

BIG BOX BIOCHAR: SCALED-UP, IN-WOODS BIOCHAR PRODUCTION

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Big Box biochar kilns are an alternative to open pile burning that allow for in-woods biochar production in a simple metal box with no moving parts. This approach is based on technology used by charcoal makers for centuries, but with a modern, mechanized approach. A mini-excavator or other piece of machinery is used to operate the kilns.

The Utah Biomass Resources Group (UBRG) started developing Big Box biochar kilns in 2019 with a Utah Public Lands Initiative Grant. The UBRG has focused on in-woods biochar production and application since 2011. We have focused on simple kiln technology since 2017 with our Oregon kilns which are 1.4 cubic meters in volume. Big Box kilns are 10-20 cubic meters in volume, or about 14 times the volume of Oregon kilns. We partner with the Utah Bureau of Land Management to continually test and improve the kilns and the method of production. Since first being introduced in Utah, Big Box Biochar kilns are being adopted in Colorado, Montana, New York, Wisconsin, Massachusetts (Harvard University), and Texas, as well as Canadian provinces Alberta and Saskatchewan.



One of these kilns is capable of making upwards of 30 cubic meters of biochar in a day, they cost less than \$10,000 USD to build, and have no moving parts. Multiple kilns can be run in the same location by a single machine; increasing productivity to more than 100 cubic meters of biochar per day. These kilns have produced biochar in all weather conditions, using a dozen types of woody feedstock, and from pieces as large as one meter in diameter and three meters long, without any feedstock preparation. The biochar we produce from these kilns is in the 85-87% organic carbon range and has ash content below 20%. This presentation will outline Big Box biochar kiln best practices including the design, transportation, placement, loading, lighting, quenching, dumping, and safety procedures.