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Study Shows Sugarcane Ethanol Production Causes Air Pollution

UC Merced researchers show burning of sugarcane fields prior to harvest can create more pollution than previously thought, detracting from benefits of the alternative fuel source

MERCED, Calif. — The burning of sugarcane fields prior to harvest for ethanol production can create air pollution that detracts from the biofuel’s overall sustainability, according to research published recently by a team of researchers led by scientists at the University of California, Merced.

UC Merced graduate student Chi-Chung Tsao was the lead author on the paper and was aided in the study by UC Merced professors Elliott Campbell and Yihsu Chen. The study — published online this week in the [Nature Climate Change](#) journal — focused on Brazil, the world’s top producer of sugarcane ethanol and a possible source for U.S. imports of the alternative fuel.

“There is a big strategic decision our country and others are making, in whether to develop a domestic biofuels industry or import relatively inexpensive biofuels from developing countries,” Campbell said. “Our study

Quick Facts

- A study published this week and led by UC Merced researchers shows that sugarcane ethanol production creates more air pollution than previously thought.
- The U.S. is considering whether to develop biofuels domestically or import them from countries like Brazil, the world’s largest producer of sugarcane ethanol.
- Despite efforts to reduce field burning — done in part to protect farmworkers from sharp leaves and harmful animals — more than half of sugarcane croplands in Brazil continue to be burned.

shows that importing biofuels could result in human health and environmental problems in the regions where they are cultivated.”



[Click here for a PDF of the study](#)

Ethanol is seen as an alternative to fossil fuels, which emit greenhouse gasses when used and are a major contributor to air pollution and climate change. But despite some governments encouraging farmers to reduce field burning — which is done in part to protect farmworkers by removing sharp

leaves and harmful animals — more than half of sugarcane croplands in Brazil continue to be burned.

That leads to a reduction in air quality that can offset the benefits of ethanol over petroleum fuels that emit more greenhouse gases during their use, something Campbell said the U.S. should consider when determining whether to import inexpensive ethanol from Brazil or continuing to invest in domestic corn ethanol production.

“Unlike petroleum production, the potential to produce biofuels is relatively evenly distributed across many countries, and this is a big plus from an energy security perspective,” Campbell said. “However, agriculture practices in some regions result in biofuels that lead to even more intense air pollution than petroleum.”

Satellites are currently used to measure air pollution in Brazil, but the study shows actual pollution caused by sugarcane field burning could be four times greater than satellite estimates. The researchers believe this is due to the relatively small scale of individual fires.

Other researchers involved in the study were Scott Spak and Greg Carmichael of the University of Iowa and Marcelo Mena-Carrasco of the Universidad Andres Belo in Chile.

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UC Merced opened Sept. 5, 2005, as the 10th campus in the University of California system and the first American research university of the 21st century. The campus significantly expands access to the UC system for students throughout the state, with a special mission to increase college-going rates among students in the San Joaquin Valley. It also serves as a major base of advanced research and as a stimulus to economic growth and diversification throughout the region. Situated near Yosemite National Park, the university is expected to grow rapidly, topping out at about 25,000 students within 30 years.