



There is no better feeling than knowing you were able to help someone.

Jason de Koff logs many miles a year driving around Tennessee. His rig looks like a food truck for selling hot dogs, but it's not. It's a mobile laboratory to show farmers about bioenergy—fuel from crops. Jason is an agronomist at Tennessee State University.

Jason explains, "The lab has equipment I use to show farmers how they can grow crops like soybean, sunflower, and canola and make their own fuel." From these crops, farmers can produce biodiesel. Like diesel refined from petroleum, crop-based diesel can

be used in tractors and other large farm equipment, as well as in some cars and trucks. It can also be used to produce electricity.

"There are many potential fuel crops, but each one has its advantages and disadvantages. I focus on crops that I know can grow well in Tennessee, produce a lot of biofuel, but won't cost the farmer too much to produce—and are good for the environment."

It's probably no surprise that Jason started out wanting to be a chemist and got his undergraduate degree in

chemistry. He says he wanted "to make cool things in a laboratory." But then he decided he wanted a job "that would have real world impact. There is no better feeling than knowing you were able to help someone. In agronomy, I do this by giving farmers the tools they need to do it themselves... to produce what they need on their own land."

Jason takes the mobile lab on the road in Tennessee to teach farmers about biodiesel.

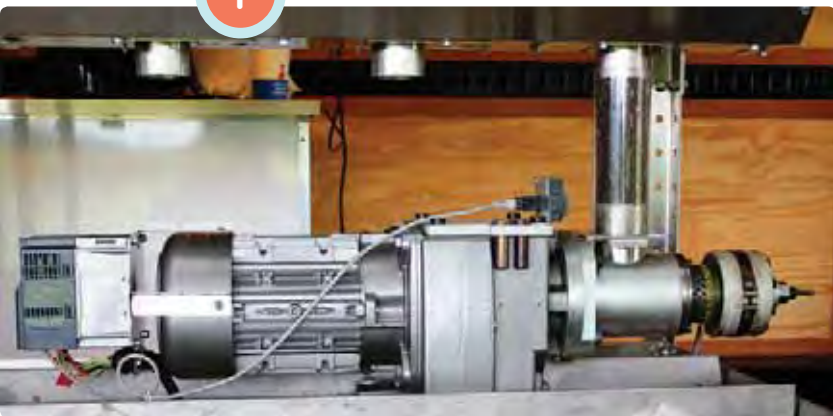


From Seeds to Fuel

The mobile laboratory includes equipment to process seeds into biodiesel.

1

Press for crushing the oilseeds like canola, sunflower, and soybean.



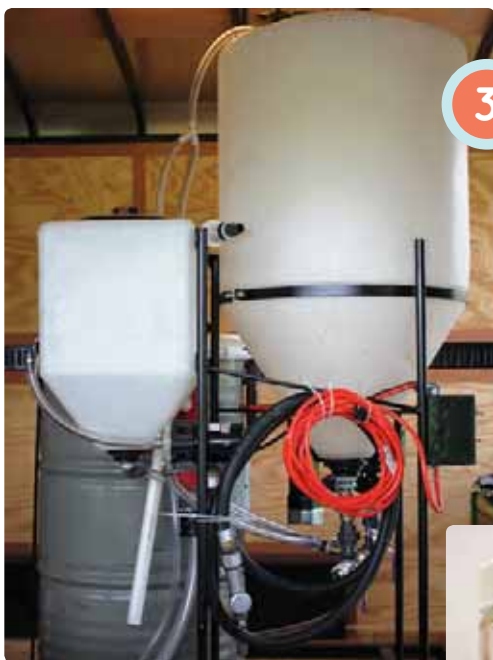
2

The press releases the oil from the seeds and leaves behind a solid meal, which can be used as animal feed.



In a processor, alcohol and a catalyst are added to the vegetable oil.

3



The oil divides into two layers. The lighter biodiesel rises to the top, and the denser glycerol sinks to the bottom.

4



IT'S ALL CONNECTED— FUEL POWERED BY the Sun

All the fuels we burn, whether they are wood, petroleum, or biodiesel, trace their energy to plants (or organisms that ate plants) that were powered by the sun.

By the process of photosynthesis, plants capture and store the sun's energy in the form of long chains of carbon and hydrogen molecules, called hydrocarbons. When a fuel is burned, the chains of hydrocarbons break apart, releasing heat and energy.

Coal, natural gas, and petroleum are fossil fuels. The sun's energy stored in these fuels was captured millions of years ago and then buried deep in the earth. The supply of fossil fuels is finite. Fuels derived from crops are renewable.