

LIFE-CYCLE ANALYSIS OF SMALL-SCALE ENERGY SYSTEMS UTILIZING OILSEEDS GROWN IN THE MIDWEST

Seth Fore*, Paul Porter, and William Lazarus

University of Minnesota

As the concern over price and supply of petroleum continues to increase, there are burgeoning efforts to find alternative sources of renewable fuel. Oilseeds commonly grown in the Midwest can be crushed on-farm to create vegetable oil and meal that can be utilized in numerous ways to decrease producers' demand for petroleum and feed products. Vegetable oil can be converted to biodiesel, run straight in diesel engines, or used as a heating fuel. The meal counterpart can be used a high-value protein substitute in livestock rations or can be burned in pellet stoves for heat generation. As alternative methods for producing renewable fuels emerge, it is important that complete life-cycle accounting measures are implemented to ensure there is a positive net energy balance over the petroleum product replaced. There is a need to conduct life-cycle analysis on small scale on-farm oilseed crushing systems to substantiate whether there is a positive net energy balance gained through utilizing oilseed crops grown on-farm as a replacement for fuel and feed.

KEY WORDS: small-scale energy production, life-cycle analysis, biodiesel, straight vegetable oil

*Corresponding author: University of Minnesota, Department of Agronomy and Plant Genetics, 1991 Upper Buford Circle, St. Paul, MN 55108; Phone: (701) 212-6625; Email: fore0046@umn.edu