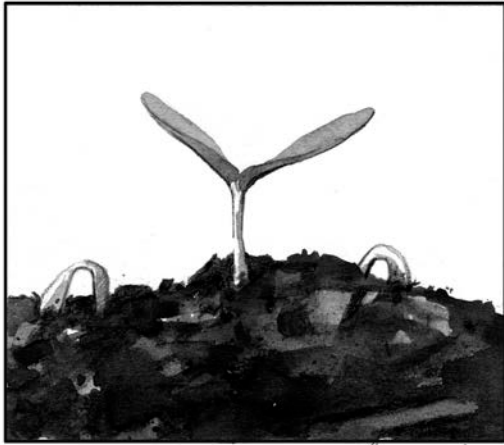


The Outside Story



August

To Boost Plant Growth, Growers Enrich Soils with Biochar By: Meghan McCarthy McPhaul

At this time of year, many a gardener's daydreams turn to the springtime promise of sprouting plants. Seed catalogs start arriving in the mail months before the soil will be thawed and drained enough for planting, and we use this downtime to plan for the coming season.

At Green Fire Farm in Peacham, Vermont, Michael Low is also planning, not only for this year's crops, but for biochar to help those crops grow. He harvests about 50 cords of low-grade wood each year on his 67-acre homestead, and turns the wood into his own version of black gold. Biochar is charcoal used for agricultural purposes. Its advocates laud its potential to retain

soil nutrients, sustain moisture levels in both drought and heavy rain conditions, and sequester carbon in the ground. For evidence of biochar's usefulness, they point to the terra preta of the Amazon region, where biochar-enriched soils have maintained high fertility for thousands of years.

For Low, making biochar is a way to create a value-added product and to improve the productivity of the land. In early spring, when many of his neighbors are sugaring, he loads wood into his Adam retort, a brick kiln measuring four feet tall by five feet wide by nine feet long. Through the process of pyrolysis (thermochemical decomposition without oxygen), the retort gradually cooks all the moisture from the wood. Volatile gases are released and cycled back through the kiln, heating it to temperatures higher than 900 degrees. After several hours, what remains in the chamber is bone dry charcoal. As a final step, Low inoculates this biochar with a blend of microbes beneficial to soil health.

Low incorporates biochar into nearly every aspect of the farm, disking it into reclaimed pastures, working it into the soil of the vegetable gardens and fruit orchards, and adding it to the dirt around tree seedlings. He even mixes it into his animals' fresh bedding pack. Old bedding, containing straw and biochar mixed with manure, is recycled as fertilizer.

What he can't use, he sells. Low makes about 50 cubic yards of biochar each year, and sells about half of that under his label, Vermont Biochar. He has both local and online customers.

While Vermont Biochar is a one-man business, biochar production is being studied by a variety of interests, from commercial landscapers to large-scale farmers. For example, a multi-year study in Quebec indicated that long-term use of biochar as a soil amendment could enhance grazing plants for dairy cows, and indirectly, increase milk production. Bartlett Tree Experts, an international landscaping company with several locations in New England, has found that incorporating biochar into tree and shrub plantings seems to increase resistance to disease, improve retention of soil moisture, and prompt greater growth.

Just as there are many potential uses for biochar, there is also more than one way to make it. For example, a neighbor of Michael Low, Jock Gill, has been experimenting with pyrolysis using micro-gasifiers.

These stoves turn biomass – in Gill’s case, locally produced wood pellets – into charcoal while also producing heat for cooking. The timing of the pyrolysis process depends on the amount of pellets used. Gill generally aims for about 45 minutes – enough time to cook “whatever is on the menu.” Each cooked meal also results in about 200 grams of charcoal. Gill mixes this with 600 grams of compost, lets it all sit for a few weeks, and applies the mixture to his family’s garden beds.

Gill has what he called a “tin cannery” in his back yard, and he endeavors to share the simple usefulness of micro-gasifiers with anyone willing to learn. He has improvised pyrolysis stoves from tin cans, altered Weber grills, even large trash

cans. “It’s not high-tech. It’s not dramatic,” he said about his back yard tinkering. “You can make a stove on your own, it’s useful, and you end up with a product you can use in your gardens.”

Meghan McCarthy McPhaul is an author and freelance writer. She lives in Franconia, New Hampshire. The illustration for this column was drawn by Adelaide Tyrol. The Outside Story is assigned and edited by Northern Woodlands magazine and sponsored by the Wellborn Ecology Fund of New Hampshire Charitable Foundation: wellborn@nhcf.org

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