



Windbreaks Find New Life Below Ground

NORTH DAKOTA

Aging windbreaks have left the state of North Dakota with an overabundance of wood residues from windbreak management. These wood residues are not suitable for traditional forest product uses, but the North Dakota Forest Service (NDFS), in partnership with the USDA-Natural Resources Conservation Service, Soil Conservation Districts, state and tribal colleges, farmers, and others worked to turn wood waste from windbreak renovations into carbon-sequestering soil amendments in the form of biochar. To do this, NDFS expanded upon the work of surrounding states in the Great Plains Biochar Initiative to promote biochar production and utilization.

A monumental shelterbelt planting effort was initiated throughout the Prairie Grasslands Region following the Dustbowl of the 1930s. An estimated 18,670 miles of trees and shrubs were planted to protect soil and valuable cropland. The original shelterbelts are now more than 75 years old. Over-maturity, droughts, flooding, storm damage, and a variety of insect and disease threats have caused these important resources to decline. Many are in need of immediate renovation. The landscape of the Great Plains is changing and so too are conservation priorities and farming practices, including shelterbelts.

Today, shelterbelts are commonly referred to as windbreaks, and they continue to serve a role in the 21st century. Through research and field trials, the intended functions, design, and implementation of windbreaks are evolving. An important, and increasingly apparent, consideration in windbreak management is how to restore them and what to do with the volume of wood produced when trees are removed or pruned.

Wood residues from windbreak management and fuels reduction efforts are often not suitable for the manufacture of traditional wood products. The North Dakota Forest Service contracted with Wilson Biochar Associates of Cave Junction, OR to determine the feasibility of converting wood waste from windbreak renovations into biochar using on-farm equipment. Biochar is a form of stable charcoal with a wide range of potential applications, including use as a carbon-sequestering soil amendment.

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The feasibility study laid the groundwork for a Conservation Collaboration Grant (CCG) from the Natural Resources Conservation Service (NRCS) for the expansion of the Great Plains Biochar Initiative to North Dakota. The project built on the excellent work already done in Nebraska and Kansas. The partnership resulted in the fabrication of nine biochar kilns from surplus agricultural and oilfield materials, the distribution of 72 cubic yards of high-quality biochar for biochar research, nine days of public workshops covering biochar production and application, and publication of a guidance document for registering biochar-based products with individual states.



Loading trees and branches with a wheel loader into an oil tank biochar kiln. *Photo Credit: Kelpie Wilson*



Moving half a surplus oilfield tank to be used as a flame-cap biochar kiln. *Photo Credit: Kelpie Wilson*



Converting wood into biochar in a kiln fabricated from a hopper bin bottom. *Photo Credit: Kelpie Wilson*



North Dakota Forest Service

www.ag.ndsu.edu/ndfs/biochar