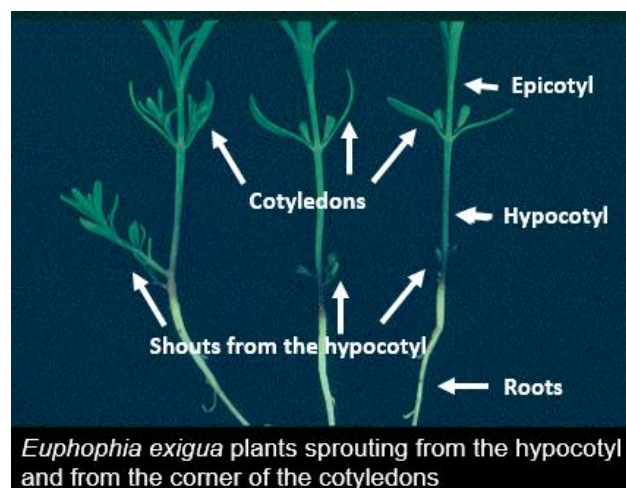


## Some small dicotyledonous weed seedlings may be challenging to control with laser

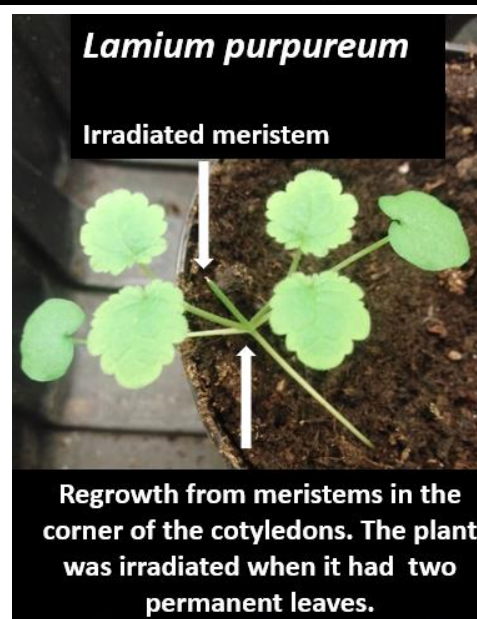
### Sprouting from the hypocotyl

Laser beams can control most dicotyledonous weed seedlings when they are in the early growth stages by pointing the beam towards the apical meristem. However, some weed species have a unique ability to regrow from lateral meristems on the hypocotyl. Examples are species of the *Euphopia* genus like *E. exigua*, *E. peplus*, and *E. helioscopia*. If the laser beam hits the apical meristem, the plant may survive depending on how much energy they have stored in the survived tissue. However, the treatment will always delay the growth and reduce their ability to compete against fast-growing crop plants.



### Sprouting from the cotyledons

Other weed species, like *Stellaria media*, *Lamium purpureum*, and *Veronica species*, have lateral meristems in the corners of the cotyledons, which can quickly sprout if only the apical meristem has been harmed by laser irradiation. That may happen if the epicotyl has been developed and the apical meristem is placed a certain distance from the cotyledons, for example, if the plants have developed the first two permanent leaves. Therefore, it is recommended to irradiate the plants before the epicotyl develops.



### Conclusion

Some small dicotyledonous weed seedlings can sprout from lateral meristems. The smaller the plants are, the less risk of regrowth because only small resources are left in the plants after irradiation. Therefore, the best effect is obtained if the plants are irradiated very early, even before the epicotyl has been developed. However, it might be necessary to treat the plants more than once to eliminate them.

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