

OC3. Influence of N and Si on the photosynthetic activity of rice

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Objectives:

This experiment was performed to evaluate the photosynthetic activity in rice by the application of N and Si with special emphasis on the fluorescence activity of rice.

Materials and Methods:

Rice cropping: Thirty-day old rice seedling was transplanted in the pot.

Fertilization level: N(Urea-15N₂, 10.2 Atom %): 0, 50, 100% of the RDA recommendation.

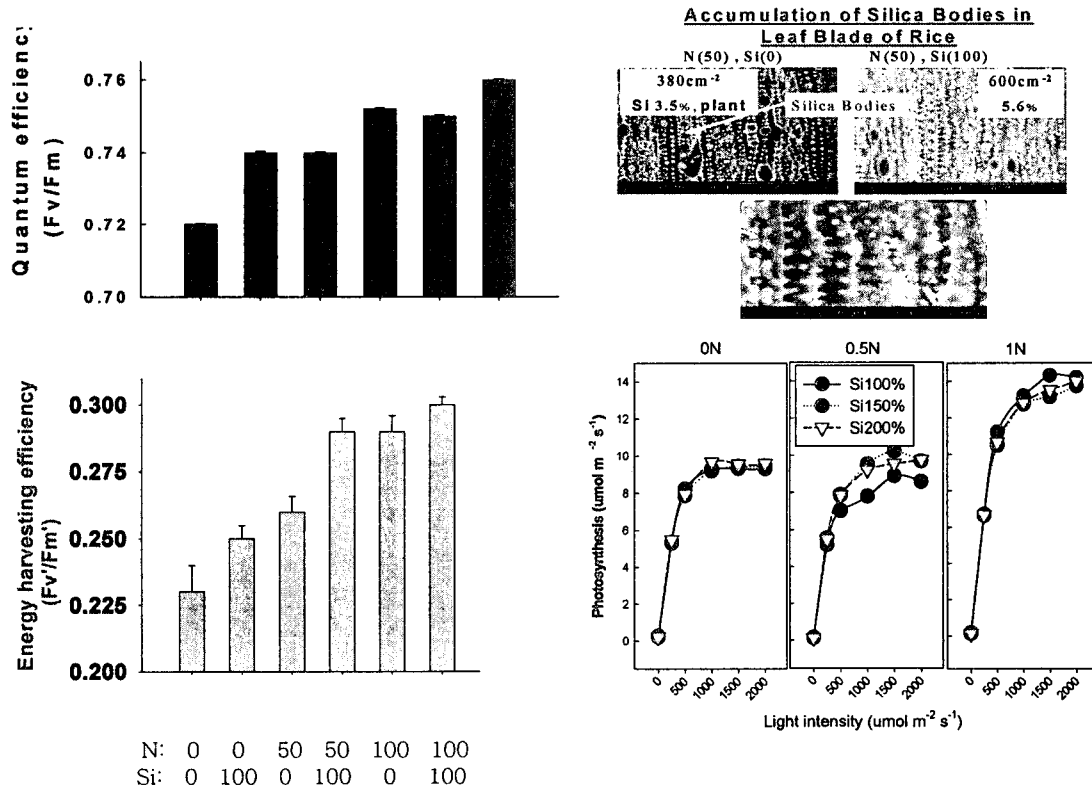
SiO₂ (Silicon 99.8%, powder) was fertilized. 75, 130, 170ppm.

Rice cultivar: Hwayeongbyeo; Soil texture: Sandy soil; a sandy loam.

Photosynthetic analyzer: LI-6400; LI-6400-40 LCF was used for measuring fluorescence.

Results and Discussion:

At first, silica body in leaf blade was about two times greater by the application of 170ppm of SiO₂ than 75ppm which also increased the quantum efficiency (Fv/Fm) and energy harvesting efficiency of rice plant in all N levels. However, total photosynthetic activity in light curve was not improved by Si fertilization. Conclusively, Si could not improve the net photosynthetic activity but PSII related fluorescence activity increased by reduced fluorescence emission.



Figs. Leaf quantum efficiency (Up-Left), Silica bodies accumulation (Up-Right), Energy harvesting efficiency (Down-Left), and Photosynthesis in light-curve (Down-Right).

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