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采前赤霉素结合采后热水处理对‘苹果梨’冷藏期间黑皮的控制及其部分机制

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摘 要:【目的】探讨果实发育期间多次喷施赤霉素结合采后热水处理对‘苹果梨’低温贮藏过程中黑皮病的控制。【方法】以‘苹果梨’为材料,用50 mg·L^{-1}赤霉素分别于幼果期、膨大期和成熟期对果实进行喷施,果实采后用45 ℃的热水浸泡15 min,研究低温(0±1 ℃)贮藏条件下果皮黑皮指数的变化,分析酚类物质含量、细胞膜完整性及抗氧化酶活性,观察表皮结构及表皮细胞超微结构。【结果】赤霉素及热水单独或复合处理均可有效降低‘苹果梨’冷藏期间的黑皮指数,其中以复合处理效果最好,贮藏120 d时,黑皮指数仅相当于同期对照的30.8%。处理均抑制了酚类物质积累,降低了丙二醛含量和多酚氧化酶活性,维持了细胞膜的完整性,提高了超氧化物歧化酶、过氧化物酶和过氧化氢酶活性,其中以复合处理效果最为明显。同时,复合处理减少了果实表皮裂缝,增厚了表面保护组织,维持了细胞膜和细胞壁的完整性。【结论】果实发育期间喷施赤霉素结合采后热水处理可有效减轻冷藏期间‘苹果梨’的黑皮病,黑皮病控制机制与维持细胞膜的完整性、提高抗氧化酶活性、减少酚类物质积累、增加果实表面保护组织厚度密切相关。

关键词:梨;赤霉素;热水;黑皮

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Preharvest GA_3 sprays combined with postharvest hot water dipping control of peel browning in ‘Pingguoli’ pear fruit during low temperature storage and its partial mechanism

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Abstract:【Objective】‘Pingguoli’ is a famous pear cultivar in China, however, peel browning of the fruit is a major physiological disorder during postharvest, which results in many different size dark brown spots on the peel, significantly damaging the appearance quality of the fruit. Therefore, it is necessary for the pear industry to find an effective strategy to control peel browning of ‘Pingguoli’ pear fruit. The aim of this study is to investigate the effects of spraying gibberellin three times during fruit development and postharvest hot water dipping on the peel browning of ‘Pingguoli’ pears during low temperature storage, and to explore its partial mechanism of these treatments.【Methods】The 17 year old pear trees were selected and sprayed three times with gibberellin at 50 mg·L^{-1} during fruit development, during the young fruit period, fruit enlarging period and maturation period, with water sprayed as the control. We selected the commercial mature and uniform size fruit, without disease and pests, for our experimental materials. Harvested pears were dipped in hot water at 45 ℃ for 15 min. The treated fruits were stored at low temperature (0±1 ℃) to investigate the effects of preharvest gibberellin spray combined with postharvest hot water dipping on the index of peel browning of ‘Pingguoli’ pears during storage by using a statistical method. The spec-

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