

2010-11 IGERT Report

Journal Articles in Refereed Publications

Assefa, Y., Staggenborg, S. A. (2010). Grain sorghum yield with hybrid advancement and changes in agronomic practices from 1957 through 2008. *Agronomy Journal*, 102, 703-706.

Brijwani, K., *Rigdon, A., Vadlani, P. (2010). Fungal laccases: Production, function and applications in food processing. *Enzyme Research*, 2010, 10 pages. doi: 10.4061/2010/149748.

Bulatwicz, T., Yang, X., Peterson, J.M., Staggenborg, S., Welch, S.M., Steward, D.R. (2010). Accessible integration of agriculture, groundwater, and economic models using the open modeling interface (OpenMI): Methodology and initial results. *Hydrology and Earth System Sciences*, 14, 521-534.

Douglas-Mankin, K.R., Srinivasan, R., Arnold, J.G. (2010). Soil and water assessment tool (SWAT) Model: Current developments and applications. *Transactions of the ASABE*, 53(5), 1423-1431.

Pfromm, P.H., Amanor-Boadu, V., Nelson, R. (2011). Sustainability of algae derived biodiesel: A mass balance approach. *Bioresource Technology*, 102, 1185-1193.

Pfromm, P.H., Amanor-Boadu, V., Nelson, R., Vadlani, P., Madl, R. (2010). Bio-butanol vs. bio-ethanol: A technical and economic assessment for corn and switchgrass fermented by yeast or *Clostridium acetobutylicum*. *Biomass & Bioenergy*, 34, 515-524.

Propheter, J., Staggenborg, S. (2010). Performance of Annual and Perennial Biofuel Crops: Nutrient Removal during the first two years. *Agronomy Journal*, 102, 798-805.

Propheter, J., Staggenborg, S. (2010). Performance of Annual and Perennial Biofuel Crops: Yield during the first two years. *Agronomy Journal*, 102, 806-814.

Theerarattananon, K., Wu, X. R., Staggenborg, S., Propheter, J., Madl, R., Wang, D. (2010). Evaluation and Characterization of sorghum biomass as feedstock for sugar production. *Transactions of the ASABE*, 53, 509-525.

Theerarattananon, K., Xu, F., Wilson, J., Ballard, R., Mckinney, S., Staggenborg, L., Vadlani, P., Pei, Z.J., Wang, D. (2011). Physical properties of pellets made from sorghum stalk, corn stover, wheat straw, and big bluestem. *Industrial Crop and Products*, 33(2), 335-342.

Wu, X.R., Staggenborg, S., Propheter, J., Rooney, W.L., Yu, J.M., Wang, D.H. (2010). Features of sweet sorghum juice and their performance in ethanol fermentation. *Industrial Crops and Products*, 31, 164-170.

Xu, F., Shi, Y.C., Wu, X.R., Theerarattananoon, K., Staggenborg, S., Wang, D.H. (2011). Sulfuric acid pretreatment and enzymatic hydrolysis of photoperiod sensitive sorghum for ethanol production. *Bioprocess and Biosystems Engineering* 34, 485-492.

Conference Publications

Paradis S., K. Douglas-Mankin, S. Hutchinson, M. Gay, T. Selfa. 2010. AREM: An original joint educational program to improve the sustainability of agricultural natural resources and environmental management. 9th European International Farming Systems Association (IFSA) Symposium, 4-7 July 2010, Vienna (Austria). WS5.4 (Education in landscape and territory agronomy): 2184-2190.

Conference Presentations

*Ballard, T., Bansal, S., Agrupis, S., Haag, L., Vadlani, P., Staggenborg, S.A. (2010, August). Seeding rate effects for ethanol production in corn and sorghum. Paper presented at the International Symposium on renewable feedstock for bio-fuel and products: the role of kenaf, jute and allied fibers, Austin, TX.

*Ballard, T., Freeman, O., Staggenborg, S. (2011, April). Annual oil production totals in Kansas from crop combinations. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

Bergtold, J., *Fewell, J., Williams, J. (2010, August). Cellulosic Biofuel Feedstock Production and Contracting: An Interactive Survey Building Session. Paper presented at the 2010 Risk and Profit Conference, Manhattan, KS.

Brewer, L., *Rigdon, A., Abdillahi, H., Liu, W. (2010, July). Pumpkin Seed Oil as a Potential Chemical Feedstock. Paper presented at the Intensive Program: Sustainable Utilization of Renewable Resource II, Graz, Austria.

Campabadal, C., Channaiah, K., Lawrence, J., Martinez, A., *Rigdon, A., Maier, D.E. (2010, October). Stored Product Protection and Technology Research Group. Poster session presented at Grain Science and Industry Centennial Celebration, Manhattan, KS.

Chin, A.M., English, K.G., Gerlak, A., Harden, C., McDowell, P., Peterson, J., Poff, L., Rosa, E., Wohl, E. (2010, June). Economic linkages to changing landscapes. Paper presented at Landscapes in the Anthropocene: Exploring the Human Connections. Eugene, OR.

*Fewell, J.E., Bergtold, J., Williams, J. (2011, April). Farmer's willingness to grow crops for cellulosic bioenergy: A stated-choice approach. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

*Fewell, J. and J. Bergtold. (2011, April). Biofuel Production and Crop Acreage Demand Implications. Presentation at the 16th Annual K-State Research Forum, Agricultural Sciences Oral Session, Manhattan, KS.

*Fewell, J.E., Bergtold, J., Williams, J. (2011, May). Farmer's willingness to grow crops for cellulosic bioenergy: A stated-choice approach. Poster session presented at the NSF 2011 IGERT Trainee Poster Competition on IGERT.org.

*Fewell, J. and J. Bergtold. (2011, May). Biofuel Production and Crop Acreage Demand Implications. Poster session presented at the annual Capitol Graduate Research Summit, Topeka, KS.

Freeman, O., *Ballard, T., Staggenborg, S. (2011, April). Cover crop benefits in corn and forage sorghum rotations in the central plains. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

Garay, P.V., Peterson, J.M., Golden, B.B., Smith, C.M. (2010, July). Disaggregated Spatial Modeling of Irrigated Land and Water use. Paper presented at the Agricultural and Applied Economics Association Annual Meeting, Denver, CO.

Maier, D. (2010, May). Sustainability of Human Capital for the Grain Processing Industry. Paper presented at the Corn Dry Milling Conference, Peoria, IL.

Maier, D.E. (2010, May). Stored Product Protection Research. Paper presented at the New Technologies and Practices, Food Safety Workshop, Delhi, India.

Maier, D.E., Channaiah, L.H., Martinez-Kawas, A., Lawrence, J.S., Chaves, E.V., Coradi, P.C., Fromme, G. A. (2010, July) Monitoring carbon dioxide concentration for early detection of spoilage in stored grain. Paper presented at the 10th International Working Conference on Stored Product Protection. Esortil, Portugal.

Martinez, A., Maier, D.E. (2010, September). Quantifying feedstock availability using a geographical information system. Paper presented at the 3rd GSI Graduate Student Organization Symposium, Manhattan, KS.

Martinez, A., Maier, D.E. (2011, April). Quantifying feedstock availability using a geographical information system. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

Michalsky, R., Pfromm, P.H. (2010, February). Sustainable production of ammonia from air water and biomass in Kansas. Poster session presented at the annual Kansas State Research Forum, Manhattan, KS.

Michalsky, R., Pfromm, P.H. (2010, March). Sustainable production of ammonia from air, water and biomass in Kansas. Poster session presented at the annual Capitol Graduate Research Summit, Topeka, KS.

Michalsky, R., Pfromm, P.H. (2010, May). Sustainable production of ammonia utilizing a chromium reactant and solar processing. Poster session presented at the annual meeting of the Center for Sustainable Energy, Manhattan, KS.

Michalsky, R., Pfromm, P. H. (2010, September). Sustainable production of ammonia utilizing transition metal reactants and solar processing. Poster session presented at the annual IGERT Energy and Sustainability Conference, Newark, DE.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu, V. (2011, April). Reactive NH₃ synthesis for food and fuel production via solar thermochemical processing at atmospheric pressure. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

*Parman, B., Amanor-Boadu, V., Michalsky, R., Pfromm, P. H., (2011, April). Plant configuration, scale, and economic feasibility of Reactive NH₃ synthesis using solar thermochemical processing. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

*Parman, B. Amanor-Boadu, V., Pfromm, P.H. (2011, January). Third Generation Biofuels and the Food versus

Fuel Debate: The Case of Algae Biofuels from a Systems Perspective. Paper presentation at the 7th International Conference on Environmental, Cultural, Economic, and Social Sustainability, Hamilton, New Zealand: University of Waikato.

Peterson, J.M. (2010, March). Economic Linkages to Changing Landscapes. Invited presentation at the workshop, Landscapes in the Anthropocene: Exploring the Human Connection, Eugene, OR: University of Oregon.

Pfromm, P.H., Amanor-Boadu, V., Nelson, R. (2010, October). Sustainability of algae derived biodiesel: a mass balance approach. Presentation for the University of Missouri, Columbia Department of Chemical Engineering Research Seminar, Columbia, MO.

Pfromm, P.H., Amanor-Boadu, V., Nelson, R. (2010, October). Sustainability of algae derived biodiesel: a mass balance approach. Presentation for Missouri University of Science and Technology Department of Chemical and Biological Engineering Research Seminar, Rolla, MO.

Pfromm, P.H., Amanor-Boadu, V., Nelson, R. (2010, October). Sustainability of algae derived biodiesel: a mass balance approach. Presentation for the University of Nebraska, Lincoln Department of Chemical and Biomolecular Engineering Research Seminar, Lincoln, NE.

Rezac, M.E. (2010, May) Bioenergy perspectives. Paper presented at the Tribal Renewable Energy Research Workshop, University of Washington, Seattle, WA.

*Rigdon, A., *Ballard, T., Brewer, L., Bunnell, K. (2010, July). Renewable resources and sustainability in the US Central Great Plains. Paper presented at the Intensive Program: Sustainable Utilization of Renewable Resource II, Graz, Austria.

* Rigdon, A., Maier, D.E., Vadlani, P., Jumponen, A. (2011, April). Evaluation of composition and enzymatic activity changes of sorghum biomass under various storage conditions. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

*Schulte, L., Rezac, M.E., *Ballard, T., Staggenborg, S.A. (2011, April). Synthesis of cyclic carbonates from epoxides and carbon dioxide. Poster session presented at the Kansas State University Center for Sustainable Energy Bioenergy Symposium, Manhattan, KS.

Smith, C.M., Peterson, J.M., Leatherman, J.C. (2010, July). Simulation of Factors Impeding Water Quality Trading Market Performance. Paper presented at the Agricultural and Applied Economics Association Annual Meeting, Denver, CO.

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Publications, Presentations, and Patents

Journal Articles in Refereed Publications

Martinez, A., Maier, D. E. (2011). Quantifying Feedstock Availability Using a Geographical Information System. *Biological Engineering*, 4(3), 133-146.

Michalsky, R., Pfromm, P. H. (2011). Chromium as reactant for solar thermochemical synthesis of ammonia from steam, nitrogen, and biomass at atmospheric pressure. *Solar Energy*, 85(11), 2642-2654.

Michalsky, R., Pfromm, P. H. (2011). Thermodynamics of metal reactants for ammonia synthesis from steam, nitrogen and biomass at atmospheric pressure. *AIChE Journal*, doi:

10.1002/aic.13717/pdf

*Parman, B. J., Amanor-Boadu, V., Pfromm, P.H., & Michalsky, R. (2011). Third generation biofuels and the food versus fuel debate: A systems perspective. *The International Journal of Environmental, Cultural, Economic and Social Sustainability*, 7(2), 287-300.

Pena, L., Ikenberry, M., Ware, B., Hohn, K.L., Boyle, D. Sun, X.S., & Wang, D. (2011). Cellulose hydrolysis using acid-functionalized nanoparticles. *Biotechnology and Bioprocess Engineering*, 16, 1214-1222.

Book Chapters

*Ballard, T., Bansal, S., Agrupis, S., Haag, L.A., Vadlani, P., and Staggenborg, S. (2011). Seeding Rate Effects on Ethanol production in Corn and Sorghum. *Plant Fibers as Renewable Feedstocks for Biofuel and Bio-Based Products*. (pp. 253-261), ISBN: 9780974869612, Webber TTT, C. L., and Liu, A. (Eds.), St. Paul, MN: CCG International Inc.

Conference Publications

Martinez, A. & Maier, D.E. (2011). Feedstock availability using a geographic information system. *American Society of Agricultural and Biological Engineers*, St. Joseph, Michigan, 11-11730.

Michalsky, R., & Pfromm, P. H. (2011). Solar fuel production via water splitting and protonation of solid-state nitrogen ions forming ammonia. *Preprint Papers- American Chemical Society, Division of Fuel Chemistry*. 56(2), 529-530.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu, V. (2011). Reactive synthesis of ammonia at ambient pressure via solar thermochemical processing. *Preprint Papers- American Chemical Society, Division of Fuel Chemistry*. 242, 100-TEC.

Conference Presentations

*Ballard, T.C., *Schulte, L.R., Samarakoon, T., Staggenborg, S.A., Rezac, M.E.(2012, May) Lipid Profile of Drought Stressed Crops. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

Bergtold, J.S. (2011, August). An exploration of land use and cover change at the county level in Kansas. Paper presented at *Biofuels and Climate Change: Farmers' Land Use Decision Research Symposium*, Lawrence, KS.

*Bollin, P., Young, M., Pfromm, P.H., & Rezac, M.E.(2012, May) Catalytic Upgrading of Bio-oil

Using Metal Coated Membranes. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Boyer, E., and Rezac, M.E. (2012, May) Polymeric Membranes and High Temperature Gaseous Separations. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Fewell, J., Law, J., & Bergtold, J.S. (2011, April). Cellulosic biofuel feedstock choice survey. Paper presentation at the 16th Annual Kansas State University Research Forum, Undergraduate Oral Presentation Session, Manhattan, KS.

*Fewell, J., Bergtold, J., & Williams, J.R. (2011, May). Farmers' willingness to grow cellulosic biofuel feedstocks: contracting and pricing. Paper presentation at The World Congress on Industrial Biotechnology and Bioprocessing, Toronto, ON, Canada.

*Fewell, J., Bergtold, J., & Williams, J.R. (2011, June). Farmers' willingness to grow switchgrass as a biofuel feedstock: A stated choice approach. Paper presented at the Joint Annual Meeting of the Canadian Agricultural Economics Society and Western Agricultural Economics Association, Banff, AB, Canada. <http://purl.umn.edu/109776>

*Fewell, J., Bergtold, J., & Williams, J.R. (2011, July). Farmers' willingness to grow sweet sorghum as a cellulosic bioenergy feedstock: A stated choice approach. Paper presentation at 2011 Agricultural and Applied Economics Association and Northeastern Agricultural and Resource Economics Association Joint Annual Meeting, Pittsburgh, PA. <http://purl.umn.edu/108068>

*Fewell, J., Bergtold, J., & Williams, J.R. (2011, August). Biofuels contracting for cellulosic feedstocks. Paper presented at the 2011 Risk and Profit Conference, Manhattan, KS.

*Fewell, J., Bergtold, J., Williams, J.R., & Peterson, J. (2011, August). Farmers' willingness to grow sweet sorghum for biofuels: A stated choice approach. Poster session presented at Biofuels and Climate Change: Farmers' Land Use Decisions, Lawrence, KS.

*Fewell, J.E., Bergtold, J.S., and Williams, J.R.(2012, May). Kansas Farmers Willingness to Grow Crops for Cellulosic Bioenergy. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Freeman, O. F., and Staggenborg, S.A., (2012, March). Winter cover crops in a corn forage sorghum crop rotation system. Poster Session presented at the annual meeting of Minorities in Agriculture Natural Resources and Related Sciences, Atlanta, GA.

*Freeman, O. F., and Staggenborg, S.A., (2012, April). Winter cover crops in a corn forage sorghum crop rotation system. Poster Session presented at the annual meeting for the 2012 International Biomass Conference and Exposition, Denver, CO.

*Freeman, O.F., and Staggenborg, S.A.(2012, May). Winter Cover Crops in a Corn-Forage Sorghum Crop Rotation System. Poster Session presented at the Kansas University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Lauer, B., Bergtold, J., Caldas, S., Sherwood, S., Earnhart, D.(2012, May). Agricultural Land-Use and Spatial Proximity of Ethanol Production: A County-Level Analysis within Kansas. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Lindbloom, M., Sherwood, S., Shearer, D.(2012, May). Utilizing Conservation Reserve Program Land for Cellulosic Bio-fuel Production. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

Martinez, A., & Maier D. E. (2011, February). Quantifying feedstock availability using a geographical information system. Paper presented at the NC-213 Scientific Forum, Kansas City, MO.

Martinez, A., & Maier D. E. (2011, August). Quantifying feedstock availability using a geographical information system. Paper presented at the American Society of Agricultural and Biological Engineers International Meeting, Louisville, KY.

Martinez, A. and Maier, D. E. (2012, May). Quantifying Feedstock Availability Using a Geographical Information System. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*McGowan, A., Inouye, J., Rice, C. (2011, October). Nitrous oxide emissions in different biofuel cropping systems. Poster session presented at the annual National Science Foundation Experimental Program to Stimulate Competitive Research meeting, Coeur d'Alen, ID.

*McGowan, A., Rice, C., Arango, M., Salas, W., Li., C. (2011, October). Strategies to reduce N₂O emissions from cropland ecosystems: technology, monitoring and policy. In Jones, S., Tuller, M., Knighton, R. (Chairs), Emission of regulated and greenhouse gases: measurement technology, monitoring and policy: T. Symposium conducted at American Society of Agronomy-Crop Science Society of America-Soil Science Society of America International Annual meetings, San Antonio, TX.

*McGowan, A., Inouye, J., Arango, M., Rice, C. (2012, May). Nitrous oxide emissions in different bioenergy cropping systems. Poster session presented at the Coalition for National Science Funding Exhibit, Washington, D.C.

*McGowan, A., Inouye, J., Rice, C.W. (2012, May). Nitrous oxide emissions in bioenergy cropping systems: Implications for life cycle assessment. Poster Session presented at the Kansas

State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu V. (2011, April). Food and fuel from solar ammonia. Poster session presented at the Bioenergy Symposium, Manhattan, KS.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu V. (2011, August-September). Reactive synthesis of ammonia at ambient pressure via solar thermochemical processing. Paper presented at the Annual Meeting of the American Chemical Society (ACS), Division of Industrial and Engineering Chemistry, Denver, CO.

Michalsky, R., Pfromm, P.H., *Parman, B., Amanor-Boadu V., (2011 August-September). Reactive synthesis of ammonia at ambient pressure via solar thermochemical processing, Annual Meeting and Poster Presentation, at the American Chemical Society (ACS), Division of Industrial and Engineering Chemistry, Denver, CO.

Michalsky, R., Pfromm, P. H. (2011, October). Solar thermochemical hydrolysis of metal nitrides for H₂ production and integrated storage in form of ammonia. Paper presented at the Annual Meeting of the American Institute of Chemical Engineers (AIChE), Minneapolis, MN.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu V. (2011, October). Solar thermochemical production of solar-grade silicon: thermodynamic and economic analyses paper presented at the Annual Meeting of the American Institute of Chemical Engineers (AIChE), Minneapolis, MN.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu V. (2011, October). Solar thermochemistry for sustainable fuel and food production and for industrial CO₂ capture and sequestration. Poster session presented at the Annual Meeting of the American Institute of Chemical Engineers (AIChE), Minneapolis, MN.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu V. (2011, October). Techno-economical analysis of solar thermochemical ammonia production at near atmospheric pressure. Paper presented at the Annual Meeting of the American Institute of Chemical Engineers (AIChE), Minneapolis, MN.

Michalsky, R., Pfromm, P. H. (2011, November). Solar fuels and fertilizer and their link to sustainable biomass production and conversion. Poster session presented at the Society for Biological Engineering's (SBE's) Conference on Electrofuels Research, Providence, RI.

Michalsky, R., Pfromm, P. H., *Parman, B., Amanor-Boadu V. (2012, January). Sustainable fertilizer via solar-thermal nitrogen reduction and water cleavage. Poster session presented at the Global Aspects of Biobased Products and Bioenergy Seminar, Manhattan, KS.

Michalsky, R., Pfromm, P.H., *Parman, B., Amanor-Boadu, V. (2012, May). Sustainable

ammonia and its link to the production of food and fuel. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Parman, B., Amanor-Boadu, V., Pfromm, P.H., Michalsky, R.(2012, May). Plant Configuration, Scale, and Economic Feasibility of Reactive NH₃ Synthesis using Solar Thermochemical Processing. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Parman, B., Michalsky, R., Amanor-Boadu, V., Pfromm, P.H. (2012, May). Poster Presentation and Video on Sustainable nitrogen fertilizer, NSF TGERT Trainee Online Video & Poster Competition 2012.

Pena, L., Ikenberry, M., Ware, B., Hohn, K.L., Boyle, D. Sun, X.S., & Wang, D. (2011, October). Cellobiose hydrolysis using acid-functionalized nanoparticles. Proceedings of the International Congress on Energy 2011, Minneapolis, MN.
<http://apps.aiche.org/Proceedings/Abstract.aspx?PaperTD=222428>

Pena, L., Lorg, B., Hohn, K.L., Boyle, D., and Wang, D.(2012, May). Propyl-Sulfonic Acid Functionalized Nanoparticles for Biomass Conversion. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Probst, K.V. (2011, December). Bioemulsifiers from single cell oils. Poster session presented at the Pepsico New York Academy of Science December Career Day, New York, NY.

*Probst, K.V. (2012, January). Bioemulsifiers from single cell oils. Poster session presented at the Global Aspects of Biobased Products and Bioenergy Conference at Kansas State University, Manhattan, KS.

*Probst, K., and Vadlani, P.(2012, May). Optimization of Process and Media Parameters for Single-Cell Oil Biosynthesis using *Lipomyces Starkeyi*. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Rigdon, A. R., Maier, D. E., Staggenborg, S.A., Vadlani, P. & Wilson, J.(2011, February). Preliminary Study: Impact of biomass storage on conversion to ethanol and other characteristics. Paper presented at the Annual Meeting for NC-213, Kansas City, MO.

*Rigdon, A.R., Jumpponen, A.M., Vadlani, P., Staggenborg, S.A., and Maier, D.E.(2012, May). Impact of various storage conditions on composition, enzymatic activity and conversion to ethanol yields of sorghum biomass used as a bioenergy crop. Poster Session presented at the

Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Schulte, L., Rezac, M.E., Pfromm, P.H.(2012, May). Green Chemistry Applied to the Production of Cyclic Carbonates from an Epoxide and Carbon Dioxide. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

*Stanford, J. and Rezac, M.E. (2012, May). Production of Dimethylfuran from Hydroxymethylfurfural, a Biomass Derived Product, using a Copper-Ruthenium Catalyst Coated Membrane. Poster Session presented at the Kansas State University Center for Sustainable Energy Corporate Sustainability Symposium, Manhattan, KS.

2012-13 IGERT Report

Journal Articles in Refereed Publications

Michalsky, R., *Parman, B., Amanor-Boadu, V., Pfromm, P.H. (2012, June). Solar thermochemical production of ammonia from water, air and sunlight. Thermodynamic and economic analyses, *Energy* 42, 251-260.

Michalsky, R., Pfromm, P.H. (2012, November). An ionicity rationale to design solid phase metal nitride reactants for solar ammonia production, *The Journal of Physical Chemistry C* 116, 23243-23251.

Michalsky, R., Pfromm, P.H. (2012, October). Thermodynamics of metal reactants for ammonia synthesis from steam, nitrogen and biomass at atmospheric pressure, *American Institute of Chemical Engineers Journal* 58, 3203-3213.

Peña, L., Ikenberry, M., Hohn, K.L., Wang, D. (2012, July). Acid-functionalized nanoparticles for pretreatment of wheat straw. *Journal of Biomaterials and Nanobiotechnology*: 3, 342-352, DOI: 10.4236/jbnb.2012.33032.

*Rigdon, A.R., Jumpponen, A., Vadlani, P., Maier, D. (2013, March). Impact of various storage conditions on enzymatic activity, biomass components and conversion to ethanol yields from sorghum biomass used as a bioenergy crop. *Bioresource Technology* 132, 269-275.

Books

*Ballard, T. (2012) Cellulose and Oil Production from Annual Crops: Annual Cellulose Crop Options for Ethanol and Oil Cropping Intensification for Biodiesel Feedstocks. Manhattan, KS: Lambert Academic Publishing. ISBN-13: 978-3659126130.

Michalsky, R. (2012) Thermochemical production of ammonia using sunlight, air, water and biomass. Manhattan, KS: UMI Dissertation Publishing. ISBN-13: 9781267600714.

Book Chapters

*Ballard, T., Bansal, S., Agrupis, S., Haag, L.A., Vadlani, P., and Staggenborg, S. (2011). Seeding Rate Effects on Ethanol production in Corn and Sorghum. In Plant Fibers as Renewable Feedstocks for Biofuel and Bio-Based Products. Webber III, C. L., and Liu, A. (Eds.), St. Paul, MN: CCG International Inc. ISBN: 9780974869612.

Patent Applications

Michalsky, R., Pfromm, P.H. (2012). U.S. Patent Application No. 61/729,850. Washington, DC. U.S. Patent and Trademark Office.

Patents Awarded

Ileleji, K.E., *Probst, K.V. (2012). U.S. Patent No. US 8118582. Washington DC: U.S. Patent and Trademark Office.

Conference Presentations

*Appiah-Nkansah, N.B., Wang, D. (2013, April). Fully utilizing non-structural carbohydrates in sweet sorghum via diffusion process. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Arango, M., *McGowan, A. (2012, August). N₂O in Biofuels, Climate Change and Mitigation, Annual Research Symposium. Poster session presented at the symposium conducted at Kansas EPSCoR annual research symposium, Lawrence, KS.

Bergtold, J.S., *Fewell, J., Williams, J. (2012, October). Farmers' Willingness to Produce Alternative Cellulosic Biofuel Feedstocks in Kansas Using Stated Choice Experiments. Paper presentation at 2012 Sun Grant National Conference: Science for Biomass Feedstock Production and Utilization, New Orleans, LA.

*Correa, G., Vadlani, P., Subramanyam, B. (2013, April). Ethanol production from infested corn by maize weevil. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Campabadal, C., Martinez, A. (2012, October). Importance and Storage Techniques to Obtain Optimum Quality Grain. Oral presentation at the Latin American Animal Nutrition Congress (CLANA), Puerto Vallarta, Mexico.

*Freeman, O., Kirham, M.B. (2013, April). Cover crop benefits for corn and forage sorghum rotations in the Great Plains. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Heidlage, M. G., Pfromm, P. H., Rezac, M.E., Young, M. (2013, April). Catalytic membrane-facilitated hydrotreating of bio-oil. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Horstmeier, M., Kulcsar, L. (2013, April). The right to own land, the impact of land acquisitions for biofuels production on resident populations. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Lauer, B., Bergtold, J., Caldas, M., Sherwood, S., Earnhart, D. (2013, April). Agricultural Land-Use and Spatial Proximity of Ethanol Production. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Lauer, B., Bergtold, J., Caldas, M., Sherwood, S., Earnhart, D. (2012, August). Agricultural Land-Use and Spatial Proximity of Ethanol Production. Poster session presented at the BACC-FLUD Symposium, Lawrence, KS.

*Lindbloom, M., Sherwood, S., Shearer, D. (2013, April) The feasibility of utilizing conservation reserve program land in Kansas for producing cellulosic ethanol feedstock. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Martinez, A., Maier, D.E. (2012, August). Improvements in Quantification of Biomass Feedstock Availability to a Biorefinery Using a GIS-based Method. Oral presentation presented at the 2012 ASABE International Meeting, paper #121336807, Dallas, Texas.

Martinez, A., *Probst, K., *Rigdon, Gutowski, A.S. (2012, September). GSI Study Abroad Trip to Germany and Switzerland. Oral presentation at the AACC-GSI meeting, Manhattan, KS.

Martinez, A., McKinney, L., Behnke, K. (2012, October). Flushing Procedures to Prevent Drug Carryover During Medicated Feed Manufacturing. Oral presentation at the V Latin American Animal Nutrition Congress (CLANA), Puerto Vallarta, Mexico.

*McGowan, A., Inouye, J., Swamy, A., Staggenborg, S., Rice, C. (2012, October). Nitrous oxide emissions in bioenergy cropping systems: Implications for life cycle assessment. Poster session

presented at the American Society of Agronomy-Crop Science Society of American-Soil Science Society of America International Meetings, Cincinnati, Ohio.

*McGowan, A., Rice, C., Sattazahn, B. (2013, April). Greenhouse gas balance of cellulosic biofuel, understanding the importance of nitrous oxide from soils. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*McGowan, A., Rice, C., Staggenborg, S., Swamy, A. (2012, October). Nitrous oxide emissions in bioenergy cropping systems: Implications for life cycle assessment. Paper presented at Growing the Bioeconomy, Banff, Alberta, Canada.

*McGowan, A., Rice, C., Staggenborg, S., Swamy, A. (2012, October). Nitrous oxide emissions in bioenergy cropping systems: Implications for life cycle assessment. Poster session presented at the Growing the Bioeconomy, Banff, Alberta, Canada.

*McGowan, A., Rice, C., Staggenborg, S. (2012, August). Nitrous oxide emissions in bioenergy cropping systems. Implications for life cycle assessment. Poster session presented at the Environmental Sustainability and Bioenergy symposium conducted at the Department of Soil Science, University of Sao Paulo, Piracicaba, Sao Paulo, Brazil.

*McGowan, A., Inouye, J., Swamy, A., Staggenborg, S., Rice, C. (2012, August). Nitrous oxide emissions in bioenergy cropping systems: Implications for life cycle assessment. Poster session presented at the Symposium conducted at Kansas EPSCoR annual research symposium, Lawrence, KS.

Michalsky, R., Pfromm, P.H., Peterson, A.A, *Parman, B., Amanor-Boadu. V. (2012, October). Solar Fuels between Mars van Krevelen Catalysis and Solar Thermal Reaction Engineering. Paper presented as a seminar for the Department of Mechanical Engineering, ETH Zürich, Switzerland.

*Parman, B., Amanor-Boadu, V., Pfromm, P.H., Michalsky, R. (2013, April). Plant configuration, scale, and economic feasibility of reactive NH₃ synthesis solar thermochemical processing. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Peña, L., Hohn, K.L., Wang, D. (2012, June). Acid functionalized nanoparticles for biomass conversion. Poster session presented at the 20th European Biomass Conference, Milan, IT.

Peña, L., Lorg, B., Hohn, K.L., Wang, D. (2012, November). Pretreatment of corn stover using propyl-sulfonic acid-functionalized nanoparticles. Paper presented at the annual meeting of the American Institute of Chemical Engineers, Pittsburgh, PA.

Peña, L., Wang, D. (2012, November). Nanotechnology for biofuels. Poster session presented at the annual meeting of the American Institute of Chemical Engineers, Pittsburgh, PA.

Peña, L., Hohn, K.L., Wang, D., Sun, X.S. (2013, April). Development of a nanocatalyst for the hydrolysis of 1, 4 linked sugars. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Probst, K.V., Vadlani, P. (2012, August). Optimization of single cell oil production from oleaginous yeast using fed-batch fermentation. Paper presented at the annual international meeting of the American Society of Agricultural and Biological Engineers (ASABE), Dallas, TX.

*Probst, K.V., Vadlani, P. (2012, August). Producing single cell oils using oleaginous yeast for the production of renewable value-added products. Environmental Sustainability and Bioenergy Seminar. Paper presented at the Luiz de Queiroz College of Agriculture Universidade de São Paulo. Piracicaba/SP, Brazil.

*Probst, K.V., *Rigdon, A., Gutkowski, S., Martinez-Kawas, A. (2012, September). Germany and Switzerland Study Abroad Activities. Paper presented at the regional meeting of the American Association of Cereal Chemists (AACC), Manhattan, KS.

*Probst, K.V., Vadlani, P. (2013, April) Fed-batch fermentation for increased single cell oil production from *lipomyces starkeyi*. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Rice, C., Zeglin, L., Bottomly, P., Tisdell, N., Jumpponen, A., David, M., Prestat, E., Jansson, J., Tringe, S., VerBerkmoes, N., Hettich, R., *McGowan, A., Mfombep, P., Arango, M., Myrold, D. (2012, October). Response of microbial transcriptome, proteome and activity to rainfall pulses in a prairie soil. Poster session presented at the American Society of Agronomy-Crop Science Society of American-Soil Science Society of America International Meetings, Cincinnati, Ohio.

*Rigdon, A. (2012, June). Storage of biomass influences fungal communities, enzyme activities and substrate quality for lignocellulosic ethanol production. Poster session presented at the KSU Ecological Genomics Research Forum, Manhattan, KS

*Rigdon, A., Jumpponen, A., Vadlani, P., Maier, D. (2012, August). Impact of storage conditions on composition, enzymatic activity and ethanol yield of sorghum biomass. 2012 ASABE Annual International Meeting, Dallas, TX. Paper No: 121336830.

*Rigdon, A. (2012, September). Storage of biomass influences fungal communities, enzymatic activities and substrate quality for lignocellulosic ethanol production. Poster session presented at the Grain Science Graduate Student Organization Symposium, Manhattan, KS.

*Rigdon, A., Jumpponen, A., Vadlani, P. and Maier, D. (2012, October). Storage of biomass influences fungal communities, enzymatic activities and substrate quality for lignocellulosic ethanol production. Poster session presented at the 10th Annual Ecological Genomics Symposium, Kansas City, KS.

*Schulte, L., Gana, K., Rezac, M. (2012, July). Green Chemistry Applied to the Production of Cyclic Carbonates from Epoxides and Carbon Dioxide. Poster session presented at the American Chemical Society's Summer School on Green Chemistry and Sustainable Energy, Golden, CO.

*Schulte, L. Gana, K., Rezac, M. (2013, April). Green chemistry applied to the production of cyclic carbonates. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Stanford, J. P., Rezac, M. E. (2012, June). Dimethylfuran (DMF) Production using Membrane Reactor Technology. Poster session presented at the annual meeting of the North American Membrane Society, New Orleans, LA.

*Stanford, J. P., Rezac, M. E. (2013, April). Dimethylfuran (DMF) Production using Membrane Reactor Technology. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

*Stanford, J. P., Rezac, M. E. (2013, March). Dimethylfuran (DMF) Production using Membrane Reactor Technology. Poster session presented at the Kansas State Research Forum, Kansas State University, Manhattan, KS.

*Wales, M. D., Rezac M.E., Pfromm, P. H. (2013, April). Catalytic polymeric hollow fiber membrane modules for use in model three phase reactions. Understanding the influence of the ratio of membrane area to reaction volume treated. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Zhang, Z., Vadlani, P. (2013, April). Production of D-Lactic acid from renewable biomass. Poster session presented at the 2013 K-State Center for Sustainable Energy Symposium, Manhattan, KS.

Zhang, Z., Vadlani, V. P. (2012, August). D-lactic acid production from paper residue. Poster session presented at the annual meeting of Society for Industry Microbiology and Biotechnology meeting, Washington, DC.

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Journal Articles in Refereed Publications

5a. Journal Articles in Refereed Publications

*Fewell, J.E., Lynes, M.K., Williams, J.R., & Bergtold, J.S. (2013). Kansas farmer's interest and preferences for growing cellulosic bioenergy crops. *Journal of the American Society of Farm Managers and Rural Appraisers*, 76(1), 132-153.

Guragain, Y.N., Wilson, J., Staggenborg, S., McKinney, L., Wang, D., & Vadlani, P.V. (2013). Evaluation of pelleting as a pre-processing step for effective biomass deconstruction and fermentation. *Biochemical Engineering Journal*, 77, 198-207.

Lui, K., Fang, C.J., Li, Z.Q., & *Young, M. (2014). Separation of thiophene/n-heptane mixtures using PEBA/PVDF-composited membranes via preevaporation. *Journal of Membrane Science*, 451, 24-31.

Michalsky, R., Peterson, B.A., & Pfromm, P.H. (2014). Rapid synthesis of nanocrystalline magnesium chromite and ferrite ceramics with concentrated sunlight. *Thermochimica Acta*, 582, 10-16.

Peña, L., Xu, F., Hohn, K.L., & Wang, D. (2014). Pretreatment of corn stover using propyl-sulfonic acid functionalized nanoparticles. *Journal of Biomaterials and Nanobiotechnology*, 5(1), 8-16. doi: 10.4236/jbnb.2014.51002

Brown, S.P., *Rigdon-Huss, A.R., Jumpponen, A. 2014. Analyses of ITS and LSU gene regions provide congruent results on fungal community responses. *Fungal Ecology*.
<http://dx.doi.org/10.1016/j.funeco.2014.02.002>

*Rigdon-Huss, A.R., Jumpponen, A., Vadlani, P., & Maier, D. (2013). Impact of various storage conditions on enzymatic activity, biomass components and conversion to ethanol yields from sorghum biomass used as a bioenergy crop. *Biosource Technology*, 269-275. doi: 10.1016/j.biortech.2013.01.055

*Schulte, L.R. et al. (2013). Increased growing temperature reduces content of polyunsaturated fatty acids in four oilseed crops. *Industrial Crops and Products*, 51, 212-219.

Zhang, Y. & Vadlani, V.P. (2013). D-lactic acid biosynthesis from biomass derived sugars via *Lactobacillus delbrueckii* fermentation. *Bioprocess and Biosystems Engineering*. 36(12):1897-1904

Books

5c. Books

Martinez-Kawas, Adrian, & Maier, D. (2013). A feasibility study of postharvest handling, storage and logistics of bioenergy crops. (Doctoral dissertation, Kansas State University, Manhattan, Kansas, USA). <http://hdl.handle.net/2097/16304>

*Parman, B., Featherstone, A., & Amanor-Boadu, V. (2013). Economies of scale for data envelopment analysis with a Kansas farm application. (Doctoral dissertation, Kansas State University, Manhattan, Kansas, USA). <http://hdl.handle.net/2097/16002>

Peña Duque, Leidy Eugenia, & Wang, D. (2013). Acid-functionalized nanoparticles for biomass hydrolysis. (Doctoral dissertation, Kansas State University, Manhattan, Kansas, USA). <http://hdl.handle.net/2097/16800>

*Rigdon, A., & Maier, D. (2013). Coverage impacts biomass composition, conversion to ethanol yields and microbial communities during storage. (Doctoral dissertation, Kansas State University, Manhattan, Kansas, USA). <http://hdl.handle.net/2097/16541>

Conference Publications

5g. Conference Publications

*Freeman, O.W. & Kirkham, M.B. (2013). Water use efficiency of six cover crops. Annual Wheat Newsletter, Vol. 59, pages 135-137. Kansas Agricultural Experiment Station Contribution No. 14-049-D.

Conference Presentations

5h. Conference Presentations

*Appiah-Nkansah, A., *Probst, K. & Madl, R. (2013, July). Ethanol fermentation from grain sorghum starch and recommended ways of obtaining information on biofuels topics. Oral presentation for the Multicultural Academic Program Success summer bridge program at Kansas State University, Manhattan, Kansas, USA.

*Appiah-Nkansah, A., & Wang, D. (2014, April). FULLY UTILIZING NON-STRUCTURAL CARBOHYDRATES IN SWEET SORGHUM VIA DIFFUSION PROCESS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

Bergtold, J.S. (2013, June). Farmer's willingness to produce alternative cellulosic biofuel feedstocks in Kansas using stated choice experiments. Presented as a seminar in the Department of Economics, Administration, and Sociology, ESALQ, University of Sao Paulo, Piracicaba, San Paulo, Brazil.

Bergtold, J.S., Gong, S., Altman, I., Williams, J., & *Fewell, J. (2013, June). Farmer's willingness to harvest agricultural residues in Kansas under contract: The case for corn stover. Oral presentation at the 2013 WERA-72 Annual Meeting in Las Vegas, Nevada, USA.

Guragain, Y.N., Meier, G.T., & Vadlani, P.V. (2013, August). 2, 3 butanediol synthesis from mixed sugars: Fermentation and product concentration. Poster presented at Research Experience for Undergraduates (REU) Program at Kansas State University, Manhattan, Kansas, USA.

Guragain, Y.N., Bastola, K., & Vadlani, P.V. (2014, March). Pretreatment of lignocellulosic biomass using alkaline organic solvents, A green approach for fuels and chemicals production. Oral presentation presented at the American Chemical Society National Meeting in Dallas, Texas, USA.

Guragain, Y.N., & Vadlani, P. (2014, April). EVALUATION OF ORGANIC SOLVENTS FOR THE BIOMASS PRETREATMENT TO PRODUCE 2, 3-BUTANEDIOL. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Heidlage, M.G., Pfromm, P.H., Rezac, M.E., & *Young, M. (2013, July). Hydro treating of fast pyrolysis oil using catalytic membranes at mild conditions. Oral presentation at the World Renewable Energy Conference in Perth, Australia.

*Heidlage, M.G., *Nti, F., Pfromm, P.H., & Amanor-Boadu, V. (2013, October). Use of catalytic membrane reactors to facilitate hydro treatment of bio-oil. Poster presented at the Annual Symposium Research and the State, at Kansas State University, Manhattan, Kansas, USA.

*Heidlage, M., Pfromm, P., Rezac, M., & Amanor-Boadu, V. (2014, April). HYDROTREATING OF FAST PYROLYSIS OIL WITH CATALYTIC INTEGRALASYMMETRIC MEMBRANES AT MILD CONDITIONS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Lauer, B., Bergtold, J., Caldas, M., & Earnhart, D. (2013, August). Impact of biofuel production in Kansas on corn production and irrigation. Poster presented at 2013 BACC-FLUD Symposium at the University of Kansas, Lawrence, Kansas, USA.

*Lauer, B., Bergtold, J., Caldas, M., Peterson, J., Earnhart, D., Brown, C. & Hanley, E., (2014, April). AGRICULTURAL LAND-USE AND SPATIAL PROXIMITY OF ETHANOL PRODUCTION, A COUNTY-LEVEL ANALYSIS WITHIN KANSAS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Lindbloom, M. (2013, June). HYPEREXTRACTIVE IRRIGATION AND THE OGALLALA AQUIFER: AN ECONOMIC POLICY ANALYSIS USING OPENMI AND ARCGIS. Oral presentation at BIO World Congress on Industrial Biotechnology in Montreal, Canada.

*Lindbloom, M. (2013, October). HYPEREXTRACTIVE IRRIGATION AND THE OGALLALA AQUIFER: AN ECONOMIC POLICY ANALYSIS USING OPENMI AND ARCGIS. Poster presented at the Governor's Conference on the Future of Water in Kansas State University, Manhattan, Kansas, USA.

*Lindbloom, M. (2014, April). HYPEREXTRACTIVE IRRIGATION AND THE OGALLALA AQUIFER: AN ECONOMIC POLICY ANALYSIS USING OPENMI AND ARCGIS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

Martinez-Kawas, Adrian, & Maier, D. (2013, August). A feasibility study of postharvest handling, storage and logistics of bioenergy crops. (Doctoral dissertation defense at Kansas State University, Manhattan, Kansas, USA.) <http://krex.k-state.edu/dspace/handle/2097/16304>

*McGowan, A., Sattazahn, B., & Rice, C.W. (2013, July). Nitrous oxide emissions in bioenergy cropping systems: Implications for life cycle assessment. Oral presentation at World Renewable Energy Congress in Perth, Australia.

*McGowan, A., Sattazahn, B., & Rice, C.W. (2013, August). Impact of nitrogen rate on nitrous oxide emissions and life cycle greenhouse gas emissions in switch grass based cellulosic ethanol. Poster presented at improving nitrogen use efficiency in crop and livestock production systems in Kansas City, Kansas, USA.

*McGowan, A. & Rice, C.W. (2013, October). Understanding the impact of nitrous oxide on the life cycle greenhouse gas emissions of ethanol. Oral presentation at the NSF EPSCoR 2013 Annual Meeting at Kansas State University, Manhattan, Kansas, USA.

*McGowan, A., Sattazahn, B., & Rice, C.W. (2013, October). Impact of nitrogen rate on nitrous oxide emissions and life cycle greenhouse gas emissions in switch grass based cellulosic ethanol. Poster presented at NSF EPSCoR 2013 Annual Meeting, Kansas State University, Manhattan, Kansas, USA.

*McGowan, A., Sattazahn, B., & Rice, C.W. (2013, October). Impact of nitrogen rate on nitrous oxide emissions and life cycle greenhouse gas emissions in switch grass based cellulosic ethanol. Poster presented at Research and State Poster Session at Kansas State University, Manhattan, Kansas, USA.

*McGowan, A., Sattazahn, B., & Rice, C.W. (2013, November). Impact of nitrogen rate on nitrous oxide emissions and life cycle greenhouse gas emissions in switch grass based cellulosic ethanol. Oral presentation at ASA-CSSA-SSSA International Meeting in Tampa, Florida, USA.

*McGowan, A., Sattazahn, B., & Rice, C.W. (2014, February). Impact of nitrogen rate on nitrous oxide emissions and life cycle greenhouse gas emissions in switch grass based cellulosic ethanol. Poster presented at Capital Graduate Research Summit in Topeka, Kansas, USA.

*McGowan, A., Sattazahn, B., & Rice, C.W. (2014, April). IMPACT OF NITROGEN RATE ON NITROUS OXIDE EMISSIONS AND LIFE CYCLE GREENHOUSE GAS EMISSIONS IN SWITCH GRASS BASED CELLULOSIC ETHANOL. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University in Manhattan, Kansas, USA.

Michalsky, R. & Pfromm, P.H. (2014, July). Solar-driven thermochemical ammonia synthesis from air and water at ambient pressure. Invited seminar at Meeting of the Royal Society, Do we need a global project on artificial photosynthesis (solar fuels and chemicals). Oral presentation at Chicheley Hall, UK.

*Nti, F., & Amanor-Boadu, V. (2014, April). THE ECONOMIC DEVELOPMENT-ENERGY NEEDS SYSTEM: A SIMULATION OF ALTERNATIVE FUTURES FOR GHANA. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Parman, B., Featherstone, A., & Amanor-Boadu, V. (2013, August). Economies of scale for data envelopment analysis with a Kansas farm application. (Doctoral dissertation defense at Kansas State University, Manhattan, Kansas, USA.) <http://krex.k-state.edu/dspace/handle/2097/16002>

Peña Duque, Leidy Eugenia, & Wang, D. (2013, December). Acid-functionalized nanoparticles for biomass hydrolysis. (Doctoral dissertation defense at Kansas State University, Manhattan, Kansas, USA.) <http://krex.k-state.edu/dspace/handle/2097/16800>

*Probst, K.V. & Vadlani, P. (2013, June). Operational characteristics for maximizing single cell oil production from *Lipomyces starkeyi*. Oral presentation at BIO World Congress on Industrial Biotechnology in Montreal, Canada.

*Probst, K.V., Zhang, Y., Wilson, J., & Vadlani, P. (2013, July). Microbial bioprocessing for the conversion of low-valued inputs to biofuels and platform chemicals. Oral presentation at WREC-International Conference on Renewable Energy for Sustainable Development and Decarbonisation at Murdoch University in Perth, Australia.

*Probst, K.V. (2013, September). Single cell oils from oleaginous yeast *Lipomyces starkeyi*. Oral presentation at Grain Science Graduate Student Symposium at Kansas State University, Manhattan, Kansas, USA.

*Probst, K.V. & Vadlani, P. (2014, March). Utilization of hemicellulose-rich biomass feedstocks for production of single cell oils. Oral presentation at Kansas State Research Forum (KRF) in Kansas State University, Manhattan, Kansas, USA.

*Probst, K., & Vadlani, P. (2014, April). UTILIZATION OF HEMICELLULOSE-RICH BIOMASS FEEDSTOCKS FOR PRODUCTION OF SINGLE CELL OILS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Rigdon-Huss, A. (2013, December). Coverage of biomass for ethanol production impacts composition, conversion to ethanol yields and microbial communities during storage. (Doctoral dissertation defense at Kansas State University, Manhattan, Kansas, USA.) K-State Research Exchange. <http://hdl.handle.net/2097/16541>

*Schulte, L. (2014, May). PBI-Matrimid gas separation blends for high temperature and harsh environment applications. Poster presented at the North American Membrane Society in Houston, Texas, USA.

*Schulte, L. (2013, July). Production of fatty alcohols from methyl esters in an integrated biorefinery. Oral presentation at the World Renewable Energy Congress at Murdoch University, Perth, Australia.

*Schulte, L. (2013, October). Using a membrane reactor to upgrade biodiesel to more valuable fatty alcohols. Poster presented at Research and the State at Kansas State University, Manhattan, Kansas, USA.

*Schulte, L. & Rezac, M. (2014, April). CHARACTERIZATION OF PBI-MATRIMID BLEND GAS SEPARATION MEMBRANES FOR LIGNIN UPGRADING APPLICATIONS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Stanford, J. (2014, April). HYDROGENATION OF HYDROXYMETHYLFURFURAL USING A RUTHENIUM COATED POLYMERIC MEMBRANE REACTOR. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Wales, M.D., Rezac, M.E., Pfromm, P.H. (2013, June). Catalytic polymeric hollow fiber membrane modules for use in model three phase reactions: Understanding the influence of the ratio of membrane area to reaction volume treated. Poster presented at North American Membrane Society Annual Meeting in Boise, Idaho, USA.

*Wales, M.D., Traylor, M.E., Rezac, M.E., & Pfromm, P.H. (2013, October). Membrane reactors for use in the partial hydrogenation of vegetable oil: Understanding the influence of pressure and the ratio of membrane area to reaction volume. Poster presented at Research and the State Graduate Student Poster Session at Kansas State University, Manhattan, Kansas, USA.

*Wales, M.D. et al. (2014, March and April). Membrane reactors for multiphase hydro treating of biomass: Overcoming gas-liquid mass transfer limitations. Oral presentation to the AIChE 2014 Spring Meeting and 10th Global Congress on Process Safety in New Orleans, LA, USA.

*Wales, M.D., Traylor, W., Joos, L., Pfromm, P.H., Rezac, M.E. (2014, April). LIGNIN VALORIZATION USING CATALYTIC MEMBRANE REACTORS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Walker, V., & Rice, C. (2014, April). NUTRIENT AMENDMENT AND MANAGEMENT EFFECTS DURING BIOFUEL PRODUCTION ON SOIL MICROBIAL DYNAMICS AT KONZA TALLGRASS PRAIRIE ECOSYSTEM. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

*Young, M., Pfromm, P., Rezac, M., & Law, B. (2014, April). IN SITU ATOMIC FORCE MICROSCOPY STUDY OF METAL SURFACES IN CATALYTIC HYDROGENATION MEMBRANE REACTORS. Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

Zhang, Y., & Vadlani, P. (2014, April). LACTIC ACID PRODUCTION FROM BIOMASS DERIVED SUGARS USING COCULTURE FERMENTATION, Poster presented at the Center for Sustainable Energy, Energy Symposium at Kansas State University, Manhattan, Kansas, USA.

Zhang, Y., & Vadlani, V. P. (2014, March). D lactic acid biosynthesis from biomass derived sugars using engineered lactobacillus delbrueckii ATCC 9649. Oral presentation presented at 247th American Chemical Society National Meeting. Dallas. Texas, USA.