

# Monitoring and potential establishment of the Brown Marmorated Stink Bug (BMSB) *Halyomorpha halys* in Scotland

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## Introduction

The brown marmorated stink bug *Halyomorpha halys* (BMSB), native to East Asia, is an invasive species of the shield bug family that was first detected in North America in 1996 and in Europe in 2004. It can be introduced either as a 'hitchhiker' on packing material or via plant imports.

The BMSB attacks a wide range of hosts including *Rubus idaeus* (raspberry) and *Prunus avium* (sweet cherry). The potential economic impact in Scotland is not yet fully understood, however conditions in Scotland may be suitable for establishment of the pest.

## Acknowledgements

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## Objectives

- Monitor for the pest in Scotland focusing on 'At risk' sites (fruit growing area) and 'risk points' sites (proximity to airports and distribution centres, with known host plants on site).
- Develop robust identification methods (classical and molecular) for diagnostic services at SASA and Hutton.
- Model the potential distribution of BMSB under current and future climates.

## Project outcomes

- No BMSB were found at any of the 9 sites monitored.
- DNA barcodes of local stink/shield bug species found at the monitoring sites and of reference BMSB specimens were created and now form a barcode database for rapid identification of any suspected BMSB specimens.
- Under current and projected (2030) outdoor temperatures there are insufficient degree days (DD) for BMSB to complete one generation in Scotland (Fig. 1). However, there are areas in England where BMSB could currently complete an outdoor generation, with a wider area potentially suitable in 2030 (Fig. 1).

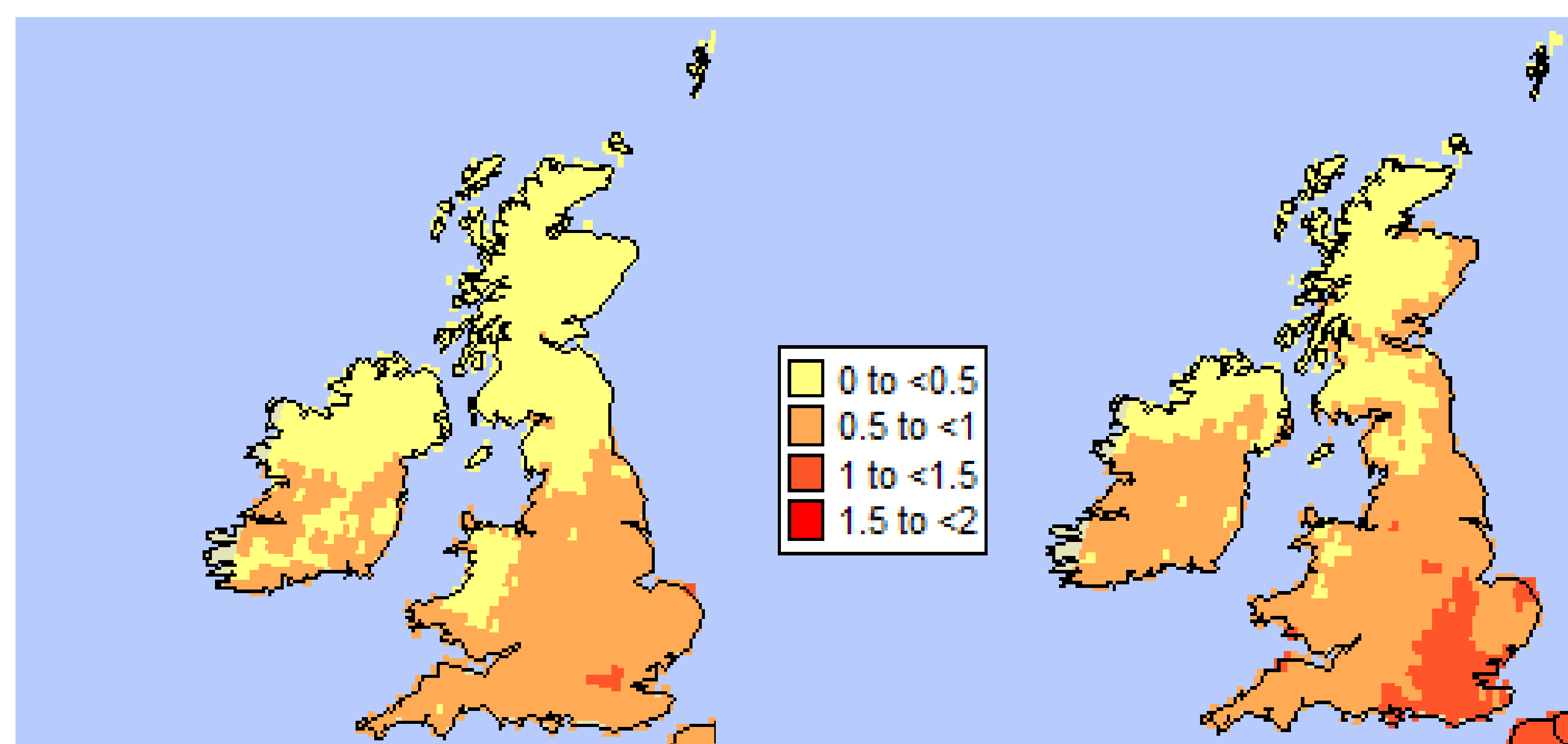
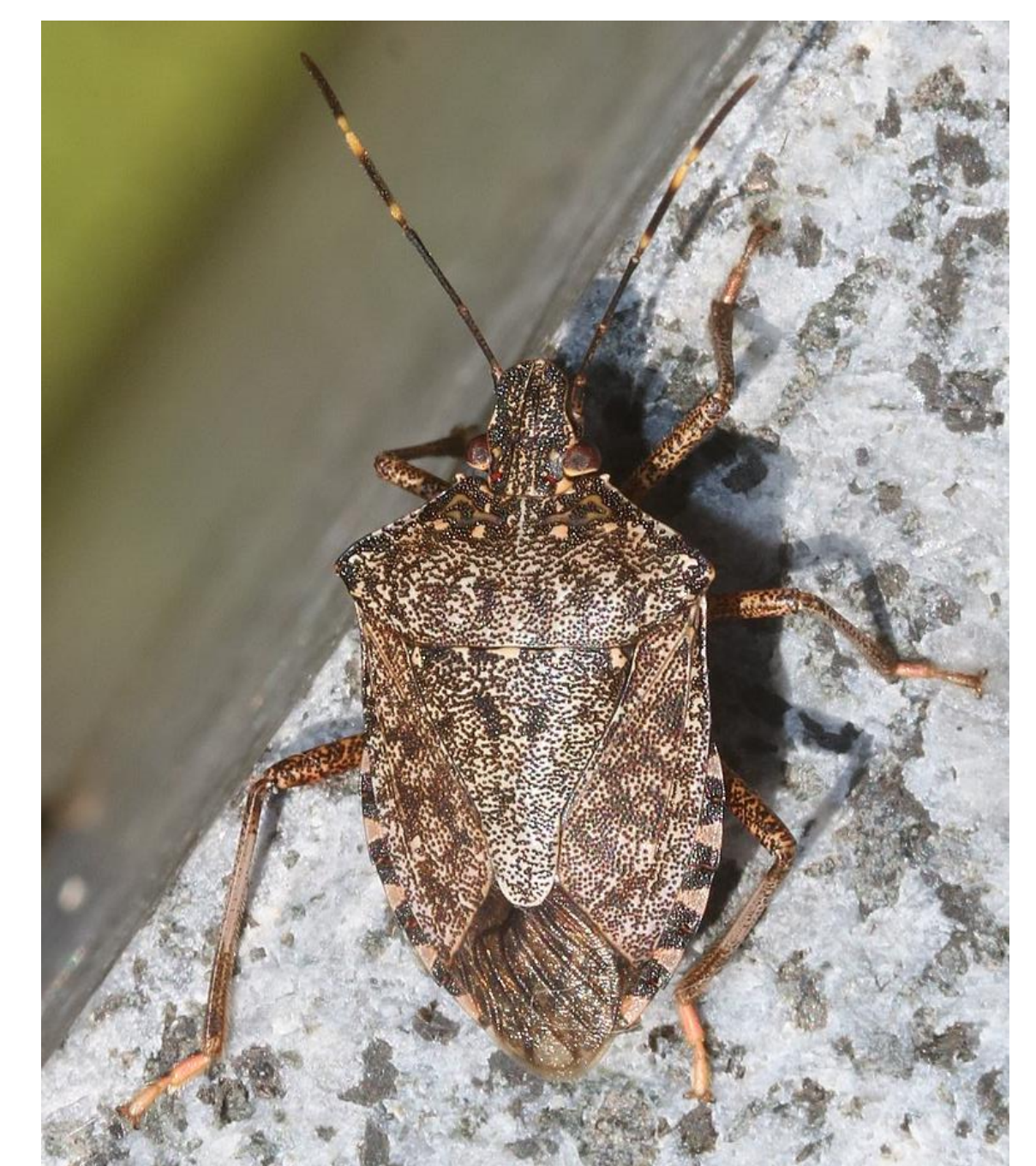


Fig. 1. Potential No. of outdoor generations a year of BMSB under the current (left) and 2030 (right) climate

- There is potential for BMSB to complete a generation within heated or unheated tunnels if introduced into a tunnel early in the season.
- At the James Hutton monitoring site, the cumulated degree days (DD) for BMSB development recorded within a covered tunnel between 1<sup>st</sup> Aug and 31<sup>st</sup> Oct was 237 DD, compared to 106 DD for the outdoor temperature. BMSB requires 595 DD above the developmental threshold temperature of 12°C to complete a generation.
- Temperatures within tunnels could allow the completion of a BMSB generation if they were to get into tunnels early enough in the season

## Key messages

- No BMSB were found at any of the Scottish sites monitored using pheromone traps or visual searching.
- A DNA barcode database of Scottish stink/shield bug species and BMSB has been established to enable rapid identification of any suspected BMSB found in Scotland.
- The Scottish outdoor climate is unsuitable for establishment of a breeding colony of BMSB under the current and 2030 projected climate.
- Temperatures within tunnels would potentially allow the establishment of a breeding colony of BMSB if they were introduced early enough in the season.
- Further modelling of BMSB and tunnel temperatures is currently underway.