



Effect of different amendments on soil moisture, salinity, Oat growth and yield in a reclaimed coastal saline soil, Eastern China

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Abstract: Land reclamation partially alleviated the shortage of agricultural land. However, salt affected soil restoration is crucial for soil quality and agricultural productivity due to high soil salinity. This study aimed to explore the dynamics of soil moisture, soil salinity, growth and yield of oat (*Avena sativa* L.) during the restoration of a reclaimed coastal saline soil using different amendments. The field experiment was conducted by six soil treatment: control (CK), application of organic manure (OM); combined application of PAM and organic manure (PAM+OM); combined application of straw mulching and organic manure (SM+OM); combined application of buried straw and organic manure (BS+OM); and combined application of bacterial manure and organic manure (BM+OM). Soil moisture were observed gradually decreased during the growing season. The amendment treatments considerably increased surface soil moisture compared with CK throughout the growing season, except in the later growing stage of SM+OM. Soil amendment treatments significantly reduced soil salinity at 0-40 cm depth. Compared with CK, the topsoil salinity was decreased by 68.0-81.4%, 54.6-75.2%, 56.9-78.2%, 55.1-65.7%, and 28.8-53.4% under SM+OM, PAM+OM, BS+OM, BM+OM and OM throughout the growing season. Furthermore, BM+OM significantly promoted oat growth, as indicated by thicker stem diameter and taller plant. The highest aboveground biomass and yield of oat were always obtained from BM+OM treatment. Therefore, BM+OM may be an effective soil management practice for oat production in reclaimed coastal saline soils.

Keywords: Soil amendments; Soil salinity; Oat growth; Salt-affected soil; Eastern China