The use of biofuels in the United States has increased dramatically in the last few years. The largest source of feedstock for ethanol to date has been corn. However, corn is also a vitally important food crop and is used commonly as feed for cattle and other livestock. To prevent further diversion of an important food crop to production of ethanol, there is great interest in developing commercial-scale technologies to make ethanol from non-food crops, or other suitable plant material. This is commonly referred to as biomass.

A review is made of lignocellulosic sources being considered as feedstocks to produce ethanol. Current technologies for pretreatment and hydrolysis of the biomass material are examined and discussed. Production data and cost estimates are culled from the literature, and used to assist in development of mathematical models for evaluation of production ramp-up profiles, and cost estimation. Costs for labor, capital, operations and maintenance, feedstock, raw materials, and credits for ethanol production are considered and modeled.

The production and costs as a function of time for a 25 million gallon capacity cellulosic ethanol plant are evaluated in MATLAB with a deterministic, continuous system simulation model. Simulation results for a high, medium, and low cost scenario are included. Assumptions for the model and for each scenario are included and proposals for reducing costs are introduced. Limitations and shortcomings of the research activity are discussed, along with recommendations for potential future work in improving the simulation model, and model verification activities.

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The public is welcome to attend.