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Effects of supplying silicon nutrient on utilization rate of nitrogen and phosphorus nutrients by rice and its soil ecological mechanism in a hybrid rice double-cropping system

Key words: **Silicon nutrient, Utilization rate of fertilizer, Ecological mechanism, Rice double-cropping system**

Research Summary

This research article focused on the effects of supplying silicon nutrient on utilization rate of nitrogen and phosphorus nutrients by rice and its soil ecological mechanism in a hybrid rice double-cropping system.

- **Effects of supplying silicon nutrient on growth and yield of rice**
- **Effects of supplying silicon nutrient on N and P nutrient uptake from soil and N and P utilization rates from fertilizer**
- **Effects of supplying silicon nutrient on availability of soil N and P nutrients**
- **Effects of supplying silicon nutrient on soil microbial biomass C, N, and P**
- **The relationship between grain yield and N and P use efficiency of fertilizer, mineralization of soil N and P nutrients, and the reserves of organic N and P nutrients in microorganism**

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Innovation points

● **Introduction** **of an essential function for silicon (Si) in promoting biomass production and grain yield of plant and enhancing tolerance of plant to various abiotic and biotic.**

● **Summary** **of the effects of Si application on nutrient utilization efficiency by rice, and on soil nutrient availability and soil microorganisms in a hybrid rice double-cropping planting system.**

● **Emphasis** **of the ecological mechanism for Si application enhancing rice growth and increasing the utilization rate.**

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Figure 4

Innovation points

A series of comprehensive tables were generated to summarize the effects of supplying silicon nutrient on utilization rate of nitrogen and phosphorus nutrients by rice and its soil ecological mechanism in a hybrid rice double-cropping system.

Table 1 | Effects of different levels of Si nutrient application on growth and yield of rice.

Table 2 | Effects of different levels of Si nutrient application on N and P nutrient uptake from soil and N and P utilization rates of fertilizer by rice.

Table 3 | Effects of different levels of Si nutrient application on mineralization of soil N and P nutrients in a hybrid rice double-cropping system.

Table 4 | Effects of different levels of Si nutrient application on soil microbial biomass C(MBC), N(MBN), P(MBP) at the tiller stage of rice.

Table 5 | Coefficients (r) of correlation between grain yield and N and P use efficiency of fertilizer, mineralization of soil N and P nutrients, and the reserves of organic N and P nutrients in a hybrid rice double-cropping system.

Table 6 | Coefficients (r) of correlation between the reserves of organic N and P nutrients and mineralization of soil N and P nutrients in a hybrid rice double-cropping system at the tiller stage.