Qualterra – Scalable biomass processing technologies for sustainable agriculture

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QUALTERRA: Scalable Biomass Processing Technologies for Sustainable Agriculture

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OVERVIEW

Qualterra is a U.S.-based agriculture-technology company (Pullman, Washington) that strives to develop innovations to support sustainable agriculture. In alignment with this mission, we have pioneered a patented Biomass Processing Unit (BPU) technology that processes any agricultural biomass waste into unique, consistent-quality formulations of biochar while generating renewable energy.

Each Qualterra BPU is housed in a rugged, modular shipping container and combines time-tested gasification and energy generating processes with modern, automated control systems, and they are adaptable to accommodate a variety of biomass types and site requirements. During the gasification process, the BPUs generate renewable energy as syngas that can power a generator, deliver energy to a boiler system, and/or heat a facility located adjacent to the processing unit.

The biochar produced from the BPU operations is a stable carbon sequestration medium that imparts improved water and nutrient holding capacity, aeration, and microbial activity when used to amend agricultural soils. These improvements enable plants to use less water and fertilizer while increasing resilience to stresses. The water and nutrient holding capacity represents an important climate adaptation benefit as drought and high temperature conditions become more prevalent.

The scalable and portable nature of the BPUs makes them ideal for positioning at sites of prolific agricultural activity, where large amounts of crop waste are generated. This waste can be converted into biochar and reapplied to the fields/orchards to bolster crop and soil health.

Overall, Qualterra’s BPU technology and biochar products offer a comprehensive solution for modern production and recycling challenges in agriculture. As we continue to promote and expand on this technology, Qualterra aims to establish the foundation for broad adoption. These efforts are directed towards propelling the agricultural sector into a more sustainable and resilient future.

BIOMASS PROCESSING & CARBON SEQUESTRATION

NEXT-GENERATION BIOMASS PROCESSING

Key Features:
- Cleanly eliminates biomass waste
- Designed for high-silica field residues to produce unique biochar derived from crops
- Controlled parameters for consistent biochar product
- Deployable, portable and scalable to meet demand
- Fully autonomous, continuous feed gasification system
- Eliminates waste and produces renewable energy
- Designed for high-volume manufacturing
- Technology covered by 3 US patents

Annual Biochar & Energy Output: In a typical year, one BPU can:
- Sequester and offset 664 tons CO₂
- Process 408 metric tons of biomass (450 US tons)
- Produce 650 m³ of biochar (850 yd³)
- Generate 570,000 kWh energy

BIOMASS PROCESSING UNIT SPECIFICATIONS

Dimensions: 640 cm x 256.5 cm x 426.7 cm (21’ x 8’ 5” x 14’)
Input: Chopped biomass
- Usable power output of 75 kW
- 45-68 kg/hr (100-150 lbs/hr)
- Less than 20% moisture
Output:
- Activated Biochar
  - 9.1–13.6 kg/hr (20-30 lbs/hr)
- Syngas
  - 30–60 cfm
- 10% – 20% H₂ content
- Usable power output of 75 kW

Agricultural Regeneration Station Concept:
Qualterra has established a first-in-kind Agriculture Regeneration Station (ARS) to demonstrate how the BPU technology integrated with an agriculture operation can serve as a full-lifecycle approach to sustainably processing biomass waste, sequestering carbon, generating renewable energy, enhancing crop production, and improving soil health.

Biochar Trials Demonstrate Beneficial Impacts:
Multiple crop production trials using Qualterra’s Ag Biochar are underway in Washington State, USA. Results of this work have shown that Ag Biochar results in the following benefits:
- Enhanced activity of beneficial soil microbes
- Improved fruit biomass in tomatoes (results varied by genetic background and biochar type)
  - Study conducted at Washington State University, manuscript in preparation.
- 10% increase in tree canopy density in apple and cherry orchards; significant increase in caliper of newly planted apple trees
  - Trial ongoing at collaborating farm.
- 100% increase in cone production in hops
  - Trial ongoing at collaborating farm.

PARTNER WITH US TO SOLVE SUSTAINABILITY CHALLENGES:
Qualterra has roots in University R&D at Washington State University and Texas A&M University. We have volumes of data and knowledge combined with a world-class, multidisciplinary team of experts in science, horticulture, engineering, and business. We invite you to partner with us so that together we can generate innovations and solutions to today’s biggest agricultural and sustainability challenges.

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