¼” mesh hardware cloth gives good wood gas penetration and is fine enough to hold the char.

My first test was to place a piece of flat hardware cloth across the top of the reactor. This did not work for two reasons. The hardware cloth seems to effect the flow of the air more than the flow of the wood gas, and slowed the air flow down too much. Second, the char was held too high. The flame burned more below the char than above. The solution was to lower the top of the char to about .5 cm below the top of the reactor and use several wire hooks to hold the grid in place, thus not interfering with the air flow.

The char toward the center did not burn. Leaving the center char out and having only a ring of char did not work I think because this produced less resistance to the wood-gas flow toward the center and acted to funnel the wood-gas to the center. One thing I want to try is to put a sheet metal disk in the center to force the wood-gas outward.

This method is independent of the fuel level. Very little char is burned.

Fuel

Char from a previous test was placed on the raised grid.

A problem occurred at the end of the test when almost all of the fuel had been pyrolyzed. The flame cooled and went out, causing considerable smoke. The smoke could not be reignited. I poured the char out and it stopped smoking. It was all char and I found no unburned fuel.

The secondary flame heats the surface char. When the tallest tips of the char are glowing red hot, the primary air can be reduced and the flame and power level will turn-down.