

### 柑橘落花落果的营养元素含量及其脱落损耗

王男麒, 彭良志, 邢飞, 周薇, 曹立, 黄翼, 江才伦

(1 西南大学柑桔研究所/国家柑桔工程技术研究中心, 重庆 400712; 2 西南大学园艺园林学院, 重庆 400700)

### Nutrient Element Content in Dropped Flowers and Young Fruits and Nutrient Losses Caused by Their Drops in *Citrus*

WANG Nan-Qi, PENG Liang-Zhi, XING Fei, ZHOU Wei, CAO Li, HUANG Yi, JIANG Cai-Lun

(1Citrus Research Institute, Southwest University/National Citrus Engineering Research Center, Chongqing 400712, China; 2College of Horticulture and Landscape Architecture, Southwest University, Chongqing 400700, China)

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摘要 以成年纽荷尔脐橙、兴津温州蜜柑和沙田柚为材料, 研究落蕾、落花和脱落幼果中的养分含量及其脱落造成的损耗。结果表明, 3 个品种的蕾和花营养元素含量为N 3.34% ~ 3.66%, P 0.26% ~ 0.31%, K 1.67% ~ 2.30%, Ca、Mg 和S 含量0.17% ~ 0.48%, Fe、Mn、Zn、Cu 和B 含量8.1 ~ 87.5 mg · kg<sup>-1</sup>。

除花的B 含量显著高于蕾外, 花和蕾的多数营养元素含量相近, 且品种间差异小。与蕾和花相比, 幼果的N 和P 含量较少, N 和P 含量分别少21.8%和19.5%, 但Fe 含量较多, 其它营养元素含量变化不明显。纽荷尔脐橙、兴津温州蜜柑和沙田柚单株脱落的蕾、花和幼果干物质量合计分别为3 016.3 g、3 533.6 g 和1 486.7 g, 由此所造成的单株主要养分损耗为N 49.2 ~ 119.4 g、P 4.3 ~ 10.1 g、K 30.1 ~ 76.2 g、Mg 2.5 ~ 7.1 g、Zn 24.0 ~ 81.5 mg 和B 65.5 ~ 170.2 mg。兴津温州蜜柑和沙田柚均以落花的养分损耗最大, 落蕾其次, 落果最小; 纽荷尔脐橙则是落花和落蕾的养分损耗相近且远高于落果。品种间以兴津温州蜜柑脱落的养分损耗最大, 纽荷尔脐橙其次, 沙田柚最小。因此, 柑橘应控制过量开花, 并在萌芽开花期及时补充养分。

关键词: 柑橘 花蕾 花 幼果 营养元素

Abstract: Nutrient element content in dropped flower buds, flowers and young fruits as well as the nutrient losses caused by their drops were studied in Newhall navel orange (*Citrus sinensis* L. Osb. 'Newhall'), Okitsu Wase satsuma (*Citrus unshiu* Marc. 'Okitsu Wase') and Shatian pomelo (*Citrus grandis* Osb. 'Shatian') adult trees. Results showed that the nutrient element content in flower buds and flowers of the 3 varieties were N 3.34% - 3.66%; P 0.26% - 0.31%; K 1.67% - 2.30%; Ca, Mg and S content were 0.17% - 0.48%; Fe, Mn, Zn, Cu and B content were 8.1 - 87.5 mg · kg<sup>-1</sup>. B content was significantly higher in flowers than in flower buds, but other nutrient element content in flowers were close to in flower buds. For the same organs, the content of each nutrient element was slightly different among the 3 varieties. Compared with flower buds and flowers, N and P content in young fruits greatly decreased and Fe content increased obviously, while the average decreases by 21.8% N and 19.5% P were measured for the 3 varieties, but the changes of other nutrient element content were not remarkable. The total dry weight of dropped flower buds, flowers and young fruits was 3 016.3 g per tree for Newhall navel orange, 3 533.6 g per tree for Okitsu Wase satsuma, and 1 486.7 g per tree for Shatian pomelo, which resulted in serious nutrient element losses of N 49.2 - 119.4 g, P 4.3 - 10.1 g, K 30.1 - 76.2 g, Mg 2.5 - 7.1 g, Zn 24.0 - 81.5 mg and B 65.5 - 170.2 mg for per tree. The losses of nutrient element caused by flower drops > by flower bud drops > by young fruit drops for Okitsu Wase satsuma and Shatian pomelo, while caused by flower bud drops were close to by flower drops > by young fruit drops for Newhall navel orange. Okitsu Wase satsuma had the biggest losses of nutrient element caused by those drops, followed by Newhall navel orange and Shatian pomelo. Therefore, for citrus management practices, it's important to control excessive flowering, and to apply enough fertilizers during spring sprout and blossoms.

Keywords:

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