

## Abstract

The interaction, both above and belowground, between tree saplings and the surrounding grass sward is dependent on solar radiation, temperature, rainfall, soil depth, tree species and sward composition. These factors, as well as level of sward defoliation, influence whether the system will remain as savanna or move towards a woodland or grassland state. The effects of above- and below- ground competition between grasses and two Acacia species and the effects of soil depth on these interactions were examined by planting *A. karroo* and *A. nilotica* seedlings into a natural sward on three different soil depths. Three aboveground treatments: full shading, reduced shading by tying back the neighbouring grasses and reduced shading by clipping, and two belowground treatments: full and no belowground competition, were used. Plant size increased with increasing soil depth, while belowground competitive intensity was unaffected. Removing belowground competition increased sapling biomass by half ( $P < 0.05$ ) on all soil depths. By contrast, reduced shading had little effect at all soil depths, whereas sward clipping increased sapling biomass (47%) on shallow soils only ( $P = 0.027$ ), indicating that encroachment on shallow soils may result from factors that decrease root vigor of the surrounding grasses rather than light competition. Irrespective of soil depth, root competition appeared to be the major factor influencing sapling growth rates, thus grazing management practices that reduce grass root productivity are expected to result in woody encroachment.