# Rehabilitation of grasslands through perennial grass recruitment within existing swards

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**Key words :** recruitment , phalaris , seeds , herbage mass , bare ground

**Introduction** Phalaris ( *P . aquatica*) is an introduced C3 grass species , widely sown in southern Australian temperate regions . Phalaris is drought tolerant , can withstand extended periods of heavy grazing , performs well in poorly drained and waterlogged soils , and provides good quality grazing for all types of livestock . Phalaris is known to produce large quantities of seed , but little recruitment within phalaris stands has been reported ( Lodge , 2004) . When stands thin , encouraging natural recruitment could be more cost-effective than resowing grasslands . The low natural recruitment of phalaris has been attributed to competition from annual grasses and legumes , preventing the weak phalaris seedling from establishing , and to a high level of seed harvesting by ants . The ideal microsites for recruitment are poorly understood . It is often noted that phalaris spreads naturally along roadsides in south-eastern Australia though the mechanisms are not understood . This paper presents findings on the recruitment of phalaris within existing pastures .

**Materials and methods** A factorial combination of seed delivery mechanisms ( A1 : uncut , A2 : cut & remove , A3 : slash & leave) , seed addition ( B1 : nil , B2 : + seed , B3 : +insecticide) and site preparation ( C1 : nil , C2 : light scarifying , C3 : + herbicide) were used . Seedling numbers were recorded 2 weeks after a significant rainfall event ( 50mm over 2-3 days) and monitored for survival 6 , 24 and 48 weeks after first emergence .

**Results and discussion** Highest seedling numbers resulted from the nil intervention control , where phalaris was allowed to flower , set seed and to remain standing ( Figure 1) . Cutting the tall grass and either removing the cut material or leaving it on the soil surface failed to achieve as many seedlings . The uncut treatment could result in slightly lower vapour pressure deficits compared with cutting and leaving the herbage mass on the surface . This suggests that the micro-climate at micro-sites where seedlings establish may be initially more important than competition for soil moisture and nutrients , for this species under dry conditions . That view was supported by regression analysis ( assuming Poisson distribution) which showed that less bare ground and greater herbage mass resulted in more seedlings ( Figure 2) . Seedling survival was though poor due to drought conditions over the next year .

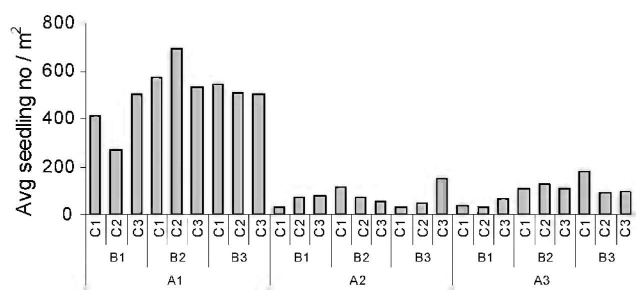


**Figure 1** *Initial emergence of phalaris seedling across treatment combinations in March 2007 .*

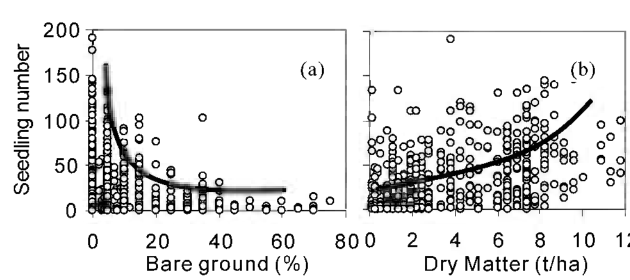


**Figure 2** *Effect of ( a) bare ground and ( b) dry matter on seedling numbers/m² . Lines of best fit using all treatments were significant .*

**Conclusions** Leaving swards undisturbed may be preferable to slashing and building up a layer of litter on the ground for recruitment of new phalaris plants . This affect may arise from subtle changes in humidity at ground level ; changes that are very difficult to measure . Conditions for ideal seedling emergence may differ from those for seedling survival .

## Reference

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