

Impact of grassland management on pests and diseases of white clover

Phil Murray, Maxime Terascou, Victor Debenardi & Hadewij Sint

One of the major aims of managing sustainable grassland systems is to minimise the use of industrially produced fertiliser, due the large amount of energy required for its production and the environmental and human health impacts arising from leaching into watercourses and aquifers often because of improper application in timing and amount. Therefore, the introduction of legumes and the management of the composition of grassland sward to maximize atmospheric N-fixation is one of the pillars in these production systems worldwide.

White clover (*Trifolium repens* L.) is the dominant forage legume species in north-west Europe and is an integral part of many grassland systems in mixtures with perennial ryegrass (*Lolium perenne* L.). White clover is valued not only for its N-fixation ability, but also for its nutritive value for livestock, especially sheep. However, the establishment and maintenance of clover to ensure an adequate balance in the sward for optimum feeding quality is often difficult.

Several pests and diseases are known to attack white clover in the UK and are one of the main reasons for its failure to thrive. In this study we identified pest and disease damage to white clover plants in fields that had been resown with grass/ white clover mixtures in two consecutive years.

We assessed the percentage damage due to *Sitona* spp. and *Apion* spp. weevils along with that caused by slugs on the first, i.e. youngest, fully unfolded leaf from each growing point. In addition, we estimated the percent incidence of large (*Pseudopeziza* spp.) and small (*Leptosphaerulina* spp.) spot diseases.

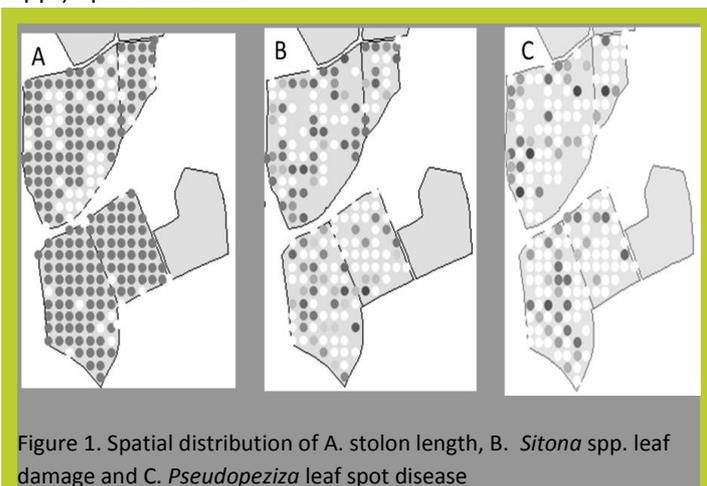


Figure 1. Spatial distribution of A. stolon length, B. *Sitona* spp. leaf damage and C. *Pseudopeziza* leaf spot disease



Figure 1 shows the spatial distribution of clover and damage at each of the sampling points. What is noticeable is that there was a fairly even establishment of clover across both fields, however the pattern of the distribution of the damage was not the same in both fields.

Pest and disease damage represents continual attrition of plant resources putting pressure on the clover plants. For both *Sitona* and *Pseudopeziza* the damage levels in the newer 2014 sowing tended to be greatest around the edges of the field, whereas in the older 2013 sowing there tended to be a more even spread. This indicates that these pest organisms may be utilising the field margins as refugia allowing recolonization of the pasture.

Further work is necessary to identify mitigation strategies.

Murray et al. 2016. "Proceedings of the Ninth Australasian Conference on Grassland Invertebrate Ecology"



Clockwise: Leaf spot, Apion, Sitona, Slug, Clover stolon