

Abstract:

High quality tropical fruit, when exported to distant markets, are limited by their postharvest characteristics. These include limited supplies, irregular quality of many of the minor fruit crops, chilling sensitivity, insect disinfestation treatments, shipping and storage duration, and lack of understanding of storage limitations. Any success in improving postharvest quality by extending shelf life or preventing postharvest decay is advantageous in enlarging markets and broadening consumer appeal. Significant advances are being made in applying biotechnology to banana, papaya, pineapple, and mango to improve postharvest quality. The major limitations to the application of biotechnology are a lack of efficient transformation protocols and limited understanding of the molecular biology, biochemistry and physiology of these crops. This technology also needs to take into consideration commercial and economic impacts. Fruit packers, shippers, handlers and consumers may not see a significant advantage of modified handling and ripening characteristics and hence may not be willing to pay a premium price, particularly if fruits are available all year around from a single or multiple sources, such as banana and papaya. Three approaches are being utilized to extend postharvest life and maintain quality: selecting for slower ripening lines, modification of ethylene responses or reducing softening rate. For example, papaya varieties having slow ripening characteristics have been selected, delayed ripening by the down-regulation of ethylene synthesis enzymes (ACS and ACO) is being tested for banana and papaya, and the modification of fruit softening related enzymes is being examined. The new cultivars developed from these programs could significantly influence tropical tree fruit marketing.