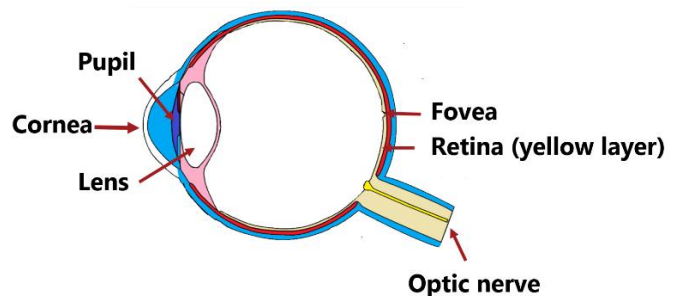


Safety Issues with Laser Weeding (3)

How laser can affect your eyes

Laser beam executes high levels of energy in the form of a narrow and non-spreading beam, which is transmitted into heat energy when it hits a surface. If this concentrate heat energy hits the eye, it can pose irreversible damage like blindness.

Depending on the laser wavelength, the laser can be more or less harmful to the eyes. Visible and near-infrared (400–1400 nm) laser light poses a critical hazard on the **retina**. Since the tissue structures of the retina are unable to undergo any repair, lesions caused by the focusing of visible or near-infrared light on the retina may be permanent. The most critical area of the **retina** is the central portion, the **fovea** and the area around fovea (macula) (See the figure).



Schematic drawing of an eye

Laser light in the ultraviolet or far-infrared spectrum can cause damage to the **cornea** or the **lens** in the eyes (See the figure). Far infrared (1,400 nm – 1 mm; CO₂ lasers, 10,600 nm) can cause thermal damage by the heating of the tears and tissue water of the cornea. Excessive exposure to infrared radiation results in a loss of transparency of the **cornea** or surface irregularities (OSHA, 2022).

Practical recommendation

Always avoid laser beam exposure. Use protective glasses corresponding to the **specific wavelength** of the laser, when you work with laser. These can be fairly expensive, but they are necessary to protect your eyes. Ensure that the authorities have approved the glasses. If you do not need to be close the autonomous laser weeder, always keep a distance to avoid being exposed to reflected laser light.

Reference

Occupational Safety and Health Administration [OSHA] (2022). Laser Hazards. OSHA Technical Manual (OTM). Section III, Chapter 6. US Department of Labor. <https://www.osha.gov/otm/section-3-health-hazards/chapter-6>

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