

Biofuels may lead to a 'drink or drive' issue

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Rice University scientists warned that the United States must be careful that the new emphasis on developing biofuels as an alternative to imported oil takes into account potential damage to the nation's water resources.

"The ongoing, rapid growth in biofuels production could have far-reaching environmental and economic repercussions, and it will likely highlight the interdependence and growing tension between energy and water security," said a report titled "The Water Footprint of Biofuels: A Drink or Drive Issue?"

The report, written by Pedro Alvarez, the George R. Brown Professor of Civil and Environmental Engineering, and three colleagues was funded by Rice University's Shell Center for Sustainability.

The researchers asked if increased biofuel-driven agriculture will affect water-resource availability and degrade water quality. They pointed out that fuel crops require large quantities of water and that water pollution is exacerbated by agricultural drainage containing fertilizers, pesticides and sediment. "These potential drawbacks," which the authors labeled the "water footprint," must be "balanced by biofuels' significant potential to ease dependence on foreign oil and improve trade balance while mitigating [air pollution](#) and reducing fossil carbon emissions to the atmosphere."

The report analyzed the amount of water needed to grow particular crops used to produce biofuels and noted that certain crops yield more biofuel

energy while using less land, fertilizer and water. "Thus, from a water supply perspective," the authors said, "the ideal fuel crops would be drought-tolerant, high-yield plants grown on little irrigation water."

To demonstrate their point, the authors estimated it takes about 50 gallons of water to produce enough irrigated-corn ethanol in Nebraska to fuel an average car for one mile. Given differing land use practices and other factors, that number decreases to 23 gallons for Iowa-grown corn and rises to 115 gallons for Texas-grown sorghum.

The debate over biofuels must also "recognize the impact of increased agricultural activity on water quality as well as water consumption," the authors said. Raising biofuel crops in some areas will require greater use of fertilizers, with the runoff affecting local aquifers and even coastal regions like the Chesapeake Bay and the Gulf of Mexico, it warned.

The report acknowledged that some biofuel sources, like switchgrass and other lignocellulosic options, can "deliver more potential biofuel energy with lower requirements for agricultural land, agrichemicals and water." Accordingly, the authors urged that crops be chosen based on their appropriateness to the local climate and that producers raise crops that can be sustained by rainfall rather than irrigation.

The report called on policymakers to evaluate the water footprint as they devise an environmentally sustainable biofuels program. "Through energy conservation and careful planning that includes adoption of agricultural practices and crop choices that reduce water consumption and mitigate water pollution from agrichemicals, and identification of the local and regional water resources that will be needed to meet the [biofuel](#) mandate," the authors said, "we can have our drive and drink our water too."

Source: Rice University ([news](#) : [web](#))

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