BIOTECHNOLOGY

Sweet transgenic immunity

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Credit: David Hancock/Alamy Stock Photo

Banana is not just every kid's favourite fruit; it is also a major staple crop that feeds (directly or indirectly) half a billion people in (sub)tropical areas. Unfortunately, banana is once again threatened by Fusarium wilt, a devastating fungal disease. A mostly Australian team has now used biotechnology to create a transgenic resistant banana.

Last century, the Gros Michel cultivar was decimated by the same disease, and replaced by the resistant Cavendish — the fruit most of us are familiar with. But Cavendish is no match for a new Fusarium race now spreading in Asia and Africa, causing fears over what may happen when the disease reaches Latin America, the most important region of production. No chemical treatment is efficient, and spores can stay dormant in the soil for decades. As in the case of the Hawaiian papaya, saved from the ringspot virus by a transgenic approach, the authors thought to use biotechnology to increase banana resistance to the disease.

The researchers overexpressed two genes, including one nucleotide-binding/leucine-rich repeat (NB-LRR) gene called *RGA2* from a resistant wild banana. Unlike previous research performed in a glasshouse, the transformed lines were tested in a heavily contaminated field. The results after three years were impressive: while most of the control plants were dead or infected, the plants highly expressing *RGA2* were completely immune to the disease, without any detrimental effect on yield.

Even more interesting from a regulatory and public acceptance point of view, the cultivated banana already contains a weakly expressed *RGA2* homologue; therefore slightly modifying the endogenous gene may lead to the same level of resistance. This success story in the making is another reminder of the power of crop biotechnology as a tool to improve food security.

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