

Storage and Market Diseases of Fruit. XIV

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Supplement to *CSIRO Food Research Quarterly*

Volume 33, Number 1, March 1973

COOL STORAGE DISORDERS OF CITRUS FRUITS

Cold Scald (Scald or Browning)

Cold scald is a superficial grey to brown discoloration of the rind, mainly affecting oranges, which develops in cold storage at temperatures below about 3°C. It may be just a faint grey discoloration over small areas that is readily confused with *sooty blotch*, or an extensive, often dense, and sometimes shiny browning (Fig. 55). There is often a sharp margin, characteristically on one side of the lesion, between sound and affected rind. When severe the lesion may become slightly depressed, especially between the oil glands which do not collapse as in storage spot. The early stages of the brown type may show up as many very small pale shallow pits and some forms remain somewhat speckled in appearance.

An 'oleocellosis scald', pale in colour and with indistinct margins, may develop, usually around the stem end; the first sign is when the tissue between the oil glands sinks, giving the rind a 'pebbly' appearance. It often merges into speckled storage spot or *flavocellosis* and may be followed by rind breakdown, especially on frosted fruit. Scald may be induced by mechanical injuries or oleocellosis (Fig. 56). Scald develops early and rapidly in cool storage but unlike storage spot does not become more pronounced after removal from low temperature; indeed, it may become less obvious as the general colour of the fruit deepens. Moreover, unlike storage spot, mature fruit is more susceptible to cold scald than that picked earlier in the season.



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Cold scald on Washington Navel oranges.



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Cold scald on Washington Navel oranges. Note induction by injuries.

Flavocellosis (Skin Bleach)

The initial symptom of this disorder on oranges is a bleaching of the rind between darkened oil glands with the development of a light yellow or cream, somewhat opaque, discoloration of a considerable portion of the skin which becomes rather soft and readily invaded by fungi (Fig. 57). Later the affected area extends and the older parts may dry and harden. In advanced cases the oil glands usually collapse and the affected rind becomes depressed but the colour remains pale. At low temperatures it may develop into a greyish, somewhat water-soaked rind breakdown. Flavocellosis mostly occurs at temperatures below 2°C, rarely at 5°C, and is more common on inland fruit, especially if slightly frosted.



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Flavocellosis on Washington Navel orange. Diseased fruit on left, normal fruit on right.

Glazed Scab

This disorder occurs more frequently at temperatures in the range 7–10°C. Oranges develop hard, slightly raised, glazed ('enamelled') areas which are cream to grey in colour and in which the oil glands may or may not show through (Fig. 58). The disorder may develop into a general greyish breakdown with the development of secondary fungal rots. Glazed scab is most common on Navel oranges picked early in the season.

Further reading

Huelin, F. E. (1942).—The handling and storage of Australian oranges, mandarins and grapefruit. Coun. sci. industr. Res. Aust. Bull. No. 154.



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Glazed scab on Washington Navel orange. Diseased fruit on right, normal fruit on left.