

Instructions for Making Biochar with a Cavity Kiln

Picking a Time

Pick a day for your burn when it is legal; i.e., that there is not a burn ban on. Check the [Salt Spring Fire Department website](#) below to confirm that it's okay to burn.

Get a [burn permit](#) if you don't already have one. You can burn in just about any weather short of pouring rain, but naturally it's best done in good weather. A burn typically takes about three hours if you have the material ready in a pile and the kiln at the site where the burn will take place.

Please be careful! **Doing a biochar burn is not especially dangerous, but it involves fire and therefore ensuring that it is done safely is a top priority.**

Burn Site and Setup

Pick an open location away from buildings and overhanging branches. Material to be turned into biochar should be piled close by. Kiln should be fairly level, and ideally the drainpipe in the bottom of the kiln should be at the lowest edge of the kiln so that it drains out when you're finished.

The area underneath and around the edge of the kiln will be exposed to very high heat and will possibly burn. If the kiln is placed on a lawn, the grass underneath the kiln will be scorched. Material overhanging the edge of the kiln during the burn can fall on the grass and ignite it. If the kiln is placed on any surface except pavement, the area underneath and around the kiln should be thoroughly wetted with a hose before burn starts, and periodically during the burn.

Connect a hose to the drainpipe at the bottom. It is helpful to have a 'Y' connector on your hose, with one hose going to the kiln and a second one available to wet down the area around the kiln, and in case of emergency. Use the provided short length of hose to ensure that you don't damage the end of a good hose. **DO NOT ATTACH A PLASTIC HOSE OR QUICK-CONNECT DIRECTLY TO THE KILN—IT WILL MELT.**

Material to be Burned

Just about any woody material can be turned into biochar, but the ideal feedstock for our cavity kilns are tree branches up to about three inches in diameter. Very small twigs will be consumed by the fire and turned to ash. Wood greater than about three inches in diameter will likely not be carbonized all the way through, which means that the resulting biochar will only be partially carbonized on the inside, making it not ideal for gardening purposes, but suitable for tossing onto a forest floor.

Ideally the material should be fairly dry, but once the kiln has become hot it will consume quite damp material. So if the material to be burned is not dry, it will be best to start out with some dry kindling and then add in the wet stuff. If you anticipate burning wet wood and can prepare ahead of time, tarping the pile is worthwhile.

Lighting the Kiln

It's best to start with a small amount of dry material in the bottom of the kiln. If the material you want to turn into biochar isn't dry, use some dry kindling and a bit of firewood to get the fire going, as though you were starting a bonfire. It's fine to use firestarter or a bit of vegetable oil to get the fire going; gasoline, aside from being dangerous to light, generally isn't very helpful in getting the fire going as it tends to burn off much too quickly and is therefore not recommended.

In wet weather, a tiger torch can be helpful in getting the fire going. You can also use a blower such as a hair dryer to put air into the fire, **BUT DO NOT USE A LEAF BLOWER**—the resulting fire can get hot enough to warp the kiln. The kiln is designed to operate at very high temperatures, but there is a limit that can be exceeded when too much air is pumped into the fire.

The Burn

Once the fire is going and you have a bed of hot coals in the bottom of the kiln you can start to add material. It's best if it is cut to a length of about five feet or less so that it doesn't overhang the edges of the kiln. For this purpose, long-handled loppers or a small electric chainsaw are ideal.

Add the material gradually, so that the newly added material is about six inches to a foot high on top of the burning coals underneath. As the new material burns it will develop a white ash covering—that's your signal to add more material. Adding large amounts of material at once is not ideal; the fire will be much smokier. Once the kiln has reached a high

operating temperature the fire will should burn with very little smoke, and will often assume the shape of a candle flame, burning straight up.

As you add material to the kiln it will gradually fill with biochar. The material under the top layer is still burning, but being starved for oxygen it is carbonizing—turning into biochar. Continue adding material until the kiln is full, you have used up all of the material that you have gathered, or you are out of time.

Extinguishing the Kiln

To extinguish the kiln, turn on the hose that you have connected to the pipe at the bottom. As the kiln fills with water, the fire will go out. The burning material on top will float on the water as it fills up, so it's helpful to push it down into the water with a rake or shovel. Once all of the material has been submerged, you can turn off the hose, disconnect it from the kiln and let the water drain out. The water won't hurt anything, but it does contain some ash and some people like to collect it for use in their garden to 'sweeten' the soil; i.e., make it less acidic.

It is possible to put the kiln out by hosing it down from above, but this method suffers from several drawbacks: it produces a lot of smoke and steam, and it can be difficult to ensure that you have the fire completely out. Therefore, it is recommended that you flood the kiln from below with a hose connected to the drainpipe at the bottom.

Finishing Up

Shovel the finished biochar out of the kiln into a wheelbarrow, buckets or other containers, or onto a tarp on the ground. It will be slightly damp, so cardboard boxes or paper bags are not ideal for storage.

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