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Assessment of hand-transmitted vibration in self propelled vertical conveyor reaper

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■ **ABSTRACT :** The self propelled vertical conveyor reaper is commonly used for harvesting wheat, rice etc. It has become a main or the sole of mechanical power source on small and medium size farms in India. The operators of VCR are exposed to a high level of vibration arising from single cylinder engine during field operations. The vibration from the VCR is transmitted from handle to hands, arms and shoulders. The detrimental effect of the prolonged exposure to hand-transmitted vibration on the operators has been known for a long time. In the present study, experiments were conducted to assess the vibration extent in VCR for two operational conditions *i.e.* transportation on bitumen road and wheat harvesting operation. The vibrations were measured at engine speed 2200 and 2800 rpm. In this study it was found that the vibration magnitudes decreased with increase in engine speed from 2200 to 2800 rpm in both operational conditions. The highest vibration values were observed in x-direction. The maximum frequency-weighted vibration acceleration (rms) in x-direction was 18.76 and 22.8 ms^{-2} in transportation and wheat harvesting. One third octave band frequency spectra were also obtained. The peak acceleration appeared around 50 Hz for both transportation and wheat harvesting at engine speed 2200 and 2800 rpm. The average 8 hour exposure time for occurrence of white finger syndrome was 1.16 and 0.93 years at transportation and wheat harvesting operation.

■ **KEY WORDS :** VCR, Engine speed, Wheat harvesting, Vibrations, White finger syndrome

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