



Rice infested with bacterial blight, which can cause crop losses as high as 75%. Credit: Nigel Cattlin/Alamy

**CRISPR-CAS9 GENOME EDITING** · 29 OCTOBER 2019

# A crop that feeds billions freed from blight by CRISPR

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Genome editing has made one of the world's most important crops resistant to a devastating bacterial infection.

Bacterial blight, which is caused by *Xanthomonas oryzae* pathovar *oryzae* (*Xoo*), can slash farmers' yields of rice, which is a staple food for billions of people. Seeking to lessen the blight's impact, Ricardo Oliva at the International Rice Research Institute in Manila and his colleagues studied *Xoo* genes that code for proteins called TALEs. *Xoo* use these proteins to turn on the plant's *SWEET* genes, which produce sugar-transporting molecules. This gives the bacteria access to nutrients in the plants' leaves.

The team's analysis of 63 *Xoo* strains revealed that each strain has one or more TALE variants. Each variant can activate at least one of three *SWEET* genes.

The researchers used CRISPR–Cas9 gene editing to modify three *SWEET* genes found in rice varieties that are grown across Asia and Africa. Bacterial TALE proteins could no longer activate the edited genes, and the team found that rice plants with these engineered genes were resistant to at least 95 *Xoo* strains.

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CRISPR-Cas9 genome editing

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