Storage and Market Diseases of Fruit

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Recognition and knowledge of the physiological disorders and fungal diseases affecting fresh fruit after harvest and during storage and marketing are important to everyone in the fresh fruit industry. Therefore, the CSIRO Division of Food Preservation has prepared a series of colour plates* and notes on the more important diseases.

It is hoped that these will be of value to research workers and to those engaged in growing, storing, marketing, or processing fresh fruit. It is planned to issue additional notes and illustrations from time to time.

Enquiries or requests for further information should be directed to the Chief, Division of Food Preservation, CSIRO, Box 43, P.O., Ryde, N.S.W. 2112 (Telephone 88 0233).

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INTERNAL BREAKDOWN OF APPLES

Internal breakdown, which affects many apple varieties in cool storage, is a disorder in which the flesh of the apple breaks down and browning occurs.

Fruit grown in cool, moist climates, fruit from light crops or from young trees, and large fruit are particularly susceptible to breakdown of all kinds. Fruits previously affected by bruising, bitter pit, or water-core are also more susceptible. The risk of breakdown is increased by high humidities in the cool store and by storage in bags or liners of polyethylene or other plastic material. Recent work* has shown that many conditions that

* Scott, K. J., and Roberts, E. A. (1967).—Breakdown in Jonathan and Delicious apples in relation to weight lost during cool storage. *Aust. J. exp. Agric. Anim. Husb.* 7, 87–90.



Senescent Breakdown (Fig. 1, in Jonathan) develops if fruit is overmature when picked, or when it ages in store. Conditions after harvest which lead to this breakdown are delays before cooling, slow cooling, high storage temperatures, and over-long storage. The first symptoms are undue softening of the flesh, followed by mealiness and brown discoloration. In its severest form the fruit becomes very soft and the exterior browns.



Breakdown associated with Watercore (Fig. 2, in Delicious) frequently occurs in storage, particularly with apples affected by radial water-core. Water-core or 'glassiness' is a glassy translucent condition of the flesh of apples that develops before harvest, especially in exposed fruit. Sudden rises of temperature in the orchard and heat waves frequently bring on this disorder, which appears to be due to moisture stress. Late, or radial, watercore, in which discrete areas around the main vascular system are affected, develops late in the life of fruit on the tree and is more likely with late pickings.

increase weight loss (water loss) from the fruit reduce breakdown.

Cox's Orange Pippin, Ribston Pippin, Sturmer, and Jonathan are highly susceptible, Rome Beauty and Delicious are moderately susceptible, and Cleopatra, Crofton, Granny Smith, and Democrat have low susceptibility to breakdown.

Low-temperature Breakdown (Fig. 3, in Jonathan) occurs in some varieties of apple when stored at low temperatures; the flesh is moister and less mealy, firmer and usually darker in colour than with senescent breakdown. Frequently the affected area appears as a band in the mid cortex without any external sign, and it can develop rapidly in fruit apparently sound on removal from storage. Low-temperature breakdown is usually not serious at 36°F, and rarely occurs at 38°F, but accumulation of carbon dioxide in storage atmospheres favours this disorder.



Breakdown following Bruising (Fig. 4, in Jonathan), like breakdown following water-core, or bitter pit, is a premature, senescent type of breakdown induced by the previous injury. As susceptibility to both bruising and senescent breakdown increases with increasing maturity and ripeness of the fruit, it is greatest in over-mature fruit held too long in storage or at too high a temperature, particularly in softer varieties like Cox, McIntosh, and Jonathan. Unless severe, early pre-storage bruises usually dry out and do not induce breakdown.



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