

Climate change could increase rice yields

August 31 2020, by Rachel Schutte



Many people around the globe rely on rice as a source of nutrition. Credit: Rachel Schutte

Rice is the most consumed staple food in the world. It is especially common in Asia, where hunger concerns are prevalent.

Rice is classified as an annual plant, which means it completes its life cycle within one growing season then dies. However, in some [tropical areas](#), rice can continue to grow year after year when taken care of properly.

Just as grass grows back in a lawn after it is mowed, rice can be cut after it is harvested, and the plant will regrow. The farming practice of cutting the rice above ground and allowing it to regrow is called ratooning.

Although Rice ratooning allows farmers to harvest more rice from the same fields, it requires a longer growing season compared to traditional single-harvest rice farming.

In many areas of the world where rice is grown, a long growing season isn't a problem due to the tropical climates. But in Japan, cooler weather means rice ratooning has been a rare farming practice.

Hiroshi Nakano and a research team set out to learn more about the potential of ratooning to help Japanese rice farmers. Nakano is a researcher at the National Agriculture and Food Research Organization.

Average temperatures in Japan have been higher in recent years. As climate change continues to affect the region, rice farmers may have a longer window for growing rice. "Rice seedlings will be able to be transplanted earlier in the spring, and farmers can harvest rice later into the year," explains Nakano.



Rice seeds are arranged on the plant in groups, called spikelets. This field of rice is ready for harvest. Credit: Hiroshi Nakano

"The goal of our research is to determine the effects of harvest time and cutting [height](#) of the first harvest on the yield of the first and second rice crops," says Nakano. "Ultimately, we want to propose new farming strategies to increase yield as farmers in southwestern Japan adjust to climate change."

During the study on rice ratooning, researchers compared two harvest times and two cutting heights of the first crop. After the first harvest, they collected the seeds from the cut off portions of the rice [plants](#).

Researchers measured the yield by counting and weighing the seeds. The second harvest of rice was done by hand and the yield was determined in the same way.

The total grain yield and the yields from the first and second crops were different depending on the harvest times and cutting heights. This wasn't too surprising, since the team already knew harvest time and height affected yield.

Rice plants harvested at the normal time for the first crop yielded more seed than the rice plants harvested earlier. "That's because the plants had more time to fill their spikelets with seed," explains Nakano.



Comparison of the two cut heights of rice five days after harvesting the first crop. Credit: Chiemi Nagamatsu

"At both harvest times, rice harvested at the high cutting height had a higher yield than the low cutting height," says Nakano. That's because the plants cut at a higher height had access to more energy and nutrients stored in their leaves and stems.

"Our results suggest that combining the normal [harvest](#) time with the high cutting height is important for increasing yield in rice ratooning in southwestern Japan and similar climate regions," says Nakano. "This technology will likely increase [rice](#) grain yield in new environments that arise through global climate change."

More information: Hiroshi Nakano et al. Breaking rice yield barrier with the ratooning method under changing climatic conditions: A paradigm shift in rice-cropping systems in southwestern Japan, *Agronomy Journal* (2020). [DOI: 10.1002/agj2.20309](https://doi.org/10.1002/agj2.20309)

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