Forest Service
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Although similar to charcoal, biochar is used for nonheating applications and is produced much more sustainably. Courtesy photo provided by Heather Nobert, Nebraska Forest Service

Biochar Initiative Sweeping Across the Great Plains

When Heather Nobert was a graduate student at West Virginia University, she was introduced to biochar, an organic material used in reclaiming landscapes scarred by coal mining. This introduction, she says, soon turned into a passion for the possibilities of biochar.

Today, Nobert is a forest products specialist with the Nebraska Forest Service. She explains that biochar is produced by burning organic material from agricultural and forestry wastes (i.e., biomass) in a controlled and sustainable process. “If you ever made a campfire, you created a simple biochar,” she says. In addition to its ability to sequester carbon, biochar improves soil nutrient and moisture retention, provides habitat for soil microorganisms, and enhances plant growth and yield. Biomass generated from the removal of invasive and aggressive native species, forestry thinning, and storm-damaged wood debris can provide the fuel to create biochar.

Building Appreciation through Education and Financial Support

In 2017, Nobert, along with her colleagues in the Nebraska and Kansas Forest Services, the University of Nebraska-Lincoln (UNL), and other private and public partners, launched the Great Plains Biochar Initiative (GPBI). GPBI, funded in large part with a series of grants through the U.S. Department of Agriculture (USDA) Forest Service Wood Innovations Grant Program, seeks to improve biochar awareness and market development in the Great Plains.

Among other activities, the funding is used to promote GPBI through technical assistance, publications, educational workshops, and community engagement, including informal “Char Days,” where participants gather to make biochar and learn about its myriad uses. Nobert notes that much of the $220,000 Wood Innovations grant was used in 2018 and 2019 for passthrough biochar grants. Available to individuals, businesses, and organizations, the grants provided up to $5,000 in funding for biochar production and utilization projects.

The Present and the Future of Biochar

Biochar has been used in a number of recent projects, including to improve soil health and tree growth in compacted urban soils; in a green roof at the UNL's Recreation and Wellness Center; and in a variety of agricultural crop trials (as a soil additive) across the State. Teams are also exploring how biochar can improve water quality, particularly in waterways with urban runoff.

Recently, GPBI has expanded its work with the students and faculty in the Animal Sciences Department at UNL, thanks to an additional $250,000 of Wood Innovations funding. The ongoing trial is exploring the use of biochar as a cattle feed additive, including its potential in reducing methane and carbon dioxide emissions. The project has generated a lot of interest in Nebraska, where agriculture is the primary industry and cattle production represents the largest segment of that industry.

In 2018, the Nebraska Forest Service completed an indepth forest inventory, providing the basis from which to analyze the State's sustainable biomass supply. "This information was super helpful in understanding what we have available for harvest," says Nobert. She adds that GPBI has "lots of moving parts," including developing biochar production facilities, moving biomass from the landscape to these facilities, exploring new markets, and promoting existing biochar opportunities in a manner that is both environmentally sustainable and economically beneficial.

Information on the GPBI can be found at https://nfs.unl.edu/great-plains-biochar-initiative

More Information

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FAST FACTS

- Biochar is produced by thermally processing organic material from agricultural and forestry wastes (i.e., biomass) in a controlled and sustainable process.
- Biochar sequesters carbon, improves soil nutrient and moisture retention, provides habitat for soil microorganisms, and enhances plant growth and yield.
- Biomass generated from the removal of invasive and aggressive native species, forestry thinning, and storm-damaged wood debris can provide the fuel to create biochar.
- Biochar has been used in trials to improve soil health and tree growth in compacted urban soils; in a green roof at the UNL's Recreation and Wellness Center; and in a variety of agricultural crop trials (as a soil amendment) across the state.
- Investigators are also exploring how biochar can improve water quality, particularly in waterways with urban runoff.
- GPBI has expanded its work with the students and faculty in the Animal Sciences Department at UNL. The ongoing research is exploring the use of biochar as a cattle feed additive, including its potential in reducing methane and carbon dioxide emissions.

Biochar is increasingly used throughout the Great Plains as a soil amendment. Courtesy photo provided by Heather Nobert, Nebraska Forest Service