

# Storage and Market Diseases of Fruit. V

By

E. G. Hall

Division of Food Preservation, CSIRO

and

K. J. Scott

New South Wales Department of Agriculture

### WATER CORE OF APPLES

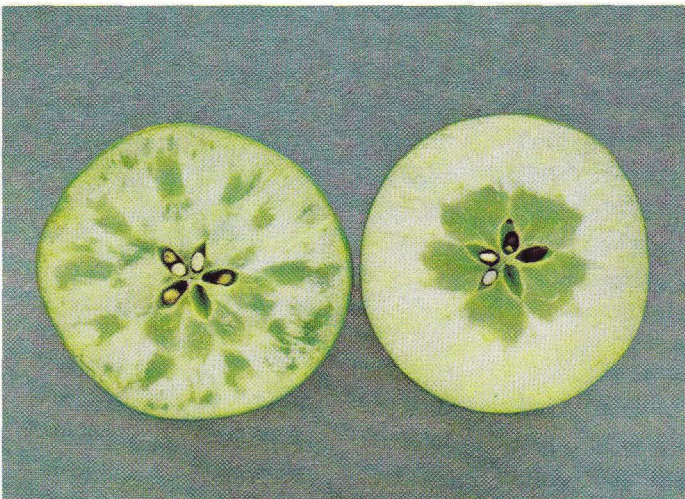
Water core or 'glassiness' is a translucent or glassy condition of the flesh of apples. The disorder develops in growing fruits on the tree that have suffered moisture stress as a result of sudden hot, dry weather in early summer or later. Exposed fruit on the tree receives more solar radiation and therefore suffers greater rises in temperature, with consequent greater evaporation and more severe internal moisture stresses and thus is more susceptible to water core.

These stresses cause premature, localized conversion of starch to sugar and a pronounced leakage of sap from the cells, or an influx of sap into the fruit, which fills the intercellular spaces and produces the glassy appearance. This sap is characteristically sticky and is sweeter than normal.

There are two types of water core. One develops early in the life of the fruit and appears as one or two larger lesions of glassy flesh whereas the other develops later and characteristically shows several translucent areas of flesh oriented radially from the



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**Early Diffuse Water Core** in Granny Smith apples (Figs. 17, 18). Early water core usually occurs as a diffuse and glassy region of the flesh, towards the calyx end. It may be confined to the core or ramify through the flesh, appearing as many lesions on cutting (Fig. 18). When the disorder is severe some firm, shiny, and water-soaked areas may show through to the skin (Fig. 17). Early water core may disappear before picking. The variety Rokewood is particularly prone to develop early water core, but the popular varieties Jonathan, Delicious, and Granny Smith can be affected if growing conditions are unfavourable.



core. Both types may disappear during storage but breakdown is often associated with the later radial type.\*

Apples that show more than slight symptoms of water core should not be put into cool storage or exported, especially if they are of a variety susceptible to breakdown. Larger fruits from light crops, particularly when the trees are in heavy growth, are more liable to develop water core.

#### Further reading

Harley, C. P. (1938).—Some associated factors in the development of water core. *Proc. Am. Soc. hort. Sci.* **36**, 435-9.

Carne, W. M. (1948).—The non-parasitic disorders of apple fruits in Australia. *Bull. Coun. scient. ind. Res.*, Melb. No. 238.

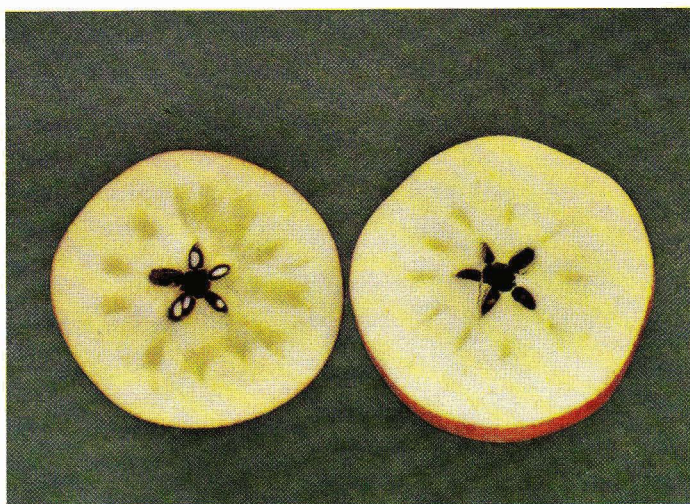
\*CSIRO *Fd Preserv. Q.* **29**(2), 1969, Suppl., Fig. 2.

**Later Radial Water Core** in Delicious apple (Fig. 19). In radial water core, discrete and lenticular areas around the main vascular system are affected. There are usually 10 such areas, regularly spaced out from the 10 major vascular bundles. The disorder occurs late in the life of the fruit on the tree and increases as picking is delayed. Radial water core mainly occurs in the softer early and mid-season varieties of apple such as Gravenstein, Jonathan, and Delicious.

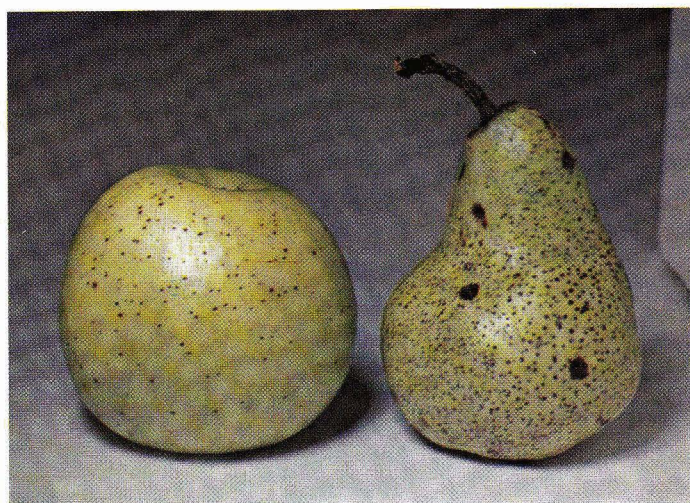
### CHEMICAL INJURY TO APPLES AND PEARS

Exposure to ammonia gas from leaking refrigerating pipes may cause injury to apples and pears. Early symptoms are small brownish rings or spots around lenticels and breaks in the skin due to punctures or abrasions. Upon removal from the atmosphere containing ammonia the spots become black. In mild injury the spots are small and superficial (Fig. 20); with more severe exposure they may become enlarged and coalesce, and the discoloration may extend into the flesh. The presence of moisture on the fruit favours ammonia injury. Varieties differ considerably in susceptibility to ammonia and similar injuries.

Lenticels are natural breaks in the skin through which injury-producing chemicals may enter or in which they may accumulate. Therefore lenticel spotting varying in colour from pale and bleached through brown to black, according to the particular compound concerned, may be caused by other chemicals, either as gas or in solution.



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