

Lenz, T.I., Moyle-Croft, J.L., & Facelli, J.M. (2003). Direct and indirect effects of exotic annual grasses on species composition of a South Australian grassland. *Austral Ecology* 28(1): 23-32.

Invasion by Mediterranean annual grasses, such as *Avena* L. spp. and *Bromus* L. spp., is one of the major threats to temperate perennial grassland. This study investigated the effects of annual grasses and their litter on the species composition of a grassland near Burra, South Australia. The placement of annual grass litter on soil samples in the glasshouse decreased the establishment or growth of several exotic annual dicots. In the field the addition of annual grass litter slightly decreased the frequency of *Danthonia* Lam. & DC. tussocks. Furthermore, litter strongly reduced the species richness from 13 species in plots with no litter to nine species in plots with the highest litter level, mainly by decreasing the frequency of common exotic dicots. Native dicot frequency similarly appeared to be decreased by litter addition. In addition to the negative effects of their litter, annual grasses also directly competed with perennial grasses. The magnitude of the competitive effect varied systematically along a slope, suggesting that other factors such as soil properties may control competitive interactions. The biomass of annual grasses also tended to increase with the addition of their own litter. This combination of positive and negative feedback mechanisms suggests that brief periods favourable for annual grasses, either through management changes or environmental conditions, can lead to persistent changes in the species composition of the system.