

## Lower Cost Fuels

(Continued from cover page)

and his brother" is in such a hurry to convert to propane:

"In January of 1978, there was a 5¢ per gallon differential between gasoline and LP (tax paid). For a vehicle that averaged 10 miles to the gallon and 30,000 miles per year, it would take approximately 4 to 5

years to pay back the investment of \$750 to convert to LP. Today, it's possible to get this investment back on the same vehicle in one year on the fuel savings alone."

Because of soaring gas and diesel prices, even waste crankcase oil is getting a serious "second look" as an alternative fuel for cars and pickups.

Here's a closer look at these promising new developments to help you beat the energy crunch:

# Kit Converts Diesel Tractors To Alcohol

First on the market with a way to burn home-brewed alcohol in diesel tractors is M & W Gear Co., Gibson City, Ill.

"We're taking orders and plan to produce 200 kits for delivery in early 1980," reports John Smith, general sales manager. "They'll be designed to fit 86 series IH tractors and the 50 series Deere tractors. Kits for other makes and models of diesel tractors, and for diesel powered combines, are under development."

The \$900 Aquahol kit works only on turbocharged diesel tractors. "Its greatest benefit is that it produces more horsepower for less fuel," ex-

plains Smith. "Unlike Gasohol, which requires 200 proof alcohol, the water-alcohol mixture injected by the Aquahol kit requires only 100 to 140 proof alcohol which can be produced in the first stage of distilling. In addition to increasing horsepower and decreasing the amount of diesel fuel consumed, the water-alcohol injection reduces engine temperature 200 to 300 degrees."

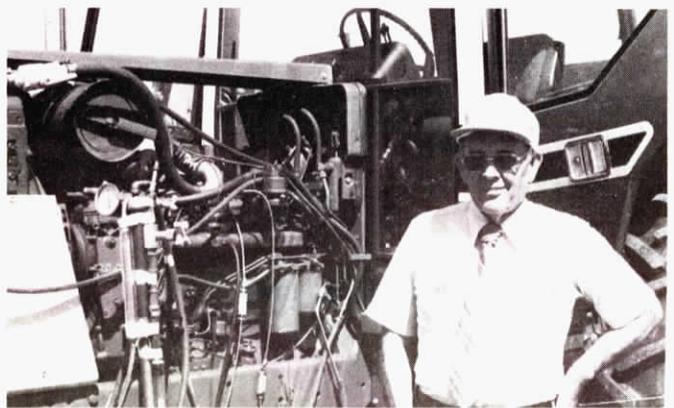
The water-alcohol injection system consists of a 30 gal. tank mounted on the front of the tractor. It contains a 50/50 mixture of filtered water and ethanol or methanol alcohol, a pressure line and a feedline. Here's how Smith describes its operation:

"As the load on the tractor increases, turbocharger boost pressure increases. The alcohol tank is pressurized with turbocharger air at 5 lbs. of boost, and the mixture is forced through the feedline to the intake side of the turbocharger. As the boost increases, more of the mixture is injected automatically. An orifice in the feedline meters the mixture. The size of this orifice is determined by engine requirements.

"As the mixture is injected into the airstream, air is cooled, providing a denser charge of air for combustion. The air-water-alcohol mixture combines with diesel fuel in the cylinder to create a cooler, more powerful combustion. The cylinder sleeves, pistons and valves stay cleaner and last longer. Less heat is transferred to the cooling water and oil. Cleaner combustion at a time when blow-by is greatest also helps keep the oil cleaner.

"In testing, the turbocharged 986 International diesel tractor produced 125 hp. at rated speed on diesel fuel alone while consuming 8½ gal. of fuel per hour. By introducing water and alcohol, horsepower output increased so the engine was throttled back to 125 hp. for comparison. The engine then consumed 6 gal. of diesel fuel, 1 gal. of alcohol and 1 gal. of water per hour. Not only was the total amount of fuel required reduced by 1/2 gal., but the amount of petroleum based fuel was reduced by 2½ gal. No internal modifications were made on the tractor engine."

For more details, contact: FARM SHOW Followup, M & W Gear Co., Route 47 South, Gibson City, Ill. 60936 (ph toll free 1-800-637-1144).



Sukup crop-drying furnace, originally designed to burn fuel oil, has been modified to also burn straight alcohol.

## CAN ALSO BE USED AS A FURNACE

# Alcohol-Fired Crop Dryer

"About all we did to adapt it to burn alcohol was to wire around the electric eye on the burner," explains Wayne Zickafoose, sales manager of Sukup Mfg., Sheffield, Iowa. The company manufactures the Heatway fuel oil burner for crop drying which also doubles as a furnace, and which was first featured in the July-August, 1977, issue of FARM SHOW.

"The burner's electric eye is designed to shut off the flow of fuel oil if the flame goes out," explains Zickafoose. "With alcohol, the flame was so clear and colorless that the electric eye couldn't detect it. So, to keep the valve open, we had to wire around it."

The Sukup Heatway burner has a capacity of up to 1,000,000 btu's/hr. It's indirect fired, which means no fumes exhaust into the crop but go up an inner chimney. Because of this design for exhausting fumes and odors, the Heatway burner can be used as a furnace to heat farm shops, livestock barns or other buildings.

Compared to fuel oil at 138,000 btu's per gallon, propane at 97,560

and gasoline at 125,000, a gallon of 160 proof alcohol has about 84,000 btu's, says Zickafoose.

"We have a fuel oil furnace in our farm home which I plan to fire with straight 160 proof, home-brewed alcohol this winter," he told FARM SHOW. He plans to use an experimental commercial still which Sukup Mfg. has under development to produce the alcohol from shelled corn grown on his farm. "Because alcohol is lower in btu's than fuel oil, I'll have to put in larger jets on the burner. I don't anticipate having to do anything else in switching the furnace from fuel oil to straight alcohol."

Retail cost of Sukup Heatway fuel oil burner for crop drying is \$1,739, not including a fan. Sukup makes a centrifugal fan in 5 to 20 hp. sizes which is designed to work in conjunction with the Heatway burner.

For more details, contact: FARM SHOW Followup, Sukup Mfg. Co., Sukup Parkway, Sheffield, Iowa 50475 (ph 515 892-4222).



Elmo Meiners, president of M & W Gear Co., notes that, unlike gasohol, which requires 200 proof alcohol, the Acquahol injector requires only 100 to 140 proof.

# FARM SHOW

For everyone in agriculture interested in latest new products

Vol. 3, No. 6, 1979

Editor-Publisher — Harold M. Johnson  
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Office Manager — Joan C. Johnson

FARM SHOW is published bimonthly for \$9.00 per year (\$11 in Canada and foreign countries) by Farm Show Publishing Inc., P.O. Box 704, 8500 210 St., Johnson Bldg., Lakeville, Minn. 55044. Controlled circulation postage paid at Lakeville, Minn., and Madelia, Minn. POSTMASTER: Send address changes to FARM SHOW, Box 704, Lakeville, Minn. 55044 (ph. 612 469-3303). Publication No. 470870

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