

# Silicon: An important element in rice production

April 28 2015

---



Credit: Earth100/Wikipedia

Silicon (Si) is the second most abundant element of the earth's crust after oxygen. It has long been neglected by ecologists, as it is not considered an essential nutrient for plants. However, research of recent years showed that it is beneficial for the growth of many plants, including important crops such as rice, wheat and barley.

For instance, Si enhanced the resistance against pests, pathogens and abiotic stresses such as salts, drought and storms. Silicon might, thus, play a crucial role in the development of `sustainable` rice production systems with lower or zero input of harmful pesticides.

Researchers from the interdisciplinary [LEGATO project](#) on sustainable rice production look in more detail at the cycle of plant-available Si in contrasting regions of Vietnam and the Philippines to provide insights on the importance of this element on [rice production](#).

A recent article published in the journal *Plant and Soil* reports on Si cycling and budgets on the farm level in the Laguna province of the Philippines. The data show that the irrigation water can provide a considerable amount of the Si that is taken up by [plants](#). In rain water, the concentrations of Si were below the detection limit of the analytical method; the researchers, thus, assume that rain is no important Si source for plants. Another major source of plant-available Si is the dissolution of solid soil particles.

In a subsequent study, the LEGATO researchers currently focus on the soil processes that determine the pool of plant-available Si during the growing period. Recent literature suggests that the recycling and decomposition of rice straw plays a crucial role for Si availability. The farmers should therefore recycle the straw completely.

This is not done by all of the farmers that were interviewed within the LEGATO project, i.e., some of them remove part of the straw and use it e.g., as fertilizer on vegetable fields. Over the long-term, this could have negative effects on the Si supply to [rice plants](#). Particularly in regions, where soils are strongly weathered, and the Si availability is therefore very low (e.g., the LEGATO study sites in Vietnam), farmers should consider Si availability as a factor in the management of the [rice](#) field.

**More information:** Klotzbücher, T., Leuther, F., Marxen, A., Vetterlein, D., Horgan, F., Jahn, R. 2015. Forms and fluxes of potential plant-available silicon in irrigated lowland rice production (Laguna, the Philippines). *Plant and Soil*, [DOI: 10.1007/s11104-015-2480-y](https://doi.org/10.1007/s11104-015-2480-y)

Klotzbücher, T., Marxen, A., Vetterlein, D., Schneiker, J., Türke, M., Van Sinh, N., Manh, N.H., Van Chien, H., Marquez, L., Villareal, S., Bustamante, J.V., Jahn, R. 2015. Plant-available silicon in Southeast Asian paddy soils - baseline data for the LEGATO project. *Basic and Applied Ecology*. [DOI: 10.1016/j.baae.2014.08.002](https://doi.org/10.1016/j.baae.2014.08.002)

Provided by Pensoft Publishers

Citation: Silicon: An important element in rice production (2015, April 28) retrieved 22 May 2024 from <https://phys.org/news/2015-04-silicon-important-element-rice-production.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.