

Poster number 1

Adriaenssens Evelien

Katholieke Universiteit Leuven Biosystems

Bacteriophages for the control of the potato tuber rot bacterium 'Dickeya solani'

Bacteriophages LIMEstone1 and LIMEstone2 were isolated from soil samples and extensively characterized for their suitability as biocontrol agents against a new, virulent Dickeya type, 'Dickeya solani'. They are members of the Myoviridae family, with a genome related to the well-studied phage T4. After the phages passed certain microbiological standards, in vivo experiments were performed on potato tubers. Phage application resulted in reduced disease incidence and severity on a laboratory scale and gave a higher yield in a field trial.



Poster number 2

AGO EXPEDIT EVARISTE

Université de Gembloux SCIENCE AND TECHNIC OF ENVIRONMENT

Diurnal and seasonal CO₂ fluxes responses in cultivated savanna in Benin (West Africa)

Turbulent CO₂ exchanges between a cultivated savanna and the atmosphere were measured during 21 months (August 2007 to May 2009) by an eddy co-variance system in North-Western Benin. The site (Lat 9.74°N, Long 1.60°E, Alt: 449 m) is part of the international AMMA-CATCH program under Sudanian climate. The main types of vegetation are woodland, shrubland, herbaceous and crops. Measurements were made and treated following the CarboEurope methodology (Aubinet et al., 2000). The data were completed by meteorological measurements and an inventory of dominating species around the tower.

Water is the main factor controlling the ecosystem dynamics: much larger assimilation was observed in wet than in dry season. During wet season, a very clear answer of flux to photosynthetically photon fluxes density (PPFD) was observed, CO₂ assimilation increasing with increasing PPFD following a typical curvilinear function and saturating for high PPFD (PPFD > 1000 μmol m⁻² s⁻¹).



Poster number 3

Akbarian Abdollah

Universiteit Gent Department of Animal Production

Effect of lemon peel extract, orange peel extract and Curcuma xanthorrhiza essential oil on the antioxidant status and some metabolic parameters of br

Introduction:

Chronic heat stress, occurring in temperate countries as well as in the tropical world, interferes with broiler comfort and exerts deleterious effects on performance and survival of broiler chickens (Azad et al, 2010). The metabolic changes induced in chickens by chronic heat exposure include impairment of endocrine functions (Yalcin et al, 2009), depletion of minerals in the body and oxidative stress (Lin et al, 2006). The latter is documented by decreased antioxidant enzyme activities and increased levels of oxidation products. Dietary modifications are among the most preferred and practical ways to alleviate the effect of high environmental temperature on poultry performance (Attia et al, 2011). Recently, studies have shown that phenolic compounds (PC) can act as antioxi



Poster number 4

André Marie

Université de Gembloux Département Forêts, Nature et Paysage

Toward a single definition of periurban zones?

Remote sensing image interpretation and classification require a clear definition of what is considered as a rural, a periurban or an urban area. Such a definition is also essential in order to compare results of studies in periurban zones. Different terms, definitions and characteristics relating to these three concepts have been reviewed in the literature and compared according to different criteria like their type, strenghts and weaknesses, in the scope of a landscape evolution analysis. Causes of the differences, relevance, gaps and the potential contribution of landscape metrics have been discussed.



Poster number 5

Arnould Valérie

Université de Gembloux Animal Science Unit

Variability among morning and evening milk compositions during the lactation

Differences in milk composition between morning and evening milk are documented for major milk components. This study extended research to milk fat composition. Milk samples ($n = 195.960$) were collected between October 2007 and November 2011 (from 29.636 cows in 491 Luxembourg farms) and analyzed by MIR spectrometry. The milk contents of saturated, mono-unsaturated, poly-unsaturated and unsaturated fatty acids, and short, medium and long chain fatty acids were predicted from the recorded MIR spectral data. As expected, the milk composition and, especially, the milk fat composition, were affected by AM / PM milking during the lactation. Therefore adjustments for morning / evening milking are required before using it jointly. Differences in composition could allow different uses of milk.



Poster number 6

Baijot Amandine

Université Catholique Louvain-la-Neuve Institut des sciences de la vie

Fonctional characterization of NtPDR3, a pleiotropic drug resistance transporter from *Nicotiana tabacum* involved in iron deficiency

Iron is an essential micronutrient for virtually all living organisms. Our work deals with the functional characterization of NtPDR3, an ABC transporter from *Nicotiana tabacum*. Its expression is induced in the root epidermis in response to iron deficiency and is hypothesized to transport phenolics that solubilize iron in the soil. NtPDR3-silenced plants are more sensitive to iron deficiency unless catechol phenolics are added to the medium. To directly identify NtPDR3 substrates, we sought to set up a convenient expression system. Expression in yeast was unsatisfactory. We therefore relied on a homologous expression system: suspension cells from *N. tabacum*. After investigating NtPDR3 localization to the plasma membrane, we performed transport assays. Purification of NtPDR3 is underway.



Poster number 7

Barsics Fanny

Université de Gembloux Agronomic Sciences

Volatile organic compounds released by barley roots attract wireworms

Wireworms are the soil dwelling larvae of click beetles and are pests of many crops worldwide. Alternatives to insecticide treatments are needed in order to develop integrated management strategies. Our work consists in elucidating the role of barley root-emitted volatile organic compounds on the orientation behavior of *Agriotes sordidus* wireworms. Using a dual choice olfactometer we have evaluated the attractiveness of a variety of baits ranging from barley roots themselves to isolated root-emitted volatile organic compounds. Wireworms were significantly attracted towards most of the tested baits. Our results should be taken into account in varietal selection, in crop rotation, or in trapping systems aiming at the reduction of the populations of this pest.



Poster number 8

Bastiaanse Héloïse

Other Sciences du Vivant

Expression analysis of defense-related genes in a partial resistant apple cultivar during infection by *Venturia inaequalis*

Scab is one of the most important diseases of apple. Whereas genes governing qualitative resistance have been isolated, those governing quantitative resistance, hypothesized to be more durable, are still unknown. In this study we used transcript profiling strategies combined with phenotypic data from a segregating population to identify candidate genes involved in the partial scab resistance of an old Belgian apple cv. By cDNA-AFLP we selected a set of defense related genes modulated in the resistant cv. The expression of these genes was then assessed by qRT-PCR in a progeny derived from a cross between the resistant cv and a susceptible one. Transcripts levels were found to differ among the genotypes and to co-segregate with scab resistance levels in the progeny suggesting their potential involvement in the partial resistance. This study may lead to novel disease control strategies.



Poster number 9

Bastin Catherine

Université de Gembloux Animal Science Unit

Using fatty acid contents in milk to improve fertility of dairy cows

Improving dairy cow fertility by means of genetic selection has become increasingly important over the last years in order to overcome the declining cow fertility. This study investigated whether the fatty acids profile in milk could be used as an early predictor of genetic merit for fertility. Genetic covariances among 17 fatty acid contents in milk and the number of days from calving to conception were estimated from 29,792 first-parity Holstein cows. Results substantiated the unfavorable relationship among fertility and body fat mobilization in early lactation. Also, about 75% of the genetic variability of fertility was explained by the variability in milk fatty acids profile over the lactation indicating that these traits could be used to supplement genetic evaluations for fertility.



Poster number 10

Bastin Jean-François

Université de Gembloux Forêts, Nature et Paysage

The impact of forest spatial structure on forest type and aboveground biomass distribution, within tropical dense semi-deciduous forest of DR Congo

The spatial variability of carbon stocks was studied within several semi-deciduous forest patches of the Northern Bateke plateau, characterized by a fragmented landscape known as a forest-savannah mosaic (Democratic Republic of the Congo). Stem density, basal area and above-ground biomass (AGB) were estimated from a randomized stratified sampling design with total cover of 28.25 ha. Stratification was applied in order to study the determinism of forest biomass variability due to forest type succession along a forest-savannah transition. This stratification provided the opportunity to study the influence of the forest spatial structure through the edge effect, and to improve estimates of AGB through consideration of spatial pattern as an additive parameter.



Poster number 11

Bérénice Dethier

Université de Gembloux Chemistry and Bioindustries

A new HPLC method to quantify alliin, the major sulfur compound in garlic

Garlic is recognized for centuries for its health benefits, mostly linked to its sulfur- components. Among the products extracted from the cloves, alliin retained our attention.

Alliin was synthesized. This process leads to two stereoisomers. Their HPLC separation was the aim of this work.

The method described in the literature (amino column, detection at 210 nm) showed a resolution of 1,1 between the isomers. A second method was developed: the stationary phase was porous graphitic carbon and a water-ACN gradient was used for the elution. It provided a resolution of 3,1, was shorter and underwent the validation process.

The method leads to satisfying results. The separation is excellent, and the validation criteria are fulfilled. This may be valuable for future research on garlic.



Poster number 12

Bink Anna

Katholieke Universiteit Leuven Microbiële en Moleculaire Systemen

The non-steroidal anti-inflammatory drug diclofenac potentiates the in vitro activity of miconazole against *Candida albicans* biofilms

In this study, we aimed at identifying compounds that increase the activity of miconazole against *C. albicans* biofilms. Diclofenac was previously shown to reduce the expression level of different key genes involved in biofilm formation and development. Therefore, we investigated a potential enhancing effect of diclofenac on the activity of miconazole in vitro against *C. albicans* biofilms. We found that *C. albicans* biofilms grown in the presence of diclofenac showed increased sensitivity to miconazole. These results indicate that diclofenac is useful in combination therapy with antifungals like miconazole to treat *C. albicans*- biofilm associated infections.



Poster number 13

Boisson Sylvain

Université de Gembloux Forêts, Nature et Paysage

Modelling realized niche of metallophyte species along copper and cobalt gradients on Katangan copper hills

In South Central Africa were identified more than 650 plant species tolerant to heavy metals, several of which endemic to Katanga and critically endangered by mining activities. These metallophyte species are distributed over a hundred hills containing high copper and cobalt concentrations (20 to 10000 mg/kg for copper and 2 to 1000 mg/kg for cobalt). To understand the response of metallophyte to heavy metals, the ecological niches of 80 cupro-cobaltophytes were modeled with general additive models (GAM). Results show that (1) three groups of species were identified according to their optimum along a metal concentrations gradient and (2) a positive relationship exists between niche amplitude and optimum copper concentration.



Poster number 14

BOTULA MANYALA Yves-Dady

Universiteit Gent Soil Management

Development of pedotransfer functions to predict water retention of soils in the Lower Congo

Soil water retention curve (SWRC) is a key parameter to solve many soil and water management problems. However, its direct measurement is laborious, time-consuming and expensive. An alternative is its estimation by pedotransfer functions (PTFs). These are predictive functions relating easily measurable soil data (e.g. texture, organic carbon, bulk density) with hydraulic parameters such as the SWRC. In a preliminary study, published PTFs were evaluated and development of new PTFs was recommended for Lower Congo. Then, the best potential predictors of water content for Lower Congo soils were identified. The objective of our research is to develop PTFs to predict water content of soils in Lower Congo, based on multiple linear regressions and the newly developed k-Nearest Neighbour approach.



Poster number 15

Bui Tuyet

Katholieke Universiteit Leuven Biosystem

The response of antioxidant metabolism in apple fruit to post-harvest storage disease Botrytis cinerea.

Apples are usually stored for a period of up to 6 months to ensure a steady year-round supply of high-quality fruits. *Botrytis cinerea* is a necrotrophic fungal pathogen with a very wide host range, including apple. Apple fruit from cultivars with a higher vitamin C and antioxidant content at harvest have a higher tolerance to post-harvest infection with *B. cinerea*. The objective of this study was to improve post-harvest nutritional quality and storage potential. In the present research, apples from two cultivars Braeburn and Golden Delicious were selected to analyse their antioxidant metabolites and antioxidant metabolising enzyme activities. The results show that the susceptibility of fruits of different apple genotypes to postharvest infection with *B. cinerea* differ and pre-harvest exposure to high-light/high temperature stress can induce cross-tolerance to post-harvest *B. cinerea* infection.



Poster number 16

Bulens Anneleen

Katholieke Universiteit Leuven Biosystemen

The use of a straw dispenser in the farrowing crate

According to the European Directive (2001/93/EC) pigs should have access to enriching material and this also applies to sows and piglets in the farrowing crate. However, the way of providing enriching material needs to take into account the specific housing of sows. Therefore, the use of a straw dispenser and the suitability in the farrowing crate were studied. The results show that the intake of straw varies greatly. Also the difference between the pre and post farrowing period is very variable. Some sows take more straw before farrowing, while others take more after farrowing. The intake of straw shows that there is a need for straw or enrichment in the farrowing crate. It can be concluded that the straw dispenser is an interesting enrichment application for use in the farrowing crate.



Poster number 17

Buyse Pauline

Université de Gembloux Environmental Sciences and Technology

50 Years of contrasted residue management in an agricultural crop: impacts on the soil carbon budget and on soil heterotrophic respiration.

This study aims to estimate the carbon (C) loss by soil heterotrophic respiration (SHR) in three contrasted residue management treatments (Residue Export, Farm Yard Manure addition and Residue Restitution after harvest) through the establishment of soil C budgets, and to compare these estimations with field SHR measurements.

The soil C budgets were calculated in each case on the basis of total soil organic C content and C input data compiled since the beginning of the experiment in Belgium, 50 years ago. SHR fluxes were measured in 2010 and 2011 to compare them with the budget-based estimates and to assess SHR sensitivity to temperature. The comparison suggested that the treatment receiving the largest C input does not necessarily sequester the most C or produce the largest CO₂ fluxes.



Poster number 18

Callewaert Chris

Universiteit Gent Department of Biochemical and Microbial Technology

The bacterial fingerprint of the armpit and its variation in time

Screening of 48 individuals shows that everybody has an unique bacterial community in the armpit. About the half of the population has bacterial differences between left and right armpit, probably due to the handedness of the person, which causes different environmental conditions in the axilla. On a short time scale, and when the environment of the person remains the same, the bacterial community remains more or less constant. On a longer time scale, and when the environment of the person changes, the bacterial community can be altered as well. Sequencing of the community showed some unfamiliar genera in the armpit. Suggestions can be made that the environment, season and the deodorant/antiperspirant usage has a distinct impact on the bacterial community in the axilla.



Poster number 19

Caparros Megido Rudy

Université de Gembloux Agronomical Sciences

Infestation potential of *Tuta absoluta* (Meyrick, 1917) on potatoes (*Solanum tuberosum*).

The tomato miner, *T. absoluta* (Meyrick), is an important pest of tomato crops that also feeds on other host plants from the Solanaceae family. We studied the effect of potato (variety Spunta) on the development of *T. Absoluta*. Larval development time, pupal time, total developmental time, adult longevity and female fecundity on one hundred insects were recorded on tomato and potato. Eggs, larvae and pupae developmental time were longer on tomato than on potato. Adult longevity was also longer on tomato than on potato. These results show an important infestation capacity of *T. absoluta* on potato even if the insects seems to prefer developing on tomato. We are actually testing others potatoes varieties in due to study the varietal effect of potatoes on the development of *T. absoluta*.



Poster number **20**

Chen Jian

Universiteit Gent Sustainable Organic Chemistry and Technology

Isolation and identification of the chemical constituents from two *Gynura* species

Various chemical constituents were isolated from the aerial parts of *Gynura bicolor* and *G. divaricata*, which are both used as folk recipes for the treatment of diabetes in China. Their structures were determined spectroscopically as hydroxymethylfurfural (1), benzoic acid (2), 4-hydroxybenzoic acid (3), protocatechuic acid (4), vanillic acid (5), kaempferol (6), 3,3'-di-O-methylellagic acid-4-O- β -D-xylopyranoside (7), benzyl- β -D-glucopyranoside (8), 2-phenylethyl- β -D-glucopyranoside (9), and (6S,9S)-roseoside (10), succinic acid (11), ethyl methyl succinate (12), salicylic acid (13), isovanillic acid (14), 4-hydroxycinnamic acid (15), esculetin (16). Compounds 1-2, 4-5 and 7-16 were isolated for the first time from these plants. Biotesting of the isolated compounds is currently performed.



Poster number 21

Courtens Emilie

Universiteit Gent Department of Biochemical and Microbial Technology

Simple strategies to control the oxygen budget of an OLAND rotating biological contactor

Oxygen-limited autotrophic nitrification/denitrification (OLAND) combines partial nitrification and anammox for the removal of nitrogen from wastewater. A rotating biological contactor (RBC) is a robust OLAND technology, yet the factors controlling the oxygen uptake rates (OUR) are unknown. In lab-scale RBC, disc rotation speeds (1.8 and 3.6 rpm) showed no influence on the process performance, although an abiotic set-up showed a significant effect. In contrast, increasing the disc immersion level (50 to 75%) could significantly prevent undesired nitrification, and vice versa. Determination of the biological OUR confirmed that about 90% of the oxygen was taken directly from the atmosphere. Overall, these results demonstrated a novel and simple way to control nitrification in an OLAND RBC.



Poster number 22

De Backer Mathias

Other Plant Sciences Unit

Genotypic and phenotypic characterization of *Puccinia horiana*, a quarantine rust pathogen on *Chrysanthemum*

Puccinia horiana is one of the most important diseases in chrysanthemum production. Phenotypic characterization of a worldwide collection of isolates via controlled inoculation experiments on a set of differential cultivars revealed the presence of pathotypes and at least seven avirulence genes. Genotypic characterization involved the development and application of 25 differential SNP markers. Genotypic diversity was strongly related to geographic origin, while evidence of sporadic large distance international spread as well as recombination were also observed. Although pathotype-based diversity was larger than SNP-based diversity, the most virulent pathotypes could be identified based on their SNP profile. This allows the use of the genotyping technique in quarantine monitoring.



Poster number 23

De Bruyne Lieselotte

Universiteit Gent Crop Protection

The role of brassinosteroids in the interaction of rice with *Magnaporthe oryzae* and *Cochliobolus miyabeanus*

It has been shown that brassinosteroid plant hormones (BR) play an important role in rice resistance to (hemi)biotrophic pathogens. Using exogenous brassinolide application and differential gene expression analysis, we investigated the role of BR in resistance to the hemibiotrophic blast fungus (*Magnaporthe oryzae*) and the necrotrophic brown spot fungus (*Cochliobolus miyabeanus*). Besides confirming brassinolide induced resistance to blast, we also showed induced resistance to brown spot. Furthermore, blast infection affected the expression pattern of several BR biosynthesis and signaling associated genes. Our results suggest that BR can contribute to broad spectrum resistance in rice and that blast infection affects the BR metabolism in planta.



Poster number 24

De Clerck Caroline

Université de Gembloux Sciences Agronomiques

Identification of bacterial endosymbionts present in *Pentalonia nigronervosa* Coq. strains

Interactions between Luteoviruses particles and proteins of aphid's symbionts are well known and suspected to explain the viral particles lifetimes in the insect haemolymph. In opposite, that kind of interactions have never been studied in the case of the Banana Bunchy Top Virus (BBTV, Nanoviridae), transmitted by the aphid *Pentalonia nigronervosa*.

This work focuses on the identification of the bacterial symbionts present in *P. nigronervosa* as a first step in the characterization of such an interaction. Five aphid's strains were studied and screened for symbiont detection. *Buchnera aphidicola* and *Wolbachia pipentis* were detected in every strain. *Candidatus Serratia* which is an aphid symbiont known to provide protection against parasitoids was identified in three of the five strains studied



Poster number 25

De Coninck Maarten

Katholieke Universiteit Leuven Biosystems

Mechanical downstream processing of Single Cell Oils

Nowadays, harvesting and recovery of interesting products from microalgae is one of the most problematic areas of algal biofuel production technology. The traditional downstream process runs up to more than 50% of the total production cost of Single Cell Oils (SCO). This research is focused on the development of a simple and economical feasible mechanical downstream process set up for the commercial production of SCO. An efficient yield technique to extract the biomass from its growing medium and the disruption of the harvested cells are the main focuses. Crossflow microfiltration is investigated as an alternative for the concentration of microalgae. Tests at lab-/pilot scale were performed and research is done to optimize the membrane cleaning to extend life time and reduce operating costs



Poster number 26

De Keersmaecker Wanda

Katholieke Universiteit Leuven Biosystems Engineering

Upscaling the Biodiversity – Ecosystem functioning paradigm through remote sensing

The hypothesis that greater species diversity leads to greater ecosystem stability is one of the most challenging research topics in ecology. Current scientific insights are almost exclusively based on field and laboratory experiments. Yet, the limited scale and the restricted number of biodiversity treatments strongly hamper generalizations. In this project, we will make use of vegetation data, and optical reflectance data acquired from satellite observations to upscale existing knowledge. The main objective is to evaluate, based on satellite observations, the hypothesis that ecosystems with higher plant species diversity are generally more robust against environmental disturbances, such as extreme drought events.



Poster number 27

De Keyser Kirsten

Katholieke Universiteit Leuven Biosystems

Early detection of Chronic Progressive Lymphoedema Susceptibility in Belgian Draught Horse Stallions by means of ELISA

Belgian draught horses are susceptible to chronic progressive lymphoedema (CPL), a disorder with genetic predisposition. Breeding decisions require early diagnosis. Healthy individuals have minor elastin (ELN) turnover, eliciting only basic antibody formation (anti-ELN antibodies/AEAb's). In CPL-affected draught horses, AEAb levels have been shown to correlate with clinical severity. It was hypothesized that AEAb levels in young horses, with no/minor clinical signs, indicate CPL susceptibility. Therefore, plasma samples, distal limb radiographs and clinical scores were obtained from stallions (< 36 months), and these data were linked to disease progression at least 2 years later. If initial AEAb levels correlate with the later disease status, this test could allow for early identification.



Poster number 28

De Roy Karen

Universiteit Gent Biochemical and Microbial Technology

Flow cytometry for fast microbial community fingerprinting

Conventional methods to study the microbial community of water, e.g. HPC, are time consuming and labour intensive. A flow cytometry (FC) based approach was developed for a fast and objective comparison of microbial communities based on cellular features of the single cells. The method consists of two main parts: (1) the generation of fingerprint data by FC and (2) the analysis of FC data by a novel statistical pipeline. The combined method was shown to be useful for the discrimination and classification of different brands of drinking water and to detect changes within these communities caused by changing environmental factors. Generally, the method can be used as a fast fingerprinting method of microbial communities and as a tool to detect shifts within these communities.



Poster number 29

De Ryck Tine

Universiteit Gent Geneeskunde en gezondheidswetenschappen

Development of an in vitro model to study host-microbe interactions in the oral cavity

Bacteria-host interactions receive more and more attention in medical microbiology research. Many diseases and inflammation reactions arise due to the crosstalk between both partners. There is a need for good in vitro models where bacteria-host interactions can be studied for longer time periods. In this poster, we present an innovative in vitro model of the oral mucosa that takes into account the contribution of the microflora, mucin layer and epithelium. Using this model, we assessed the effect of oral-derived biofilms on wound healing of the epithelium. Our results show that oral bacteria decrease wound recovery at least in part due to the secretion of acids. Therefore, our model can be applied to study bacteria-host interactions present in the oral cavity.



Poster number 30

De Vrieze Jo

Universiteit Gent Biochemical and Microbial Technology

Feeding pattern variation induces functional stability in anaerobic digestion.

Anaerobic digestion is an environmental key technology for the conversion of organic waste into biogas. To achieve functional stability, a certain microbial community diversity and “elasticity” is required. It was evaluated whether a higher functional stability could be achieved by changing the evenness, dynamics and richness of the bacterial community by altering the feeding pattern. Average biogas production was the same in both reactors, although daily variation was higher in the pulse fed reactor, which had higher bacterial community dynamics than the daily fed reactor. It also was more tolerant to organic overloading and high ammonium levels. The results imply occasional application of a limited pulse of organic material to obtain a higher functional stability in anaerobic digestion.



Poster number 31

Degard Christelle

Université de Gembloux Environmental science and technology

CLIMAGRO - Climatic impact of agri-environmental measure in Walloon region: analysis of the “low stocking rate” program.

The study aims to calculate the impact of cattle stocking rate on the greenhouse gas (GHG) balance (CO₂, CH₄, N₂O) of suckler calf type of farming in Wallonia.

First a model was build, which took account of all the GHG emissions and absorptions at the farm scale. An extensive search, through peer-reviewed scientific literature was then carried out in order to quantify each flux and evaluate its uncertainty. Finally the model was run, allowing an identification of the main GHG sources/sinks at farm scale, a quantification of the net GHG balance and of its uncertainties and, finally, an estimation of the impact of cattle stocking rate on this balance.



Poster number 32

Delameilleure Laurens

Universiteit Gent Department of Food Safety and Food Quality

Adhesion of allergenic proteins to food contact materials

Cross-contamination of allergens is a major food safety concern for the food industry. A possible source of cross-contamination is adhesion of produced food containing food allergens to food contact materials.

In this research, adsorption is tested of milk to stainless steel, high-density polyethylene (HDPE), neoprene and polytetrafluoroethylene (Teflon) as different food contact materials. The milk is artificially contaminated with allergenic proteins as indicator allergens and incubated in contact with one of the before mentioned contact materials in a closed cell. After incubation and subsequent rinsing, the rinsing water is analysed for the indicator allergens using a reversed-phase HPLC method or an in-house developed Elisa kit.



Poster number 33

Delory Benjamin

Université de Gembloux Agricultural Science

Growth modelling and profiling of volatile organic compounds in Barley (*Hordeum vulgare* L.) roots

The roles played by root volatile organic compounds (VOC) remain essentially unknown. This study aims at identifying VOC contained by *H. vulgare* roots at selected growth developmental stages. As an original contribution, these were positioned on growth models calibrated for barley plants cultivated in our growth conditions. By SPME-GC/MS, a total of 110 compounds were detected and 70% of them were tentatively identified based on their mass spectra and retention time. Alcohols, aldehydes, ketones and organic acid esters accounted for 55,5% of the total number of detected VOC. Multivariate analysis revealed qualitative and quantitative changes in such profiles according to the developmental stage. In general, the VOC content was the highest when young roots just emerged from the coleorhiza.



Poster number **34**

D'hondt Rob

Universiteit Gent Applied Ecology and Environmental Biology

Modelling Freshwater Ecosystem Services using Bayesian Belief Networks

Modelling Freshwater Ecosystem Services using Bayesian Belief networks

Rob D'hondt, Tom Debie, Steven Broekx, Pieter Lemmens, Inge Liekens, Luc De Meester, Peter Goethals

The last decades the modeling of Ecosystem Services (ES) has become an emerging topic. We investigated the applicability of Bayesian Belief Networks (BBNs) in modeling ES provision and trade-offs of a freshwater system. Using a model based on system dynamics, the services fish production, nitrogen removal and recreational value were assessed for a pond under three fish breeding management scenarios. In this case study, BBNs proved a promising tool for evaluating ES trade-offs and facilitating a knowledge transfer to decision-makers.



Poster number 35

Dufranne Delphine

Université de Gembloux Science, Technology and Environment (STE)

Impact of cultivation practices (tillage and residue restitution) on soil respiration

Authors: Dufranne D., Vancutsem F., Bodson B., Aubinet M.

Cultivation practices are known to induce a modification of soil organic matter quantity, quality and spatial distribution, which may impact dry matter decomposition kinetics. In order to bring answers to these questions, a multidisciplinary project (SOLRESIDUS) was set up by the University of Liege, Gembloux Agro-Bio Tech in collaboration with Walloon Agricultural Research Centre (CRA-W). The aim was to investigate the impact of cultivation practices (tillage and residue restitution) on crop growth, yield and environment, as well as on soil properties and on activities. In the present study, we focused on the impacts on soil respiration soil for 3 years. We will present our first results.



Poster number 36

Dufrasne Marie

Université de Gembloux Sciences Agronomiques

Advanced genetic models for Piétrain boars involved in crossbreeding in the Walloon Region using test station and on-farm phenotypic and genomic data

Since 2007 the Walloon Region is acquiring a new advanced genetic evaluation program for Piétrain boars. Comprehensive models for routine genetic evaluation of boars involved in crossbreeding programs, using simultaneously data recorded on crossbred progeny at central test station and data recorded on-farm on purebred or crossbred pigs, are under development. Traits evaluated include growth, carcass quality traits and feed intake. Estimated breeding values allow breeders to select the best boars according to their selection objectives. But to have comprehensive models for crossbreeding performances, more advanced modelling of non-additive and crossbreeding effects will be added to current models. Additionally potential use of genomic information will be explored.



Poster number 38

ESMAEILPOUR ALI

Universiteit Gent PLANT PRODUCTION

Effects of seed priming duration on seed germination and vegetative growth in pistachio(*Pistacia Vera L.*) seedlings

Pistachio(*Pistacia Vera L.*) is one of the important fruit trees in sub-tropical area in the world such as Iran, Turkey, Syria and united state of America. In this study, we evaluated the effects of seed soaking duration on pistachio (*P.vera L. Cv.Badami*) seeds for 1 hour, 6, 12 and 24 hours.

These parameters was measured:

Germination percentage, germination speed, length growth of shoot in different stages, number of leaves, fresh and dry weight of shoot and root and shoot diameter.

Results showed that germination speed and primary leaves growth was higher in 24 hours duration but there was no differences between the treatments. Shoot and root length growth , number of leaves, fresh and dry weight of shoot and root and shoot diameter in 6 hours duration was higher than other treatments.



Poster number 39

Fassotte Bérénice

Université de Gembloux Sciences Agronomiques

Characterization of *Harmonia axyridis* (Pallas) (Coleoptera: Coccinellidae) overwintering sites

The invasive multicoloured Asian ladybird, *Harmonia axyridis* (Pallas), forms large aggregates inside dwellings to overwinter. In order to highlight the specific features of infested houses, we investigated a large number of overwintering sites in Wallonia between 2007 and 2011. These sites were characterized through a survey sent to homeowners confronted to invasion problems. The results indicate that *H. axyridis* preferentially selects isolated brick houses with red or white fronts to take shelter. Aggregations are mostly located at the first floor, essentially inside south or west oriented rooms. Furthermore, ladybirds were generally gathered into wooden windows frames facing south or west, and in a lesser extent, in the upper corners of walls presenting the same orientation.



Poster number 40

Faux Anne-Michelle

Université Catholique Louvain-la-Neuve Eart and Life Institute

Sex determinism in hemp (*Cannabis sativa* L.): a quantitative approach

In a context of increasing attention for alternative crops, our research focuses on hemp (*Cannabis sativa* L.), a naturally dioecious plant with high plasticity of sexual phenotype and flowering responding to daylength variations. These features have determinant implications in the genetic improvement and cultivation of the species. Effects of the flowering phenology and sex expression on yields were described in field conditions. Monoecious hemp wears homomorphic sex chromosomes and its sexual phenotype varies among cultivars. In the present study, quantitative trait loci associated to the monoecious trait are looked for. Two segregant populations were created, phenotyped and screened with AFLP markers. Next steps include the mapping of markers and the identification of putative QTL's.



Poster number 41

Faux Pierre

Université de Gembloux Zootechnie

Optimizing genomic prediction: strategies to obtain inverse of large relationship matrices

For main domestic species, molecular information is obtained by using dense panel chips (several 100k bi-allelic single nucleotide polymorphism markers). Its use in traditional genetic evaluations led to genomic prediction of breeding values, what often implies the inverse of relationship matrices summarizing similarity between genotyped animals. Computation time of such inverses increases cubically with the number of genotyped animals. A strategy to obtain an approximation of these inverses was developed, based on the direct inversion of the pedigree relationship matrix. Genomic evaluations have been performed with different approximations. Results for genomic evaluation of cattle and poultry will be presented, showing that computational gains depend on the structure of population.



Poster number 42

Feyaerts Julie

Katholieke Universiteit Leuven Microbiële en Moleculaire Systemen

High hydrostatic pressure and oxidative stress inducing natural compounds act synergistically in buffer and in milk.

High Pressure (HP) induces sublethal injury in bacteria that sensitizes them for other stresses. As a result, the combination of HP with antimicrobials often results in synergistic bacterial inactivation, although the magnitude of synergy varies substantially. In the current work we have studied the inactivation of several Gram-negative and -positive bacteria by HP in combination with 3-propionaldehyde (reuterin) and cinnamaldehyde, two structurally related oxidative stress inducing antimicrobials, to identify some factors that influence this synergy. It was found that synergy depended both on the compound and the bacteria. Interestingly, while the synergistic effect of HP and reuterin was strongly suppressed in milk as compared to buffer, this was not the case for HP and cinnamaldehyde.



Poster number 43

Fischer Christophe

Université de Gembloux Analysis, Quality and Risks

Implication of honeydew microflora in ant-aphid mutualism

Some ant and aphid species can present a mutualistic relationship, ants using aphid honeydew as sugar source and in exchange providing the aphid colony cleaning and protection. From a behavioral point of view, this phenomenon has been well studied from decades. However, its chemistry is still largely unknown. This study aims to identify semiochemicals involved in the establishment of this relation. Bioassays revealed that the greatest part of ant attraction toward aphid colonies is due to honeydew volatile compounds; enabling ant scouts to find more quickly aphid colonies and distantly recognize myrmecophilous species. Many of those VOCs seeming to have microbial origins, the role of honeydew microorganisms in ant attraction has been investigated.



Poster number 44

Franssens Lies

Katholieke Universiteit Leuven Biosystemen

The effect of tolbutamide or insulin injection during the embryonic period on the glucose metabolism of the embryo and newly hatched chick

Chickens have plasma glucose concentrations that are two times higher than that of mammals and develop a resistance to insulin early in life. Little is known about the ontogeny of the glucose metabolism during late embryonic development. This study aims to explore the glucose metabolism during the perinatal period by the injection of tolbutamide or insulin in the embryonic blood and by sampling blood after each injection at different timepoints. Use of blood is for determination of plasma glucose concentrations. Results will be published by the poster presentation.



Poster number 45

Frederickx Christine

Université de Gembloux Agronomic Science

Hymenoptera colonization of pig carcasses in an urban biotope

Most reports published in the field of forensic entomology studies are focused on Diptera pattern colonization and are neglecting Hymenoptera succession. Hymenoptera are part of the entomofaunal colonization of a dead body as parasitoids of fly pupae. However, one should consider Hymenoptera parasitoids in a forensic entomology context to evaluate the time of death. Blowflies parasitoids may indeed be of particular importance as their time of attack is often restricted to a small, well-defined window of developmental time of the insect host. Because these parasitoids also interfere with developmental times of colonizing Diptera, a better understanding of their ecology is needed.



Poster number 46

Galonde Nadine

Université de Gembloux General and Organic Chemistry

Lipase catalyzed synthesis of fatty acid sugar esters in pure ionic liquids and optimisation by response surface methodology

Sugar fatty acid esters are used for many applications in the pharmaceutical, cosmetic and food industries. They can be synthesized by biocatalysis but the low sugar solubility in the organic solvents commonly used with lipases may hinder the enzymatic synthesis. Therefore ionic liquids (ILs) represent an attractive “green” alternative to organic solvents for carbohydrate biotransformation. Since they are good solvents to solubilize polar and less polar compounds, ILs lead to an enhanced enzymatic reactivity, selectivity and stability. In this context, our study focuses on the lipase catalyzed synthesis of mannosyl myristate and compares the yields and initial rates obtained in different ILs. A response surface methodology was used to determine the conditions leading to the best yield.



Poster number 47

Garcia Suzana

Katholieke Universiteit Leuven Biosystems

Characterization of the physiological responses to ABA to understand drought tolerance in Banana

The aim of this work is to get an insight into the different levels of drought tolerance. Two banana varieties: Cachaco (drought tolerant) and Mbwazirume (drought susceptible) were characterized at both, plant and cell level. We measured the transpiration rate, growth and photosynthetic capacity in response to the application of the stress hormone abscisic acid (ABA). ABA affected the transpiration rate of both varieties and impaired the growth of Cachaco plants. However, it did not affect the photosynthetic capacity. At the cell level, our goal is to identify plasma membrane proteins isolated from roots. To obtain a high and pure enrichment of plasma membrane proteins, four different PEG and dextran concentrations were tested. The higher the concentration, the purer the fraction is.



Poster number 48

Gebremikael Mesfin Tsegaye

Universiteit Gent Soil management

Interactions between Free-living Soil Nematodes, Microbes and Plants: Effects on Nitrogen Mineralization and Microbial Properties

Free-living nematodes have been estimated to contribute 8-19% to total N mineralization in the soil. Despite abundance, diversity and complex interactions of these nematodes with soil biota, these estimations are based on theoretical food web calculations or on very simplified experiments including only selected few species and often in sterilized media. Data that include the interactions among different groups of nematodes, microbes and plants is rarely available. To address this issue we conducted an incubation experiment for 86 days with and without plants, by extracting and re-inoculating entire nematode populations into soil cores that had been defaunated using low-dose gamma irradiation which selectively kills fauna while minimally disturbing the microbial population. Three treatment



Poster number 49

Goubau Amaury

Université de Gembloux Animal Science Unit

OptiMIR: new tools for a more sustainable dairy sector

The OptiMIR project aims to improve the sustainability of the dairy sector by providing milk producers with new tools enabling them to manage the cow's fertility, feeding, health, pollutants and milk quality. Data provided by milk recording organizations and recorded in different environments will be pooled and used to identify the links between animal status and milk composition changes. The entire MIR milk spectrum will be used as indicator of the cows' status in order to 1) reduce production costs 2) give an access to high added value market 3) reduce the environmental impact.

OptiMIR is a 5 years project involving 5 research units, 11 milk recording organizations from Belgium, France, Germany, Ireland, Luxembourg and United Kingdom. The project is co-financed by INTERREG IVB program.



Poster number 50

Guo Xiaoquan

Katholieke Universiteit Leuven Department of Biosystems

High Calcium and High Protein Diets Cause Gout in Growing Layer

160 pullets were randomly divided into four groups at 35 d of age, and each group was given different diet for 30 d: namely, normal calcium (Ca) and crude protein (CP) diet (NCNP), high calcium and normal protein diet (HC), normal calcium and high protein diet (HP) or high calcium and high protein diet (HCHP) respectively. Interestingly, the HCHP diet induced typical visceral gout, and the HCHP and HC diet caused severe kidney damage. The HP diet significantly enhanced plasma uric acid and inorganic phosphorus concentrations. The HC diet significantly increased plasma uric acid, calcium and sodium levels, while significantly declined plasma inorganic phosphorus, potassium and magnesium concentrations. The HCHP diet significantly elevated plasma uric acid, calcium and sodium levels.



Poster number 51

Hamshou Mohamad

Universiteit Gent Crop Protection

The Fungal Lectin *Rhizoctonia solani* Agglutinin as a Biological Insecticide

Problems associated with the worldwide use of insecticides have prompted the entomologist to search for alternative methods to control insects. An interesting group of proteins with insecticidal activity are the carbohydrate binding proteins or lectins. In this project we have investigated the insecticidal activity of a lectin purified from the plant pathogen *Rhizoctonia solani*, named RSA or *Rhizoctonia solani* agglutinin, towards the cotton leafworm (*Spodoptera littoralis*) as model for biting-chewing insects and the pea aphid (*Acyrtosiphon pisum*) as model for the piercing-sucking insects.

In vivo experiments: Treatment of *S. littoralis* via diet containing 10 mg/g RSA caused 89% weight reduction which was accompanied with a high mortality rate (82%). In addition, RSA diet exerted toxicity



Poster number 52

Hawinkel Pieter

Katholieke Universiteit Leuven Earth and Environmental Sciences

Monitoring vegetation dynamics and carbon stocks in complex landscapes under variable climate conditions

Attempted international measures to reduce carbon emissions from deforestation and forest degradation (REDD) require accounting for both climatic and human impacts on vegetation, and a shift towards a whole-landscape approach. Remote sensing archives allow for an area-covering, spatio-temporally explicit analysis of vegetation dynamics on different scales. This research attempts to quantify and separate the effects of regional and local variability in weather and soil conditions on vegetation, via time series analysis of satellite imagery and weather records, image classification and field surveys. Carbon stocks are estimated from field data and linked to detected land use for up-scaling to a national carbon balance, thereby comparing a sectoral forest approach with a landscape approach.



Poster number 53

Hias Nick

Katholieke Universiteit Leuven Bio-ingenieurswetenschappen

The role of polyploidisation in (a)biotic stress resistance in horticultural crops

Studies have shown that polyploidy frequently confers an increased resistance to biotic and abiotic stress. The main objective of this project is to determine whether artificial polyploidisation is able to improve the natural defense mechanisms to these stress factors in horticultural crops, namely rose and apple.

Initially, varieties of rose and apple will be screened for their resistance to powdery mildew and apple scab, respectively and then for resistance to drought. 20 diploid genotypes will be selected and mitotically doubled.

Finally a comparative study on a morphological, molecular and biochemical level between the tetraploid and diploid genotypes will map differences in resistance and improve our insight in natural stress responses.



Poster number 54

Hofman Jelle

Universiteit Antwerpen Bio-Engineering Sciences

Spatial Distribution Assessment Of Particulate Matter Inside A Street Canyon Using Biomagnetic Monitoring

This paper investigates the usefulness of biomagnetic tree leaf monitoring to assess the spatial PM distribution inside an urban street canyon in the city center of Ghent. Preliminary results of this study demonstrate that biomagnetic monitoring can be used to assess small scale PM variations, even within a single tree crown. All 384 leaf samples show saturation remanence values within the range of $3.5 - 64.1 \times 10^{-6}$ A and significant effects of height and azimuthal position are obtained. As far as known this study is the first to present biomagnetic monitoring results at such a small spatial scale. The results not only give valuable insights into the spatial distribution of particulate matter inside a street a canyon, but can also be used as a validation tool for air quality modelling.



Poster number 55

Huruma Tuntufye

Katholieke Universiteit Leuven Biosystems

Comparative in silico analysis of transketolases found in Extraintestinal pathogenic Escherichia coli.

Transketolase enzyme is involved in the pentose phosphate pathway. In bacteria, this pathway plays a protective role during oxidative stress by the production of the reducing power via NADPH. In Extra intestinal E.coli (ExPEC) three forms of transketolases exist namely TktA, TktB and Transketolase 1. Here, the in silico analysis of these three sequences is reported in an attempt to identify the differences between the proteins and the reason for the existence of the three variants. The analysis showed that the proteins contained conserved domains, could be differentiated on the basis of the organisation of sequence motifs and were found to segregate into different branches in phylogenetic analysis. One form of transketolase, Transketolase 1 share 100% nucleotide identity with Human gut met



Poster number 56

Jans Ann

Katholieke Universiteit Leuven Microbial and Molecular Systems

Novel insights in the general stress response of *Rhizobium etli*.

Rhizobium etli is responsible for the development of nitrogen fixing root nodules on the common bean plant *Phaseolus vulgaris*. In the soil, the bacterium is often exposed to adverse conditions such as a shortage of nutrients, non-optimal temperatures or competition with other micro-organisms. Rhizobia therefore spend most of their time in a nutrient-limited or stress-induced stationary phase. Little is known, however, about the general mechanisms which contribute to the survival of *R. etli* in non-growing conditions. Recently, a regulatory module that is strongly conserved among alpha-proteobacteria has

been proposed to play a central role in the general stress response in these species. We here present a functional and expression analysis of its counterpart in *R. etli*.



Poster number 57

Jochems Peter

Universiteit Antwerpen Department of Bioscience Engineering

Immobilization of beta-galactosidase on membranes for process intensification

Beta-galactosidase has two important applications i.e. the removal of lactose from milk and the production of galactooligosaccharides (GOS). The immobilization of this enzyme on a membrane enables integration of conversion and separation. This is important during the production of GOS, because of the equilibrium between GOS formation and GOS hydrolysis. In the present study, beta-galactosidase was immobilized on mixed-matrix membranes, which are capable of adsorbing enzymes on their surface. The aim was to immobilize beta-galactosidase in an optimal way on a membrane and to investigate the effect of immobilization on enzyme and membrane characteristics. Currently, design of experiments is being evaluated to obtain faster results compared to the “one parameter at a time” approach.



Poster number 59

Kambashi Bienvenu

Université de Gembloux Animal Science Unit

Voluntary intake of tropical forage legumes hays by growing pig

Voluntary intake of tropical forage legumes hays by growing pig.

Dietary forage legumes can improve the economics of pig producers in the Tropics. Adding forages, requires incorporation levels maintaining the animal's voluntary intake (VI) since forages reduce the energy density of the diet, influencing growth. 12 groups of 2 pigs were offered one of the 13 diets: a corn-soybean meal based diet containing 0, 10, 20 or 40% of one of the following legume hays: *V. unguiculata*, *P. scandens*, *P. javanica* or *S. guianensis*. After 10 d, VI was measured for 5 d. The experiment was repeated 4 times. No difference in VI was observed between species ($P > 0.20$). Polynomial contrasts revealed a linear response to forage level ($P < 0.05$) decreasing from 75 g/kg 0.75 for the control to 50 for 40% forage diets.



Poster number **60**

Kerckhof Frederiek - Maarten

Universiteit Gent Biochemical and microbial technology (BW06)

Closing the carbon gap: PHB as valuable product from methane-rich sidestreams

A challenge faced in all bio-industries (anaerobic digestions, biorefineries, aquaculture, ...) is to close the loops for all nutrients. This research focuses on the use of methane-rich waste streams to create added value - but not for energy - by using methane oxidizing bacteria (MOB) to produce polyhydroxybutyrate (PHB), a well-known biopolymer that can be used as bioplastics. The results clearly showed that by limiting certain nutrients - thus stressing the MOB - the PHB production could be enhanced. This study clearly showed that by using MOB, methane emissions can be avoided and that the carbon of the methane can be converted into PHB.



Poster number 61

Kissel Ewaut

Katholieke Universiteit Leuven Biosystemen

The quest for drought tolerant varieties: high throughput phenotyping at plant and molecular level

Water deficit is one of world's major constraints in agriculture and its influence is projected to rise significantly. Hence, an efficient use of water at the plant level is of great importance for a sustainable agriculture. Therefore we put forward a methodology to study water shortage on banana (Musa), an important food crop worldwide. The first objective is to screen the biodiversity through phenotyping to identify drought tolerant varieties that can be recommended to the farmer. For a high throughput phenotyping we developed a matlab based program to quantify leaf growth and damage. In a last phase, the discovered tolerant and sensitive varieties will be employed to map relevant drought tolerance mechanisms at cellular level which will form a powerful basis for crop improvement.



Poster number 62

Laloux Morgan

Université de Gembloux General and Organic Chemistry

Development of a headspace solid-phase microextraction method coupled to gas chromatography (HS-SPME GC-MS) to capture and analyze the volatile organi

Parts of plants above and below ground emit volatile organic compounds (VOCs) that have beneficial (growth promotion, attraction) or detrimental effects (toxicity, repellence) on other organisms. This multidisciplinary project studies the role of the VOCs emitted by the roots of barley (*Hordeum vulgare* cv. Quench) in multitrophic interactions with other organisms (plants, insects, fungi, bacteria, and virus) of the rhizosphere. One of the first aims of this project was therefore to be able to capture and analyze the emitted VOCs. A headspace solid-phase microextraction method, coupled to gas chromatography-mass spectrometry (HS-SPME GC-MS) was developed. This analytical method allowed to identify and quantify about 30 compounds (2-pentylfuran, octan-1-ol, (E)-non-2-enal, for example).



Poster number 63

Laloux Morgan

Université de Gembloux General and Organic Chemistry

Identification and quantification of VOCs emitted by the roots of barley (*Hordeum vulgare* cv. Quench) aged from 21 days by headspace solid-phase micro

The rhizosphere is the site of biotic interactions between multiple agents populating this environment (bacteria, insects, fungi, weeds). Rhizovol is a project bringing together different partners with the objective of studying the roles of volatile organic compounds (VOCs) emitted by the roots of barley (*Hordeum vulgare* cv. Quench). In this context, the main objective of this study is to build a profile of VOCs. The identification of these molecules is a key step necessary to the project partners so they can investigate the physiological roles of VOCs in allelopathic interactions in the rhizosphere. 31 VOCs were identified and a quantified. There are alcohols (45%), aldehydes (19%), esters (16%), ketones (7%), sulfur (7%) and furan compounds (6%).



Poster number 64

Lamaudière Stéphane

Université Catholique Louvain-la-Neuve Earth & Life Institut (ELI)

METHOD OF DETERMINATION OF MONO-DI AND OLIGOSACCHARIDES SOLUBLES BY HPLC-ELSD TO

We adapted and optimised a method to monitor the principal mono- and di-saccharides found in biomass (fructose, glucose and sucrose) simultaneously with soluble oligosaccharides (oligofructans, oligoglucans, dextrans). The method is also suitable to monitor the carbohydrate that can be released by the hydrolysis of structural polysaccharides or starch (xylose, arabinose, mannose, galactose, cellobiose, maltose). A HPLC-ELSD was used. The response of the ELSD follows the relationship $[Area] = a.[concentration]^b$.

On the basis of many analyses, we were able to set $b = 1.5$ for fructose, glucose and sucrose and oligofructans. This allowed to reproducibly calibrate the a value for each analysed carbohydrates. Results of this calibration will be presented in the poster.



Poster number 65

Leclercq Gil

Université de Gembloux Agronomical Sciences

Evaluation of the genetic diversity of honey bees (*Apis mellifera* L.) in the Walloon Region and selection of strains tolerant to *Varroa destructor*

For more than a decade, high losses of honey bee colonies have been noticed in several countries, including Belgium. Currently often the mite *Varroa destructor* is considered a main threat for beekeeping. In view of the inefficiency of the current chemical treatments, one of the solutions is to select honey bees tolerant to this parasite using genomic selection. To reach this objective the genetic diversity of honey bees needs first to be studied using mainly ‘Single Nucleotide Polymorphisms’ (SNP). Records and samples will be collected all over the Walloon Region in order to create an informative phenotypic and genomic data base that will be used for ‘Genome Wide Association Studies’ (GWAS) to detect associations between SNPs and tolerance, and to select bees tolerant to *Varroa destructor*.



Poster number 66

Mariya Petrova

Katholieke Universiteit Leuven Department of Microbial and Molecular Systems

Putative lectins from probiotic *Lactobacillus rhamnosus* GG

In this study, the role of putative sugar-binding lectins of the probiotic strain *Lactobacillus rhamnosus* GG is studied in relation to pathogen exclusion. Two genes encoding putative lectin-like proteins (Llp1 and Llp2) were identified in the genome of LGG. Llp1 and Llp2 contain a highly conserved N-terminal L-type lectin domain. Knock-out mutant analyses indicate that Llp1 and Llp2 modulate the binding of LGG to intestinal epithelial cells, possibly via their lectin-like domain. Preliminary sugar-binding assays suggest that the llp1 and llp2 mutants are affected in binding to glucose, maltose and mannose. Further experiments should provide information on the exact sugar specificity and their role in pathogen exclusion.



Poster number 67

Morin-Rivat Julie

Université de Gembloux Forêt, Nature et Paysage

A palaeoecological contribution to the African tropical forest management in the global change context

Highlight the relationship between human settlement and distribution of vegetation is the main topic tackled by my PhD project. Recent studies show that human disturbances in the African tropical forest had an influence on vegetation, particularly allowing the expansion of light-demanding tree species. Those species are exploited for their wood but recently most of them are considered as endangered species (IUCN).

To contribute to this issue I chose to study macro-charcoals from pits excavated in several sites in Cameroon (anthracology) to understand the evolution of tropical tree stands. The scarcity of anthracological studies for tropical Africa, and palaeoecological studies in general, gives its importance to this innovative contribution. The objective is to understand the past and pres



Poster number 68

Mputu Kanyinda Jean-Noel

Université de Gembloux Chemistry and Bioindustry

Impact of glycerol and storage temperature on glutathione concentration and physiological state of *Pseudomonas fluorescens* BTP1 freeze-dried.

Pseudomonas fluorescens are commonly used as bio-fungicides in agriculture. The use of *Pseudomonas fluorescens* as fungicide requires formulations as either liquid or powder. Formulations have two advantages, storage and transport. Freeze-drying is a commonly used method to preserve bacteria. However, freeze-drying damages the cells, which results in loss of viability. To reduce loss of viability during freeze-drying and storage, we used protective compounds like glycerol compared with a control (cells without protective compounds).



Poster number 69

Mubiru Edward

Universiteit Gent Department of Food Safety and Food Quality

Production of volatile lipid oxidation products in foods: Fast Mass Spectrometry-based methods for monitoring of volatile organic compounds (VOCs)

Foods are exposed to various oxidation reactions giving rise to the production of volatile organic compounds which are undesirable due to sensorial and safety reasons. Due to a nutritional drive, foods nowadays are frequently being enriched with highly unsaturated, oxidation sensitive, ω -3 fatty acids. This results in foods that are more sensitive to oxidation which is a potential food quality and safety problem. The objective is to characterise the oxidation of selected ω -3 fatty acid enriched foods in order to evaluate their increased oxidation sensitivity by studying the generation of volatile oxidation products. A powerful analytical technique, Selected Ion Flow Tube Mass Spectrometry is being used to develop applications with high implementation potential in terms of sensitivity.



Poster number 70

Nacoulima Nafissatou Lalaïssa

Université de Gembloux Phytotechnie tropicale et Horticulture

Introgression of improved fiber fineness trait in *G.hirsutum* L.from *G. longicalyx* Hutch. & Lee.

The diameter and the ribbon width of swelled fibers produced by (*Gossypium hirsutum* x *G. longicalyx*)² hexaploid, [*G. hirsutum* x *G. thurberi*]² x *G. longicalyx*] trispecies hybrid, their parents, and their progeny were assessed using an optical microscope. The results of these analyses show that *G. longicalyx* contains genes that reduce drastically the diameter of the fiber when associated to *G. hirsutum* genome. Introgressed genetic stocks were obtained by backcrossing to *G. hirsutum* both bi-specific and tri-specific hybrids. SSR (simple sequence repeat) markers, classical cytogenetic and GISH (Genomic In situ Hybridization) were used to characterize the introgressed plants and try to map the *G. longicalyx* genes inducing a drastic reduction of the fiber diameter.



Poster number 71

Nguyen Dao

Katholieke Universiteit Leuven Biosystems

Enrichment of *Histomonas meleagridis*

The extracellular protozoon *Histomonas meleagridis* is the causative agent of histomonosis or enterohepatitis in poultry, especially turkeys. Currently, no therapeutic or prophylactic measures against blackhead disease are available, as all

active drugs have been banned from the European market due to public health concerns. This has led to an increase of outbreaks and may drive poultry farmers towards

the use of illegal and dangerous drugs. Hence, there is an urgent need for basic research of the parasite. Therefore, this study aims at establishing of a well-defined mono-eukaryotic *H. meleagridis* culture to obtain pure protozoa for biological and biochemical studies. This investigation includes a possible enrichment protocol of the cultured *H. meleagridis*.



Poster number 72

NINTIJE Pierre

Université de Gembloux Agronomic sciences

Banana Streak Virus activation by tissue culture in natural interspecific banana hybrids

Banana and plantains are important in Burundi as a staple food crop and source of income for farmers. Nevertheless, their productions are threatened by pathogens among which viruses are especially harmful. Elimination procedures of viruses are mainly performed by banana tissue culture techniques (TC) giving good sanitation results for most bananas' viruses.

However, Banana Streak Virus (BSV) a pararetrovirus is activated by TC for banana with the B genome. Therefore, there is a risk of encouraging the emergence of BSV in Burundi by the distribution of TC products to growers.

In this work, we studied the activation of BSV by tissue culture in 5 banana cultivars collected in Burundi and micropropagated in vitro. The BSV activation was demonstrated in 4 cultivars using molecular tools.



Poster number 73

Peeters Ken

Katholieke Universiteit Leuven Biology

Deregulation of glycolysis triggers apoptosis in yeast

Recently we found that glucose, the most-preferred carbon substrate of many microorganisms, is a potent inducer of apoptosis in yeast cells in which downregulation of hexokinase activity is compromised. Yeast hexokinase is inhibited by trehalose-6-phosphate, the product of the Tps1 enzyme. Absence of the inhibitor causes rapid expression of classical apoptotic markers followed by cell death upon addition of glucose. Deletion of the HXK2 gene, encoding the major yeast hexokinase, prevents the glucose-induced apoptotic cascade. The Tps1 control of hexokinase was discovered because of the inability of tps1 mutants to grow on glucose and related rapidly-fermented sugars. Addition of glucose to tps1 mutants causes hyperaccumulation of sugar phosphates and depletion of ATP and free phosphate.



Poster number 74

Peeters Liesbet

Katholieke Universiteit Leuven Biosystems

EVALUATION OF IGE LEVELS AGAINST CULICOIDES NUBECULOSUS ALLERGENS IN BELGIAN WARMBLOOD HORSES

Insect bite hypersensitivity (IBH) is a heritable allergic reaction to the bites of Culicoides species in horses. The aim of this study is to evaluate IgE levels against recombinant Culicoides nubeculosus allergens (Culn1-10) in Warmblood horses (BWH). In this study, IgE levels were measured in 118 plasma samples of BWH sampled in Belgium (65 IBH cases 53 IBH controls) using an allergen-specific IgE ELISA. 28 horses had clear symptoms at the time of sampling, 18 horses had mild symptoms and 19 horses had no symptoms. This study shows that BWH are sensitised against several Culicoides nubeculosus salivary gland allergens, although to a lower extent than Icelandic horses. The IgE level of horses with clear clinical symptoms seems to be higher compared to horses without or with mild symptoms,



Poster number 75

Permentier Liesbet

Katholieke Universiteit Leuven Biosystems

Comparison of pigs' growth performance, body composition, body conformation and meat quality between three genetic lines selected for leanness

Growth performance, body composition, conformation and meat quality were evaluated in crossbred pigs originating from three sire lines selected for leanness and conformation. Crossbred P, which was based on Belgian Piétrain had a leaner carcass and a better ham conformation compared to the other crossbreds. The presence of the halothane gene resulted in poorer meat quality in comparison to the homozygous halothane negative crossbred. Differences between genders for growth and carcass traits were generally in agreement with previous research. Body composition and conformation were not correlated. Hence, both these traits are needed to characterize genetic lines in order to determine the true commercial value of pig carcasses, especially when meat quality has to be taken into account.



Poster number 76

Pletinckx Larissa

Katholieke Universiteit Leuven Biosystems

MRSA spread in pigs and between different livestock species residing on the same farm.

Besides HA- and CA-MRSA, also LA-MRSA has emerged, this type is reported mainly in pigs but also in other livestock.

MRSA prevalence in different pig age categories, contamination in barn environment and spread to other livestock species and humans present on the same farms was evaluated in 2 pig, 2 poultry-pig and 2 dairy-pig farms.

Overall MRSA prevalence was highest in post-weaned piglets and slightly decreased to slaughter age. MRSA prevalence in pigs was related to contamination in environment. MRSA occurred in all other animal species present on the farm. Results of molecular typing and antibiogram suggest interspecies transmission of MRSA ST398. Results indicate that in order to enable preventive measures, not only pigs, but also all other animal species present on farms need to be targeted.



Poster number 77

Poelaert Christine

Université de Gembloux Agronomical Sciences

Influence of reducing agent on microbial fermentation characteristics by bacteria isolated from pig intestine using an in vitro gas production method

Various compositions of incubation medium for in vitro gas production methods used in animal nutrition have been described. Usually a reducing agent, such as Na₂S or cysteine HCl, generates the required anaerobic environment. The addition of a reducing agent can disrupt the balance between bacterial species by the production of toxic metabolites in non physiological concentration. An experiment was conducted using protein (soy, casein) and carbohydrate (potato starch, cellulose) ingredients fermented in vitro by pig intestinal bacteria in three incubation media (containing Na₂S, cysteine HCl or without reducing agent). Gas fermentation kinetics and short-chain fatty acid production were compared. The results show that the omission of reducing agent doesn't alter the fermentation kinetics, total short-chain fatty acid production and molar ratio after 72 hours of fermentation.



Poster number 78

Pothakos Vasileios

Universiteit Gent Food Safety and Food Quality

Total mesophilic counts underestimate in many cases the contamination levels of psychrotrophic lactic acid bacteria in chilled stored food products

A comparison between the total viable counts on plates incubated at 30oC (representing the mesophiles) and at 22oC (indicating the psychrotrophs) for 86 various packaged, chilled-stored, retail food products covering a wide range showed that a consistent underestimation of the microbial load occurs when the total aerobic mesophilic counts are used as a shelf-life parameter. In 38% of the samples the psychrotrophic counts had significantly higher values than the corresponding total aerobic mesophilic counts. 154 lactic acid bacteria unable to proliferate at 30oC were isolated. rep-PCR and AFLP analysis were combined to facilitate the taxonomic distribution of the recovered isolates. *Leuconostoc* spp. and *Lactococcus piscium* proved to be the most competent and predominant species.



Poster number 79

Raulier Pierre

Université Catholique Louvain-la-Neuve ELI

Elaboration a panel for association mapping

This poster describes the elaboration and characterization of an association mapping panel based only on genetic data. First, a germplasm gathering all variability available in industrial chicory (*Cichorium intybus*) was characterized with 16 SSR markers. It presented an intermediate level of genetic variability and a segregation of the individuals in 4 groups. Secondly, different sampling strategies based on SSR data were tested, in order to maximize the variability and minimize the structure among the panel. Thirdly, the phenotypic variability and heritability of the root morphology of the panel were characterized, validating the strategy.



Poster number **80**

Robijns Stijn

Katholieke Universiteit Leuven Department Microbial and Molecular Systems (M2S)

DETERMINATION OF THE MODE OF ACTION OF NEW BROAD APPLICABLE SMALL MOLECULE INHIBITORS OF SALMONELLA BIOFILM FORMATION

Salmonella is able to form biofilms on many surfaces. Within these biofilms Salmonella is protected against many stress factors and therefore is an important survival strategy of Salmonella. Therefore, the prevention and eradication of biofilms can be an effective way to limit the spread and prevent infections of Salmonella.

Initially 144 possible biofilm inhibitors were identified and after further characterization and early structure-activity relationship studies, 3 chemically distinct compound families were selected.

Of those the 'mode of action' is being determined using a newly created library of 81 reporter biofilm-gene fusions. This way we can quickly identify the effect of the compounds on specific biofilm-related processes and determine their precise 'mode of action'.



Poster number **81**

Rosselle Lien

Katholieke Universiteit Leuven Biosystems

Weather influences on cattle sheltering behaviour in a temperate climate

Although (behavioural) thermoregulation in cattle has been studied a lot, information about how cows react to different weather conditions in a temperate climate is missing. Sheltering behaviour of pastoral cattle was studied in relation to various weather parameters. Concerning cold stress, shelter use seemed to increase at lower temperatures and higher wind speed. Especially rain seemed to have a remarkable impact, cattle seek shelter 2 to 3 times more often. Research on heat stress showed that shelter use was higher when temperature and solar radiation increased, but the impact of wind speed may not be ignored.

The fact that cattle use shelter in variable conditions indicates that they try to maintain their thermal comfort this way, so even in a temperate climate shelter can be useful.



Poster number 82

Sablon Ludovic

Université de Gembloux Department of Agricultural Sciences

Use of *Chrysoperla carnea* larvae for biological control of immature stages of *Leptinotarsa decemlineata*

In laboratory assays, we demonstrated predation of *Chrysoperla carnea* lacewing larvae against eggs, first and second larval instars of Colorado potato beetle (CPB). When looking at the daily consumption, we found that prey consumption by the third larval instar was 3-fold higher compared to the two first instars. Partial or total consumption of prey was also numbered. Different proportions of partial/total consumption were found and these depend on the lacewing larval stage.

This study provides new perspectives for possible use of *C. carnea* as a biological agent to control CPB. Nevertheless, additional work has to be conducted under semi-natural and field to completely evaluate this predatory potential.



Poster number 83

Sadeghi pasvisheh roghayeh

Universiteit Gent Plant Production

Genetic algorithm and greedy stepwise methods for optimisation of predictive *Azolla filiculoides* (Lam) based on classification tree

Cover percentage of *Azolla* and 33 wetland characteristics were collected at the Selkeh wildlife refuge, in Anzali wetland, northern Iran over the study period 2007-2008. Classification tree (CT) was developed in order to find the relationship between the wetland characteristics and the dynamic pattern of *Azolla*. Greedy stepwise and genetic algorithms were combined with CT so as to select the most important explanatory variables for the prediction of *Azolla* distribution. The applied methods were assessed based on the percentage of Correctly Classified Instances and Cohen's kappa statistics. The results of the present study demonstrated that after variable selection, the predictive performances of CT improved drastically and hence resulted in to an easy interpretation of CT model.



Poster number **84**

Sainvitu Pauline

Université de Gembloux Chemistry

Synthesis and physico-chemical characterization of fatty esters comprising an aromatic part.

Specific antioxidant molecules (e.g. phenolics) help to prevent oxidation reaction of the cell membrane. A fatty chain grafted on these compounds should enhance their capacity to interact with the membrane lipids.

In our study, four fatty esters comprising an aromatic part were synthesized. They differentiate by their chain length, the position of the ester function or the aromatic substituent. The relationships between their structure and their physico-chemical properties (e.g. monolayer film behavior at an air-water interface) were investigated. The chain length is the parameter which has the greater effect but other structural changes also play a role.

In the future, we will investigate the effect of the presence of a sugar unit on these molecules.



Poster number 85

Salomonsson Helena

Universiteit Gent Food Safety and Food Quality

Carry-over of (allergenic) proteins in wash waters in the vegetable processing industry

In the vegetable processing industry, water is often re-used due to environmental and economical reasons. This means that several batches of vegetables are washed in the same water or that water is re-circulated after treatment. These practices can lead to carry-over of allergens.

In this research the total carry-over of protein in the vegetable processing industry is being investigated. This can be seen as a worst-case scenario of the carry-over of allergens in the washing process. Secondly, simulations of the washing process are carried out with four different proteins as indicator allergens, in order to study the influence of different parameters on the carry-over of allergens. The generated data will build up a data base in order to be able to predict the carry-over via wash waters.



Poster number 86

Saunier de Cazenave Magdalena

Université de Gembloux Sciences Agronomiques

Rhizobacteria affect growth, biomass partitioning and root architecture in *Brachypodium distachyon* (L.) P. Beauv. through the emission of volatile or

Some soil bacteria can promote plant growth by synthesizing various compounds including volatile organic compounds (VOC). They are known as plant growth-promoting rhizobacteria (PGPR). Our aim is to evaluate the interactions between a model monocot, *Brachypodium distachyon* (L.) P. Beauv., and 19 rhizobacterial strains selected for their growth promotion ability. The bacterial VOC impacts were studied using an in vitro system allowing interactions between plants and bacteria within a shared atmosphere but without physical contact. The results show that the VOC of several bacteria promote plant growth, modulate biomass partitioning and affect shoot and root architecture (secondary and adventitious root growth). The results are discussed with regard to the bacterial VOC profiles.



Poster number 87

Schaubroeck Thomas

Universiteit Gent BW11 - Sustainable Organic Chemistry and Technology

Successful hydraulic strategies to start up OLAND sequencing batch reactors at lab scale

Oxygen-limited autotrophic nitrification/denitrification (OLAND) is a one-stage combination of partial nitrification and anammox, which can have a challenging process start-up. In this study, start-up strategies were tested for sequencing batch reactors, varying hydraulic parameters, i.e. volumetric exchange ratio (VER) (25% vs. 50%) and feeding regime (semi-continuous vs. pulse) and salinity (0, 3 and 5 g NaCl L⁻¹). All systems achieved granulation and similar biomass-specific nitrogen removal rates (141-220 mg N g⁻¹ VSS d⁻¹). The fast start-up of reactors with a VER of 25% and/or semi-continuous feeding regime suggests that stable hydraulic conditions are beneficial for OLAND while increased salinity at the tested levels is not needed for good reactor performance.



Poster number 88

Schaubroeck Thomas

Universiteit Gent BW11 - Sustainable Organic Chemistry and Technology

Accounting for ecosystem functioning using an improved ecological network analysis methodology; a case study on a forest ecosystem

The flow networks of an ecosystem provide insight into its functioning. A tool to study these flow networks is Ecological Network Analysis (ENA), in which total system indicators are calculated. ENA indicators characterize the functioning (or aspects of it, e.g. cycling) of an ecosystem. The goal of the study is the improvement of ENA for application in the field of environmental sustainability assessment, as the functioning of ecosystems and their alterations should be taken into account in such an assessment. The most important improvement is the specification of interactions of an ecosystem with its environment, since this is desired for an environmental sustainability assessment. Using the adapted ENA methodology, a case study has been performed on a forest ecosystem.



Poster number 89

Segers Marijke

Katholieke Universiteit Leuven Microbial and Molecular Systems (M²S)

The interaction between lipoteichoic acid of *Lactobacillus rhamnosus* GG and Toll-like receptors

Lactobacillus rhamnosus GG (LGG) is a well-studied probiotic of which the molecular mechanisms of probiotic relevance are still only fragmentarily known. Its extracellular molecules are thought to contain microbe-associated molecular patterns, which can interact with pattern recognition receptors like Toll-like receptors (TLRs), resulting in immunomodulatory effects. Lipoteichoic acid (LTA) is an important immunostimulatory surface molecule of Gram-positive bacteria. We study the influence of LGG LTA on immunomodulation of intestinal epithelial cells and its role in the interaction with TLRs. Results indicate that LTA of LGG is a pro-inflammatory molecule. The lipid chains are crucial for TLR2/TLR6 interaction, while D-ala substituents are required for IL-8 induction in Caco-2 cells.



Poster number **90**

shokribousjein zahra

Katholieke Universiteit Leuven Microbial and Molecular Systems

Effect of hop extract on primary gushing

Gushing is vigorously overfoaming of overcarbonated beverages which is disastrous phenomenon for companies. End of the 1990s, hydrophobins, surface active proteins, produced by filamentous fungi were tackled as responsible factors. Since these proteins have both hydrophobic and hydrophilic parts, this research focused on a curative method for gushing by hydrophobic interaction. Here the effect of hop extract was studied. It was known that odorless hop fractions influence gushing significantly. Nevertheless it is important to improve the selectivity and specificity. Therefore further study is now underway in order to demonstrate, characterize and understand in a scientific way the activity of surfactants on hydrophobic patch of class II hydrophobins.



Poster number 91

Snoeks Melissa

Katholieke Universiteit Leuven Biosystems

Effects of the Belgian weather on shelter behavior of horses

To investigate the influence from the weather conditions on the well-being of horses, 244 observations of 15 minutes each, were collected from different horses in different circumstances, by instantaneous sampling. Behavioural parameters were related to sheltering under natural or artificial protection, feed and water intake,... Climatic parameters were: sunshine, raining, cloudiness, dry air temperature, wind speed and RH. The lowest frequency of sheltering behavior was observed by temperatures above 25°C, a moderated wind speed or by a moderate wind speed together with a humidity between 70 and 80%. There was also a influence of temperature x RH, temperature x wind speed interactions, but without a clear trend. Conclusion: sheltering behavior is indeed influenced by weather conditions.



Poster number **92**

Steinhauer Sven

Université de Gembloux Chimie et bio-industries

Replacing explicit water and membrane molecules in molecular dynamics simulations to boost simulation speed

Authors: Steinhauer S, Crowet JM, Lins L & Brasseur R

Molecular dynamics (MD) is a method, which helps in explaining experimental results or in getting insight into details, inaccessible by laboratory methods. Current atomistic membrane/protein simulations are limited by the needed time to perform them. Reducing the complexity of the simulated systems helps reaching the biologically relevant time scales above the milli second, which is of high importance for drug design, toxicology and other fields. The implicit force field "IMPALA" replaces water and lipids by a couple of simple equations. Its integration into "Gromacs", a MD program suite, will turn IMPALAs rigid molecules flexible and will lead to a considerable gain of simulation speed.



Poster number 93

Tagliabue Michele Martino

Universiteit Gent Department of Animal Production

OXIDATIVE STATUS IN FREE-RANGE BROILERS COMPARED TO CONVENTIONAL INDOORS REARED CHICKENS

In recent years, western consumers are more and more oriented to meat produced with respect for the environment and in particular for the animal (Verhoef, 2005). Concerning poultry, the perception of consumers about free-range chickens is one of happier and healthier animals compared to animals reared under conventional indoor conditions (Sossidou et al., 2011). It is known that pasture consumption and the typology of grass available can influence meat quality in free-range chickens (Ponte et al., 2008a) and also can increase the levels of n-3 PUFA in breast meat with the potential to reduce the risk for cardiovascular diseases in humans (Simopoulos, 2008). Through a sensorial test it appeared that meat of chickens reared on pasture was more appreciated than conventional meat (Ponte et al.



Poster number 94

Terren Marieke

Université de Gembloux Sciences Agronomiques

Study of agronomic constraints to the dissemination of the cultivation of *Jatropha curcas* L. in Senegal

Alternatives to fossil fuels are needed to satisfy the world demand for energy. The oil of *Jatropha curcas* L. can be used in simple engines, in adapted stoves and as bio pesticide. Growing JCL can alleviate rural poverty and improve the environment. Selection works carried out in field trials installed in Northern Senegal permitted to indentify superior JCL clones. These clones were installed in three different agro-ecological environments in order to assess the actual yield potential of the crop and the importance of the main agronomic constraints (pests and diseases, water stress, soil types) that affect its profitability. The preliminary results of these trials are presented and discussed.



Poster number 95

Tiffany Sosa Rodriguez

Université Catholique Louvain-la-Neuve ELIM

In vitro mycorrhization of autotrophic grown *Hevea brasiliensis* plantlets

Hevea brasiliensis plantlets were grown under 500 and 1000 ppm of CO₂ and their roots placed in a dense mycorrhizal network of *Rhizophagus* sp. developed from a mycelium donor plant *Medicago truncatula*. After 8 weeks of contact between the roots of *H. brasiliensis* and the extraradical mycelium, colonization started. Only the newly produced roots were colonized by the AM fungus. At week 13, $23 \pm 2,3\%$ of the length of the new roots were colonized and harbored numerous vesicles and arbuscules. CO₂ enrichment had no effect on plant growth and on the establishment of the symbiosis, but increased the level of root colonization. As solely newly produced roots were colonized, it appears essential to improve their initiation and growth for improving the in vitro mycorrhization of *H. brasiliensis*.



Poster number 96

Tsilia Varvara

Universiteit Gent Department of Food Safety and Food Quality

DETECTION OF ENTEROTOXINS PRODUCED BY B. CER-EUS ISOLATES USING MASS SPECTROMETRY

B.cereus (BC) is involved in diarrheal outbreaks caused by enterotoxin (ET) production in the small intestine. ET characterization (CytK1, NHE) is critical for food safety risk assessment, but no efficient tools are available for this purpose. To date, CytK1 and NheB cannot be detected by commercial tests, but an immunological kit is available for NheA, although its efficiency depends on the antibody specificity and the genetic diversity of ETs. We have developed a MALDI-TOF/MS approach to successfully study tryptic gel digests of CytK1 and NHE components from pure BC cultures. The MS method is specific, it overcomes the limitations associated to polymorphic sequences and offers the potential for quantification, a step required in food risk management for dose-response analysis of ETs.



Poster number 97

Van Bockhaven Jonas

Universiteit Gent Crop protection

Silicon-primed brown spot resistance in rice (*Oryza sativa* L.)

Rice, the most important cereal and staple food for over 3 billion people worldwide is threatened by over 70 diseases. Despite the destructive potential of these pathogens, the lack of adequate disease control methods opposes a risk to rice cultivation, now and especially in the future. A promising new strategy in this context is the application of silicon (Si) which is known to 'prime' plants for quicker and faster defense responses. This priming effect protects Si treated rice plants against a plethora of microbial pathogens and herbivorous insects. Future studies are necessary to identify how exactly Si primes the immune system in rice, therefore we are investigating the role of various signaling components thought to play a key function in the Si-mediated priming. This will guide novel strategies for biologically based, environmentally friendly and durable disease control in various agricultural settings.



Poster number 98

Van de Perre Evelien

Universiteit Gent Voedelsveiligheid en voedselkwaliteit

Screening of mycotoxins in tomatoes, onions, bell peppers, soft red fruits and derived tomato products with LC-TOF-MS

Up to date, data risk assessment and legislation are available for multiple mycotoxins as AF, OTA, DON, ZEN, fumonisin, T-2 and HT-2 toxin in cereals, maize and dried plant. However, limited data is available for mycotoxins associated with fresh produce and derived products. Therefore, a screening was performed on tomatoes, onions, bell peppers, soft red fruits and derived tomato products with LC-TOF-MS for new emerging mycotoxins (AOH, AME, OTA, FB1, FB2 and FB3). Results showed that AOH and AME occur in moulded tomatoes, onions and soft red fruits but also in derived tomato products such as concentrates and tomatopurees. Further exposure risk assessment should be performed to estimate the effect on human health by eating derived tomato products.



Poster number 99

Van Eynde Erik

Universiteit Antwerpen Bio-ingenieurswetenschappen

An innovative manufacture route for silica-titania photocatalysts by using diatoms

Photocatalysis by polycrystalline semiconductor oxides such as TiO_2 is a promising technology for the degradation of air pollutants. However, there are some problems with the present generation photocatalyst such as the inadequate immobilization of photocatalyst on a carrier material and the insufficient activity of the photocatalyst. Therefore there is need for novel materials and production methods to overcome these problems.

An innovative biological production method for silica supported titania materials by using the diatom *Eunotia binularis* is presented. Diatoms are unicellular microalgae which form an hierarchically ordered silica shell (frustule) with a high surface area. These natural *Eunotia* frustules will be used as biotemplate for the production of photocatalysts by deposition of titania.



Poster number **100**

Van Goethem Davina

Universiteit Antwerpen bio-science engineering

MODELLING SEASONAL VARIATIONS OF FLUORESCENCE IN BAMBOO LEAVES

In the search of renewable energy resources and bio-based materials, bamboo has been proposed as a high yield biomass product that can be used as a phytoremediator on polluted soils. To monitor the performance of the plants, chlorophyll fluorescence was measured on the leaves of *Phyllostachys humilis* in Ballyboughal, Co. Dublin, Ireland. Measurements were attained on the leaves of each node of the plant and taken on a seasonal basis. The parameter most frequently used in chlorophyll fluorescence is F_v/F_m , also known as TRo/ABS (ratio of number of photons trapped and number of photons absorbed). In this study, we compared different mathematical models to describe seasonal, diurnal and height-dependent variation of this parameter, and the interaction between them.



Poster number 101

Van Hese Nathalie

Universiteit Gent Crop protection

A sustainable approach to control downy mildew (*Bremia lactucae*) in lettuce

Downy mildew causes high yield losses in lettuce. The development of a sustainable protection system requires profound knowledge of the epidemiology of the pathogen, *Bremia lactucae*. This work focuses on the critical circumstances for the pathogen to survive and infect plants, the possible sources of primary inoculum, and the translation of this knowledge into practical advice for breeders. Climatological circumstances are mainly important during germination, penetration and sporulation. There is evidence that oospores might be a possible source of primary inoculum. Sometimes it is however practically impossible or economically unfeasible to adapt the climate to the circumstances necessary to suppress the pathogen. Consideration of (bio)chemical treatments is thus inevitable.



Poster number 102

Van Hoestenbergh Stijn

Katholieke Universiteit Leuven Biosystemen

Replacement of fish oil with vegetable oils in juvenile jade perch (*Scortum barcoo*) diets and the effect on the growth and fatty acid composition of f

To determine the replacement of fish oil with vegetable oils in the diet of juvenile Jade Perch (*Scortum barcoo*, omegabaars™), four feeds with each a different oil (fish, sunflower, linseed and canola oil), were fed to jade perch reared in recirculating aquaculture systems (RAS). The trial lasted for 10 weeks and the fatty acid (FA) profile of both feed and fish muscle tissue was examined. There was no difference in growth, feed conversion rate (FCR) and mortality. The fish grew from 10 to 110 grams with a FCR of 1,25 and zero mortality. The FA profile of the fish muscle tissue reflected the FA profile of the feed. The highest ω -3 FA content was obtained in the muscle of the fish fed linseed oil diet and the highest ω -6 FA content in the muscle of the fish fed sunflower oil diet.



Poster number **103**

van Parijs Frederik

Other Plant

Cell Wall Digestibility of Perennial Ryegrass: A Strategy to Increasing Forage Quality

Perennial ryegrass is an important source of forage on dairy farms. Currently, there are varieties on the market with a high energy content, because of their high levels of water-soluble carbohydrates (WSC). However, as WSC are released quickly in the rumen, and is converted to lactic acid, this leads to ruminal acidosis. Therefore, the focus is now turned on increasing the digestibility of cell wall carbohydrates, which are converted to sugars gradually. A collection of 600 genotypes is phenotyped for cell wall digestibility over several seasons. Also, a SNP database for perennial ryegrass will be used for identifying SNP markers in candidate genes to select and identify significant associations between genetic differences and cell wall digestibility.



Poster number 104

Vandenberghe Els

Katholieke Universiteit Leuven Biosystems Department

Gradients of fundamental material parameters in Gouda cheese

The fundamental material parameters of Gouda cheese, needed for finite element modeling, were measured at specific places in rectangular blocks of cheese from 4 till 19 weeks old, ranging from measurements close to the cheese rind to measurements at the center of the block. Young's Moduli E turn out to be significantly higher near the crust compared to the center of the cheese blocks for every ripening stage. For a 4 weeks old Gouda E is approximately three times higher at the corners of the block compared to the center. During ripening this difference even increases. The residual Prony series coefficients representing the elastic behavior of cheese at an infinite relaxation time are significantly higher at the corners compared to the center.



Poster number 105

Vandenplas Jérémie

Université de Gembloux Animal Science Unit

Integration of external information into genetic evaluations by a Bayesian procedure

One of the most important theoretical assumptions of methods used to assess genetic values is that all available information has to be considered simultaneously to obtain unbiased estimates. However, the widespread international exchange of genetic material and, more recently, the important development of the genomic selection lead to the coexistence of different genetic evaluations. Therefore, the blending of the different sources of information is necessary to achieve better prediction. Integration of external information into genetic evaluations by a Bayesian procedure can partially resolve the problem under some assumptions. Results from such a method that also avoids double counting among external animals are highly similar to those from a joint evaluation.



Poster number 106

Vandereycken Axel

Université de Gembloux Agronomical Science

Aphid predators sampling in agrosystems in Belgium between 2009 and 2011

The Multicolored Asian ladybird, *Harmonia axyridis* Pallas (Coleoptera: Coccinellidae), was imported in 1997 into Belgium to control aphids' populations. Few years ago after its introduction, this exotic insect was well adapted to temperate climate conditions and spread out all over ecosystems in Europe causing decline of other aphidophagous species. In arboreal habitats, *H. axyridis* is the most dominant Coccinellid but we are still lacking information about its occurrence in agrosystems. An aphidophages sampling was realized between 2009 and 2011 in four agrosystems such as broad bean, wheat, corn and potato. Although *H. axyridis* populations rose (by 5 times) from 2009 to 2011, *H. axyridis*, in 2011 is the third most observed aphidophages after *Episyrphus balteatus* (De Geer) and *Coccinella*



Poster number 107

Vandersteegen Katrien

Katholieke Universiteit Leuven Biosystemen

Molecular and microbiological assessment of the bacterial virus ISP for the control of Staphylococcus aureus

The increasing antibiotic resistance requires alternatives for classical treatment of infectious diseases and therefore renews the interest in phage therapy. Phage ISP infects Staphylococcus aureus, a Gram-positive pathogen associated with various infections.

Whole-genome sequencing and mass spectrometric analysis of ISP virions revealed 215 gene products on the 138.339 bp genome, of which 22 were confirmed as structural proteins. The host range was determined and ISP was proved to be active against clinical S. aureus strains. Further the biophysical stability was analyzed, a killing curve was generated and the adsorption parameters were examined.

The characterization of ISP supports the medical exploitation of its antimicrobial potential in bacteriophage cocktails.



Poster number **108**

Vanderzande Stijn

Katholieke Universiteit Leuven Biosystemen

Evaluation of a new 9K apple SNP-chip

Recently a 9K apple SNP-chip was developed by the International RosBREED SNP Consortium and we are now evaluating this chip for its use in genome wide association studies. We used this chip to genotype a collection from our breeding population as well as commercial and old apple varieties. We also can compare identical cultivars over 2 different datasets. While 740 SNPs fail to genotype all the cultivars, other SNPs have an inconsistency in their observed frequencies or show problems in their clustering used to call the genotype. These problems are probably caused by paralogous sequences in the apple genome. Comparing the 2 datasets shows that the genotype callings are mainly the same across the datasets and that the majority of differences are due to ‘no calls’ in one of the two datasets.



Poster number 109

Vanrobays Marie-Laure

Université de Gembloux Animal Science Unit

Relationship between methane emission of dairy cattle and farm management.

Livestock is considered as an important contributor to global methane emissions, predominately due to methanogenesis from ruminants. Moreover, these emissions also represent major losses of energy for dairy cows and therefore are linked to production efficiency. The on-going development of predictive equations (e.g., from milk composition) would allow to relate methane emission to farm management (e.g., nutrition, environment) on a large scale in the Walloon Region of Belgium. Finally, by acquiring improved knowledge of these relationships, contributions to mitigate methane emissions could be based on an improved management of dairy herds.



Poster number **110**

VARIN Sébastien

Université de Gembloux : Department Université de Gembloux Université de Liège Gembloux
Agro-Bio Tech

RHIZOBACTERIAL VOLATILE ORGANIC COMPOUNDS MODULATE BIOMASS PRODUCTION AND ROOT ARCHITECTURE IN ARABIDOPSIS THALIANA (L.) HEYNH.

Positive interactions between plant growth promoting rhizobacteria (PGPR) and the root system may lead to improved fertility management strategies. These interactions are mediated by liquid diffusates as well as volatile organic compounds (VOC).

In this study, 19 PGPR strains were screened for their VOC-mediated growth promotion ability on *Arabidopsis thaliana* (L.) Heynh. by using a vertical in vitro system allowing interactions between plantlets and bacteria via a shared atmosphere.

Several of the selected strains significantly increased total biomass and affected its partitioning (root/shoot ratio) while inducing changes in the root system architecture. The results are tentatively linked to the VOC profiles in order to unravel new mediators effectors of plant growth and architecture.



Poster number 111

Vercruyse Jop

Universiteit Gent Biosystems Engineering

Process design for tailoring primary and secondary decomposition reactions of biomass constituents during pyrolysis and gasification.

Pyrolysis is the thermal decomposition of organic material in the absence of oxygen. Natural polymeric constituents (i.e. lignin, cellulose, fats and starches) are thermally broken into numerous smaller components, which are traditionally classified among the following three categories: bio-oil (condensed vapors), char (solid) and non-condensable gases. In order to obtain a better understanding of the reaction pathways occurring on the thermochemical degradation in the vapor phase and to test strategies for controlling (i.e. tailoring) pyrolysis and bio-oil composition with respect to its end-use (drop-in biofuels, chemicals), a micropyrolyser coupled to a GC-MS system will be used in this research. The poster will cover the outline and some preliminary results of the PhD research.



Poster number 112

Vermeulen Liesbeth

Katholieke Universiteit Leuven Bio-ingenieurswetenschappen

A non-destructive method to determine the lean meat percentage of meat pigs

There is a growing demand from industry to optimize the breeding of meat pigs. The carcass quality is mainly determined by the lean meat percentage. Unlike most methods, the proposed method is a non-invasive method to determine this percentage, whereby multiple echograms of the longissimus dorsi of living barrows and gilts are taken for different growth stages. These echograms were carefully analyzed in order to calculate the fat percentage, being highly correlated with the lean meat percentage. In addition, meat samples were taken and analyzed by the Soxhlet-method. The measurements prove that the proposed method achieves similar results. Thus, the latter provides representative and repeatable results and is a non-destructive method to accurately monitor the fat percentage of the pigs.



Poster number 113

Vranken Isabelle

Université de Gembloux Forêts, nature et paysage

Entropy, anthropogenic effects and the intermediate disturbance hypothesis: trends inferred from landscapes in D.R.C. and Benin

Structural and thermodynamic applications of entropy related to spatial heterogeneity under growing anthropogenic pressure have been examined. 16 zones from classified LANDSAT TM scenes presenting different anthropogenic effect intensities have been used. Anthropogenic effects, compositional and configurational entropy have been measured. The scatter plot shows bell curves with maximal entropy at intermediate anthropogenic effects. Distinction of natural and anthropogenic classes shows opposed tendencies according to class and compositional/configurational type. These results have been interpreted as spatial transformation processes, energy production and release, and linked to the habitat heterogeneity and intermediate disturbance hypotheses.



Poster number 114

Wang Yufeng

Katholieke Universiteit Leuven Department of Biosystems

The Winner of the Incubation Became the Loser in Post-hatch Performance

Chicken egg incubation is a 21 days marathon, the first “player” who reaches the terminal (hatch) is 30 to 48 hours ahead of the last. Nevertheless, the end line was just the start point of another long race: the post-hatch growth. In this study, the aim was to investigate the effects of hatching time on broiler post-hatch performance up to day 5 and its potential mechanisms.

Taken together, we found that the early hatched chicks, who won the “race” of incubation, lost in the “competition” of post hatch performance, at least until day 5. The central and peripheral changes at hatch may have contributed to the distinct post-hatch performance by programming. Mechanisms underlying programming effects from epigenetic aspects are currently under investigation.



Poster number 115

Willems Els

Katholieke Universiteit Leuven Biosystems

PRENATAL UNDERNUTRITION OF THE CHICKEN EM-BRYO AFFECTS POST HATCH FEED INTAKE, BODY WEIGHT AND COMPOSITION.

In mammalian species prenatal nutritional constraints are known to program offspring, resulting in an altered metabolic phenotype, characterized by increased risk of developing chronic diseases such as type II diabetes in later life. In mammals no distinction can be made between maternal and strictly nutritional effects. Chicken embryos however develop independent from the hen. Prenatal undernutrition was established in layer-type eggs by removal of albumen and replacing it with saline (albumen group), only a hole was made in 114 eggs (sham group) and 114 eggs served as control group. At hatch, no differences in body weight could be observed. From day 3 until day 21 chicks from the albumen group weighed significantly less than chicks from either the control or sham group. From day 13 until day 21, chicks from the albumen group had a higher feed intake than chicks from the control group. Chicks from the sham group had intermediate values.



Poster number 116

Zekker Ivar

Universiteit Gent Bioengineering

SELECTING NITRIFYING INOCULA ON DIFFERENT AMMONIUM CONCENTRATIONS

The number of intensive aquaculture systems is continuously increasing. Maintenance of good water quality and removal of ammonium by bacteria is of great importance. When constructing biofilters its effluent NH_4^+ and nitrite (NO_2^-) concentrations need to be maintained below 0.1 mg N L^{-1} . Under these low NH_4^+ and NO_2^- concentrations no health problems for fishes occur (van Rijn et al., 1990). We propose a high volumetric throughput set-up ($\text{HRT} = \sim 2 \text{ min}$) to develop an effective inoculum for a quick biofilter start-up in aquaria or recirculating aquaculture systems. The study found the optimal conditions (ammonium concentration 25 mg N L^{-1}) for fastest growth of nitrifying biomass among the three different ammonium concentration ($1, 25, 100 \text{ mg N L}^{-1}$) in the Recirculating Biofilter Reactors.



Poster number 117

Zekker Ivar

Universiteit Gent Bioengineering

SULFATE- REDUCING AND NITRITE-DEPENDENT ANAMMOX FOR AMMONIUM REMOVAL

Wastewaters originating from domestic, industrial and agricultural sources have high NH_4^+ (up to 2000 mg N/L) and low organic carbon content. Treatment of these flows has high costs on external carbon source, aeration and utilization of excess sludge when nitrification-denitrification methods are applied. The nitrite-dependent anaerobic ammonium oxidation (Anammox) process has been proven to be feasible for biological nitrogen removal from nitrogen-rich waste streams (Strous et al., 1999). Although there is no genome information available on the ability of Anammox bacteria to consume SO_4^{2-} as electron acceptor, SO_4^{2-} reduction by Anammox bacteria has been experimentally observed (Fdz.-Polanco et al. 2001).



Poster number 118

Zimmer Jean-Yves

Université de Gembloux Sciences Agronomiques

Distribution of Culicoides, bluetongue virus vectors, on Belgium farms

Bluetongue (BT) is a non-contagious vectorborne disease of domestic and wild ruminants that has caused considerable economic losses to the sheep and cattle in northern Europe. The biological vectors of BTV are biting midges of the genus *Culicoides*.

During this study, populations of biting midges were monitored on a cattle and a sheep farm in the province of Namur (Belgium). UV light traps were placed both indoors and in nearby meadows. Results of trappings showed that *Culicoides* are most abundant close to livestock buildings than in surrounding meadows; meadows had however a greater species diversity and therefore a lower percentage of species known as vectors of BTV. The statement of minimum and maximum temperatures, as well as observation of females' physiology completed this study.



Poster number **119**

Jose C. Jimenez-Lopez

Other Biochemistry, Cell & Molecular Biology of Plants



Poster number 120

Zune Quentin

Université de Gembloux Chemistry and Bio-industry

Design of a biofilm reactor comprising a metal structured packing for the production of lipopeptides by *B. subtilis*

The design of a new single species biofilm reactor has been investigated for the production of lipopeptides from *Bacillus subtilis*. However, surface active properties for these metabolites involve the use of important amount of antifoam in processes based on submerged culture in stirred-tank reactor. Therefore downstream processes are tedious. An original process was developed with an experimental setting leading to the suppression of foam formation during the culture. A biofilm of *B. subtilis* S499, monitored by X-ray tomography, colonizes a metal structured packing in the top of a reactor, nutrient and oxygen supply being carried out by the media recirculation on the packing. Lipopeptides are accumulated in the liquid phase under the packing and reach concentrations as high as 800 mg/l.



Poster number 121

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CYP2E1 and its relation with boar taint in Belgian pig breeds.

Boar taint is an offensive odour in the cooked meat of some entire male pigs. This odour is associated with high levels of androstenone and skatole. Both compounds reach their highest levels in puberty and castration would significantly decrease them, however due to animal welfare castration without anaesthesia is no longer acceptable. In this study, a SNP in Cytochrome P450 2E1 (CYP2E1), is studied in relation to boar taint. CYP2E1 is a good candidate gene because of its relation with both androstenone and skatole. Although in a variety of pig populations this SNP segregated with the trait, in our study we did not observe this association in typical Belgian breeds, such as Landrace, Large White and Piétrain. Other solutions emerge, and selection against boar taint is one of them.



Poster number 122

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Engineering the trehalose pathway to create stress tolerant crops

The trehalose pathways consist three important points, the synthesis of trehalose-6-phosphate (by Trehalose Synthase Phosphatase, TPS), dephosphorylation of this compound to trehalose (by Trehalose Phosphate Phosphorylase, TPP), and trehalose digestion to two glucose units by the enzyme trehalase (TRE). In the light of recent discoveries, the trehalose pathway has become more and more intriguing plant physiological pathway. Definitely, the role of its phosphorylated intermediates compound, trehalose-6-phosphate (Tre6P), is striking and seems to be absolutely crucial for plant physiology. Numbers of reports have shown the importance of this molecules in various physiological actions such as starch synthesis, signaling in guard cell, abscisic acid signaling, seed germination, flowering, and drought stress. But probably the function that can be the most important for plant is the role of a signal for the level of available energy, the sucrose status of the plant and acts also as a fuel gauge. In such situation, there is a need to understand what exactly Tre6-P does in the plant cell. This question raised to be one of the most important in the field of plant physiology. Furthermore, it has been shown clearly that Tre6P level is regulated on the translational level. That is why use of proteomics approaches as first source of information is obvious and reasonable. We would like to investigate the protein pattern of different trehalose pathway mutants (that efficiently control the level of Tre6P) by 2DE, 2D-LC MS MS etc., to understand the role of Tre6P in plant physiology especially in aspect of plant development and response to unfavorable conditions.



