Diversity in Arable Foodwebs

Scottish Crop Research Institute

Intensification of arable systems affects the diversity and abundance of arable plants and the animals that depend on them. This has raised concerns about the sustainability of farmland systems.

We are investigating the complex relations between organisms in arable food webs to identify management practices that optimise crop yield and biodiversity.

Impact of farm management

Large-scale surveys of plants and insects inhabiting arable fields have shown arable food webs are highly sensitive to changes in management.

Management affects weed dynamics – plant growth, flowering duration and seed return to the seedbank

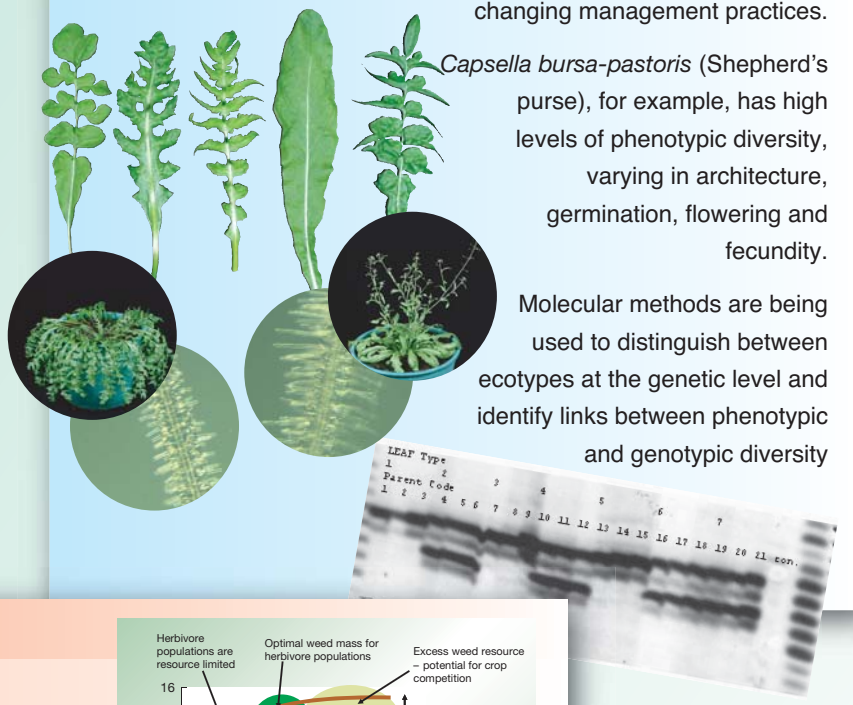
Changes in plant biomass have a direct impact on the insect community

Functional diversity within species

The functional attributes of arable plants affect their response to changing management practices.

Capsella bursa-pastoris (Shepherd's purse), for example, has high levels of phenotypic diversity, varying in architecture, germination, flowering and fecundity.

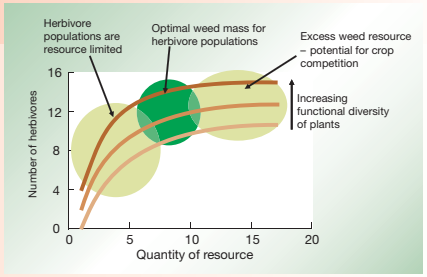
Molecular methods are being used to distinguish between ecotypes at the genetic level and identify links between phenotypic and genotypic diversity



Patch-scale dynamics

Communities of ecotypes with known traits were established at different levels of plant diversity to examine the effect of plant resource availability on insect communities.

These studies can be used to identify an optimal abundance and diversity of weeds necessary to sustain the arable food web without affecting crop yield.



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