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营养液浓度对甜瓜幼苗生长和光合特性的影响

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Effect of nutrient solution concentration on growth and photosynthetic characteristics of muskmelon seedling

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摘要 以厚皮甜瓜皇后为试材,研究了不同营养液浓度对基质积盐和甜瓜幼苗生长、光合特性的影响。结果表明,EC>2mS/cm的高浓度营养液导致幼苗根际出现盐分的积累,影响幼苗光合特性;叶片细胞超微结构出现一定程度的盐害症状,细胞质空泡化,叶绿体肿胀、球形化,超微结构发生解体,净光合速率下降;但单株叶面积、叶绿素含量与营养液浓度呈正相关。因此,甜瓜穴盘育苗,营养液浓度不应超过2.0mS/cm,以保持在1.5～2.0mS/cm之间为宜。

关键词: 营养液浓度 光合特性 甜瓜幼苗 营养液浓度 光合特性 甜瓜幼苗

Abstract: With muskmelon (cucumis melo L.cvs) "Huanghou" as the material, the effects of concentration of nutrient solution on the growth and photosynthetic characteristics of muskmelon seedling were studied. The results showed that high concentration of nutrient solution induced the accumulation of salt in the root zone and its EC value reached 0.8 (mS/cm) when the concentration of nutrient solution was higher than 2.0 (mS/cm). When the concentration was higher than 2.0 (mS/cm), there was a salt toxic symptom in the cell's ultrastructure. The cytoplasm became hollow inside and the chloroplast was swelling with a global shape which was partly grided. Cell walls were sunken and there was a separation between the cytoplasm and its cell wall. When EC was higher than 2.5 (mS/cm), these symptoms became much more (severe.) The reaction of the net photosynthetic rate of muskmelon leaves was same as roots. Before 12 a.m, the net photosynthetic rate was increased with the increase of concentration of nutrient solution, but after 12.a.m, it decreased with the increase in the value of EC, especially when EC was over 2.0 mS/cm. When EC got over 2.5 (mS/cm,) it decreased more. However, leaf area per seedling and chlorophyll concentration showed a positive correlation with the increase of concentration of nutrient solution, Therefore, we concluded that the concentration of solution should not be higher than 2.0 mS/cm, and EC should be kept within a range between 1.5 and 2.0 mS/cm.

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