MEDIA INFORMATION

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BROAD BEANS IN IRELAND DEPEND ON WILD BUMBLEBEES FOR BEST YIELDS – NEW RESEARCH PUBLISHED BY ROYAL ENTOMOLOGICAL SOCIETY FROM UNIVERSITY COLLEGE DUBLIN



IN BRIEF: Farmers of broad beans in Ireland would benefit from reduced pesticide use and the creation of habitats for wild bumblebee populations to secure the best possible marketable crop yields. While honeybee populations might aid pollination, seasonally introduced or nearby year-round, it is the wild bumblebee that accounts for around 70% of the marketable yield. This is according to new research published today (31 January 2023) in the Royal Entomological Society (RES) journal [*Agricultural and Forest Entomology*](https://resjournals.onlinelibrary.wiley.com/doi/10.1111/afe.12553)and conducted by Dr Katherine Burns and Dr Dara Anne Stanley from the School of Agriculture & Food Science at University College Dublin. It comes just days after it was suggested by researchers at University of Reading, that using broad bean flour in commercial bread production could offer significant environmental and nutritional benefits.

Though broad beans (also known as faba or fava beans) are capable of self-pollination, several studies have indicated that insect pollinators significantly increase yields[[1]](#footnote-2). This new research, the first to study identifiable insect pollination of broad beans in Ireland, finds that wild bumblebee pollination contributes most significantly to the crop’s production value. Insect pollination accounts for almost half of Ireland’s total broad bean market value, with the pollinator contribution estimated at almost €4,000,000 per year. Relative to other pollinators, wild bumblebees contribute to around 70% of the economic value of pollinated broad beans, driven mainly by the long-tongued species *Bombus hortorum*, which is best adapted to the long-corollae flowers of broad beans.

Speaking about the findings of the research, which was conducted in eight conventionally managed broad bean fields in Southeast Ireland in 2018 and 2019, Dr Katherine Burns said:

“With this research we wanted to quantify the contributions of insect pollinators to what is a hugely valuable crop here in Ireland to better understand how pollinators should be managed and protected. We found that wild bumblebees are overwhelmingly the most important pollinator of broad beans and that plants pollinated by wild bumblebees, which are less abundant but much more effective, accounted for most of the marketable bean yields.”

She continues: “As a result of the findings, we recommend that *Bombus hortorum* (commonly known as the garden bumblebee) populations are actively encouraged on farmland for both economic and environmental benefits. Legume-based wildflower mixes, particularly perennial mixes dominated by *Trifolium pratense* (red clover), should be introduced to field margins. They have a longer flowering season than the broad bean crops, encouraging the bumblebees to continue to use the farmland beyond the bean harvest. It might also help to provide appropriate nesting material along the edges of fields to encourage wild bumblebee populations for the longer-term.”

Broad bean is a widely grown insect-pollinated crop, with 5.4 million tonnes produced globally over 2.6 million hectares of land in 2019[[2]](#footnote-3). It is grown as protein-rich food for humans and livestock, and as a nitrogen-fixing break crop to improve soil conditions of arable land[[3]](#footnote-4). The total area of broad bean and pea crops grown in Ireland increased by almost 10% from 2016-2020[[4]](#footnote-5) and yearly Irish broad bean production was valued at approximately €12.9 million for the year 2020[[5]](#footnote-6). Though investigated elsewhere in Europe, no previous research has studied the identity of contributions of insect pollinators to broad bean production in Ireland, despite it being an economically important crop in the country. This new country-specific information may influence future management of the crop and its most valuable pollinators.

Commenting on the potential significance of this new research, Dr Adam Vanbergen of INRAE and the Royal Entomological Society, said:

“RES journals exist to bring much needed scientific research on insects to audiences that can benefit from it and ultimately make a difference to the future of insects on our planet. This research has great significance to broad bean farmers in Ireland and internationally, as they plan pollination management of farmland in the coming growing season. Pollinators like wild bumblebees face multiple threats including intensive land management and loss of floral resources. This might increase competition for pollen and nectar with managed honeybee populations introduced to farmland for pollination services, but these managed insects are not always the most efficient pollinators as shown by Burns et al.,. We support the recommendations of this research for farmers to prioritise the welfare of wild bumblebees, not only to improve the economic viability of their crops, but also to secure the long-term survival of a wild pollinator also important for wild plants. We can see that these findings may stimulate land management research and applications encouraging researchers and the agricultural sector (farmers, agri-business, and retailers) to work together to assure crop yields whilst conserving vital wild pollinator biodiversity.”

The full research paper can be found [here](https://resjournals.onlinelibrary.wiley.com/doi/10.1111/afe.12553). [*Agricultural and Forest Entomology*](https://resjournals.onlinelibrary.wiley.com/journal/14619563) provides a multi-disciplinary and international forum in which researchers can present their work on all aspects of agricultural and forest entomology to other researchers, policy makers and professionals. RES publishes seven scientific journals which are free for RES Members to view online.

RES exists to advance insect science through research and global scientific collaboration and to increase public understanding and appreciation of insects and the diverse and important roles they play in our global ecosystems. For further information about RES visit [www.royentsoc.org.](http://www.royentsoc.org/)

**ENDS**

For media enquiries about the Royal Entomological Society, high res images and to arrange interviews, please contact Jennie Spears or Clare Johnson at Bloom PR & Communications at hello@bloom-pr.co.uk

**NOTES FOR EDITORS**

**Entomology** is the study of insects. More than one million different species of insect have been described to date. They are the most abundant group of animals in the world and live in almost every habitat. Insects have lived on earth for more than 350 million years. Entomology is crucial to our understanding of human disease, agriculture, evolution, ecology, and biodiversity.

**Entomologists** are people who study insects, as a career, as amateurs or both.

**About Royal Entomological Society**

The Royal Entomological Society (RES) is devoted to the understanding and development of insect science. It is one of the world’s leading authorities on insect conservation and control, supporting international collaboration, research and the publication of insect science discoveries and understanding. RES aims to show every person how remarkable and valuable insects are and wants to enrich the world with insect science. It funds, organises, and supports events and activities for anyone that wants to learn more about insects and entomology through its outreach and education programmes.

The Royal Entomological Society is staging a show garden at RHS Chelsea Flower Show 2023, designed by Tom Massey. It will be the first time the organisation has had a garden at the world-famous event, and has been made possible thanks to the generous support of [Project Giving Back](https://www.givingback.org.uk/our-gardens/the-royal-entomological-society-garden).

Find out more and become a member at [www.royentsoc.org](http://www.royentsoc.org)

1. e.g. Kendall & Smith 1975; Somerville 199; Aouar-Sadli, Louadi & Doumandji 2008; Cunningham & Le Feuvre 2013; Marzinzig *et al.* 2018. [↑](#footnote-ref-2)
2. UN Food & Agriculture Organisation 2020 [↑](#footnote-ref-3)
3. Jensen, Peoples & Hauggaard-Nielsen 2010; Stoddard 2017a [↑](#footnote-ref-4)
4. 12,500 ha to 13,700 ha; Central Statistics Office 2019; Central Statistics Office 2021 [↑](#footnote-ref-5)
5. Collins & Phelan 2020; Central Statistics Office 2021 [↑](#footnote-ref-6)