

**Title** Characterisation of postharvest appearance of 'Fuji' stain  
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### **Abstract**

In Tasmania there have been a number of fruit rejections due to 'Fuji' stain and this is causing financial concerns to growers. Stain is characterised by the appearance of a brown discolouration on the skin of the apples. This discolouration may appear preharvest, as a symptom of sunburn damage to the fruit, or postharvest, during storage or transport to market. A feature of the disorder is that it is often transient and has the potential to disappear. It has been found that fumigation of apples with methyl bromide, necessary for apples destined for Japan, aggravates the appearance of 'Fuji' stain and this has caused many problems of fruit consigned to Japan. This paper summarises findings from surveys and trials conducted since 2003 in Tasmania characterising conditions that induce postharvest appearance of stain and developing strategies to minimise its appearance. As well as a large season to season variation in the appearance of postharvest stain it has been found that there is also a large grower to grower variation with stain being present on greater than 5% of fruit in 4 out of 11 orchards studied in detail. This may be due to differences in maturity with less advanced fruit at harvest developing less stain in storage and transport. Stain was found to be less prevalent on striped strains of 'Fuji' and more prevalent on the red side of the fruit which had been exposed to the sun. It was found that fruit that had been waxed on the grading line was highly susceptible to stain development when compared to fruit from the same line that had not been waxed. A study of the grading systems employed identified the drying tunnel as the main cause of stain development. Studies with different brands of wax revealed large differences, however, due to the variation encountered these differences could not be separated. The use of 2% ascorbic acid postharvest drench was found to reduce the problem although this treatment is too expensive to use on a regular basis. Commercially, when stain development during transport to market causes problems, it has been found that reducing the temperature of the wax drying tunnel appears to solve the problem and is readily accepted by growers due to cost savings.