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Engineering Economic Analysis of a Cotton By-Product Fuel Pellet Operation

Authors: Greg Holt, James Simonton, Mario Beruvides, and Ana Maria Canto

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In the 2001 crop year, the United States produced approximately 19.8 million bales of upland cotton. From the bales produced, there was an estimated 2.9 million t (3.2 million tons) of waste generated in the ginning process. Moving cotton by-product from a liability to a source of income would be a positive strategy for ginners, oil mills, the textile industry, and producers. Processing cotton by-products into fuel pellets would furnish a renewable resource that could be used to reduce the consumption of fossil fuels, while having a minimal impact on the environment. The objective of this study was to explore the cost feasibility of creating a fuel pellet manufacturing operation utilizing cotton gin byproducts. In order to conservatively address key elements, such as marketing, transportation, and manufacturing, an economic model was developed and evaluated assuming a worst-case scenario. The cost system model was developed and analyzed to examine the factors influencing the sensitivity of critical areas such as cost and profits. The cost system model simulated changes for 24 cost variables associated with the proposed fuel pellet operation. Results from the analysis indicate the probability of obtaining a 15% return on investment as 29.95 or 54.4% depending on whether the product was shipped to various distribution hubs via truck or rail, respectively. Based upon the information contained in this study, it appears that a fuel pellet operation can be a viable means of utilizing cotton gin byproducts to enhance revenue.