Flanders
is agriculture and fisheries

Annual report 2015

ILVO
Institute for Agricultural and Fisheries Research

www.ilvo.vlaanderen.be

Annual report ILVO 2015

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Two reports for the price of one

The reporting in this annual report covers both parts of ILVO, the government-funded part (ILVO-VO) and the funds gathered under ILVO's Own Capital fund, known as ILVO-EV in Dutch. ILVO-VO is an internal independent organisation of the Government of Flanders, while ILVO-Own Capital (ILVO-OC or ILVO-EV in Dutch) manages grant monies, royalties, product revenues and other income streams. Each of these two entities have their own budgets, governing committees, audits, and legally separate employees. In practice, however, these two organisations work as one: they share the same mission and ILVO-VO personnel work alongside ILVO-EV personnel, with no externally distinguishable differences.

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.





Vlaanderen
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ILVO
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Dear reader,

This annual report gives you a taste of the wide range of activities performed at ILVO in the last year. We shine the spotlight on several projects – both research and service-related – and proudly report that many of our activities have struck a chord in the media as well. All of these accomplishments are the work of the 600+ enthusiastic ILVO employees. I hereby sincerely thank them for all they do.

During The Year of the Soil, a great deal of attention went to the health of this crucial production factor for Flemish agriculture. ILVO also showcased our soil research during a very successful seminar and the publication of an amusing yet serious New Year's letter, "The 10 commandments for sustainable use of the soil."

The ILVO buildings and infrastructure are undergoing a continual process of modernization. The new sow and fattening pig barns were opened together with the Minister of Education. In response to a direct request from the Minister of Agriculture, Fisheries and Nature and several farmers' organizations, an experimental barn for meat cattle was created in the context of PAS, the Flemish ammonia reduction plan.

The purchase of ILVO's own drone, which is used for the new ILVO research platform on smart sensors (I-Sense), proves ILVO's commitment to Smart Farming. When ILVO researchers add the element of the climate problem, they speak authoritatively about Climate Smart Agriculture.

More and more food processing companies have found their way to the Food Pilot, a joint ILVO-Flanders FOOD venture. This pilot plant for the food industry is performing pioneering work in the valorization of waste streams, a particularly relevant issue for the fisheries sector in the wake of the new by-catch "landing obligation".

ILVO is contributing to the social debate about open space, agriculture and rural areas in the Pilot Projects on Productive Landscapes together with the atelier of the Flemish Building Master and the pioneering ILVO work that exposed the hidden urbanization of rural areas.

You will undoubtedly notice that in addition to the majority of ILVO research focusing on cost reduction for agriculture, horticulture, fisheries and food processing companies, a number of research projects are focusing on how to create added value for Flemish agricultural products.

Enjoy your reading and we hope to see you at one of our many ILVO activities!

Joris Relaes

ILVO will open its doors during the Open Business Day in Flanders on Sunday, October 2nd, 2016

Research 2015

Theme

Bio-economy & closed-loop systems

NEWS ITEM

Organic: here and abroad

- On Sunday 27th and Monday 28th September, the first BioXpo (an organic trade show) was organized in Brussels. As coordinator and member of the Network for Research on Organic Farming (NOBL) ILVO and its partners within the Flemish knowledge network for organic agriculture and food (CCBT and Biobedrijfsforum) set up a stand to highlight research and knowledge about organic. ILVO research was also presented during the workshops.
- The CORE-Organic ERA-Net is a network financed by Europe whose goal is to improve the quality, relevance and use of resources by European researchers working on organic food and agriculture. This will be done via coordination of the research and fostering international partnerships. ILVO, an active partner in the network, helps to grow the impact of these efforts over the international borders.

Future miscanthus varieties more tolerant of chilling and frost?

Miscanthus x *giganteus* is a woody, perennial grass that produces high yields of biomass with limited inputs of fertilizer, pesticides and labor. This native to southern Japan may suffer from cold stress in Europe. New miscanthus varieties are needed that combine enhanced cold tolerance with a high yield and good quality biomass. Therefore ILVO, is looking for genotypes with greater cold tolerance in a collection of over 100 miscanthus genotypes provided by European breeders. Protocols have been developed to screen cold tolerance on a large scale. In field trials and experiments in growth chambers genotypes were found with a higher tolerance to frost stress and better growth at the low temperatures in early spring. These genotypes can be used by breeders for breeding new cold tolerant varieties which will make the cultivation of miscanthus more profitable.

Valorization of byproducts from the Belgian fisheries and fish processing industries

Tighter regulations are confronting the fisheries and fish processing industries with the challenge of decreasing waste production and increasing the utilization of byproducts. In order to determine the opportunities and bottlenecks for both sectors in Belgium, a multidisciplinary consortium was assembled, with ILVO, eCoast, KULAK, UGent and VIVES as members. Byproduct valorization opportunities were determined by characterizing the different types of byproducts, pinpointing valuable components, performing a socio-economic analysis and experimenting with small-scale processing techniques. In total, 80% of the unwanted bycatch from the Belgian fishing fleet consists of: plaice, dab, sole, whiting, bib, lesser-spotted dogfish and monkfish. Homogenization experiments were performed on several matrices (meat, head, skin, bone and viscera) of these species in order to prepare the samples for further analysis. Chemical characterization was then performed on the matrices to identify valuable components. Fish silage was also produced to determine the possibility of producing a fish meal substitute using whole Belgian bycatch. Experiments indicated that it was possible to produce a fish silage of pH < 4.5 using 2.5% formic acid (w/w). The nutritional and chemical aspects of the fish silage are still to be determined.

NEW PROJECT

'Upcycling' of agro-food by-products and waste fractions

In early 2015, the ERA-NET SUSFOOD project SUNNIVA, entitled "Sustainable food production through quality optimized raw material production and processing technologies for premium quality vegetable products and generated by-products" started. In this European research projects the focus is on the improvement of the sustainability of the entire food production chain, from harvest to consumption. For Flanders, DCM-KUL and BND Telersvereniging-ILVO participate in the project. ILVO is working towards improved valorization of all vegetable biomass produced. The focus is on targeted characterization of the available, underutilized biomass fractions and innovative processing into raw materials, ingredients and end products for the food industry.

NEWS ITEM

Bio-economy: from fossil to bio-based

The transition from a fossil-fuel based economy to a biobased economy creates opportunities for the Flemish agriculture and fisheries sectors and the agri-food businesses. ILVO wishes to help this transition by implementing four research axes. The transition to the bio-economy requires completely rethinking the socio-technological system. New institutional organizations are formed, infrastructures change, and policies must be adjusted. In the first research axis, the processes are required for this system innovation are developed, organized and followed up. The bio-economy results in a higher demand for biomass and a pressure on natural resources. In a second research axis, processes such as plan production or the processing of biomass waste streams are analyzed via a sustainability analysis. Closing the nutrient loops is an essential issue here.
In a third axis, ILVO researches the growing demand for biomass: the potential of specific crops in the bioeconomy. Research focuses on diversification of crops, genetic research and crop optimization. Not only plant production but insects and algae production also come into the picture. The last research axis concerns the optimal processing of locally produced biomass (waste) streams, taking the cascade principle into account. This research strategy takes form as various research projects, both national and international.

Quarantine nematodes in residues during potato and vegetable processing

The potato cyst nematodes (*Globodera* spp.) and root-knot nematodes *Meloidogyne chitwoodi* and *M. fallax* are quarantine nematodes ("q-nematodes") that can be found in potato and vegetable growing areas. The FOD project NEMASPREAD investigated what could be done to prevent spread of these q-nematodes via the residues of the potato and vegetable processing industry. Without treatment, they can survive for a long time in wash water and waste soil. Heating at a temperature of at least 60 °C for 1 hour was found to be sufficient to kill more than 98% of *M. fallax* and *M. chitwoodi*. Inundation of residual soil yielded good results when organic material (fresh or steamed potato peelings and green waste from leeks) was mixed with the soil, with 99.5% mortality of *Globodera* spp. and *M. fallax* after 4 weeks. For *M. chitwoodi* 6 weeks inundation was required to obtain 99.5% mortality. Besides prevention and awareness, careful handling of residues also certainly helps to prevent further spread of q-nematodes.

Root damage caused by Meloidogyne chitwoodi

Theme

Soil & water

NEWS ITEM

The 10 commandments for healthy soils:

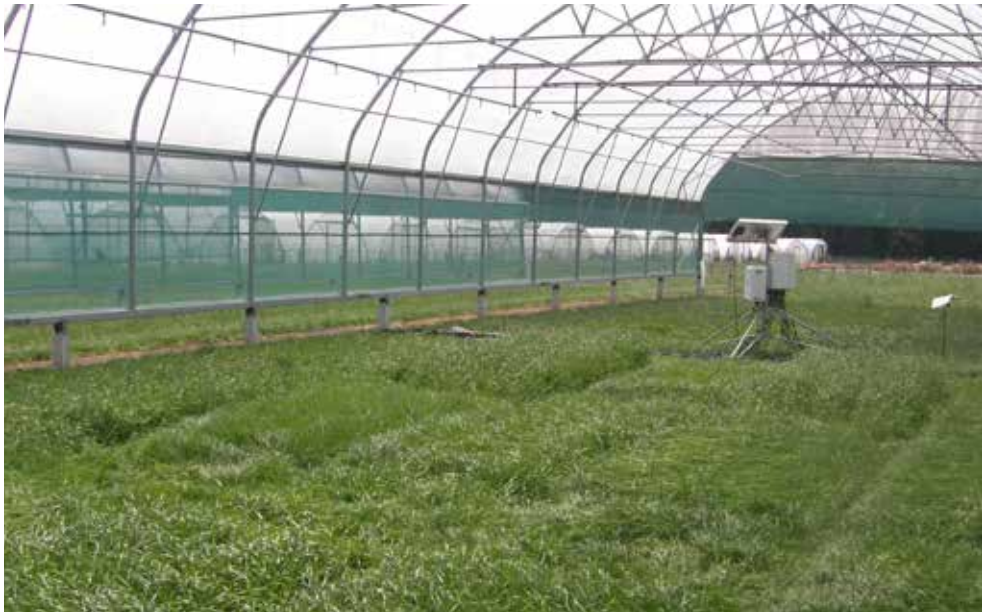
1. Thou shalt love your soil above all else
2. Thou shalt descend from thy tractor and meet the ground
3. Thou shalt know and respect the law of eat and be eaten
4. Thou shalt never forget organic material
5. Thou shalt only work the soil when it is dry enough
6. Thou shalt never apply too much pressure on the soil
7. Thou shall request regular soil testing
8. Thou shall not fertilize more than needed
9. Thou shalt always cover thy soils
10. Thou shall rotate thy crops

In short, in this apt and original way, ILVO soil experts call for attention to organic matter, soil compaction, fertilization, analysis, cover crops, and crop rotation.

How do grasses cope with drought stress?

Drought tolerance is a major challenge for grass breeding. Interest in drought tolerance is now rising in Europe, because drought periods are expected to increase as a result of climate change. The current dominant forage grass species (especially *Lolium* spp.) provide high yields of nutritious forage, but are susceptible to drought. Festuca grasses are more resistant to drought, but are less digestible. Interspecific crosses between *Festuca* and *Lolium* grasses may combine the desired characteristics of both genera in so-called Festulolium grasses.

Festuca, Lolium and *Festulolium* grasses were exposed to drought treatments in pots in a greenhouse and in fields under a mobile rainout shelter to induce controlled drought conditions. Once established, tall fescue (*Festuca arundinacea*) performed best during drought periods, while Italian ryegrass (*Lolium multiflorum*) had the highest production under drought conditions during youth growth in pots and during the first mowing year in the field. Drought clearly affected yield, forage quality and the various physiological (photosynthesis, transpiration) and phytochemical measurements (proline, flavonoids and phenolic acids). The results gave more insight into the tolerance strategies that grasses use during drought periods.



NEW PROJECT

Valorization of digestate

Digestate, a valuable byproduct of anaerobic digestion, is rich in organic matter and nutrients. It has great potential as a soil improver and organic fertilizer, but the composition and properties of digestate differ greatly from the input materials and the digestion process in the biogas plant. These differences create a gap between the biogas plants and digestate end-users. The objective of the DIMA project is to close that gap by adapting the digestate processing to create more standardized products than can be applied as ecological sustainable fertilizers and soil improvers. This IWT-VIS project is coordinated by Vlaco with ILVO as partner, together with OWS, Ecca, Soil Service of Belgium, DLV, MAS and XIO.

DIMA
Ontwikkeling van digestaat op maat

NEWS ITEM

PTO lab

ILVO's laboratory for plant, soil and substrates is now recognized by LNE-ALBON for soil analysis (subdomain soil protection) in addition to the BELAC-accreditation for plant and soil analysis and the recognition by the Manure Bank division of VLM for soil analysis. The LNE-ALBON recognition was granted permanently in February 2015.

NEWS ITEM

Soil improvement through compost, non-inversion tillage, and the KnowSoil tool

At the Agribex trade show in December, ILVO presented the results of the multi-year field experiment BOPACT in the context of the Year of the Soil. ILVO showed how soil quality improved after applying farm compost and non-inversion tillage over a period of five years. KnowSoil, a useful tool for agricultural soils, was also demonstrated.

NEW PROJECT

How can farmers combat soil erosion while maintaining yield and quality?

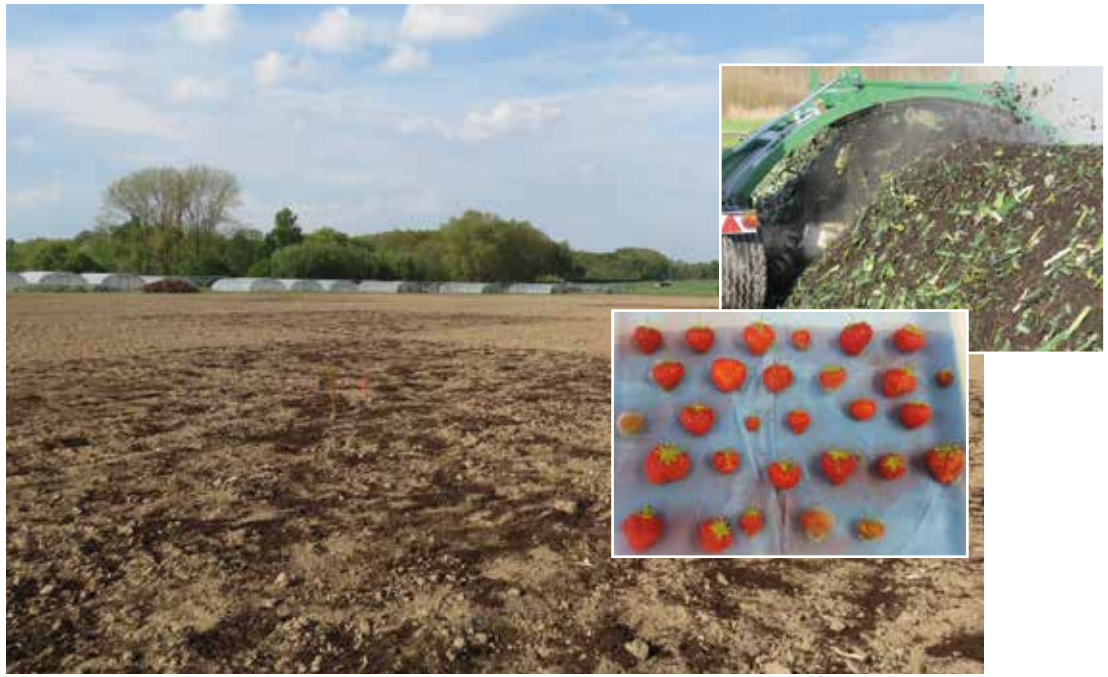
Since 2015-2016, non-inversion tillage techniques have been strongly encouraged for soil tillage and crop management on fields that are highly susceptible to soil erosion. ILVO has teamed up with the Provincial Centre for Vegetables (PCG) and Inagro in the GOMEROS project to search for techniques that maximally inhibit erosion at the source while guaranteeing the yield and quality of vegetable and maize crops. Four years of field experiments will be conducted in the hilly regions of Flanders. The treatments in the field trials are then discussed in small farmer groups called "erosion cafés". This project is financed by IWT, Boerenbond, ABS, Steeno, Packo, Vegebe, BND, Vegras and Ingro. For research results and more information, see **www.gomeros.be**

Soil management, fertilization and soil microbiology: in search of an easy indicator for soil quality

Microbial activity plays a vital role in many soil functions. Not only do microbes help to decompose organic matter and help plants acquire and assimilate nutrients, they also affect soil structure and disease suppressiveness of the soil. The members of a joint project (ILVO, CCBT, Inagro, PCG, pcFruit and Proefcentrum Pamel) have been looking for an easy method to measure microbial activity in soil. Soil was incubated in a sugar solution to simulate the activation of soil micro-organisms that come intp contact with root exudates. When we incubate the soil in a solution without sugars, we only count the bacteria that feed on undecomposed organic material. Using this test (Rusch, 1968), no differences were found between soil management and fertilization treatments. However, we did find a correlation between the readings of this test and important chemical soil indicators, such as organic carbon and "hot-water-extractable carbon" (HWC). Moreover, HWC was also correlated with several functional groups of the soil food web as determined with phospholipids fatty acid (PLFA) analysis. The PLFA method did differentiate between soil management treatments conducted in multi-year field experiments.

Left: saline solution
Right: sugar solution
Foam (right) indicates bacterial activity

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video
Biochar does not work magic on European soils!



Fertiplus: using biochar and/or compost as a soil improver

The aim of the European project Fertiplus (www.fertiplus.eu) was to identify technologies and strategies to convert urban and farm organic waste into valuable and safe products for agriculture such as biochar (a carbon-rich material obtained from thermochemical conversion of biomass), compost or a combination of both. Within the Fertiplus project, ILVO determined the effects of those products by means of composting, pot and field trials. Adding biochar at the start of the composting process increased efficiency and reduced nutrient losses and greenhouse gas emissions. Pot trials showed that the addition of biochar and compost to soil reduced disease pressure in strawberry and potato, respectively. Under field conditions, however, biochar did not meet expectations. Although a single biochar application clearly contributed to carbon sequestration in the soil, hardly any effects on overall soil quality were reported. In the field, the repeated application of compost emerged as the best strategy for increasing soil organic carbon content and soil quality in the short term without increasing the risk for nutrient leaching.

NEW PROJECT

Can the new roller-crimper optimize use of cover crops in organic farming?

The use of the new "roller-crimper" tool for destroying cover crops is being explored in the context of organic vegetable cropping systems. The European SOILVEG project, a collaboration between ILVO, Ghent University, Inagro and the European project partners, is investigating how this innovative termination technique can enhance the agro-ecological value of cover crops. This new practice may result in increased disease suppressiveness, reduced use of fossil fuel energy, improved general soil quality and reduced nutrient losses and greenhouse gas emissions. These effects will be investigated during two years on multiple locations. The yield and product quality of the cultivated vegetables will also be considered. The project is funded by the Department Agriculture and Fisheries in the frame of the CORE Organic Plus ERA-NET.

NEW PROJECT

Applying legumes to fulfill European "greening" policy: focus on dairy farms with a narrow crop rotation

In the Common Agricultural Policy (CAP), legume feed crops such as lucerne, clover, field bean and peas get a new chance to contribute. These crops fix nitrogen in the soil and can be used to either partially or completely fill in the Ecological Attention Area (EAA) on an agricultural firm. On assignment from the Flemish Department of Agricultural and Fisheries, some (demonstration) trials were planted at ILVO and University College Ghent, as well as at extension centers across Flanders. The partners Inagro and Hooibeekhoeve (in Geel) have the responsibility to study how these crops can be applied in the ration of dairy and meat cattle on a variety of farms (organic and conventional). Posters about these leguminous crops and informative meetings are used to translate the knowledge gained into practice.

NEWS ITEM

ILVO encourages and assists stakeholders to implement agroforestry

Designing and implementing a successful agroforestry system doesn't happen by itself: in-depth knowledge and practical experience, help farmers make the right choices. What is the right tree species for the desired objective and soil conditions? Which orientation and distance between the trees fit best for the intercrop and machinery? What are the appropriate soil protection measures? And what about the complex administrative and legal aspects? ILVO and the partners of the project "Agroforestry in Flanders", offer free support to farmers and moderate the contacts with other agencies. Contact us at info@agroforestryvlaanderen.be and **www.agroforestryvlaanderen.be**.

NEWS ITEM

ILVO rolled them flat!

During the Machinery Field Days in Oudenaarde, ILVO introduced a new type of agricultural equipment, the "roller-crimper", as an alternative for chemical or intensive mechanical destruction of cover crops. The role of cover crops has been encouraged by governmental rules regarding the Manure Action Plan and CAP. The roller crimper crushes and flattens the cover crop during the flowering stage. The next crop is sown or planted throughout the mulch layer without additional tillage. ILVO will look at the potential of this technique in an organic vegetable cropping system.

Theme

PLANT PRODUCTION

NEWS ITEM

Collections of diseases and pests on plants

International plant trade is increasing tremendously. This is associated with high risk of importing plant pests and pathogens, some of which are quarantine organisms for the EU. But climate change is affecting the ability of plant pests to survive in regions other than those of their origin. There is an urgent need for reference material to enable reliable diagnosis and detection of these harmful organisms. The main outputs of the FP7-Qcollect project are an inventory of collections within Europe that harbor reference material, guidelines to enhance collection quality and access, and installing collection networks for Plant Health.

NEWS ITEM

Diagnostic Center for Plants reaches new high

The number of plant samples analyzed by the ILVO Diagnostic Centre for Plants rose in 2015 by 15% to over 7000. The pressure was particularly high in the mycology (fungal diseases) section. The DCP is an expertise center for the various types of diseases and pests (fungi, bacteria, viruses, insects, nematodes, etc.). The researchers develop new and more effective detection methods and work to better understand new pathogens.

NEW PROJECT

Sector-wide integrated control of wireworms

Wireworms, the soil-dwelling larvae of click beetles (Elateridae), are currently regarded as one of the most damaging soil insect pests in the agricultural sector. Due to their polyphagous feeding behavior and their long life cycle, these beetle larvae are difficult to control. The goal of this new IWT-LA project is to develop a multi-crop wireworm compendium for the grower, based on three IPM pillars (monitoring of the crop, threshold levels as decision tool for pest control and preferably non-chemical control techniques as stated in the EU-directive on integrated pest management). This compendium will be integrated in an existing online tool of the Agricultural Application Platform and should give the farmer more clout in controlling wireworms in both integrated and organically grown crops.

Integrated control of the invasive leaf miner *Tuta absoluta* in tomato cultivation in Flanders

ILVO has studied the design of an integrated control system for the now-common tomato leaf miner, in a consortium with the Research Station for Vegetable Production, the laboratory of Agrozoology (Ghent University) and the Research Centre Hoogstraten. Laboratory tests showed that this exotic moth can survive up to two weeks in greenhouses without any host plants, implying that low pest densities are certainly needed at the end of the cultivation period. At this moment we also know that the control of this pest with the predatory bug *M. pygmaeus* should be undertaken shortly after planting. This bug prefers to eat the eggs of *T. absoluta*: leaf miner larvae by the predator was insufficient. Laboratory tests showed that insect parasitic nematodes can be particularly effective in the management of the leaf miner. The promising laboratory results are difficult to transfer into practice; further research concerning application techniques and conditions is needed. In case of insufficient biological, mechanical and/or physical control of *T. absoluta*, chemical pesticides can offer a solution. The number of treatments is now reduced to a minimum and the possible side-effects on beneficial organisms were studied.

NEW PROJECT

Flying "fire"-fighters rescue fruit trees

Fire blight (*Erwinia amylovora*) is an economic threat to fruit production in Flanders, causing extensive damage on apple and pear. Infection occurs through the flowers, leading often to death of the tree after only a few weeks. ILVO aims to apply biological control organisms (BCOs) carried on bumblebees to protect the blossoms from infection. Usually BCOs are applied by spraying, but this only treats open blossoms, not flowers that are still closed at the time of spraying. Delivery of BCOs via bumblebees may result in the trees receiving a continuous supply of BCOs throughout the blooming period.

NEWS ITEM

Experimental harvester for marigolds

Marigold is an innovative crop with great potential for various possible uses. For example, the oil extracted from the flowers can be used in cosmetics and pharmaceuticals. Before this crop can be developed further, machines must be developed for harvesting the flowers. ILVO demonstrated a prototype mechanical harvester which cuts off the flowers and collects them. Although this machine was developed to harvest chamomile, it also works well in marigold. Further optimization of the flower harvester should enable us to improve quality and yield.

Longhorns of the genus *Monochamus* as vector of the pine wilt nematode

It is likely that the quarantine pine wood nematode *Bursaphelenchus xylophilus* will be introduced into Belgium in the near future via imported timber and wood products. This species can cause catastrophic damage to local pine stands and forests. The nematode relies on the presence of suitable vectors or "carriers" for its dispersal, such as longhorn beetles of the genus Monochamus. Little is known about the occurrence, population densities and geographical distribution of these vectors in Belgium.
During a three-year monitoring survey, only 7 *Monochamus* individuals were observed in Belgium. This implies that the vector either occurs in extremely low numbers across Belgium or that they are introduced into Belgium through international trade. Using a modified trapping technique, the introduced vectors as well as the pine wood nematodes they could be carrying, can rapidly be detected in the future. The knowledge gained in this project has contributed to the development of both an annual monitoring program for Belgium and a national contingency plan to be implemented when a vector with or without pinewood nematodes is detected.

NEW PROJECT

Which soy variety will work in Flanders?

In 2014 and 2015, ILVO studied several varieties of soy. Researchers strove to determine which varieties will perform best under Flemish conditions. In two locations (Merelbeke en Geel), 14 varieties were compared. The growing season of 2014 had a very wet month of August and clear differences in tendency to fall over were observed and susceptibility to the fungal disease *Sclerotinia*. In 2015 the summer was hot and dry, which resulted in drier beans at harvest.
On average, across both years and the two locations, the 14 varieties together yielded approximately 3 tons/ha and they were 19% water. Future research will focus on optimizing agronomy techniques to raise both yield and protein content, ultimately arriving at a feasible crop for the Flemish farmer.

NEWS ITEM

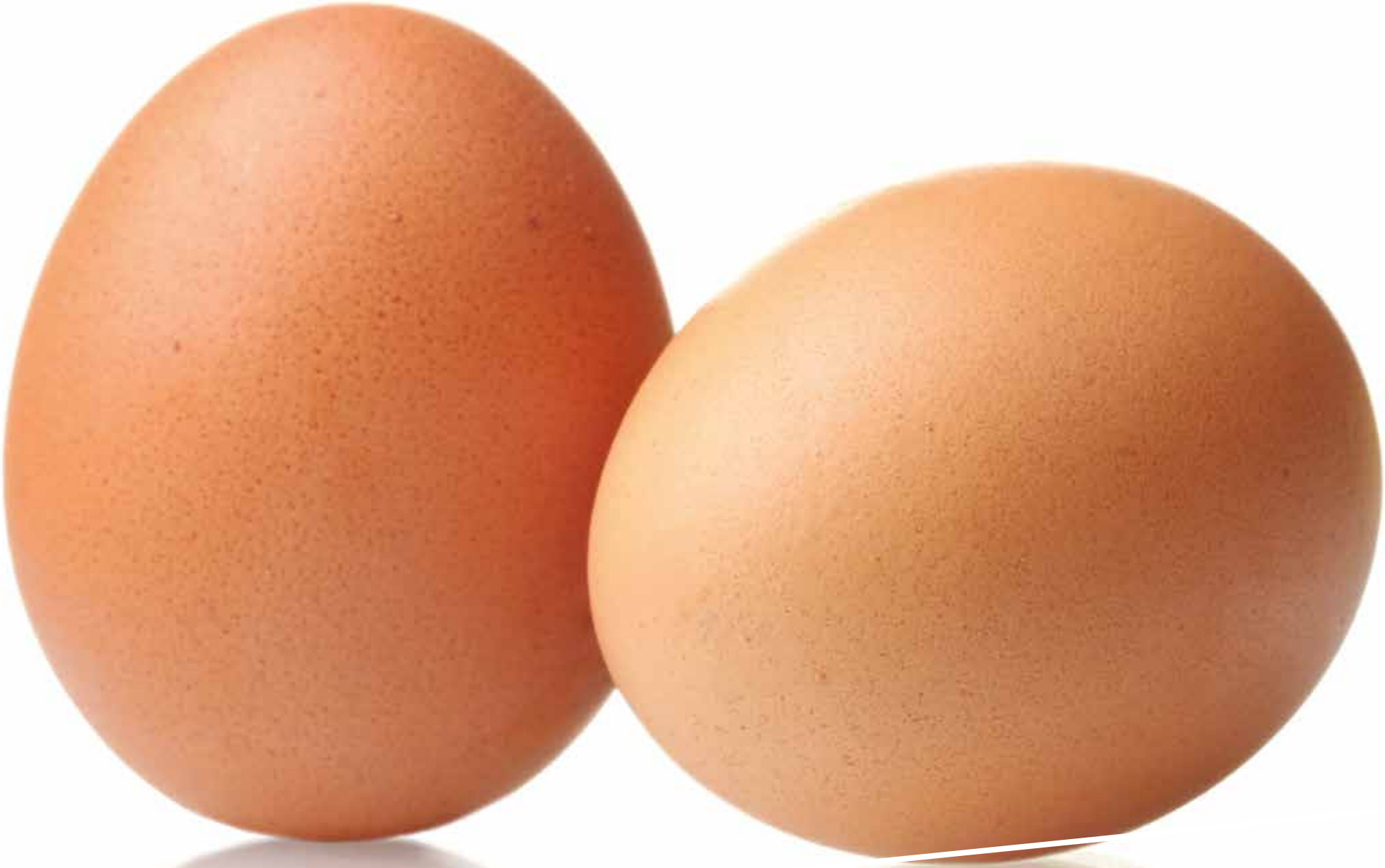
Plant breeders from around the world united in Melle and Gent

In 2015, ILVO organized the EUCARPIA congress for the Ornamentals section and the Fodder Crops and Amenity Grasses section. As many as 345 researchers and breeders from over 25 different nationalities were guests at ILVO and visited our laboratory facilities and test fields. EUCARPIA or the European Association for Research on Plant Breeding aims to promote scientific and technical co-operation in the field of plant breeding in different crops in order to foster its further development. To achieve this purpose, EUCARPIA organizes regular meetings to discuss general or specific problems from all fields of plant breeding and genetic research.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video
Legumes need specific bacteria in order to take nitrogen out of the soil

Non-chemical control of cyst nematodes

Potato cyst nematodes (*Globodera* spp.) cause yield losses in potato. They survive as cysts in the soil in between two potato crops. These survival structures enable the spread of these nematodes, as they are also present in waste soil and can travel with harvested potato tubers.
We examined which treatments can kill eggs inside cysts, thus reducing cyst survival. Amending field soil with pig and cattle slurry, as well as with nitrogen fertilizer and various composts, resulted in decreased cyst viability (6-25%). This resulted in 86% fewer cysts after a potato cropping. Surprisingly, incorporation of biochar weakened the effect of these amendments. In addition, we found that growers of early potato varieties can reduce cyst numbers in the field by harvesting very early (early June), so that the nematode cycle is interrupted in time.
We also found that killing cysts present in tare soil, a waste product for potato processors, can be performed by inundating (flooding) soil mixed with leek and potato residues. This technique resulted in 100% mortality of cyst content after 4 weeks.



Theme

Animal production

NEW PROJECT

Alternative rabbit housing

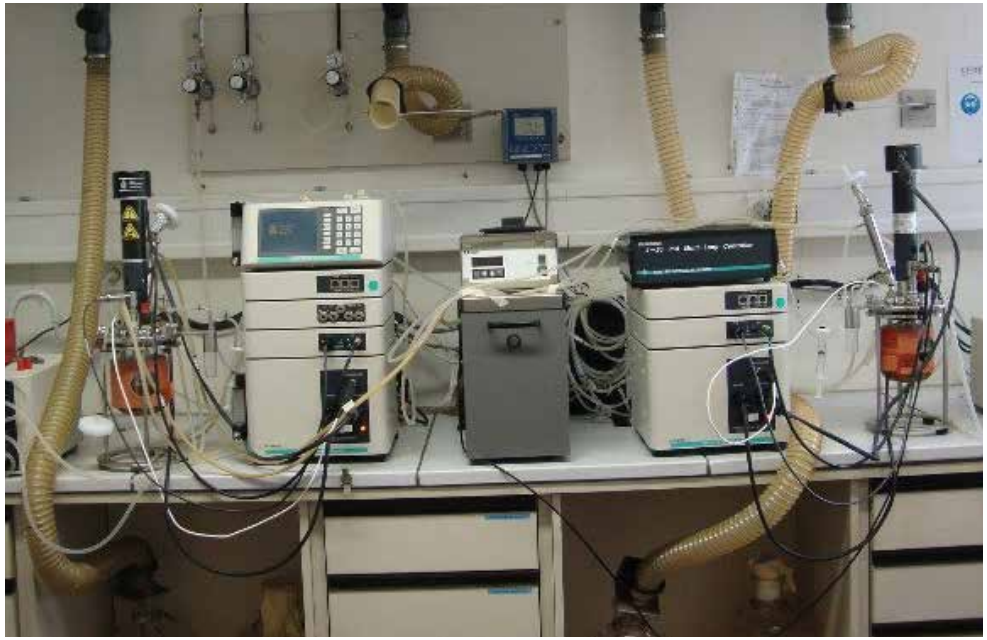
In 2014, Belgian legislation was published on a gradual switch from individual cage housing to park housing of rabbits. Existing farms and newly interested breeders will be assisted by ILVO using demos and field trials to achieve this more sustainable form of rabbit production. Flanders Animal Care Service will monitor the health status of the rabbits during the project.

The time is ripe for integrated aquaculture in Flanders

Flanders has the knowledge, the room and the market to farm aquaculture products in an integrated and sustainable way, according to recent research results from the AquaValue project. Eleven project partners, including ILVO, researched the potential of, and possible roadblocks for, integrated aquaculture in Flanders and in the North Sea. The study revealed opportunities for Flemish entrepreneurs and research institutes within and outside of Flanders. Additionally, there is still room to increase the amount of aquaculture that consumers eat as well as diversification of the products themselves. The partners suggest four feasible pilot projects: a marine multi-species hatchery, an open fish farm at sea, a mussel- and seaweed farm between windmills and a coastal defense project featuring harvestable bio-builders. To be able to realize the potential there, funding is needed for applied research for the technical and biological aspects of integrated aquaculture as well as support for start-ups.

Dysentery in pigs: optimizing detection and treatment

Brachyspira, the cause of dysentery in pigs, has a major economic impact on pig farms in Flanders. An IWT project focused on improved detection of this pathogen and treatment of the disease. Current treatments are based on the curative and preventive use of antimicrobial compounds, but this has led to a high level of antimicrobial resistance in *Brachyspira* isolates.
Certain medium-chain fatty acids and essential oils may be promising, as in vitro research has shown that these compounds can inhibit the growth of *Brachyspira*. In animal experiments, however, this effect was rather limited but can probably be further optimized via the formulation of these compounds. Acidifying the gastro-intestinal tract also seems promising - experiments in a simulation model which mimics the pig's cecum showed that lowering the pH affects the growth of *Brachyspira*. Animal experiments have demonstrated that changes in the microbiota may play an important role in the development of dysentery, thus it may be important to minimize such changes.



NEWS ITEM

ILVO opens the barn doors

In 2015 about 2000 interested visitors came to the new dairy research barn. ILVO researchers welcomed 72 groups from Belgium and abroad. During a tour of the barn, experts gave all of the visitors information about the set-up of the barn and the extensive research possibilities for different stakeholders such as dairy farmers, supply industries and processing industries within the dairy chain. The highlight was the dairy evening market on June 3rd, where more than 20 researchers talked with 200 dairy farmers about both completed and ongoing ILVO research.

NEW PROJECT

Sinking into zink...exploring dysbacteriosis in broilers

Zinc is a nutritional component with an important function for the gut health of broilers. Zinc can prevent oxidative stress in the intestinal epithelium if it is given in sufficient amounts and in an easily-absorbed form. If not, the risk for oxidative stress and enteritis caused by dysbacteriosis increases. To determine the effects on inflammation processes of zinc preparations as a broiler feed additive, ILVO and Ghent University have started a new, four-year research project. The first research results are expected during 2017.

Omega-3 doesn't necessarily make a good egg

For efficient broiler production, the interaction between nutrition of the breeder and the quality of the offspring is of importance. A possible feeding strategy is to add omega-3 fatty acids to the diet of broiler breeders.
ILVO research has shown that maternal dietary n-3 fatty acids changed the yolk composition but this did not result in stronger day-old chicks. The maternal dietary omega-3 fatty acids were transferred to the offspring: the yolk, residual yolk and liver of the progeny were enriched in long-chain omega-3 fatty acids, reflecting the breeder's dietary supplementation. Although the transition of the fatty acids to the offspring was clearly demonstrated, no effects on embryonic development and health of the offspring were found.

NEWS ITEM

Pig Information Counter and ILVO share latest research results at symposium

Which form should feed be? When should immunocastration happen? How can farmers evaluate breeding value? On June 4th farmers got answers to these questions and more at a joint ILVO and Pig Information Counter symposium about recent research results. Concrete results and practical information were directly usable for the many pig farmers who attended. The large number of attendants illustrates the relevance of this type of research for the pig value chain. All presentations and main findings can be consulted (in Dutch) at www.varkensloket.be .

Rumen degradability of maize starch increases with longer ensiling time

Good milk production depends in part on including a large portion of grains in the dairy cows' diet, with the main component of those grains being starch. Starch is for the most part degraded in the rumen, leading to formation of mainly propionic acid and in some cases lactic acid; it is partly digested in the small intestine as glucose. Propionic acid and glucose are both precursors of lactose (milk sugar). Corn (maize) starch is generally slower to degrade in the rumen than starch from wheat or barley. As a consequence there is less risk for rumen acidosis when using corn in the diet. It is also known that the degradation of corn slows down more the later (drier) the plant is harvested. Recent research by ILVO and Ghent University College have also shown that the longer maize is ensiled, the more starch is degraded in the rumen. It appears that rumen bypass of starch from corn silage as well as from CCM decreases by 1.3% points per month of ensiling, resulting in a higher risk for rumen acidosis and a lower milk production. The advantage of maize over the other grains thus disappears after one year in the silo.

NEW PROJECT

Demonstration project focuses on the importance of feed spillage on pig farms

Feed conversion is a main determinant of the profitability of a pig farm. Efficient use of feed is thus a key issue. But a great deal of feed is lost in the trajectory between production, storage, transport from the silo and the feed trough. And of course, the pigs themselves spill some of their feed while eating. For optimal feed conversion, not only factors such as the animals' genetics, their gender and the feed composition should be examined, but also any other factors that affect the use of feed on-farm. Specifically, simple adjustments to the feed troughs such as height, or the form of the feed can make a difference. In the demonstration project "Reduction of feed usage as a key to profitable pig production", ILVO works together with PVL Bocholt, KU Leuven, Ghent University and Vives to pique the pig farmers' attention for this issue through interactive workshops.

Claw quality in pigs: the link with zinc

Zinc is good for our fingernails and for pig's claws as well, according to the results of doctoral research of ILVO-Ghent University research Miriam van Riet.
She performed a study of 24 weaned piglets and 131 sows that were all divided among groups that received either a control feed or a zinc-enriched feed. The sows were also divided between pens with different types of flooring, specifically either a bare concrete floor or a rubber-covered floor. In the control piglets, it appeared that after 5 weeks that the zinc concentration in their blood plasma was clearly lower than the experimental group, and their horn growth and wear of the claws were both lower. In the sows, the zinc concentration in the feed had no apparent effect on the metallothionene (a protein that binds zinc) concentrations in the serum and on the concentrations of zinc in the blood plasma, liver, bone and horn. The amount of zinc given in feed appeared to be less important for claw quality than the type of flooring used.
In terms of the effect of zinc on the claw quality, the researcher says, "In this study we could show a positive effect of zinc supplementation on claw quality in piglets. In sows this effect was less clear." These preliminary results show more progress in claw quality by adjusting floor type. This will be further studied at Ghent University.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video
Intensive dairy farming in the post-quota era

Thermal stress for outdoor cattle: negative effects on welfare and milk production

Dairy and beef cattle and wild bovines in nature reserves all benefit from shelter under extreme weather conditions. This was the clear conclusion of ILVO-UGent researcher Eva Van Laer's doctoral thesis. Dairy and beef cattle exposed to heat not only experience physical discomfort, for example as exhibited by panting, but in dairy cows the milk production may drop by 1 liter per day. For cattle in nature reserves, artificial shelter is recommended if the natural vegetation does not offer adequate protection against harsh weather conditions. This study has yielded new insights about the thermal comfort of cattle in temperate climates. Even in temperate climates, extremely cold and hot weather conditions can and do occur. A thoroughly validated method has been developed for scoring the degree of heat stress in cattle. Recommendations for mitigating heat stress in cattle have been listed and disseminated. Climate change models predict more frequent peaks in temperature such that farmers and nature conservationists will be increasingly expected to protect the animals under their care from heat waves and other extreme weather.

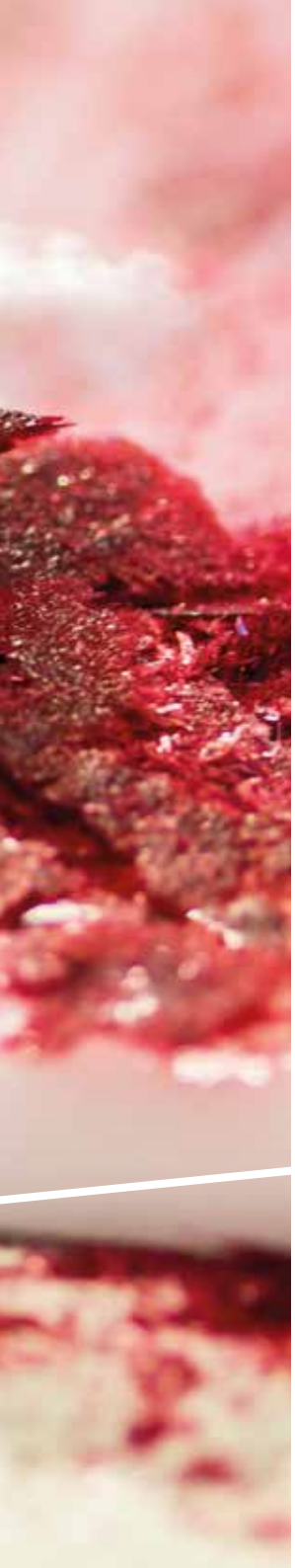
NEW PROJECT

Vaccination of pigs against *Salmonella* Typhimurium under field conditions

The ultimate goal of the new project SUSALVAC is to produce slaughter pigs that constitute only a minor risk for *Salmonella* Typhimurium transfer to humans. The project aims at providing scientifically based advice on the effect of vaccination under field conditions with a commercially live but attenuated *Salmonella* Typhimurium vaccine (Salmoporc, IDT Biologika) on sows and/or piglets. Additionally, its eventual implementation in a national control program will be thoroughly investigated. The research runs until the end of 2017 and will be conducted by a consortium led by Ghent University, with the participation of ILVO, CODA and DGZ. The assignment of ILVO is to type the *Salmonella* Typhimurium strains, to investigate the effect of vaccination on strain level as well as the persistence of the vaccine strain.

Theme

Healthy & high-quality food



NEWS ITEM

FAVV @ ILVO

ILVO and FAVV (Belgium's Federal Agency for Safety of the Food Chain) both wish to build on their long history of cooperation by starting new projects and assignments. With this idea in mind, nearly 15 staff members of FAVV visited ILVO at the end of September. With a guided tour through the different labs of the Food Pilot, the analytical possibilities and research topics in relation to food and the food production chain were presented. Their visit continued with a tour of the production halls of the Food Pilot and a chosen presentation or visit in relation to crop protection, the research on plant production, the new dairy and pig stables and the research on cultivating insects. Now the FAVV has a very clear picture of how to apply ILVO's focus in research and services in future collaborations.

NEW PROJECT

It's not a miracle – just good food drying technology

The Food Pilot has recently built a new innovative food dryer, the Dry-On-Water™. This technology, the first of its kind in Europe, is a robust and energy-efficient thin film drying technology in which the moist product is applied as a thin layer on a transparent plastic conveyer belt. The belt rotates over a sealed hot water bath that supplies the energy to the drying product. The finished product, usually in the form of dry flakes, is easily scraped from the belt. Because this technology dries food products at relatively low temperatures, the loss of its functionality, taste, odor and color are minimized. The possible applications are now being studied in a collective Flanders' FOOD research project named INNODRY as well as by several individual companies.

Processing of pangasius in Vietnam: room for microbiological quality improvement

Vietnamese pangasius is popular: Belgium imports approximately 9000 tons of frozen pangasius each year for a total value of 20 billion euros.
A Ghent University/ILVO study has revealed that Vietnamese pangasius can contain large amounts of bacteria. On a small sampling survey of defrosted pangasius (fillets, portions and steaks) imported in Belgium, high total colony counts from 10^4 to a maximum of 10^5 germs per gram were found. This is high but still within the limits. Eighteen different bacterial species were found. The same species, together with 20 others, were also found in a parallel investigation in Vietnam at large and small pangasius processing units. The numbers of Enterobacteriaceae varied between 50 to 10^4 germs per gram, with the highest count found on filets of a specific brand. These counts can be linked to the hygiene conditions for processing of the fish.
The results of this microbiological investigation are a wake-up call for the pangasius sector.

QUOTE

DECO PROTESTE

Deco Proteste (Consumer Reports, Portugal) on the Food Pilot's service

I am writing to thank you for all the help given in the elaboration of this test. The support of a good lab is in fact essential in our work and it has always been like this with your lab.

I wish you a good day
Dulce Ricardo
Estudos de Alimentação e Saúde

NEWS ITEM

NRL Allergens Symposium

On September 17th, 2015 the Belgian National Reference Lab on Allergens, a consortium with FAVV, CER Groupe and ILVO organized an international symposium titled 'Food Allergens: Regulation, Management and Detection'. The symposium took place in Brussels with 240 partcipants. It brought stakeholders from various angles such as policymakers, doctors, user associations and governments together to discuss the issues of food allergens. Scientists and research institutions came in contact with each other through a program of lectures interspersed with poster sessions. Through some of the posters, both the activities of the NRL on Allergens as ongoing research projects of the partners were explained within the NRL.

NEWS ITEM

Food Pilot process innovation for anti-waste, high-quality pear juice now launched in commercial circuit

The pear and apple producers Mark and Erik Nickmans from Halen (Limburg) see a market for the oxygen-free pressing of apple and pear juice using the Vaqulic™ procedure. The food technologists from the Food Pilot have optimized that procedure, then Fruitbedrijf Nickmans then developed their juices in the pilot hall of the Food Pilot. The first batch of mixed apple and pear juice has now been launched under the name PUURSAP.
Tests at the Food Pilot and the professional ILVO taste panel allow for the verdict that this is an ultimately high-quality juice, which is very comparable to fresh juice in terms of taste, turbidity, amount of antioxidants and nutrients. In terms of valorizing waste streams in fruit production, this is great news: the fruits that were not beautiful enough to be marketed are no longer simply composted but can now be used to create a valuable product.

NEWS ITEM

The Food Pilot: the go-to center for the food industry

The Food Pilot, an application and analysis center for the food industry, provides pilot testing for new products, food analyses and scientific advice. The Food Pilot is now a frequently visited and very accessible point of contact for the food industry. Using a tailored and integrated approach, Food Pilot staff provide expert and scientific guidance to companies during their process or product innovations. In 2015 7,600 food analyses and 353 pilot tests were done. In total, 105 different companies in various food sectors, including ingredients (17%), dairy (16%), vegetable products (15%), and meat and fish (9%).

NEW PROJECT

Plaice... in a box or a tub?

A pilot project was started in the Flemish Fish Auctions to transport plaice in tubs instead of the traditional fish boxes, at the request of the major buyers of plaice. Tubs are large plastic bins into which the fish is stored in chilled water with a layer of ice on top. This simplifies the logistics process in the further processing chain. To guarantee the quality and food safety of these fish, ILVO investigates the optimum storage conditions of fish in these tubs in collaboration with the auctions and the fish buyers. This is done by follow-up of the cold chain in various locations in the tubs and on the basis of a shelf life experiment.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video
Extensive taste-testing: an expert panel at the Food Pilot

NEWS ITEM

From idea to product: case studies from the Food Pilot

The Food Pilot provides tailored help for agro-food companies to improve their products and processes. Some companies start looking for a good idea, others to test a recipe or a process. Often they end in success, like the start-up of a juice production line at the fruit farmer Nickmans, a new concept and adapted production line fort the 'patébonbon' of Polca, an optimized production process and packaging for the insect burger of BenSBugS, the inclusion of a pasteurization process for a soup with a longer shelf-life of Soepmie, and the acquiring of the cheese craft and the development of the world's best Gouda cheese, the Flandrien cheese from Triporteur.

NEW PROJECT

Allersens: Toward simultaneous detection of allergens in processed food products

Current detection methods (ELISA, PCR, etc.) for food allergens such as milk, egg, peanut and tree nuts, are generally sensitive and specific. Nevertheless, ELISA and PCR results often show high variabilities and at the same time miss the necessary robustness in order to be a solid routine application. One of the reasons for this observation are modifications of the allergen that happen during processing of raw materials to food products. The Allersens project aims to use mass spectrophotometry to tackle this problem of processing modifications. A reference method will be developed within the project, allowing us to determine allergens in processed food products.

NEWS ITEM

Number of ISO 17025 accredited food analyses still rising

In 2015, ILVO celebrated the 20th anniversary of having ISO 17025 accredited food analyses (BELAC TEST-033). In 1995 the former Dairy Institute in Melle was one of the very first ISO accredited laboratories in Belgium. When launched with 25 different analyses on milk and milk products, the actual scope, 20 years later, includes 82 analytical methods on all kinds of food types. Five laboratories (Chromatography, Physics-Chemistry, Screening antibiotics, Food Microbiology and GMOs) have received more than 14,000 samples and have performed approximately 40,000 analyses performed; in 2012, this indicates a rise from 40% since 2012. The analyses are also performed with attention to the environment thanks to an ISO 14001 environmental certification. Traceability, delivery of correct results, support with interpretation of results, and customer satisfaction are the strengths and focus of these services.

NEW PROJECT

Nicotine in mushrooms – where can it be coming from?

In recent years, nicotine has been occasionally detected in cultivated mushrooms under certain circumstances, yet it is still unclear where this nicotine is coming from. Does it originate from contaminated growth substrate? Or is it possible that mushrooms can produce nicotine themselves? To answer these questions, ILVO has created a new analytical method for the quantification of nicotine (and its precursors) in mushrooms. This method will be used to assess the level of nicotine and its precursors in mushrooms grown, treated and stored according to common practice. In addition, we will examine whether nicotine-enriched or contaminated growth substrate can be the cause for the presence of nicotine in mushrooms.

Innovation and collaboration: food industry speeds along

For last three years, the Food Pilot intensified its close interaction with the food business: they listened to the needs for innovation, and a network of available pilot infrastructures was identified. No less than 300 pilot machines available in Flanders were inventoried and can be consulted online (www.foodpilot.be). The Food Pilot eliminated the barrier towards service suppliers, organized workshops about innovative themes and started many innovation trajectories. In order to further promote this form of open innovation, the Food Pilot organized a network event. Business testimonials illustrated the importance of pilot tests, the added value of open innovation and of the benefit of collaborating with third parties. This was situated within the project FOODINOFRA, supported by '*Agentschap Ondernemen*', and performed by Fevia Vlaanderen, Flanders' FOOD and ILVO. During this project, 143 company visits were conducted as well. Every single company said that they were innovating in one or more products, processes or concepts. The challenges turned to be situated around innovative technologies, products, safety/quality of products, odor and flavor, shelf-life of products and valorization of side streams.

Theme

Precision Agriculture

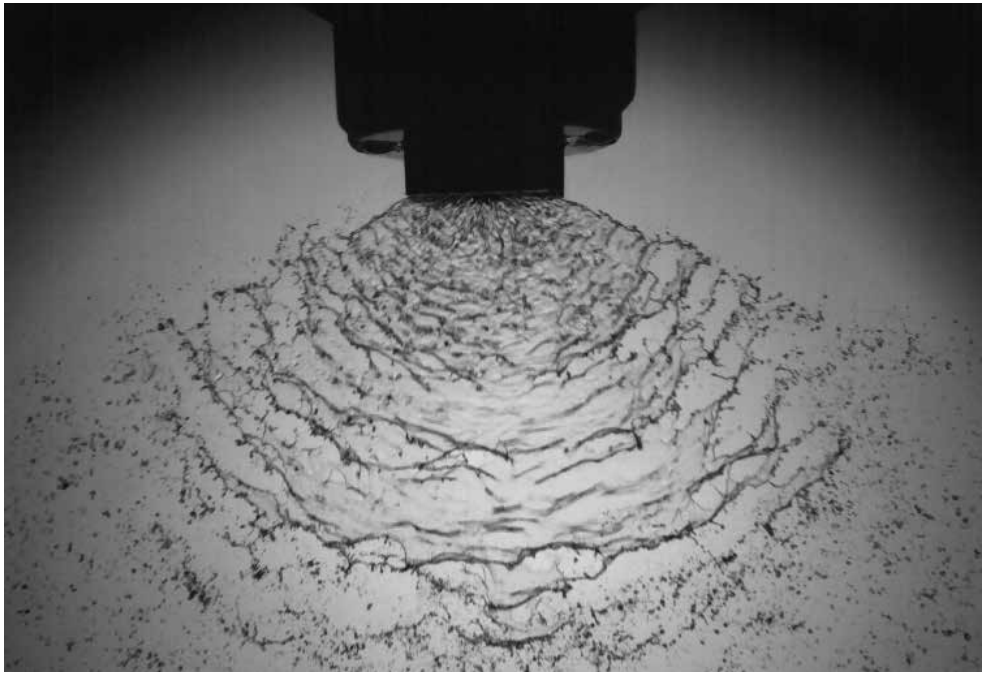
NEWS ITEM

ILVO blogs. Will precision agriculture will be smart...or not?

What can drones and by extension, all precision agriculture technology such as autonomous vehicles or robots, or close sensing techniques really bring to the farmer? In his blog proposed ILVO's Agrictultural Engineering Scientific Director Jürgen Vangeyte the following: "Drones are "nice to have" and beautiful maps are fun, but they have no direct value to the farmer himself. To become more relevant, precision agriculture technology must be smart most of all, or at least a lot smarter." The mass of data collected by a drone should be intelligently interpreted and perfectly integrated with other relevant and historical information in a convenient, modular and open farm management system that supports the farmer in his farm management. Farmers wants to know what he should do with all this information and also when or where. So should I fertilize more or less? Should I sow closer together or not? Should I irrigate more or less? Where are diseased plants or weeds, and how can I treat them most selectively or remove them? Smart technology provides those answers and realizes those answers later in the field. It offers a real cost advantage, thus surpassing the gadget level. That is now exactly precision agriculture 2.0, also called 'Smart Farming'.

Imaging of pesticide sprays using high speed camera techniques

Two high speed image acquisition techniques were developed based on single droplet experiments using a piezoelectric droplet generator. These techniques can be used to either measure macro spray characteristics like spray angle, spray shape and liquid sheet length or to measure micro spray characteristics like droplet size and velocity.
Results of these measurements were compared with existing techniques such as the Phase Doppler Particle Analyzer. Both techniques were used to measure the effect of nozzle type, size and position on both macro and micro spray characteristics.
These advanced imaging techniques allow spray characteristics to be measured in a detailed, non-intrusive way. They allow a better evaluation of spray application techniques and can be used to develop new prototypes. This research contributes to a more efficient use of plant protection products.



NEWS ITEM

ILVO's new Dust Lab

ILVO has established a Dust Lab to study the problem of dust drift from pesticide seed dressing during sowing. Measuring techniques like the Heubach dust meter, an individual sowing element, a sonic sifter, etc. are available to measure dust generation and dust characteristics (e.g. particle size distribution) from pesticide treated seeds.

NEW PROJECT

ISense: ILVO's platform on sensor technology

Despite the enormous potential of sensor technology and ICT, the practical implementation of these technologies in agriculture, fisheries and food technology are still limited. Research does not get translated into concrete innovations. The fast evolution of sensor technology is making it difficult to stay on top of all of the recent, relevant developments in the various sectors and disciplines. In addition, knowledge about sensors and the demand for sensors is spread over various research areas. Technology developers are often not aware of the various problems needing solutions, and the enormous market potential of their developments in the agro-food complex. ISense is ILVO's answer to these needs.

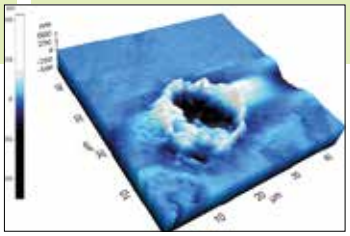
The Isense approach goes beyond simply being multidisciplinary and creates opportunities by applying technologies from one sector to solve problems in a (completely) different sector. Concretely, we see these technologies from other sectors being applied in three initial cases:

Biosensor: By transferring technology from the medical and pharmaceutical industries, we hope to develop biosensors

Precision Livestock Farming (PLF):
By implementing Ultra Wide Band (UWB) technology, already being used in logistics, health care and help services, for positioning in the pork industry and development of inexpensive gas sensors for emissions measurements in pig barns.

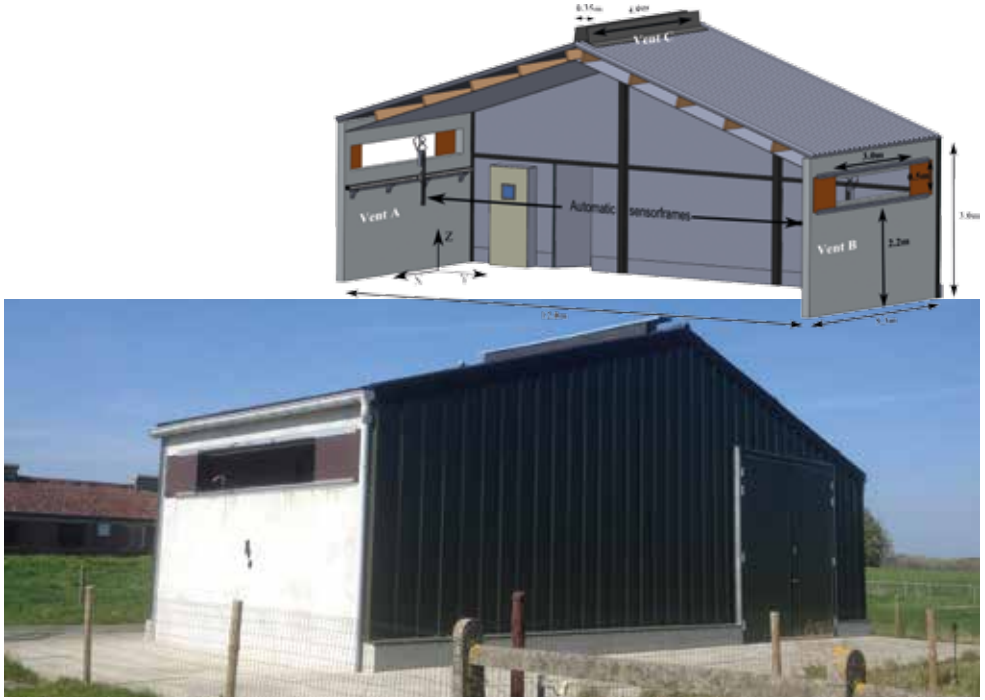
Precision Crop Farming (PCF):
UAV technology was first developed for military use. By adopting this technology as a platform for innovative imaging sensors, several applications become possible for use in precision agriculture.

A Knowledge and Innovation Platform (KIP) will create a pool of expertise on sensor technology in the agricultural, fisheries and food processing sectors. From these case studies, valorization of the sensors/technologies will then be able to start. More info at Isense.farm or isense.vlaanderen.



Newly developed airflow sensor for naturally ventilated animal housing

Gases produced in animal houses, such as NH_3 and CO_2, are harmful to the animals and farmers and have negative effects on the environment. Indoor climate control, and especially emission control, are crucial to ensure a healthy climate inside and outside animal houses. But controlling in- and outdoor air quality requires a reliable measuring technique for the airflow rate.
During the last four years ILVO and Ghent University have developed an accurate measuring technique in a small naturally ventilated test facility. This method uses a 3D velocity sensor that automatically moves across a rectangular vent, yielding detailed velocity profiles that are translated into airflow rates with an accuracy of ±20%. We are now scaling up the sensor for application in a commercial dairy barn.



NEWS ITEM

A GPS on individual chickens?

For several years, ILVO has been studying the behavior of free-range broiler chickens. Risk factors for suboptimal use of the free-range area have been identified, such as weather conditions and lack of shelter. However, personality traits such as fearfulness or exploration motivation could also play a role. Therefore, a system was tested in 2015 to monitor the position of individual chickens. By giving them a backpack containing a sensor, their position can be registered every minute. This makes it possible to study free-range behavior and relate that to personality, animal welfare and the meat quality of the individual chicken.

Innovative techniques to reduce dust drift from pesticide seed dressing during sowing

Using an integrated experimental and modeling approach, ILVO and KU Leuven estimated the importance of dust drift from pesticide seed dressing during sowing. This project resulted in adaptations to, and a better use of, existing sowing techniques; development of new sowing techniques; dust drift reducing measures and recommendations for the seed drilling process; simulation software to evaluate and optimize the sowing process with regard to dust drift and data; measuring techniques; and simulation software to evaluate the dust drift risk as a function of seed quality, sowing technique and environmental conditions.

NEWS ITEM

MoniCow: sensors for monitoring and localizing cows

In the new Monicow-project, ILVO will collaborate with iMinds, KU Leuven, the industry and dairy producers to develop an energy-efficient, real-time wireless system to detect and localize cows that need treatment or care. The system will be based on logging and combining multiple sensor parameters such as body temperature, activity, feeding & drinking behavior and location. The system, attached to the collar of cow, will be charged wirelessly and is complemented with a user-friendly app. The function of the app is to help the farmer or the vet to localize the cow that needs attention. A technical-economic analysis and marketing study will enable the industrial partners to commercialize the proof-of-concept.

QUOTE

www.spuithulp.be helps when choosing product and spray technique

The online tool www.spuithulp.be is interactive and user-friendly, and helps farmers make correct choices regarding the product used, width of the buffer zone and the spray technique (type of sprayer, type and size of the nozzle, pressure and driving speed) in function of the pest needing to be controlled. The online tool offers a concrete solution for the practical questions that farmers have.

Can dairy farms cut costs by aiming for a higher resource efficiency?

Feed - purchased and grown on-farm - is responsible for the majority of natural resources consumed throughout the milk production. This is shown by the results of the ELCA project, a Ghent University/ILVO project supported by IWT.
Because resource efficiency, in addition to mitigating climate change, is increasingly becoming a top priority in international policy, this project examined feed consumption on dairy farms. Benchmarking of 103 Flemish specialized dairy farms showed that substantial natural resource savings are possible by changing farm management. Moreover, by aiming for a higher resource efficiency, farmers can simultaneously cut costs. An average potential cost saving of 11 cents per earned euro was calculated.
Further research is required to reveal how a specific farmer can best change his own farm management.

NEWS ITEM

Smart Young Engineer

Jarissa Maselyne (ILVO's Agricultural Engineering group) received, together with 7 other young engineers, a diploma of recognition for 'outstanding engineering skills and valuable contribution and engagement to elevate our industries into an innovated and digitized future'. This award was given by the Committee for European Construction Equipment (CECE) and the European Agricultural Machinery Association (CEMA) on their 2015 summit. Jarissa is working on a smart early warning system for improvement of the welfare and performance of individual fattening pigs together with the KU Leuven (MeBioS division), supported by IWT financing.

NEWS ITEM

Agrobody-mediated crop protection

ILVO, in collaboration with AgroSavfe and KU Leuven, participated in the research on and the development of crop protection products based on Agrobody™-technology against fungal diseases of potatoes and tomatoes. Agrobodies™ can be generated for virtually any target, which they bind to with high affinity and specificity. In this way, Agrobody™-based crop protection products enable targeted delivery and retention of the active ingredient at or near its site of action. As a consequence, these products can get improved performance, their dosage and application frequencies decrease and their impact on humans and environment drops.

Theme

Social Sciences

Cultural sustainability or a sustainable culture?

Sustainability is not a fixed concept: its meaning is subject to negotiation and discussion and is continuously enriched based on new insights. Recently, the absence of 'culture' in the common sustainability frameworks has been discussed.
Therefore, ILVO co-organized a four-year long interdisciplinary consultation about the topic: what is the role and meaning of culture in sustainability? This international network made explicit three perspectives in 'culture in sustainability'.

(1) Culture is an autonomous, fourth pillar of sustainability, as is for instance acknowledged in 'cultural heritage'.

(2) Culture mediates the implementation of sustainability principles in a specific context. For instance, increasing regional identity (as an expression of culture) can enhance sustainable regional development.

(3) Culture deeply transforms the way that a society deals with sustainability, and consistently steers the practices of people towards more sustainability.
This, of course, is reflected in research priorities of research institutes or in policy orientation. These perspectives are valuable in itself, but also include a gradient toward more sustainability and complexity.

ILVO co-organized an international conference on the theme of "culture and sustainability"

NEW PROJECT

Advantages and stumbling blocks in the transition to small-scale fisheries

Small-scale fisheries have a number of advantages such as less use of fossil fuels, and an added value when emphasizing the locally-caught and sustainable nature of the catch. In addition, the further development of small-scale fisheries fits within the policy vision at European and national level. But still, it is not so easy for a recreational fisherman in Belgium to switch to being a small-scale commercial fishing operation. Thus ILVO, together with VLIZ, started a study of how these fishermen can transition into small-scale commercial fishing. This can come from both recreational fishers with their own boat as well as existing commercial fisheries who wish to work on a smaller scale. Parallel to this, a more appropriate national legal framework could attract handline fishermen who are currently operating under a Dutch flag, so they could operate under the Belgian flag in the future. ILVO and VLIZ are exploring what the potential is from the recreational fisheries, what the profitability can be of a small-scale commercial fishery, and which stumbling blocks currently would get in the way of such a transition.

Success, organically grown...

Whether organic farming is successful or not is a farm specific question, one that cannot be expressed only by analysis of farm economic or management related data. It is not even always easy to put into words. 'Organic farming in the picture' aimed to gain a better understanding of the success factors for a well-performing organic farming system. To achieve this goal, a transdisciplinary and systems approach was developed and implemented in three sectors (vegetable-arable production, beef cattle sector, and dairy farming).

The overall farming system, which links determinative factors for a well-balanced farming system, was revealed for each sector. Where possible, this was further specified by explaining this with farm specific data. The results were discussed with farmers to understand them within the context of individual farms.

Despite the great diversity among farms in the organic sector, there appear to be many common concerns and problems. How individual farms deal with them, often depends on farm- and even farmer-related characteristics. Exchanging experiences between farmers can reveal new insights to take while considering the continued development of individual organic farming systems.

NEWS ITEM

Hidden urbanization of the countryside

The doctoral research of Anna Verhoeve, entitled " The takeover of agricultural buildings and agricultural land by non-agricultural economic activities: the case of Flanders" shows that agricultural areas are increasingly being used for non-agricultural economic activities. During the research non-agricultural businesses represent 64% of all companies within the agricultural area. The official statistics underestimate the diversity of land use in the Flemish countryside. The actual land use in the countryside is more than just agriculture, forest and nature: agrarian buildings are increasingly housing other economic activities. Further, 85% of the non-agricultural economic activities don't conform to the current spatial planning regulations. This stealthy change in autonomous land use presents both research and policy with a big challenge.

"Towards a more sustainable agri-food chain" is out of the starting blocks!

The main sector federations of the Flemish agro-food chain (Boerenbond, ABS, Fevia, Bemefa, Unizo and Comeos), have been working in the past two years on seeding a transformation to a more sustainable agro-food chain. ILVO performed a system analysis, describing the current state of the agro-food chain, and provided guidance to develop a strategic and action plan to support a more sustainable agro-food chain. A follow-up project 'Towards a sustainable transformation of the Flemish agricultural and food system. Actors in action', started on November 1 2015, where the sector federations will now turn these results into concrete action.
The project will focus entirely on change in the working field by creating experimental spaces for agro-food businesses. This will be achieved through providing financial support for 'action labs'. Besides the financial support, the action lab partners will receive opportunities to learn from their own and others' experiences. ILVO researchers are responsible for guidance on content and process facilitation. Minister of Agriculture, Fisheries and Nature Schauvliege has provided € 100,000 to launch various action labs.

NEW PROJECT

Education as a leverage for agroecology in Flanders?

Agroecology is gaining importance as an alternative for sustainable development of food production and consumption. Because agroecology requires specific knowledge and skills, education could function as a lever for scaling it up in Flemish agriculture. But to what extent do current (agro-) educational activities in Flanders offer agroecology as a valuable alternative? ILVO answers this question in a project commissioned by the Flemish Department of Environment, Nature and Energy. First, we define agroecology and the competencies required for its practitioners. We use this information to screen agricultural educational activities. These screenings should reveal shortcomings and opportunities that can later be translated into policy recommendations.

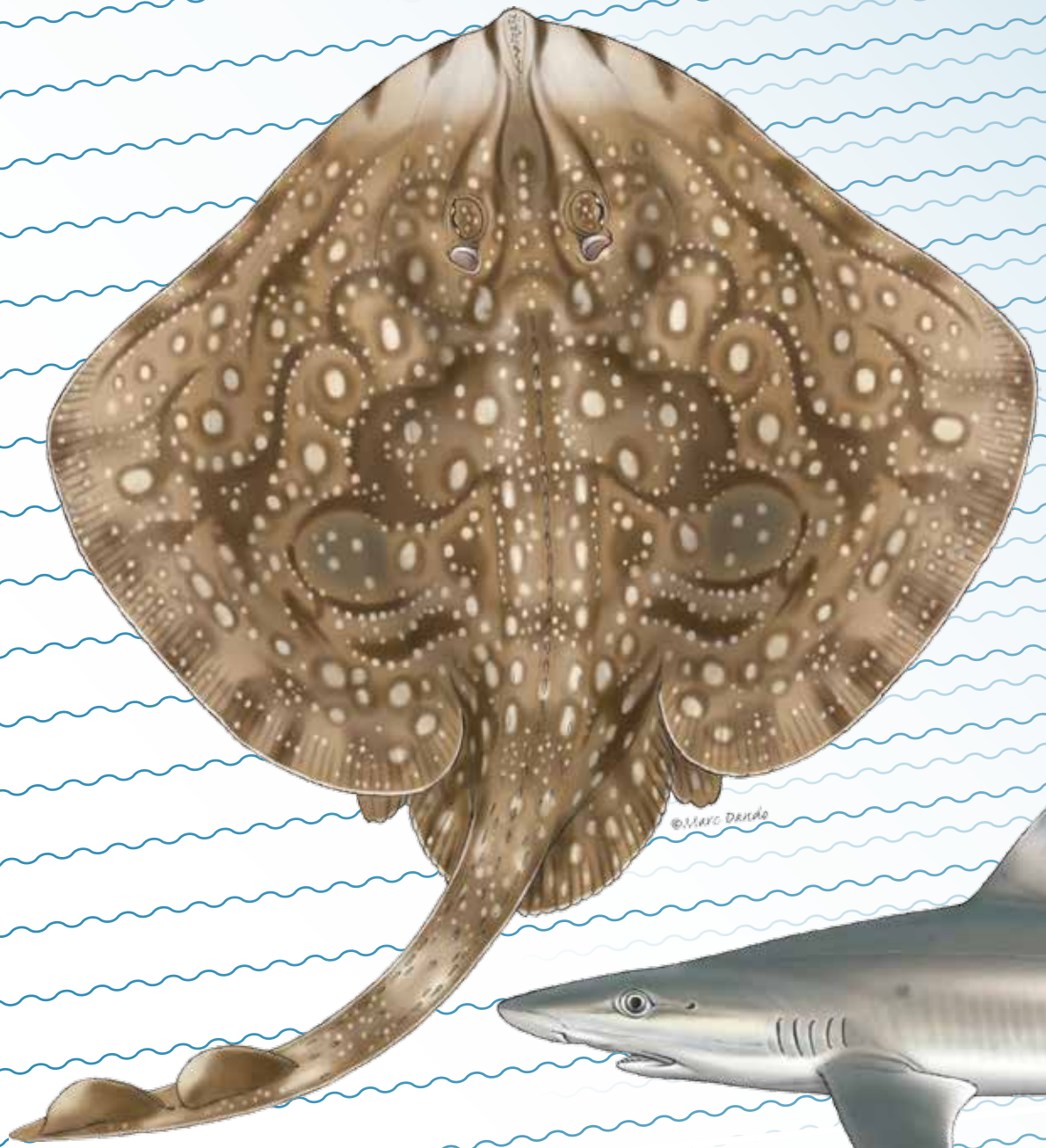
A new look at modern agriculture and rural development

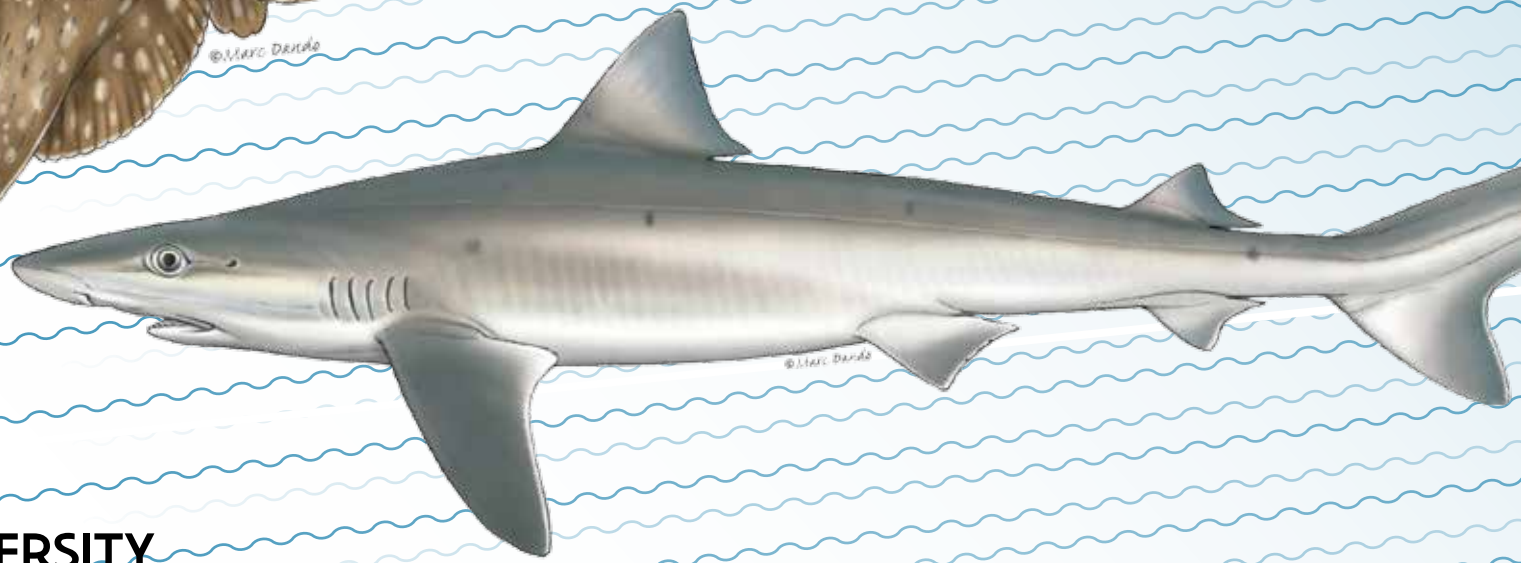
A research project in the framework of the ERA-net RURAGRI called "Rethink" has united researchers from 14 countries to study the link between modernization of agriculture, rural development and the resilience of agricultural systems. The researchers wanted to know how agriculture and rural development are connected and whether they can contribute to a resilient and prosperous rural area in times of change (e.g., increasing scarcity of natural resources and dramatic changes in production systems and lifestyle). Fourteen examples of innovative development strategies, all geared to positive synergies between sustainable agriculture and rural development, were analyzed according to four overarching concepts: resilience, governance, prosperity, and knowledge/learning. ILVO took on the concept of governance. The ILVO research revealed that the sometimes contradictory regulations from various levels of government and a lack of sense of ownership over a project by the local actors can often creates stumbling blocks to innovation. Informal networks, leadership, transparency and trust appear to be crucially important for success of innovative partnerships between agriculture and other local actors.

NEW PROJECT

IMAGO: toolbox for territorial rural development

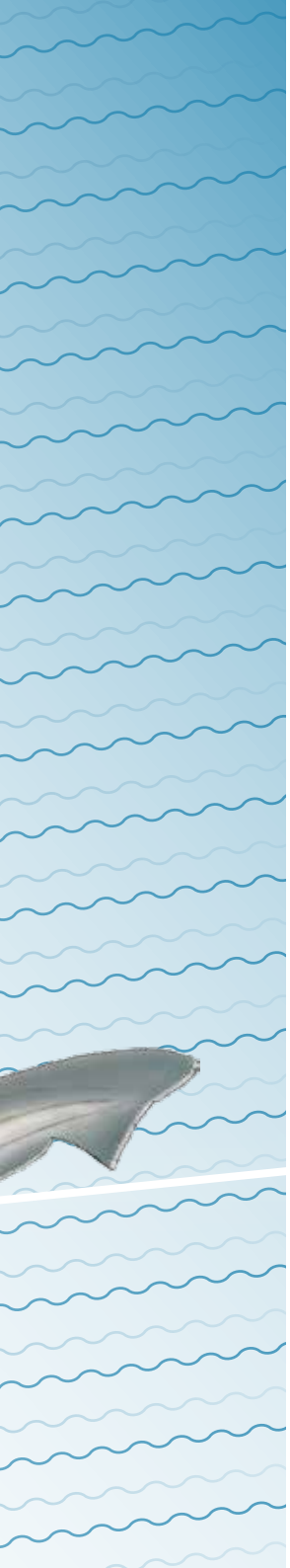
How can the diversity of rural development processes be coordinated and harmonized? And how can cooperation between actors involved in rural development be enabled? How can project coordinators develop and implement a vision and strategy for the preservation and development of the region and its open space? The IMAGO project looks for answers to these and other questions and aims to develop a toolbox that supports project coordinators of territorial rural development processes. Through action research in two regions in Flanders, we aim to translate theoretical concepts into practical tools, ready to use in rural development projects.





Theme

Environment & Biodiversity



Marine litter in Europe: trying to keep our heads above water

Plastic litter at sea is a problem that is gaining in importance worldwide. In a European context, the problem was examined closely in the CleanSea project, with ILVO being the Flemish partner. This intensive research on the prevention and spread of marine litter, and the biological and socio-economic consequences in Europe, showed that all of the studied seas, coastal areas, canals and lakes are polluted with plastic. This can be either large, visible objects or miniscule but widely abundant microplastics. The researchers studied how the plastic waste in the environment is broken into smaller fragments, but they also researched how to degrade the plastic using bacteria. The results of this study on environmental effects show that microplastics and plastic objects impact the entire food chain, from microalgae to fish and birds. Last, the project partners revealed gaps in the regulations on marine litter in Europe based on laws in effect, available reports, research and workshops with stakeholders and they formulated suggestions to improve the waste management policy. This project has had an important contribution to the knowledge about plastic litter at sea and the search for a solution to the problem, both in terms of degrading the waste already present and preventing new waves of plastic pollution.

ILVO research about the ammonia problem

The nitrogen depositions from industry, traffic, households and farming are threatening the future of various types of habitats and species. The Government of Flanders therefore approved an Ammonia Reduction Plan (PAS) in April of last year.
To help the agricultural sector to play its part in meeting the required ammonia reductions, ILVO first performed a literature study and then identified a series of measures to reduce the amount of ammonia emitted from animal housing. In further work, ILVO is contributing to PAS by continuing a number of ongoing projects (such as the ILVO-Ghent University partnership project MELKNAM as well as building an experimental set-up for meat cattle in emissions containers) and sending in new project proposals.
These projects focus on developing new reduction strategies as well as new emissions measurement techniques and sharing PAS-related information with the sector. At first the emphasis was on dairy cows, pigs and meat cattle, but now steps are being taken to include poultry and other animals in this research.
Last but not least, ILVO and the Policy Area for the Environment, Nature and Energy work together to perform reference tasks focusing on farm emissions, low-emission animal housing, giving building permits and reporting on the environmental effects.

NEW PROJECT

Skin ulcerations of flatfish in the North Sea: what are they? What do they do? And most importantly: what is causing them?

*Example of an ulcer on a dab (*Limanda limanda*) caught on 23rd September 2015*

The increasing prevalence of skin ulcers in flatfish poses an emerging ecological threat to wildlife populations but also constitutes an economical hazard to the fishing industry. The underlying etiology is complex and is not yet elucidated. Possible factors are temperature fluctuations, pollution, the presence of biotoxins, fishery and the presence of harmful microorganisms. Based on monitoring data at sea, the possible involvement of characteristics of the individual fish, environmental- and human-related factors will be investigated. Experimental studies will be designed based on these findings to gain better insights in the etiology and impact of skin ulcers in flatfish.

NEWS ITEM

SEFINS: Attention for invasive exotic species in estuaries

As part of the European SEFINS project, ILVO worked to raise public consciousness about exotic species that can have undesired effects on estuaries, such as that of the River Scheldt. Estuaries are open systems influenced by rivers, the sea and the surrounding land. They are often densely populated and used for industry, which makes them a point of entry for commercial and cargo ships as well as a prime location for a diversity of recreational and fisheries activities. Such activities often result in exotic species finding their way into the estuary, which sometimes leads to real invasions and important effects on the ecological balance. In an attempt to end these invasions, one of the goals of this project was to inform estuary users about the ways exotic species can get introduced and spread, how to combat them and the identity of the invasive species.

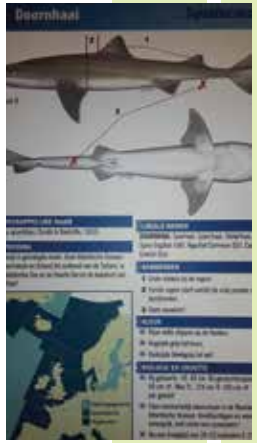
NEW PROJECT

Sustainable phosphorus use in Flanders

What are the ideal phosphorus levels in Flemish soils to ensure optimal crop yields while minimizing losses to the environment? In this collaborative project, ILVO, the Soil Service of Belgium and KU Leuven will choose the best test(s) that reflect phosphorus availability for the crop and the risk for environmental losses. Target values for phosphorus in soil will be determined based on field and column experiments. Additional investigations of fertilization doses and techniques will help to support sustainable phosphorus fertilization of Flemish soils.

NEW PROJECT

Belgian fisheries will improve protection of threatened sharks and rays



In their routine fishing trips, Belgian fishermen can come across more than 30 types of sharks and rays. Several types of sharks and rays are difficult to distinguish from one another, but this is important information because some sharks and rays are threatened with extinction. Natuurpunt, ILVO and VLIZ (the Flemish Insitute for the Sea) have created a handy folder with determination cards and maps to help Belgian fishers figure out whether they have accidentally caught or landed a threatened species. Every Belgian fishing boat gets the folder with the determination cards and the maps, along with the staff of the fish auctions in Ostend and Zeebrugge. At school, fishers in training and professional education learn how to tell the various species apart. In this way, reliable data about the state of the various stocks can be obtained, and threatened species can be better protected.

Watch the video: http://www.ilvo.vlaanderen.be/EN/Press-and-Media/Video
How many flatfish survive after being returned to the sea?

NEWS ITEM

International design studio: 'Climate adaptation in the Kempen'

From August 27 to September 3 ILVO and the University of Antwerp organized the summer school 'Shifting Climate, Reshaping Urban Landscapes'. During 8 days students sought from all over the world to landscape strategies for climate adaptation. They went looking for creative answers to the questions " How can we make the region Lommel-Overspelt resilient to the consequences of climate change? And whate role can agriculture and open space play in it?" The students were assisted by international designers, including Henri Bava, Florian Boer and Cees van der Veeken.

New insights put fishery discard ban into perspective

Once the European ban on fishery discards ban has been phased in completely, both positive and negative ecological effects are to be expected, according to the doctoral research of Jochen Depestele (Ghent University/ILVO).
The ban on discards means that all fish, including those too small to be economically important and those fish for which the fishers have already used up their quota, are to be brought on land instead of thrown back into the sea (either alive or dead). Researcher Depestele predicts that this policy-driven pressure to develop more selective fisheries techniques will lead to decrease in mortality of young fish and other sea creatures. But the landing obligation also means that the young fish who might have otherwise survived long enough to spawn will no longer have a chance anymore. Furthermore, the current feeding pattern of seabirds and food resources for benthic scavengers could change dramatically.
Using observations, case studies, experiments and modeling, this is the first study to shed light on the fate of discarded sea creatures. That knowledge could lead to adjustments in the fisheries policy.

Theme

Added value & valorization

NEWS ITEM

When eating becomes more difficult...

Taste and smell can diminish with age and particularly in certain specific diseases such as Parkinson's disease and MS. In the elderly, swallowing and chewing problems also occur, causing malnutrition and posing a real risk. ILVO performs research in this area collaboration with dietitians and health care. ILVO and the Food Pilot have provided technological and analytical cooperation and support for Parkinson's patients. This initiative aims to create tasty food in function of chewing and swallowing problems, smell and taste loss, and it produced a cookbook called "When eating becomes more difficult..." ILVO continues its research in this area.

By-products and waste fractions from the agrofood chain valorized as animal feed

In 2012, ILVO and several European partners started NOSHAN, an FP7 project. The central research question was, "Which processes can be used to turn available by-products and waste fractions from the agrofood chain into raw materials or additives for feed production?"
Initially a diverse set of currently underutilized biomass fractions (especially from the fruit, vegetable and dairy industries) was analyzed in detail to build a database of potential feed ingredients. ILVO played an important role in evaluating different processing technologies to convert the highly perishable fractions into stable bulk ingredients and functional additives. When pigs and broilers were fed with the different NOSHAN feeds developed within the project, they performed at least as well as those fed a standard diet. The meat products derived from those animals also tasted more than good enough, according to a taste trial performed at ILVO's Taste Lab. Conclusion? These stabilized agrofood fractions obtained from waste and by-products can contribute to improving the sustainability of animal production.

Belgian and Flemish agriculture as a niche on the global market

From the op-ed written by Joris Relaes in De Tijd, *Sept 7 2015*

Apparently the agricultural markets will continue to produce more supply than demand. In that economic environment, competing purely on price is is either extremely difficult or simply not an option for Flemish producers selling on a global market.
Then what should they do? To take the idea of niche products, such as local products, bio- or specially labeled products, a step further. Their unique characteristics generate value and meet the demands of a rather limited public.
Can't we extend this idea to all of Flemish agriculture? Our products in their whole can be positioned as a niche on the global market. What about the story of 'Belgian chocolates and Belgian beers'?
When we put the entire weight of the agri-food chain behind such a story, we can again offer a brighter future to the thousands of families and companies that work in agriculture and food production.

NEWS ITEM

TOSHI®: a new series of azaleas

Five years after the AIKO®, a series of azaleas with beautiful double flowers, ILVO and the growers' association Azanova are ready to launch the new Toshi® azaleas. Toshi® azaleas have single flowers in attractive colors that stand out for their long-lasting blooms in the living room. They are available in white (Berlin), red (Paris) and soft pink (London).

NEWS ITEM

Ornamentals strategy 2020

ILVO is part of the working group called Floriculture Strategy 2020, which was founded as an initiative of the Flemish government. The aim is to outline policy suggestions together with the key figures from the floricultural sector, namely experts and representatives of professional organizations. The future of the Flemish floriculture must be ensured. This group has drafted a vision text and plan of action. Seven important themes were defined: space, staff, innovation, research & education, family character of the production chain, and professionalism. More information at **www.sierteeltstrategie2020.org.**

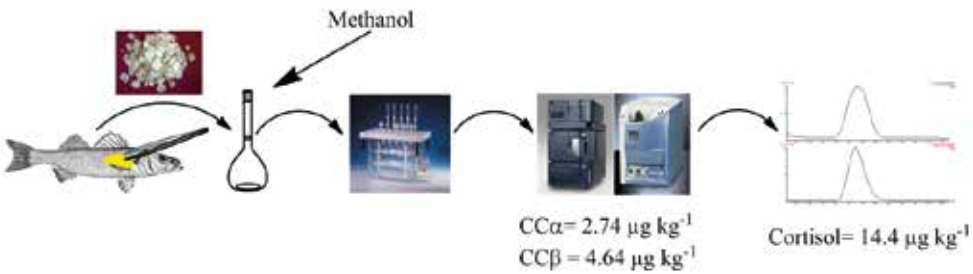
NEW PROJECT

Flemish fisheries and the fish processing industry: how (in) dependent are they?

The Flemish fishery has been through a difficult period and is expected to face more challenges in the future. Many initiatives and research projects have been set up to provide new opportunities, but few of them have focused on the destination of the product. Who buys Flemish fish? What are their reasons for buying these products? What commercial activities are they used for? And to what extent does the Flemish fish stay in Belgium? These and other questions are the main focus of the VERWERKVIS-project at ILVO.
ILVO aims to study the characteristics of the landings and volumes that typify the Belgian fishery and assess to what extent they satisfy the demand of local fishmongers, traders and the end consumer. This market awareness can help define innovative local fish processing options that make locally sourced fishery products more attractive to local buyers. Additionally, better collaboration within the supply chain can create a better connection between local supply and demand.

Long-sought biomarker for chronic stress in fish discovered

During research at ILVO and Ghent University a biomarker for chronic stress in fish has been discovered. Glucocorticoids (specifically cortisol) in a fish scale give a full and reliable picture of the fish's stress history. In contrast, cortisol measured in blood plasma was not a good biomarker for chronic stress because that biomarker can only give a snapshot of the the stress reaction at one particular moment. But when glucocorticoids are quantified in the scale of the same fish, it is possible to reconstruct all of the times when stress was present as well as the degree of severity of that stress, says researcher Johan Aerts.
This biomarker now makes it possible to relate recurrent or constant stress in fish with the many negative effects of stress on health, growth and reproduction. The biomarker will contribute to monitoring the general health status of fish in the wild. It is expected to play a crucial role in the development of more sustainable aquaculture, to ensure the performance of fish in public aquaria and in scientific research as well. Furthermore, this biomarker makes more profound scientific insight possible in the areas of stress and bone physiology.



MANAGEMENT 2015

Management on track? Tables and trends in 2015

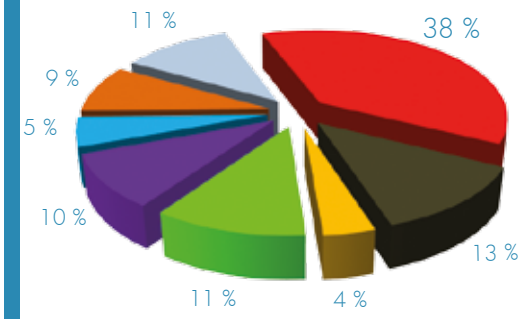
Funding: the shift towards Own Capital continues

2015 is the first year since ILVO was created that the structural grant from the Flemish Government was less than 40% of the total operating budget. The proportions are now 62% income from project funding (ad hoc assignments and competitive research) versus 38% funding from the Government of Flanders.

Take note: as it has always been and as agreed with our supervising government body, these figures represent all of ILVO (ILVO Own Capital and ILVO Flemish Government). The latter is called ILVO Govt (being an Internal Independent Agency without corporate personality, an IAA of the Government of Flanders) and ILVO Own Capital. Both legally separate entities have their own budget, their own employee roster and management committees, but they work together to meet the same goals. Where ILVO Govt is mainly supported by the structural grant, the ILVO OC is flexible and garners resources through competitive research within Belgium and internationally, from companies and paid service provision.

For a long time, ILVO Govt and ILVO OC proportion was about 50/50. In 2013 that started to shift to 43%/57%, in 2014 40%/60%, and now 38%/62%. The shift can be explained simply by the success of the Own Capital, which could even compensate for some of the cost-savings required by the Government of Flanders.

Division of ILVO operational resources 2015



Basic funding from Govt of Flanders Ag & Fisheries Policy Area	38 %	Structural funding 38 %
Endowment from Govt of Flanders Ag & Fisheries	13 %	Project funding (research assignments and competitive research) 62 %
Policy Areas of the Govt of Flanders	4 %	
IWT	11 %	
Federal government agencies	10 %	
EU	5 %	
Private sector	9 %	
Business Unit	11 %	

Human capital: shrinking number of employees and hands-on HR management

At the end of 2015, ILVO counted 22 fewer employees than the previous year. In Full-time Equivalents (FTEs), we now have 562.5 employees striving to deliver the same ambitious results as before. The shrinking number of employees, parallel with the above story about the proportion of income from the government and Own Capital, was largely realized within the governmental contingent (-14 employees) than the Own Capital group (-8 employees). Budget cuts and a more difficult financial position at the governmental clients of Own Capital (fewer ad hoc research assignments) required ILVO management to tighten its belt in terms of personnel and other costs.

(2015: Shrinking number of ILVO-personnel)

	Number of Employees			FTE		
	Govt	OC	total	Govt	OC	total
31/12/2015	260	347	607	231.6	330.9	562.5
The year before	274	355	629	241	339	580
Decrease of ...	-14	-8	-22	-9.6	-8.1	-12.5

This year was a turning point for Human Resources management: during the last 4 years, HR has been working hard to achieve the operational HR goals of 2015 in terms of

1) operational capability,
2) knowledge-sharing and collaboration and
3) leadership and coaching,

and it was the year that the new HR policy plan 2016-19 was written. In this new HR plan, we chose to focus on

1) an open culture and working on the 5 ILVO values (i.e., Working Together, Exemplary Function, Positivity, Professionalism and Proactivity),
2) sustainability with a focus on stress and burn-out and
3) preparing ILVO for a possible new promotion and remuneration policy.

Future plans for HR include building up a contact point for all employees (not just the managers) and for a broader range of services (not just the standard and practical questions, but also advice about promotions, the importance of training, and even personal coaching.
The background goal stays unchanged, namely to keep the very high employee satisfaction score (93% very satisfied in 2014).
The high point for Personnel in 2015 was the HR event on 'Leadership and coaching' with three external top speakers. ILVO organized that event for all managers together with the four other scientific institutions of the Government of Flanders.

Scientific and social output: another framework, more international and more flexible

In terms of organizational management and scientific coordination, 2015 was a year of transition. The classic management agreement between ILVO and its supervising government, which has always provided security and structure, has ended as a system. From now on, government organizations such as ILVO have to make up their own business plan. The elements of this plan will be taken up into the new Flanders-wide monitoring tool called 'Traject' so the supervising government can clearly track whether every agency, every administrative department and every governmental body is on track. ILVO sailed through all of the steps to fit into this new management framework.

Also in 2015 ILVO followed the internal plan to optimize several processes. Internal transparency and economies of scale were achieved by consolidating and optimizing ILVO bookkeeping and creating a new series of overarching contracts for several types of purchases.
The risk-analysis of ILVO's processes and process registration has once again been brought up to date. Work with the annual sets of operational goals (which flow from the strategic goal-setting and SWOTs) has become routine and remains useful: the operational goals from 2015 were met without flaw. At the annual Strategic Seminar, operational goals for 2016 were selected.

The Belgian governmental auditing agency 'Rekenhof' performed an in-depth audit of ILVO in 2015. This resulted in a report entitled "ILVO: give and take between the agency and the Own Capital". Based on this examination, the Minister has confirmed that the two legal ILVO entities (IAA and OC) do fall within the current legal limits and should therefore strive for maximal collaboration to achieve ILVO's goals, which takes the form of joint financial reporting, now and in the future.
The decision-making processes and perogatives within the units were, where possible and easily done, written in a more explicit fashion. The ILVO Board of Directors thus started meeting regularly every two weeks and a representative from HR and finances were added to the regular voting members. This facilitates strict monitoring of the required budget cuts of ILVO Govt as described above.

The scientific and social output – results of the research projects and services and the entire reason for ILVO's existence – will be more directly monitored from now on thanks to the new management framework (Traject vs. the old Management Agreement). The complex calculation of Performance Indicators is a thing of the past. We no longer have to calculate the "weighted index for number of speeches" the "number of scientific publications", the "number of popularized articles", the "number of technical recommendations", the "number of reference tasks", the "number of services provided", the "number of MSc/PhD promotorships", the sum of which in 2014 was 4950. Determining the cause of a possible rise or fall in each of these numbers was tremendously difficult. Of course, the disadvantage of a simplified output evaluation is that this year no comparison will be possible with the last 8 years.

Based on a qualitative evaluation, we dare to call 2015 a more international year that was more stakeholder-driven and with a more future-oriented and flexible research effort. A year where the outreach and public attention for ILVO results and service provision have once again increased. The knowledge generated here has led to either an measurably higher number of measurable innovations in the economic sectors or has stimulated such innovations.
The research coordination team at ILVO has realized more than ever in 2015 just how fast the social environment surrounding research institutes' work in the areas of agriculture, fisheries, food and rural environments. Such fast changes requires flexibility and vision. Supported and guided by the ILVO values – Partnership, Exemplary Function, Positivity, Professionalism and Proactivity – ILVO worked hard in 2015 to develop a well-founded vision of the future and to build on existing internal and external partnerships.

Because partnerships are crucial to scientific research, ILVO continues to seek out and build on partnerships with other knowledge centers. ILVO is still a loyal partner within Agrolink Flanders, which has enjoyed a successful first year filled with well-attended workshops and its first Horizon 2020 project. More than ever, bundling expertise within Flanders has become more important, as better partnerships ensure that scientific findings can be translated more effectively and more quickly to concrete innovations. In this area as well, 2015 became an important milestone through the creation of a strategic alliance with the Flemish Institute for Biotechnology (VIB). Renowned, close by and with a great deal of complementary expertise. A logical and promising alliance that we enthusiastically support.

Within ILVO, the trans- and multidisciplinary groups forming around larger challenges has earned its stripes. In 2015 such a group formed around PAS (ammonia reduction). The 4 existing platforms (GeneSys for valorization of waste streams, Genomics for molecular population research, Meet@ILVO for high-resolution mass spectrometry and the latest newcomer, I-Sense, a group for precision agriculture in cattle and plant husbandry) have made a remarkable, fast impact. For example, I-Sense came into the spotlight during the ag trade show "Agribex".

The popularized communication about ILVO-research continues to score high marks. The trade journalists, as well as print and audio-visual mass media, come nearly every week to spontaneously ask if we have any news. The communication team takes every opportunity to spread the latest ILVO news. On average once monthly, an ILVO subject fills several pages of trade press in a regular in-depth feature.

2015 was a successful research year in many areas, and we will continue on this path in 2016. With an open and positive attitude, we will continue to work on the solid scientific support for a sustainable, economically profitable, agro-food and fisheries sector in Flanders.

Infrastructure, Environment and Employee Health: the year of the pig campus and sustainable smaller construction projects

Besides several smaller but not unimportant projects, a large, new research complex was built: the Pig Campus. In this brand new experimental barn, researchers, technicians, and students from ILVO, Ghent University and University College Ghent will all deliver work relevant for the Flemish pig production industry. This is no run-of-the mill pig barn: it has enriched pens, a feed system, a foil basin to contain manure, animal weighing, electricity, water and ventilation. Ergonomic aspects were taken into account and a double air-washing system was installed.

Animal campus – Field lane with drainage installed next to the dairy barn

To assist with the traffic associated with corn silage and emptying the manure pit, a field lane was installed next to the dairy barn. The lane was installed using granulated cement recuperated from recycled cement waste. These have a drainage function so that excess water can sink into the soil and maintain the groundwater layers.
The dairy barn is lower than the fields surrounding it, so an embankment was installed. Under and next to the lane, drainage pipes were installed to be able to pump extra water as needed.
A sandy area was also installed outside to allow lame cows to go outside.

Before

After

Renovation powder area

The Food Sciences powder area got a new epoxy floor, ceiling, water drain and the walls were also painted with epoxy paint. The lab next to it was divided into new cooling cells and a renovated lab section. When choosing the cooling cells, we adhered to the latest regulations regarding the impact of cooling materials on the ozone layer.

Before

After

Seed triage plant gets a high-powered vacuum cleaner

Unpacking or pouring grass seeds is a dusty business. To protect the workers' health and safety, a high-powered vacuum was installed. The installation protects against noise pollution, danger of explosion, and minimizes energy use.

new roof

The seed triage unit also got a new roof to replace the old asbestos-laden roofing. The asbestos roofing was removed with all necessary attention to safety and a new insulated sandwich-plate roof was built. Fire safety was upgraded and extra windows and a lighter color on the inside of the roof brightened up the work area. The worker's comfort has been significantly impacted by the insulation and sunlight.

Before After

Energy savings in the future

At the end of 2015, ILVO signed a partnership agreement with the Flemish Energy Company. When we do a thorough energy audit and see a real potential for energy savings, this partnership will look for a private company that may want to invest in energy-saving measures at ILVO.

ILVO is ecologically responsible and responsive to human need

The sustainability plan is one pillar of ILVO's function as an example to others. Besides landscape integration, biodiversity and environmental questions, ILVO also pays attention to manure processing, soil compaction, energy and water use, pesticide use, and an ecologically-responsible purchasing policy.
This year an entire "Sustainability Day" was open for all personnel. Every employee got the chance to participate in one of 13 hands-on activities, from pruning woody borders to building birdhouses to picking up litter to building bee hotels. An added bonus was the opportunity for inter-unit collegiality and teambuilding.
Syria was also on the ILVO agenda this year, as a motion of solidarity with a Syrian employee and all Syrians, both those in Syria and the refugees. ILVO supported the solidarity action entitled "Together for Syria" via the sale of cheese, plants, leek powder and fruit juices. All the products had been developed either at ILVO or in partnership with ILVO.

ILVO

Administrator General

Joris Relaes
administrator General

Bart Sonck
Unit Head

X
Unit Head

Kristiaan Van Laecke
Unit Head

Lieve Herman
Unit Head

Animal Sciences

Sam De Campeneere
Scientific Director
Animal Husbandry

Hans Polet
Scientific Director
Aquatic Environment and Quality
Fisheries and Aquatic Production

Social Sciences

Ludwig Lauwers
Scientific Director
Agricultural and Farm Development

X
Scientific Director
Rural Development

Plant Sciences

Isabel Roldán-Ruiz
Scientific Director
Growth and Development

Johan Van Huylenbroeck
Scientific Director
Applied Genetics and Breeding

Johan Van Waes
Scientific Director
Crop Husbandry and Environment

Martine Maes
Scientific Director
Crop Protection

Technology & Food Science

Jürgen Vangeyte
Scientific Director
Agricultural Engineering

Marc Heyndrickx
Scientific Director
Food Safety

Marc De Loose
Scientific Director
Product Quality and Innovation

Own Capital (OC) Management Council

Members from ILVO:
- Joris Relaes,
  Executive Director, Chair
- Kristiaan Van Laecke,
  Unit Head
- Bart Sonck,
  Unit Head
- Lieve Herman,
  Unit Head
- Greet Riebbels
  Advisor communication
- Katrien De Bruyn
  Financial coordinator

Leading representative from the Department of Agriculture and Fisheries, Secretary General:
Jules Van Liefferinge

Representative of the Flemish Minister of Science and Technology:
Wim Winderickx

Representative of SALV (Strategic Advisory Council for Agriculture and Fisheries):
Georges Van Keerberghen

Representative of financial inspection:
Stefaan Ghesquiere, inspector-general

External guest member of the Department of Agriculture and Fisheries:
Els Mestdach, advisor

Guest member: Ludwig Lauwers, ILVO

Advisory Comittee

Full members:
Joris Relaes, ILVO
Marc De Loose, ILVO-T&V
Kristiaan Van Laecke, ILVO-Plant
Cathy Plasman, ILVO-Dier
Bart Sonck, ILVO-Dier
Lieve Herman, ILVO-T&V
Dirk Van Gijseghem, Departement Landbouw en Visserij - AMS
Els Lapage, Departement Landbouw en Visserij
Monica Höfte, UGent
Dirk Reheul, UGent
Guido Van Huylenbroeck, UGent
Mieke Uyttendaele, UGent
Annemie Geeraerd, KU Leuven
Nadine Buys, KU Leuven
Erik Mathijs, KU Leuven
Wannes Keulemans, KU Leuven
Els Prinsen, Universiteit Antwerpen
Steven Dessein, Plantentuin Meise
Yvan Dejaegher, BEMEFA
Brigitte Wallays, Ter Beke
Georges Van Keerberghen, Boerenbond
Hendrik Vandamme, ABS
Marijke Jordens, Groene Kring
An Jamart, BioForum Vlaanderen

Substitutes:

Greet Riebbels, ILVO
Johan Van Huylenbroeck, ILVO Plant Sciences
Hans Polet, ILVO Animal Science
Isabel Roldán-Ruiz, ILVO Plant Sciences
Ludwig Lauwers, ILVO Social Sciences
Sam De Campeneere, ILVO Animal Science
Marc Heyndrickx, ILVO Technology & Food Science
Anne Vuylsteke, Departement Landbouw en Visserij - AMS
Tsang Tsey Chow, Departement Landbouw en Visserij - ADLO
Peter Bossier, Ghent University
Christian Stevens, Ghent University
Veerle Fievez, Ghent University
Kathy Steppe, Ghent University
Jean-Marie Aerts, K.U.Leuven
Johan Buyse, K.U.Leuven
Liesbet Vranken, K.U.Leuven
Chris Michiels, K.U.Leuven
Geert Angenon, VUB
Roger Dijkmans, VITO
Bruno Gobin, PCS
Isabelle Coucke, Packo Inox NV
Joris Van Olmen, Boerenbond
Hendrik Van den Haute, ABS
Claire Bosch, Fevia
Kurt Sannen, Bioforum Vlaanderen

EVOLUTIE VAN HET SPUITMACHINEPARK IN VLAANDEREN

BELANG VAN HET VACCINATIE-TIJDSTIP BIJ IMMUNOCASTRATIE

In 2018 moet de sector klaar zijn om de omschakeling te maken naar alternatieven voor chirurgische castratie. De praktische en economische haalbaarheid van deze alternatieven is een belangrijke succesfactor voor de varkenshouders. Bij de omschakeling naar immunocastratie en intacte beren zijn er heel vragen.

– Marijke Aluwé, ILVO-Dier; Isabelle Degroote & Lies Degroote, Vlaes

ILVO open veld namiddag

Begin september gaven de ILVO-onderzoekers op 15 verschillende proefvelden relaas van hun bevindingen

Vollegrond

Warm en vochtig weer zorgt vo grote opbrengsten en veel wo

Spinazie is een langedagplant. Dat maakt dat schot bij de jaarsteelt een belangrijk gegeven is. Door warme weersom heden kan zowel gewashoogte als schot snel evolueren. kan dan toeslaan.

Teeltverloop

Nieuwsblad 9/2/2015

Vissers en ov willen duurza

UWPOORT De Vlaam- verheid, de vissers en urpunt hebben een

ONDERZOEK

Rubberen toplaag vloer kan kreupelheid ve

Recent afgerond ILVO-BOnet onderzoek laat aan dat een rubberen toplaag op de vloer het voorkomen van klauwproblemen en kreupelheid bij zeugen in groepshuisvesting kan verminderen.

De constatie tussen klauwproblemen en kreupelheid

LANDBOUWLEVEN 17/7/2015

VEETEELT

Vlaamse overheid

erwaarde vlinderbloemigen vleesvee

In het kader van de vergroening van het Europees landbouwbeleid, la de steun voor eiwithoudende gewassen gevoelig opgetrokken. Dat maakt deze vlinderbloemigen opnieuw heel wat interessanter, ook voor vleesveehouders.

Drie redenen

LANDBOUWLEVEN 15/05/2015

MECHANISA

Wat is het en waarom toepassen

Precisielandbouw: wat brengt het

Afgelopen winter organiseerde Volsog, de vereniging van loonspro het onderwerp: nieuwe technologieën rond precisielandbouw in de nen het ILVO actief is met Agrotechniek, gaf een heel duidelijke presentatie over precisielandbouw bescherming.

De eerste bemerking die David Nuyttens maakte, was dat er het voorbije decennia een gan- werkten we nog met paard en kar. se weg is afgelegd. Begin vorige eeuw Nu is het spuitoestel misschien wel het meest gradatieverende werktuig in de landbouw. Het spuitoestel maakt immers gebruik van mechanische, hydraulische en elektronische technieken. De spuitmachine van vandaag bevat meestal heel wat technologie in de vorm van een spuitcomputer, sectieafsluiting, gps, automatisch stuursystem.

Stilaan zijn we van precisielandbouw editie 1.0 aan het doorevolu-

Sam De Campeneere en Daniël De Brabander gelaven rotbadst in het VEM-systeem. "Onder onderzoekers is er eensgezindheid: we zouden naar een systeem kunnen en moeten gaan", schat Daniël De Brabander

VEETEELT

LANDBOUWLEVEN 15/05/

De Brabander en Sam De Campeneere

e koeien morgen te eten?

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tijging huidzweren bij vissen blijft

nysterie

1/07/2015 om 06:57 door Dany Van Loo

PCS AZALEA

HOE KOUD HEEFT EEN WEEKHUIDMIJT HET IN DE FRIGO?

MELKCAFÉ VAN ILVO


ONDERZOEK AMMONIAKEMISSIES IN STROOMVERSNELLING?
Witblauwveestapel leverde normen voor energie, eiwit en structuur
MELKVEEHOUDERIJ
Luc Van Dijck
en Nederland moet zich onderscheiden door het leveren van een nicheproduct op de wereldmarkt. Bijvoorbeeld door te onderscheiden op productveiligheid. Dat zegt Joris Relaes, de voormalige kabinetschef van Landbouw in Vlaanderen is nu de hoogste baas bij het onderzoeksinstituut ILVO.
Vooruitzichten
TWEE NIEUWE CICHO
OP BELGISCHE RASS
DOSSIER Vlinderbloemigen als dere
op rundveebedrijven
MEER FOSFOR BESCHI
BAAR IN DE BODEM
BEMESTING
Maatregelen voor de bodem
Biologische maatrege
Verbreed de blik
Vollegrond
Courgettevirussen in Vlaanderen
van kennis tot beheersing
Door de sterke areaaltoename van de courgetteteelt in Vlaanderen tijdens de voorbije vijftien jaar is de aandacht voor de virusproblematiek sterk gestegen. Dat lag aan de basis van het IWT-project 'Ecologi van courgettevirussen in Vlaanderen'. Op basis van een uitgebreid survey, rassenproeven en teeltexperimenten werd de problemati in kaart gebracht en werden beheersingsstrategieën bepaald.
GRATIS STIKSTOF
UIT DE LUCHT
VOEDERBIETEN, EEN TROEF
VOOR HET MELKVEERANTS
IFCN ZIET GUNSTIGE PERSPECTIEVEN VOOR
Het melkquotum is voorbij.

© Gazet van Antwerpen

nalen en sprot uit Noordze
t plasticdeeltjes

015 om 20:01 door mige

Onderzoeksveestapel witblauw op het ILVO dreigt te verdwijnen

Kind van de rekening ?

De unieke witblauwveestapel op het onderzoeksinstituut ILVO zorgde voor baanbrekende inz
bij dikbillen, vooral op nutritioneel vlak. Het gebrek aan een toekomstvisie en aan financieel e
ment vanuit de sector dreigt de veestapel de das om te doen. En dat betekent een stopzettin
het vleesveeonderzoek.

door Guy Nuttier

De relatief kleine vleesveesector verkeert momenteel in overlevingsmo
dus: zowel producenten als toeleveranciers hebben het bijzonder moeilijk om
het hoofd boven water te houden van
wege de heel krappe marges. En de over
eid, die in besparingsmodus is, doet daar
'n schep bovenop met een dwingende
ik op haar overheidsinstellingen om
duit in het besparingszakje te doen.
geldt dus ook voor het Instituut voor
'kozee- en Visserijonderzoek (ILVO) te
'eke-Melle. Het ILVO staat daardoor
voor moeilijke keuze: moet de onder
zoeksknoppe met witblauwruiniers op
korte termijn verdwijnen en stopt daar
door ook het vleesveeonderzoek?

Geen interesse uit sector

'Ik weet dat het hart van velen, vooral ook
van de onderzoekers, bij stopzetting zal
bloeden en ik wil er ook alles aan doen
om dit te voorkomen', zegt Joris Relaes,
administrateur-generaal van het ILVO.
'Maar we halen voor vleesvee geen finan
ciële middelen meer binnen bij het IWT
of uit Europese steunprogramma's.'
Subsidiering van onderzoeksprojecten via
het Vlaams overheidsagentschap voor in
novatie door wetenschap en technologie
(IWT) of via Europese programma's
via een publiek-privat
blijkt (zie kader 1). Dit
tor zelf ook een deel
het onderzoek moet o
krijgt het schoentje. 'De
(meer) geïnteresseerd.' Ook
onderzoek koopt volgens
teur-generaal voor geen
ook kader 1).
Gedurende een tiental jaa
lars kabinetschef Landbo
lig Vlaams minister-pres
ters, die ook bevoegd was
Onder diens ministerse
2009 de Vlaamse dialoog

Foto:
Onze garnalen en sprot uit de Noordzee zijn besmet met microplastics, microscopisch kleine deeltjes plastic, die in de zee belanden door ons eigen toedoen.

Reportage

Biomerker voor chronische stress bij vissen ontdekt

De contourbeslandbouw van Rik Dethaye. ILVO

Agroforestry in de praktijk

Bomen op het veld

Het einde van november tot en met het begin van decem
ber is hét moment om bomen te planten. Dat kan op land
bouwgrond, tussen het gewas of de dieren, in het kader van
agroforestry. Dat teeltsysteem streeft emaar om de op
brengst te verhogen van zowel boom als gewas of vee door
een optimale interactie tussen de twee.

Agroforestry combineert klas
sieke landbouwteelt of vee
houderij met de aanplant van
bomen. In het buitenland worden
veelbelovende resultaten gepeg
kend wat betreft de opbrengst van
verschillende bomen en gewassen
in Vlaanderen te onderzoeken, na te
gaan wat de knelpunten zijn in de
ingeoefening en landbouwers te be
geleiden bij de aanleg van agrofore
strysystemen.

Agroforestry combineert klassieke landbouwteelt met bomen.

heid. In een kleine regio, waar
grond schaars is, zou dat welkom
zijn. De vraag is natuurlijk of meer
opbrengst resulteert in meer inko
men.

Agroforestry biedt naar ver
wachting een aantal veelbelovende
effecten. De bomen zou stabiliteit en
weerbaarder worden. Het koolstof
gehalte in de toplaag neemt mogelij
lijk toe. De boomwortels groeien
dieper dan die van eenjarige gewas
sen, en maken vermoedelijk water
en nutriënten uit de diepere lagen
beschikbaar. De biodiversiteit op en
in de bodem neemt naar alle ver
wachtingen toe, wat zorgt voor be

kan op worden ingespeeld door
wintergraan te telen, die veer die
tijd worden geoogst. Tweeldertijd
bleek al na een jaar onderzoek dat
het koolstofgehalte van de bodem
hoger is in agroforestrysystemen.

Bomen op een landbouwperceel
bieden bescherming tegen wind en
water. Vee staat meer beschut, ge
wassen ingroen minder water op de
planten verdampt minder snel, en
bodems ondergaan minder erosie.
In de zomer zoeken koeien graag de
schaduw van een boom op. Uit re
cent onderzoek blijkt dat kippen
meer gebruikmaken van hun uit
loop als daar bomen staan.

www.landbouwleven.be

Drie vormen van onderzoek op het I

Het Vlaamse instituut voor Landbouw- en Visserijonderzoek ILVO en haar rechtsvoorgangers bestaan 75 jaar. Gedurende al die jaren heeft het instituut een uitgebreide kennis en expertise opgebouwd. Momenteel zijn er 620 mede-

werkers werkzaam. He
beslaat 200 hectare proe
vierkante meter serres
20.000 vierkante mete
(melkvee, vleesvee, varke
ILVO is een onafhankelijk

ILVO doet ook contractonderzoek zoals voederproever voor marktpartijen

INTENSIEVE ZAADTEELT VAN ITALIAANS RAAIGRAS

In Boer&Tuinder 36 brachten ve
graszaadvermeerdering van het ILV
bekend. — Georges Rickaert, ILVO & Patrick

LANDBOUWLEVEN

HOME	NIEUWS	DE KRANT
Vacts	Akkerbouw	Veeteelt	Economie	Marktnieuwtje	Foorbes
Editorial	Weer	Agenda	Marktkrant	Rubon	Archief

ILVO 'voorzichtig optimistisch' voor sojateelt in Vlaanderen

LANDBOUWLEVEN 21/8/2015

AKKERBOUW

Openveldnamiddag Non- & New Food te Herent

Op zoek naar een toekomst voor quinoa, goudsbloem en miscanthus bij ons

De openveldag werd ingeleid door gedeputeerde Monique Swinnen. Ze benadrukte het belang van innovatief praktijkonderzoek naar nieuwe teelten die ontwikkelingsmogelijkheden voor de landbouwbedrijven meer economische zekerheid kunnen geven. Voorafgaandelijk onderzoek naar de teeltechnische haalbaarheid en de marktkansen is essentieel om de teelten zonder al te grote risico's op praktijkniveau te kunnen introduceren. Voor meerdere non- & new foodgewassen wordt dit onderzoek verricht op Proefcentrum Herent en de Nationale Proeftuin voor Witloof (waar het witloofonderzoek nog steeds het grootste uitbangbord blijft). Zo werd binnen het Interreg-project Groene Grondstoffen de werking rond koolzaad versterkt en de werking rond miscanthus opgestart. Recent kwamen daar ook de teelten van goudsbloem en quinoa bij.

Op maandag 13 juli 2015 vond op Proefcentrum Herent (Vlaams-Brabant) de eerste 'Openveldday Non- & New Food' plaats. De term 'non-food' staat voor teelten die toepassingsmogelijkheden hebben als energiebron of grondstof voor de industrie. 'New food' verwijst naar voedselgewassen die relatief nieuw zijn in onze regio of die we terug van onder het stof halen. Ze hebben de potentie om hier een plaats te vertoeren, zowel op de akker als op ons bord. Op deze openveldday werden de proefvelden quinoa, goudsbloem en miscanthus in Herent voorgesteld aan het publiek.

Alex De Vleeschauwer geeft uitleg bij het quinoapeen.

wen. Het zaad rijpt namelijk niet gelijkmatig af, waardoor gelijktijdig maaien en dorsen tot een te hoge vochtgehalte kan leiden. De opbrengstverwachting voor quinoa is tot 2 ton per ha. De teelt kent zijn afzet voornamelijk in de voeding. Quinoa bevat veel hoogwaardige eiwitten, waardoor het een goede vleesvervanger is in vegetarische diëten. Het is bovendien gluetenvrij en daarom ook interessant voor gluetenvrije diëten. Dat er een stijgende vraag is naar dit pseudograan is dus niet so verwonderlijk.

Teelt goudsbloem

Een andere teelt met potentiële meerwaarde is goudsbloem (Calendula officinalis). Ook deze wordt nu intensief opgevolgd en bestudeerd op Proefcentrum Herent. Mieke Vandermeersch (Proefcentrum Herent) en Marc van Waes (Oilitis) gaven toelichting bij de mogelijke opbrengsten, toepassingen en toekomstperspectieven van de teelt van goudsbloem. Uit de bloemen van dit gewas wordt via extractie

publieke aquaria alsook in het wetenschappelijk onderzoek.

- Ten slotte wordt meer diepgaand stressfysiologisch en hatfysiologisch onderzoek mogelijk.

Johan Aerts: 'Op 8 vissoorten hebben we betrefdde terugkerende fenomeen vastgesteld in onze analyses en stresexperimenten, nl. dat de vissen in hun schubben glucocorticoïden (voornamelijk cortisol) incorporeren doorheen de tijd. Meer bepaald zijn er analyses gebeurd op voor zoals de karper (Cyprinus carpio), gouvbrasem (Sparus aurata), reebaars (Dicentrarchus labrax), Mozambique tilapia (Oreochromis mossambicus), Atlantische zalm (Salmo salar), regenboogforel (Oncorhynchus mykiss) en snoekbaars (Stizostedion lucioperca), en verder ook op vissen die vaak gebruikt worden in experimentele studies zoals de rebravis (Danio rerio). ■

JOHAN AERTS EN GIRET BIEBELS

Openveldnamiddag toont V

LVO toont gev

honderd hectare

Voor een belangrijk en quinoa niveau. O boeren o hand hon

Monitoring

Microbiële groei

Figuur 1.

in het natuurgebied "De Luysen" in Bree heeft een particulier in jul
insect en schadelijke exoot opgemerkt. Entomologen van ILVO beve
amme-kastanjegalwesp Dryocosmus kuriphilus. Het insect is noo
De wesp is afkomstig uit China en al langere tijd aan een veroverin

eksveestapel witblauw op het ILVO dreigt te verdwijnen

d van de rekening ?

witblauwveestapel op het onderzoeksinstituut ILVO zorgde voor baanbrekende
, vooral op nutritioneel vlak. Het gebrek aan een toekomstvisie en aan financie
t de sector dreigt de veestapel de das om te doen. En dat betekent een stopzett
eonderzoek.

ma

urzame beheersing van Tuta oluta een feit?!

soluta is sinds de eerste vaststelling in 2009 uitgegroeid van
er gevreesde' tot een 'goed controleerbare' plaag. Dat neemt
g dat beheersing van *T. absoluta* jaarrond de nodige aandacht
Dit artikel schetst de belangrijkste aandachtspunten en vat ze
in een beheersstrategie.

ring als basis

g van zowel de plaag *T. absoluta* als
vijand *M. pygmaeus* vormt de basis
heerstrategie. Inzicht in de evolu-
Tuta- en *Macrolophus*-populatie is
om na te gaan of er een biologisch
aanwezig is. Als dat niet het geval
laag de bovenhand heeft, moet er
n worden om een chemische behan-
te voeren.

g van Tuta absoluta
het teeltseizoen bieden feromoon-
belangrijke bron van informatie.

Voor de detectie van de aan- of afwezigheid van *T. absoluta* volstaat één val per hectare. Om na te gaan waar de mineermot zich schuilhoudt in de serre, is het aan te raden om meerdere vallen per hectare te plaatsen. De frequentie waarmee de vangsten worden geteld, is afhankelijk van de plaagdruk. Het is aan te raden om tijdens de eerste tien teltweken de vallen wekelijks te controleren. Nadien volstaat een tweewekelijkse controle zolang de druk van *T. absoluta* laag is, dat wil zeggen minder dan 20 motten per val en per week. Worden tijdens de eerste weken na opplanten meer dan 10 motten per val gevangen dan is het aan te raden het gewas te controle-

ren op gangen van *T. absoluta* in het tomatengewas zijn wol
heeft bereikt, is monitoring
gewezen vanaf 20 motten p

Monitoring van Macrolop
M. pygmaeus is de belang
bestrijder van *T. absoluta*. D
gewezen om ook de populat
volgen. *M. pygmaeus* kan w
de gele vangplaten die worden gebruikt voor de monitoring van witte vlieg. Deze vangplaten bieden zeer waardevolle informatie over de verspreiding van *M. pygmaeus* doorheen de serre. Stel je schade van *T. absoluta* vast in het gewas, dan is het raadzaam om ook het gewas te controleren op de aanwezigheid van *M. pygmaeus*. Dat kan op dezelfde manier als bij monitoring van *T. absoluta*. Door wekelijks of tweewekelijks de evolutie van *T. absoluta* enerzijds en *M. pygmaeus* anderzijds op te volgen, kan je nagaan of *M. pygmaeus* de *Tuta*-populatie onder controle heeft (Figuur 2).

Beheersing van Tuta absoluta doorheen het teeltseizoen

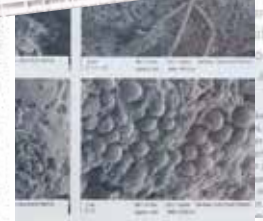
De toelichting over de monitoring van *T. absoluta* in het gewas geeft al weer dat de actiedrempels evolueren doorheen het teeltseizoen. Ook de aard van de beheersmaat-

Schematische voorstelling van de vindplaats van de verschillende stadia van *T. absoluta* in het overeenstemmende schadebeeld

gemeend en is één van de parameters in de negen kwaliteitsklassen in ISO 8573.1. Door lucht te drogen worden beide kansen op condensatie voorkomen. Voor processen

de een vastrepen of beschadiging van het systeem te verhinderen. Fijnfilters bestaan uit meerdere lagen filtermateriaal en kunnen partikels tot 1 micron scheiden. Ultrafijnfilters daarvoorgeldend kunnen zeer kleine deeltjes, waterdruppels en olienist (aërosolen) tot 0,1 micron uit de lucht verwijderen. Een actiefkoolfilter is in staat om gaswormige stoffen zoals koolwaterstoffen,

'Ook allergenen kunnen door perslucht in voeding gebracht worden'



ONDERZOEK ILVO

Miscanthus als alternatief bedding

Daarom is het Instituut voor Landbouw en Visserijonderzoek (ILVO) op zoek gegaan naar een goedkoper alternatief dat ons zelf kan leren. Miscanthus x giganteus, oftewel olifantengras, wordt hiervoor onder de loep genomen. Zal miscanthus binnenkort de concurrentie aangaan met stro als beddingsmateriaal?

Belang ligbedmateriaal

Onderzoek en ervaring tonen aan dat een goede huisvesting cruciaal is voor de gezondheid en het resultaten te boeken, is het belangrijk dat de koeien minstens 12 uur per dag neerliggen. Langere ligtijden worden immers gemoedsrust met een hogere voedenopname, verbetende klauwgezondheid, minder stress en zelfs een hogere melkproductie.

Bij de opening v
engelijke be

S DAT MET DE BOER
E RUNDEREN?

ren produceren door verteringsprocessen in hun pens meth
at van dat methaan hebben ze een belangrijk aandeel in de b
or de landbouw. Bovendien is CH_4-productie een nutritioneel ongunstig lenoaanglezen 5 tot 12% van de voederenergie hierdoor verloren gaat.

Zonder de natuurlijke broeikasgassen zou de gemiddelde jaartemperatuur op aarde -18 °C zijn in plaats van +15°C.

ILVO topman Joris Relaes over de Vlaa

die betrokken de Wetterese GGO-aardappelveldproef in 2011-2012 hebben met hun collega's van Wageningen Universiteit & Research Center (Rodeo

'Pluimveesecto
onderscl

GEEFT OMEGA 3 IN HET
GEZONDERE VLEESKUIKE

voeder aan legkippen geven tot omega 3-rijke e
omega 3-gevoederde vleeskuikenm
dspakket mee aa

BODEMONTSMETTINGS-
ACHINES ZIJN KEURINGSPLICHTIG

ns de vorige Belgische driejaarlijkse keuringscyclus (2011-2013) werden de
ande keuringsprotocols voor de verschillende types spuitoestellen in het
13 maart 2011 (BS 05/04/11) grondig aangepast om te voldoen aan de
richtlijn van oktober 2009. Aangezien ook bodemontsme
doelgebied van deze Europese richtlijn vall
tocol gepubliceerd specifiek

DE MOGELIJKHEDEN VAN SORGHUM EN GIERST

Gierst en sorghum behoren tot de oudste gewassen die door de mens wo
geteeld. Kunnen ze ook een alternatief zijn in onze contreien?

— Bert Weerdenburg, stamboomkweker Boerenbond & Johan Van Waes, ILVO

Er is de vertrekpunten hiervoor met onderzoek gebeurd naar de mogelijkheid om ook in onze streken sorghum en gierst te teelten. Als alternatief voor maïs bieden ze enkele interessante mogelijkheden voor hergebruik als energiegewas voor de menselijke voeding. Maar zaaien steeds zijn er voor- en nadelen verbonden aan de teelt van deze veeltelevende gewassen.

Sorghum
Het graangewas sorghum (Sorghum bicolor) is ook nu nog in grote delen van de wereld een van de belangrijkste voedingsgrassen. Wereldwijd staat het op de vijfde plaats, na tarwe, maïs, rijst en gerst. Er zijn voor sorghum heel veel andere namen in gebruik. Ook kwalificeert men verschillende soorten van grasachtige gewassen onder de noemer sorghum. De meest voorkomende namen in het Nederlandse taalgebied is 'kaffirkoren'. Dit duidt op de Afrikaanse herkomst van dit gewas. Dat deze benaming vreemd of laat onder voor zal komen van anti-rochtmeningsstanen. Doordat dit gewas uit Afrika komt is de gevoeligheid voor koude een belangrijk nadeel, een als bij maïs, dat erinnert verwant is. Er is echter nog enorm veel genetische diversiteit bij sorghum. Daardoor zal men de koudegevoeligheid er bij mais waren de resultaten op dat vlak zeer spectacular.
Sorghum is, net maïs maïs, een C4-plant dan C3-planten, waarvan je er hier meer vindt (zie kader p. 32). Onder de vele sorghummoeitesten zijn voeder-, grasen en suikerrassen. Sorghum heeft Lichtsorgaat is dan weer een tastigste oekruiden weetelijk.

Vervanger voor maïs
In de tropen wordt sorghum meer gebruikt voor de productie suiker. Sommige rassen kunnen stengels tot 10% suiker bevatten. Deze heet maar ze in afwisseling met maïs (riet). Door zijn korte groeiperiode kan plant trouwens gebruikt worden tussen de broodperiode als het suikerriet weg opgerund en er nog geen nieuw is aangeplant.
In onze contreien zal men zich vooral beperken tot de teelt als voedergewas als grondstof voor de vergisting het biogas (Sorghum bicolor). In dat geval kan men een opbrengst van 15 tot 20 ton droge stof verwachten. In bezonnenlandgebieden

JE MELKKOEIEN ECONOM
VOEREN IN CRISISTIJD

Het streefdoel van iedere melkveehouder is een maximale melkpro
beperkte kostprijs. Voldoende kwalitatief ruwvoeder moet hierbij de
gaande van het beschikbare ruwvoeder zal het rantsoen aangevuld
meest geschikte krachtvoer. — Eddy Decaestecker, Imagro; Roel Vlaes, landbouwcons
Leen Vandaele, ILVO-Dier

De melkveehouder(s) zag de toe-komst in het peil-spuitamstijgers wel vertrouwen tegemoet. Een half jaar later zijn het hande, moeilijke tijden voor de melkveehouders. Met de huidige melkprijs kunnen ze niet uit hun kosten. Zoals blijkt uit het vorige artikel. Deze opstelling is gebaseerd op gemiddelde cijfers; de verschillen tussen bedrijven

Een goede kuil zonder broei brengt duizenden euro's op.

om de kosten op hun bedrijf onder de
bedrijven die de
kunt halen. Dorf
Uiteindelijk is h
op je bedrijf het

Oogstfijnheid en

ILVO - Management

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