

LEAF Guidance notes on pollinating insects and bees

These guidance notes set out the views of LEAF on the decline of pollinating insects and in particular the sudden and dramatic fall of honey bee populations and its potential threat to agriculture. They also provide some practical points on minimising impacts associated with farming activities, plus creating and maintaining wildlife habitats for pollinating insects.



Pollination, the transfer of pollen from one flower to another, is critical to fruit and seed production, and is regularly provided by insects and other animals on the hunt for nectar, pollen or other floral rewards. In doing so, pollinating insects perform a vital ecological and economic role. It is estimated that pollinating insects contribute £200 million to UK agriculture, pollinating key crops such as top and soft fruit, field, runner and broad beans, oilseed rape and linseed crops. Therefore pollinating insects and in particular honey bees are of paramount importance to meeting modern agriculture's peak pollination requirements. Graminae species e.g maize, cereals, rice etc have no insect pollinating requirement as they are wind pollinated.

Dramatic declines in managed honey bee populations (so-called Colony Collapse Disorder) both globally and in particular throughout North America have been reported over the last 3 years. Recently published evidence in the UK suggests that the number of insect pollinators have fallen. The British Bee Keepers Association (2009) reported almost a 20% decline by the end of the 2008/09 winter which followed a 33% fall in honey bee colonies by the end of the winter 2007/08. The potential impact of these declines on agriculture may yet to be realised.

The exact causes of honey bee and other pollinator population declines are likely to be numerous and may involve some or all of the following:-

- Parasitisation and disease – the increasing spread of treatment-resistant Varroa parasites exacerbated by fungal and viral diseases
- Bee management and the environment – colony management, weather, climate change etc.
- Habitat management – periods during the year when there is a need for nectar and pollen but is unavailable or in limited amounts to sustain populations, nest sites (rough undergrowth, willow trees etc)
- The inappropriate use of agrochemicals, specifically insecticides,

It must also be remembered that honey bees, although very important, are only one of numerous species that have a role in pollinating flowering plants. Insect species include bumble bees, solitary wasps, social wasps; hoverflies, flies, moths, butterflies, beetles and other species also provide this service to flowering plants.

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Population declines in both managed and wild insect pollinators have generated a significant amount of media and public interest. The British Beekeeper Association has taken a lead in proposing relevant and appropriate research into this area (<http://www.britishbee.org.uk/files/bbka-research-concepts.pdf>). This has resulted in a number of initiatives being recently set up to address honey bee health and the decline in all insect pollinators. The Healthy Bees Plan is a joint Welsh Assembly and Defra 10 year plan that seeks to reverse the decline in the honey bee population, protect and improve the health of honey bees in Wales and England. The Insect Pollinator Initiative, starting in 2010, is a £10 million research programme over five years and is designed to help identify the main threats to bees and other insect pollinators. Further details can be found at the websites listed below:-

www.defra.gov.uk/news/latest/2009/animal-0309.htm

www.bbsrc.ac.uk/funding/opportunities/2009/insect_pollinators_initiative.html

What can LEAF farmers do to promote pollinating insects and honey bee populations?

LEAF is committed to a viable agriculture which is environmentally and socially acceptable, and ensures the continuity of supply of wholesome affordable food, while conserving and enhancing the fabric and wildlife of the countryside for future generations.

LEAF acknowledges that agriculture, horticulture and land use/management practices can influence pollinator species, numbers and behaviour over wide areas. Honey bees for example can forage over an area of up to 16 square miles and will seek out and target the highest sugar content plants. This means that farmers and land owners can make an important contribution to maintaining and increasing populations. To provide nectar, pollen and nesting and hibernation sites for pollinating insects through as much of the year as possible, it is important to offer as wide range of diverse habitats and flowering sources.

- Outlined below are some of the possible suggestions that can help sustain populations of pollinating insects and honey bees.
- Investigate the possibility of hosting some hives in a appropriate area of your farm.
- Minimise the use of insecticide by promoting other beneficial predators such as lacewings, ladybirds and carabid beetles. Only use an insecticide when it is the only/essential means of control.
- If you use an insecticide, be sure to follow the stewardship guidelines associated with the product. Where possible, select one that presents the least hazard to bees and other non-target species and do not apply when

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crops are in full or partial flower e.g. oil seed rape and field beans. When applying avoid drift into any wildlife habitat. If you spray any product that presents a definitive hazard to bees, you must warn any local bee keepers several days prior to application. Many local bee associations will have a spray liaison officer. Further details on pesticides, IFM practices and spray liaison officers can be found at the website below:-

www.pesticides.gov.uk/uploadedfiles/Web_Assets/Pesticides_Forum/PesticidesandIFM.pdf

http://www.britishbee.org.uk/spray_liaison_officers.php

- Use legumes within grass leys e.g. white and red clover species.
- Sow flowering nectar rich plants such as phacelia on the headland areas of crops such as combinable beans or as a constituent of game cover crops. Sow areas of borage, this plant produces large amounts of nectar. These plants can be self seeding. Retain areas of willow and hazel as the catkins provide important early pollen (protein) in spring.
- Retain ivy on trees, this provides a late season nectar source.
- Sow an area (field headlands or field corners etc) of flowering plants into the farmed landscape; this will boost the availability of essential food sources for a range of nectar-feeding insects, including butterflies and bumblebees. Sow a mixture of at least four nectar-rich plants (e.g. red clover, alsike clover, bird's-foot-trefoil, sainfoin, musk mallow, common knapweed), with no single species making up more than 50 per cent of the mix by weight. To maximise flowering cut half the area in mid June so as to stimulate a second flowering into the autumn. Cut the whole area in the autumn, ideally cuttings should be removed. Avoid shaded, damp areas, preferably site in warm sunny locations, bumble bees prefer flowers with warm nectar, and obtain direct physical warmth in addition to chemical energy. The area will need to be re-established on a regular basis e.g. once every 3 years. There may also be a need control grass weeds.
- Creating tussocky grass margins, ideally with some flowering species such as legume species will provide nesting, foraging areas and hibernation sites for bumble bees.
- Create a floristically diverse grass margin managed so as to provide pollen and nectar sources throughout the majority of the year.
- Maintain hedgerows so as to provide nectar and pollen by not cutting all hedges annually.

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- Tolerate wasp's nests, as these insects not only perform important pollination roles but predate on insects such as aphids and flies for the earlier parts of the summer which are subsequently fed to the eggs in the nest.

Many of the above suggestions can be funded through Environmental Stewardship.

Other useful websites:

www.britishbee.org.uk/

[www.naturalengland.org.uk/ourwork/farming/funding/es/.](http://www.naturalengland.org.uk/ourwork/farming/funding/es/)

www.naturalengland.org.uk/about_us/news/2009/010609.aspx

www.plantpress.com/wildlife/o441-bufftailedbumblebee.php

I would like to acknowledge the help from Pat Lehain of Natural England and bee keeper in the production of this guidance.

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