

Can couch grass (*Elymus repens*) be controlled with a laser?

Couch grass (quack grass)

Couch grass is a perennial grass that competes well with most crops. Infestation of the weed can result in severe yield reduction. The weed primarily spreads with rhizomes, which are difficult to kill or remove from the field, as even a small piece of living rhizomes with one node can develop into a new plant. Couch grass can be controlled by the glyphosate herbicide or mechanically by repetitive tillage. However, potential restrictions on glyphosate use in the future and side effects of intensive tillage make its eradication very difficult.

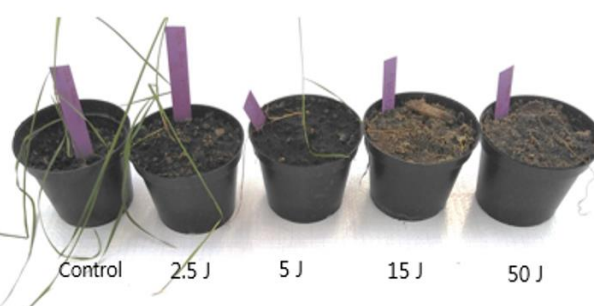
Lasering couch grass

Combining mechanical weeding and destroying the plant foliage with a laser could be a possible method to control couch grass. We irradiated couch grass plants with a 50 W laser beam with a wavelength of 2 μm and a diameter of 2 mm in two stages of plant development (1st and 2nd leaf stages) established from small pieces of rhizomes up to 2 cm with one node. We irradiated the plants the second time three weeks after the first treatment to empty the rhizomes from resources. The biomass of the plants was estimated three weeks later (see the figures).

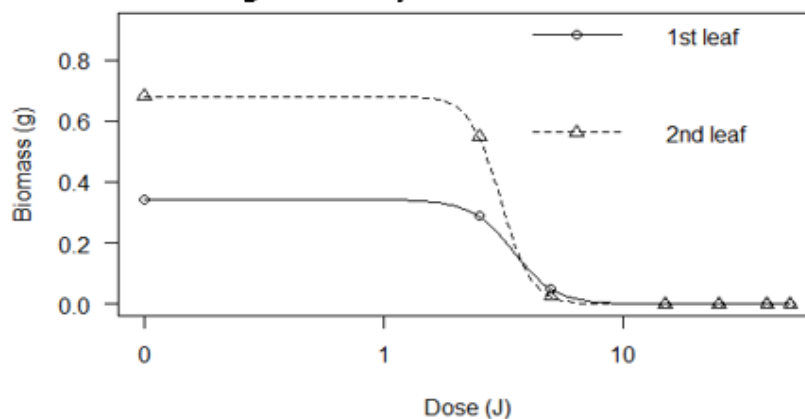


E. repens plant with rhizomes

E. repens plants 3 weeks after 2nd treatment



Weight of *E. repens* after 2nd treatment



Results and conclusion

Couch grass was destroyed at the first and second leaf stages, even with small laser energy doses (15 – 50 J). The experiments showed that it was possible to control couch grass plants established from small rhizomes when they have one to two leaves. Killing plants established from larger rhizomes is expected to require more treatments.

Authors: UCPH

Date: October 2023



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



van den borne
aardappelen