

2018 Meeting minutes

2018 S-1041 Meeting Notes

Meeting Opened: 9:03 am

Attendees: Mike Tumbleson, Chris Saffron, Ali Demerci, David Brune, Ruihong Zhang, Troy Runge, Scott Pryor, Deepak Kumar, Tim Rials, Buddhi Lamsal, Ajay Shah, Barry Goodell, Hasan Atiyeh, Deepak Keshwani, Jian Shi, Loren Isom, Donghai Wang, Al Womac, Roger Ruan, Samir Khanal, Kasi Muthukumarappan, Jessica McCord, Yi Wang, Haibo Wang, Julie Carrier, Bishnu, Carl Houtman, Ashish Manandhar, Bin Yang

Scott Pryor welcomes attendees and gave brief instructions and information about meeting and building. Thanks Troy Runge and Carl Houtman (FPL) for organizing meeting. New format for station reports. Members will gather in objective groups and discuss their activities.

Troy Runge welcomes attendees. Troy introduces Alan Rudie, assistant director for wood fibers and composites. 9:09

Alan Rudie addresses the members. Talks about FPL history. Here since 1910. Building owned by Fed govt. 9:14

Pryor introduces Tim Rials. 9:16

Tim Rials welcomes the members. Daniel Cassidy is no longer NIFA representative for S1041. Tim explains his role with the committee. He coordinates the committee and is liaison between the committee and the Southern Exp. Station Directors and NIFA. A continuation proposal has been developed. Carrier, Isom, Pryor, Runge and Wilkins developed the proposal. The continuation proposal should be approved by the Southern directors this week. It's not clear who our new NIFA rep will be.

Members introduce themselves. 9:25

Discussion of rewrite. 9:41 Scott Pryor goes over the new project's objectives. A document that summarizes how the objectives changed from the current project to the proposed project was provided to the members. The current project has 4 objectives. The new project has 3 objectives. The first three objectives are largely unchanged. The educational objective from the current project was taken out of the proposed project. Womac points out that conversion researchers need to take into account what specifications they need to maximize their conversion yields. Members discussed if we need to have the states listed on the project. Rials pointed out that NIFA needs to know which states are responsible for each objective and task. Our committee was criticized at the ABE department heads meeting for not having progress reports each year. Researchers are members, not universities. Ruan points out that we need to have a consistent deadline, perhaps the meeting date should be the deadline. The deadline for submission of this year's reports from stations will be July 23.

Discussion of public feedstock database: 10:13

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One proposal reviewer suggested that a feedstock database be made. NREL has a similar database. Pryor feels we don't have the manpower to do that. There are several databases available. Runge agreed with Pryor. The consensus was not to construct a database.

10:20 Pryor introduces breakout format. Members will meet with others interested in their objective. Shah asked whether we could develop a list of keywords and have them tied to individual researchers. Could we develop 5 to 6 keywords and have people tie themselves to each keyword. Runge points out that the annual report will provide much of that information. Runge will develop a list of keywords that people can choose to link to themselves.

10:30 Members break out into groups.

11:52 Reports from groups

TEA and LCA methodologies be part of AFRI Foundational Program. Not always be a tack on onto projects.

Disconnect between conversion and logistics. Conversion engineers say "give me whatever material you can and we'll figure out how to convert it." Logistics engineers say "tell us what type of biomass that you want."

17 people in conversion group. Each shared what types of things we were doing. We need to build a deeper sense of community. Can we bring our reports of work to the meeting, and then we can share them and know what the opportunities are. Bring back "show and tell" that present key strengths at each institution. Could also have posters with similar information. This would allow us to know what the strengths are to more quickly form teams. Also develop preproposals around key ideas for future proposal development.

Lunch served: 12:04 pm.

Business meeting: 1:05

Approval of the meeting agenda. Motion made by Muthu, 2nd by Runge. Motion approved.

Approval of the meeting minutes, Muthu moved, Shah 2nd. Motion approved.

Election of secretary. Chris Saffron nominated. Nominations closed. Muthu moved, Keshwani. 2nd. Saffron elected secretary.

Next meeting location discussion. Why are we meeting? What are we looking for.

Ruan comes to learn and to collaborate. He would like some presentations and then discussion time. Have more opportunity to visit with others. Would like more visuals. Womac states this meeting is more intimate than ASABE. Muthu states that we must work together from multiple states to qualify for funding. Smaller states can benefit from collaborating with bigger universities that have more equipment. Keshwani enjoyed today's breakouts. One reason to come is to pick up ideas from others. Muthu talked about NC-1023 which is on food

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engineering. They are organizing a conference. Should we have a symposium? Zhang values the meeting more than a symposium. Demirci thinks maybe the mini-presentations could be kind of like a symposium. Atiyeh states that some of the value of the presentations is to present to people outside of your area. Relaxed atmosphere. Looking at future trends. We need to have NIFA here to discuss funding trends. Womac would not change anything. Should graduate students participate? If there is an opportunity to fund graduate students, then do it. If not, then no. We can't afford to be picky. We need to be opportunistic. It's OK not to have a symposium theme. Take advantage of the local opportunities. Low-key interaction and flexibility. Graduate student participation is secondary. If you're at a university, try to get the local graduate students involved. Runge thinks it is OK to have more faculty to faculty interaction. Khanal points out that graduate students can bring out more details about their research. Zhang states she benefitted from coming to a multi-state meeting as a graduate student and that we need to welcome graduate students. Consensus seems to be to maintain the status quo.

Meeting location: Pryor proposes having the S1041 meeting after the end of the ASABE meeting. This would bring some cost benefits. We could start on Wednesday afternoon and continue on Thursday. This would conflict with some committee meetings. Khanal does not like the idea of having the meeting after ASABE. Demirci states it makes sense logistically, but it's too long and people will be distracted by committee meetings. ASABE might be more expensive. Atiyeh thinks it would be good to have it separate. Most people don't want to have the meeting with ASABE.

Now we are looking at future meetings:

Fargo, ND; Ames, Iowa; UC-Davis; NREL;

NREL plan A, Fargo, plan B.

Last week of July, 1st week of August.

Atiyeh suggested that we can put PDFs of our posters on the S1041 website. Send the PDF to Ajay Shah (shah.971@osu.edu).

A Google Drive for the committee will be created.

LIGNOCELLULOSIC BIOMASS FRACTIONATION USING GAMMA VALEROLACTONE AS SOLVENT

David Martin Alonso
Director of Research and Development
Glucan Biorenewables LLC

Biography:

David Martin Alonso is the Director of Research and Development at Glucan Biorenewables LLC, a star up company focused on the production of furanics. He earned his BA in Chemical Engineering at the University of Salamanca (Spain). For his PhD, he worked at the Catalysis and Petroleochemistry Research Institute under the supervision of Dr Rafael Mariscal working on the production of biodiesel using heterogeneous catalysis. In 2009, he moved to the University of Wisconsin-Madison to work with Prof. James A. Dumesic as a Research Associate studying new catalytic processes to convert lignocellulosic biomass into valuable chemicals and fuels. During his postdoc, Dr. Alonso developed several new processes that led to the creation of the startup company to commercialize the technology.

Abstract:

The first step toward a successful biorefinery is the effective deconstruction of lignocellulosic biomass into its main components, cellulose, hemicellulose and lignin. Once these fractions are separated, they can be converted to several chemicals and fuels, maximizing the revenue obtained.

Using gamma valerolactone (GVL), as organosolv solvent, offers many advantages which facilitates achieving that objective. For example, hydrolysis (100x) and dehydration (30x) reactions rates are faster in GVL than in water, which allow to perform the biomass fractionation step at mild conditions (time, temperature, acid concentration and pressure) still producing a high purity solid cellulose stream and a concentrated liquid hemicellulose and lignin without degrading or diminishing the value of any of the fractions. In addition, because GVL solubilizes >90% of the hemicellulose and 90% of the lignin, the fractionation can be done at high biomass loading (>30%) reducing solvent utilization. The high solubility of lignin in GVL/water solutions also facilitates working at high biomass loading. The high chemical stability of the GVL enables solvent recovery and the fact that GVL can be produced easily from biomass, helps to improve the process economics.

The cellulose produced by this technology has high purity and can be used as dissolving pulp, converted into fermentable sugars, ethanol or specialty chemicals such as levulinic acid and HMF. The mild processing conditions used during the biomass fractionation allow it to retain the native structure of the lignin that can be isolated at high purity and used to produce carbon foams or battery anodes. The hemicellulose fraction can be converted into furfural, a specialty chemical, at high yields and without intermediate separations. This technology maximizes the conversion of lignocellulosic biomass into high value products (up to 80% of the biomass to useful products) producing a revenue more than \$500/MT of dry biomass which makes the technology economically competitive.

SUSTAINABLE PRODUCTION OF FUELS AND CHEMICALS FROM PLANT BIOMASS

Tim Donohue

University of Wisconsin Foundation Chairman Fetzer-Bascom Professor of Bacteriology;
Director, Great Lakes Bioenergy; and Interim Director, Wisconsin Energy Institute,
University of Wisconsin-Madison

Biography:

Tim Donohue has been a faculty member at the University of Wisconsin-Madison for 32 years. In his research program, he studies how microbes can be used to capture and divert energy from renewable resources into useful products. He has been a member of federal research panels, served on editorial boards and advisory committees, coauthored reports for the Department of Energy, led cross disciplinary graduate training programs and is a Past President of the American Society for Microbiology. Since 2007, Dr. Donohue has served as Director of the Great Lakes Bioenergy Research Center, a US Department of Energy renewable fuels and chemicals research center. Dr. Donohue also is Interim Director of the Wisconsin Energy Institute, a cross campus unit that is the administrative home of Great Lakes Bioenergy and other programs which seek to develop tomorrow's clean energy systems. Dr. Donohue will describe the challenge of meeting the ever growing needs of society for energy and highlight how faculty members at the University of Wisconsin-Madison, as a Land Grant Institution, are able to address this challenge.

Abstract:

Dr. Donohue will report on the past role of Great Lakes Bioenergy and its plans for the future. Great Lakes Bioenergy conducts basic, genome enabled research to design microbial and plant systems needed to convert lignocellulosic biomass into fuels and chemicals that currently are derived from petroleum. In the past 10 years, Great Lakes Bioenergy personnel have published more than 1100 papers, made discoveries that are part of more than 170 patents, leading to over 90 licenses and the formation of 5 startup companies. Dr. Donohue also will describe future activities of this Center in producing fuels and chemicals that currently are derived from petroleum using dedicated energy crops grown on marginal lands as a feedstock.

THE ROLE OF FOREST PRODUCTS RESEARCH IN MEETING LAND MANAGEMENT GOALS

Carl J. Houtman

Research Chemical Engineer

USDA Forest Service, Forest Products Laboratory

Biography:

For the last 20 years Carl Houtman has been a research chemical engineer with the USDA, FS, Forest Products Laboratory. Dr. Houtman's current research areas include nanocellulose production, fungal degradation mechanism and biorefinery. Dr. Houtman holds a BChE and a MS degree from the University of Minnesota and a PhD in chemical engineering from the University of Delaware, where he studied noble metal catalysis.

Abstract:

Dr. Houtman will describe the land management challenges faced by the US Forest Service. He will use examples to illustrate how current research projects at the Forest Products Laboratory will help address these problems.

LESAFFRE AND PROCELYS: YEAST AND YEAST DERIVED FERMENTATION NUTRIENTS

Shawn Nelson

Technical Service Manager, North America

Procelys, Lesaffre Fermentation Nutrients

Biography:

Shawn works as the technical lead on yeast derived products sold into the fermentation industry. In addition, Shawn serves as Adjunct Assistant Professor for the Department of Biological Systems Engineering at the University of Wisconsin-Madison. Prior to joining Procelys, he worked for Didion Milling in Cambria, WI, as Research and Development Manager. Shawn earned his PhD from the University of Wisconsin-Milwaukee in Microbiology studying bacterial motility and completed his postdoctoral work at the Forest Products Laboratory in Madison working on genetic engineering of alternative yeasts.

Abstract:

This talk will include an overview of Lesaffre and its subsidiaries including the history and manufacturing processes. We also will cover Procelys and learn more about how it serves the fermentation industry.

S-1041 Multistate Committee

Annual Meeting and Symposium

July 9 - 10, 2018 **Madison, WI**

Host and Host Institution: USDA FS Forest Products Laboratory

Meeting Organizing Committee: Troy Runge (Univ. of Wisconsin), Scott Pryor (North Dakota State University), Kent Rausch (Univ. of Illinois), M.E. Tumbleson (Univ. of Illinois), and Carl Houtman (USDA/FS FPL).

S1041 Exec Committee: Troy Runge (Chair), Scott Pryor (Vice Chair), Mark Wilkins (Secretary)

Monday, July 9th (Day One)

- 8:00-9:00 AM Registration. Poster setup. Coffee/Tea/Breakfast.
- 9:00-9:05 AM Welcome and introduction (Scott Pryor)
- 9:05-9:10 AM Opening remarks by FPL representative (Alan Rudie)
- 9:10-9:20 AM Welcome and opening remarks by S-1041 Administrative Advisor and/or CSREES representative (Tim Rials, NIFA representative)
- 9:20-9:40 AM Brief introductions of attendees
- 9:40-10:00 AM Review of project rewrite: process, comments, status. (Julie Carrier, Mark Wilkins, Scott Pryor, Troy Runge)
- 10:00-10:10 AM Breakout orientation (Scott Pryor)
- 10:10-10:40 AM Station reports via Project Objective Breakouts (3 groups)
- 10:45-11:15 AM Station reports via 2ndary Project Objective Breakouts (3 groups)
- 11:20-12:00 (PM) Report out by Project Objective + Discussion
- 12:00-1:00 PM Lunch and Poster viewing
- 1:00-2:00 PM Business meeting
- 1) Old Business (Scott Pryor)
 - a) Approval/Additions of 2018 Meeting Agenda
 - b) Approval of 2017 meeting minutes
 - 2) New Business (Scott Pryor and Mark Wilkins)
 - a) Election of officers: Secretary/Vice Chair
 - b) Symposium topic and/or format for 2019
 - c) Discussion of location for 2019 meeting.
 - d) Discussion of format/mechanism for Annual Project Reports
 - e) Other additional items for discussion
- 2:00-2:40 PM Tim Donohue, GLBRC
- 2:40-3:20 PM Shawn Nelson, Lesaffre Fermentation Nutrients
- 3:20-3:40 PM Break
- 3:40-4:20 PM Carl Houtmann, Forest Products Lab
- 4:20-5:00 PM David Alonso, Glucan Bio
- 5:00 PM Transportation to "The Terrace"
- 6:00 – 8:00 PM Dinner

2018 Meeting Agenda

Tuesday, July 11th (Day Two)

8:00-9:00 AM Coffee/Tea/Breakfast + Poster viewing

9:00-10:30 Forest Products lab tour

10:30- 11:00 Travel to next tour

11:00- 12:00 Dairy processing plant tour

12:00-1:00 Lunch in nearby room (ice cream for dessert)

1:00 Group photo, Meeting adjourned