New sorghum cultivars can produce thousands of gallons of ethanol

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UF/IFAS scientists like sorghum because it can be cultivated twice a year in Florida, requires little fertilizer, uses water efficiently and can be drought resistant. Credit: UF/IFAS-Developed Sorghum Cultivars Can Produce Thousands of Gallons of Ethanol

Sweet sorghum is not just for breakfast anymore. Although sorghum is a

source for table syrup, scientists see a future in which we convert sorghum to biofuel, rather than relying on fossil fuel. That potential just grew as University of Florida researchers found three UF/IFAS-developed sorghum varieties could produce up to 1,000 gallons of ethanol per acre.

"Sweet sorghum has the potential to be an effective feedstock for ethanol production," said Wilfred Vermerris, a UF/IFAS professor of microbiology and cell science and a co-author on the study.

Ethanol produced from sweet sorghum can be used for auto and jet fuel, UF/IFAS researchers said.

UF/IFAS researchers picture big fuel potential from sorghum partly because it's so abundant. Sorghum is the fifth largest cereal crop in the world and the third largest in the United States, according to the U.S. Department of Agriculture. In 2014, the U.S. was the largest producer of sorghum in the world.

UF/IFAS scientists like sorghum because it can be cultivated twice a year in Florida, requires little fertilizer, uses water efficiently and can be drought resistant, UF/IFAS research shows.

For a newly published study, UF/IFAS scientists wanted to see if they could use the three sweet sorghum cultivars as raw material for bioethanol production.

Eulogio Castro, a former visiting assistant professor at UF/IFAS and lead author of the study, worked with UF/IFAS researchers to grow the sorghum cultivars at the UF/IFAS Plant Science Research and Education Unit in Citra, Florida. Castro is now a researcher at the University of Jaén in Spain.

Once researchers grew and harvested the sorghum, they took it to the UF/IFAS Stan Mayfield Biorefinery Pilot Plant in Perry, Florida. There, they processed the crop and collected the sugar-rich juice from the stems, which could be directly fermented to fuel ethanol. The bagasse—the dry, pulpy residue left after extracting the juice from the plant—was processed to generate an additional source of fermentable sugars that could also be converted to ethanol.

They found potential for the crop to produce up to 1,000 gallons ethanol per acre from the combined juice and bagasse-derived sugars.

The new study is published in the journal *Industrial Crops & Products*.

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