





Research Centre Agroecology, Water and Resilience





Check a Sweet Chestnut: case study for engaging the general public for tree health citizen science

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Background

Trees in Europe are under increasing pressure from new and emerging forest pests and diseases¹. The limited resources of plant health authorities to prevent outbreaks and minimise the damage caused by new and emerging threats could be made to go further by engaging the general public as a means of increasing the number of 'eyes on the ground'. Equipped with smartphone technology, members of the public are able to capture images and location data and contribute as citizen scientists to help scientists and plant health authorities track the emergence of new tree health threats. As part of the EU Horizon 2020 Project HOMED², UK partners from the RHS & Coventry University designed a case study informed by the principles of citizen

science³ to engage members of the general public to use smartphone applications to monitor tree health problems. The aim was to explore best practice so as to inform the design of future projects. This was explored for the example of the Oriental chestnut gall wasp, an emerging pests affecting sweet chestnut trees in the UK since it first detection here in 2015.

Rationale for the project design

We liaised with plant health authorities and existing citizen science practitioners to select a suitable tree (sweet chestnut, *Castanea sativa*) and pest (Oriental chestnut gall wasp, OCGW, Dryocosmus kuriphilus) to survey with existing online reporting tools (Treezilla and Tree Alert). Both organisms are easily identifiable from photographs and OCGW records and observed absences are valuable to plant health authorities and forest health scientists.

Recruiting and training citizen scientists

We recruited participants through radio segments, in-print articles, in-person events and presentations and on social media (Twitter). We created a flyer that was stocked in RHS gardens and Wildlife Trust visitor centres. Interested parties were directed to the project website⁴ which featured participation instructions, training on tree and pest identification and biosecurity and a demonstration video.



Fig. 1 (top left): Developing gall of the Oriental chestnut gall wasp (Dryocosmus kuriphilus) Fig. 2 (below left): Exited gall remaining on a sweet chestnut branch over winter Fig. 3 (below right): Locations of those registered. Stars show OCGW reports, yellow for new areas

Check

a Sweet

Chestnut



Participating in the project

- Training via the materials on the project website
- Registering with Check a Sweet Chestnut
- Recording sweet chestnut in Treezilla, including 3. measuring DBH, noting how healthy it appears and inspecting for OCGW galls (Fig. 1, 2 & 5)
- If OCGW was found, reporting via Tree Alert 4.
- Evaluating the project 5.





Successes

120 participants from all over the UK from 42 counties spread across all four nations (Fig. 3). Tree Alert records for OCGW in 2021 occurred in Surrey, London, Hertfordshire, Kent, West Sussex – reflecting the known range (orange stars, Fig. 3) – plus Berkshire, South Cambridgeshire and Norfolk where the pest was not previously known to occur (yellow stars, Fig 3).

By June 2022, 250 sweet chestnut trees had been recorded on Treezilla.

Outlook for designing future project design

Fig 4 (left): Modal traits of participants (prelim. data) Fig 5 (right): Participant checking a sweet chestnut

- Mapping all trees on Treezilla meant participants could contribute whether or not OCGW was found and absence data is important for spread modelling
- Most participants did not find OCGW or use Tree Alert
- Data entry can be made even easier and more flexible
- Mobile data and GPS signal often impeded in-the-field data entry
- There is value in improving the ease of data sharing between organisations
- Widespread recruitment is possible without national media coverage, but in smaller numbers and in a way that may exclude certain demographics (Fig. 4)

1: Jactel, H., et al., 2020. Neobiota 58:107-127 doi:10.3897/neobiota.58.54389 2: This study is conducted by HOMED project - Holistic Management of Emerging Forest Pests and Diseases – an EU Horizon 2020 research and innovation programme under grant agreement No 771271. 3: Robinson, L.D., et al., 2018. UCL Press 1-23 doi:10.14324/111.9781787352339



