

Relationship between Cold Storage and Viral RNA Accumulation in Plum Pox Virus-Infected Red Lyon Plum Fruits

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DESCRIPTION

The Sharka disease-causing Plum Pox Virus (PPV) seriously impairs the stone fruit industry's bottom line. Fruit from nations where Sharka is prevalent is seen as having a minimal risk of spreading PPV since the illness is not propagated through seeds. Nonetheless, there have been instances that make one wonder if it is safe to export fruit from nations where Sharka disease is present. This makes the creation of fresh scientific data crucial in resolving these issues. In order to simulate the circumstances of fruit transiting to export markets, this study compared the relative buildup of PPV viral titer in infected fruit that had been picked recently to fruit that had been kept cold. Fruit from a PPV-infected cv. Red Lyon plum orchard was collected during two consecutive seasons, but with separate experiments conducted in each. The fruit was then split into three treatments (T): freshly harvested fruit (T1), fruit exposed to cold (0°C) for seven days (T2), and fruit exposed to cold (0°C) for fifteen days (T3). The viral titer was estimated using semi-quantitative RT-PCR; band density values obtained for PPV genome fragment amplification products were normalised using nad5 constitutive gene density values and plotted in relation to treatment T1, which was used as a control for this analysis. A significant difference ($p < 0.05$) was seen in the outcomes between T1 and the other treatments. In T2, the viral RNA decrease during the first season was 50%. Whereas 61% in T3 as opposed to T1. In comparison to T1, the equivalent RNA virus decreases for the second season were 56% in T3 and 45% in T2. The Plum Pox Virus (PPV), which belongs to the Potyvirus genus in the Potyviridae

family, is the cause of Sharka disease, which has a severe effect on the stone fruit sector globally. According to Garcia in his book, several nations have imposed stringent limitations on the admission of plant propagation material in an effort to stop the disease's spread. Fruit is exempt from these limitations as it is consumed by people rather than being propagated. PPV is not spread by seeds, according to a number of studies, despite the virus being found in seed components that are not found in the embryo. It is widely accepted that stone fruit is free to travel across international markets based on this information, irrespective of whether the country of origin is impacted by the Sharka disease.

Two main factors have allowed Chile's stone fruit industry to escape significant economic losses caused by the virus: The country only harbours the Dideron (PPV-D) strain of PPV, which is thought to be non-epidemic or attenuated and the diligent efforts of the Agricultural and Livestock Service (SAG), which is in charge of ensuring plant health in Chile, which has enforced stringent quarantine regulations, produced stone fruit trees free of the plum pox virus, and monitored orchards ever since the illness first appeared. But when PPV-D was found in Chilean fruit that was sent to Brazil, the situation was altered.

The rejection of whole cargoes of stone fruit resulted in substantial losses for the Chilean sector, causing serious challenges. With 68.8% of all rejected shipments of fruit, plums were the most negatively impacted fruit. Instruction 17 of the Phytosanitary Regulations of the Brazilian Ministry of Agriculture, Livestock and Supply (MAPA) went into effect on October 3, 2016, limiting fruit imports from nations.

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