

Growth of biofuel industry hurt by GMO regulations: study

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Faster development of the promising field of cellulosic biofuels - the renewable energy produced from grasses and trees - is being significantly hampered by a "deep and thorny regulatory thicket" that makes almost impossible the use of advanced gene modification methods, researchers say.

In a new study published today in the journal *BioScience*, scientists argue that major regulatory reforms and possibly new laws are needed to allow cellulosic [bioenergy](#) to reach its true potential as a form of renewable energy, and in some cases help reduce [greenhouse gas emissions](#) that cause global warming.

"It's extraordinary that gene modification technology, which has been adapted more rapidly than any other technology in the history of agriculture, and had some profound environmental and economic benefits, has been regulated virtually out of existence for perennial cellulosic biofuels crops," said Steve Strauss, a distinguished professor of forest biotechnology at Oregon State University, and lead author of the paper.

In the report, the authors noted that exotic plant species pose a serious risk of spread and ecosystem impacts, but face much less stringent regulation or obstacles than genetically engineered crops, which are carefully designed to solve problems, not cause them.

A genetically modified plant in which one or a few genes have been

changed is treated as more of a risk than an [invasive species](#) that has thousands of new genes, and as a result is often resistant to multiple pests and has novel adaptive traits such as drought and heat tolerance, they said.

Companies that have the technical expertise to conduct advanced research have been forced to stay away from gene modification methods, rather than adopt them to speed breeding progress and insert novel traits important to the growing biofuels industry.

Traits that could be improved with gene modification include enhanced [stress tolerance](#), reduced costs of conversion to [liquid fuels](#), reduced use of water and fertilizer in cultivation, avoiding dispersal into the environment, and synthesis of new, renewable products such as industrial enzymes.

But virtually none of that potential is now being developed, they said.

The current environment poses enormous legal risks that can and have cost some companies millions of dollars in civil lawsuits, the scientists said, sometimes for damages that were more of perception and market issues, than of safety or environmental impact.

"Even research on traits expressly intended to reduce environmental impacts face the same legal risks and regulatory barriers as other traits," Strauss said. "Our own federally-funded research on means to promote ecological containment of gene-modified and exotic biofuel crops has been brought to a standstill by regulations."

The scientists said that the end result of a gene modification project - the trait produced, and whether it is safe and beneficial or not - should be the primary consideration for regulation, not the process used to produce it. Low-level risk and high benefit projects should be identified and

allowed to move forward with much less stringent regulation or none at all. They also made several other suggestions for reform to make the overall system less slow, costly and uncertain.

"It is essential that we create an intelligent regulatory system that does not indiscriminately penalize the gene modification process and obstruct essential field research," Strauss said. "The one-size-fits-all style system of today treats the process of genetic modification as inherently dangerous, although many high-level science panels have concluded that the process is at least as safe as conventional breeding methods."

In some cases, the stringent regulations make it virtually impossible to do the very research needed to adequately understand issues of value and safety, the researchers said.

"The regulations in place, forthcoming, and those that have been imposed by legal actions result in the presumption that all forms of gene modified trees and grasses are 'plant pests' or 'noxious weeds' until extensive experimentation and associated documentation 'prove' otherwise," the scientists wrote in their report.

Solving these problems will require new ways of thinking and strong scientific and political leadership to create a regulatory system that enables, rather than arbitrarily blocks, the use of gene modification as a tool to accelerate and diversify the breeding of perennial biofuel crops, the researchers concluded.

Provided by Oregon State University

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