

Bacteria to aid sustainable sugarcane production

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Scientists have discovered a bacterium that could reduce the use of fertiliser in sugarcane production and improve yield.

Sugar is an important commodity around the world and sugarcane accounts for about 80% of production. The price of sugar has increased at a rate considerably above inflation over the last 30 years. This is not least due to the rising cost of [fertilisers](#), which is partly driven by increased global demand, and linked to the degradation of soil quality over decades of agricultural use. Of course, with increasing pressure on water, energy and other resources, there are multiple other reasons to reduce the use of synthetic chemicals in agriculture wherever possible.

This research, published today (19 December) in SfAM's journal, *Microbial Biotechnology*, describes how scientists searched the roots of sugar cane and found a new [bacterium](#), *Burkholderia australis*, that promotes plant growth through a process called [nitrogen fixation](#).

Bacteria are widely used in sugar cane production, as well as with other crops, where they help to break down organic matter in the soil to make vital nutrients available to the growing plants or turn nitrogen from the air into nitrogen compounds that are essential for growth (so-called biological nitrogen fixation). The results can be very variable, which is unsurprising given the complexity of biological processes in and around the plant root. This variability means that the success of bacterial fertilisers might depend on developing tailor-made versions for different crop cultivars and environments.

Lead researcher, Dr Chanyarat Paungfoo-Lonhienne from The University of Queensland, Australia, said "We took a new approach and went looking for bacteria that were present in large numbers around the roots of thriving sugar cane plants. While two of the most abundant bacteria did not have noticeable effects on plant growth, *Burkholderia australis* was doing quite well in competition with other [soil bacteria](#) in the environment, and turned out to be particularly good for the plants."

The team tested the bacteria, checking that they were happy living amongst the roots of growing sugarcane seedlings, and sequencing the genome to confirm that they had the genetic ability to turn nitrogen into plant food.

Paungfoo-Lonhienne and colleagues are also looking for bacteria that break down waste produces from [sugar cane](#) processing, or livestock manures, to provide better natural fertiliser for next generation crop production. They hope to conduct field tests with a view to assisting the development of commercial products that will be used to improve the health and productivity of sugarcane crops, whilst reducing the need for synthetic fertilisers.

More information: The article referred to is: A new species of *Burkholderia* isolated from sugarcane roots promotes plant growth. Chanyarat Paungfoo-Lonhienne, Thierry G. A. Lonhienne, Yun Kit Yeoh, Richard I. Webb, Prakash Lakshmanan, Cheong Xin Chan, Phaik-Eem Lim, Mark A. Ragan, Susanne Schmidt and Philip Hugenholtz. *Microbial Biotechnology*, Accepted Articles, [DOI: 10.1111/1751-7915.12105](#)

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