

By Nao Nakanishi HONG KONG, Dec 21 (Reuters) - Flood resistant rice, developed this year with the help of genetic engineering, may reach farmers as soon as 2009, helping them cope with global warming and the extreme weather it is expected to bring.

Scientists, led by David Mackill at the International Rice Research Institute in the Philippines, announced in August that they had identified a gene that enables rice to survive for up to two weeks in water.

It is regarded as one of the top breakthroughs in rice research this year as flooding causes annual losses of over \$1 billion, with south and southeast Asia the hardest hit.

Mackill said they were already conducting field trials in India and Bangladesh and that they planned to extend it next year to Laos, Indonesia, Cambodia and Myanmar.

"It's going pretty well," he told Reuters via telephone on Thursday, referring to the tests in India and Bangladesh that could lead to commercialization of the variety. "If everything goes well, we might see it in two years. That would probably be in 2009," he said.

Mackill and Pamela Ronald at the University of California at Davis said they were also sending the rice seed to China, the world's top rice producer and consumer, which faces many floods and droughts each year.

Though the flood resistance rice on trial is not genetically modified, they used genetic engineering to identify the submergence-tolerant gene after decades of attempts to do so via conventional methods, they said.

OTHER TRAITS, NON-GMO

"We are quite excited," said Ronald, adding the technique could also be used to identify other complex genes for traits such as drought- or salt-tolerance.

"I think this is really the first case where we've been able to successfully identify one of the key traits," said Ronald.

The scientist is also known for her disease-resistant Xa21 rice -- one of the top candidates to become the world's first GMO rice grown commercially, possibly in China.

The breakthrough came in a year full of renewed warnings about the devastating effects of climate change. The Consultative Group on International Agricultural Research also said new crops were needed to prepare the most vulnerable.

Mackill and Ronald said they used the non-GMO species for field trials partly due to consumer concerns over the safety of GMO products. "What we would like to do is get something we can use quickly," said Mackill. "Right now, there is really no GMO rice approved for commercialisation. So the countries would have to develop safety guidelines and all that. That may take time." But looking further ahead, the scientists did not exclude the possibility of also

developing GMO species. "Consumers are not aware of the huge potential of genetic engineering," Ronald said.

"The marker assisted breeding is quite limited because you can't change the gene. We can only attain a tolerance of about two weeks under water ... We are trying to enhance that tolerance for in the future when people are not so worried about GMO."