



LEAF Global Impacts Report 2021

Appendix and Methods

About the Appendix

This document details the methods and data sources for the Global Impacts Report 2021.

Where external data sources are cited, data can be independently verified by accessing those sources.

All LEAF Marque inspections are carried out by LEAF Marque approved, independent Certification Bodies. These Certification Bodies are ISO 17065 accredited. They are responsible for accurately recording a business' conformance with the control points set out in the LEAF Marque Standard as well as their certification decision in the LEAF Marque data system (therefore providing the LEAF Marque certificate status for a business).

The LEAF Marque Standard is available in several languages which are available on the [LEAF website](http://www.leafuk.org/leaf/farmers/LEAFmarquecertification/standard.eb) (<http://www.leafuk.org/leaf/farmers/LEAFmarquecertification/standard.eb>). The English version of the Standard is the definitive version and therefore any issues of interpretation from other translations need to be referred to the English version.

Where data has been provided by self-assessment, this has been sense-checked and excluded if appropriate, where possible. It should be noted that it is a requirement of the LEAF Marque Standard v15.0 for a LEAF Marque certified business to complete the LEAF Sustainable Farming Review and to provide correct and up to date 'farm details and production information'.

When citing elements of this report or using any of the data please acknowledge LEAF as the source and provide a download date and website link; or cite as: **LEAF Global Impact Report 2021**.

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For technical issues related to the data please contact: Jennifer.Clark@leafuk.org



Sources of Data

The key data used in the LEAF's Global Impacts Report 2021 includes information from the LEAF Audit, the LEAF Sustainable Farming Review, and Independent Evaluations.

LEAF Sustainable Farming Review

The LEAF Sustainable Farming Review is an online self-assessment resource for LEAF members to support their implementation of Integrated Farm Management. The LEAF Sustainable Farming Review has an annual scope. The LEAF Sustainable Farming Review replaced the LEAF Audit in December 2014. The completion of the LEAF Sustainable Farming Review is a requirement of the LEAF Marque Standard (v12.0 onwards) and this completion is independently verified. However, the specific responses within the LEAF Sustainable Farming Review are self-assessed and not verified through third party inspection.

The LEAF Sustainable Farming Review is composed of around 90 principles based around the nine sections of Integrated Farm Management along with further guidance information and links to support the user. Each question must be answered in one of the following five ways: Fully Achieved; Considerable Progress; Some Progress; Not Started; or Not Applicable. Additionally, the user indicates which of the supporting practices, which are associated with the principle, they carry out. From the LEAF Sustainable Farming Review 2016 scope onwards, questions that required businesses to provide numerical detail on some areas of Integrated Farm Management were introduced. The answers to all questions are not pre-populated.

Independent Evaluations

Data from the following independent evaluations were included:

- Rees, W. Tremma, O. Manning, L (2019). Sustainability cues on packaging: The influence of recognition on purchasing behaviour. *Journal of Cleaner Production*. 235. 841-853.
- Good Housekeeping. (2021). The Good Housekeeping Health Report. *Good Housekeeping*. February 2021. 76-79
- FAO (2017). The future of food and agriculture. Trends and Challenges. *Food and Agriculture Organisation of the United Nations*. Rome.

Full details of evaluators, methodology, key findings, conclusions, limitations and recommendation can be found in the full report.

Methods for the Global Impacts Reports 2021

Method A – Determining a LEAF Marque certified business

A LEAF Marque certified business is defined as a business that is holding a LEAF charity membership number, holding a LEAF Marque membership status of 'Current' and holding a LEAF Marque certificate status of 'FULL' as at the 31st December for the year corresponding to the year of the data. Businesses that held a LEAF Marque membership status of 'Grace' were also included as this usually refers to



businesses who hold a valid certificate but where payment to the certification body is outstanding. Businesses with a LEAF Marque membership status of 'Closed and 'Transferred Out' and businesses with LEAF Membership Type of 'Non-paying agent' were sorted manually to confirm possible exclusions (e.g. duplications or expired certificates). Test companies and businesses with LEAF Marque membership status of 'Applied' and 'Registered' were excluded.

This definition of a LEAF Marque certified business is also used to determine further statistics and maps for the Global Impacts Report 2021.

Method B – Determining crop area and number of livestock units for LEAF Marque certified businesses

Determining the crop area and number of livestock units for LEAF Marque certified businesses required the number of LEAF Marque certified businesses (see **Method A – Determining a LEAF Marque certified business**) in a certain year alongside aspects of Production Information. Production Information, which includes farm details (including country), crop class, crop enterprise and areas of crop, is self-assessed by all LEAF members however it is a requirement of LEAF Marque certification for businesses to provide correct and up to date production information. This is annually confirmed during their completion of the LEAF Sustainable Farming Review and verified during the LEAF Marque inspection process. Alterations were made to data which was obviously questionable including translating information into English as required and checking excessively large figures and altering to include a more realistic figure based on farm size. Due to updates to the product list at the beginning of 2020, there was production data missing for farmers who had filled in the information before the changes were made. In these circumstances, data from 2019 was used instead.

This method is used to create hectares of crop on LEAF Marque businesses around the globe and in certain countries (pages 8 & 9), the number of countries with LEAF Marque certified businesses (pages 8 & 9), the area of certain crop classes (pages 7, 8 & 9), number and area of crop and livestock enterprises (pages 8, 9 & 25) in the Global Impacts Report 2021.

For more information about determining statistics relating to crop area and number of livestock units for LEAF Marque certified businesses please contact LEAF.

Mapping Methods

In order to show where LEAF Marque certified businesses operate around the world, all LEAF Marque certified businesses were mapped (see pages 8 & 9 in the Global Impacts Report 2021). A vector file map was downloaded from <https://freevectormaps.com/world-maps/WRLD-EPS-01-0006> and Adobe Photoshop was used to colour in the areas that corresponded to countries of LEAF Marque certified businesses.

Method C – Determining UK LEAF Marque crop area and livestock population as a proportion of all UK crop area and livestock population

To present the proportion of UK LEAF Marque production compared to all UK production, crop area and number of livestock units for UK LEAF Marque certified businesses only (see **Method B – Determining**



crop area and number of livestock units for LEAF Marque certified businesses) was compared to Defra statistics. At the time analysis was performed the most up-to-date information available from Defra statistics were:

- Defra Horticulture statistics as at July 2020 (containing 2019 data)
- Defra UK Livestock Population statistics as at March 2020 (containing 2019 data)
- Defra Farming Statistics 2020 Report (containing 2019 data)

It should be noted that all Horticulture or fruit & vegetable data here excludes potatoes. Data for LEAF Marque certified businesses also excludes peas as there is not enough certainty in the difference between dried, processed and fresh peas.

The proportion of UK LEAF Marque production out of all UK production can be seen for fruit and vegetables on page 7 of the Global Impacts Report 2021. Proportions of UK cereal, potato and livestock production have not been presented and can instead be accessed on request from LEAF.

Method D – Determining Impact Indicators for LEAF Marque certified businesses

Aligned with the LEAF Marque Intended Impacts, the Impact Indicators presented in Global Impacts Report 2021 demonstrate how LEAF Marque certified businesses are increasing the implementation of more environmentally sustainable farming practices through Integrated Farm Management (IFM).

Data provided in relation to the indicators is, in part, taken from the answers LEAF Marque businesses have provided in the LEAF Sustainable Farming Review or LEAF Audit alongside Production Information (see **Method B – Determining crop area and number of livestock units for LEAF Marque certified businesses**). It is a requirement of LEAF Marque certification, from 2015 (LEAF Marque Standard v12.0 onwards), for businesses to complete the LEAF Sustainable Farming Review. While this is a self-assessment tool, answers are sense-checked and reviewed for appropriateness, where possible. The questions and practices used to develop the Impact Indicators are kept consistent where possible, however best practice and the LEAF Marque Standard has evolved over time so some changes may have been made. For more information on the individual questions and/or practices used please contact LEAF.

Impact Indicators for 2016 to 2020

Impact Indicators containing 2016, 2017, 2018, 2019, and 2020 figures were established using a combination of LEAF Marque certified business' production information and the answers provided in the LEAF Sustainable Farming Review to questions, practices, and metrics.

Data shows the total crop area (not farm business area) or number of LEAF Marque certified businesses (**Method B - Determining crop area and number of livestock units for LEAF Marque certified businesses**) that answered "Fully Achieved" to corresponding questions 2016 and/or 2017 and/or 2018 and/or 2019 and/or 2020 for statistics presented in Global Impacts Report 2021 on:

- Number of LEAF Marque certified businesses monitoring energy consumption (page 18)



It should be noted that LEAF members who responded “Considerable Progress” or “Some Progress” may still meet the criteria required within the LEAF Marque Standard; however, this is not represented within this report.

Data shows the total crop area (not farm business area) or number of LEAF Marque certified businesses (**Method B - Determining crop area and number of livestock units for LEAF Marque certified businesses**) that ticked the corresponding practice(s) in 2016 and/or 2017 and /or 2018 and/or 2019 and/or 2020 for statistics presented in Global Impacts Report 2021 on:

- Hectares of crop on LEAF Marque certified businesses where steps are taken to minimise damage to beneficial species and non-target organisms (page 25)
- Percentage of LEAF Marque certified businesses with livestock who regularly monitor animal welfare indicators to assess performance (page 27)
- Percentage of LEAF Marque certified businesses have one or more types of renewable energy generation on-farm (page 18 & 27)
- Percentage of LEAF Marque certified businesses with a reservoir who manage their reservoir for water quality, safety and wildlife (page 29)
- Percentage of LEAF Marque certified businesses working with others in the catchment to improve water quality and water management (page 36)

The Integrated Pest Management Best Practice metric (presented on page 27 of Global Impacts Report 2020) was designed in 2017. LEAF defines the 8 aspects of IPM Best Practice as those businesses that, according to the LEAF Sustainable Farming Review 2021:

- Consider themselves to be Fully Achieving **or** making Considerable Progress towards **all** the following statements:
 - “We have a Crop Health and Protection Policy”
 - “We assess crop health regularly”
 - “We use a range of crop protection measures”
- **AND** consider themselves to be meeting the practice: “Carry out a regular programme of crop walking”
- **AND IF** they considered the practice “We do not use PPPs” to be false for their business (i.e. the business uses pesticides) then they must also meet all the following criteria:
 - Fully Achieved or making Considerable Progress towards “We base PPP application based on evidence of need”
 - Consider themselves to “Include PPP strategy such as product choice, dose rate and effect on beneficial species”
 - Consider themselves to be doing at least 4 of the following practices:
 - “Include a resistance management strategy”
 - “Review and update the Policy annually”
 - “Map areas where heavy infestations occur regularly and patch spray”
 - “Use biological control measures”
 - “Use economic thresholds for spraying decisions”



- “Use selective rather than broad spectrum plant protection products where possible and practical”

The Waste Management Best Practice metric (presented on page 27 of Global Impacts Report 2021) was designed in 2016. LEAF defines Waste Management Best Practice as those businesses that, according to the LEAF Sustainable Farming Review of the corresponding year:

- Consider themselves to be “Fully Achieving” or making “Considerable Progress” towards **all** the following statements:
 - “We reduce possible wastes”
 - “We reuse our by-products effectively”
 - “We recycle or carefully dispose of wastes”
- **AND** consider themselves to be doing **at least 4** of the following practices:
 - “Comply with waste disposal legislative requirements”
 - “Plan purchase of goods in detail to reduce wastage”
 - “Consider whether suppliers will accept return of packaging and containers for recycling/disposal”
 - “Consider ease of recycling/disposal of packaging when comparing goods for purchase”
 - “Recycle, or dispose of, all wastes which cannot be used in our business”
 - “Ensure that wastes are disposed of without risk to water quality and the wider environment”
- Those businesses that considered “We reuse our by-products effectively” to be “N/A” to their business but they met all other requirements were also included.

The Antibiotic Best Practice Metric (presented on page 27 of Global Impacts Report 2021) was designed in 2020. LEAF defines Antibiotic Best Practice as those business that, according to the LEAF Sustainable Farming Review of the corresponding year:

- Consider themselves to be Fully Achieving or making Considerable Progress towards **all** the following statements:
 - “We have a Livestock Health Plan”
 - “We have high standards of animal welfare”
 - “We carefully manage veterinary medicine use”
- **AND** consider themselves to be meeting the practices “We treat sick and injured animals promptly correctly”
- **AND** “We strictly observe withdrawal periods for the protection of human and animal health”
- **AND IF** they consider themselves to be doing **at least 1** of the following practices related to biosecurity:
 - “Use LEAF’s Simply Sustainable Biosecurity to help develop our strategy for biosecurity”
 - “Observe strict biosecurity for movements on and off farm”
 - “Test stock at appropriate intervals to ensure there are no disease carriers”
- **AND IF** they consider themselves to be doing **at least 4** of the following practices:
 - “Consider appropriate levels of preventative treatment”
 - “Consider keeping a record of animals that are antibiotic-free”



- “Only use veterinary medicines as part of Livestock Health Plan for the control or treatment of disease”
- “Record all details for all treatments”
- “Take steps to prevent veterinary medicine resistance build up”
- “Use narrow spectrum antibiotics where possible”

The creation of new questions in the LEAF Sustainable Farming Review that captured quantitative data was only available from 2016 onwards. Data was calculated from LEAF Marque certified businesses who provided data for the Impact Indicators related to the following questions:

- Staff on LEAF Marque certified businesses who have appropriate awareness of IFM (page 27)
- LEAF Marque certified businesses recorded Soil Organic Matter % (page 18 & 27)
- LEAF Marque certified businesses used a Carbon Footprint Tool (page 18)
- Average habitat area on LEAF Marque certified businesses (page 26)
- Businesses that engaged with a wider audience through social media, websites and written media (page 27 & 34)
- Business that engaged with the media, television and radio (page 34)
- The number of on and off farm events to a variety of audiences (page 34)

It should be noted that Habitat Area (page 26 and 29) was calculated as a percentage of “Total Farmed Area”, with those businesses that resulted in habitat area <0.0001% or >100% were excluded from the data. Where habitat area was >75% for business, the Total Farm Area was used instead (where provided) as it was felt that the business’ definition of Total Farm Area or Total Farmed Area was perhaps misunderstood and therefore the full information provided by the business was utilised to more accurately estimate habitat area. In 2017, small fruit farms with number of trees >50,000 were removed from the data set as it was assumed these were including trees used for cropping. The guidance has subsequently been improved to prevent this happening in future scopes.

Other Methodologies

LEAF Sustainable Farming Review Users

All LEAF members (includes all LEAF Membership Types), excluding test sites, who had completed the LEAF Sustainable Farming Review² 2020 were presented as a total number of ‘Users of the LEAF Sustainable Farming Review’. Completion was considered to be all companies where the LEAF Sustainable Farming Review workflow state is ‘audit approved’. The LEAF Sustainable Farming Review can be completed and edited at any time during the year, with final responses being used in all data analysis.

For more statistics relating to the LEAF Sustainable Farming Review please contact LEAF.



Other External Data Sources

“The world’s population is expected to increase by 2 billion in the next 30 years, rising to 9.7 billion in 2050” quote on page 22 of the Global Impacts Report 2021 was sourced from FAO (2017). The future of food and agriculture. Trends and Challenges. *Food and Agriculture Organisation of the United Nations*. Rome.

30,31

Figures related to The Jordans Farm Partnership in the case study on pages 31 and 31 were confirmed by the primary contacts for those businesses.

Supplementary Tables and Figures

Please see contact LEAF if you require more supplementary tables and figures.

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