

农学—研究报告

农田施用水葫芦对水稻钾素吸收利用的影响

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摘要:

以粳稻品种‘运2645’为供试材料,设计农田施用水葫芦(将晒干水葫芦按4500 kg/hm2农田施用)、不施用水葫芦处理和施N量为120 kg/hm2(LN)、240 kg/hm2(NN)处理,研究其对水稻不同生育时期K素含量、K素吸收、K素分配和K素利用效率的影响。结果表明:(1)农田施用水葫芦使水稻不同生育时期植株含K率显著提高,增加幅度从够苗期逐渐下降,到抽穗后又逐渐增加;使各生育时期吸K量显著提高;(2)农田施用水葫芦对水稻不同生育时期K素在茎鞘、叶片中分配比例多无显著影响,使成熟期K素在穗中分配比例显著降低;(3)农田施用水葫芦使水稻不同生育时期K素干物质生产效率均显著或极显著降低,使K素籽粒效率和K素收获指数均显著降低;(4)增施N肥,使水稻不同生育时期的植株K素含量和吸K量均得到极显著的增加,使K素干物质生产效率和K素籽粒生产效率均显著或极显著下降;(5)水葫芦×N对稻株K素吸收利用多无显著互作效应。农田施用水葫芦使水稻植株含K率、K素吸收量显著提高,使K素干物质生产效率和K素籽粒生产效率显著降低。

关键词: K素效率

Effect of Hyacinth Mulching on Kalium Uptake and Utilization of Rice (Oryza sativa L.)

Abstract:

With the development of agriculture, more and more nitrogen and phosphorus fertilizer were supplied in field rice growth in China. But in the mass, Kalium (K) was absent in many areas. Hyacinth could absorb large quantities of Kalium and concentrate them in their tissues. In this study, the field experiment was conducted to investigate the effects of hyacinth mulching on rice Kalium concentration, uptake, efficiency and allocation at different growth stages. Took ‘Yun 2645’ as material, the Kalium uptake and utilization of rice were evaluated under two different levels of N input: low (LN, 120 kg/hm2) and normal N (NN, 240 kg/hm2) in 2009. The results showed that: (1) Compared with AMB, hyacinth mulching significantly increased K concentration in rice plant over the season, and the increasing rate was gradual decline from mid-tillering to heading, but from heading to maturity the increasing rate was gradual addition, hyacinth mulching significantly increased Kalium accumulation in rice plant. (2) Hyacinth mulching had no obvious effect on Kalium allocation pattern in leaves and stems of rice over the season, significantly decreased Kalium allocation pattern in spikes at grain maturity. (3) Hyacinth mulching resulted in the significant decrease in K use efficiency for biomass (KUEp) over the season, K use efficiency for grain yield (KUEg) and K harvest index (KHI) decreased under hyacinth mulching. (4) Kalium concentration and accumulation at different growth stages of rice increased with increasing N supply (P < 0.01), but KUEp and KUEg showed the opposite trends. (5) Interactions between hyacinth mulching × N were not observed for K uptake and utilization. Hyacinth mulching increased K concentration and K uptake, decreased KUEp and KUEg at different growth stages of rice.

Keywords: Kalium allocation

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