

Challenges and Safety Considerations in the Adoption of Autonomous Agricultural Vehicles

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Abstract

Agriculture remains one of the most hazardous industries in the United States. In addition to a high rate of injuries and fatalities, the sector faces an ongoing labor shortage and growing pressure to adopt piece-rate payment systems, further increasing risks for workers. To address these challenges, the industry is rapidly turning to digital agriculture and autonomous vehicles. However, the implementation of new technologies often outpaces the development of corresponding safety regulations and standards. This raises new concerns regarding the safety and health of workers working around these vehicles. Existing international guidelines—such as ISO 18497, ISO 25119 (functional safety), Australia’s Code of Practice for Autonomous Agricultural Machinery, the UK’s BS 8646:2023, and the European Union’s Regulation (EU) 2023/1230—represent important steps forward. Still, they often remain too general and fail to address the practical risks associated with specific types of machines or tasks in agricultural environments. This presentation highlights current gaps and challenges in worker safety during the deployment of autonomous agricultural vehicles. It emphasizes the urgent need for targeted safety research and development of practical standards to ensure the well-being of those working alongside advanced technologies in agriculture.

Key Words: *Agricultural Safety, Autonomous Vehicles, ISO 18497, Digital Agriculture, Occupational Health*