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Development of a Plant Oil Pressure Stove

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Abstract

In rural areas of tropical and subtropical countries wood is still the main energy source. Steadily increasing wood consumption for cooking purposes results in deforestation of large areas. This leads to severe ecological, economical and sociological problems. Today, more than 1 billion people face wood shortages.

Cooking on open fires with firewood is often done in poorly ventilated or even closed rooms, which lead to serious health risks for the users. Noxious gases cause eye and lung maladies.

This current situation urgently requires introduction of alternative ways of cooking. Fuel-efficient wood stoves can significantly reduce the firewood consumption but the decrease in consumption will soon be compensated by the fast growing population. Plant oils are a promising alternative energy source offering a variety of economical and ecological advantages. Their utilisation as cooking fuel will assure a sustainable energy supply for numerous communities in developing countries and will secure an adequate food preparation.

At the Institute of Agricultural Engineering of Hohenheim University in cooperation with Bosch-Siemens-Haushaltsgeräte GmbH a plant oil pressure stove has been developed. The plant oil pressure stove can be operated with various plant oils like coconut oil, cottonseed oil, sunflower oil and palm oil as well as with plant oils from different qualities. Just for start-up a small amount of ethanol is required.

During the operation of plant oil pressure stoves it comes to the formation of deposits in the vaporizer pipe. This means the vaporizer has to be cleaned periodically. The formation of residues can be caused by different reaction mechanisms. The amount of residues that are deposited in the vaporizer of the plant oil pressure stove depends on the type of plant oil. Therefore investigations are focused on plant oil ingredients and plant oil parameters, which can influence deposition of residues inside the vaporizer during operation.

Keywords: Cooking stove, energy, plant oil