

THE ROLE OF SILICON IN SUPPRESSING PLANT DISEASES

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Abstract

Silicon (Si) is a bioactive element associated with beneficial effects on mechanical and physiological properties of plants. Silicon was originally not recognised as an essential element for the growth of plants. However, it has been shown to alleviate abiotic and biotic stresses, and it increases the resistance of plants to pathogenic fungi. Several studies have suggested that Si activates plant defense mechanisms. There are proposed hypotheses that suggest the mode of action for Si-enhanced resistance to diseases and pests. It can act as a modulator influencing the timing and extent of plant defense responses in a manner reminiscent of the role of secondary messengers in induced systemic resistance. It can also bind to hydroxyl groups of proteins strategically involved in signal transduction; or it can interfere with cationic co-factors of enzymes influencing pathogenesis-related events. Silicon may, therefore, interact with several key components of plant stress signaling systems leading to induced resistance. However, there is a paucity of information on the control of fungal pathogens in oil-plants by Si.