

农学—研究报告

长期施肥对紫色土水旱轮作田麦季土壤活性碳的影响

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摘要:

为了了解长期施肥,尤其是氮肥对紫色土麦季土壤活性碳的影响,并揭示部分土壤理化性质和土壤活性碳之间的关系,笔者以重庆北碚国家紫色土肥力监测基地的8个不同施肥处理为基础,于麦季(2008年11月—2009年5月)研究了不同施肥对土壤可溶性有机碳及微生物量碳的影响。结果表明:紫色土水旱轮作田麦季各处理间土壤的可溶性有机碳差异不显著。PKR-处理的微生物量碳含量显著低于其他处理。而N肥的施用有利于土壤中微生物量碳的升高,但方差分析显示作用并不明显。对比相同秸秆还田方式下各处理间MBC的差异发现: $R+ > FnR+ \geq FhR+$; $NR- > R- > FnR-$,但差异不显著。不同秸秆还田情况下R-比R+微生物量碳减少了44.4%,且差异显著,FnR+与FnR-相比后者也减少30.9%。相关分析显示,土壤温度、土壤充水空隙度和pH均与土壤DOC存在显著的相关性,且土壤温度是负相关,WFPS、pH是正相关。

关键词: 微生物量碳

Impact of Long-term Fertilization on Active Carbon of Purple Soil under Paddy-upland Rotation in Wheat Season

Abstract:

In order to study the impact of long-term fertilization on active carbon of purple soil in wheat season, the relationship between nature of soil and active carbon, based on eight treatments with different fertilization from national purple soil fertility monitored base in Beibei, Chongqing, the author discussed the impact of different fertilization on dissolved organic carbon (DOC) and microbial biomass carbon (MBC) in soil from November, 2008 to May, 2009. The results showed that: the differences of DOC between treatments were not significant. The MBC in soil with PKR- treated was significantly lower than other treatments. The application of N was conducive to the increase of MBC, but variance analysis showed no significant effect. The concentration of MBC followed as $R+ > FnR+ \geq FhR+$, $NR- > R- > FnR-$ under the same straw amendment, but the differences was not significant. For the concentration of MBC under different straw amendments, R- was 44.4% lower than R+, FnR- was 30.9% lower than FnR+. Correlation analysis showed that temperature, water-filled porosity and pH in soil were significantly related to DOC, while temperature was a negative correlation, WFPS and pH were positive correlations.

Keywords: microbial biomass carbon

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