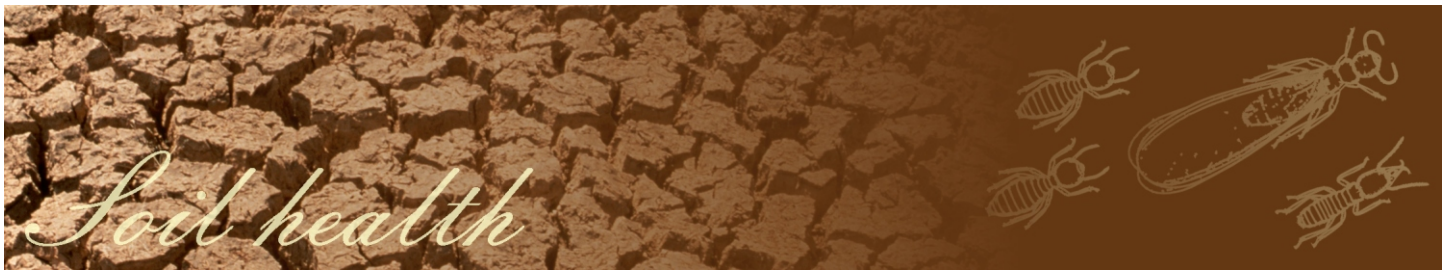

Soil macroinvertebrates and landscape health

The Issue

Soil macroinvertebrates recycle nutrients and carbon in soils, and their activities increase soil porosity critical to the infiltration of water. These processes are vital to sustaining production and biodiversity in tropical savannas. Grazing by cattle and fire can significantly alter macroinvertebrate activity and consequently change landscape processes and therefore the health of the environment. Understanding the effect of land management on the relationship between soil macroinvertebrates and landscape processes will help develop ways to improve the resilience of healthy systems and hasten the recovery of degraded systems.

CSIRO Research

Our research addresses the following key questions:

- How does land condition affect the functional role of macroinvertebrates in forming soil pores and improving water infiltration?
- How does grazing intensity affect soil function through changes in the diversity, activity and functional roles of macroinvertebrates in savannas? What is the relationship with the diversity and abundance of other animals?
- Can macroinvertebrate activity be manipulated to hasten the recovery of soil function in degraded landscapes?
- How does fire frequency and seasonal timing affect the activity, diversity and functional role of key soil macroinvertebrates and what are the consequences for soil health?

Preliminary results suggest that intensive grazing leads to greater termite activity and diversity, and greater number of termite mounds. Conversely, earthworm activity declines with increasing disturbance. Mulching of degraded sites increases invertebrate activity and diversity, which leads to the creation of macropores in soils, increased water infiltration and increased litter decomposition rates. The consequences of these changes for soil processes and landscape health are being investigated.

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