

Safety Issues with Laser Weeding (2)

Exposure of laser beams to the surrounding environment

Laser beams can be harmful to humans and animals. Therefore, humans and animals should not be unintentionally exposed to laser radiation. Curtains and screens can be mounted on the autonomous vehicle to reduce the risk of exposing the surrounding environment to laser radiation. However, if the curtains and screens are too close to the soil surface and touch the crop, they may damage the crop plants and spread plant pathogens from one crop plant to the other, while the robot moves across the field. Therefore, it may not be possible to protect the surroundings completely against laser radiation. If the laser beam accidentally hits a stone, sand, or any other item, which can reflect the beam, it may escape the target area exposing the surroundings to the laser radiation (Figure 1).

Practical recommendation

Keep distance to the WeLASER vehicle when it is working. Use laser safety glasses for the specific laser wavelength when it is necessary to adjust, clean or work close to the laser weeder. Wear protective gear to avoid heat injuries to the skin.

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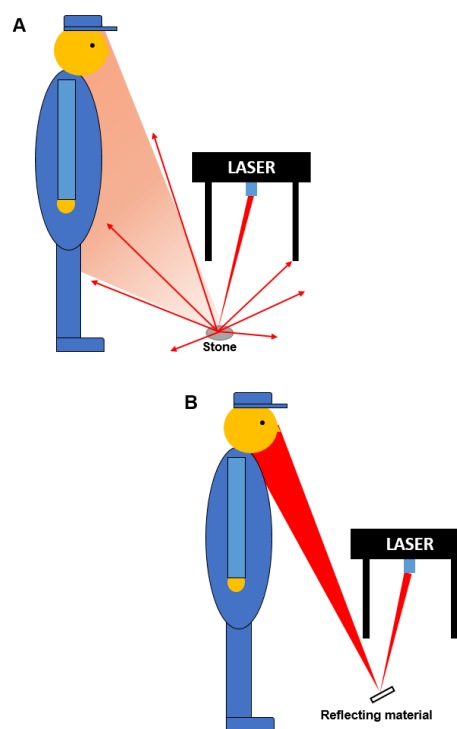


Figure 1. The laser beam can be reflected by materials in the field and escape the target area. **A.** If the laser beam hits a stone, it is reflected diffusely, and the laser energy is spread in all directions. The farther a person is away from the weeder, the lower the energy density of the laser beam. **B.** A reflected beam remains directed and expands as given by the laser optic. It may pose a serious risk for the person and the surroundings. Laser radiation is painted red in the figure, but the WeLASER vehicle executes an **invisible** laser beam.