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Evaluating Agri-Environmental Measures for Conserving Bumblebees

Bumblebees are incredibly important pollinators to a wide range of native plant species as well as commercial crops, as such they contribute significantly both to global crop yields as well as the persistence of plant communities. There is evidence for long-term decline in populations, and shrinking range sizes in Europe and North America. The cause of these reductions are varied, but the most important are changes in land use and intensification of agriculture, both of which have led to habitat loss. Other factors influencing bumblebee loss include pesticide use, pathogen spill-over from managed populations, introduction of invasive species and climate change.

Agricultural intensification can have substantial negative influence on ecosystems and landscapes, including degradation on the environment, such as decrease in biodiversity, deterioration of water quality and erosion. In Europe, the main policy instrument to counteract these effects are agri-environment schemes (AES) which have been obligatory in EU member states since 1992 under the Common Agricultural Policy. Agri-environment schemes involve government providing funding to farmers to manage their land in a way that is more ecologically friendly.

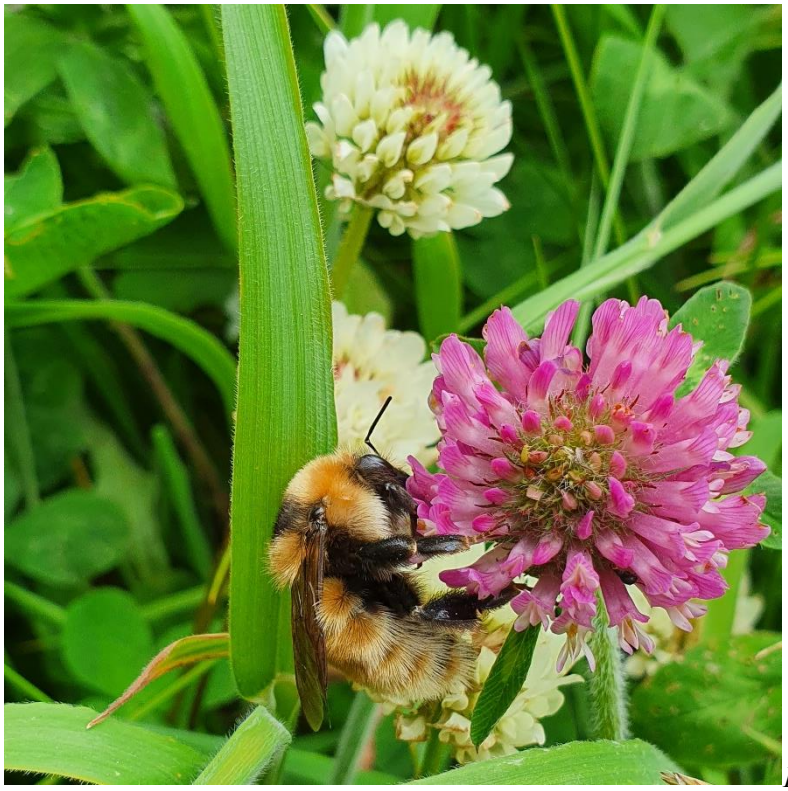
Two potentially effective agri-environment measures, particularly for species-rich or semi-natural grassland areas , are delayed grazing and delayed mowing. Both these measures are designed to ensure that flowers in grasslands get time to bloom and provide resources for pollinators before they are grazed or cut. This differs from conventional system which are often grazed throughout the system, or mowed before flowering has ceased.

Logo for the Great Yellow Bumblebee EIP

This research evaluates how delayed grazing and delayed mowing, as implemented under the Great Yellow Bumblebee Project – a one-year European Innovation Programme pilot project – impacted the abundance species richness and diversity of bumblebees and floral resources in and around the Mullet Peninsula in NW county Mayo. This study used a paired-field design, so for each of the delayed grazed and delayed mowed fields, there was a control field that was maintained conventionally. In 2022 and 2023, three rounds of sampling were done per field. In each round of sampling bumblebee and floral transects were undertaken. The bumblebee transects involved recording all observed species, as well as their behaviours, and if they were foraging, what species of flower they were foraging on. The floral transects involved recording all floral species, and the number of floral units.

One of the delayed grazing field sites on the Mullet Peninsula

From this work it seems that these delayed grazing and delayed mowing measures have resulted in an increase in floral abundance and species richness which in turn is increasing the abundance and species richness of bumblebee species. This is especially valuable information because this area of Ireland is home to a number rare species such as *Bombus muscorum* (Moss Carder Bee), and the rarest bumblebee in Ireland, *Bombus distinguendus* (Great Yellow Bumblebee). From this work it could be suggested to policy makes that these measures are integrated at a larger scale, because they seem to be providing valuable resources to the bumblebee population.



Bombus distinguendus