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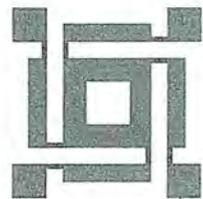
Risks of Musculoskeletal Disorders in California Winegrape Trellis Systems

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The agricultural sector has been considered as one of the most hazardous among all industries in terms of work related injuries. The most commonly reported injuries are associated with Musculoskeletal Disorders (MSDs), with a work related MSD incidence rate of 80 per 1,000 workers in the winegrape industry alone. These injuries are attributed to MSDs of the lower back and upper extremities due to the highly forceful and repetitive hand intensive movements combined with frequent stooped postures observed during harvest and pruning operations. Field observations have documented extensive deviations of the wrist from the neutral position while pruning. These deviations are coupled with extremely repetitive cuts and high grip forces applied to the pruning shear. This combination has proven to increase the risk of developing MSDs of the wrist such as Carpal Tunnel Syndrome (CTS). In addition, the frequent stooped postures combined with highly dynamic movements of the torso may result in increased risks of low back disorders. The purpose of this study is to determine if differences in the risk of developing musculoskeletal injuries exist based on exposure to various trellis systems while pruning and harvesting. Twenty two vineyard employees participated in two simulation studies where they performed, respectively, a pruning task and a harvesting task on five unique trellis systems most commonly used throughout the industry. The Lumbar Motion Monitor (LMM) and the Greenleaf Motion Analysis System (MAS) were used to capture the kinematics of the spine and wrist, respectively. The results of this study indicate that there is a relationship between trellis characteristics and trunk and hand/wrist kinematics. As expected, trellis height had a direct impact on the level of MSD risks to the back, wrist, and shoulder joints. Means for incorporating the results of the study into guidelines for designing trellis systems that help minimize the risks of MSDs to vineyard workers will be also discussed.

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