

## Safety Issues with Laser Weeding (1)

### Heat and Fire Risks

#### Autonomous vehicles for laser weeding

Autonomous vehicles for laser weeding have the same safety issues as other autonomous vehicles. Although such vehicles are only approved driving on the roads in a few experimental places until now, some robots (e.g., lawnmowers) are widely accepted and used on private and public properties. Also, small autonomous agricultural robots are approved to drive on private and public properties (e.g., in EU and UK) as long as all safety guidelines are followed (Basu et al., 2020).

#### Risk of Heating

Laser beam executes high levels of energy in the form of a narrow and non-spreading beam, transmitting into heat energy when it hits a surface. The heat can potentially ignite dry material in the field (e.g., straw, leaves, other organic matters, lost paper) and start a fire. Various sensors (e.g., smoke sensors and cameras) can be mounted on the autonomous vehicle to register any sign of uncontrolled heating or fire. However, when the laser weeder has passed, a spark could be hidden and expose a danger. Many fires have been started by leaving a spark after flame weeding and this is also a risk with laser weeding.



#### Practical recommendation

It is important to consider surveillance of the laser weeder and the treated field area. Leaving the laser weeder driving without surveillance, for example, during the night, could be too risky. Dry organic matter should be avoided on the soil surface, and therefore ploughing, might be necessary to reduce fire risks in some fields.

#### Reference

Basu, S., Omotubora, A., Beeson, M., Charles Fox, C. (2020). Legal framework for small autonomous agricultural robots. *AI Society* 35:113–134. <https://doi.org/10.1007/s00146-018-0846-4>

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**Date:** January 2022



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