Algae biofuel can help meet world energy demand, researchers say

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At a pilot plant facility at Coyote Gulch outside Durango, Colo., microalgae is grown for biofuel production. In a recent paper published in *Proceedings of the National Academy of Sciences*, Utah State University researchers reveal findings of an worldwide assessment of microalgae productivity potential. The team's research was supported by the U.S. Department of Energy. Credit: Solix BioSystems.

(Phys.org) —Microalgae-based biofuel not only has the potential to quench a sizable chunk of the world's energy demands, say Utah State University researchers. It's a potential game-changer.

"That's because microalgae produces much higher yields of fuel-producing biomass than other traditional fuel feedstocks and it doesn't compete with food crops," says USU mechanical engineering graduate student Jeff Moody.

With USU colleagues Chris McGinty and Jason Quinn, Moody published findings from an unprecedented worldwide microalgae productivity assessment in the May 26, 2014, online Early Edition of the *Proceedings of the National Academy of Sciences*. The team's research was supported by the U.S. Department of Energy.

Despite its promise as a biofuel source, the USU investigators questioned whether "pond scum" could be a silver bullet-solution to challenges posed by fossil fuel dependence.

"Our aim wasn't to debunk existing literature, but to produce a more exhaustive, accurate and realistic assessment of the current global yield of microalgae biomass and lipids," Moody says.

With Quinn, assistant professor in USU's Department of Mechanical and Aerospace Engineering, and McGinty, associate director of USU's Remote Sensing/Geographic Information Systems Laboratory in the Department of Wildland Resources, Moody leveraged a large-scale, outdoor microalgae growth model. Using meteorological data from 4,388 global locations, the team determined the current global productivity potential of microalgae.

"Our results were much more conservative than those found in the current literature," Quinn says. "Even so, the numbers are impressive."

Algae, he says, yields about 2,500 gallons of biofuel per acre per year. In contrast, soybeans yield approximately 48 gallons; corn about 18 gallons.

"In addition, soybeans and corn require arable land that detracts from food production," Quinn says. "Microalgae can be produced in non-arable areas unsuitable for agriculture."

The researchers estimate untillable land in Brazil, Canada, China and the U.S. could be used to produce enough algal biofuel to supplement more than 30 percent of those countries' fuel consumption.

"That's an impressive percentage from renewable energy," Moody says. "Our findings will help to justify the investment in technology development and infrastructure to make algal biofuel a viable fuel source."

Provided by Utah State University