中国农学通报 2011, 27(第12期5月) 134-139 DOI: ISSN: 1000-6850 CN: 11-1984/S

农学—研究报告

影响磷矿粉在淹水水稻土中溶解和有效性因素的研究

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摘要:

通过对在采自浙江省金华市的12种不同性质的水稻土添加江西省吴村磷矿粉（WPR）进行淹水培养试验，研究淹水条件下影响磷矿粉溶解和有效性的土壤因素。结果表明，磷矿粉在土壤中的溶解量与土壤pH（KCl）、交换性钙离子含量以及土壤粉粒含量呈极显著或显著的负相关，而与土壤粘粒含量呈显著的正相关。经逐步回归发现，土壤pH（KCl）是影响磷矿粉溶解的第一因素，土壤pH（KCl）和土壤磷吸附常数K共同解释了78%的磷矿粉溶解。加入磷矿粉后土壤有效磷的增加量（Resin-P）与土壤的Olsen-P含量呈极显著的正相关。施用磷矿粉后土壤有效磷增加量占溶解量的百分比与土壤Olsen-P含量呈极显著性正相关，而与土壤粘粒含量、最大吸磷量呈显著负相关。

关键词: 磷矿粉

Factors Affecting the Dissolution and Availability of Phosphate Rock in Flooded Paddy Soils

Abstract:

Two P fertilizer of varying solubility, namely, Wucun phosphate rock (WPR), monocalcium phosphate (MCP), were incubated with twelve flooded paddy soils to quantify factors affecting the dissolution and availability of PR, the twelve paddy soils were sampled from Jinhua, Zhejiang province. Results showed the amounts of WPR dissolution (?NaOH-P) was negatively correlated with soil pH (P<0.01), exchangeable calcium and soil silt content (P<0.05), positively correlated with soil clay content (P<0.05). Stepwise multiple regression indicated that KCl extractable pH was the soil property that most affected PR dissolution, soil pH and adsorption parameter K together accounted for 78% of the variation in PR dissolution. The increase of soil available P (ΔResin-P) after WPR application was positively correlated with soil Olsen-P (P<0.01). Percentage of ΔResin-P by ΔNaOH-P after WPR application was positively correlated with soil Olsen-P (P<0.01), negatively correlated with soil clay content and Xm (P<0.01). Stepwise multiple regression indicated that soil Olsen-P and Xm were the soil properties that mainly affected percentage of ΔResin-P by ΔNaOH-P after WPR application.

Keywords: phosphate rock

收稿日期 2010-12-28 **修回日期** 2011-01-18 **网络版发布日期** 2011-05-27

DOI:

基金项目:

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