S-1041 Multistate Committee Annual Meeting Minutes

Date: July 10-11, 2017

Location: USDA NIFA, Washington DC

Meeting organizing committee: Jillian Worthen – USDA NIFA, Kent Rausch – U. of Illinois, Mike Tumbleson – U. Of Illinois, Ganti Murthy – Oregon State University, Troy Runge – U. of Wisconsin, Scott Pryor – North Dakota State University.

G. Murthy. Welcomed group and made some introductory remarks about registration and housekeeping.

Daniel Cassidy (NIFA) welcomed everyone. He is looking forward to next two days of discussion and presentations. He gave a brief orientation to safety issues and facilities in the building.

Tim Conner is a new director at NIFA in the bioenergy office and welcomed everyone.

All participants introduced themselves.

Station reports. Each state gave a 3-5 min overview of work being done. A brief synopsis of each report follows:

- TAMU: much of their work focuses on thermal conversion processes
- Mississippi State: Working on a BRDi with Ohio State and other universities for converting raw biogas to biofuel.
- Univ. of Illinois: projects include use of DDGS and increasing ethanol yields, fouling of evaporators, sugarcane bagasse pretreatment, and traditional established corn wet milling and dry grind workshops.
- Univ. of Kentucky: Discussed use of lignin for biobased materials.
- Virginia Tech: Discussed protein extraction from brewers spent grains for fish feed; extraction of polyphenols from grape pomace.
- Univ. of Hawaii – Discussed use of metabolic tools for synthetic biology, synthetic biology to develop proteins to complement cellulases…such as scaffolding for cellulosome construction. Also discussed specialty crops such as papaya and high yield tropical grasses (BRDi project).
- Montana State: Working on BRDi with Kansas State – camelina feedstock development and use, sugabeet processing.
- Clemson: Discussed treatment of brewery liquid wastes, collabporation with Novozyme on project for enzymatic transesterification. Other projects include hemp production and anaerobic digestion for biogas.
- Purdue: Discussed genetic expression of new fungal cellulases, high-value biomaterials for pharmaceuticals or nutraceuticals; extraction and processing of soy oil components; hemp, nanocellulose for materials.
- Michigan State: Discussed anaerobic digestion integrated with solar power, cell wall composition and use as predictive tool for biorefineries, biomass depots for pretreatment and densification, AFEX and SSCF, conversion of ethanol to other hydrocarbons, pyrolysis and electrocatalysis for upgrading.

- Wisconsin: Many projects with GLBRC and Michigan State including separation of bioproducts and nanocellulose, manure separations, biorefinery logistics.
- NDSU: Discussed use of emerging oilseeds such as crambe, biomass logistics, use of biomass densification to reduce pretreatment inputs.
- Nebraska: Discussed modeling fed-batch processes for biomass hydrolysis, food/energy/water nexus and education around the system interactions, lignin depolymerization and valorization, alternative uses of DDGS through separation into high fiber and high protein fractions.
- Washington State: Discussed use of pyrolysis for jet fuel, biological conversion of lignin to PHA.
- Tennessee: Work includes biomass feedstock logistics, and feedstock handling properties.
- Oregon State: Discussed using biomass hydrolyzates in microbial fuel cells for hydrogen production, modeling of nitrifying and denitrifying bacteria in soils, uncontrollable uncertainties in LCA, technoeconomic analyses of alternative biobased products and high solids reactors, tailored enzyme cocktails for biomass hydrolysis, other projects related to the food/energy/water NEXUS.
- UC Davis: Working on a CAP with Univ of Washington for feedstock production in NW, microbial communities and biogenomics for enzyme identification, Use of grape pomace as a soil amendment for solarization to reduce pathogens in soil systems, imaging to understand basic of cellulose degradation cellulose/cellulase interactions, modifying a fungal strain to increase yields of cellobionic acid without need of cellulase addition.

Discussion of project rewrite was led by Troy Runge and Julie Carrier. Notes:

2008 rewrite occurred in 1 month but that was a stressful process. 2013 rewrite was begun in 2011. We need to be approved in Sept 2018 and should be ready for review in May 2018. Rewrite needs to show that we are linked, inclusive, and working together..

We had 4 objectives in the previous (current) project in these categories:

1. Feedstocks
2. Biofuels and bioproducts
3. LCA
4. Education

There was a question about the need or appropriateness of an educational objective since it is a research committee.

Julie noted that discussion of current work included:

1. Carbon sources: cellulosic and oilseed feedstocks, processing wastes, algae, handling, location
2. Conversions: 1G, biochemical, thermochemical, AD
3. Products: catalytic, high-value extracts, fermentation, lignin

Could add 4th category of systems analysis for the bioeconomy to include modeling, LCA, water/food/energy nexus, and technoeconomic analysis.

The categories noted above fit reasonably well into our current objectives and we should use those as our base. They may need some rewording to explicitly include lignin or make other minor modifications.

There was discussion of the suggestion to add an objective to look at bioproducts properties. Some questioned if there is a critical mass to include this as a full objective. Suggestion was made to use it as a subobjective under the "conversion" objective.

Members felt the need to explicitly identify the term "valuable" as meaning both economically and environmentally beneficial.

There was a suggestion that Objective 1 should identify desired feedstock properties such as flowability and handling.

Objective 3 could include terms like "optimization", "analytical systems approach" or "use systems-level approach to inform…"

Julie Carrier will lead project rewrite with primary assistance from Runge, Pryor, and Wilkins. Runge will send out email requesting station reports and input from each station on concise suggestions for modifications of current project objectives and tasks.

Wilkins/Womac moved to approve 2015 minutes. Approved.

Tao/Rausch moved to approve 2016 minutes. Approved.

Mark Wilkins was nominated to serve in the secretary/Vice-chair/Chair progression.

Chris Saffron considered self-nominating but decided to wait until next year.

Walker/Tao moved to close nominations and approve Mark Wilkins. Passed with unanimous approval

Discussion of next year's meeting:

Murthy suggested meeting in conjunction with the International Bioprocessing Association, led by A. Pandey (Editor of Bioresource Technology). After some discussion, group moved away from this idea for the coming year.

Location ideas also included Madison, WI; Idaho National Lab, and Argonne National Lab.

Pryor/Tao moved to suggest Madison WI. Approved unanimously.

Tentative date for the 2018 meeting is July 9-10, 2018

Wilkins/Murthy moved to adjourn business meeting. Approved unanimously.

Speakers:

David Turpin, Agenda 2020. Challenges in Pulp and Paper Industry

Why paper and pulp, industry goals, cellulose nanomaterials

Todd Anderson, DOE Biological Science Systems Division

Basic bioenergy research programs funded by the Office of Biological and Environmental Research

Mark Elless, DOE BETO – Feedstock Cost, quantity and quality

Daniel Cassidy, USDA NIFA – bioenergy funding programs through NIFA