

# Bananas are threatened with extinction

*Author(s):* Нора Иванова, Редактор Растителна Защита /PЗ/

*Date:* 20.04.2014 *Issue:* 4/2014



Bananas in Europe and North America are seriously threatened by pathogenic fungal diseases. In almost all regions where bananas are cultivated, plant diseases are spreading increasingly and lead simultaneously to poor and weak harvests, as well as to the use of more fungicides. One of the alternatives is the introduction of hybrids that are resistant to the specific pathogens.

Bananas are known for their nutritional and taste qualities, and it is no coincidence that in many countries they are a preferred and essential food. On average, a European consumes about 14 kilograms per year. It is estimated that 410 million people worldwide rely on bananas to provide one-third of their daily calorie intake. According to one expert assessment, the new disease could destroy up to 85 percent of the world's bananas.

More than a thousand banana varieties are known worldwide, but almost all are unpleasant in taste. Among the sweet, suitable for consumption, and disease-resistant bananas are the

Rajapuri, Mysore (sweet-sour), Ice Cream, Robusta, and Lady Finger varieties.

Bananas of the Goldfinger variety taste similar to the "classic" ones and are more reminiscent of apples. This is a hybrid introduced by Philip Rowe, who cultivates them in small quantities in Australia. It is little known that wild bananas are practically unsuitable for consumption because they contain many large seeds. Cultivated bananas are only capable of reproducing vegetatively due to the fact that their fruits contain almost no seeds. This is why breeding new disease-resistant varieties proves difficult because only one seed is found in about three hundred fruits. This is one of the reasons why current banana varieties are quite susceptible to various diseases and pests. In the 1950s-60s, the specially created export banana *Gros Michel* was completely destroyed by Panama disease. The causal agent of the disease is considered to be *Fusarium wilt*. In infected plants, the transport of water and nutrients is suppressed and they wither.

This necessitated the cultivation of a new banana variety - Cavendish, which is currently the leading variety on all world markets. Unfortunately, the statistics are alarming. Cavendish and the remaining banana varieties have no protection whatsoever against the new mutation of *Fusarium wilt*, called *TR4 (Tropical Race Four)* - a fungus for which there is no cure. All chemical fungicides stand no chance against the aggressive strain. It lives in the soil, from where it is taken up by the plant and destroys it by limiting the transport of water and nutrients.

Panama disease is not the only problem. The leaf fungus *Black Sigatoka* is also found in most banana plantations, whether it concerns small agricultural producers or mass production. The pathogen limits the photosynthesis of the affected plant, consequently reducing the number of fruits. In addition, the fruits ripen earlier and become unsuitable for export.

So far, traditional control methods, as well as known banana cultivation techniques, have not yielded the expected results. Therefore, scientists are beginning to experiment in the field of genetic engineering.

In 2010, the first trials with a GM banana resistant to black Sigatoka were conducted in Uganda. This banana possesses enzymes that break down the cell wall of the fungus.

A working group led by James Dale from the Queensland University of Technology (Australia) has been established, working on new banana varieties that will be resistant to Panama disease. For the moment, there is no definitive evidence that these bananas could survive outside the greenhouses where they are being experimented with.