

Don't blend ethanol with regular gasoline

UNIVERSITY PARK — should not be mixed with homemade ethanol alcohol gasoline for motor fuel,

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according to agricultural engineers at Penn State

Such alcohol, as commonly distilled, will always contain at least 5 per cent water and probably more, says Kermit Q. Stephenson of the agricultural engineering faculty. The alcohol and water separate from the gasoline, resulting in irregular engine performance and stalling, Stephenson claimed. The result is what chemists call "phase separation."

The water can also damage engines by creating rust and corrosion with time.

Stephenson and associates experienced "phase separation" when using gasoline with 190 and 180 proof ethanol, five per cent and 10 per cent water respectively.

"Ethanol with five per cent or more water will require modifications in fuel

system such as separate fuel supplies and higher than normal intake manifold temperatures," Stephenson stated.

"In addition, fuel consumption can be expected to increase as the heat content of the mixture decreases and water content of the ethanol increases," he added.

Thermal efficiency, an engine's ability to convert heat content of the fuel to useful mechanical output, tends to increase slightly with increased proportions of ethanol, the experiments found. However, thermal efficiency decreased with increased proportions of water in ethanol-gasoline blends.

Stephenson and Garthe tested alcohol fuel blends in a small, single-cylinder, air-cooled gasoline engine. Ethyl alcohol was used in various blends with gasoline,

as well as straight ethanol, and with five and 10 per cent water content.

The engine operated satisfactorily with water-free ethanol at 25 to 50 per cent by volume mixtures with both regular and unleaded gasoline. However, starting difficulties occurred with higher percentages of ethanol, at room temperature, when the engine was cold.

The Penn State report that blending of nine parts unleaded gasoline to one part water-free ethanol works fine as "gasohol." No engine modifications are needed to burn "gasohol," research at Penn State and elsewhere found.

"The cost of alcohol is related to its water content," Stephenson commented, "since removal of water by distillation is an extra

process using considerable energy."

"Water tolerance and engine modifications needed for satisfactory performance will determine the degree of refinement, and cost, for fuel-grade alcohol," he affirmed.

The engine used in the experiments was mounted for stationary tests. It was coupled to a calibrated, magnetic-particle brake dynamometer for loading (simulated pulling) purposes. All tests were conducted indoors at room temperature. Atmospheric conditions were recorded for standardizing the results.

Stephenson pointed out that renewable sources of alcohol fuels are important to agriculture, both from the standpoint of producing the raw material and the end use in trucks, tractors, and combines.

Stillwagen wins "Sound Off for Agriculture"

SCHNECKSVILLE — Frederic H. Stillwagen, vocational agriculture teacher in the Lehigh Co. Voc-Tech school at Schnecksville, has been named the state winner of the 1980 National Vocational Agricultural Teachers' Assoc. - Elanco Products Company "Sound Off For Agriculture" award for Pennsylvania.

The award, sponsored by Elanco Products Company, Indianapolis, Indiana, in cooperation with the National Vocational

Agricultural Teachers' Association, Alexandria, Virginia, recognizes vocational agriculture teachers who promote agriculture to the non-farm community via public relations activities and publicity throughout the year, plus activities conducted in conjunction with American Agriculture Day.

"Agriculture Day was conceived by those who recognized a need for better facts about agriculture among urban consumers. It provided an opportunity to

tell how ranchers, farmers, and growers contribute to America's strength and well-being. "Agriculture Day" has become a national event.

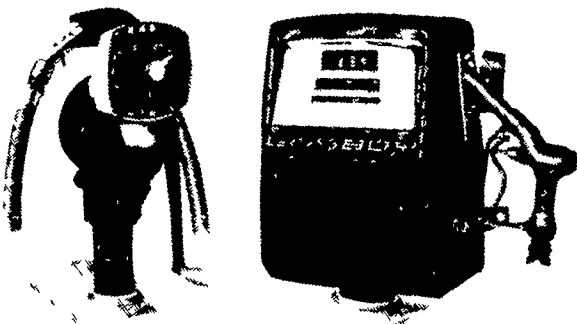
The vocational agriculture teacher was selected as a vital local link in promoting the national recognition day for agriculture. They promote agriculture in the local school and community through various classroom and FFA programs, activities and contests.

A criteria to winning the "Sound Off For Agriculture" award is that the program

must include activities conducted within a week of "Agriculture Day." It must be directed to the urban people within the community, not those in the agricultural populace.

The "Sound Off For Agriculture" award application of state winners, including Stillwagen's entry, will be evaluated by special NVATA Selection Committees June 15. Six regional winners will be named. The regional winners will be announced July 1.

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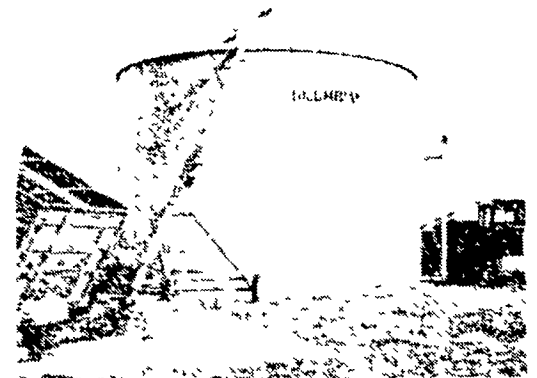
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