Checking in with CenUSA

Sustainable Production and Distribution of Bioenergy for the Central US

CenUSA Bioenergy is a multidisciplinary project funded by the U.S. Department of Agriculture-National Institute of Food and Agriculture (USDA-NIFA). The goal of the project is to research the production and use of perennial grasses on marginal lands for use as alternative biofuels and bioproducts. Learn more about CenUSA at www.cenusa.iastate.edu

Jill Euken[1], retiring deputy director of the Bioeconomy Institute, spoke in April 2019 about her work and experience as a CenUSA co-project director focused on outreach and Extension with CenUSA Communications Tyler Worsham. [2] Euken elaborated on her integral role in the early formation of the project and how Extension worked with farmers and the public to communicate the CenUSA vision.

Our main objective was not only to help farmers learn about producing these grasses, but to also have them adopt the practice of growing them, but because there was no market, we can't expect farmers to grow them. J*ill Euken*

How did you initially get involved with CenUSA?

"Way back before the request for proposal (RFP) was ever released, we heard through the grapevine that the USDA would be releasing requests for large coordinated projects targeting integrated projects around the production of biofuels, so we formed a team. The team was looking at corn stover as the feedstock for the supply chain to make biofuels. I was part of the BEI (Bioeconomy Institute) at the time and helped pull the team together in order to write a working draft for what we thought we would propose.

When the RFP came out, corn and corn stover were not eligible feedstocks, so we had to regroup. I set up a call with Bill Goldner, who is the USDA-NIFA program manager for the project, and I asked the question whether or not he meant to eliminate the Midwest. He said, 'No, we didn't mean to eliminate the Midwest as a candidate, but I can guarantee that if you send a proposal with the word corn in it, it will be eliminated.'

We thought about what we could do that would be helpful to the Midwestern economy and what would be helpful to the Midwest's agricultural-environmental footprint, and we came up with the concept of using perennial grasses as a feedstock for biofuels that would be strategically placed on the landscape to provide not only feedstocks for biofuels and bioproducts, but also environmental benefits as well. At about the same

[1] Learn more about Jill Euken at https://www.engineering.iastate.edu/research/eri/initiatives/strategies/icne/icne-members/jill-euken/

[2] All of the words and ideas expressed in this interview fairly and accurately represent the speaker. Some quotes may be paraphrased for brevity and clarity. The opinions expressed in herein do not necessarily reflect those of Iowa State University, USDA-NIFA, Purdue University, Ohio State University, USDA-ARS, the University of Minnesota, the University of Nebraska, Lincoln, the University of Vermont, or the University of Wisconsin.

time, we learned that the University of Nebraska and the ARS were going to promote that same kind of concept, so I organized what my husband referred to as the Geneva Convention for the CenUSA project.

We set up a meeting between the ISU team and the Nebraska-ARS team at our family farm which is located about two hours from each university. Each group shared their vision for what they thought we should do. At the end of the day, we arrived at a joint project idea which is what CenUSA turned out to be. We also selected the leader for that project, Ken Moore, who was not at the meeting. He was somebody whose name surfaced throughout the discussion about who would be the logical leader, so we came back to Iowa State and talked to Ken, and he agreed to lead the project.

We started studying the RFP in more detail, and of course, it called for all of the different areas of feedstock breeding, agronomic production and economic and environmental footprint, but of course, two other components were education and Extension outreach. I was asked if I could pull together a team to lead the Extension and Outreach component. I was excited to do that, so I started making calls to Extension colleagues in the target states of Minnesota, Indiana, Nebraska, and South Dakota, which we had as a part of the project at the time. I had the whole team lined up, and we came up with the program which we submitted.

The budget that we had for the project at the time was $45 million, but when our project was selected, it was provided with only $25 million which meant that all of the platforms, the breeding and everything, had to be cut back. We said there were parts of the Extension budget that could be eliminated, so South Dakota was removed from our Extension budget. For the rest of the team, however, we shuffled things around, cut back on hours, cut back on the number of demonstration plots and so on in order to meet the reduced budget requirements. I basically recruited about 25 people to be a part of the Extension effort in those [remaining] states."

Specifically, how did you end up in your position with the project?

"Robert Brown asked if I would lead the Extension component. I had a 25-year history in extension and outreach work, and I was the deputy director for Extension and Outreach with the Bio-Economy Institute, so it fit very well with my responsibilities, experience and skill set."

In what ways did the project broaden and challenge your professional knowledge and skill set?

"I had never been a part of such a large project before, especially coordinating the efforts between so many states where Extension cultures and personalities were very different. I have done a lot of consensus building with teams, and that was probably the most difficult part, especially when you have to cut a lot of money out of your budget. Working on a regional basis and cutting budgets challenged me in that respect."

To what new ideas and disciplines were you exposed in your work?

"Well, I was very familiar with biofuels because I worked here for a lot of years, but I was not as familiar with switchgrass production, breeding and that kind of thing. I was very familiar with CARD (Center for Agricultural and Rural Development See: https://www.card.iastate.edu) and the environmental work they did, so I would say it was the switchgrass, bluestem grass production that I didn't know. I am a farmer, so I am very

familiar with agriculture in general, but the switchgrass was the newest for me."

Have you worked in any other projects as large or well-funded as CenUSA?

"I had certainly worked on other projects before, but not $25 million projects. These are almost unheard of in in the history of the USDA, so the short answer is no. I've been a part of some big projects, but more so in the $2-to-$5 million range, not the $25 million range."

How have these other projects differed from CenUSA?

"They're not as comprehensive. The CAP projects were strategically designed to do the full supply chain, and that is indeed a very rare program. Universities tend to work in silos where everyone stays in their own departments, very focused on a very narrow set of problems and solutions."

How many people were involved in Extension?

"There were about 25 of us. It was a big group."

How was that number reached or determined?

"Well, we needed to have a core team in each of the states, so as I mentioned, we had Nebraska, Iowa, Indiana and Minnesota. We had a core group of CenUSA Extension folks in each of those states. We needed to have agronomists, people who could organize all of these demonstration plots who would go for five years, coordinate their maintenance, the spraying, the harvest, the data collection and all of the organized field days. We needed to have experienced people, so we sort of looked at the skill sets of those who would be the best partners. I took recommendations from people I knew here on campus who knew their colleagues from other states, so that core group was derived from that process."

Did you encounter any obstacles, whether unforeseen or expected, in the process of your work?

"I would say that the number-one problem was that there is no market for these grasses, and as I would remind my ivory-tower colleagues, farmers have mortgages to pay. They have families to support. They can't grow a crop for fun. They have to grow a crop they can sell. Our main objective was not only to help farmers learn about producing these grasses, but to also have them adopt the practice of growing them, but because there was no market, we can't expect farmers to grow them. That was the number-one problem with the project in my estimation. Another problem that was more subtle. Those of us in the Extension all felt that there is an ongoing problem at land-grant institutions worldwide. Research people don't always value the importance of the skill set required to do good outreach. Some of our team did, but others did not, so Extension was sometimes seen as 'the red-headed step-child.'"

Do you think that is because they are locked into that research phase?

"Of course. Because they are very committed to their experiments and research, they think that their particular area of the supply chain is the most important and deserves more money, so of course."

The Master Gardener demonstration gardens had plots with no biochar, a half-rate of biochar and a full-rate of biochar, as well as all of the different fruits and vegetables that were grown in the plots."

Read our White Paper

Were there any noteworthy discoveries or successes achieved in your work with CenUSA?

"In good Extension work, we do evaluation at the end of the work period to get a feel for how we are doing with our outreach programming. We planned Extension publications, fact sheets and videos, and they were all done in collaboration with the research people. When they made a new discovery, our team would meet with them and come up with the publications. One success was a huge amount of publicly available information that was designed for farmers and other people in agricultural businesses. That we have such a body of information for when we do have that market available was a huge success.

In addition to all of the knowledge pieces, we held a lot of workshops and field days where people would come to our CenUSA demonstration plots. We would have surveys where we asked people how much they already knew about some particular production practice -- like best practices for fertilizing switchgrass. We would ask how much they knew before and after the meeting so we could compare their knowledge gain with participants in these events. We have fact sheets on our evaluation summaries on our website, and you can see that people learned, so that was a success. We certainly have anecdotal evidence that farmers are willing to grow these crops when there is a market. Farmers will grow anything that has a market. They have mortgages and families to support, so they have to grow things they can sell."

Was there anything that you wanted to accomplish but didn't quite achieve that success?

"Absolutely. The overall objective of the whole project was to have people actually growing these crops and making biofuels with them, and that has yet to happen, even for the processing systems that can use those crops. The existing facilities like the POET facility up in Emmetsburg (Iowa) use corn stover. We at the Bioeconomy Institute now have an initiative that can use any kind of biomass. We are building a demonstration pilot-scale system that can use switchgrass, but it's a demonstration. It's going to take another two years to get the demonstration done, and then it will take a while to actually expand outward into the country if the economics work. That's the question. Yeah, of course, what we wanted to have happen was to have bio-refineries using cellulosic feedstocks like switchgrass out in the field."

What were your primary means of sharing the knowledge you developed with CenUSA? Was it just the Extension website in particular, or were there other things?

"Certainly there was the website, but as I mentioned, we had Extension staff in all four states establishing switchgrass demonstration plots and conducting a large number of outreach events. We worked with the

agronomists to design the plots. One plot could demonstrate the recommended fertilizer and the seeding rate while another would not, and you could observe how the recommended production processes actually impacted the yields. We harvested these plots every year, and the ones that were not done by the prescribed route did not yield as well. There were very visual systems out there as a part of our Extension program that people could view.

In addition, we didn't want to limit our outreach program to just farmers and ag-business people, so that's why we had the whole Extension Master Gardener (Master Gardener) program that ran a similar set of plots in gardens that reached nearly five-thousand people alone with programs at Master Gardener demonstration plots. The Master Gardener demonstration gardens had plots with no biochar, a half-rate of biochar and a full-rate of biochar, as well as all of the different fruits and vegetables that were grown in the plots. Then master gardeners would weigh the produce and evaluate it for not only its yield, but also for its quality. We had Master Gardener publications for that as well.

We did a number of videos and publications about using biochar in urban settings, and at each of those many Master Gardener meetings, we had an educational component about

what switchgrass is. We had some switchgrass at each of the demonstration gardens. We explained the environmental impacts of switchgrass compared to garden or row-crop practices, as well as pyrolysis, how to convert switchgrass through pyrolysis into other products and so on. We were able to reach a non-farming audience through that set of activities that I think were very valuable."

What is most likely to move producers to apply and adapt to these new skills and information from this project?

"Farmers need an established market. I was on a teleconference recently about the farm bill. There is now a market for hemp because of marijuana adoption in some states and because industrial hemp can be used for industrial purposes in other states, so the new farm bill has a new program on hemp. There is no such program for switchgrass. There is no market pull for switchgrass now."

What would it take to open that market for switchgrass?

"We need biomass conversion systems that can convert switchgrass and other cellulosic feedstocks into bio-based chemicals, biofuels, biopower and so on. We need an established market to which farmers can sell."

Is there anything your team learned as a part of your outreach effort that would change your approach to outreach in the future?

"I think what we learned was that social media is great for awareness and getting things onto people's radar. It's also great to share snippets of knowledge , but if you really want people to adopt a new crop, they have to see it, experience it , and most importantly of all, they have to have a market. All of the social media in the world is not going to encourage adoption. You've got to understand the whole system. You've got to see it and feel it.

Adoption requires in-depth learning and experience, but isn't that true in life? If you hear something or see a picture while sitting in a lecture, you learn a little, but when you're actually doing something in a lab, it's a , it's a whole new and different level of learning. I think this was the point that came home with me after 39 years that

I've been doing Extension and Outreach. If anything, CenUSA taught me that this is most important. If you really want adoption, you need hands-on learning experiences. We have a whole youth outreach program too. That was really fun, and again, we tried to build in hands-on learning experiences into the program. If you look at the curriculum, you will find that we had hands-on activities throughout."

Are there any other tools, programs or resources that that could be developed to reach, educate and generally inform those who engage with it?

"Absolutely. When we get these conversion processes commercialized, we'll have to do a lot more of what we did with CenUSA. We created a whole decision tool on the web where farmers can go in and learn about the recommended crops and production practices, plug in their cost of land and fertilizer and such, and evaluate whether it made sense for them to grow it or see if there were other crops for them to grow. We will have to do a lot more of those kinds of things if we really want farmers to grow these crops."

What is the most noteworthy or most interesting facet of your work that you think that the interested members of the general public should know and understand about your work?

"There is a lot of publicly about 'big bad corn,' in Iowa in particular, but recently, a publication about how many people are killed per bushel of corn production was released. It was really drastic, but if you read the fine print of the article, it is the ammonia from the fertilizer we put on corn that combines with the sulfur from fossil fuel emissions from urban cars that creates pollution.

It all comes back to the fact that farmers have an established market for corn and soybeans. They have mortgages to pay and families to support. There are markets for these crops, so that's what they grow. If we want farmers to grow something else, we have to create the market for them, or we cannot expect them to do it."

Read our Biochar White Paper

You need to come up with the right incentives.

"Exactly! Certainly, CRP (Conservation Reserve Program) and other set-aside programs can just take land out of production. That's been done in the past, but our government is in such debt, and the farm bill is stretched so thin, that CRP is likely to get smaller rather than larger. We are really going to have to have markets for these things if we want them to happen. That's the biggest challenge by far."

How will you take your experience with CenUSA and put it to use in future projects?

"I've learned a lot about people and how they learn, and hopefully that will continue to be useful. I don't

quite know all of what I'll be doing in retirement, so it's kind of hard to answer that, but I do intend to maintain relationships with people who are still active in Extension and Outreach. Hopefully, I can continue the dialog about the most effective practices."

Jill Euken CenUSA Bioenergy Work Product

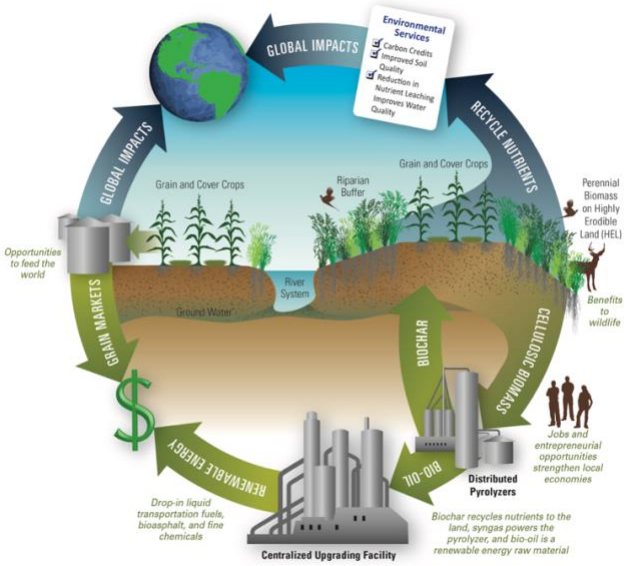
Extension and Outreach/Publications

- ✓ Project Overview: CenUSA Extension and Outreach Perennial Grass Bioenergy Research and Knowhow for Producers, Students and Stakeholders. Jill Euken, Iowa State Univ. Amy Kohmetscher, Ohio State Univ. & Susan Harlow, eXtension. 2017. https://cenusa.iastate.edu/files/cenusa_2019_005.pdf
- ✓ Fact Sheet: CenUSA Biochar Research Efforts. David Laird & Jill Euken, Iowa State Univ. 2017. https://cenusa.iastate.edu/files/cenusa_2019_055.pdf
- ✓ CenUSA Legacy Flyer. https://cenusa.iastate.edu/files/cenusa_2019_100.pdf
- ✓ Instructional Video: CenUSA Legacy Video. 2017. (8:29). https://www.youtube.com/watch?v=yUs_5vOGgAI
- ✓ Moore, K.J., S. Birrell, R.C. Brown, M.D. Casler, **J.E. Euken**, H.M. Hanna, D.J. Hayes, J.D. Hill, K.L. Jacobs, C.L. Kling, D. Laird, R.B. Mitchell, P.T. Murphy, D.R. Raman, C.V. Schwab, K.J. Shinners, K.P. Vogel, J.J. Volenec. 2014. Midwest Vision for Sustainable Fuel Production. Biofuels 5(6): 687-702. doi: 10.1080/17597269.2015.1015312

See Also

- ✓ 2014 Extension Master Gardener's CenUSA Biochar Demonstration Gardens: Is biochar a good soil amendment for home gardens? Lynn Hagen & Julie Weisenhorn, Univ. of Minnesota. 2014. https://cenusa.iastate.edu/files/cenusa_2019_030.pdf
- ✓ Instructional Video: University of Minnesota Extension Master Gardener Biochar Research Summary. Julie Weisenhorn, Univ. of Minnesota Extension. 2014. (4:15). https://www.youtube.com/watch?v=zZX7u5kjLWU
- ✓ Biofuels Harvest Survey Results 2014 – Purdue Univ. Sorrel Brown & Guang Han, Iowa State Univ. 2014. 2014 Purdue Univ. Educational Field Day. https://cenusa.iastate.edu/files/cb88-rep_yr_4_biofuels_harvest_survey_report_-_in_2014.pdf
- ✓ How To: Interviewing an Audience for Feedback on Biochar. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb99-instruct_yr_2_interviewing_an_audience_for_feedback_on_biochar.pdf
- ✓ How To: Retrospective Pre-then-Post Survey Format – Biofuel Producers. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb102-instruct_yr_2_retrospective_pre-then-post_survey_format_-_biofuel_producers.pdf
- ✓ How To: Retrospective Pre-then-Post Survey Format – Master Gardeners. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb101-instruct_yr_2_retrospective_pre-then-post_survey_format_-_master_gardeners.pdf

- ✓ How To: Retrospective Pre-then-Post Survey Format – Youth. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb103-instruct_yr_2_retrospective_pre-then-post_survey_format_-_youth.pdf
- ✓ Human Subjects Review Protocol. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb100-instruct_yr_2_human_subjects_review_protocol.pdf
- ✓ Nat'l Assn of County Agricultural Agents Learn about Perennial Grasses for Biomass. Sorrel Brown & Guang Han, Iowa State Univ. 2015. 2015 National Association of County Agricultural Agents Annual Meeting. https://cenusa.iastate.edu/files/cb93-rep_natl_assn_of_county_agricultural_agents_learn_about_perennial_grasses_forbiomass.pdf
- ✓ Value of Introduction for Outreach Surveys. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb97-instruct_yr_2_value_of_intros_for_outreach_surveys.pdf
- ✓ Webinar/Instructional Video Evaluation Template. Sorrel Brown, Iowa State Univ. Extension. 2012. https://www.cenusa.iastate.edu/files/cb104-instruct_webinar_evaluation_question_template.pdf



CenUSA Bioenergy Vision

Learn more about CenUSA at www.cenusa.iastate.edu