

BIOCHAR

Why Should You Know About Biochar?

This and other efforts to deal with global warming will help save you, your children and grandchildren and the wildlife that lives on Earth. Society at large doesn't seem to be responding to this threat so it is up to those who understand to take any steps we can ourselves and to kindly communicate to others what we are doing. You and I must help shift the collective mind ourselves if it is going to happen. AND IT CAN HAPPEN.

There is a fairly simple method for individuals using woody sticks and limbs that fall from trees to lock carbon away in the soil where it can't be part of CO₂ (the main greenhouse gas) in the atmosphere. Carbon as biochar is an excellent way to enrich garden or lawn soils.

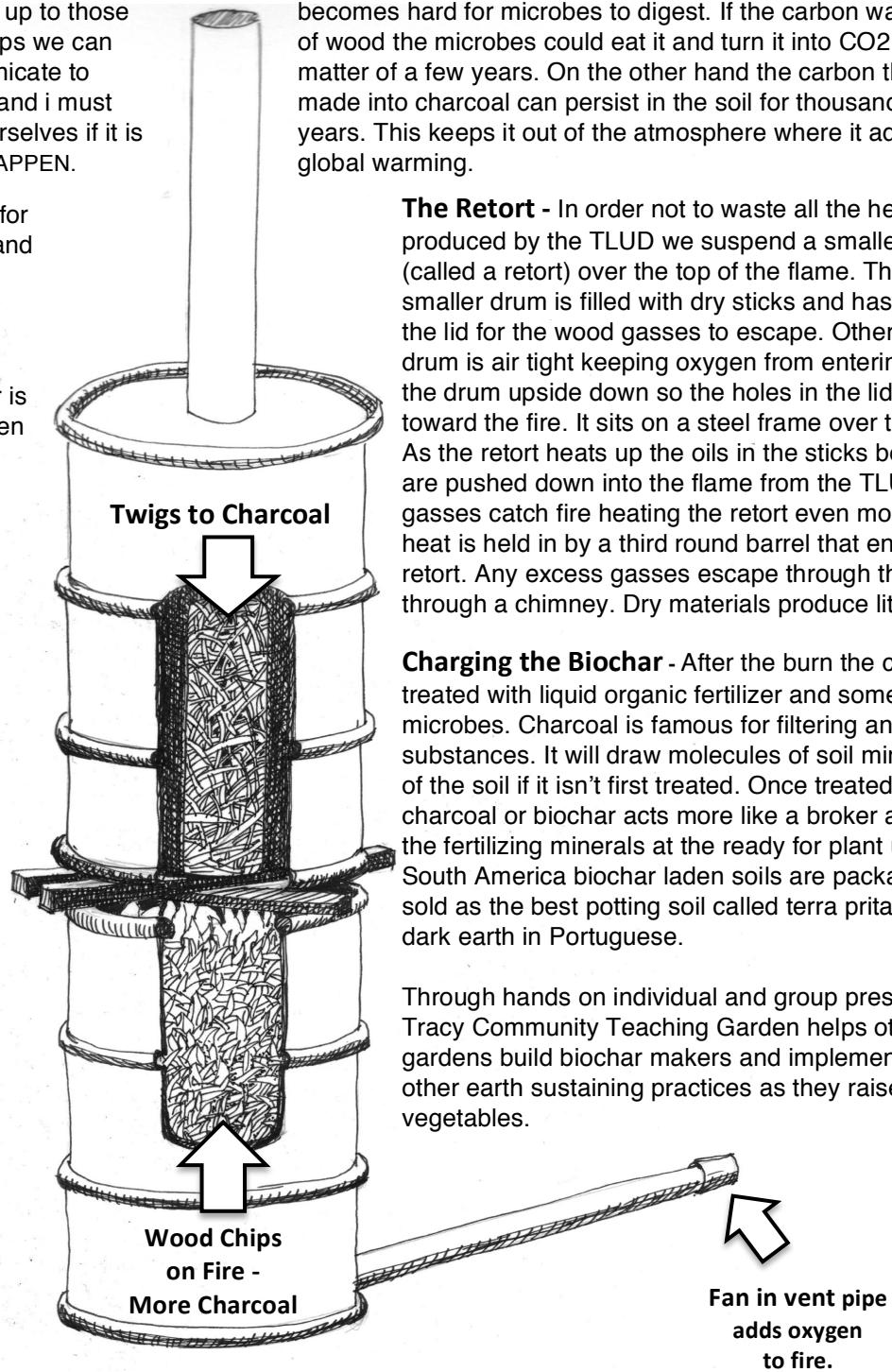
The TLUD - Look into a fire pit or campfire after it has gone out and grown cold. Dig down and you will find chunks of charcoal. The charcoal formed because it was under the ash and didn't get enough oxygen to completely burn. To achieve heating but incomplete burning we use a TLUD burner, Top Lit Up Draft device by drilling holes in the bottom of a drum (the Up Draft part) to do this. We fill the drum with dry wood chips and light them on fire from the top. The fire burns down, drawing limited air (oxygen) through the holes in the bottom of the drum. Even though the oxygen is somewhat limited the fire puts out a lot of heat. When the fire burns down about two thirds or three quarters of the way to the bottom we hose it down with water stopping the process. In the bottom we

How it works - Trees take in carbon as CO₂ through their leaves. They make this carbon into their trunks and branches as wood. We can take this wood as chips or twigs and heat it in the absence of oxygen. This process is known as pyrolysis. Through this process the carbon is changed in a way that it becomes hard for microbes to digest. If the carbon was still part of wood the microbes could eat it and turn it into CO₂ in a matter of a few years. On the other hand the carbon that is made into charcoal can persist in the soil for thousands of years. This keeps it out of the atmosphere where it adds to global warming.

The Retort - In order not to waste all the heat produced by the TLUD we suspend a smaller drum (called a retort) over the top of the flame. That closed smaller drum is filled with dry sticks and has holes in the lid for the wood gasses to escape. Otherwise the drum is air tight keeping oxygen from entering. We flip the drum upside down so the holes in the lid are down toward the fire. It sits on a steel frame over the flame. As the retort heats up the oils in the sticks boil out and are pushed down into the flame from the TLUD. The gasses catch fire heating the retort even more. That heat is held in by a third round barrel that encloses the retort. Any excess gasses escape through the top through a chimney. Dry materials produce little smoke.

Charging the Biochar - After the burn the charcoal is treated with liquid organic fertilizer and sometimes microbes. Charcoal is famous for filtering and purifying substances. It will draw molecules of soil minerals out of the soil if it isn't first treated. Once treated, the charcoal or biochar acts more like a broker and keeps the fertilizing minerals at the ready for plant uptake. In South America biochar laden soils are packaged and sold as the best potting soil called terra prita meaning dark earth in Portuguese.

Through hands on individual and group presentations Tracy Community Teaching Garden helps other gardens build biochar makers and implement this and other earth sustaining practices as they raise healthy vegetables.



The Jolly Roger design you see here was developed by Doug Clayton putting a retort on top of a John Rogers TLUD.