

## From the Campus

# Liquid fuels can be made from agricultural wastes

Producing gasoline or diesel substitutes from wood residues and other agricultural wastes is being researched by Texas scientists as a possible energy resource. It has the potential to convert wasted or poorly utilized resources into valuable fuels to help relieve our energy situation.

The seriousness of our energy shortages has in part been masked by our agricultural exports. Since 1970, total agricultural exports have grown from 6.7 billion dollars to an estimated 22.1 billion dollars in 1976. Meanwhile, oil imports have increased from 3.4 million barrels per day (23 percent of consumption) in 1970, to 6 million barrels per day (37 percent of consumption) in 1975.

Imported oil cost the U.S. 27 billion dollars in 1975 (\$125 per person) as compared with about 3 billion dollars (\$15 per person) in 1970. The December meeting of oil exporting countries is expected to result in another increase of at least 10 percent.

"About one billion tons of residues are available each year from farms, forests, agri-business, and municipal wastes. If ways can be developed to convert these to valuable fuels, it could substitute for about 15 percent of our total energy needs," says Dr. Ed Soltes, research scientist with the Texas Agricultural Experiment Station.

"That 15 percent translates into the equivalent of several hundred million barrels of oil worth billions of dollars.

"And the beauty of it is that unlike oil and gas, agricultural residues are renewable; more grow each year.

"In the pulp and paper industry, for example, it's estimated that if forest residues can be utilized as energy, it will make the industry self-sufficient for energy and save the nation the equivalent of 100 million barrels of oil per year," says Soltes, a woods chemist in the Department of Forest Science at Texas A&M University.

Soltes heads a research team working on developing valuable energy uses for waste. The work is sponsored by the Experiment Station, the Center for Energy and Mineral Resources at A&M, and the St. Regis Paper Company.

You get an idea of the immensity of our annual agricultural residues from recent estimates that cereal straws amount to about 145 million tons; other plant residues, 240 million tons; and cow manure, 230 million tons.

"Most farmers probably raise enough residues to make them self-sufficient for energy if they could efficiently convert these materials into liquid fuels. The 'if' is what our team is working on," Soltes says.

"Use is being made of an old process called pyrolysis (heat in absence of air). It can change low-density residues into high-density liquid and solid fuels with higher energy contents.

"But the work doesn't stop there. The liquids and solid materials from pyrolysis are similar to petroleum and coal in several respects. So, petrochemical and coal conversion technology will be borrowed to transform these materials into more desirable liquid fuels and chemicals.

"Despite the variability of the physical forms of agricultural and wood residues, there are many chemical similarities between them.

"Pyrolysis promises to be a leveling device that takes, for example, a mixture of corn cobs, cotton wastes, tree limbs or bark, and converts them into a uniform mass of material for energy and chemical products," Soltes says.

Currently, the research team is working on an assessment of residue availability in the State of Texas and on the chemical analysis of pyrolysis oils.

Who knows, we may live to see the day when agriculture producers are worrying about their "mesquite crop." □

# KEES

Better lawn care products to do the job easier & faster



Model 21F35 illustrated

## POWERMOW

NEW!

New from F. D. Kees, this powerful 21" mower with heavy 12 gauge steel deck and frame is built to stand up under rough use and keep on working year after year.

- Choice of 4 cycle, 3.5 or 5 hp Briggs & Stratton engine with high inertia fly-wheel.
- Heavy gauge steel handle folds down without tools for easy transport and storage. Rigid "T" type handle also available.
- Special one-piece, suction-lift blade with tempered cutting edges. Adjustable cutting heights 1 to 3.5 inches.
- Heavy-duty steel wheels with grease fitting and sealed ball bearings. 8 x 1.75 tires.
- Special crankshaft protector. Oil minder for visual oil check.
- Extra large 1½ bushel nylon bag grass catcher available.

## KEES-KASTER

Model B-53



Large capacity broadcast type spreader for seed or fertilizer. Choice of push or pull-type models. Delivers up to 5 times normal coverage.

- Non-corrosive, 50 to 60 lb. capacity Cyclac hopper
- Dual control handle
- 10" rubber-tired wheels
- Chrome plated, corrosion resistant tubular frame and handle
- Spreads 5 to 10 ft. in diameter



Since 1874

Write P.O. Box 873

**F. D. KEES MFG. CO.**  
Beatrice, Nebraska 68310

Circle 107 on free information card