

Impact of Grassland Reseeding on Diversity and Abundance of Soil Arthropods

Phil Murray, *Wei Liu, *Junling Zhang, Stuart Norris

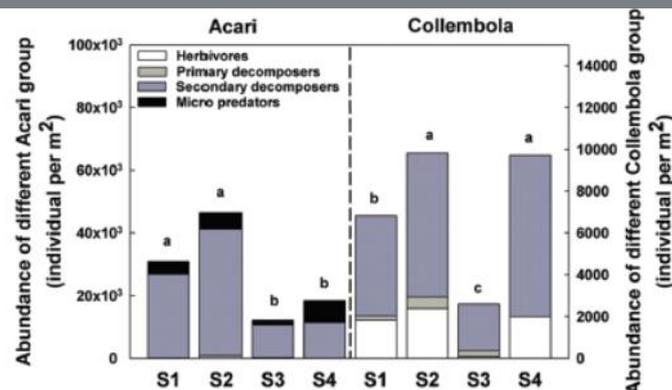
*China Agriculture University, Beijing

The perennial nature of grasslands means that interactions between the plant and the soil are crucial in regulating soil processes. The perenniality of grassland systems implies that they generally have a relatively stable and permanent plant cover which provides a secure habitat for abundant and diverse soil invertebrate fauna that contribute to effective soil functioning.

Agricultural grassland management practices such as reseeded can affect sward structure and plant species composition and, probably more importantly, the soil structure and habitat all of which have a knock-on effect on the associated soil fauna.

In this study we determine the impact of perturbation (herbicide, ploughing), during grassland reseeded on the soil faunal community and its subsequent recovery.

Soil samples were collected four times during the study: 1) before chemical herbicide spraying (S1, 26th June), 2) after spraying but before ploughing (S2, 3th July), 3) after ploughing but before reseeded (S3, 24th July) and 4) after one year of recovery (S4, 26th August, 2014). Intact soil cores (8 cm diameter, 10 cm deep; weighing on average 1.2 ± 0.02 kg, wet weight) were taken from the four fields. Overlaying the NWFP is a GPS defined 50m grid and on each sampling occasion, 6 grid locations were randomly selected and a single soil core was collected at each point.



Herbicide application tended to increase soil invertebrate abundance. Whereas subsequent ploughing significantly reduced soil invertebrate number and biomass due to its disturbance effects. Ploughing had an obvious negative effect on soil primary and secondary decomposers. This change was mainly due to the Acari (especially Oribatida) and some Coleoptera group abundance variations. Reseed also reduced individual number of these groups, and favoured those predators had larger body size and individual weight.

Over the following year, different arthropod groups responded differently, with Collembola populations recovering to pre-treatment levels. However, the Acari populations still appeared to be in flux one year on.

loss of soil biodiversity together with the simplification of communities negatively impacts on many ecosystem functions. Thus, maintenance of a healthy soil food web is key in increasing agricultural productivity. This study highlights how common agricultural practices impact on soil communities and how different components of the community respond differently to the disturbance caused.

Liu et al. 2016. *Frontiers in Plant Science*. doi: 10.3389/fpls.2016.01200

