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» THE NEW BLACK GOLD

Why Biochar Is Key to Forestry’s Future

By Jeanne Harmor, NCEA Director of Communications

In the last couple of months, how many times have you heard of or read about biochar? Chances are, at least once. Biochar is plastered across headlines and news surrounding agriculture and the latest innovations in forestry.

But... what is it?


Biochar is a charcoal-like substance that’s made by burning organic material from wood and other biomass waste. When properly produced, biochar is a powerful soil amendment that can regenerate and condition soil, increase agricultural yields, and sequester carbon.

The NCEA recently spoke with John Fletcher, owner of Suncrest LLC and one of North Carolina’s few biochar producers, to better understand biochar’s growing role in forestry’s emerging markets.

Expertise Meets Opportunity

John Fletcher is no stranger to the forestry industry. Upon graduating from Denison University, Fletcher operated a sawmill for 10 years, incorporating logging into his business model. His background includes working for the NC Forest Service, showcasing his expertise through projects featuring best management practices (BMPs).



 The Tigercat 6040 Carbonizer operates in Waynesville, NC. Suncrest LLC is a biochar producer in western NC.

In 2009, he and his family purchased the Canton Sawmill and ran it until tariffs and market fluctuations brought challenges to the table. Meanwhile, Fletcher grew his logging business and made the decision in 2018 to purchase a chip mill. In its prime, the chip mill processed 4,500 tons of chips per week. When COVID-19 hit in 2020, chip production slowed immensely, and Fletcher's business contracts were suddenly cut short. Then, in 2023, Pactiv Evergreen closed, resulting in a massive hit to the forestry industry in Western NC.

Upon the heels of the mill closure, Fletcher's son, a Clemson forestry graduate, continued running their logging business on the side — but Fletcher knew he needed to start investigating other options for revenue opportunities.

Biochar Enters the Chat

In 2024, Tigercat had just released a limited inventory of its newest creation, the Tigercat 6040 Carbonizer, an advanced, cost-effective, and environmentally appealing wood debris conversion system. The machine sequesters carbon for beneficial reuse while reducing the total fiber volume onsite. This sophisticated machine can't be run by just anyone — its operator truly needs to know the ins and outs of the machine, understanding both the biochar process and the safety requirements within.

Fletcher was intrigued by this machine and knew that, given his background and experience, he was the right person to operate it. Considering the area's recent devastation brought forth by Hurricane Helene, he knew it would be a crucial tool in more ways than one.

With the help of a state-led grant, Fletcher leased the machine and has been using it ever since, proving its worth as a solution to the forestry industry's market and environmental challenges.

Is Biochar New?

Although biochar has more recently entered the stage, the truth is that it has been used in various forms of agriculture for thousands of years. Like today, biochar was first and foremost used as a form of charcoal mixed into soil to strengthen its retention of nutrients and water. The practice of using biochar allowed for productive crops in nutrient-poor soils, improving land production and increasing food supply.

The historic method of creating biochar was to simply pile and cover wood, allowing it to burn slowly with limited air. This method, still used today in some developing



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countries, creates considerable smoke and is not the best approach as it compromises air quality, leading to human health impacts. Through new patented technology made possible by the 6040 Carbonizer, biochar is produced in an environmentally friendly way that limits emissions.

With the rising emphasis on identifying effective strategies for addressing climate change, growing energy demands, and excessive biomass waste, biochar has been “rediscovered” by industry experts as a revolutionary substance with an incredible amount of potential.

“Biochar is very boutique in nature,” said Fletcher. “Markets are starting to open up, and we are beginning to see biochar as a viable solution to many of the challenges our industry is currently facing.”

How Does It Work?

Fletcher describes the biochar process with enthusiasm.

“The 6040 Carbonizer is a mobile, robust machine, weighing about 87,000 pounds,” said Fletcher. “The machine will not accept small pieces of wood like chips and mulch, as they will fall through the grate. You can add wood slabs up to 18 feet long into the system. The wood material

“PLANTS CAN STAY ALIVE UP TO 50% LONGER IN DROUGHT CONDITIONS WITH BIOCHAR APPLIED TO THE SOIL.”

– John Fletcher, Owner, Suncrest LLC

is processed at 1,200 degrees F, and the output resembles little pellets. When it is finished, augers push the material to a conveyor where it is cleaned and cooled, then stored in totes.”

He mentions that he has had the product tested, and it is about 92% pure carbon when the process is finished. His goal is to produce two tons of biochar per hour, one that he is very close to achieving.

“There are several applications when it comes to using biochar,” said Fletcher. “Biochar can be used as a water filtration product, or it can be used as a soil amendment to absorb the toxins that are preventing farmers from capitalizing on their crop yields. The carbon is held in place, which helps plants to survive natural disaster situations and bad weather

patterns. Plants can stay alive up to 50% longer in drought conditions with biochar applied to the soil.”

Market Viability and Opportunities

The machine reduces organic wood waste by 90%, which Fletcher believes would be a great solution for a landfill or a massive clearing job. On a much larger scale, this technology would be a much-needed solution for clearing the wood debris from Helene.

The machine, however, is extremely costly, which can be a barrier to entry for many interested in contributing to biochar production.

“We’ve seen firsthand how a natural



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disaster like Helene can negatively impact the forestry industry in western NC and beyond,” he said. “It would benefit all communities involved if FEMA approved biochar as part of a recovery plan to handle storm debris. We need funding so more people can contribute to the effort, and so that more data can be produced to prove its success and efficacy. The machine’s contributions to its surrounding communities are exponential, helping clear storm-ravaged areas, and the product it creates can be applied to the soil that is producing the area’s food supply. With this approach, we are solving many challenges at once, with as little waste as possible.”

The supply and demand of forest products is subject to an ever-fluctuating market landscape. Mills are starting to evaluate their business models to better understand what changes will keep them afloat and thriving for years to come. With the dwindling demand for pulpwood, companies might see biochar as one of their solutions, opening a new market opportunity.

“A carbonizer machine uses four gallons of diesel fuel per hour, whereas a typical grinder at a mill uses 40-60 gallons,” said Fletcher. “This is a huge difference in resources and shows that running a biochar machine is more

economical in the long run. This path can open doors for many mills seeking to diversify their business offerings.”

Looking Ahead

Fletcher aspires to make biochar production his full-time job. He currently has some contracts with agricultural operations and hopes the business will grow from there.

“We need to make enough material, and at a fast pace, so we can put biochar on the market,” said Fletcher. “When we show success with our process, business markets will start to open, and we can scale this operation.”

Industry experts agree that biochar has officially graduated from a “high potential” product to one that has “real-world adoption” qualities. Universities across the country are conducting studies on biochar to fully understand its positive impact on different crops, as well as its benefits in other areas, such as water quality.

“Biochar is considered brand-new to the forestry industry, and we need to be the first ones at the table,” said Fletcher. “We didn’t see a use for this in the past, but it is proving to be a real viable option for us now. The forest products industry has had its ups and downs, but the need to practice good forestry has never changed.” ■

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– John Fletcher, Owner, Suncrest LLC

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