EFFECTS OF CATTLE GRAZING ON THE REGENERATION OF CALLUNA VULGARIS IN DRY GRASS RICH HEATHLANDS.

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SUMMARY
Cattle grazing appears to be a successfull management technique for the re-establishment of Calluna vulgaris in grass dominated heathlands in the Netherlands. To achieve a better understanding of the different working mechanisms involved, the effects of grazing on the topsoil and on the regeneration of Calluna vulgaris, germination and seedling survival under dry conditions were experimentally studied (see also paper of A. Vermaat).

Topsoils (Ao + 5 cm A1) from grazed and ungrazed heathland areas were placed on cylindrical pots (diam = 18 cm) in a greenhouse. Gap creation by hoofs was simulated by removal of the litter (Ao). After sowing of Calluna vulgaris seed, the pots were submitted to a moist regime during 9 weeks (germination period) followed by a dry regime of 7 weeks (survival period). Seedlings were counted weekly. Moisture content of the 3 cm topsoil was measured repeatedly during the survival period. Plant height, root length, Ao thickness, organic matter content and organic matter density of the topsoil were measured at the end of the experiment.

The substrates were: Go = Ao-Grass litter, not grazed; Gg = Ao-Grass litter, grazed; Ho = Ao-Heather litter, not grazed; Hg = Ao-Heather litter, grazed; Gop = A1-Grass litter removed, not grazed; Ggp = A1-Grass litter removed, grazed; Hgp = A1-Heather litter removed, grazed; S = Fixed sand from the C-horizont.

Germination of sown seeds was most successful on substrates with a smooth surface: Hgp > S > Gop > Gg > Hg > Ggp > Ho > Go, confirming the role of light as the limiting factor for germination under moist conditions. In loose litter, seeds fall into darkness.

Seedling survival (%) was highest on topsoils with a litter layer: Go > Ho > Gg > Ggp > Hg > Hgp > Gop > S. Topsoils with a litter layer contained more moisture during the desiccation period. Root length was smallest in the most compacted topsoils from grazed areas.

Regeneration (mean number of surviving seedlings/pot after 16 weeks) was as follows: Hg(94) > Ho(52) > Gg(34) > Ggp(29) > Go(14) > Hgp(10) > S(4) > Gop(0).

It is concluded that cattle grazing has a positive effect on the regeneration success of Calluna vulgaris in Grass litter and in Heather litter, due to a better germination on smooth, compacted litter and in litter gaps.