

Topics: Talks

Plant Sciences

T1: *MAGIC population in winter wheat: creation, validation and map construction*

Stadlmeier, Melanie [TUM Plant Breeding, LfL Crop Science and Plant Breeding]

It is an ongoing effort to develop suitable plant genetic resources for scientific questions in the field of plant breeding. An eight-parent MAGIC (multiparent advanced generation inter-cross) winter wheat population was constructed to provide a useful germplasm resource for studying a huge range of relevant breeding parameters, like quality, agronomic, and resistance traits.

Ecology

T2: *Does the sowing of rare arable weeds increase the functional diversity of agricultural landscapes?*

Twerski, Alina [TUM Restoration ecology]

One consequence of the intensification of agricultural land use is the decreasing biodiversity in these landscapes. Currently, scientifically evaluated arguments for the conservation of arable weeds are incomplete. Therefore, the aim of this project is to analyse the following ecosystem services of rare arable weeds: their contribution to biodiversity, their influence on pollinators, pests, soil fertility and agricultural productivity.

T3: *Management of *Senecio aquaticus* in Bavarian Grassland*

Ditton, Julia [TUM Restoration ecology]

In the pre-alpine regions on Germany, *Senecio aquaticus* (marsh ragwort) is a poisonous Asteraceae, which is occurring in moist to wet grassland. Over the last years it frequently became dominant in such habitats and therefore, my PhD project aims to find management measures (e.g. application of slurry, mowing frequency, mulching) that will suppress *Senecio aquaticus*.

T4: *Organic Matter protection through mineral interaction in soils*

Inagaki, Thiago Massao [TUM Soil Science]

Soil organic matter contains more organic carbon than global vegetation and the atmosphere combined. Despite its recognized importance, our knowledge of its nature and cycling is still remarkably limited. In this research, we examine mechanisms responsible for long term carbon stabilization through strong binding into minerals.

T5: *Biopores in subsoil differ in their ability to use nitrate*

Fogt, Marta [TUM Soil Science, HelmholtzZentrum München]

This work is focused on functional and taxonomical differences between microbial hotspots in subsoil. We used a metagenome approach to reconstruct microbial energy conserving pathways within different different soil compartments (rhizosphere, drilosphere and bulk soil). Our results indicate that microbial hotspots determine the microbial potential for nitrate utilisation.

Economics

T6: *Women empowerment in Agriculture: Examining the Economic Impact of Human Recognition in Agriculture in Malawi*

Ebelechukwu, Maduekwe [TUM Land Management]

Access to resources are affected by norms which are dominant in an individual's household and community. These norms are harmful, particularly to women and often deprive women of recognition, dignity and rights to resources within their communities. My research empirically assesses the economic effect of human recognition on target women farmers in Malawi. By

adapting the Alkire Foster method of multidimensional deprivation counting, we estimated the human recognition deprivation level for women and women who work in Agriculture in Malawi. Prevalence of deprivation across regions in Malawi was also analyzed. The outcomes will present novel and alternative dimensions to economic development that links access and basic rights to material wellbeing for women farmers in Malawi.

Animal Sciences

T7: *Analyzing early B cell development in chicken embryos by reverse genetics*

Schlickenrieder, Antonia [TUM Reproductive Biotechnology]

The bursa of Fabricius is unique organ for B cell development in avian species. B cell precursors migrate to the bursa of Fabricius where they undergo diversification, proliferation and maturation into B cells expressing the B cell receptor (BCR). The role of the bursa in avian B cell development is well understood. However, the underlying mechanisms of B cell development are not well studied. Goal of our study is to identify factors involved in migration of B lymphocytes towards the bursa.

Engineering/Data Management

T8: *Validation of different milk logistic chains*

Schmid, Michael [TUM Agricultural Systems Engineering]

This paper copes with validation of a milk supply chain between 70 milk producers and dairy processor, whereby six different milk logistic chains and two different distance scenarios (50 km, 200 km) are considered.

The determination of an optimized process variant for each milk draw area requires a distance, time and monetary valuation of different milk logistic chains.

The objective of this contribution is to determine the full costs for different process variants in two milk draw areas. Exemplarily the distance and marginal costs are estimated for six process variants of a milk logistic chain.

The cost calculation of each process variant uses full cost accounting.

The unique full cost accounting of the various process variants for each milk draw area differ. The results are peculiarly adapted for cost optimization in the supply chain milk.

T9: *CowEnergy – Integration of weather influences into an on-farm energy management system*

Höhendinger, Martin [TUM Agricultural Systems Engineering]

In dairy farming, automatization and sensor based management creates this flexibilisation potentials of working processes, additionally modern farms produce energy through photovoltaic plants and wind turbines. An autonomous energy- and production management system, should enable the adoption of energy consumption to the fluctuating energy production. In comparison to industrial systems, the agricultural production faces challenges by external effects and the animal farming. Crucial for this system is the energy scheduling based on external data and the production processes. The resulting flexibility farmers could use to gain energetic self-sufficiency or profit by the selling of these potentials at energy markets.

Topics: Poster

Plant Sciences

P1: *Polyphenols in white and red poinsettia bracts*

Stefanini, Carmen [TUM, Fruit Science]

P2: *Phenolic profiling of red-fleshed apples*

Kolarek, Martina [TUM Fruit Science]

Red-fleshed apples are increasingly important for consumer preference and marketability, not only due to aesthetic reasons, but also for the health benefits associated particularly with red pigments. Anthocyanins are the major determinants of the red colour of apple fruit skin and, in case of red-fleshed apples, fruit flesh. Phenolics demonstrate strong antioxidant activity (Wang et al., 2015).

The objective of this research was to evaluate the phenolic profiles of seven different red-fleshed apple genotypes by means of high performance liquid chromatography (HPLC). The acquired detailed information on phenolic pattern could sustain future breeding efforts towards additional improvement of apple fruit quality and could support the potential of red-fleshed apples as functional food.

P3: *Mapping the scald resistance locus Rrs1 in barley*

Eibel, Sonja [TUM Phytopathology, LfL Plant Breeding]

Scald, induced by the fungus *Rhynchosporium commune*, is a persistent threat in barley production. The resistance locus Rrs1 on chromosome 3H is effective but unknown gene structure and function, as well as a lack of diagnostic molecular markers impede its use in breeding programs. We aim to map the Rrs1 locus genetically in a doubled-haploid population derived from resistance donor SBCC145 and susceptible variety Beatrix. For physical mapping we will apply chromosome sorting of 3H, sequencing and long-range assembly for SBCC145. This combined approach will allow cloning of the resistance gene, understand its function and will provide diagnostic and functional markers for future breeding programs.

Ecology

P4: *Positional and spatial scale effects on erosivity derived from spatially comprehensive radar rain data*

Fischer, Franziska [LfL, Inst. For Organic Farming, Soil and Resource Management]

Rain erosivity R is required for soil loss predictions. As heavy rains occur with large variability already within 1 km², R derived from spatial grid radar (1 x 1 km²) and point rain gauge measurements can strongly deviate for the same rain event. The thereby caused effects on R were estimated for single events and long-term averages reflecting the positional and the spatial scale effect. The quantification of these effects is mandatory for erosion control.

P5: *Multifunctional trade-offs for a sustainable Green infrastructure (GI) to foster smart urban growth: the European blueprint as options for more resilient Chinese cities*

Wang, Jingxia [TUM Strategic Landscape planning and management, Helmholtz Centre for Environmental Research]

The project involves indicator-based assessment of multifunctional GI and its potential application at different spatial scales.

Animal Science

P6: *Evaluation of welfare aspects of different docking methods of tail docking in lambs*

Kuhnle, Elena [LfL, Universität Hohenheim]

Tail docking is a routine procedure performed in lambs during the first week of life. Pain relief is not mandatory but may improve welfare aspects. Thus measurements of cortisol concentrations in urine were compared before and after different tail docking methods with and without pain to evaluate the level of stress caused by the different tail docking methods. Additionally animal behaviour was recorded and analysed for all methods. The routine procedure of tail docking (use of a rubber ring, removing two third of the original length without any pain relief) seemed to be the most painful variant according to cortisol levels and behaviour. Analgesic treatment (either Meloxicam subcutaneously or topical cold analgesic spray) or removing only one third of the tail seem to be less stressful according to endocrine and behavioural parameter.

P7: *Seasonal changes of the ruminal microbiome of roe deer (*Capreolus capreolus*) in different habitats in Bavaria (Germany)*

Dahl, Sarah [TUM Animal Nutrition, Wildlife Biology Group]

This doctoral project aims in investigating the seasonal changes of the ruminal microbiome of roe deer (*Capreolus capreolus*) in different habitats across Bavaria (Germany). Special interest is related to differences in the microbiota spectrum related to the respective habitat as well as the seasonal changes of the diet. These questions will be addressed using next generation sequencing and qPCR analysis of DNA extracts of ruminal contents in combination with a sophisticated analysis of the ingested nutrient spectrum.

P8: *Effects of trypsin inhibitors on physiological processes in broilers*

Kuenz, Sylvia [TUM Animal Nutrition]

Due to their protein value, soybean products are the most important amino acid supply for high-yielding monogastric livestock worldwide. However, raw soybeans can express a high activity of trypsin inhibitors (TIA), which impair animal health and productivity. Therefore, soybean products are heated to reduce this antinutritive potential. This doctoral project aims at the physiological adaptation of broilers to varying dietary TIA. Special interest is related to the potential of usual residual activities in processed complete feed to modulate animal physiology. This should clarify the question whether the currently accepted upper limits for TIA in feed are sufficiently low.

Engineering/Data Management

P9: *Detection of microfilms and CIP cleaning media in dairy plants using electrochemical methods*

Fysun, Olga [TUM Food Packaging Technology]

Microbial biofilm formation in dairy plants is a concerning issue, which lead to the contamination of dairy products and more frequent cleaning events. Electrochemical voltammetric methods, linear sweep voltammetry (LSV) and differential pulse voltammetry (DPV), were probed in this study to detect *P. polymyxa* biofilm and CIP cleaning media on electrochemical microelectrodes. The use of microsensors for early biofilm detection and for cleaning processes monitoring could be a strategy for real time biofilm control in plants.
