The writing committee appreciates the time and effort that each reviewer has spent on our project submission. The writing committee has addressed the comments below.

Reviewer 1

Comment #1. " While the background and related research show that the participants have the required expertise to conduct the research described in the Methods, the objectives are not approached as specific, hypotheses-driven, researchable problems. What is the specifc Biobased Industry and Economy knowledge gap that each participant's research is addressing and how does it specifically meet the proposed objectives"?

Comment #2. " If the goal is to produce knowledge and technology related to feedstock production, processing, transportation, and conversion then outputs and outcomes as written seem achievable, but need clarification. If the goal is to apply the feedstock and conversion research to demonstrate the processes and systems then the outputs, outcomes, and milestones are poorly defined.

> Assuming that the goal of the project is to produce and disseminate knowledge/technology that others will apply to establish a biobased industry and economy, what are the most crucial problems of feedstock logistics and conversion technology that will be addressed in the next 5 years?
> What are the yearly milestones that will be met that show that the research has yielded technological solutions to these critical issues?
> At the end of 5 years what specific problems will have been solved?
> The measurement of progress is vague and insufficiently defined?
> What metric would a post-project review use to determine success of the 5-year project, a defined number of publications, patents, presentations, specific technological advancements(s), a defined number of processes or systems reduced to practice through demonstration?
> If the goal of the project is application oriented and meant to enable practice, demonstration, or commercialization of developed feedstock logistics and conversion technology, what are the specific yearly milestones?
> What specific feedstocks will be used, how much will be transported, how much will be converted, what fuel or chemical product specifications will be used to determine success.
> The proposal's projected impacts states that the research will enable reduced dependency on foreign-based fuels and chemicals. How, specifically?
> What measureable metric will be used to determine success, amount of feedstock converted, defined amount of fuel or chemicals produced, number of conversion facilities established?
> Again, the projected impact of the research is vague and milestones are not provided. The methods section and companying attachments detail an amalgam of peripherally related individuals pursuits, and it is unclear which of the myriad

participants researchable problems will combine to establish an economically feasible, biomass to biobased products conversation processes.
The proposal lacks management strategies and procedures, including go/no go decision gates for specific research avenues, associated targets/metrics, and risk mitigation (contingencies) for unsuccessful research avenues.
Again, the proposal's objectives are too expansive, non-specific, and lack milestones metrics to determine success.

These comments are excellent. The group recognizes that some sort of focus must be put in place; however, given the diverse nature of a Multi-State project, having a managerial structure with 'go/no go decisions' is not realistic. We have, therefore, proposed a structure where each year we will decide, as a group, which 'problem of the year' we will be tackling. Problems could include: determining yields of a selected energy crop in stations that represent a diversity in terms of climate and soil conditions; control the conversion of biomass into a fermentable sugar stream using different processing technologies and conditions; build durable and sustainable relationships to ensure that developed on-line courses are well attended; or, develop a systems approach to feedstock handling and processing to ensure maximum production of fermentable sugars. Members of this Multi-State project will parcel out who works on which aspect of the problem. Our annual Symposium will serve as a platform to disseminate the results of this research. Additionally, a White Paper, a review article or a scientific paper will be prepared to reflect the progress made in this area. Please see page 21 of revised proposal for description of this implementation.

Comment #3. " The objectives seem extremely far reaching for a 5-year project. The concern is that the project is too expansive and all-inclusive and that metrics for output and outcome (projected impact) assessments are not clearly defined.

Comment #4. Potential for significant outputs (products) and/or impacts. The outputs and outcomes are vaguely stated and it is hard to determine their significance for practical application in establishing a Biobased Industry and Economy. Specific yearly milestones and related target/metrics are needed.

If the goal is to produce knowledge and technology related to

Comment #5. Overall Technical merit.
It is evident that the listed participants possess the expertise and technical capabilities to conduct quality research pursuant to the proposed objectives. What is lacking is evidence of a managerial structure to organize and evaluate the individual participant's progress and assemble the participant's progress and assemble the participant's accomplishments into a technical and economically feasible biomass to biobased products (seed to tank/shelf) process.

Reviewer 2

This has been a successful multi-state project that involves a broad group of experts from key land grant universities. Thus, this project should be allowed to continue with appropriated federal and state funding support.

This group of researchers did not give itself enough credit for the development of the BST graduate certificate which was the result of a successful grant from the USDA Higher Education Challenge Grant program. Faculty have worked together well to develop and launch the program during the past project cycle. The objectives are reasonable and achievable. Including Objective D that outlines tasks related to education of undergraduate and graduate students, extension to biomass producers, and outreach to bio-industry stakeholder is a critical component of this multi-state project. The BST certificate needs to be more effectively marketed among all multi-state partners and as a result gain greater popularity among graduate students. Each graduate student of each of the multi-state project researchers should be encouraged to take some of these courses and most should complete the certificate.
This has been noted. Please see page 20 of revised proposal for updated information.

Unfortunately, the Outreach Plan section of the proposal is weakly developed and mostly emphasized peer publications. It should be better developed and tied in with Objective D, which represents important outreach efforts.
We are adding the launching of a web site and an electronic Newsletter to our Outreach Plan in order to provide another avenue for dissemination of results. Please see page 22 of revised proposal for description of the proposed website.

The CRIS database search should also have yielded the NC-213 project, which includes and aspect of bioenergy coproducts properties, handling, transport, storage and utilization. This ties in complementary with this project with little overlap. Outcomes generated are truly impacting feedstock producers such as farmers and users such as biorefiners, as well as allied equipment and service suppliers who should have a stakeholder interest in this multi-state project. That is the primary reason why this reviewer could only give the project a (weak) good with respect or significance of outcomes and impacts. If stakeholders are strongly involved and attend the annual meeting then it should be mentioned in the proposal and this criticism would not apply. If stakeholders are not engaged, then project leaders and participants should begin to spend more effort on connecting with and engaging the industry.
Activity in NC-213 has been noted. In fact, we are going to use the NC-213 web site as a drawing board for our web site. Please see the augmented outreach plan on page 22 of revised proposal.

Our annual Symposium will be re-designed to incorporate Stakeholders. Please see page 21 of revised proposal.

Additionally, this is a heavily focused engineering project that would benefit from the involvement of other scientists, especially economists and social scientists. Ag economists are needed to quantify these efforts with respect to economical viability and

sustainability, and social scientists are needed to quantify these efforts with respect to the prospect of willingness to adopt by producers.

Our annual Symposium will be re-designed to further incorporate economists and social scientists. Please see page 21 of revised proposal.

The listing of participating stations seems to miss Kansas!
This has been noted.

Reviewer 3

This multi state program addresses the production of alternative fuels, chemicals, and materials from biomass, targeting a national priority of reduced dependence on petroleum. The PIs provide a sound justification of the need for this line of research, and make a convincing case for the potential impact of the program. Importantly the program clearly builds on the progress of the earlier project (S-1041) while taking into account related work and other funded projects. Also by recognizing recent changes in the energy landscape with the increased availability of natural gas, the project incorporates new directions that complement current efforts and should ultimately advance the information needs for expanded use of biomass.

The proposal describes an ambitious effort that conducts work at virtually every operation along the supply chain, a structure that instills the opportunity for collaboration and integration of tasks being conducted at the individual institutions. The level of coordination is not entirely apparent; however, evidence of cooperation in the prior project lends some degree of confidence that this will, in fact, occur.
We are proposing a structure where each year we will decide, as a group, which 'problem of the year' we will be tackling. This will enable to coordinate our research efforts. Please see page 21 of revised proposal for description of this approach.

Specific areas where added value of the research can occur include coordinated yield trials of new energy crop varieties, performance evaluation of biomass in different pretreatment technologies and conversion platforms, and life-cycle analyses. A more integrated approach to these challenge areas will significantly increase the impact of the program well beyond those results generated by the highly innovative research described.
We feel that this can be achieved through increased focus on an annual challenge area as previously described, and included on page 21 of revised proposal.

An additional strength of the program comes through the team's recognition of education and outreach as a need. In advancing this new industry sector that is solidly based in chemical sciences and engineering, workforce training and outreach to a portfolio of customers is a vital element.

We have emphasized this aspect through additional comments on page 20 of revised proposal.

This multi-state program brings together an incredibly powerful team of scientists and researchers. It incorporates innovative science and technology approaches to an array of challenges and information needs along the supply chain. It also describes creative approaches to new chemicals and materials, as well as fuels that will unquestionably move the nation away from its petroleum dependence. I strongly recommend support of this important work.