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Opinion Article

Fungal Pathogens in Plants and Their Control Methods

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DESCRIPTION

Despite being one of the most common eukaryotic lifestyles, parasite population genetics lags far behind that of free-living organisms.

Nonetheless, the development of molecular markers provides excellent tools for studying important processes such as dispersal, mating systems, host adaptation, and speciation. In this section, we highlight some studies that used molecular markers to investigate the population genetics of fungal (including oomycetes) plant pathogens.

We conclude that population-genetic approaches have provided tremendous insights into the biology of a few fungal parasites and that they should be used more widely in phytopathology.

However, theoretical advances are desperately needed to best apply existing methods. Fungi are of particular interest not only because they are major plant and animal parasites, but also because they are tractable.

Despite plant pathologists' best efforts, fungal plant diseases continue to cause significant crop losses. The most widely accepted approaches to plant disease management are breeding for disease-resistant varieties and the use of synthetic chemical fungicides. Biological control utilising antifungal bacteria with direct action on fungal pathogens could be employed to avoid the negative effects of chemical control. Different fungal infections have been targeted by a number of biocontrol agents that have been registered and released on the commercial market. Due to the inherent restrictions in using living organisms, such as the products' generally brief shelf lives and variable effectiveness in the field, these have not yet reached their full economic potential.

The microbial biocontrol of fungal plant diseases has been linked to a variety of methods of action, including competition for nutrients or space, the synthesis of antifungal compounds, and the secretion of hydrolytic enzymes like chitinases and glucanases.

The most significant targeted structural element of fungal pathogens, chitinous fungal cell walls, are hydrolyzed by bacterial chitinases. With over 8,000 species known to cause illness,fungus and fungal-like organisms collectively cause more plant diseases than any other class of plant pest.

FLOs are organisms that, up until recently, were classified as fungi and are now found in the kingdom of Chromista. Examples of these species are Pythium and Phytophthora, as well as those that cause downy mildew.

Both harmful and helpful fungi and FLOs can exist. Good fungus take part in biological cycles like rotting transforming dead plant and animal components into nutrients that are taken up by active plants. Some helpful fungi flourish. interacting symbiotically with upper green's root cells.

This kind of living is known as mycorrhizal in plants. the most common crops including corn, beans, cotton, tobacco, peas, and red Apples, oranges, pines, aspens, birches, various types of turfgrass, clover, have mycorrhizal connections with soil fungus, among others.

The Mycorrhizae seem to be very helpful, frequently vital, and for the best development of many plants. a few helpful fungi, Effective examples are those from the genus Trichoderma.

In general, skilled plant production experts and producers have more tools to manage viral and bacterial illnesses than fungal diseases. Strict cleanliness to eradicate the pathogenic organism, beginning with the early phases of proliferation and growth of the prospective host plants, is one of the most effective ways to treat fungus illnesses.

Control methods

Host resistance genes: Only if cultivars that are Fusarium-resistant are planted can tomatoes be grown on soils that are Fusarium-infested. Wheat cultivars resistant to stem rust are continuously developed by plant breeders, however the fungus quickly mutates and attacks the previously resistant cultivars, necessitating the creation of new resistant cultivars.

Uses for chemicals: The application of fungicide drenches, seed treatments, or preplant soil fumigants.

- Applications of fungicides.
- Fungicides are applied to fruits and vegetables after harvest.
- The use of biological control organisms to stop harmful fungus from growing.

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