NEWS

Flood-Resistant Rice Aids Farmers in South Asia

November 02, 2009 6:04 PM

Share

Most rice grows in wet environments, but too much water can be disastrous for rice crops. Plant biologist Pamela Ronald helped create a type of flood-resistant rice that is being introduced to India and Bangladesh. In Davis, California, we spoke with Ronald about her new rice and its promise for small farmers in South Asia.

Most rice plants will die if submerged for just three days, but the new variety can withstand two weeks of flooding. Ronald, a plant pathologist at the University of California, Davis, says it can make a crucial difference in a region where subsistence farmers grow rice to feed their families and four million tons of rice is lost each year to flooding. That is enough to feed 30 million people.

Pamela Ronald developed the new rice strain with a colleague at the International Rice Research Institute near Manila, David Mackill, and another scientist at the University of California Riverside, Julia Bailey-Serres.

Ronald says they began with an ancient rice strain from Eastern India that farmers knew could survive long periods under water.

"It was not in use," said Pamela Ronald. "Very, very low yield and very poor flavor, so no one was eating it. It's really more like a grassy weed, but it had these properties."

She says they worked to identify the genes for flood resistance and then transfer them to rice with high yield and good flavor.

"And the idea was, if we could identify the genes, then we could transfer just those genes into the varieties preferred by growers in India and Bangladesh," she said. "And so we were hoping to develop a new rice that retained all those traits that were important to those growers, but also had this additional gene."

Using a technique called precision breeding, they transferred the flood-resistant property to a popular rice known as Swarna. The new variety is called Swarna-Submergence1, or Swarna-Sub1. About 100 farmers took part in field trials in Eastern India and Bangladesh.

Ronald says the results were dramatic, with farmers seeing increases from two to five-fold under conditions of flooding. She met with some of the farmers last year.

"We wanted to hear what kind of difference it made to their families, and a couple of the women told me that they were able to feed their families and they had extra rice to sell, which is really important in those areas to bring in a little cash," said Pamela Ronald.

The U.S. Department of Agriculture conferred a major research award on Ronald and her colleagues in December.

The new rice type is in the final stages of certification in India and Bangladesh, and

should be widely available within two years. The new strain is genetically improved, but not genetically modified, so is not subject to tight controls on genetically modified foods.

Ronald has devoted her career to rice research and notes that rice is the staple food for half of the world's people. She is now turning her attention to another major problem for rice farmers in Asia and Africa.

"We're trying to understand what makes the plant resistant to disease, and we're also looking at the disease-causing bacterial organism that devastates crops in Asia and Africa, and we're trying to understand how the bacteria and the plant communicate," she said.

The scientist hopes to interrupt that process and breed into rice plants a natural resistance to the disease, called bacterial blight of rice.

Ronald lives and works in the heart of California's Central Valley, which produces half the fruits and vegetables for the United States. Her husband, Raoul Adamchak, is an organic farmer and the couple has written a book called, Tomorrow's Table that argues for a combination of genetic engineering and organic farming. Ronald says that both can help farmers feed the world in a green and sustainable way.

Related

O'Sullivan report

Comedy Impresario: Use Government Funds for Comic Bailout

Video: Flood Resistant Rice

FOLLOW US

OTHER WAYS TO ACCESS VOA

ABOUT THIS SITE