

Can Canada thistle be controlled with laser beams?

Canada thistle

Despite its name, Canada thistle (*Cirsium arvense* L. (Scop.)) is native to Europe. It is an aggressive perennial plant with a vigorous root system that continually produces new shoots, invading new areas and outcompeting other vegetation types. Therefore, it severely threatens organic agriculture, which mainly relies on mechanical weed control. Harrowing breaks the root system into smaller parts with the risk of spreading the roots further in the fields and stimulating root parts to establish new shoots and plants. However, many mechanical treatments will harm the thistle plants and starve the roots, making it difficult for the small root parts to establish new plants.

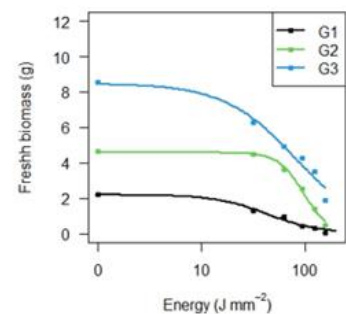
Laser treatment of Canada thistle

Laser beams will only affect the above-ground parts of the thistle plants and stimulate the roots to produce new shoots based on the resources stored in the root parts. Therefore, starving the roots to death by continuously killing the above-ground biomass with laser will require many treatments to control a well-established perennial thistle population. We treated thistle plants established from small root fragments with a laser beam at three growth stages.

Plant from root



Weight of *Cirsium arvense* after three weeks



Growth stage 1 (G1) Growth stage 2 (G2) Growth stage (G3)



Conclusion

Laser is not a good solution to kill well-established perennial thistle populations. However, if the root system is cut into many small parts mechanically, it is possible to kill the small new plants with a laser beam. The smaller the root segments and the smaller the new sprouts are, the better control we obtain. Controlling *C. arvense* with laser beams requires more energy than controlling many other weed species.

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