

Climate Change Increases Need for Fungicides for Coffee Trees

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Leonard Gianessi and Ashley Williams

Coffee rust is considered one of the most catastrophic plant diseases of all time. In the 1860s, coffee rust was largely responsible for destroying the coffee plantations of Ceylon (Sri Lanka), which had been the greatest coffee-producing country in the world [1]. The coffee trees were destroyed because the fungicides available in the 1860s were not effective on coffee rust [2]. The British, who had imported coffee from Ceylon, changed their drinking habits to tea.



Coffee beans

As coffee rust spread throughout Asia and Africa into the early 1900s, copper sprays became widely used after research demonstrated that copper fungicides could control the disease [1]. In the 1900s, coffee production increased significantly in Latin America because coffee rust was not present. However, coffee rust was first detected in Brazil in 1970 and has subsequently spread throughout Latin America, where copper and synthetic chemical fungicides are widely-used to reduce its impact [1].



Rust infection

Coffee is the only known host of the fungus *Hemileia vastatrix*, which causes coffee rust. The disease damages coffee trees by causing the premature drop of infected leaves, which can lower yields by 50 percent and have a cumulative weakening effect on the trees for succeeding years [3]. Because water is essential for spore dispersal and germination, epidemic progression of coffee rust is dependent on rain. Higher temperatures shorten the time between succeeding generations of spores [4].

Coffee rust has become a greater problem for coffee growers because of climate change. Average temperatures have risen and in some coffee-producing regions, such as Columbia, rain has been 25 percent above average in the past few years [5]. Temperatures are projected to increase 1°C to 5.8°C and the rainfall by 15 percent in the tropical areas of Brazil [6].



Premature leaf drop

Fungicides are widely-used today to prevent coffee rust from destroying trees [7]. Epidemic conditions for the disease will prevail if more rain and higher temperatures change the climate in coffee-producing regions [8].

References

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Coffee trees killed by rust