

DAKOTA HOPS PROCESSING TRAILER PROJECT

Project Sponsor / Client: Dakota Hops, LLC

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Project Term: Spring 2013 – Fall 2013

SDSM&T Project Program: Industrial Engineering & Engineering Management

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Project Overview:

Dakota Hops, LLC. was formed to investigate the production feasibility of frozen hops for specialty home brew and microbrew beers in the State of South Dakota. The typical industrial process for the production of hops requires them to be kiln-dried at approximately 145°F for 8 – 10 hours until the water content is reduced to under 10% by weight. This drying process has the side-effect of reducing acids and oils desired by specialty brewers. The alternative processes under consideration are to vacuum seal and freeze the hops either conventionally or cryogenically . The processes are being investigated in an SBIR grant at the start-up phase, and the process(es) developed must be scalable for small- and medium-sized agribusinesses. As such, we have an immediate need to further develop prototype processes, test and collect data, and analyze and document best-practices and work procedures to meet USDA standards.

For the Processing Trailer Project the firm is seeking the following deliverables:

- Use the existing Operations Process Charts and Value-Stream Analysis of the planned frozen hops processes to identify and select appropriate purchased processing equipment for a trailer portable system
- Design and prototype a “bolt-on” framework for housing the purchased processing equipment to a purchased trailer frame

- Develop process metrics for quantifying process operations
- Test prototype production of the trailer-mobile workstation(s) for the process

Project Interfacing:

In order to meet the requirements for further SBIR development funding, this project will need to address productivity, repeatability (statistical quality control), safety (identify and address USDA standards), and storability. This project will need to coordinate with the business model project to inform decisions on product parameters for cost/producibility and distribution logistics. It is expected that the team will need to allow one and a half hours every other week (outside of scheduled reporting) for interfacing with Dakota Hops.

Project Team Requirements and Deliverables Description:

This project will require a team of approximately three to four senior design students, some of which may be multidisciplinary. Software to document the processes will be selected by the student team, and may include MS Excel, Visio or other SDSMT-available packages.

The following deliverable items are expected for this project:

Selection of Processing Equipment and Design of Trailer Framing – identifying the specific machines to be used for performing work, and the bolt-on framework for a trailer to transport the hop-freezing process(es).

Process Operations Experiments and Process Metrics – using the process equipment, identify and develop additional industrial experiments, develop a spreadsheet-based system for collecting and analyzing relevant data, and generate process instructions to quantify production metrics

Develop Prototype Trailer Production Workstation and Test Production Methods – design and prototype any necessary “right-sized automation” the team thinks necessary, demonstrating and documenting its’ use.

These items are expected within the time frames and along with the other deliverables described in the Industrial Engineering and Engineering Management Senior Design Projects document. That document provides a more complete description of the process, deliverables, and timing of SDSM&T IEEM Senior Design Projects.