

Title Vibration Levels and Damages to Huanghua Pears (*Pyrus pyrifolia* Nakai Huanghua) During Truck Transport on Different Kinds of Road Surfaces

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Abstract

Vertical vibrations of a 2-ton truck rear floor with leaf-spring suspension and of the Huanghua pears (*Pyrus Pyrifolia* Nakai. Huanghua) carried by the truck were measured when the truck traveled along four kinds of typical roads. In this research, the power spectral density (PSD) was used to compare the vertical vibration experienced on the four kinds of roads of the rear floor and of the Huanghua pears (*Pyrus Pyrifolia* Nakai. Huanghua) in the top reusable plastic container (RPC) of the column on the rear floor of the truck. The top PSD and the root mean square PSD of the rear trailer and of the pears indicated that higher vertical vibration level was induced by higher speed of the truck and rougher road surface. The analysis revealed that the severe PSD values of the rear floor of the truck often happened in the range of 2-5Hz, and that the main PSD values of the pears usually appeared within the bandwidth of 2-5Hz and 10-20Hz. The vertical vibration levels transmitted from the four kinds of roads traveled by the truck were significantly different ($p < 0.05$), resulting in the different number of the bruises on the Huanghua pears during transport.