**Rothamsted Press Release** Thursday, 17 May 2018 **Food security and health: revenge of the nasty fungi**

*Knowledge of fungal disease in agriculture emphasises a "global collapse" in the ability of chemicals to control pathogenic fungi that threaten human health as well as food security.*

Fungi can evolve so swiftly to counter the chemical treatments designed to protect health and food, in much the same way as bacteria change in the face of increasingly powerful antibiotics, that urgent action is necessary to control this rapid emergence of resistant strains.

“To avoid a global collapse in our ability to control fungal infections and to avoid critical failures in medicine and food security, we must improve our stewardship of extant chemicals, promote new antifungal discovery and leverage emerging technologies for alternative solutions,” warns a research team in [*Science*](http://science.sciencemag.org/content/360/6390/739) today.

Crop-destroying fungi regularly reduce annual yields worldwide by a fifth, with another 10% loss after the crop has been harvested, and fungal effects on human health are spiralling, says the team from Imperial College, Rothamsted Research and the universities of Lausanne and Exeter.

“Most people now have heard of bacterial ‘superbugs’, but resistance is a problem in all kinds of infectious diseases and agricultural pests,” says Nichola Hawkins, a molecular plant pathologist and evolutionary biologist at Rothamsted and co-author of the *Science* review.

“The causes of resistance have a lot in common across these different systems,” she says. “Ultimately, they all come down to evolution by natural selection. But there are some important differences too.

“With antibiotic resistance, we often see the sharing of resistance genes between species. For fungal pathogens, what we’re seeing is mostly parallel evolution, where resistance evolves repeatedly in multiple different species that are each under the same, strong selective pressure.”

Hawkins advocates the sharing of knowledge across agricultural and clinical fields in an effort to seek the common drivers of resistance, and for the fields to work together to come up with new solutions. But the most obvious solution, to keep coming up with more new compounds, is not the whole answer, she notes.

“Recent experience tells us that this is not sustainable unless we also become more aware of resistance management, and develop non-chemical control measures too,” says Hawkins. “By aiming for as broad a toolkit as possible, we reduce the pressure on any one component, and improve our chances of a longer-term solution.”

The work at Rothamsted forms part of the Smart Crop Protection (SCP) strategic programme (BBS/OS/CP/000001) funded through the Biotechnology and Biological Sciences Research Council’s Industrial Strategy Challenge Fund.

**Publication:**

Fisher *et al*, 2018, *Science*: [Worldwide emergence of resistance to antifungal drugs challenges human health and food security](http://science.sciencemag.org/content/360/6390/739)

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