WeLASER
Eco-innovative weeding with laser

Practice Abstract N. 18

How laser weeding can contribute to improving the environment and sustaining biodiversity (I)

Minimizing the treated area

Laser weeding requires an efficient recognition tool to find and identify weeds and crops. Combining artificial intelligence and deep learning methods makes it possible to do that and direct the laser beam towards the growth points (meristems) of the weed seedlings while the system is moving across the field. Only a tiny proportion of the field will be exposed to the treatment. If the laser beam has a diameter of 3 mm and there are 100 weeds/m^2, the exposed area is equal to 707,1 mm^2/m^2 (0.071% of the total area).

Respecting beneficial living organisms

Living organisms, which are not sitting on the target plants or accidentally fly into the laser beam, will not be exposed. Suppose some non-crop plants do not affect the crop negatively. In that case, an algorithm can define them as non-targets. It could be plants providing ecological services: species supporting pollinators, species that create hiding and nesting places for beneficial insects, rare and endangered species, and plant species with a positive allelopathic effect on the crop.

Anagallis arvensis: a species which supports pollinators

Practical recommendation

Compared with herbicide application, mechanical weeding and flame weeding, where the entire area or a large part of the field is exposed for the treatment, laser weeding can significantly reduce weed control's environmental effect. In addition, AI perception systems used in laser weeding treatment can protect those non-crop plants that do not affect the crop negatively.

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