

# Rice research gets a leg up on understanding plant reactions to environment

November 2 2009

---



This photo shows rice growing in Texas. Credit: (Texas AgriLife Research photo).

One might say plants don't have a leg to stand on, but that may actually give them a leg up on the animal kingdom when it comes to environmental adaptability.

"Plants are rooted in the ground. They can't move away when it gets too hot, too dry or too wet," said Dr. Lee Tarpley, Texas AgriLife Research plant physiologist in Beaumont. "If we can understand how plants respond to the environment, that would give us some clues on how to breed plants more capable of adapting to extremes."

Take rice. More than 558 million metric tons are produced annually in

some 100 nations. It's a staple on which human survival depends in many developing countries, so assuring a harvest is vital.

"As a rice plant grows, its structure changes based on its age, what kind of weather it has faced, the use of chemicals if any, and what it inherited as a plant variety," Tarpley explained.

Yet with so many variables possible across numerous varieties worldwide, researchers have not had a way to analyze enough samples to target particular plant responses for improvement in breeding programs.

In his research, Tarpley has identified biomarkers in rice - 17 markers thus far that can follow changes in metabolism rapidly across a large number of plant samples. The technique is called [metabolite](#) screening. Tarpley has developed procedures for six of these markers so that researchers can begin using them to help diagnose the plant's needs.

"Perhaps we will be able to use these procedures in the lab to screen how tillering occurs and how metabolism changes in that process," Tarpley said. "Then we might understand how to change this to help a plant yield more rice."

A tiller is the stem of the plant where flowers appear before developing individual grains of rice. A [rice plant](#) may have about 15 tillers, each with about 200 flowers, according to University of California-Davis statistics.

Tarpley noted that metabolite screening is also used in animals - including humans - to diagnose certain diseases. A urinalysis, for example, may measure 20 metabolites to look for changes from a normal range.

This study in rice is new, he said, because in the past scientists have only

considered a few aspects of rice [metabolism](#). So while one aspect might be understood, its interactions with other aspects were not included in breeding decisions.

Likewise, Tarpley added, other research has attempted to examine all of a plant's metabolites. But screening for such a large number was also difficult. That's why Tarpley decided to zero in on 17 major metabolites in [rice](#).

He plans to continue working out the processes for the remaining biomarkers so that the information can be used in crop breeding as well as for managing crop environments in the field.

Source: Texas A&M AgriLife Communications

Citation: Rice research gets a leg up on understanding plant reactions to environment (2009, November 2) retrieved 27 April 2024 from <https://phys.org/news/2009-11-rice-leg-reactions-environment.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.