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Alternating patterns of crops can reduce the spread of harmful plant pathogens **FREE**

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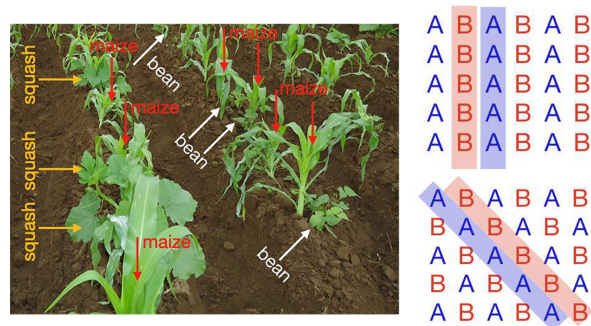


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Creative cropping solutions are needed to slow the propagation of the intrusive and dangerous pathogen *Phytophthora*.



Phytophthora is a common and very aggressive genus of pathogen, whose name literally translates to “plant destroyer.” Since pesticides and fungicides are often ineffective against *Phytophthora*, the pathogen can cause extreme devastation when it propagates through a forest or crop plantation. To help develop eco-friendly strategies for fighting this harmful pathogen, Rosales Herrera et al. simulated the impacts of two different intercropping designs on its percolation.

“Frequently, many farmers [have] completely lost the entire production yield of the plantation because of *Phytophthora*,” said author Jhony Ramírez.

By modeling a plantation as a square lattice with two different types of crop, each with a different susceptibility to the pathogen, the group predicted how *Phytophthora* would propagate through the field. They tested two geometric configurations, one where the two types made up alternating columns, and one with an alternating diagonal plan. In their calculations, a certain percentage of the soil was assumed to have the pathogen present at the start of the propagation process, a value that can be obtained by testing the soil in real life.

According to their results, if a farmer opts to sow plants at smaller distances to increase plant density, an alternate column configuration will better prevent the dissemination of *Phytophthora*. Otherwise, the diagonal configuration is preferred.

Ramírez said farmers can already start taking their findings to heed. By considering the characteristics and susceptibilities of their plants, and the pathogen’s distribution in the soil, they can choose the best sowing configuration and plantation density.

“This would require technical work, but with this information, producers may reduce the incidence of damages caused by *Phytophthora* or other phytopathogens,” he said.

Source: “Percolation-intercropping strategies to prevent dissemination of phytopathogens on plantations,” by Diana Rosales Herrera, J. E. Ramírez, M. I. Martínez, H. Cruz-Suárez, A. Fernández Téllez, Jesús F. López-Olguín, and Agustín Aragón García, *Chaos* (2021). The article can be accessed at <https://doi.org/10.1063/5.0044714>.

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