

连续施磷条件下渗育性水稻土无机磷土层分布及移动特征

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Distribution and movability of inorganic phosphorous on the percogetic paddy soil under continuously phosphorous fertilizer application

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摘要 通过3年田间肥料定位试验,采用顾益初、蒋柏藩的石灰性土壤无机磷分级方法,研究了太湖地区砂壤质渗育性水稻土不同无机磷形态在0—15 cm、15—30 cm和30—45 cm土层的分布及移动特征。结果表明,太湖地区砂壤质渗育性水稻土中的无机磷以Ca-P为主,其中Ca₁₀-P含量最高。无论施肥与否,各土层中不同形态无机磷的含量都是Ca₁₀-P>O-P、Fe-P>Al-P、Ca₂-P、Ca₈-P。3年定位施磷后,随施磷量增大表层(0—15 cm)土壤中总磷、Olsen磷、无机磷和无机磷各组分含量显著增加,而15—30 cm和30—45 cm土层中各无机磷组分的增加相对较小。土壤中总磷、无机磷和Olsen磷在土壤剖面中向下移动性随着土层的加深而减弱。其移动性呈Olsen磷>无机磷>总磷。植物有效无机磷源(Ca₂-P、Ca₈-P、Al-P)的下移比植物无效或缓效无机磷源(Ca₁₀-P、Fe-P、O-P)的下移更明显。Olsen磷与土壤各层中的Ca₂-P、Ca₈-P、Al-P的相关性要比Fe-P、O-P和Ca₁₀-P更大。

关键词: 施磷 无机磷形态 土层分布 移动 水稻土 施磷 无机磷形态 土层分布 移动 水稻土

Abstract: A three-year field experiment was conducted to study the effects of phosphorus fertilization on the distribution of different inorganic P fractions of the percogetic paddy soil in Taihu region. The results indicated: Ca-P was the dominant soil inorganic P in Taihu region, among which the content of Ca₁₀-P was the highest. No matter P fertilizer was (applied) or not, the contents of inorganic P fractions showed same tendency in all three layers: Ca₁₀-P > O-P and Fe-P > Al-P and Ca₂-P and Ca₈-P. After three years P application at same site, contents of total-P, Olsen-P, inorganic P, and inorganic P fractions at surface soil layer (0—15 cm) were increased remarkably, but in the deeper layers (15—30 and 30—45 cm) no significant increase was observed. The movability of total P, inorganic P and Olsen-P to deeper layer was descended with soil depths. The movability of Olsen-P, was the highest followed by inorganic P and total P. Plant available organic P (Ca₂-P, Ca₈-P, Al-P) had higher downward movability than plant no/slow available P (Ca₁₀-P, Fe-P, O-P). The correlations between Olsen-P, and Ca₂-P, Ca₈-P, and Al-P at these three layers were more significant than that between O-P and Fe-P, O-P, and Ca₁₀-P.

Keywords:

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