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### 作物秸秆与城市污泥高温好氧堆肥产物对土壤氮矿化的影响

#### Nitrogen mineralization in soils amended with sewage sludge composted with different crop straws as bulking agent

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中文关键词: [秸秆](#) [污泥处理](#) [堆肥](#) [氮矿化](#) [土壤](#)

英文关键词: [straw](#) [sludge disposal](#) [composting](#) [nitrogen mineralization](#) [soil](#)

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#### 中文摘要:

为揭示不同作物秸秆与污泥堆肥产物对土壤氮素矿化特征的影响,为科学施用城市污泥堆肥提供参考依据,通过室内培养试验研究了城市污泥与4种秸秆(小麦、水稻、玉米和油菜)高温好氧堆肥产物施入酸性紫色土、黄壤、石灰性紫色土后土壤氮矿化的差异。结果表明,4种秸秆污泥堆肥均可显著提高3种土壤氮的潜在矿化势( $N_0$ )和矿化速度( $k$ ),促进土壤氮的矿化,提高土壤 $NH_4^+-N$ 、 $NO_3^- -N$ 质量分数,其中石灰性紫色土以油菜秸秆污泥堆肥和小麦秸秆污泥堆肥处理、黄壤以油菜秸秆污泥堆肥处理、酸性紫色土以小麦秸秆污泥堆肥处理提高幅度最大。作物秸秆与污泥堆肥施入土壤后,黄壤、酸性紫色土在培养60 d和30 d后趋于稳定,石灰性紫色土在培养60 d后仍有增高的趋势,但不同秸秆污泥堆肥对土壤氮矿化速度的影响无明显规律。结果说明秸秆污泥堆肥对土壤氮矿化的效应因土壤及秸秆类型的不同而异,根据研究结果提出了4种作物秸秆与城市污泥堆肥施用的建议。

#### 英文摘要:

An incubation experiment was conducted to investigate the differences of nitrogen mineralization among three soils amended with four sewage sludge composted with the straws of wheat(XMC), rice(SDC), corn(YMC) and rape(YCC). The purpose was to understand the effect of sewage sludge composted with different crop straws on nitrogen mineralization in soils and establish a scientific way for sewage sludge compost application in agriculture. The soils tested included an acidic purple soil, a yellow soil and a calcareous purple soil. All the compost treatments could significantly improve the values of potentially mineralizable nitrogen( $N_0$ ), promoted nitrogen mineralization, and consequently increase the  $NH_4^+-N$  and  $NO_3^- -N$  concentrations in soils. The optimal amounts of nitrogen mineralized and the  $N_0$  values were found in the treatments of YCC and XMC for the calcareous purple soil, in the treatment of XMC for the acidic purple soil and in the treatment of YCC for the yellow soil. The amount of nitrogen mineralized increased after 90 days incubation in the compost treated calcareous purple soil, while it became stable at 60 days and 30 days incubation in the compost treated- acidic purple soil and yellow soil, respectively. However, no obvious tendency of the mineralization rate constant ( $k$ ) values was found in the three soils treated with the four composts. The results illustrated that the effect of sewage sludge compost on the mineralization of nitrogen varied with soils and the properties of crop straws. Based on the results of the present study, some advices on the application of sewage sludge compost were put forward.

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