Cornell Digital Agriculture Initiative - Seminar Series

“Improving Food and Nutritional Security for the Global South: The Genetic Improvement of Maize and Cassava with Smallholder Farmers”

Mike Gore, Associate Professor of Molecular Breeding and Genetics for Nutritional Quality, Liberty Hyde Bailey Professor, and International Professor of Plant Breeding and Genetics at Cornell University

Tuesday December 12, 2017 - Room 114, Gates Hall, Ithaca, NY
4:00pm - 5:30pm - Refreshments Will Be Served

Abstract: Nutritional deficiencies are a major public health challenge facing a burgeoning human population. Maize is an important food staple, particularly in sub-Saharan African countries where it can account for more than half of daily calories. With considerable natural variation in grain carotenoid (provitamin A) levels, maize could have far-reaching impact in the global South where vitamin A deficiency is prevalent. Through a genome-wide association study in an experimental maize population, the genetic basis of quantitative variation for grain carotenoid levels was determined and most of the causal genes identified. These findings serve as a comprehensive framework for accelerating progress in breeding for higher levels of provitamin A content in maize grain. The lessons learned from this work in maize are now being collaboratively leveraged for the development of provitamin A-biofortified cassava for Nigeria and Uganda. In parallel, field-based high-throughput plant phenotyping approaches based on aerial, ground, and smartphone platforms are in development to further accelerate the selection of nutrient-dense, resilient breeding lines within maize and cassava breeding programs.

Bio: Michael (Mike) Gore is an associate professor of molecular breeding and genetics for nutritional quality, Liberty Hyde Bailey professor, and international professor of plant breeding and genetics at Cornell University, where he is a member of the faculty in the Plant Breeding and Genetics Section in the School of Integrative Plant Science. Mike is also a faculty fellow in the Atkinson Center for a Sustainable Future and Cornell Institute for Food Systems. He holds a BS and MS from Virginia Tech in Blacksburg, Virginia, and a PhD from Cornell University. His expertise is in the field of quantitative genetics and genomics, especially the genetic dissection of metabolic seed traits related to nutritional quality. He also develops and applies field-based, high-throughput phenotyping tools for plant breeding and genetics research. He serves on the editorial boards of Crop Science, Theoretical and Applied Genetics, The Plant Phenome Journal, and Plant Breeding and Biotechnology, and served as the Chair for the Plant Breeding Coordinating Committee (SCC080)—the USDA-sponsored advisory group of representatives from land grant universities. His career accomplishments in plant breeding and genetics earned him the National Association of Plant Breeders Early Career Scientist Award in 2012, the American Society of Plant Biologists Early Career Award in 2013, and the Maize Genetics Executive Committee Early Career Excellence in Maize Genetics Award in 2016.

Background on the Cornell Digital Agriculture Initiative: An interdisciplinary group of Cornell University faculty began meeting in early 2017 to formulate a Digital Agriculture (DA) initiative, believing that Cornell is uniquely equipped to lead in this emerging arena that will benefit the public for generations. We define DA to mean the application of computational and information technologies coupled with nanotechnology, biology, systems engineering and economics to both the research and operational sides of agriculture and food production. With approximately 70 faculty from 5 Cornell colleges participating, we are in the formative stages of this initiative, collaborating internally on defining a research agenda for DA that will build a pipeline of discovery and innovations for the next 10+ years. For further information, please contact Dr. Jim Ballingall, Executive Director at jmb436@cornell.edu.