and patients with these problems is growing dramatically.

new project 2016

PLANT TOXINS IN FOOD SUPPLEMENTS?

Which plant toxins might be present in food supplements? Which are the most important and how can they be detected? In light of public health and consumer safety, ILVO and CER Groupe have developed standardized, sensitive and reliable methodologies for detecting plant toxins.

MEAT QUALITY OF FREE-RANGE CHICKENS IS BETTER

Free-range broilers aren't as heavy as their indoor counterparts but their meat tastes better and shows higher quality, according to a recent ILVO study. More exercise and more plant material in their diet result in juicy and tender meat and higher amounts of unsaturated fat.

Demand for meat from free-range broilers is growing. This is partly because consumers are starting to value animal welfare but also because they think the meat is better quality. Lisanne Stadig studied whether this is actually true by tracking broilers from chick to slaughter. Three groups of chickens were studied: no free range, access to grass with wooden shelter, or access to a free-range area with natural willows as shelter.

Access to free range had positive effects on quality, composition and taste of the meat. Free range with willow had small but important differences: the broilers in that group used their range more and their meat was judged as more tender.

ANALYSIS METHOD DEVELOPED TO DETECT *E. COLI* "NON-0157 STEC" IN FOOD

Good news for food safety. Reliable detection and precise identification of additional *E. coli* bacteria in food is now possible thanks to the doctoral work of Bavo Verhaegen.

Verhaegen has worked on the so-called non-0157 STEC, a group of *E. coli* bacteria that are hard to detect in food due to a lack of appropriate analysis methods.

Beef in the dryer?

'Dry aging' or dry ripening of beef is trending in Flanders, Belgium, and beyond. Using this aging process, meat deboners, butchers and restaurants are trying to meet the increasing demand for high-quality, tasty and tender beef. During the dry aging process, pieces of meat are hung or put on racks over a period of several weeks and exposed to a cooled and ventilated area. As a result, a protective dry surface layer is formed as a barrier against microbial outgrowth. When the drying process has ended, the dry outer layer, or the crust, is removed. The remaining quality meat can be sold and consumed as baked beef by the consumer.

But what exactly are the criteria for a good and safe end product? What is the relationship between process conditions (ripening period, temperature, relative air humidity), and quality and safety of the end product? To get more insight into the additional sensory value of 'dry-aged' beef, the microbiological safety and the ideal process conditions to get a qualitative and safe product on the market, the OPTIDRYBEEF project was started in 2016. Within this international CORNET project ILVO, UGent, KU Leuven and Flanders' FOOD, work together with DIL (German Institute of Food Technology) and FEI (Research association of the German Food Industry).

Dairy contact day

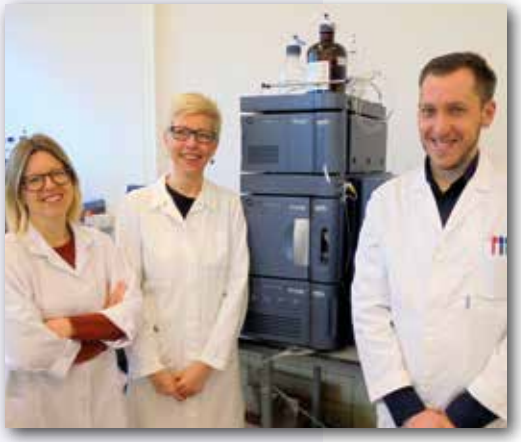
On 17 November 2016 the 3rd edition of the ILVO Contact Day for Dairy took place for producers, processors and distributors of dairy products and for related technology providers. Results of the most recent research in the dairy sector was presented and linked to the current most pressing problems in dairy.

The entire chain, from farmer to a high quality end-product, was addressed. First was the problem of *Mycobacterium avium* subsp. paratuberculosis (MAP) in dairy cattle and the impact on public health. Cleaning and disinfection of production environments came next, and milk spoilage by heat-resistant organisms. In a section about product authenticity, researchers presented analyses to determine the animal from which milk has originated (e.g., cow or buffalo) and which processing steps it has undergone (e.g., degree of heating). Requirements for labeling were addressed as well. Last was an explanation of how Design of Experiments (DOE) can help tackle research questions in the Food Pilot with a minimal number of tests and a maximized output.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video

Kippen met vrije uitloop kiezen natuurlijke beschutting

Europe buys tons of milk powder due to low price: more than 20,000 analyses on milk powder



The milk quota ended, the milk prices fell, and Europe intervened by taking milk power temporarily off the market. Purchased milk powder first needed to be analyzed for quality and authenticity by an independent lab.

ILVO fulfilled that role, performing 17 analyses per sample: fat content, organoleptic evaluation, number of coliform bacteria, presence of antibiotics, etc. Lieve Herman (ILVO): "The market participant, after providing a ticket of delivery, got only 21 days to deliver skimmed milk powder for public storage – together with proof that it passed all of the lab tests." With nearly 100 samples arriving per day from across Belgium, the deadlines were extremely strict for our lab personnel. It took quite some overtime and flexibility, but we delivered."

An express purchase of a Ultra-High Performance Liquid Chromatographic (UPLC) Spectrometer enabled the Chromatography lab to perform in-house detection of (illegal) additions of buttermilk powder. In total, 1197 samples were analyzed, which increased the unit's income by 39%.

new project 2016

TASTY AND HIGH-QUALITY VEGGIE AND FRUIT JUICES

As part of the HighQJuice consortium, ILVO looks for processing steps that result in juices or purees with the highest possible quality level. Innovative techniques for grating and pasteurizing are combined to result in end-products with the best possible consistency, composition, taste, color and microbial characteristics.

Controlling *Mycobacterium avium* subsp. *paratuberculosis* (MAP) through decontamination of colostrum

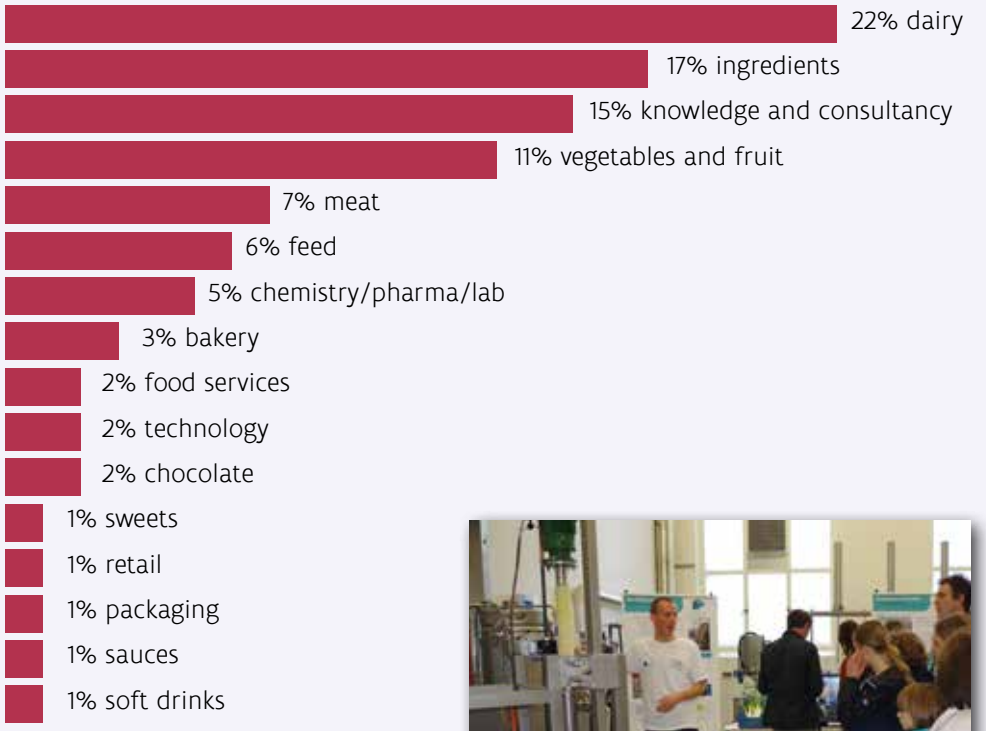
Mycobacterium avium subsp. *paratuberculosis* (MAP) causes paratuberculosis (Johne's disease), a chronic, often lethal, contagious enteritis in cows that reduces milk yields. Calves younger than one year are most susceptible for the intake of this bacterium through various routes such as the environment, feces and contaminated colostrum.

ILVO has developed a decontamination procedure for colostrum, which removes MAP using centrifugation. Nutritional components vital for the calf remain in the colostrum. In 2017, this method will be available at the Food Pilot. Dairy and beef farmers will be able to bring or send frozen colostrum (min. 30 L – max. 50 L) to the Food Pilot. Within 15 working days, the colostrum will be centrifuged and ready for use.

Food Pilot: Service for agro-food companies

The service provision of the Food Pilot (ILVO and Flanders' FOOD) for food processing companies increases every year. In 2016, 293 pilot tests were performed for 93 companies, including 31% SMEs, 8% knowledge centers, 8% farms, and 48% large companies. International companies represented 18% of the tests. The companies came from various subsectors, including dairy (22%), ingredients (17%), consultancy (15%), vegetables and fruit (11%), and meat (7%). In addition to pilot tests, 20,921 analyses were performed for 201 customers. Interest in chemical aroma profiling is clearly growing. In total, 50 quality assurance tests were performed (ring testing, standards, reference series, control samples) were performed for 34 customers (milk control labs, companies, kit producers, etc.).

In 2016 the Food Pilot organized an extensive customer satisfaction survey. Although the pilot plant is nearly constantly fully booked, nearly all of the customers were satisfied with the waiting times. Ninety-seven percent said they would likely or quite likely return to the Food Pilot and would recommend it to others. Ratio of price and quality were judged as good by 95.5% of respondents. And more than 90% were pleased with the expertise of the pre-testing discussions, performance of pilot tests, and post-testing reports and analyses. The personal service is greatly appreciated and customers emphasized the importance of keeping a wide range of expertise in house. The Food Pilot is an application and analysis center with a wide range of pilot tests, food analyses and knowledge. This tailored set of services and integrated approach are the basis used by the food technologists and experts when working with agro-food companies.



new project 2016

NEW PILOT TESTING HALL AND DEMONSTRATIONS FOR BALANCED DIET

In the EFRO project "FoodInnoTech" ILVO and Flanders' FOOD wish to support companies in their societal role of providing special and balanced foods for target groups. Special requirements regarding texture, taste and nutritional value spur innovation. New process techniques are needed in food processing plants, such as emulgation, drying, texturizing, etc. The project will promote and demonstrate existing equipment as well as new technologies such as the Dry-On-Water®.

A new, flexible demonstration space will be built at the Food Pilot specially for this purpose.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video

Drogen van aardbeipuree met Dry-On-Water®

Flemish Minister-President visits Food Pilot

Flemish Minister-President Bourgeois said, during the signing of the valorization contract of the Dry-On-Water® and equipment builder Spiessens: "It is incredibly inspiring to me to be at a place where people are passionately working at the highest level to develop the building blocks for innovative and sustainable food processing and products. The ILVO researchers must feel an incredible sense of accomplishment to work for four years on innovative thinking and acting, then to see those efforts crowned by a prototype for a food dryer that is unique for Flanders and Europe. I wish to congratulate ILVO from the bottom of my heart for this impressive act of scientific development. And if I may be slightly chauvinistic, I am particularly pleased that Spiessens is a West-Flemish business. Mid-West-Flanders is the beating heart of the Flemish food industry."

Theme

Bio-economy & closed-loop systems

INSECTS AS RAW MATERIAL: HOW SUSTAINABLE ARE THEY REALLY?

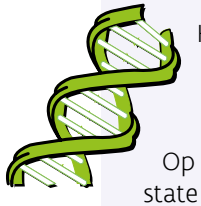
The black soldier fly has a well-proven track record as a waste processor. Residues from food and agriculture, including vegetal and animal substances and manure, are converted into larval biomass. But can this exotic species do the job well enough in our climate, on the farm, while still creating sufficient market value to be profitable for the farmer? And how sustainable is this really? The MIP-project M2LARV established optimal rearing conditions for controlled insect farming in climate rooms. These results were then scaled up to larger bioconversion units on the farm.

Black soldier fly larvae can indeed be grown on pig manure on the farm. Normal indoor temperatures in fattening pig stables is sufficient. Good aeriation of the substrate is crucial to enable automatic harvesting of the larvae. Profitability depends strongly on the market value of the larvae and the residual substrate, both of which are unclear at this time. The sustainability of the process is subject to ongoing research.

Flemish bio-based industry on the rise – Flanders profiles itself as top-region for bio-economy at EFIB congress in Glasgow

Brussels, 14 October 2016 – Some 10% of Flemish production is bio-based. The next step is to increase an already-high level of specialization of industrial biotech in Flanders thus to realize the full economic potential. Eight partners jointly promoted the Flemish region at the EFIB congress, the leading European trade show for bio-economy from 18-20 October in Glasgow.

The ILVO Genomics platform: DNA of millions of organisms



Het ILVO genomics platform on next-generation DNA-sequencing (NGS) technologies and related bio-informatica tools for genome analysis has reached cruising speed after 3 years, with more than 20 projects now running and 5 terabytes of raw data.

Op 21 April 2016, during a thematic symposium, 130 specialists from Flanders and the Netherlands, the state of the technology was presented by 4 invited experts and no less than 18 ILVO researchers.

Four themes were presented:
First was "Genome structure, function and diversity". One example given was how NGS can contribute to the identification of *Phytophthora* hybrids (important disease agents in plants).
"Environmental and population genomics" presented how DNA-based techniques can be used to monitor organisms in their environment, such as nematodes in soil or bacteria on plastic trash in the sea. ics for food quality and gastrointestinal microbial communities of livestock" showed how NGS is also finding its way into food-related research, with studies on subjects such as shelf life of gray shrimp.
Last, the theme "The first and second plant genome function", took a closer look at the functions of plants and plant-associated micro-organisms: genes involved in the cell wall digestibility in ray grasses or influencing microbial communities in the soil to benefit plant health.

ARE BELGIAN ENDIVE ROOTS REALLY ONLY GOOD FOR CATTLE FEED?

In Belgium, about 40,000 tons of Belgian endive (*chicons*) are produced per year, along with 36,000 tons of their roots. The roots meet a rather unglamorous end as feed for local cattle. But according to the principles of the circular economy, this is only a low-value use of a possibly valuable resource. Could these forced Belgian endive roots contain valuable compounds that may increase the roots' value?

This was investigated by researcher Lies Kips, who analyzed the roots for the occurrence and concentration of bitter compounds, phenolic compounds, minerals and antioxidant capacities. She found that the roots do indeed contain a range of bitter compounds and phenolic compounds, in even higher concentrations than the leafy plant parts we call Belgian endive. The roots could be better valorized in the food or pharmaceutical industry, as a biocide or a biostimulant. Furthermore, the roots are a source of the minerals Fe and Cu, which could allow the use of a food claim. The presence of the measured compounds could make it possible to make a bioactive extract from the roots that is rich in bitter and phenolic compounds. However, before these industrial applications can be made into reality, many steps must be taken such as the research on the activity, stability and toxicity of the compounds and scaling-up the extraction process.

STRESS-RESISTANT ELEPHANT GRASS (*MISCANTHUS*)?

In the EU OPTIMISC project which ran from 2011 to 2016, ILVO investigated the stress tolerance of about 100 genotypes of *Miscanthus,* also known as elephant grass. The focus was on frost and chilling tolerance, where the former was studied in terms of rhizome survival during winter, while the latter as a function of the length of the growing season and the potential light captation. In addition to stress tolerance, plant quality of *Miscanthus* was investigated for applications like fiber-board production. Interesting genotypes were selected and the impact of stress tolerance on yield was evaluated.

FARM COMPOST COMES A STEP CLOSER AFTER DOCTORAL STUDY WITH ENCOURAGING TEST CASES

More than three-fourths of farmers in Flanders know that homemade compost would work to improve the quality of their soil. But the investment required (compost turner, concrete pad), the know-how, the legal restrictions and problems with availability of the required ingredients (such as a shortage of brown/woody material) stop the farmers from implementing on-farm composting.

That was the conclusion of Jarinda Viane's doctoral research. Experiments where nurseries, cattle farmers, and sometimes nature management and/or hired hands were brought together in local composting units, appeared to hit the bullseye. The groups even decided to continue composting together after the research period had ended. This study has resulted in pioneering work for non- or underused biomass waste streams to get used as a stable soil improver. Quality determination of the raw materials was optimized, so the composters have a better guarantee of production and application of their compost. Viaene and her colleagues say that this is a chance to simultaneously close the production cycle, combat the climate problem, and improve the quality of agricultural soils.

Bio-economie @ ILVO

For as long as anyone can remember, the primary purpose of agriculture and fisheries has been to produce food. Now in the 21st century, the bio-economy (food and non-food) is increasingly flirting with the primary food production sector. On 18 November ILVO presented our vision of and research on the bio-economy. More than 100 participants got insight into the current policy about the bio-economy and listened to the experiences of a number of industrial pioneers. During a "speed dating" session with more than 20 researchers, participants learned more about ILVO's ambitions regarding the bio-economy.

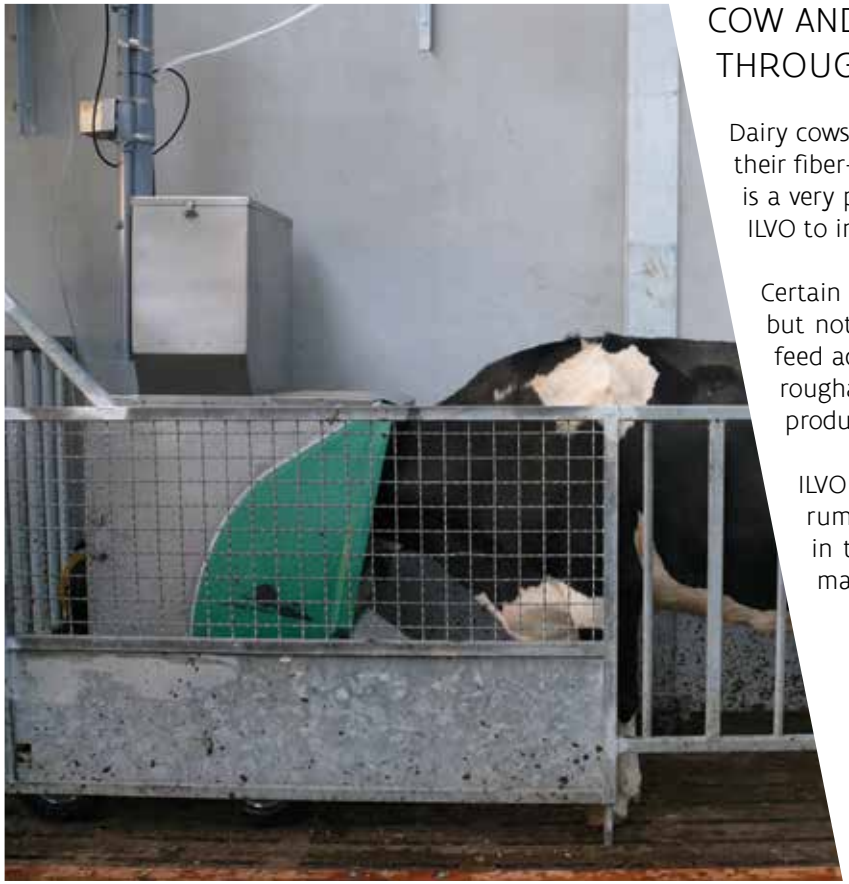
ILVO's research focus is on:

1) Shifting from only agro-food to the bio-economy
2) Optimal use of natural resources
3) Primary biomass production
4) Better valorization of locally-processed biomass

A booklet entitled "Bio-economy@ILVO" was published to accompany the event. It is now available.

Theme

Environment & Biodiversity



COW AND CLIMATE: CAN METHANE REALLY BE MITIGATED THROUGH NUTRITION?

Dairy cows produce approximately 30 liters of milk per cow per day. While digesting their fiber-rich diet, the cow also produces about 450 g of methane per day. Methane is a very potent greenhouse gas which contributes to global warming. This has led ILVO to investigate whether methane can truly be mitigated through nutrition.

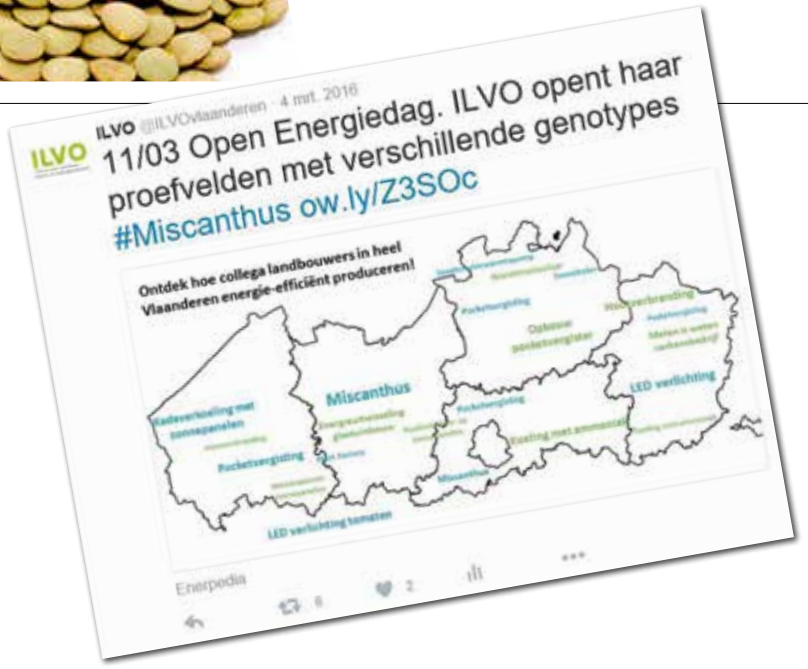
Certain feed additives were found to reduce methane emissions by 10 to 15%, but not all of them are on the feed (additive) market yet. In addition to using feed additives, methane emissions can be reduced by changing (proportions of) roughage components in the diet. Feed interventions cannot lead to lower milk production, thus methane reduction should be achieved per liter of milk.

ILVO also performs fundamental research into (methane) gas production in the rumen of the cow. When the rumen microbiome (the micro-organisms present in the rumen) has been identified and quantified, it should be possible to make this microbiome more climate-friendly in the long term.

This concentrate feeder (GreenFeed, C-Lock) measures methane and carbon dioxide emissions, which mainly occur via the mouth, of an individual cow during her meal.

FIRST STEPS TOWARD BREEDING LENTIL PLANTS THAT CAN HANDLE CLIMATE CHANGE

The growing world population calls for an increasing culture of highly nutritious sources of plant proteins such as lentils, but climate change is putting pressure on these crops. Breeding for drought tolerance is thus a high priority. ILVO-Ghent University researcher Omar Idrissi screened several Mediterranean lentil species for their sensitivity to drought. He showed that in lentil the relationship of biomass between root and stem plays an important role in drought tolerance. An important first step was taken towards identifying genetic markers for breeding for drought tolerance.



CARBON STORAGE UNDER GRASSLANDS

A literature study done at ILVO, in assignment of the largest farmers' organization (Boerenbond) shows that grassland can help greatly to combat climate change. Not only does grassland account for 30% of the agricultural land in Flanders, more carbon can be stored under grass than under cropped fields. The longer the grass remains on the same parcel, the more carbon is stored. With moderately intensive management, where the grass and the roots get enough chance to develop, the most carbon is stored. Although grasslands are important, other crops can also be managed to maximize carbon storage.

new project 2016

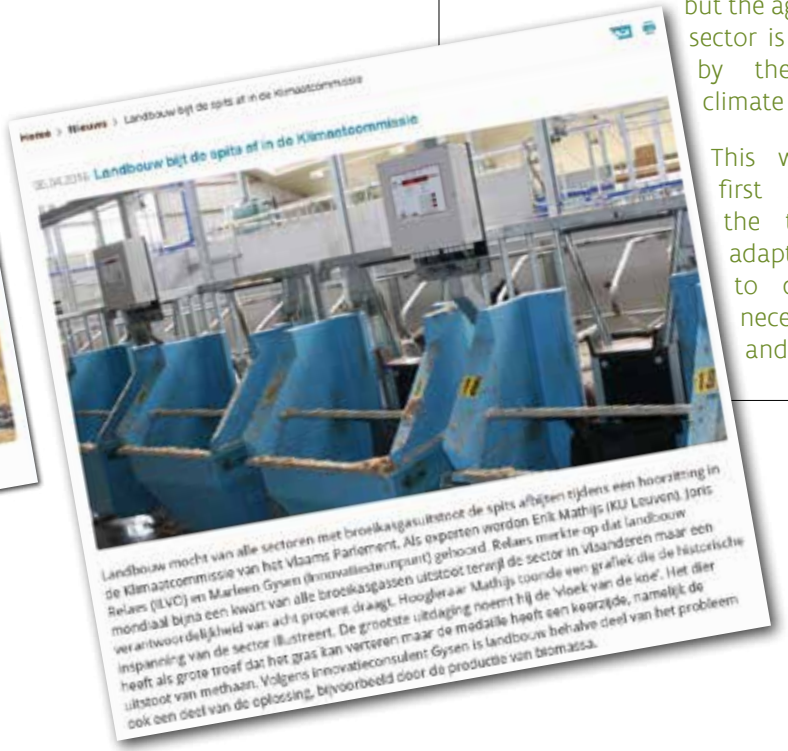
Preparing grasslands for climate change: landscape genomics and quantitative genetics make the link between climate adaptation and diversity in European grasslands

Nutritious grass will be needed in the future if we want to keep producing meat and dairy products. But increasing drought and more extreme weather conditions are putting grasslands under pressure. ILVO will partner with INRA in France, IPK in Germany and IBERS in the UK to map the natural biodiversity present in European grasslands. The ultimate goal is to apply this genomic knowledge for breeding high-yield, highly nutritious grasses.

Dutch pig farmers seek revision of odor norms and measurement techniques

ILVO and the Ghent consultancy firm OLFASCAN have completed an odor study about pig farming in the Netherlands, commissioned by the Dutch pork production sector.

Neighbors of Dutch pig farms are bothered only little or not at all by the smell. This was the result of an independent scientific study performed by ILVO and OLFASCAN for the Dutch Union of Pig Farmers. The final report was presented in Breda on 27th October 2016



ILVO and Agrolink Flanders build expertise on climate adaptation in agri- and horticulture

On Thursday 29 September 2016 a workshop on climate adaptation was organized by Agrolink Flanders, a collaboration platform of 18 knowledge centers active in agri- and horticulture.

The workshop was organized by ILVO and supported by Ghent University, KU Leuven, pcfruit and Inagro. ILVO invited all of the members of all partner organizations to brainstorm around climate adaptation. The theme of climate adaptation has not been in the picture until now, but the agri- and horticulture sector is strongly influenced by the phenomena of climate change.

This workshop was the first step in exploring the theme of climate adaptation and to begin to develop knowledge necessary for the agri- and horticulture sector.

Climate challenges: Politics looks to research

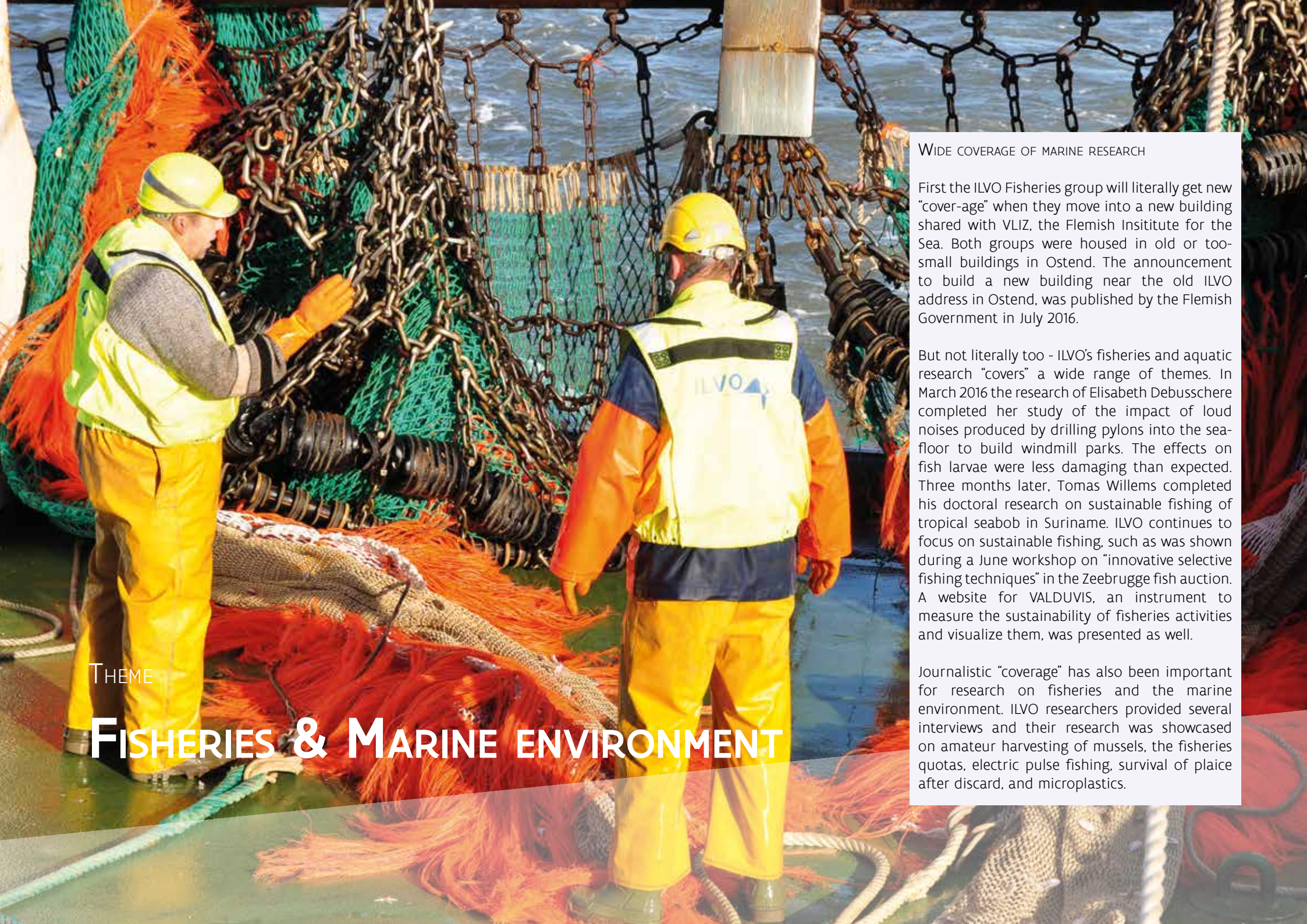
From the resolution of November 2016, in which all political parties gave a unison charge to the Flemish Government: "We request further development of the know-how of the Flemish agricultural and horticultural sector to achieve agri- and horticultural products with lower greenhouse gas emissions per product in comparison with international equivalents. In research we request a focus on precision agriculture - a tailored technique for people and animals, agro-ecology, biotech processes and other techniques that can lower the use of resources (energy, pesticides, antibiotics, chemical fertilizers, etc.).

We emphasize that Flanders should be a leader in the area of climate-efficient agri- and horticulture, instead of increasing the number of cattle. Using research and knowledge transfer, the methane emissions from cattle must drop by optimizing feed rations and/or –efficiency and by creating low-emission solutions for new and existing animal housing..."

Climate and Agriculture: a new expertise center

During the Flemish Climate and Energy Summit in Ghent on 1 December 2016, Minister of Agriculture Schauvliege announced the creation of a new Center of Expertise for Climate and Agriculture at ILVO. The goal is to make the ILVO climate knowledge available to the public in an integrated way. Existing, relevant research within and outside of ILVO will be translated into the effect on climate. New research projects at ILVO will be reoriented to address climate challenges. ILVO knowledge already shared includes knowledge related to mitigation, adaptation and LULUCF (Land Use, Land-Use Change and Forestry).

Agriculture, in comparison with the other industrial sectors that must reduce their CO_2 emissions, has unique challenges. During the 2 climate round-table discussions prior to the climate summit and during the hearings in the parliamentary climate commission, it became clear that the biological processes inherent to agriculture are much more difficult to control.



Theme

Fisheries & Marine environment

Wide coverage of marine research

First the ILVO Fisheries group will literally get new "cover-age" when they move into a new building shared with VLIZ, the Flemish Insititute for the Sea. Both groups were housed in old or too-small buildings in Ostend. The announcement to build a new building near the old ILVO address in Ostend, was published by the Flemish Government in July 2016.

But not literally too - ILVO's fisheries and aquatic research "covers" a wide range of themes. In March 2016 the research of Elisabeth Debusschere completed her study of the impact of loud noises produced by drilling pylons into the sea-floor to build windmill parks. The effects on fish larvae were less damaging than expected. Three months later, Tomas Willems completed his doctoral research on sustainable fishing of tropical seabob in Suriname. ILVO continues to focus on sustainable fishing, such as was shown during a June workshop on "innovative selective fishing techniques" in the Zeebrugge fish auction. A website for VALDUVIS, an instrument to measure the sustainability of fisheries activities and visualize them, was presented as well.

Journalistic "coverage" has also been important for research on fisheries and the marine environment. ILVO researchers provided several interviews and their research was showcased on amateur harvesting of mussels, the fisheries quotas, electric pulse fishing, survival of plaice after discard, and microplastics.


© Hans Hillewaert

NO STRICTER SOUND MEASURES ARE NEEDED WHEN BUILDING WINDMILLS AT SEA, RESEARCH ON EFFECTS ON FISH REVEALS

"The European guidelines concerning underwater noise as a result of human activities at sea should be revised," concludes ILVO/Ghent University research Elisabeth Debusschere at the end of her doctoral studies. Using experiments she tested the effects of intense underwater sound bursts on young sea bass, resulting from pounding windmill foundations into the seabed. Originally, she expected to see widespread death of the young fish in the area of the pile driving, but instead observations revealed that they survive exposure to loud sounds close to a construction site. Even though they are sensitive to intense underwater sounds due to their swim bladder, and the fish did show signs of severe stress and changed behavior, these effects were only temporary. The tests with seabass show that the effects of pile-driving noise for young fish with a pressure-sensitive swim bladder are generally milder than expected.

"In terms of damage to young fish, no stricter measures are required either in Belgium or in other Member States," says Elisabeth Debusschere, "but additional research on other species and other stages of life, as well as research on long-term effects, are clearly needed." In spite of the need for additional research, these results can already be used to steer the goals set out in the European Guidelines for Marine Strategy, which are currently nearly exclusively oriented to the effects on sea-dwelling mammals and measurement of standard sound characteristics.

FROM FLATFISH REFLEXES TO IMPLEMENTING THE EUROPEAN LANDING OBLIGATION

An exception to the landing obligation (or so-called "discard ban") is possible for plaice, according to recent research on the survival of discarded fish.

In a project done in partnership with the boat owner's association and Belgian fishers, ILVO scientists optimized a methodology to quickly and effectively determine the fate of discarded plaice based on a series of reflex tests. Observations during fishing trips on boats from different segments of the sector (coastal fisheries, small fleet, large fleet) showed that plaice has the biggest chance of surviving the discard process (43 – 57%) in the coastal fishery. Further testing in other fishing areas and adjustments to the fishery practices and handling of catch on deck could lead to similar chances for survival in the other fleet segments.

These data can be used to request an exception to the landing obligation as set out in the European Common Fisheries Policy.

new project 2016

FISHING WITH GAS? LNG AS AN ALTERNATIVE FUEL IN COMMERCIAL FISHERIES

Liquified Natural Gas (LNG) is being promoted worldwide as an alternative for diesel.

In the Flanders-funded TECHVIS project, ILVO examines the potential for using LNG in the Flemish commercial fisheries. The beam trawler fishing boats are gas-guzzlers (or diesel-guzzlers, as it were): sailing to the fishing grounds as well as pulling the fishing nets through the water use a great deal of energy. This has an important impact on the profitability of the fisheries as well as the environment.

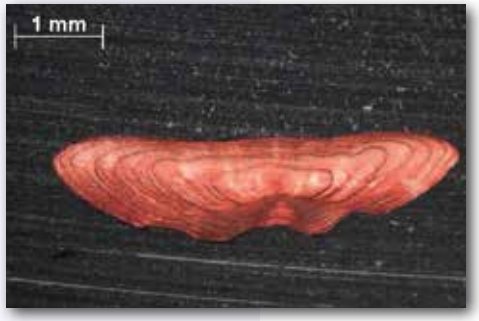
SOLE IN THE IRISH SEA: DO FISHERMEN AND FISHERIES SCIENTISTS SEE THINGS FROM A DIFFERENT PERSPECTIVE?

Fishing opportunities for sole in the Irish Sea have declined severely in the recent years. Due to consecutive TAC and quota reductions, Belgian fishermen fear the loss of a historically important fishing ground. But is the situation in the Irish Sea being correctly assessed? Fishermen claim that the low numbers observed in the British beam trawl survey (UK-BTS) do not reflect what they observe at sea: a healthy stock with a wide age distribution.

To determine whether this truly is a mismatch between science and industry, ILVO decided to organize an industry survey in the fall of 2016 and discovered that the UK-BTS does in fact give a good representation of reality. No areas with exceptionally higher numbers of sole were found and the catch composition for both survey coincided. However, these findings do not yet solve the problem of the opposing perceptions between fisheries scientists and fishermen on the status of sole, because there is no certainty on the origin of sole in the Irish Sea, among other issues. To help clarify these questions, tissue samples were collected. Using population genetics and other techniques, ILVO aims to pinpoint the nursery grounds of sole in the Irish Sea.

International service in the Otolith Lab: How old are these fish?

More than 22,000 analyses were performed in 2016 at ILVO's "Otolith Lab" to determine the age of no less than 11 fish species. An otolith is a tiny piece of calcium with rings each year like a tree that grows near the fish's throat. For the Data Collection EU network, it is crucial to know the age pyramids of each of the commercial fish species. These data are, after all, the basis of the determination of the fisheries quotas. ILVO dedicates 2.5 FTE of highly specialized personnel to determine the ages via otolith analysis. All of the otolith samples from Belgium as well as many institutes in the Netherlands, the UK, Sweden and Denmark are also processed at ILVO. This year, the Otolith Lab developed specific new software called *SmartDots* and *SmartLab* which conform to ISO 17025, the highest European quality norm. Starting in 2017, other EU otolith labs will start using this software to unify the quality of analyses across national boundaries.



Block sale of fish as an alternative sales technique – a pilot study

Fish is currently sold per boat landing, not per species. Selling fish "in block" (i.e., a block of fish from different landings but with identical quality and presentation) is possible but not easy, according to results from the VisDirectPlus project, a collaboration between ILVO and the Flemish Fish Auction. Sorting into products with similar quality (blocks) is complex because quality depends on the area of origin, season, fishing technique used and management of the catch aboard the vessel.

new project 2016

Compaction and finer sedimentation of the sea floor. Functional biodiversity in sediments are subject to change: implications for the biochemistry and food webs in a management context

Human activities at sea are affecting the bottom of the sea, making the floor harder and the particles finer. It is unclear, however, which impact these changes to the sediment may have on the coastal ecosystem.

The effect of a compacter and finer seabed on the functioning of the ecosystem on and near the seabed (biochemical and food web) will therefore be studied by experts from Ghent University, KBIN, ULg, and ILVO. ILVO will be responsible for developing functional indicators to test these changes in relation to the EU maritime environmental goals.

Research on stress physiology (StressChron)

The science park of Ghent University in Ostend, Greenbridge, has become the new home of the Stress Physiology research group (StressChron), an ILVO-Ghent University collaboration.

The research group focuses on neuro-endocrine, specifically stress physiological, research on vertebrates. Because the group has applied for several patents and shows potential for important valorization in aquaculture and biomedical applications, in 2016 joint investments were made to purchase lab equipment needed for research and service provision. StressChron (www.stresschron.eu) participated in the European Aquaculture trade show in Edinburgh to promote its research and services.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video

StressChron fish scales

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video

Maarten Soetaert wint prijs Lucien De Coninck met onderzoek over pulsvisserij

Studie toont voordelen van pulsvissen aan

new project 2016

Sustainable seabobs? Ecological and genetic basis for sustainable fishery for the Atlantic seabob shrimp *Xiphopenaeus kroyeri* in Suriname, South America

Do Guyana, French-Guiana and Suriname fish the same seabob stock? How important are mangroves as nursery and feeding grounds for seabob shrimp? Answers to these questions are essential for sustainable management of seabob shrimp stocks in this region. These questions were the reason for a doctoral study to investigate the population structure and life cycle of seabob shrimp based on both in situ research and advanced lab analyses.

Should sand stay in the sea? Effects of beach and foreshore nourishment on marine fauna

Foreshore nourishments as compared to beach nourishment is cheaper and easier to implement, but it can have also less impact on the bottom fauna under certain circumstances. These are the findings of a study conducted by ILVO and Ghent University, commissioned by the Flemish Agency for Maritime Services and Coast.

Sand nourishment to protect the coast against flooding to obtain a sustainable sea defense. In Belgium, these 'soft' coastal defenses are mainly carried out by nourishments on the beach, but recently also by foreshore nourishment. The latter consists of the construction of a sand buffer in the shallow water, which is designed to feed the beach with additional sand and therefore slow down the erosion. This approach is more cost-effective than beach nourishment, but it is also better ecologically: during a pilot project in Mariakerke, the foreshore nourishment with limited sand volume did not directly influence coastal marine fauna.

Theme

Social Sciences

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AGRO-ECO-*WHAT*? AGROECOLOGY IN AGRI- AND HORTICULTURAL EDUCATION

"What do you teach and learn about agroecology?" we asked of educators, (future) farmers and growers attending Flemish high schools, university colleges, universities and post-graduate classes. Agroecology still seems to be an unknown and difficult concept for many of those surveyed. Issues with the dissemination and provision of agro-ecological knowledge were clearly identified at the societal and policymaking level, with educators and farmers. Some educators were eager to give agroecology a more prominent place in agri- and horticultural education. This first inventory in Flanders revealed several opportunities. During a final event, these opportunities will be translated into justified policy recommendations that aim to integrate agroecology in agri- and horticultural education.

AGROECOLOGY: THE ROLE OF RESEARCH

The Belgian Agroecology Meeting 2016 brought all of the relevant Belgian researchers together to inspire each other. Current research was discussed and international speakers shared their experiences.

SOLIDAIRY. CAN ORGANIC AND LOW-INPUT DAIRY FARMING COMPETE WITH HIGHLY INTENSIVE DAIRY FARMING?

A common policy for organic, low-input (LI) and high-input (HI) dairy farming is not a good idea, as demonstrated by the European project 'Sustainable Organic and Low Input Dairying' (SOLID).

In that project, ILVO searched for a definition of LI and differences in competitiveness between LI, organic and HI farming systems across Europe. Farms were categorized as LI by use of an indicator estimating the intensity of use of external resources (purchased feed, fertilizers, plant protection products and energy). Despite lower productivity on LI and organic farms compared to HI farms, these farms are much more competitive on the general market than their productivity lag would suggest. Because LI companies are less dependent on external inputs and factors, they are more resistant in times of economic crisis. In years with high milk prices, HI farms out-perform LI farms because of their economies of scale and high productivity, but over a cycle of alternating good and bad years, LI can compete with HI.

This should be reflected in policy decisions regarding the different types of dairy farms.

Solving the wicked GMO problem

In Europe, genetically modified crops (GMC) are strongly contested; only one GMC is currently accepted for culture. Ghent University–ILVO researcher Linde Inghelbrecht examined the GM problem as a "wicked problem", which means an entrenched problem where every attempt to solve it reveals new aspects of the problem. Based on her analysis, Linde Inghelbrecht suggests tracks that we can follow to get out of the current GMO impasse. The technology itself can be approached differently. Additionally, it is important to see how this technology changes our view on agriculture and crossroad situations.

IMAGO: MAKING ROOM

How can rural actors in a given area work together to preserve and manage open space? Are there innovative methods to approach the debate about the future of an area? The IMAGO project was created to answer these questions.

Using action research, several scientific insights were translated to practical tools. Researchers joined rural actors from the area of Bruges and Mechelen to test the tools.

IMAGO offers a tool box full of inspiration to get to work in a (rural) area. The tools help you make room – literally and figuratively. The five tools reinforce each other in different ways to facilitate region-bound processes. A wide group of people involved in spatial planning processes can use one or more of the tools in their area. The user chooses one or several of the tools that are most relevant for the area and which best match the users' goals. An instruction booklet for each tool helps them get started. More information on the tool box and the project are available at www.imagotoolbox.be.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video

Open ruimte, open blik

Urban agriculture in 5 EU areas

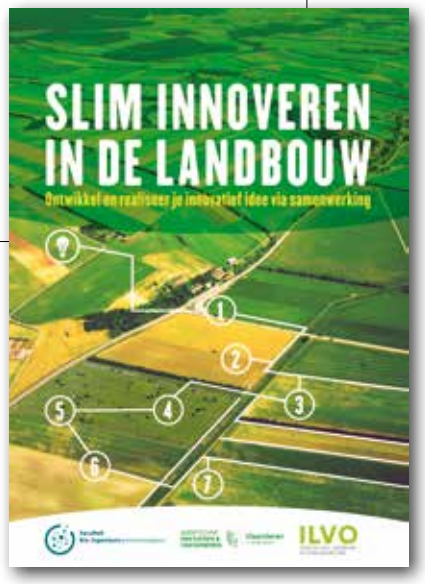
The phenomenon of "urban agriculture in Europe" was the subject of the final event of the COST Action TD1106 in Brussels (23-24 February 2016), organized by ILVO and Ghent University. The meeting resulted in a broadly supported scientific policy recommendation from 21 countries.

"A European urban agriculture policy must be situated outside of the classical agriculture policy because of the common ground with ecological sustainability, social inclusion, health, education, spatial development, climate, dynamic relations between urban and rural areas, competiveness and cultural heritage."
The event completed 4 years of work by 64 professional and knowledge centers from 21 EU countries. One of the results of the COST Action was the book "Urban Agriculture Europe".

Smart innovation in agriculture. Developing and realizing innovative ideas through cooperation

You have an innovative idea, but lack the necessary partners or knowledge to transform this idea into a successful result? Or you're curious what potential buyers think about this innovative idea? The brochure 'Smart innovation in agriculture' compiles a set of practical tips and tools to assist farmers in their search for innovation in agriculture. Ghent University and ILVO have developed this brochure based on experiences in two IWT research projects, where a number of innovation networks were studied.

http://www.ilvo.vlaanderen.be/Portals/68/documents/Mediatheek/Brochures/UGent_SlimInnoverenLandbouw.pdf



Social service provision for local governing bodies

Cities and provinces are increasingly finding their way to ILVO's Social Sciences Unit. The Province of Antwerp received fascinating results in 2016 after commissioning a study about undetected non-agrarian business activity in zones marked for agriculture in the spatial plan.
The City of Ghent requested a study on peri-urban and urban agriculture. The Province of West Flanders and the VLM commissioned a study on how to evaluate land use. East Flanders requested help to unravel the development and possible future of greenhouse horticulture in a sub-region. And for the West-Flemish knowledge center Inagro, ILVO was asked to review the processes around how building permits are assigned for agrarian building projects.

New challenges for organic dairy in Flanders draw researchers' attention

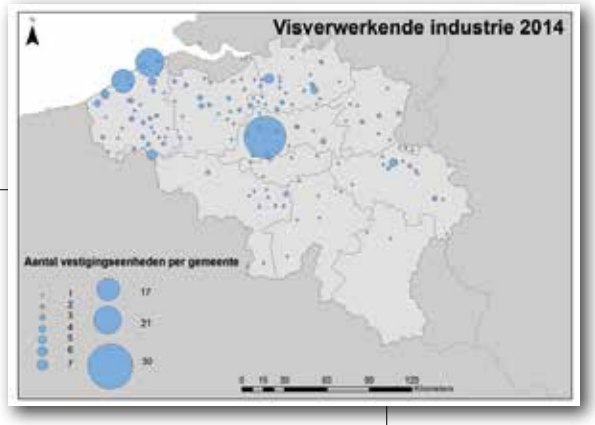
Organic dairy farming in Flanders is growing. The bad economic situation for conventional dairy farming and the good market conditions for organic dairy are causing an increasing number of dairy farmers in Flanders consider to convert to organic production. This new context creates new challenges in research. NOBL, the network for organic food and farming which is coordinated by ILVO, organized a seminar on this subject. On 30 November 2016, NOBL members, researchers and other stakeholders met at the Odisee University College to answers the questions of organic dairy farmers and related industry representatives. Around 75 people from organic and conventional research and industry listened first to several speakers then met in 4 interactive workshops. Many expressed interest in further cooperation. Concrete ideas from the workshops inspired NOBL to create future opportunities for research related to organic dairy husbandry.

Space for agriculture in Antwerp?

How big is the agri-complex in the Province of Antwerp? And to what degree is it locally anchored? What happens to the greenhouses of the horticulture businesses that stop or move to a larger, more modern building? Is the greenhouse horticulture in the macrozone of Boechout-Ranst still used for horticulture? Or are there non-agrarian activities taking place there? And what about the supposedly agrarian area in the Province of Antwerp – to what degree is that being used for non-agricultural activities? Can we develop instruments that stimulate the use of agricultural land and infrastructure to be used for agricultural activity?

These were the central questions in a partnership between ILVO and the Agricultural and Rural Services section of the Province of Antwerp. The research results, bundled into 4 sector studies, will support the Province to draw up a Provincial Spatial Planning document.

The Flemish fisheries sector and the fish processing industry: status, needs and opportunities



The Belgian fish processing industry is mostly dependent on imported species and less on locally caught fish, as shown by a 2016 ILVO analysis of the status, needs and opportunities of the Flemish fishing and fish processing industry. A local fish processing sector that offers innovative fisheries products using mainly locally sourced fish can add value for the fisheries production chain. But this will require harmonization between supply and demand, according to researchers Lancelot Blondeel and Katrien Verlé.

The supply of species in Belgian harbors is very seasonal, with relatively low volumes. The local processing industry requires large volumes with reliable availability, stable quality and stable prices to meet the demand of their customers. As a result, the Belgian fish processing industry relies heavily on imported species such as cod, salmon and trout. Local species such as sole and shrimp are partially processed locally. To connect local supply and local demand, a supply-chain wide approach will be needed to identify innovative processing techniques, develop new product that utilize locally sourced fish, to provide better education for employment in the fish processing industry and facilitate communication and cooperation throughout the fishery supply chain.

Management 2016

ILVO as organization: dynamic and realistic

INTERNAL UNIFICATION

ILVO celebrated its 10-year anniversary in 2016. As a birthday gift from ILVO to its employees, all were invited to attend the Floralies in Ghent. The Flemish Government, during the creation of the new organization on 1 April 2006, "that in the framework of the Better Management Policy and to improve the research efficiency the (former) Center for Agricultural Research (CLO) and the Center for Agricultural Economics (CLE) shall now be fused into the semi-independent ILVO, a Flemish scientific institute with an Own Capital, within the Agricultural and Fisheries Policy Area."

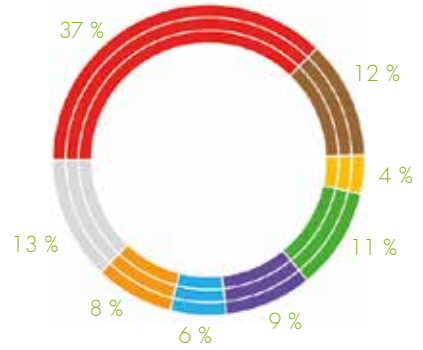
In 10 years' time a logical unity of thought and action has formed from the inside out, with stakeholders, customers, press and in the day-to-day work at ILVO. This unity achieves the stated goals with clout and short decision-making chains. In accordance with that unified logic, the supervising government wishes to receive one unified annual report.

For administrative purposes, ILVO still is comprised of two organizations: the IAA "ILVO-VO" (the internal semi-independent agency of the Flemish Government without a corporate personality) and "EV-ILVO" (the Own Capital, with corporate personality). They both have a budget, a personnel roster and management bodies. Whereas the ILVO-VO is funded primarily by a government subsidy, the EV-ILVO income stems from competitive research within Belgium and internationally, from companies and paid research and product sales.

RESOURCES: INCOME FROM OWN CAPITAL OUTGROWING THE BASIC SUBSIDY

In ILVO's first years, the income from the Flemish Government and Own Capital was more or less even. In recent years, the Own Capital is clearly outgrowing the government subsidy: 57% vs. 43% in 2013, 60% vs. 40% in 2014, 62% vs. 38% in 2015. This trend continues into 2016, with 63% of funding from competitive research and ad hoc assignments (Own Capital) and 37% from the annual subsidy from the Flemish Government.

Distribution of working capital ILVO 2016



Basic subsidy Ag & Fisheries	37 %	→ *Structural funding* 37 %
Donation from Ag & Fisheries	12 %	
Flemish Policy Areas	4 %	
IWT (VLAIO)	11 %	→ *Project funding (assignments and competitive projects)* 63 %
Federal government bodies	9 %	
EU	6 %	
Private sector	8 %	
Business Unit	13 %	

HR: SCIENTIFICALLY JUSTIFIED POLICY AND EMPLOYEE SATISFACTION SURVEY

The modern HR policy of the Flemish Government has been developed further into a more scientifically supported HR policy framework. The focus is on sustainable, inclusive and activating career paths. The functions have been professionalized further.

An HR network model realizes a better coordination between supply and demand in terms of HR and sheds light on the role distribution and the professionalization of the HR actors in the Flemish Government.

Every two years, the Flemish Government surveys the employees for their satisfaction levels. The 2016 survey for ILVO showed brilliant results: a general score of 4.4 out of 5 for satisfaction during a period of budget cuts and increasing work pressure. The management team came out with a strong message of pride in the ILVO-employees.

"This is a testimony to the excellent collaboration between management and personnel, between supervisors and employees, and between colleagues. Collaboration is one of the basic ILVO values, besides Exemplary Function, Positive, Proactive and Professional", says Joris Relaes, Administrator-General.

ILVO is the first organization in the entire Flemish Government to have classified its personnel into the function matrix according to a weighting methodology used in the Flemish Government. This assignment ended well in 2016 while the up-to-date function description for all Flemish government workers is supposed to end in 2017. The Flemish Government sees this as a first step towards a new career- and salary approach, where the basic salary will be coupled to the difficulty of the function and the salary growth in function of the employee's performance.

ILVO management has consciously chosen to implement and offer coaching to support the growth of its personnel. In 2016, ILVO's in-house coach has performed many individual, confidential coaching sessions upon request of the ILVO employees, usually in function of improving their wellbeing or as a safe listening ear. In 2016, group coaching was also used to support teams as a way of improving their performance. Coaching is therefore perceived and experienced as an important added value.

human resources

CONTEXT OF BUDGET CUTS

Ten years ago, when ILVO was created, ILVO had 487 employees (441.30 FTE), of which 245 (215.70 FTE) were part of ILVO-VO and 242 (225.60 FTE) part of EV-ILVO. The two entities were thus nearly even in the number of staff. In 2006 there were 175 researchers spread over 14 research areas. The ILVO group has swelled to 600 employees, with a peak in 2014. In 2016 ILVO has shrunk somewhat under 600: we dropped by 15. In FTE, that means 548.5.

These shrinking numbers, parallel with the above story about the relation between the Flemish Government and Own Capital, are found more in the government side (-22 in 2 years) than Own Capital (-15 in 2 years). Governmental budget cuts have affected the government clients of the Own Capital (fewer ad hoc research assignments from the federal government) and have led management to make savings in personnel as well as operations.

Shrinking number of employees in 2016

	Employees			FTE		
	FG	OC	total	FG	OC	total
31/12/2014	274	355	629	241	339	580
31/12/2015	260	347	607	231.6	330.9	562.5
31/12/2016	252	340	592	226.2	322.3	548.5
drop in 2 years	-22	-15	-37	-14.8	-16.7	-31.5
drop last year	-8	-7	-15	-5.4	-8.6	-14

RESEARCH TEMPO SLOWS

Of the 14 FTE that ILVO had to let go in 2016, only 5.8 were lost in the research team. ILVO has chosen to maintain its core business – research – when making budgetary decisions. Note in the table below that 8.5 FTE functions from EV ILVO were shifted to the ILVO-VO, in some cases with a tenured government position.

The strong dip in the number of externally-financed young researchers (such as doctoral students with external funding) has translated to a quantitative drop in the number of peer-reviewed scientific articles. In 2016 164 such articles were published compared to 171 in 2015. A slight drop in other publications was noted as well (115 A4 publications in 2016 versus 124 in 2015).

Research as core business is mostly spared from the cuts

Researchers	FG	FG in FTE	all OC	OC in FTE	OC without externals	OC (FTE) without externals	total (with externals)
12/31/2015	76	71.10	174	170.10	146	142.10	250 (241.2 FTE)
12/31/2016	83	79.60	160	155.80	127	122.80	243 (235.4 FTE)
Difference	+7	+8.5	-14	-14.3	-19	-19.3	-7 (-5.8 FTE)

70 JOURNALISTS, 5500 VISITORS AND SO MANY FLOWERS...

The annual meeting of the Association of Belgian Agricultural Journalists took place on 27 May 2016 at ILVO. The 70 registered (ex-)journalists and supporting members got to know ILVO's latest research. They all chose 3 of the 8 interactive demonstrations spread over the ILVO campus. The two months following that visit a record number of articles were written about ILVO.

In honor of the 10th anniversary of ILVO, all of the ILVO employees were invited to attend the Ghent Floralies.

The anniversary was also a good reason to participate in the Open Business Day. Three ILVO sites in Merelbeke-Melle (Plant, Animal, and Technology and Food Sciences) received a total 5500 visitors. No less than 100 ILVO employees staffed interactive demonstrations and led tours.

BOOSTING EUROPEAN-FUNDED PROJECTS

Starting in 2016, ILVO has shifted its focus to Europe, where funds are available for scientific research, including applied research for agriculture, marine sciences, and food. New in 2016 in the EU group, an ILVO employee who stays alert every day for new EU calls for proposals. The aim is to further streamline the ILVO project proposals.

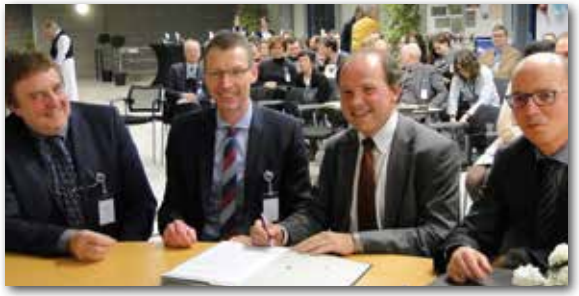
An extra impulse regarding EU calls definitely came from Agrolink. Agrolink clusters all of of the ag-related research groups and knowledge centers, supports collaboration and information transfer, and increases effectiveness within international calls. EU research projects always require proof of excellence in the relevant area and strong networks with several European or non-European research centers.

Huge jump in number of new EU projects

No less than 13 new EU projects were approved in 2016 where ILVO was either partner, work-package leader, or coordinator. This contrasts greatly with other ILVO years, where that number ranged between only 1 to 5.

One of the ambitious new EU projects is about climate-resilient grass. In 500 mini experimental fields sown with grasses from old, evolved meadows from Scandinavia to Turkey and from the Atlantic coast to in the Alps, ILVO is studying which genetic mutations have spontaneously taken place under certain climatic conditions, and where the specific characteristics can be found in the DNA. The biodiverse "G500" will be a gold mine for the 21st-century grass breeders.

In December of 2016, the last 4 approvals for EU projects came in. Those will start in 2017.



Strategic partnerships and economic valorization

On 15 January, ILVO and VIB (Flanders Institute of Biotechnology) signed a partnership agreement in the presence of the Flemish Minister for Innovation, Philip Muyters. In five areas, with five mixed teams that will realize common projects, both institutes recognize their complementarity and they both expect faster breakthroughs. Another partnership agreement was signed with the Hooibeekhoeve experimental research center to support each other's work in relation to animal husbandry. That signing was witnessed by the assigned representative of the Province of Antwerp. That agreement officially recognizes the long-term good contacts between the two knowledge centers and strengthens the infrastructural, scientific and communicative power of research in the dairy sector.

A special form of partnership and valorization was achieved when the licensing agreement for the Dry-On-Water® technology was signed. On 26 August 2016 the Flemish Minister-President visited the Food Pilot (ILVO/Flanders' FOOD) to witness the official transfer of a package of technological knowledge. A great deal of ILVO's own efforts and knowledge went into building a sustainable drying machine that uses only little energy to quickly but gently dry purées and liquids while still maintaining many of the active components of the food. A West-Flemish equipment builder has signed an exclusive contract (in exchange for royalties) in order to further develop this technology, to customize it and commercialize it.

COMMUNICATION: STARTING FROM FOOD, TELLING THE STORY OF AGRICULTURE AND FISHERIES

As the applied scientific institution of the Flemish Government, ILVO has a duty to communicate in a clear way, frequently and accurately with its stakeholders, society at large, and with policy-makers.

Does this paint a clear enough picture of how motivated we are to achieve these communication goals: 70 ILVO press releases, nearly 40 spontaneous questions from journalists that received a well-founded answer and led to an article, the 21 academic ILVO booklets (ILVO-mededelingen), the 6 full issues of the ILVO scientific newsletter in Dutch and English (sent to 3400 and 110 subscribers, respectively), the 47,000 hits on our website, three professional videos made by ILVO, and the tens of popularized articles in and for the trade press written in-house?

Our motivation to make direct, face-to-face contact with ILVO customers (companies, the research world, SMEs, consumer, government, etc.) equaled our desire for press coverage. ILVO welcomed 5500 visitors during the Open Business Day in October, 250 specialized visitors came to our Open Field Day, an annual tradition to showcase our experimental fields. ILVO organized or co-organized 50 symposiums or workshops, each of which attracted an average of 150 participants.

Approximately 20 international delegations and visits from new stakeholder groups were received with tailor-made programming.

And of course ILVO is active on social media: Twitter, Facebook, LinkedIn. Most remarkable are ILVO's visual and audio-visual efforts, which always serve at least a double function: they are used directly with specialized groups of stakeholders as well as shared via social media and on the website.

International visitors

In 2016, ILVO has explicitly chosen to intensify our face-to-face contact with stakeholders and international delegations. Together with partners including Flanders International and FIT, we had the opportunity to share our agricultural, fisheries and food research with scientific and governmental delegations from China, Arkansas (US), Kurdistan (Iraq), Uganda, Eritrea, New Zealand, Catalonia (Spain), Peru and more. In many cases this led to a lasting relationship and mutual respect and acknowledgement.

"Dear Mrs. [R], I just wanted to thank you for taking the time out of your busy day to host our office. I know I can speak for my staff and tell you that the visit was extremely interesting for all of us. We do not often get to visit with local officials and this helped us with our understanding of the role your facility plays in the food sector. Thank you again for your time and kind hospitality," writes James Higgiston, Agricultural Minister-Counselor in the U.S. Mission to the European Union on 29 March 2016 to the head of ILVO Communications.

BUILDINGS – INFRASTRUCTURE – ENVIRONMENT 2016

ILVO has its own budget for maintaining its sites. 2016 was not a year for big new projects, but rather for structural maintenance. Various projects were done to update the buildings, making them more valuable and more energy-efficient.

Maintenance plans for 2017 were prepared this year. Some of those projects:

Animal Sciences site "Animal 68"
Barn 7 demolished

The "Animal 68" site houses ILVO's large farm animals. The advanced age of most of these buildings required a global approach to the entire site. In 2016, the first steps were taken to make a master plan and a new land-use plan for the entire site.
First, in 2016 the oldest barn, Barn 7, was demolished and that space was filled with filtering sand. This left the ground permeable but still stable enough to house hay bales. In 2017, two other old barns will be taken down.

Animal Sciences site "Animal 92" / Central Services
Furnace updated

In the building that houses ILVO's Central Services, 2 old boilers (one of which was already defunct) were replaced with new gas condensation boilers and a new thermostat was installed. Not only will this ensure the comfort of the people working in the building, it represents significant gas savings.

Plant Sciences site "Plant 39"
Wastewater separation and soil clean-up

The wastewater separation project has been implemented at Animal Sciences (sites 68 and 92) and Plant Sciences (site 96). Now at site Plant 39, the wastewater was separated from rainwater and a contaminated site was cleaned up.

Technology and Food Science site "T&V 115" – Hangar C&D
Flat roof renovation

The flat roof on Hangar C&D was renovated. Isolation (1680 m) was placed and 2 large skylights were installed to allow natural light into the interior.

Plant Sciences: Bottelare and Farm sites
Circuit breakers updated

In the Plant Sciences sites 4 and 111, 2 circuit breaker cabinets were replaced to bring them up to code. Site 4 was also fitted with additional 400 V circuits, making it possible to plug in high-voltage equipment without needing transformers.

Technology and Food Science site 370
On-site wastewater treatment improvements

The ILVO buildings on the Brusselsesteenweg in Melle release treated wastewater into surface waters instead of the sewer. This means that ILVO is responsible for treating the water before releasing it. Environmental regulations stipulate that the receiving waters may not be additionally burdened by the treated water. The growing success of the Food Pilot has created not only additional water flow but also additional pollution levels. The current wastewater treatment plant has reached its capacity. In 2016, together with the responsible government agency, ILVO set up an action plan to improve the performance of the treatment plant. Those plans will be realized in 2017.

Melle-Merelbeke campus
Wastewater to water collector

Since mid-2016, all sites of the campus in Melle (Gontrode) and Merelbeke (Lemberge) are now connected to Aquafin's wastewater collector.

ART Melken, ILVO-methaanonderzoek bij melkvee
uctie via voeding: realiteit of illusie?
Onderzoek in de melkveestal
Het verhogen van het aandeel maïskuil in een rantsoen wordt vaak aangehaald als een methaanreducerende maatregel.
DOSSIER Drones, de rage voorbij
ILVO ZET IN OP GEWAS-MONITORING MET DRONES
Leven in de bodem: gezellig, maar heel complex
"Geen strengere geluidsmaatreg
bouw van windmolens op zee"
DE ILVO-RASSENLIJST VO
KUIL- EN KORRELMAÏS 2016
Nee, ik kwam van rechts !
Allez kom ! Zitten uw ogen niet juist in uw kop of wat ? ... ik kwam van rechts !
Viskleuters
Hooibeekhoeve opent demoruimte PAS-maatregelen
ILVO en Hooibeekhoeve slaan de handen in elkaar
Studieavond vermeerdering
Moederdiermanagement: doet mijn collega het beter?
Kwallenkwesties
What's in a name?

RUNDVEEVOEDING KAN EEN VERSCHIL MAKEN

"Niets aan doen is niet normaal"

In Landbouwleven nr. 3030 van 1 januari ll. schrijft een lezer in de rubriek 'Uw Stem' over de plaats van de herkauwer in onze maatschappij. Maar volgens Leo Fierns, die als voormalig ILVO-onderzoeker altijd sterk bezig was met rundveevoeding, bevat de tekst enkele punten de verbetering, en zo niet wat meer nuance verdienen. "Hiermee bewijst men geen goede diensten aan de veehouders, ook al is men nog zo sterk begaan met hun situatie", aldus de heer Fierns. We geven hem graag het woord.

Een evenwichtig rantsoen

Vicieuze cirkel

SENSOREN WAKEN OVER WELZ
GEZONDHEID EN PRODUCTIE

EIKWALITEIT VERBET
SPLITVOEDERVERST

→ ONDERZOEK

Kans op berengeur daalt bij minder huidverwondingen, een hoger mar vleespercentage en lagere omgev

Berengeur komt minder voor bij karkassen met minder verwondingen en
De berengeurprevalenties variëren sterk tussen bedrijven, maar ook tusse
de eerste fase van het onderzoeksproject 'Bedrijfsspecifieke strategieën v

De relatie tussen de huidlesiescore en berengeur wijst erop dat beren die meer agressief gedrag vertonen (of ondergaan), meer kans hebben op het ontwikkelen van berengeur.

Praktijkst

Testen op het Proefbedrijf

BERENGEUR BEÏNVLOED DOOR SLACHTGEBONDEN FACTOREN

einigen geen goed alternatief voor
gen en ontsmetten

17.01.2016 ILVO en VIB gaan intensiever samenwerken

STUDIEDAG KOESENSOR ILVO

Kreupelheiddetectie: werk aan

81 euro per koe

INNOVATIES SNELLER IN DE PRAKTIJK KRIJGEN

Vijf concrete samenwerkingspro

Vilt

27.05.2016 Antibioticareductie levert 2,67 euro per vleesvarken op

Volgrond

Bacterieziekten in kolen en prei

Bacteriëziekten in koolgewassen en prei

Optimalisatie van het bedrijfsmanagement met behulp van de witloofbarometer

Witloof

Onderzoek naar ritnaaldenuit de startblokken

AKKERBOUW

Schieters vermijden in cichorei

ting in sierteelt kan export versterken

Paprika: binnenrot aanpakken bij de bloem

Thema

De beheersing van binnenrot in paprika krijgt stilaan vorm. De strategie berust op het voorkomen van bloeminfectie zodat *Fusarium* de vrucht niet kan koloniseren. Bloeminfectie kan worden voorkomen door de *Fusarium*-sporen, die op de planten aanwezig zijn, af te doden. Daarnaast kan door het aanbrengen van een biocontroleorganisme op de bloem worden verhinderd dat de nog aanwezige *Fusarium*-sporen de bloem infecteren.

Beheersing door afdoden van de sporen

Besluit

KLIMAAT BELANGRIJK THEMA IN ILVO-ONDERZOEK

DRUK STARTJAAR OP VARKENSCAMPUS

15 juni 2016 • 3e jaargang nummer 5

ILVO anticipeert op de gevreesde plantenziekte Xylella

Vervolg van de voorpagina

Minder antibiotica en toch meer winst per vleesvarken

VARKENSHOUDERIJ

HANDEL & TECHNIEK

GROENE SECTOR BELGIË

7 Vuistregels voor gezond groen
pagina 4

Trendonderzoek moet marktpositie Franse sierteelt versterken
pagina 7

Kantoorpand krijgt groene wand
pagina 11

ILVO anticipeert op de gevreesde plantenziekte Xylella

15 juni 2016

GlobuTrike TK1200 + GPS
Kijk voor meer informatie
www.eendam.info
Uw portaaltrekker specialist
Gebr. Eendam BV

Mest m een noo

Groenten telen kan ook op het dak

De Morgen - 28 Jun. 2016
Pagina 9

Minder antibiotica in ons vlees, het kán

28/05/2016 om 06:02 door Inge Ghijs (http://www.standaard.be/auteur/inge-ghijs)

WAT IS DE KOSTPRIJS VAN BIOLOGISCHE MELK?

In het kader van het project 'Bio in beeld' (2013-2015) werd de kostprijs van melk op een tiental biologische bedrijven berekend. Tijdens biobedrijfsnetwerken werd de kostprijs bediscussieerd met de betrokken melkveehouders.

Het vergelijken van kosten tussen bedrijven onderling is niet eenvoudig.

KIEMVRIJE RUNDERBIESTMELK

Boerenbond • Boer&Tuinder • 6 juli 2016

Kordes en ILVO kapen prijzen weg

ROZENKEURING

Ignace Dierco, consulent Boerenbond

LED-belichting in sierteelt kan export verste

Wat zit er in groenten?

Wat met groenteresten?

Onderzoek naar optimale verwerking van groenten en hun reststromen

Het Instituut voor Landbouw en Visserijonderzoek (ILVO) wijdt een uitgebreid luik van het onderzoek aan de verwerking van groenten. Voorname thema's zijn het verbeteren, het evalueren van nieuwe processingtechnieken en houdbaarheid, verwerken van reststromen en...

LEGHENNENHOUDERS VOLGDEN ROEP OM BETER WELZIJN

15 juni 2016 • 3e jaargang nummer 5

Openvelddag bij ILVO in Merelbeke

Spar Eke krijgt erkenning 'Groentevakman 2016'

PROMOTIE

Groentevakman 2016
1.000 euro

14 • www.landbouwleven.be

OPENVELDDAG ILVO

AKKERBOUW

Vlas, miscanthus en cichorei: minder geteelde, maar waardevolle gewassen

Op de openvelddag van het Ilvo werden ook proeven met enkele minder gangbare teelten voorgesteld. Vlas, miscanthus en cichorei. Een afwisselend en interessant bezoek!

DEMO BEMESTING

LANDBOUWLEVEN 6/5/2016

...mixen: ...noodzaak, maar doe het veilig!

SENSOREN ZIJN EEN HULPMIDDEL VOOR DE VEEHOUDER

De partners van het Koesensorproject (KU Leuven, ILVO en Hooibeekhoeve) gingen op zoek naar het perfecte systeem voor de detectie van (verhoogde activiteit bij) bronst ter verbetering van de vruchtbaarheid. Sensortechnologie heeft veel potentieel om veehouders te helpen in hun dagelijks management.

Algemeen

Nieuwe LA-trajecten 201…

Het Agentschap Innoveren en Ondernemen heeft dit ja… onderzoeksprojecten, ofwel landbouwtrajecten, met betrekk… groenteteelt weerhouden voor financiële ondersteuning. … geven we een korte voorstelling van deze projecten.

…agtherapie in kool en prei

'Zelfgeplukte mosselen kunnen uw gezondheid schaden'

De Standaard - 12 Aug. 2016

Mosselen, oesters of schelpen plukken en opeten aan onze Belgische kust: het is verleidelijk, maar besef wel dat het fataal kan aflopen.

Van onze redactrice
Christine De Herdt

BRUSSEL Het is niet alleen goedkoop, maar ook gezellig: samen mosselen rapen en ze…

07.08.2016 Flashback 2007: 75 jaar overheidslandbouwonderzoek

In de zomer van 2007 vierde het Instituut voor Landbouw- en Visserijonderzoek 75 jaar overheidslandbouw- en visserijonderzoek in Vlaanderen. De referentie naar werd verwezen is 1932, toen in Melle … voor Veredeling der Landbouwgewassen werd … Toenmalig ILVO-directeur Erik Van Bockstaele … viering aan om te pleiten voor meer overheids… de daaropvolgende jaren ook effectief gekome… moeten we de hele keten wetenschappelijk onder… om de toekomst voor de sector te verzekeren."

destijds bij Vlaams landbouwminister Yves Leterme. Melle, de plaats waar ook vandaag nog een groot deel van de onderzoeksfaciliteiten van ILVO gehuisvest zijn, was de wieg van het Vlaamse landbouw- en visserijonderzoek. In 2007 vierde de sector op initiatief van ILVO de vijfenzeventigste verjaardag van het door de overheid gestuurde landbouw- en visserijonderzoek. Drie jaar eerder verrees er het Proefstation voor Veredeling der Landbouwgewassen, het latere Rijksstation voor Plantenveredeling. De oprichting was een initiatief van verschillende professoren van de in 1920 gestichte Rijkslandbouwhogeschool Gent.

TECHNOPOOL SIERTEELT — KENNIS WIJST DE WEG

BEOORDELING VAN MISCANTHUS IN GROEIKAMERS KAN GROEI IN HET VELD VERKLAREN

Revolutionair: van aardbeiencoulis tot schilfers in exact…

Het Nieuwsblad/Regionaal: Vlaamse Ardennen - Gentse Rand

7.000 ton bijvangst per jaar

De Standaard - 29 Aug. 2016

Vlaanderen gaat weer mosselen kweken

Do's en don'ts voor het reinigen van stallen

12.09.2016 Probiotica vallen door de mand

De aanwezigheid van ziekteverwekkende bacteriën in veestallen beïnvloedt het voorkomen van ziektes en sterfte bij dieren. Bovendien houden bepaalde bacteriën ook een mogelijk risico in voor de volksgezondheid want mensen kunnen ziek worden door het eten van besmet vlees. Het is dus belangrijk om deze ziekteverwekkers te bestrijden en de infectiedruk op een veebedrijf zo laag mogelijk te houden. Een grondige reiniging en ontsmetting maakt deel uit van een goede bioveiligheid. Resistentie tegen ontsmettingsmiddelen is sinds kort een belangrijk …

LANDBOUWLEVEN 23/9/2016

VEETEELT

…september: een goed moment …grasland in te zaaien

GRASLAND MOET JE WELOVERWOGEN SCHEUREN

7 september 2016 • 3e jaargang nummer 7

Nieuwe subsidies voor VLIZ en ILVO in Oostende

De nieuwe gedeelde huisvesting met laboratoria, technische ruimten en kantoren moet klaar zijn tegen het najaar 2019. Het project komt op de huidige site van het ILVO aan de Ankerstraat op de Oostendse Oosteroever. Ook het bestaande Marien Station Oostende aan de Wandelaarkaai zal uitgebreid worden.

"Een goede zaak voor Vlaanderen en voor de stad Oostende", aldus Björn Anseeuw. Vooral de verankering in Oostende is voor het Vlaams parlementslid van cruciaal belang. "We kunnen stilaan spreken van een …

ZIEN WE BINNENKORT SOJA OP ONZE VLAAMSE VELDEN?

De Belgische veehouderij is sterk afhankelijk van geïmporteerde, eiwitrijke gewassen. Een lokale productie van soja zou hierop een antwoord kunnen bieden. Waarom er momenteel nog geen soja groeit in onze streken is omwille van het koude groeiseizoen. Voor een selectie van een gepaste soja voor onze contreien bekeek ILVO 409 verschillende variëteiten of landrassen. …

Onderzoek ILVO
De nieuwe melkveestal van ILVO heeft heel wat potentieel voor onderzoek en het is belangrijk om dit potentieel te benutten en te valoriseren voor de melkveehouders.
Koolstofopslag onder grasland
In Vlaanderen ligt bijna 30% van het landbouwareaal onder grasland. Het is bekend dat grasland meer koolstof kan opslaan dan akkerland, omdat er constant organisch materiaal aangevoerd wordt in de vorm van wortelresten en doordat de grond niet intensief bewerkt wordt. Meerdere Franse en Belgische studies hebben aangetoond dat grasland in de bodem evenveel koolstof opslaat als bossen. Aangezien er een aanzienlijk graslandareaal is, dat bovendien een hoog koolstofopslagpotentieel heeft, kan grasland een belangrijke rol spelen in de strijd tegen de klimaatverandering.
Klimaat
Tommy D'Hose en Greet Ruysschaert (ILVO)
Blijvend of tijdelijk grasland
Akkerland
Vlaanderen gaat weer mosselen kweken
De Tijd - 13 Aug. 2016
Over een paar jaar eet u mogelijk Belgische mosselen. Onder meer Colruyt en Sioen en onderzoekers willen van mosselen tussen de windmolens in de Noordzee.
"De zee is geen buffet waar je ongestraft van mag eten"
Het Nieuwsblad - 12 Aug. 2016
Welke mogelijkheden biedt de bio-economie voor landbouw?
28.11.2016 Onderzoeksvragen zijn helder voor ILVO
Een niet al te gewaagde voorspelling is dat de agrovoedingsindustrie meer zal doen dan enkel mensen voeden. De sector zal ook hernieuwbare grondstoffen aanleveren voor allerlei industriële, farmaceutische en technische toepassingen. De bio-economie is namelijk in volle ontwikkeling. Landbouwonderzoeksinstituut ILVO greep een studiedag aan om de eigen bijdrage aan het versnellen van deze ontwikkeling helder te maken. Wat kunnen onderzoekers gespecialiseerd in landbouw, visserij en voeding betekenen voor de bio-economie? Welke kansen zijn er voor Vlaamse bedrijven om meerwaarde te creëren?
De Vlaamse bio-economie mogelijkheden
Compacte sierplanten zonder groeiremmers
Sinds 1 oktober 2016 is het nieuwe LA project 'Compacte sierplanten zonder groeiremmers' van start gegaan met steun van het Vlaams Agentschap Innoveren & Ondernemen.
Interesse of vragen?
Waarom produceert tetraploïde rode klaver minder zaad dan diploïde?
Nutriënten optimaal benut bij goede bodemstructuur
Boer&Tuinder • 13 oktober 2016
Tijdens het natte voorjaar van 2016 kon je er niet naast kijken dat de groei van de gewassen ... Op laaggelegen percelen waren opbrengstverliezen sowieso moeilijk te vermijden ... één perceel of verschillen tussen nabijgelegen percelen waren opmerkelijk ... bodemstructuur. Werken aan een goede bodemstructuur ...
UGent & Colruyt willen Belgische mosselen kweken
Het Laatste Nieuws - 16 Aug. 2016
Colruyt wil Belgische mosselen kweken tussen windmolens
Het Nieuwsblad - 16 Aug. 2016
Enkele jaren na de Belgica-mossel en de Flanders Queen Mussel - die allebei kopje-onder gingen - worden opnieuw plannen gemaakt om Belgische mosselen in de Noordzee te kweken. Enkele bedrijven, waaronder supermarktgroep Colruyt en onderzoeksinstellingen als de Universiteit Gent en het Instituut voor Landbouw- en Visserijonderzoek (ILVO) betrokken. Dat vernam De Tijd en is bevestigd aan onze redactie.
Het zou de bedoeling zijn om op termijn mosselen in 'hangcultuur' te kweken tussen de windmolens van Belwind, maar volgens het maritiem ruimtelijk plan de kweek van vis en zeedieren toegelaten is. (krs)
Vilt
27.09.2016 Food Pilot levert eerste industriële technologie af
Met een innovatieve droogmachine voor voeding heeft ILVO een technologie afgeleverd die industrieel kan gebruikt worden ...
Sterke reductie antibiotica én betere resultaten
De 61 deelnemers aan het project 'Red AB', wat staat voor reductie antibioticagebruik, hebben gemiddeld een reductie van 52% ...

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Administrator-General

Administrator General

Joris Relaes
Unit Head
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Annual report ILVO 2016

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