

FUNGICIDE RESISTANCE RESEARCH AT NIAB

Staying ahead of fungicide resistance

From monitoring pathogens in the field today to anticipating the resistance risks of tomorrow

Fungicide performance and fungicide resistance

Niab monitors Septoria sensitivity to azole, SDHI and Qil fungicides. The latest research, supported by AHDB, indicates that over-reliance on the newer SDHI fungicides isoflucypram and pydiflumetofen may select for higher levels of SDHI resistance, with cross-resistance between SDHI fungicides. Niab has identified associated gene mutations and continues to monitor the situation. These findings reinforce the importance of always using SDHIs, with a robust mixing partner with a different mode of action, alongside using resistant varieties and cultural control measures.

Next-generation DNA tests for resistance

Through the BBSRC Follow-on Fund and the JPIAMR programme, Niab is using nanopore sequencing technology to provide rapid, high-throughput, cost-effective DNA testing for known and new resistance mutations. This enables direct testing of DNA from infected leaves, without the need to isolate the fungus and wait for it to grow. Spore traps are also being used to collect fungal spores from the air for DNA testing.

Fungicides and soil fungi

While fungicides are used to control fungal disease in crops, they can also affect other fungi in the field and surrounding environment. In NERC-supported research, carried out in partnership with Imperial College London, CEH and the Open University, Niab is investigating which farming practices can help to reduce the risk from azole-resistant *Aspergillus*, and how fungicides influence the wider soil fungal microbiome.

Resistance networks

The main driving forces behind fungicide resistance also apply to antibiotic resistance in human and veterinary medicine. Niab is actively involved in UKRI-funded networks tackling resistance across different sectors, including the ARREST-AMR network to develop better diagnostics. Cutting-edge methods from medical laboratories could be adapted for crop disease testing, or perhaps the medical world may learn something from farmers!



Cyclone spore trap



Nanopore sequencing can rapidly detect any mutations in a fungicide target site gene