

## Regeneration Nature of Rumex Species Root Fragment as Affected by Desiccation

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**Abstract :** Small fragments of the roots of some Rumex species including *R. obtusifolius* and *R. crispus* have been found to regenerate readily, contributing to the severity of infestations by these very common, widespread and difficult to control perennial weeds of agricultural crops and grasslands. Their root fragments are usually created during routine agricultural practices. We found that fresh root fragments of both species containing 65-70 % of moisture, progressively lose their moisture content when desiccated under controlled growth room conditions matching summer weather of southeast England, with the greatest reduction occurring in the first 48 hours. Probability of shoot emergence and the time taken for emergence in glasshouse conditions were also reduced significantly by desiccation, with *R. obtusifolius* least affected up to 48-hour. However, the effects converged after 120 hours. In contrast, *R. obtusifolius* was significantly slower to emerge after up to 48 hours desiccation, again effects converging after longer periods, *R. crispus* entirely failed to emerge at 120 hours. The dry weight of emerged shoots was not significantly different between the species, until desiccated for 96 hours when *R. obtusifolius* was significantly reduced. At 120 hours, *R. obtusifolius* did not emerge. In outdoor trials, desiccation for 24 or 48 hours had less effect on emergence when planted at the soil surface or up to 10 cm of depth, compared to deeper plantings. In both species, emergence was significantly lower when desiccated fragments were planted at 15 or 20 cm. Time taken for emergence was not significantly different between the species until planted at 15 or 20 cm when *R. obtusifolius* was slower than *R. crispus* and reduced further by increasing desiccation. Similar variation in effects of increasing soil depth interacting with increasing desiccation was found in reductions in dry weight, the number of tillers and leaf area, with *R. obtusifolius* generally but not exclusively better able to withstand more extreme trial conditions. Our findings suggest that infestations of these highly troublesome weeds may be partly controlled by appropriate agricultural practices, notably exposing cut fragments to drying environmental conditions followed by deep burial.

**Keywords :** regeneration, root fragment, rumex crispus, rumex obtusifolius

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