

Interdepartmental Graduate
Program in Plant
Breeding and Genetics

Symposium 2008

BREEDING FOR BIOMASS AND BIOFUELS



Friday, December 12, 2008

9:00 a.m. - 4:00 p.m.

A149 Plant and Soil Sciences Bldg

Contact Information:

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Symposium website:

<http://www.hrt.msu.edu/pbgp/symposium.html>

Participation

The Symposium is open to MSU faculty, staff, and students, as well as members of the East Lansing/Lansing community and researchers from neighboring institutions. There is no registration fee or requirement for preregistration.

Emily Heaton

Iowa State University

Emily Heaton is an Assistant Professor of Agronomy focusing on the production and physiology of biomass crops at Iowa State University. While pursuing her doctorate in Crop Sciences at the University of Illinois, she pioneered and led research comparing the biomass production of *Miscanthus* and switchgrass in the US, research that indicated *Miscanthus* could produce 250% more ethanol than corn. Heaton joined ISU from Ceres, a plant genetics company in California that specializes in biomass crops for fuel. There she led the development of the largest dedicated biofuels variety evaluation network in the country. Heaton remains actively involved with her family farm in Monticello, IL, which employs diverse agricultural activities ranging from rotational poultry grazing to biomass crop production for sustainable and profitable land management. At Iowa State, Heaton focuses on best management practices for perennial energy crops, the impact these crops may have on biogeochemical cycles, and their potential for ameliorating global climate change through carbon offset and sequestration. Email: heaton@iastate.edu.

Bill Berguson

University of Minnesota

Bill Berguson is a Program Director of Applied Forestry at the University of Minnesota, Natural Resources Research Institute, Center for Applied Research and Technology Development. He is the Chair of the Minnesota Forest Productivity Research Cooperative, a joint program of the University of Minnesota, industry and public land management agencies. Since coming to the NRRI in 1986, Berguson has developed a research program focused on many facets of forest management including aspen productivity and silviculture, hybrid poplar genetic improvement and energy crop production as well as productivity and management of Red Pine plantations. Current work in woody energy crop development includes managing a large-scale poplar breeding and yield-testing effort in Minnesota. Berguson has been involved in many state committees and initiatives related to biomass energy and forest management as well as commercial application of poplar plantations for fiber production. Email: bberguso@nrri.umn.edu.

Symposium Schedule

- 9:00 a.m.** **Opening Remarks**
Stephen Pueppke
Director, Michigan
Agricultural Experiment Station
- 9:15** **Emily Heaton**
*Practical Considerations in the
Development of Energy Crops*
- 10:15** **Coffee Break**
A246 PSSB
- 10:45** **Bill Berguson**
*Breeding of Hybrid Poplar for
Energy and Fiber in Minnesota:
Past Experience and Implications to
Future Research and Commercial
Application*
- 12:15 p.m.** **Lunch with Students,
Speakers and Hosts**
Conservatory
- 1:30** **Knut Meyer**
*Enhancing Soybean Seed Lipid
Biosynthesis for Nutritional, Energy
and Industrial Applications*
- 2:30** **Nickolas Carpita**
*Maize as a Genetic Model for
Improvement of Bioenergy Grass*
- 3:30** **Discussion - Wrap up**

Knut Meyer

Pioneer Hi-Bred International

Knut Meyer, research scientist, Pioneer Hi-Bred Int'l, A DuPont Company, currently leads the plant oils/fatty acids research and development program that is part of Crop Genetics Research. Meyer has a degree in plant molecular biology from the Swiss Federal Institute of Technology, Zurich where he studied signal transduction of abscisic acid with Erwin Grill and Nikolaus Amrhein. He conducted post-doctoral work with Clint Chapple at Purdue University on metabolic engineering of lignin biosynthesis. Meyer worked as Research Scientist in Forest Biotechnology at Shell, United Kingdom. He joined DuPont in 1998 where he initially contributed to metabolic engineering of aromatic amino acid biosynthesis in plants for the production of industrial feedstocks (p-Hydroxybenzoate, hydroquinone). Meyer joined Pioneer Hy-Bred Int'l in 2003. Email: Knut.Meyer@USA.dupont.com.

Nicholas Carpita

Purdue University

Nick Carpita is Professor of Plant Biology (Purdue), and has been guest professor at the Plant Biology Institute (Zürich), and the Botanical Institute (São Paulo). His work focuses on the structural and functional architecture of cell walls, aiming to understand how polysaccharides are synthesized and what genes are involved. This includes identification and characterization of wall mutants by Fourier transform infrared spectroscopy, and various methods then characterize cell-wall biogenesis-related genes. Carpita and colleagues are using artificial neural networks to classify mutants in order to characterize genes of unknown function. He is also investigating the biosynthesis and topology of cellulose and the mixed-linkage (1,3),(1,4)-B-D-glucan to identify the catalytic machinery and associated polypeptides. Other work characterizes regulation by small-interfering RNAs of cellulose synthases and similarly regulated genes in networks that form primary and secondary walls. His group is exploiting maize's great diversity to identify genes that enhance biomass yield and quality for biofuel production. He has a BSc (Purdue), a PhD (Colorado State), and post-doctoral work on cellulose biosynthesis with Debby Delmer. Carpita won Purdue's Agricultural Research and 'Seeds of Success' awards. Email: carpita@purdue.edu.