



Office of International Programs *Monthly Newsletter*

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Bohn and Grift go “down under” to observe roots in real time



Lysimeter setup at the University of Queensland

Two ACES faculty members have ventured “Down Under” in two aspects – first by spending a sabbatical in Australia, and second, by observing how roots develop underground in real time. Dr. Martin Bohn (Crop Sciences) and Dr. Tony Grift (ABE) are defining how differences in root structure relate to plant performance under droughts and other challenges. The two are working with a group of physiologists led by Prof. Graeme Hammer at the University of

Queensland in Brisbane to study plant (mostly wheat, sorghum, and corn) performance under drought stress. The group is specifically interested in how roots contribute to stress tolerance. Drought is, in general, a big issue in Australia even though Queensland has also experienced severe flooding in the last couple of years.

Dr. Bohn explains, “Dr. Grift and I previously developed a method to capture and to analyze the structure of root systems but still needed to answer the most important question: How are the differences in root structure, which we are able to measure, related to improved plant performance under drought or for example reduced fertilization? Prof. Hammer’s group has the equipment to observe roots in real time. So, this collaboration is perfect for finding answers to our research question. In addition, the group here in Brisbane is a leader in crop modeling. Together with our colleagues, we are investigating the possibility of how our methods of root analysis can be integrated in their crop model.”



Dr. Tony Grift takes preliminary images of a Maize root growth chamber, with the aim to eliminate reflections and automate the image

Dr. Grift adds, “True collaboration among crop scientist and agricultural engineers is scant, for various reasons. Firstly, we speak a different language, and secondly, crop science departments are typically poorly set up for the development of data acquisition technologies, let alone automated ones. It is however vitally important to overcome these barriers: There is a huge payoff in this collaboration since

engineers can help crop scientists collect the vast amounts of data needed for their breeding programs in an efficient manner. While in Australia, we have designed a semi-automated system that allows root imaging in ‘rhizotrons,’ vertical growth chambers in which roots become visible behind a glass pane. We are currently testing a prototype, and full-scale implementation will take place in Australia when their growing season starts in October.”

Drs. Bohn and Grift plan to return home in mid-July.

Sierra Leone’s Njala University welcomes UIUC collaborations



In an educational and inspiring presentation to a campus-wide audience, Rev. Dr. Edwin J.J. Momoh of Njala University encouraged UIUC faculty, staff, and students to consider new collaborations with Sierra Leone’s premier school for agricultural engineering, technology, and applied sciences. Rev. Dr. Momoh

says, “Njala has been through challenges, but these challenges have not diminished our spirits. Our goal is to continue to transform Njala University into a high-quality and supportive research and educational environment and to become a major driver in the socio-economic development of Sierra Leone.”

As the Acting Director of Planning, Research and Development Directorate and the Head of the Department of Soil Science at Njala University, Dr. Momoh recently visited the campus to explore greater academic partnerships between UIUC and Njala. He recounted UIUC’s long and supportive history with Njala University, beginning with UIUC’s work to establish the university (originally as the University of Sierra Leone) in 1964. Njala is still reestablishing many of its programs following a devastating civil war that ravaged Sierra Leone from 1991 to 2002.

Rev. Dr. Momoh believes Njala can strengthen its capacity through exchanges of faculty and students and hopes to soon arrive at a position where there would be no obstacles for these relationships. He says that visiting Njala, currently with a student population of 5,896, would be a challenging yet extremely rewarding experience for faculty and students. He adds, “It is an extremely welcoming environment.”

Bill Boston, now a farmer in Greene County, spent 10 years as head of the Animal Sciences Department at Njala and strongly encourages faculty to get involved with Njala. He says, “Speaking from my experience at Njala, in Animal Sciences only, I can think of at least six research projects that would be fascinating.” Rev. Dr. Momoh noted that one way ACES faculty can immediately support Njala is to sit on students’ committees as an external member.

For more information about potential collaborations with Njala University, please contact Dr. McNamara or the Office of International Programs.

Swanson and New Zealand collaborator wrapping up research on feline/kitten diets



The trio evaluate microbial species diversity and how the count of bacteria was affected by diet.

When choosing between dry or canned food for a new kitten, most owners do not consider (or even know) what type of food their kitten's mother ate. However, a kitten's long-term health could be affected not only by the type of food it is consuming, but also by the food its mother was eating. Through a collaboration with Dr. Emma Bermingham of AgResearch Ltd. in New Zealand, Dr. Kelly Swanson, Associate Professor in Animal Sciences, is synergizing his previous work on pet intestinal health and weight management to better understand

the relationships between a queen's diet, her kittens' diet, and long-term health.

Previously, Dr. Swanson was studying various adult feline and kitten diets for their effects on body weight management and intestinal microbiota. At a conference in September 2010, he met Dr. Bermingham, who was doing similar work and had noticed huge weight gains when kittens born to mothers eating one type of food were weaned onto a different type of food. The two decided to work together to study the differences between diet formats, such as dry food vs. wet food (canned) that differ in nutrient content, and how switching to a different format/nutrient content may affect kittens' health after being weaned from their mother.

Drs. Swanson and Bermingham designed a study to be performed in New Zealand to compare growth performance data and fecal samples from 1) kittens who were born to mothers fed a wet or dry diet and then crossed to the opposite diet after weaning and 2) kittens who remained on the same diet as their mothers after weaning. The kittens had access to solid food starting at 4 weeks of age and were completely weaned from their mothers at 8 weeks of age, the time at which the fecal samples were collected. The pair have been greatly assisted by Dr. Katherine Kerr, a Spring 2012 Ph.D. graduate of the Division of Nutritional Sciences who studied under Dr. Swanson. Dr. Kerr received a College of ACES AYRE International Research and Learning Fellowship to spend April through July of 2011 in New Zealand performing next-generation sequencing and analyzing samples with Dr. Bermingham.

Recently as part of the collaboration, Dr. Bermingham visited the Urbana-Champaign campus from late April through mid-May 2012. The trio evaluated the fecal bacterial populations to get a general idea of what is going on inside the kittens around the time of weaning and worked on writing the papers to be published from this research. Their initial results show that the main determinant of a kitten's gut microbiome is the diet fed after weaning rather than their mother's diet. The trio is still investigating the potential effects of a mother's diet on long-term metabolism.

ACES student wins Illinois International Graduate Achievement Award for research on bonefish in The Bahamas



Aaron Schultz, a Ph.D. student in Natural Resources and Environmental Sciences (NRES), has been named the winner of the 2011 Illinois International Graduate Achievement Award. Shultz is Director of The Cape Eleuthera Institute, a marine research field station in The Bahamas. He

has been an active research manager at CEI's Island School and integrates high school and university students into the research process, allowing them to become involved in data collection, data analysis, and interpretation of research findings. The CEI's research topics generally focus on bonefish and include: movement patterns during the spawning period, effective catch-and-release techniques, and predator-prey relationships. Schultz is advised by Dr. Cory Suski, Assistant Professor of Natural Resources and Environmental Sciences at the University of Illinois.

Two ACES students win NSF-East Asia and Pacific Summer Institutes (EAPSI)

Graham Kent and Christopher Cirone, both students in Agricultural and Biological Engineering, have been awarded National Science Foundation (NSF) East Asia and Pacific Summer Institute (EAPSI) fellowships for summer 2012.



Kent will be applying geospatial and hydrological modeling to link Chinese agricultural practices to increased productivity and environmental integrity at China Agricultural University. He is advised by Dr. Luis Rodriguez.



Cirone will be studying absorption refrigeration technology at Zhejiang University. He is advised by Dr. Xinlei Wang.

OIP invites applications for 2012 ACES Academy for Global Engagement

OIP has opened the competition for our sixth Academy for Global Engagement (Global Academy). We strongly encourage early-to-mid-career ACES faculty, as well as faculty in disciplines that do not traditionally participate in international work, to consider taking part in this year's program. This year's theme is: Food Security and Nutrition with a regional focus on East Africa, namely Rwanda and Kenya. The details for the competition, including the deadline and the application form, can be found on our website: <http://intlprograms.aces.illinois.edu/academy>.