

Rice grown without paddies can feed drought-stricken communities, expert says

January 29 2013, by Tom Nordlie

(Phys.org)—Consumed by 3 billion people, rice is arguably the world's most important food staple, and one reason for its popularity is that rice can be grown under flooded conditions that suppress weeds, making cultivation easier.

In some parts of the world, water is in short supply, but farmers often devote what they can to rice farming because the crop is so important. However, research has led to a simple but profound solution that requires less water – growing rice in fields, a practice called aerobic rice production.

The practice relies on rainfall plus limited irrigation to meet the plants' moisture needs. It requires about 40 percent less water than paddy-grown rice, according to a University of Florida study in the current issue of [Agronomy Journal](#).

Aerobic rice production is gaining popularity in India and [Southeast Asia](#), particularly in drought-stricken or upland areas, said Rao Mylavarapu, a professor with UF's Institute of Food and [Agricultural Sciences](#) and one of the study's authors.

Mylavarapu is working to address a major challenge in aerobic rice production: yield. In the two-year study, conducted in Hyderabad, India, researchers grew rice in irrigated fields and paddies. The first year's aerobic rice harvest weighed 39 percent less than the paddy harvest; the second year the difference narrowed to 15 percent.

"Right now, there's no way you can get the same yield under optimal conditions," he said.

He explained that [grain production](#) is influenced by a [rice plant](#)'s ability to use nitrogen, which in turn is influenced by moisture availability. In other words, paddied plants grown in standing water have an advantage over aerobic plants receiving modest irrigation. And, the rice varieties used for paddied production are different from the ones in aerobic production.

But in a drought there may not be enough water to keep [rice paddies](#) flooded. Under those circumstances, aerobic production can ensure that a community has rice to eat, while the paddied plants wither away.

"The real impact of aerobic rice will be shown in a rainfall shortage year," Mylavarapu said. "However, in a rainfall shortage year, we have to be able to provide supplemental irrigation to aerobic rice and keep the root zone moist. So if there's a very bad drought, even aerobic rice will fail."

He adds that few rice varieties have been developed specifically for aerobic production. In time, breeders may develop improved varieties and close the "yield gap" with paddied rice.

Currently, Mylavarapu's focus is on another aspect of the cropping system – overall grain production in systems where rice is rotated with corn. This approach is used on about 8.65 million acres in Asia because little soil preparation is needed to plant corn in a field following aerobic rice. In contrast, rice paddies must be drained and converted from a flooded anaerobic system to an aerobic system before the land can be used for corn.

In the study, researchers found that corn yields were about 5 percent

higher when the corn followed aerobic rice, compared with paddied rice.

So far, aerobic [rice production](#) hasn't caught on with U.S. farmers, but that could be just a matter of time, he said.

"In the U.S., water quality is usually a bigger issue than water quantity," Mylavarapu said. "Certainly, it (aerobic rice) will become a very important factor for the U.S. to consider in the future, with climate change."

The United States is the world's 10th largest producer of paddied rice, with annual production of about 12 million tons, according to the United Nations' Food and Agriculture Organization. Arkansas is the leading U.S. [rice](#)

Provided by University of Florida

Citation: Rice grown without paddies can feed drought-stricken communities, expert says (2013, January 29) retrieved 19 April 2024 from <https://phys.org/news/2013-01-rice-grown-paddies-drought-stricken-expert.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.