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‘嘎啦’苹果不同饱满度芽嫁接幼苗¹³C、¹⁵N分配利用特性研究

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Effects of Different Plumpness Buds on the Distribution and Utilization of ¹³C and ¹⁵N in Gala (*Malus × domestica*/*Malus micromalus* Makino)

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摘要 以盆栽不同饱满芽(春梢基部芽)、次饱满芽(秋梢芽)和饱满芽(春梢中部芽)‘嘎啦’苹果(*Malus × domestica* ‘Gala’) / 八棱海棠(*Malus micromalus* Makino) 嫁接幼苗为试材, 采用¹⁵N、¹³C 双标记法, 研究了其碳、氮营养分配特性。结果表明, 新梢开始旺长期叶片¹³C 分配率饱满芽幼苗 > 次饱满芽幼苗 > 饱满芽幼苗, 分别为45.81%、42.49%、35.05%; 根部¹³C 分配率饱满芽幼苗 > 次饱满芽幼苗 > 饱满芽幼苗, 分别为20.04%、15.88%、12.67%。新梢旺长期3 种芽幼苗叶片、根部¹³C 分配率趋势与新梢开始旺长期相反。新梢缓长期各芽幼苗叶片碳同化物分配差异不显著, 根部¹³C 分配率, 次饱满芽幼苗和饱满芽幼苗显著高于饱满芽幼苗。叶片¹⁵N 分配率逐渐升高, 始终为饱满芽幼苗 > 次饱满芽幼苗 > 饱满芽幼苗, 至新梢缓长期分别达到55.67%、52.45%和51.54%。根部¹⁵N 分配率随生长发育而降低, 新梢开始旺长期和新梢旺长期饱满芽幼苗 > 次饱满芽幼苗 > 饱满芽幼苗。新梢缓长期各器官氮素分配率差异不显著。不同芽幼苗¹³C 固定量、¹⁵N 利用率均逐渐升高并趋于一致, 表明芽有同等更新潜质。

关键词: 苹果 饱满芽 不饱满芽 次饱满芽 ¹⁵N ¹³C 分配 利用

Abstract: Different plumpness buds were used to study the distribution and utilization of ¹³C and ¹⁵N using two-year-old potted Gala apple trees (*Malus × domestica*/*Malus micromalus* Makino) as materials under high N-level conditions. The results showed that the distribution ratios of ¹³C in leaves during the shoots early vigorous growing period ranked in the following order: Plumpless bud tree > secondary bud tree > plump bud tree, but the rank was plumpless bud tree < secondary bud tree < plump bud tree in roots at the same period. The ranks were opposite in leaves and roots of the distribution ratios of ¹³C at the vigorous growing period. The ¹³C distribution ratio in roots of plump bud tree was lower than that of secondary bud tree and plumpless bud tree at the slow growth period. The distribution ratios of ¹⁵N in leaves of plump bud, secondary bud and plumpless bud increased, and reached the highest at the slow growth period, which were 55.67%, 52.45% and 51.54% respectively. The ¹⁵N distribution ratios in roots decreased significantly with the process of growth. However, the ¹⁵N distribution ratio in roots of plumpless bud tree was the highest, followed with secondary bud tree and plump bud tree at the early vigorous growing period and vigorous growing period. There was no significant difference at the slow growth period. The utilization ratio of the N fertilizer and ¹³C fixed capacity were improved gradually with the growth and development of the trees. Different plumpness buds tree can achieve results of renewal potential.

Keywords: apple, plump bud, plumpless bud, secondary bud, ¹⁵N, ¹³C, distribution: utilization

引用本文:

孙聪伟, 冯建忠, 陈倩等. ‘嘎啦’苹果不同饱满度芽嫁接幼苗¹³C、¹⁵N分配利用特性研究[J]. 园艺学报. 2013.V40(2): 317-324

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