

Cookstove for combined production of heat and biochar.

In recent years, there has been much interest in designing improved cookstoves for use in developing countries. Improvements have focused on reducing harmful emissions and improving efficiency. We are collaborating with Prof. Johannes Lehmann in Soil Sciences to develop an improved cookstove that produces “biochar” as well as heat for cooking food. Biochar is a carbon-rich residue of combustion, similar to charcoal, that has been shown to have beneficial effects on soil productivity. Biochar in the soil also sequesters carbon, at least temporarily, thus potentially serving as a net sink for CO<sub>2</sub> from the atmosphere. In a biochar-producing cookstove, plant materials are heated in an oxygen-starved environment, producing two products: (1) gases which are burned for heat, and (2) a solid char, which is collected and mixed into soil to improve plant yields. This project will focus on modeling a current prototype biochar-producing cookstove, for which some experimental data are available. Once a model of the cookstove has been validated, a study of the impact of design parameters will be undertaken, and new prototype burners will be built and tested.