



U.S. Department of
Agriculture
National Institute of
Food & Agriculture



**Project Title: Biochars from Excelsior Woody Biomass
Residues for Improved Poplar Production**

DR. CATHERINE BREWER

Goal

The long-term goal of this research is to improve the sustainability of the excelsior industry and the local forestry and agricultural systems by creating material movement cycles between forest, farm, and factory.

Objectives

1. Compare the ease of processing, yield, and quality of hybrid poplar wood for making excelsior compared to aspen wood.
2. Identify and quantify the residues from the excelsior process and associated products that could be used as feedstocks for thermochemical processing.
3. Identify excelsior process improvements enabling incorporation of farm products (i.e. poplar, agricultural residues) into final product and on-site use of energy from residue thermochemical processing.
4. Determine the yields and properties of biochars made under varying pyrolysis conditions from available excelsior residues.
5. Optimize pyrolysis conditions to produce residue biochar with properties suitable for alkaline soils, namely, biochar with a neutral to acidic pH and minimal salinity.
6. Quantify hybrid poplar establishment and growth improvement when growth media/soil is amended with excelsior residue biochar.



PI:

Dr. Catherine Brewer
New Mexico State University
**Chemical and Materials
Engineering**

Co-PIs:

Dr. Michael O'Neill
Dr. Delia Valles-Rosales
New Mexico State University

Co-PIs:

Mr. Fred Christiansen
Western Excelsior
Corporation

Funded: \$149,995

Start Date: 09/01/2016

End Date: 08/31/2018

Expected Outcomes

This project creates opportunities to close product and supply loops at the forestry and field crop agriculture interface. Expected outcomes from this project include a graduate student well trained in biomass production and processing with industrial and research experience; an undergraduate student with research experience in thermochemical conversion and sample chemical analysis; manufacturing process, renewable energy, and raw material handling improvements at WEC; two years of poplar growth and biochar-amended soil research data; a poplar-excelsior-biochar material flow model that can be used for other biomass product and biopower scenarios; research result dissemination through multiple avenues; and a strengthened collaboration between NMSU, ASC and WEC to pursue future biomass utilization opportunities.