

A Little Research Could Make Biofuel the Next Fossil Fuel

From the creation of fuel engines, inventors such as Henry Ford and Rudolph Diesel have considered the option of biofuels as a source of energy. This option was put on the back burner because of the convenience and low cost of fossil fuels. With the current state of the fuel supply and yearly growth of Carbon emissions, biofuels are beginning to be considered again by people such as Arden Bement, Director of the National Science Foundation, who condones the use of biofuels with other sustainable sources of energy.

The problem with biofuels, however, is that current methods are expensive and use resources with a conflict of interest. The main sources of bioethanol are food sources such as corn, sugar cane, or potatoes. If the biomass used shifted to denser, woodier sources, the conflict of interest would not occur, and the cost of production would be lower.

The process of converting biomass into bioethanol consists of three main steps. First, the processable parts are removed: the cellulose, hemi-cellulose, and lignin. Next, either an enzyme or an amylase are applied to these, converting it into glucose and other simple C5 or C6 sugars. Last, these sugars are fermented, resulting in bioethanol.

Ideally, these plants will be grown to be used in a biorefinery which would create bioethanol for transportation, electricity, and biomaterials such as paper. The carbon emitted by the vehicles would be used by the increased number of plants being raised as fuel. Also, some biomaterials can be recycled and reused as fuel.

The first step in achieving this biorefinery model is to engineer the plants to be ideal for raising. This includes increasing photosynthesis efficiency; increasing disease,

drought, and temperature resistance, lessening their sense of nearby plants, regulating dormancy, and making them more processable. Other problems such as transportation of bioethanol must be faced in the future, but right now, research must go into genetically engineering plants that are ideal for creating bioethanol.