

## 长期不同施肥对棕壤微生物量磷及其周转的影响

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Effect of long-term fertilization on the content and turnover of soil microbial biomass P

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**摘要** 研究棕壤定位试验27年后, 长期不同施肥条件下土壤微生物量磷在玉米生长季内的变化及其对植物营养的贡献。结果表明, 长期施用化学磷肥或有机肥均能增加土壤微生物磷的含量, 尤以有机肥的作用更显著; 长期单一的施用氮肥降低了微生物量磷的含量。玉米生长季内土壤微生物量磷的动态变化呈先上升后下降的趋势, 其含量最大值出现在玉米生长中后期; 一个生长季后, 各处理微生物量磷的含量都较施肥前有所下降。长期施肥增加了土壤微生物体的供磷量, 微生物体供磷量与玉米产量及吸磷量关系密切, 占玉米植株体吸磷量的11.79%~34.46%。不同施肥处理土壤微生物量磷的周转期为0.68~1.61年, 施肥延长了微生物量磷的周转期; 但单施氮肥加速了其周转。土壤微生物量磷能反映土壤磷素肥力水平。

**关键词:** 棕壤 长期施肥 土壤微生物量磷 玉米 周转 棕壤 长期施肥 土壤微生物量磷 玉米 周转

Abstract:

Long-term application of chemical P fertilizer and organic fertilizer could increase SMB-P content, especially organic fertilizer, but application of single chemical N fertilizer could decrease SMB-P content. During maize growth periods, SMB-P increased first and then decreased, and showed a peak value at the metaphase or anaphase of maize growth periods. After one growing season, SMB-P content was lower than that before fertilization. Long-term fertilization could increase the P supply amount by SMB-P, there was a significant correlation between P supplying amount by SMB-P with maize yield and P uptake. P supplying amount of SMB-P took up 11.79%~34.46% of plant phosphorus uptake amount. Turnover time of SMB-P was 0.68~1.61 year in different fertilization treatments and fertilizer application could extend SMB-P turnover time, but single application of chemical nitrogen fertilizers could accelerate its turnover. There was a significant correlation between SMB-P and soil P fertility.

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