BIOGRAPHICAL SKETCH

Emily Heaton
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A. Education and Training

University of Illinois at Urbana-Champaign (UIUC)	Crop Sciences	B.S.	2001
University of Illinois at Urbana-Champaign	Crop Sciences	Ph.D.	2006

B. Employment History and Academic Appointments

2015-present	Associate Professor of Agronomy, Iowa State University
2008-2015	Assistant Professor of Agronomy, Iowa State University
2006-2008	Manager, Energy Crop Product Development, Ceres, Inc.
2004-2006	Coordinator, Strategic Research Initiative on Biomass Energy, UIUC
2001-2006	Graduate Research Assistant, UIUC

C. Professional and Synergistic Activities

- Extension specialist in biomass crops, Iowa State University (30%)
- Editorial Advisory Board of *Global Change Biology – Bioenergy* (2008-2013)
- Research Management Committee, Biofuelnet Canada (~$25 million funding portfolio)
- Reviewer, US DOE and USDA grant panels
- Ad hoc reviewer for > 20 journals
- Member of 6 agriculture-related honorary or professional societies
- Leader, Bioenergy Systems Community, American Society of Agronomy (2012-2013)

D. Honors and Awards

2013	Outstanding Young Alumni Award, College of Agricultural, Consumer and Environmental Sciences, University of Illinois
2013	ISU Dept. of Agronomy Baker Agronomic Excellence Award
2013	ISU College of Agriculture and Life Sciences Early Achievement in Extension and Outreach Award
2011	ISU Extension Team Achievement Award – Crop Advantage Series
2009	Baker Agronomic Excellence Travel Fund Award
2005	Brockson Graduate Fellowship
2005	Alumni Award for Graduate Student Travel, University of Illinois
2002, 2003	University of Illinois Fellow
2001, 2002	Special Undergraduate Research Experience Award

E. Selected Grants Received

2015 Heaton E.A., Boersma N. N. §, Bonin C.L. § and Gronstal Anderson I. Long-term Assessment of Miscanthus Productivity and Sustainability (LAMPS). Leopold Center for

2014 Heaton E.A., Boersma N. N. § and Bonin C.L. § Long-term Assessment of Miscanthus Productivity and Sustainability (LAMPS). Iowa Energy Center Opportunity Grant. $99,954.

2014 Bonin C.L. §, Elgersma K., Mupasiri D., Rajan K. & E.A. Heaton. From Data to Knowledge: Using Cyber Infrastructure to Enhance Understanding of Bioenergy Systems. Iowa EPSCoR. $19,999.

2014 Heaton E.A., Darr M., Hu G., Schulte L.A., & L. Wang. Integrated Sustainable bioEnergy Pathways project (ISEP). Iowa State University Dept. of Agronomy. $240,926.

2012 Snow A., **Heaton E.A**. & M. Miriti Gene flow networks and potential invasiveness of perennial biofuel grasses (Miscanthus). USDA NIFA Biotechnology Risk Assessment Program. $500,000.

2012 Kitchen N., Massey R., Kremer R., Thompson A., Sudduth K., Meyers B., **Heaton E.A.** & Kiniry J. Miscanthus and Switchgrass Bioenergy Production and Soil Remediation on Marginal and Vulnerable Landscapes. US DOE South Central Sun Grant Initiative. $160,000.

2012 Schulte L., Tyndall J., Arbuckle J., Franz K., **Heaton E.A.**, Helmers M., Isenhart T., Liebman M. Integrating project knowledge and models: the next step in developing a Payment for Ecosystem Services scheme for the Big Creek watershed. The Leopold Center for Sustainable Agriculture. $35,000.

2012 **Heaton E.A.**, Darr M., Hu G., Schulte L. & L. Wang. Iowa's Sustainable Energy Pathway (ISEP): Building a team to address the complete biofuels supply chain. Iowa State University Plant Sciences Institute. $50,000.

2012 Mueller, D., Staker, J., Jesse, L., Sisson, A., Saalau Rojas, E., **Heaton, E.A**., Leshen, A., Rouse, M., McCorkle, D., Bryden, M., Bryden, K., VanDerZanden, A.M., Paulsen, T., McGrath, C., Arndorfer, B., Johnson, D. Developing and Structuring Pre-Collegiate STEM Education and Outreach: Pest Management (IPM) Education, Civil Engineering, and Biorenewable Energy as Models. ISU Extension and Outreach Initiatives. $571,444.

2011 **Heaton E.A.** & M. Liebman. Where's the Nitrogen? Quantifying the timing and impact of N translocation feedstock storage and crop sustainability of switchgrass for bioenergy. ConocoPhillips. $234,979.

2011 Brown R.C. and many others. Harnessing energy flows in the biosphere to build sustainable energy systems. NSF EPSCoR RII NSF, $20,000,000.

Heaton leading agronomic research at Iowa State University within Biorenewable Platform. Approximately $126,141 to Heaton.

2011 Moore K.J. and many others. Sustainable Production and Distribution of Bioenergy for the Central USA. USDA NIFA Coordinated Agriculture Project, $25,000,000.

Heaton leading agronomic research at Iowa State University within Feedstock Production Objective. Approximately $182,414 to Heaton.

2010 Snow A., **Heaton E.A**. & M. Miriti. Gene Flow and Fitness studies of Switchgrass: Implications for New Biofuel Crops. USDA NIFA Biotechnology Risk Assessment Program. $398,619.

2010 **Heaton E.A.,** Singer J., Cruse R., Loynachan T., O'Neal M., Davenport D. & R. Depoy. Do Companion Crops Make Miscanthus Establishment More Sustainable? US DOE North Central Sun Grant. $180,969.

2010 **Heaton E.A.** Field Evaluation of Cold Tolerant Miscanthus. Mendel Biotechnology. $153,344

F. Selected Peer-reviewed Publications

*****BS, MS, Ph.D. student or § post-doctoral researcher supervised by Heaton; †Heaton corresponding author;

Sharma B., Brandes E. §, Khanchi A., Birrell S., **Heaton E.A**. & Miguez F. (2015) Evaluation of microalgae biofuel production potential and cultivation sites using Geographic Information Systems: A review. Bioenergy Research. DOI 10.1007/s12155-015-9623-0

Boersma N.N.*, Dohleman F.G., Miguez F. & **Heaton E.A.** (2015) Autumnal leaf senescence in Miscanthus × giganteus and leaf [N] differ by stand age. Journal of Experimental Botany. DOI 10.1093/jxb/erv129.

Bonin C.L.§, **Heaton E.A.**, Cogdill T.J. & Moore K. (2015) Management of sweet sorghum for biomass production. Sugar Tech. DOI 10.1007/s12355-015-0377-y

Salas Fernandez M.G.., Strand K., Hamblin M., Westgate M., Heaton E.A. & Kresovich S. (2014) Genetic analysis and phenotypic characterization of leaf photosynthetic capacity in sorghum. Genetic Resources and Crop Evolution. DOI 10.1007/s10722-014-0202-6

Hong C.O., Owens V.N., Bransby D., Farris R., Fike J., **Heaton E.A.**, Kim S., Mayton H., Mitchell R., & Viands D. (2014) Switchgrass response to nitrogen fertilizer across diverse environments in the USA: a regional feedstock partnership report. *Bioenergy Research.* DOI: 10.1007/s12155-014-9484-y 3.

Boersma N.N.* & **Heaton E.A**. (2014) Propagation method affects *Miscanthus × giganteus* developmental morphology. *Industrial Crops and Products* **57**, 59-68.

Boersma N.N.* & **Heaton E.A**. (2014) Does propagation method affect yield and survival? The potential of *Miscanthus × giganteus* in Iowa, USA. *Industrial Crops and Products* **57**, 43-51.

Bonin C.§, **Heaton E.A.**† & Barb J. (2014) *Miscanthus sacchariflorus*: biofuel parent or new weed? *Global Change Biology Bioenergy*. Article first published online: 31 JAN 2014 DOI: 10.1111/gcbb.12098

Waramit N., Moore K.J. & **Heaton E.A.** (2014) Nitrogen and harvest date affect developmental morphology and biomass yield of warm-season grasses. *Global Change Biology Bioenergy*. Article first published online: 29 AUG 2013, DOI: 10.1111/gcbb.12086

Wilson D.M.*, Heaton E.A.†, Schulte L.A., Gunther T.P., Shea M.E., Hall R.B., Headlee W.L., Moore K.J., Boersma N.N.* (2014) Establishment and short-term productivity of annual and perennial bioenergy crops across a landscape gradient. *BioEnergy Research*, 1-14. DOI10.1007/s12155-014-9409-9

Arundale R., Dohleman F., **Heaton E.A.**, McGrath J. Voigt, T. & Long S.P. (2014) Yields of *Miscanthus* x *giganteus* and *Panicum virgatum* decline with stand age in the Midwestern USA. *Global Change Biology Bioenergy*, 6, 1-13.

Wilson D.M.*, **Heaton E.A.** †, Liebman M. & Moore K.J. (2013) Intra-seasonal changes in switchgrass nitrogen distribution compared to corn. *Agronomy Journal*, 105, 285-294.

Wilson D.M.*, Dalluge D.L., Rover M., **Heaton E.A.** †, Brown R.C. (2013) Crop management impacts biofuel quality: influence of switchgrass harvest time on yield, nitrogen, and ash of fast pyrolysis products. *Bioenergy Research*, 6, 103-113.

Owens V.N., Viands D.R., Mayton H.S., Fike J.H., Farris R., **Heaton E.A**., Bransby D.I., Hong **Heaton E.A.**†, Schulte L.A, Berti M., Langeveld H., Zegada-Lizarazu W., Parrish D. & Monti, A. (2013) Integrating food and fuel: How to manage a 2G crop portfolio. *BioFPR*, 7, 702-714; **invited submission.**

Owens V.N., Viands D.R., Mayton H.S., Fike J.H., Farris R., **Heaton E.A**., & Hong C.O. (2013) Nitrogen use in switchgrass grown for bioenergy across the USA. *Biomass and Bioenergy*, 58, 286-293.

Coulman B., Dalai A., **Heaton E.A.**, Lee C.P., Lefsrud M., Levin D., Lemaux P.G., Neale D., Shoemaker S. P., Singh J., Smith D.L. & Whalen J.K. (2013) Developments in crops and management systems to improve lignocellulosic feedstock production. *BioFPR*, 7, 582-601; **invited submission**.

Cole D. P., Smith E.A., Dalluge D., Wilson D.M.*, **Heaton E.A.**, Brown R.C. & Young J.L. (2013) Molecular characterization of nitrogen-containing species in switchgrass bio-oils at various harvest times. *Fuel*, 111, 718-726.

Boersma N.N.* & **Heaton E.A**. † (2012) Effects of temperature, illumination and node position on stem propagation of Miscanthus x giganteus. *Global Change Biology Bioenergy*, 4, 680-687.

Dohleman F.G., **Heaton E.A.**, Arundale R.A. & Long, S.P. (2012) Seasonal dynamics of above- and below-ground biomass and nitrogen partitioning in *Miscanthus* × *giganteus* and *Panicum virgatum* across three growing seasons. *Global Change Biology Bioenergy*, 4, 534-544

Prasifka J., Buhay J.E., Sappinton T.W., **Heaton E.A.**, Bradshaw J.D., & Gray, M.E. (2011) Stem-boring caterpillars of switchgrass in the Midwestern United States. *Annals of the Entomological Society of America*, 104, 507-514.

Heaton E.A. †, Dohleman F.G., Miguez F., Juvik J.A., Lozovaya V., Widholm J. , Zabotina O.A., McIsaac G.F., David M.B., Voigt T.B., Boersma N.N.#, & Long S.P. (2010)

Miscanthus: a promising biomass crop. In: *Advances in Botanical Research* (ed. Jean-Claude K. & Michel D.). vol. 56**,** 75-137. Academic Press.

Heaton E.A. †, Dohleman F.G. & Long S.P. (2009) The impact of harvest time on nitrogen dynamics in Miscanthus and switchgrass. *Global Change Biology Bioenergy*, 1, 297-307.

Dohleman F.G., **Heaton E.A**., Leakey A.D.B. & Long S.P. (2009) Does greater leaf-level photosynthesis contribute to greater solar energy conversion efficiency in Miscanthus when compared to switchgrass? *Plant Cell and Environment,* 32, 1525-1537.

Heaton E.A., Flavell R.B., Mascia P.N., Thomas S.R., Dohleman F.G. & Long S.P. (2008) Herbaceous energy crop development: recent progress and future prospects. *Current Opinion in Biotechnology,* 19, 202-209.

Heaton E.A., Dohleman F.G. & Long S.P. (2008) Meeting US biofuel goals with less land: the potential of Miscanthus. *Global Change Biology,* 14, 2000-2014.

Rogers A., Allen D.J., Davey P.A., Morgan P.B., Ainsworth E.A., Bernacchi C.J., Cornic G., Dermody O., Dohleman F.G., **Heaton E.A.**, Mahoney J., Zhu X.G., Delucia E.H., Ort D.R. & Long S.P. (2004) Leaf photosynthesis and carbohydrate dynamics of soybeans grown throughout their life-cycle under Free-Air Carbon dioxide Enrichment. *Plant Cell and Environment,* 27, 449-458.

Heaton E.A., Clifton-Brown J., Voigt T.B., Jones M.B. & Long S.P. (2004) Miscanthus for Renewable Energy Generation: European Union Experience and Projections for Illinois. *Mitigation and Adaption Strategies for Global Change*, 9, 433-451.

Heaton E.A., Voigt T. & Long S.P. (2004) A quantitative review comparing the yields of two candidate C-4 perennial biomass crops in relation to nitrogen, temperature and water. *Biomass & Bioenergy*, 27, 21-30.

Ainsworth E.A., Davey P.A., Bernacchi C.J., Dermody O.C., **Heaton E.A.**, Moore D.J., Morgan P.B., Naidu S.L., Ra H.S.Y., Zhu X.G., Curtis P.S. & Long S.P. (2002) A meta-analysis of elevated [CO2] effects on soybean (*Glycine max*) physiology, growth and yield. *Global Change Biology*, 8, 695-709.