Soybean oil & ethanol have most tractor fuel promise

cylinder diesel tractor engine to

the agricultural engineering

department of the University of

modified the engine to run suc-

cessfully on a blend of soybean oil

A more ambitious research

TROY, Mich. - Ford Motor Company is actively working to develop agricultural tractor engines powered by energy sources other than diesel fuel.

Company engineers, working alone and in conjunction with governments and university research departments throughout the world, have investigated a variety of fuels and engine adaptations.

Among the fuels studied so far are vegetable oils, liquid propane gas, various gaseous fuels and hydrogen, plus alcohols including methanol and ethanol.

According to W. J. Howard, executive engineer for advanced engineering for Ford Tractor Operations (FTO), some of these fuels have already been dropped from consideration as potential power sources

Few Viable Alternatives

"The gaseous fuels, such as liquid natural gas, compressed natural gas and hydrogen, were ruled out for agricultural tractors because of limited fuel-storage capacity," explains Mr. Howard. 'A farmer would need a trailer tied behind his tractor just to carry enough fuel to operate it.

"At this time, liquid propane gas does not appear to be practical either because of unpredictable price fluctuations."

Howard says that most vegetable oils need additional refining to restructure them to meet requirements as a fuel, and at this time do not appear to offer short-term promise. Some interesting results have been discovered using a mixture of soybean oil and diesel fuel, however, and Ford currently is studying soybean-oil mixtures in cooperation with several universities.

Soybean Oil Shows Promise Last April, FTO supplied a research grant and a three-

program is currently taking place at the University of Alabama in Huntsville where researchers at the Johnson Environmental and Energy Center have had excellent results using degummed soybean oil as a diesel-fuel extender.

and diesel fuel.

According to senior research assistant, Joseph F. Peters, in preliminary tests a turbocharged diesel engine achieved maximum and continuous horsepower using a mixture of one-third degummed soybean oil and two-thirds #2 diesel fuel with about the same fuel consumption as with 100 percent diesel fuel.

Currently, the Alabama researchers are using a Ford fourcylinder 256-cubic-inch-displacement turbocharged diesel engine Missouri. Researchers there which has been modified for direct injection. Various blends of soybean oil and diesel fuel are being examined and final results should be available by the end of

Good Supply of Soy Available

Peters says that degummed soybean oil, which is a by-product of soybean meal, can be used as a fuel without further refining, even though it is a little more expensive than plain diesel at today's prices. The soy oil may prove extremely valuable to farmers in the event of a future fuel shortage, particularly during planting and harvest time, when the farmer must be in the

There is currently an oversupply of soybean oil in North America, and producers are searching for other uses. Dr. Peters estimates that one season of soybean-oil use as an emergency fuel could eliminate the present glut. However, U.S. farmers alone have an additional billion-gallon potential, since only about one half of the soybeans now grown are used for oil extraction. The widespread use of soybean oil as a fuel also could bring the cost of soybean fuel down.

Alcohol Fuel Promising

The most promising alternate fuel to date is 100 percent ethyl alcohol. Alcohol shows such strong potential that Ford has developed actual prototype tractors fueled

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W.J. Howard, executive engineer for advanced engineering at Ford Tractor Operations, inspects a prototype alcoholpowered Ford Series 10 tractor. The company has conducted extensive field tests of alcohol-powered farm tractors in Brazil.

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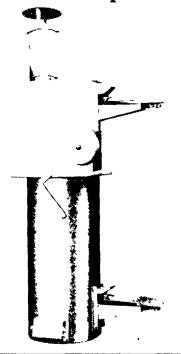
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