Chapter 37

Table Grapes

Table grapes are a high value commodity that may be carried on pallets either in containers or in breakbulk refrigerated vessels.

As grapes do not continue to ripen once they have been cut from the vine, they must be harvested in fully mature condition. Grapes can easily be physically damaged and poor handling can result in a variety of physiological defects that make them more susceptible to microbiological invasion.

Even comparatively short periods of exposure at normal temperatures, say six hours at 20°C, can result in dehydration and browning of the stems which then often results in bunch ‘shattering’ during handling. It is, therefore, normal practice to cool grapes as soon as practicable after they have been harvested.

Weather conditions, particularly rain prior to and during the harvest period, can have a significant effect on the storage life of grapes, because wetted grapes are more susceptible to fungal invasion than grapes that have been harvested after a period of dry weather.

Various species of microorganisms will invade grapes and the most common found in transportation is *Botrytis cinerea*, which produces typical grey mould, white mould or some forms of berry rot. This organism can grow at a temperature as low as minus 4°C (~4°C). Fungal infection is more likely to arise if, during the growth period of the berries, the weather has been wet,
but *Botrytis* mould can develop on grapes that have not been exposed to wet conditions before harvesting. It is impossible to completely control or arrest the spread of fungal infection by this mould, as it will tolerate high levels of sulphur dioxide treatment. Other species of microorganisms that cause deterioration include *Cladosporium herbarum*, *Alternaria*, *Penicillium* and *Aspergillus niger*. Identification of the infecting microorganism can only be determined by laboratory examination of specimens of the grapes concerned.

Grapes are stowed in refrigerated containers in pre-cooled conditions. At the normal temperatures for loading, the rate of metabolic heat production is low so there should be no heat load problems. The carrying temperature, ie the air delivery temperature, must be as low as possible and container units are normally set to 0°C. Although grape berries will not freeze at temperatures above approximately minus 2°C (–2°C), the stalks will freeze at minus 1.5°C (–1.5°C) to minus 2°C (–2°C). On thawing, the stalks blacken, shrivel and become brittle, so there can be substantial shatter (ie individual grapes becoming detached from the bunches) with overcooled fruit, even if the berries themselves are unaffected.

The lugs in which the grapes are packed must be carefully stowed and this is normally the responsibility of the shipper. The key responsibility of the ship is to ensure the carrying temperature (0°C) is maintained and that there is a legible record to confirm this.

Grapes infected with *Botrytis cinerea* will continue to deteriorate, even at 0°C, but the rate of deterioration falls as the temperature is lowered, which is why carriers are advised to keep grapes at the lowest practical temperature, always ensuring it is above 1°C.

There are many types of physiological disorders that can result in commercial losses of grapes, although some of the causes arise during growing, harvesting and handling rather than during ocean voyage. If, therefore, damage to grapes is reported, the Master should ensure that a surveyor is called in. Surveyors should be able to recognise the various conditions of infection or deterioration and take adequate samples to enable specialists to assess the nature of any damage. In cases of fungal infection, it is important that samples are drawn illustrating each particular type of fungal deterioration so that the causative organisms can be identified. This is because the types of infection involved can provide an indication of the underlying cause.

Experience has shown that claims for damage to cargoes of grapes frequently concern shipments made from the same source at about the same time, which could mean there were problems with a particular harvest. It is important for owners to advise their Association as soon as any allegations of damage are received so that the information can be collated and an investigation commenced to determine whether any particular pattern is involved.