環境因子對木黴菌促進作物生長之影響研究

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摘 要

本研究旨在探討木黴菌促進作物生長之可能因子，及受土壤環境的可能影響。試驗分成兩部分：一、木黴菌對不溶或稀溶礦物元素的溶出與嵌合能力的測定，二、不同木黴菌菌株在不同土壤環境中對作物吸收氮、磷等營養元素之影響，及其對作物生長之效應。在培養液中磷酸鈣、氧化銅、氧化鐵、氧化錳及鋅的溶出試驗，獲知接種木黴菌處理會使培養液中磷、鐵和銅元素的溶解度降低。錳及鋅在溶液中元素濃度則呈現增加。此外，木黴菌的添加可將鐵離子（Fe3+）還原成亞鐵離子（Fe2+）、銅離子（Cu2+）還原成亞銅離子（Cu+），且會產生嵌合物質與銅產生嵌合作用。在作物生長試驗方面；（1）在平鎮系酸性土壤經接種T1295-22、R1-6及Yam3-7菌株，甘藍之植株乾物量及氮素吸收量均顯著地高於對照處理。且T1295-22及Yam3-7菌株也顯著增加蘿蔔氮素吸收量。（2）吉安系鹼性土壤接種木黴菌，僅有T1295-22菌株增加甘藍乾物產量，其它接菌處理增進甘藍及蘿蔔的加氮素吸收量。在不同土壤pH值下，木黴菌對甜玉米生長及產量之效應試驗結果顯示，強酸性、中性及微鹼性土壤接菌處理，膝高期植株的乾物量均略低於未接菌處理。然而經接菌處理；植株在雌穗吐絲期之地上部乾物產量相較於未接菌處理明顯有增產效果，分別在強酸性土壤增加20％（T1295-22）、24％（R1-6）及8％（R42）。中性土壤13％（T1295-22）、10％（R1-6）、1％（R42），及微鹼性土壤9％（R1-6）。惟在三種酸鹼值土壤；各菌株間對甜玉米植株氮素吸收量之影響則略有差異。鮮穗產量之效應，分別在強酸性土壤之增產率為6％（T1295-22）、3％（R1-6）及5％（R42），中性土壤之增產率為3％（R1-6），在微鹼性土壤則為5％（T1295-22）、3％（R1-6）及1％（R42）。氮素生產效率方面；則接種木黴菌顯著增加23%（T1295-22）、20%（R1-6）及18%（R42）。接種木黴菌顯著減少胡瓜之幼瓜感病數目，延長生育日數及增加著果的數量，顯著增加胡瓜的產量。同時；接菌處理顯著增加植株乾物產量，分別增加98%(T1295-22)、51%(R1-6) 及95%(R42)。植株氮素吸收量也會增加，尤其T1295-22菌株在始花期及收穫期，提昇23%及140%的氮素吸收量，達5%顯著差異水準。

關鍵詞 : 木黴菌 ; 甜玉米 ; 氮素吸收量 ; 促進生長

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