

论文

粉煤灰和菌渣配施对矿井水污染土壤微生物学特性和小麦生长的影响

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摘要:

通过田间试验研究了不同改良措施对矿井水污染土壤微生物学特性和小麦生长的影响。试验以矿井水污染土壤作为对照(CK), 设2个土壤改良处理: T1处理(添加食用菌渣)和T2处理(添加粉煤灰+菌渣)。结果表明: 对照相比, 2个改良措施均显著提高了0~40 cm土层中微生物的数量; T2处理0~40 cm土壤层的的细菌和放线菌的数量均显著高于T1, 但真菌数量与T1间没有显著差异; 2个土壤改良措施均显著提高了0~40 cm土壤层土壤酶(脲酶、蔗糖酶和磷酸酶)活性和土壤呼吸速率, 土壤脲酶、蔗糖酶和磷酸酶活性及土壤呼吸速率均表现为T2>T1>CK; 在两测试时期(拔节期和花期) T2和T1处理小麦的群体数量、株高、叶面积和叶绿素含量均显著高于CK; 成熟期T2和T1处理小麦的成穗数、穗粒数、千粒重、产量和收获指数均显著大于对照(CK)。

关键词: 矿井水; 小麦; 粉煤灰; 菌渣; 土壤微生物; 土壤酶

Effect of soil improvements with edible fungus residue and fly ash on soil micr obiological properties and growth of wheat in the mine water contaminated soil

Abstract:

A field experiment were conducted to study effects of soil improvements on soil microbiological properties and growth of wheat in the mine water contaminated soil.Two improvement measures were employed, T1(soil improvement with edible fungus residue), T2(soil improvement with fly ash and edible fungus residue).The control(CK) is the mine water contaminated soil.The results show that two soil improvement measures improve the quantities of soil microbe(bacteria, actinomycete and fungi) in 0~40 cm soil layer compared to the control.T2 treatment has higher quantities of bacteria and actinomycete in 0~40 cm soil layer compared to T1, but has similar quantity of fungi to T1.Two soil improvement measures improve soil respiration rate and soil enzyme(soil urease, sucrose, phoshatase) activity in 0~40 cm soil layer, but followed the order of T2>T1>CK.Two soil improvement measures increases population, plant height, leaf area and chlorophyll content of wheat compared to the control at jointing and flowering stages.At maturity stage, two soil improvement measures have more spike number, spike kernel number, 1 000 kernel weigh, yield and harvest index compared to the control.

Keywords: mine water; wheat; fly ash; edible fungus residue; soil microbe; soil enzyme

收稿日期 2011-11-04 修回日期 2012-03-12 网络版发布日期 2012-09-03

DOI:

基金项目:

国家“十二五”科技支撑计划资助项目(2012BAD14B08); 中国博士后科学基金特别资助项目(201104178); 河南省高校矿山环境保护与生态修复省级重点实验室培育基地开放基金资助项目(KF2010-07)

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