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## Using biochar to boost soil moisture

posted on: november 8, 2011 - 5:32pm



Scientists at the U.S. Department of Agriculture (USDA) are leading the way in learning more about "biochar," the charred biomass created from wood, other plant material, and manure.

The studies by Agricultural Research Service (ARS) scientists at laboratories across the country support the USDA priorities of promoting international food security and responding to global climate change. ARS is USDA's chief intramural scientific research agency.

Soil scientist Jeff Novak at the ARS Coastal Plains Soil, Water and Plant Research Center in Florence, S.C., is coordinating the multi-location effort. In one project, he led a laboratory study to see if different biochars could improve the sandy soils found on the Carolina coastal plain, and Pacific Northwest silt loam soils derived from volcanic ash.

Novak's team used peanut hulls, pecan shells, poultry litter, switchgrass and hardwood waste products to produce nine different types of biochars. All the feedstocks were pyrolysed at two different temperatures to produce the biochars. Pyrolysis is a process of chemical decomposition that results from rapid heating of the raw feedstocks in the absence of oxygen. Then the biochars were mixed into one type of sandy soil and two silt loam soils at the rate of about 20 tons per acre.

After four months, the team found that biochars produced from switchgrass and hardwoods increased soil moisture storage in all three soils. They saw the greatest increase in soils amended with switchgrass biochar produced via high-temperature pyrolysis -- almost 3 to 6 percent higher than a control soil sample.

Biochars produced at higher temperatures also increased soil pH levels, and biochar made from poultry litter greatly increased soil levels of available phosphorus and sodium. The scientists also calculated that the switchgrass biochar amendments could extend the window of soil water availability by 1.0 to 3.6 days for a soybean crop in Florence, and could increase soil water availability for crops grown in Pacific Northwest silt loam soils by 0.4 to 2.5 days.

Given their results, the team believes that agricultural producers could someday select feedstocks and pyrolysis processes to make "designer" biochars with characteristics that target specific deficiencies in soil types.

Source: **United States Department of Agriculture - Research, Education and Economics**

### The fact that bio-char helps

Ken Bourne (not verified) | November 9, 2011 - 7:15pm

The fact that bio-char helps to retain moisture in a known fact! The benefits of bio-char as an agricultural amendment are ancient history, e.g. terra preta. What we need is for some brave scientist, who is not funded by international chemical companies, to start telling the truth.

The world is inundated with problems that politicians are reluctant to cure. Waste, pollution, water shortage, food shortage, diseases and other chronic health problems, and worldwide unemployment. Power is also a massive problem especially where nuclear energy is concerned. Most of these have been caused, in my opinion, by over application of chemicals which reduces the amount of nutrients in food, and the products obtained from oil.

All of these problems can be reduced, if not eliminated by bio-char and organic food production. All

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organic waste can be turned into bio-char. So can sewage, farm manure, waste from sawmills and farms, forestry waste (slash piles) and the millions of trees that dead from pine beetle. Sewage would not pollute the oceans and our water would be filtered by the charcoal in agricultural and forestry soil. Chemical farmers must change over to organic farming and the large monoculture farms split up and returned back to family intensive farms. This would eliminate the food shortages as the food produced would be nutrient rich so that the consumption would be reduced considerably as, for example, one apple would contain the same nutrients as 5 of today's! (This would be the same as the nutrient value of food 60 years ago.) There would be far more available jobs, power would be created from the heat of creating the bio-char, and the resulting bio-oils and gases can be used for vehicular power instead of oil and natural gas. the actual process of creating bio-char creates more power than is used. Organic food production results in more food per acre than chemical farming and restores the top soil that farmers have nearly eliminated. This would also reduce the amount of diseases that are caused by our immune systems being compromised, and the associated health problems of obesity. (Good food would taste so good that children would eat it!) Bill Gates and Sir Richard Branson realize the potential, lets hope that the people we elect and those that we pay to research come to the same conclusion soon.

Ken Bourne. BC. Canada

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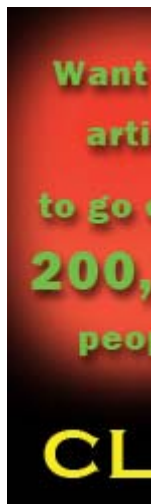
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