

# Storage and Market Diseases of Fruit. XXII

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## MARKET AND STORAGE DISEASES OF FRUIT

### PLUMS

#### Cold Storage Breakdown

If we discount fungal wastage, the cool storage life of plums is terminated by failure to ripen normally after removal to temperatures at which fruit fresh from the trees would ripen. Abnormal ripening may be due not only to over-storage but also to unsuitable ripening temperatures. While the optimum ripening temperature is about 20°C, plums will ripen satisfactorily, though slowly, at lower temperatures. The minimum temperature for normal ripening varies

with variety and may be as low as 5°.

Cold storage breakdown and abnormal ripening have varying symptoms. Normal deep skin and flesh colour and normal juiciness do not develop. Commonly the flesh becomes injected and discoloured (Fig. 90), often with a gelatinous texture; this condition may develop further to 'bladderiness', the fruit becoming a watery shapeless mass held in the skin.

Alternatively, the fruit may become spongy and dry and the flesh very pale in colour, or the flesh may become mealy. As is common following injury or death of cells the flesh of over-stored plums is frequently discoloured brown; the tissues around the stone and the vasculars are usually affected first. The colour may be distinctly greyish and the flesh either firm or softening (Fig. 91).

Symptoms vary with variety and maturity, the less mature fruit usually becoming mealy and discoloured rather than gelatinous or 'bladdery' as is common with fruit picked when more mature.

As with peaches, cool wet seasons are unfavourable to keeping quality. Plums keep best when stored either at -1°C continuously or at -1° for 2-3 weeks and then at the lowest ripening temperature, commonly 7°.

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Cold storage breakdown.

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Cold storage breakdown.

### Freezing Injury

After thawing, plums which have been frozen develop water-soaked injected areas of flesh where the cells have been disrupted by freezing and the intercellular spaces are consequently suffused with leaked cell sap (Fig. 92). As with frozen pears and apples (Supp. VI, Figs. 21–24), freezing injury may show externally as water-soaked areas on the skin. Likewise, affected tissue tends to dry and become discoloured so

that the injury is difficult to distinguish from cold storage breakdown.

The freezing point of plums and other stone fruits is higher in cool, wet seasons than in warm, dry seasons because of differences in the levels of soluble solids in the juice. These are higher in fruit maturing in warm dry weather.

Therefore in cool wet seasons the storage temperature should be raised to  $-0.5^{\circ}\text{C}$  or even  $0^{\circ}$  to avoid freezing.

## PAPAWS

### Ripe Rot

Ripening and ripened papaws and other tropical fruits such as bananas and mangoes commonly develop ripe rots which show as numerous sunken, soft, discoloured spots which enlarge and coalesce and affect the underlying flesh (Fig. 93). The fruit may show a sparse growth of fungal mycelium and dark, pinpoint, spore-producing bodies will appear later on.

These spots of ripe rot are caused by multiple latent infections of fungi, commonly anthracnose (*Gloeosporium* spp.) and other organisms such as *Botryodiplodia*.

Infection takes place during the growth of the fruit on the plant. The fungal spore germinates on the wet fruit surface, and the fungus penetrates the fruit and goes into a resting stage until the fruit commences to ripen and lose its resistance to the pathogen.

The disease may be controlled by frequent fungicidal spraying during the growth of the fruit but such a course is rarely economic.

As the infection is latent, post-harvest treatment with a fungicide is of little value. However, heat treatment of unripe fruit by dipping in hot water for 20 min, starting at a temperature of  $50^{\circ}\text{C}$  and dropping to a temperature of  $45^{\circ}$ , will kill many of the infections and delay the growth of others so that the development of ripe rots is greatly delayed. Treated fruit ripens normally but more rapidly than untreated fruit.



Freezing injury.

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Ripe rot.

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