

## 酸性水稻土上水稻对硅、钾、钙、镁的吸收及其动力学研究

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### Study on uptake of Si, K, Ca, Mg by rice and its dynamics in acid paddy soil

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**摘要** 运用盆栽试验研究了南方稻区酸性水稻土上增施硅(Si)、钾(K)、钙(Ca)、镁(Mg)肥对水稻产量的影响及其水稻对Si、K、Ca、Mg的吸收。结果表明,在酸性水稻土上增施Si、K、Ca、Mg肥及其配合施用均具有显著的增产效益,能明显地提高水稻对该种元素吸收速率和总吸收量。施Si肥主要是增加了水稻后期对Si的吸收,使水稻成熟期能保持较高的Si含量;施用K肥使水稻在移栽后能较长时间内保持较高的K吸收速率;施Ca、Mg肥能使水稻保持较高的Ca吸收速率;K和Ca之间存在不同程度的交互作用。扩散方程、Elovich方程和多项式方程均能很好地描述水稻生长期内水稻对Si、K、Ca、Mg的吸收过程。可用扩散方程和Elovich方程的参数b值来评价水稻对Si、K、Ca、Mg吸收速率。

**关键词:** 酸性水稻土 养分吸收 动力学 酸性水稻土 养分吸收 动力学

**Abstract:** Effect of Si, K, Ca and Mg fertilizers applied to acid paddy soil on yield of rice and uptake of Si, K, Ca and Mg by rice was investigated with pot culture experiment. The results showed that there were significant yield effects on rice with the single or compound application of Si, K, Ca and Mg fertilizers on the basis of NP fertilizers in acid paddy soil, and the uptake capacity and uptake rate of these nutrients were increased by the rice. Si could mainly raise the uptake capacity and uptake rate of rice during the late growth period, and had higher Si content in rice plant at mature stage. Potash supplied could keep rice higher rate of K uptake rate for a longer time. The higher rate of Ca uptake has been held by the application of Ca and Mg fertilizers during growth period of rice. There was an interaction between K and Ca. Elovich equation, Diffusion equation and Quantic equation could describe the uptake processes of rice on Si, K, Ca and Mg during growth period of rice. The uptake rate of Si, K, Ca and Mg might be evaluated with parameter b in Elovich equation and Diffusion equation.

**Keywords:**

#### 引用本文:

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