Special Issue

Phosphorus–Silicon Crosstalk in Plants: Enhancing Nutrient Efficiency and Alleviating Stress

Message from the Guest Editor

Phosphorus and silicon play a key role in increasing plant resistance to stress. Silicon is deposited in cell walls, making the plant more resistant to mechanical damage and attacks by pests and diseases and reducing stress. Silicon helps the plant cope with excess of toxic elements in the soil. Phosphorus is crucial for energy processes and cell structure. It improves the plant's overall condition and vitality, allowing it to better cope with various stress factors.

Using fertilizers containing both phosphorus and silicon can lead to complex interactions. Intensive phosphorus fertilization can limit plants' ability to absorb silicon, which can lead to reduced resistance. Particularly, for soils with low phosphorus content, silicon fertilization can cause the release of phosphorus forms unavailable to plants, improving their nutrition. Despite the potential antagonism, silicon and phosphorus can act complementarily. Silicon physically strengthens the plant, while phosphorus provides it with energy and proper development, which ultimately leads to better adaptation to stressful conditions.

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Deadline for manuscript submissions

31 August 2026

Agronomy

an Open Access Journal by MDPI

Impact Factor 4.1
CiteScore 7.6

mdpi.com/si/259937

Agronomy
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mdpi.com/journal/agronomy