



# Success Stories

How the SRFSN and JFSP bring professionals together to improve outcomes



## Biochar kilns: A simple and innovative approach to removing hazardous fuels and improving forest health

THE SOUTHERN ROCKIES FIRE SCIENCE NETWORK (SRFSN) IS COLLABORATING WITH UTAH STATE UNIVERSITY (USU) FORESTRY EXTENSION to highlight an innovative approach to removing hazardous fuels and improving forest health.

- » Traditional means of removing hazardous fuels can damage soils and air quality.
- » Biochar kilns allow for burning of hazardous fuels in ways that result in production of useful biochar, while causing minimal damage to soils and air quality.
- » The biochar can then be applied to soils to improve water-holding capacity and store carbon.
- » The SRFSN, in partnership with Utah State University Forestry Extension has held multiple events promoting the science and technology of biochar kilns which has resulted in an increase in their use throughout Utah.

**SRFSN is a support system and catalyst for managers, scientists, policy makers, and citizens** to interact and share credible fire science for sound decisions in land management and planning. Our network helps improve efficiency and effectiveness for making communities and the environment safer from wild-fire. The SRFSN is part of the Joint Fire Science Program Fire Science Exchange Network, a national collaboration of 15 regional fire science exchanges.

“For people not familiar with biochar, having SRFSN as a partner really provided legitimacy to the science. This has really helped to accelerate the adoption of the technology.”

— Darren McAvoy, *Extension Assistant Professor, Utah State University*

## Read the story...



Fifteen regional Fire Science Exchanges are funded by the Joint Fire Science Program.

Traditional means of removing or altering hazardous fuels are not without their costs. For example, burning debris piles and masticated fuels can lead to sterilized soils. When these techniques result in substantial smoldering fire they can also degrade air quality and can present safety hazards for firefighters.

The Utah Biomass Resources Group, managed by USU Forestry Extension, is working to encourage the use of a simple yet innovative approach to removing hazardous fuels while minimizing the consequences associated with pile or broadcast burning. Biochar kilns are portable metal containers that allow for the burning of forest residue under conditions with limited oxygen. Since the process results in minimal smoldering combustion, it results in very little smoke production, so the impacts on air quality are far lower than traditional burning practices. Restricting the fire to the metal container also minimizes the negative impacts of fire on soil.



The main product of combustion under low oxygen conditions is biochar, a highly porous, charcoal-like substance that has multiple benefits. When added to soils, biochar can improve water-holding capacity and provide habitat for beneficial soil microorganisms. Biochar binds to heavy metals and thus is often used to restore degraded soils. Biochar could even play a role in mitigating carbon emissions; since it is so slow to decompose, it represents a stable pool of carbon locked in the soil.

While the benefits of biochar have long been recognized in multiple industries, the production of biochar from hazardous fuel removal projects is a relatively new idea. Like any new idea, it is slow to catch on, as managers are unfamiliar with the technology and science. In partnership with USU Forestry Extension, the SRFSN is helping to promote the science behind biochar and biochar kilns.

The SRFSN and USU Forestry Extension have co-hosted and advertised several workshops and demonstrations on biochar kilns. More than 100 people attended, including foresters, wildland firefighters, fuels specialists, gardeners, arborists, city managers, and landowners. These events have been widely successful in encouraging people to utilize the technology. A survey indicated that after attending the events, many attendees had both made and utilized biochar in the lands they manage. The Utah Biomass Resources Group is currently working with state and federal partners to apply the technology at larger scales, resulting in the adoption of this method by Utah state agencies and federal partners.

Biochar kilns and related technologies represent promising and innovative approaches to addressing hazardous fuels without some of the common drawbacks associated with pile and broadcast burning. With the help of the SRFSN, USU Forestry Extension has presented the relevant science and demonstrations to local, national, and international audiences, facilitating the use of this technology in Utah and beyond. 🌲