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Priming plants: A vaccine against diseases

Plants suffer with the attack of microorganisms the same way that animals do. Diseases caused by viruses, bacteria and fungi can lead to great economical losses in agriculture. Just like animals, plants also have an 'immune' system that helps defend themselves against these aggressors. The defense mechanisms can be structural or substances derived from the plant secondary metabolism; and they may be constitutive or induced only after the plant receives damage. And after the plant is attacked, the plant keeps a long-term 'memory' from the pathogen stimuli leading to a more robust defense in the case of a future attack. Not only the aggressor can trigger this 'defense priming', but also

substances called elicitors are able to act as vaccines, thus preparing the plant and enhancing its capacity for rapid and effective activation of cellular defense responses in the presence of a challenge. In contrast to direct induced defenses, only minimal fitness cost is associated with priming. This long-term primed state is usually associated with alterations to gene responsiveness. Several chemical elicitors have been described and proven to be effective in priming plants, such as salicylic acid, methyl salicylate and chitosan. The introduction of priming plants with chemical elicitors against pathogens as an agricultural practice could minimize the scope of agrochemicals and would contribute to a more sustainable agriculture.

Biography

Jucelaine Haas is an Entomology Professor at the Federal University of Technology – Parana, in Brazil. Jucelaine field of research is insect-plant interactions, aiming at agricultural sustainability.

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