CAN BIOCHAR LINK FOREST RESTORATION WITH COMMERCIAL AGRICULTURE?

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Key words: Forest biomass, Biochar production costs, Carbon balance, Forest restoration

For the potential benefits of biochar to be fully realized, it must be produced economically in high volumes and close to stable markets. The author is part of a research team conducting an examination of the economic feasibility of linking forest restoration with commercial agriculture in a specific region of Oregon, USA through large-scale production of biochar made from forest biomass at a dedicated plant site. The focus of this presentation is the biochar production economics and carbon impacts associated with two different biochar conversion technologies, four different biochar plant configuration scenarios, and 2 potential plant locations. In all cases, the hypothetical biochar plant is designed to receive 50,000 bdt (bone dry tones) of logs per year generated through forest restoration treatments for conversion into a grade of biochar intended to enhance soil moisture retention and growth-response of high-value crops grown commercially in the region.
The capture and re-use of energy and condensable by-products in the pyrolysis gases generated during biochar production has a significant influence on the plant's complexity and cost structure, as well as it's carbon balance. A simple plant design scenario around purchased energy and flaring of all gases has the lowest establishment costs, but higher operating costs and lower carbon benefits than more-complicated scenarios that capture condensable by-products and thermal energy for drying, process heating, an/or electricity generation. Locating the plant within an existing wood products mill provides several operational and economic advantages over a stand-alone facility. How all these plant design considerations influence the final production cost of the biochar product will be discussed.