

不同光周期下黄瓜和番茄幼苗生长与ZT和IAA的相关性

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The Correlation Between Endogenous ZT and IAA Contents with the Growth of Cucumber and Tomato Seedlings Under Different Photoperiod

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摘要 研究不同光周期(12、14、16、18和20 h · d⁻¹)对黄瓜和番茄幼苗生长的影响,探讨不同光周期下幼苗生长与ZT和IAA含量的关系。结果表明:随着光周期的延长,黄瓜和番茄幼苗株高有降低趋势,番茄幼苗的可溶性蛋白和可溶性糖含量逐渐升高;光周期达到16 h · d⁻¹时,叶面积达到最大值,壮苗指数显著高于12和14 h · d⁻¹处理;随着光周期的延长,番茄叶片中ZT和IAA含量逐渐升高,茎中逐渐降低,且与番茄叶面积和株高成线性回归相关,黄瓜幼苗株高与茎中IAA含量、根鲜质量与根中ZT含量成正线性回归相关。总体而言,光周期设置在16 h · d⁻¹时有利于促进黄瓜和番茄幼苗的生长,培育壮苗。推测光周期通过调控黄瓜和番茄幼苗ZT和IAA含量的变化来影响其生长发育。

关键词: 番茄 黄瓜 幼苗 光周期 ZT IAA 相关性

Abstract: Abstract: The effects of different photoperiod (12, 14, 16, 18 and 20 h · d⁻¹) on growth of cucumber and tomato seedlings were studied. The relationship between the growth differences and endogenous hormones (ZT, IAA) was discussed. The results indicated that the extended photoperiod could significantly decrease the plant height of cucumber and tomato seedlings and promote the content of soluble protein and soluble sugar of tomato seedlings. Under the treatment of 16 h · d⁻¹ photoperiod, the leaf area reached to maximum and the healthy index significantly higher than the treatment of 12 h · d⁻¹ and 14 h · d⁻¹, but had no significant differences compare with 18 h · d⁻¹ and 20 h · d⁻¹ photoperiod. With the extension of the photoperiod, the ZT and IAA contents of tomato seedlings increased gradually in leaf and decreased gradually in stem, and it had linear regression correlation with leaf area and plant height. The IAA and ZT contents had linear regression correlation with plant height and leaf area respectively of cucumber seedlings. Overall, 16 h · d⁻¹ photoperiod was more beneficial to the growth and cultivated health seedling of cucumber and tomato plants. Photoperiod may affect the growth and development of cucumber and tomato seedlings by regulating the endogenous ZT and IAA contents.

Keywords: tomato, cucumber, seedling, photoperiod, ZT, IAA, correlation

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