

Why perennial rice developed in China is a big deal

BY SAYANTAN BERA

Farmers in China are now growing a perennial variety of rice which does not need to be planted every year. The invention could transform rice farming by making it climate-friendly, besides using less of labour and other inputs. *Mint* takes a close look.



Fengyi Hu (third from left) and his team inspecting perennial rice in Yunnan province, China.

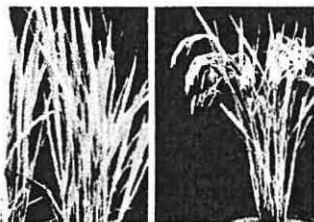
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1 What is the perennial variety of rice?

Researchers at the Yunnan University have developed a variety of perennial rice named PR23 by cross-breeding regular annual rice *Oryza sativa* with a wild perennial variety from Africa. Unlike regular rice which is planted every season, PR23 can yield eight consecutive harvests across four years (as these plants with stronger roots grow back vigorously after each harvest). PR23 yields, reported at 6.8 tons per hectare, are comparable to regular irrigated rice. But growing it is much cheaper since it requires less labour, seeds and chemical inputs. In 2021, the variety was grown by more than 44,000 farmers in southern China.

2 Does it have any other benefits?

According to the research findings reported in the journal *Nature Sustainability* in November, growing perennial rice over a period of four years resulted in remarkable environmental benefits such as soils accumulating close to a ton of organic carbon (per hectare per year) along with increases in water available to plants. The perennial varieties were preferred by farmers since it saved 58% in labour and 49% in other input costs, over each regrowth cycle. The researchers claim it can transform farming by improving livelihoods, enhancing soil quality and by inspiring research on other grains.



(Left) PR23 perennial rice showing regrowth after harvest; (right) ready to harvest. NATURE SUSTAINABILITY, NOV 2022

3 Why is the discovery of the new variety significant?

Rice feeds about half of the world, and its farming and consumption are primarily in Asia. According to plant geneticist Channa Prakash of Tuskegee University, US, "most crops grown today were once perennial, but bred to be annual, short-duration, to make them more productive. Perennial rice could be a transformational innovation if it proves to be economically sustainable."

4 How long did it take China to develop it?

After a failed attempt in the 1970s, work on perennial rice began in early 1990s at the Yunnan Academy. Between 1995 and 2001, the International Rice Research Institute initiated a project, where a young Master's student from China, Fengyi Hu, worked on perennial rice breeding. The project was terminated in 2001 due to fund cuts. But after completing his PhD, Hu continued with the research at Yunnan University with support from The Land Institute, Kansas, US. The first variety was released to Chinese growers in 2018.

5 What are the learnings for India?

India is the world's second largest rice producer, after China, and the largest exporter with a 40% share in global trade. It is grown during both summer and winter crop seasons. Perennial rice can reduce the drudgery of annual transplantation, a back-breaking task, and generate savings on seeds and other inputs. China's early success has another lesson for India: to raise investments in public research and agricultural sciences. This can help counter the impact of climate change on food security and rural incomes.