

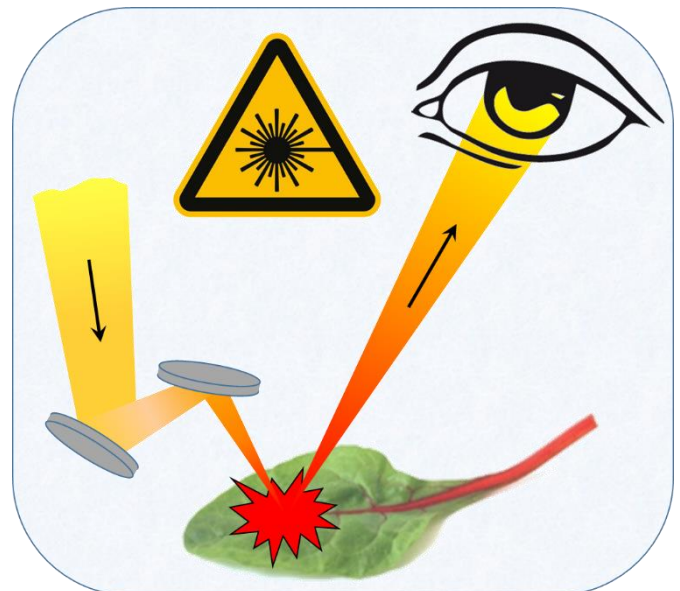
Risks from exposure to laser radiation during weed control

Why is laser radiation dangerous?

When laser radiation interacts with human tissue, energy is introduced through radiation absorption. It becomes dangerous if this energy cannot be removed from the irradiated area quickly enough. With regard to the risks, existing standards distinguish between the eyes and the skin, for which wavelength- and exposure time-dependent exposure limits are defined in the Directive 2006/25/EC. Since laser radiation is invisible in the wavelength range preferred for laser weed control, here around 2 μm , there is no reflexive aversion reaction due to occurring glare.

How can laser weed control be realized safely?

If the applied laser radiation is divergent, i.e. expanded, the irradiance decreases with increasing distance from the laser-beam focus, and the greater the divergence, the greater the decrease. Furthermore, the minimization of the exposure time leads to a limitation of the potential laser-energy input. In practice, however, a corresponding hazard reduction is not sufficient since lethal energy doses are to be applied to the weed plants. Thus, in addition, technical protective measures must be taken: In order to spatially limit the laser radiation, a sufficiently resistant shielding is installed. Radiation leakage from the enclosed space can be reliably prevented with monitoring devices that automatically switch off the laser in the event of a fault.



Practical conclusion

Despite the usage of invisible laser radiation with a high hazard potential, laser weed control can be carried out safely even in the field if a careful risk assessment is carried out and suitable technical protective measures are implemented.

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