Rising temperatures likely to increase damage caused by plant pathogens

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New research in *Nature Climate Change* provides evidence that rising temperatures are likely to increase crop losses as warmer soils favor the growth of pathogenic soil fungi species.

Researchers led by the Global Centre for Land-Based Innovation at

Western Sydney University sampled more than 235 locations with ecosystems that range from forests and croplands to deserts. They found that as air and soil temperatures progressively rise, the types of fungi likely to damage food plant species are also projected to increase over the next three decades.

"Soil-borne plant pathogens already cause hundreds of billions of dollars in crop losses each year," said Professor Brajesh Singh, a lead author of the research program.

"Our study suggests that common plant pathogens such as Fusarium and Alternaria species will become more prevalent under projected global warming scenarios, which will add to the challenges of maintaining world food production alongside other climate change-driven crises and a burgeoning human population," Professor Singh said.

The study provides important evidence of not just the prevalence of plant pathogenic fungi, but was also able to use modern DNA sequencing techniques to determine the response of plant pathogens to rising temperatures at a global scale.

This has enabled the development of mapped regions that connect project climate change to crop and ecosystem type to pinpoint where the greatest food security impacts are likely to occur first.

"Combining multiple layers of data offers a very powerful means for pinpointing priority regions," said Professor Singh.

"Since most soil-borne plant pathogenic fungi are difficult to control with chemicals, we can now focus our adaptation and resilience efforts more precisely by targeting the most at-risk regions. We can advocate for strategies that promote plant and human health, build healthy soils and use non-chemical methods to win the battle between crops and

pathogenic fungi," he said.

More information: Manuel Delgado-Baquerizo et al. The proportion of soil-borne pathogens increases with warming at the global scale, *Nature Climate Change* (2020). DOI: 10.1038/s41558-020-0759-3

Provided by Western Sydney University