

Title: The interactive effect of silicon and nitrogen on growth and spikelet filling in rice (*Oryza sativa* L.)

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Abstract: Silicon as a beneficial element for rice improves leaf erectness leading to better light interception. Greenhouse hydroponic experiments were conducted using 0, 50 and 100 ppm silicon and two 40 and 80 ppm nitrogen to study silicon and nitrogen interaction on the growth and spikelet filling of rice.

Data showed that addition of silicon in culture solution (pH 5) increased dry matter production and SiO₂ accumulation in tissues regardless of N supply. Similar significant increases in harvest index and % spikelet filling were observed, resulting in improved grain yield. On the other hand, increased N supply significantly increased total dry weight in the absence or presence of SiO₂. It was found that 100 ppm SiO₂ increased dry matter accumulation at low N but both concentrations of SiO₂ increased total dry weight at high N. The same trend of SiO₂ effect was also true for grain yield. On the other hand, high level of SiO₂ increased spikelet filling percentage only at high N supply.

The above results indicate an interaction between SiO₂ and N on growth and spikelet filling and a threshold concentration of SiO₂ with N supply is likely to improve grain yield in rice.

Author Keywords: grain filling; rice; silicon; nitrogen

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