Scotland's arable biodiversity

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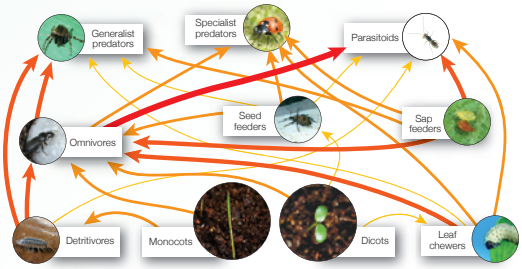
History, evolution and coexistence with crops

- The plants of arable land are a large part of lowland Scotland's biodiversity and are integral to the rural landscape.
- Some arable plant species colonised after the last ice age, others were introduced in the Bronze and Iron Ages and Roman times.
- Arable plants have coexisted with crops since the first crop cultivation.
- Most of the >300 plant species in arable seedbanks are declining through intense field management.
- Modern farming has not reduced the aggressive weeds, which remain an economic problem, but is eradicating beneficial species which are the most threatened flora in the UK.

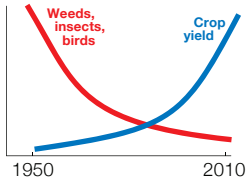


Why are weeds important?

- Biodiversity is essential to maintain ecosystem services such as decomposition, soil fertility, pollination and pest regulation.
- The weed flora forms the basis of this biodiversity, supporting a variety of different herbivores, predators, pollinators and detritivores.
- At SCRI, we have characterised over 300 species into functional groups to assess how different weeds respond to arable management.
- Variation in functional traits is also very high between plants within a species. By characterising this '*within species*' variation for the common weed *Capsella* (shepherds purse), we have shown that arable management selects for the fastest growing and most reproductively efficient plants.

Optimising biodiversity and yield

- Although plants are essential for the health of arable systems, they also represent a significant burden, which can result in reduced yields.
- We therefore need to find the optimal balance between biodiversity and crop production. The aim for weed management should be to maintain benign weeds at levels sufficient to support the arable foodweb but not so high to cause significant yield loss.



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