

Good Morning,

Can you believe it's already July and we're halfway through 2021? This month's Update from the Field mirrors our Seasonal Campaign on the topic of blind spots and operator/bystander safety.

If you have any questions, comments, or would like the full article, please email me at [kelsey-strandberg@uiowa.edu](mailto:kelsey-strandberg@uiowa.edu). Enjoy the 4th!

Very best,  
Kelsey

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**Rearward visibility issues related to agricultural tractors and self-propelled machinery: contributing factors, potential solutions**

Ehlers, S. G., & Field, W. E. (2016). Rearward visibility issues related to agricultural tractors and self-propelled machinery: contributing factors, potential solutions. *Journal of agricultural safety and health*, 22(1), 47-59.

As the size, complexity, and speed of agricultural tractors and self-propelled machinery have increased, so have the visibility-related issues, placing significant importance on the visual skills, alertness, and reactive abilities of the operator. Rearward movement of large agricultural equipment has been identified in the literature as causing both fatalities and injuries to bystanders who were not visible to the operator and damage to both the machine and stationary objects. The addition of monitoring assistance, while not a new concept, has advanced significantly, offering agricultural machinery operators greater options for increasing their awareness of the area surrounding the machine. In this research, we attempt to (1) identify and describe the key contributors to agricultural machinery visibility issues, i.e., operator-related and machine-related factors, and (2) enumerate and evaluate the potential solutions being offered that address these factors. Enhanced operator safety and efficiency should result from a better understanding of the efforts to solve the visibility problems inherent in large tractors and self-propelled agricultural machinery.

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### **Determining the Effectiveness of Mirrors and Camera Systems in Monitoring the Rearward Visibility of Self-Propelled Agricultural Machinery**

Ehlers, S. G., & Field, W. E. (2017). Determining the effectiveness of mirrors and camera systems in monitoring the rearward visibility of self-propelled agricultural machinery. *Journal of agricultural safety and health*, 23(3), 183-201.

This study concerned the ability of operators of tractors and other self-propelled agricultural machinery to visually recognize objects and/or hazards within close proximity to the rear of those machines and/or any implements in tow, especially when backing up. It was hypothesized that the data collected would identify the factors affecting rearward visibility and help determine the effectiveness of two backup-assisting devices (i.e., mirrors and camera systems) in enhancing the operator's ability to observe objects or hazards. The study's experimental design involved the following: (1) selecting nine self-propelled machines for testing (five tractors of varying sizes, a combine, a sprayer, a skid steer loader, and a UTV); (2) laying out a five cell by five cell test grid behind each machine, with an indicator pole centered in each cell; (3) positioning the mirrors (exterior/interior) and camera system (camera and display monitor) for maximum visibility; and (4) collecting images from a 50th percentile male operator's eye midpoint position. The findings were recorded graphically onto a master grid for the backup-assisting devices (both individually and in combination) on each machine. Analysis of the results confirmed that various issues related to the machines impact the effectiveness of mirrors and camera systems in enhancing rearward visibility. Among them are the operator station's design and configuration, seat adjustability, optional accessories, exterior lighting, type of implement in tow, hitching method, and highway transport mode. These findings led to recommendations relative to each of the mirrors and camera systems, as well as observations of operator interactions with accessories and perceived effects on the operator's ability to view obstructed areas in close proximity to the machinery.

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### **A Review of 2016–2017 Agricultural Youth Injuries Involving Skid Steers and a Call for Intervention and Translational Research**

Weichelt, B., & Bendixsen, C. (2018). A review of 2016–2017 agricultural youth injuries involving skid steers and a call for intervention and translational research. *Journal of agromedicine*, 23(4), 374-380.

Skid steers or loaders are becoming prolific in U.S. agriculture – as are the injuries and fatalities related to their use. A review of incidents as queried in AgInjuryNews from 2016 to 2017 revealed an overrepresentation of youth being involved in these tragic incidents. This raises concerns over parental attitudes and beliefs about the safety of these machines. Skid steer incidents do not appear to be a result from a lack of safety education materials, however. Indeed, manufacturers, the Centers for Disease Control, and many state extension systems have safety manuals and general instruction, including YouTube videos and online resources. Thus, there appears to be a significant gap between safety knowledge and practice. There is also a lack of published research, including intervention strategies, training evaluation, and translational/implementation studies specific to skid steer machines. This review of youth incidents is therefore also a call for further research for foundational studies regarding attitudes

and behaviors involving skid steers in agriculture, intervention models, and efforts to translate prevention knowledge beyond the existing materials.