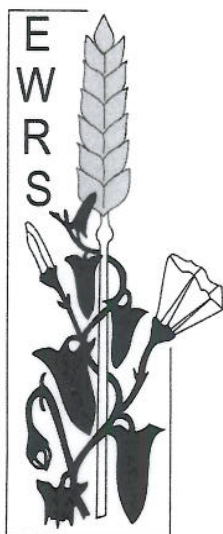


PERENNIAL WEEDS

A growing problem

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Exposure and destruction of *Elymus repens* rhizomes and *Rumex crispus* rootstocks

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The traditional strategy of repeated stubble cultivation to control *Elymus repens* evolved from the basic studies in the 1960's on *E. repens* rhizome growth in response to mechanical disintegration, uprooting, desiccation and subsequent burial. However, the efficacy depends strongly on weather. In organic farming, intensive and prolonged post-harvest tillage is often avoided because of the preference to keep the soil plant-covered to maintain otherwise leachable nutrients in the upper soil layer. Alternatively, a competitive catch crop could be sown immediately after a few initial stubble cultivations. This strategy was investigated in the recently finished Danish project *Management of perennial weed species in organic farming* (DARCOF II). However, the effect was small and the strategy would only be relevant at low infestation level.

To meet the need for plant cover during the post-harvest period, we suggest an innovative approach: effective uprooting, exposing and destroying of the rhizomes within a short time span using new machinery developed for this purpose. Melander (*unpubl. data*) found that only half of the rhizome biomass in the soil was exposed on the soil surface, using 1-2 passes on a sandy soil with the currently most promising implements. But in previous investigations, much better rhizome exposure was obtained, and with new tool designs an even more effective uprooting seems achievable, considering the predominant placement of the rhizomes in the top 5-15 cm soil layer according to the studies of Håkansson in the 60's. Exposing the rhizomes will not necessarily kill them in the humid autumn climate of Scandinavia, and a strategy aimed at exhausting the rhizomes by repeated cultivation, stimulating rhizome buds to sprout repeatedly, is costly and with erratic effect. Mechanic removal of rhizomes from the field (up to 8 tons per ha) seems not feasible. However, physical destruction quickly after exposure appears possible, and research should look at the practical use and efficiency of different methods of rhizome destruction, e.g. hot water, flaming, steaming, mechanical crushing and high voltage.

Rumex crispus control is most effective when rootstocks are manually uprooted and removed from the field. However, there is a need to rationalise uprooting and removal of rootstocks and therefore the technology developed for *E. repens* should also include capabilities to control *R. crispus* rootstocks.

The work on effective uprooting, exposing and destroying of *E. repens* rhizomes and *R. crispus* rootstocks are dealt with in the newly started Danish research project entitled: *Effective control of perennial weeds and intra-row weeds in organic farming – novel technology and new management strategies* (<http://www.weeds.elr.dk/uk/>). In this presentation, we will present the first results with destructing *E. repens* rhizomes and discuss our initiatives with designing and investigating new technologies for the exposure of vegetative propagules.