

Expertise Areas

- Biomass and feedstock process engineering
- Biomass physical properties and quality
- Biomass storage
- Postharvest and agricultural process and food engineering
- Mathematical modeling and numerical simulation
- Machine vision and computer applications in agricultural engineering
- LaTeX documentation system for journal articles and extension publications
- Innovation in research

Current Research

- Energy beet front end processing for biofuel industry development
- Affected woody biomass utilization pathways
- Biomass and bioproducts physical, mechanical, thermal, hydration properties, and quality
- Machine vision based wool fiber thickness determination and grading
- Size reduction and separation of biomass
- Biomass densification and packaging
- Mechanical preprocessing methods of feedstock
- Physical, mechanical, and thermal properties of biomass products
- Machine vision applications for dimensional, size distribution, volume estimation, and grading products
- Thermal processing and energy densification of biomass
- Biomass feedstock logistics
- Economic aspects of biomass preprocessing and delivery

Current and Recent Project Grants

- Image Processing Based Wool Testing System. 2013-2014. American Wool Council. Total grant: \$22,000. Awarded November 2012. PIs: Reid Redden, Igathinathane Cannayen, and Christopher Schauer.
- Mechanical, thermal, and storage characteristics of biomass. 2012-2013. Specific Cooperative Agreement between USDA-ARS and NDSU. Awarded November 2012. Total grant: \$17,000. PI: Igathinathane Cannayen.
- Flood Affected Wood Biomass Utilization Opportunities in North Dakota. 2013-2014. US Forest Service and Cooperative Forestry Assistance. Awarded September 2012. Total grant: \$73,570. PI: Igathinathane Cannayen.
- Energy Beet Research, Phase II. 2012-2014. Renewable Energy Program, North Dakota Energy Commission. Total grant: \$1,000,000. Front End Processing (FEP) component share: \$194,972. Awarded January 2012. PI: Lloyd Anderson; FEP lead and Co-PI: Igathinathane Cannayen, and Co-PIs for other project components.
- Environmental and Economic Consequence of Biomass Feedstock Production in The Northern Great Plains. 2008-2013. Specific Cooperative Agreement between USDA-ARS and NDSU. Total grant: \$ 24,390. Award PI: Timothy Faller; Project PI: Igathinathane Cannayen (Status: Completed).
- Biomass Testing Laboratory for Physical and Thermal Characteristics of Feedstock of North Dakota. 2010-2012. Renewable Energy Program, North Dakota Energy Commission. Total: \$450,000. Awarded April 2010. PI's: Igathinathane Cannayen and Cole Gustafson (Status: Completed).