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施肥与覆膜对棕壤Olsen-P剖面分布及动态变化的影响

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Effects of fertilization and mulching with plastic film on profile distribution and dynamics of Olsen-P in brown earth

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摘要 利用沈阳农业大学长期定位试验站裸地和覆膜的不同施肥处理(不施肥、单施氮肥、有机肥、有机无机肥配施)及其附近不同土地利用方式,探讨了不同施肥处理和覆膜对整个生长季的棕壤Olsen-P剖面(0—100.cm)分布及动态变化的影响。结果表明,耕地棕壤各施肥处理土壤剖面Olsen-P含量均表现为0—20.cm和60—100.cm大于20—60.cm;而自然草地、自然林地棕壤Olsen-P含量则随深度加深(0—100.cm)而逐渐增多。施用有机肥或有机无机肥配施处理的Olsen-P含量在60.cm土层以上均远大于不施肥或单施氮肥处理;覆膜后不施肥、有机肥、有机无机肥配施处理土壤0—40.cm土层的Olsen-P含量略有降低(0—20.cm土层有机肥处理除外),但差异未达到显著水平。说明施有机肥或有机无机肥配施,是补充土壤Olsen-P的有效措施;但施肥时应深施以补充表层以下土壤Olsen-P含量。覆膜未对本研究的棕壤Olsen-P含量产生显著的负面影响。

关键词: 棕壤 Olsen-P 施肥 覆膜 土地利用方式 棕壤 Olsen-P 施肥 覆膜 土地利用方式

Abstract: A long term located experiment with different fertilization treatments in Shenyang Agricultural University and an investigation of nearby brown earth under different land use patterns were carried out to study the profile distributions (0—100 cm) and dynamics of Olsen-P during the whole growth stage.Four fertilization treatments were involved in this experiment: no fertilization,single nitrogen application,single organic fertilizer application,combine application of organic and chemical fertilizer.The results showed that contents of Olsen-P in 0—20 and 60—100 cm of the crop land were higher than that in 20—60 cm.The contents of Olsen-P in native soils(grassland and woodland) increased with the deepening of soil layer in 0—100 cm.Contents of Olsen-P in the treatments applied organic, organic and chemical fertilizers combined were higher than that in no fertilization and single nitrogen application.Under plastic film mulching condition,Olsen-P in 0—40 cm soils,except 0—20 cm soil with single organic fertilizer application,were not statistically significantly decreased.In conclusion,using organic or organic and chemical fertilizer combined were effective measures to accumulate Olsen-P of soils.Deep placement of fertilizer should be employed for the supplement of Olsen-P.Mulching did not have significant effects on the distribution of Olsen-P in soil profile of brown earth in this study.

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