Economic impacts of producing renewable aviation fuel from cover crops: A case study using pennycress as the feedstock

Burton C English[1], **Evan Markel**[2], **R Jamey Menard**[1] and **Chad Hellwinckel**[1]
[1]University of Tennessee, USA
[2]EY, Seattle, USA

In 2015, prior to the climate talks in Paris, the Obama administration wanted to take steps to limit the greenhouse gas emissions from airplanes, after EPA had declared that the aviation emissions contribute to global warming and endanger human health. EPA deferred any ruling until seeing the report of the UN's International Civil Aviation Organization (ICAO). The use of renewable jet fuel has the potential to decrease fuel-price uncertainties, thereby decreasing fuel-hedging costs and decreasing profit volatility. The United States Government is actively supporting the development of renewable jet fuels. As of 2015, the standard setting organization, ASTM International, has approved five renewable jet fuels for use in aviation. This analysis examines the potential for pennycress (*Thlaspi arvense*) to support a renewable jet fuel industry in the United States. The objective of this study is to examine the economic feasibility of a pennycress to renewable aviation fuel plus evaluate the potential economic impacts this industry could have on the US economy. To conduct the analysis, two models are used – POLYSYS and IMPLAN. The output from POLYSYS is used to develop economic impact input data for IMPLAN. Partial equilibrium simulation results from POLYSYS suggest that pennycress has the potential to supply approximately 800 million gallons nationally to an alternative aviation fuel industry. The economic impact of this industry has the potential to increase national economic activity by almost $19 billion and add 66,000 jobs. Many of these jobs will occur in rural areas; therefore adding value to pennycress seed by converting the oil into biofuel could enhance rural American economies.

Biography

Burton C English has been evaluating renewable energy issues since 1978. His areas of concentration include market evaluation, supply chain feasibility and economic and environmental impacts of the supply chain. These are critical components to evaluating sustainability of the catalytic systems tailored for the structural features of biomass and its hydrocarbons. Our program evaluates supply chain costs and compares these costs to breakeven analysis of products. In addition, since 2005 we have evaluated the market size for chemical building blocks. Feasibility analysis and tradeoffs analysis between significant environmental and economic variables has been his particular interest. In addition, incorporation of the effects of risk parameters on the supply chain, economic impacts to the communities and techno-economic evaluations of the conversion system have been areas of interest.

benglish@utk.edu

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