Royal Society of Biology response to the Defra consultation on a Plant Biosecurity Strategy for Great Britain

November 2021

The Royal Society of Biology (RSB) is a single unified voice, representing a diverse membership of individuals, learned societies and other organisations. Our world-leading biosciences sector contributes strongly to the economy, and to society. We are committed to ensuring that we provide Government and other policymakers, including funders of biological education and research, with a distinct point of access to authoritative, independent, and evidence-based opinion, representative of the widest range of bioscience disciplines.

The RSB welcomes Defra's consultation on the new plant biosecurity strategy for Great Britain. We are pleased to provide comments informed by our membership of individuals and organisations with expert interests across the biosciences. Our Member Organisations are listed in Appendix 1.

Summary
Pests and pathogens pose serious threats to plant health in the UK and around the world, jeopardising food security, biodiversity and the natural environment. Recent decades have seen an increase in threats to UK plant biosecurity, due to increases in international trade and travel, and climate change. Proactive measures are needed to protect the UK's plants from established and emerging threats. The RSB is pleased that Defra, with partner organisations, is consulting on how to address and manage the risks.

Everybody has a role to play in protecting plant health, through being aware that the environment and our food supply are susceptible to pests and disease. Generating this awareness will involve many organisations and sectors, but education – at all levels – presents particular opportunities to convey an understanding of plant health and the value and importance of plants. Alongside teaching and curriculum content, awareness of the career opportunities in plant health must grow to build the necessary capacity.

Our response to this consultation highlights the need for more trained professionals to work in plant health, as well as some of the research needs, opportunities to speed up the detection of new plant health threats and recommendations to expand the UK's biosecurity capability.

About the RSB response
All questions are shown below as they appear on the consultation document. The RSB response addresses only those questions most relevant to our membership, shown in **bold text**, with our answers in blue text. Questions to which we have not responded are shown in grey text.

Questions 1-6 ask for details about the respondent.

7. How can Government, industry and the public work more effectively together to protect Great Britain's plants? (Please explain in no more than 250 words)

7.1 Increase public awareness of the value and importance of plants, and the susceptibility of the food supply and environment to pests and diseases. Schools, regulators, media, retailers and consumers have roles. Publicity campaigns could advance messages.

7.2 Increase the capacity and professionalization of the plant health workforce to rectify the lack of experienced professionals. Education is critical, and RSB's new 5-19 biology curriculum framework promotes greater plant awareness (https://www.rsb.org.uk/policy/education-policy/school-policy/curriculum). Appropriate training in FE and HE sectors is needed, UK-wide. The Government could promote training and education to address skills deficits, e.g. in horticulture. Defined career structures are needed, providing positions with appropriate remuneration and job stability. The RSB-Defra collaboration supports the plant health workforce through the Plant Health Professional Register, Plant Health Undergraduate Studentships, and networking opportunities across sectors and career stages.

7.3 Qualified, well-resourced professional biosecurity specialists, with regularly updated skills, are needed to provide a first response to outbreaks, diagnose and advise on control of pests and diseases, and help to identify research priorities.

7.4 Research is needed on relevant plant health threats, non-chemical alternatives for plant protection, producing resistant germplasm through plant breeding and genetic technologies, and the development of new diagnostic devices for passive monitoring by non-experts. Further research into soil quality and the soil microbiome is required.

7.5 Lack of genetic diversity increases vulnerability to pathogens. Genetic diversity must be preserved in collections, and through conservation to protect crop wild relatives. Financial pressure that leads to consolidation of suppliers in horticulture will reduce the genetic base and increase vulnerability.

8. Which of the following issues do you think poses the greatest risk to plant health? Please rank the following options in order of risk, where 1 is the highest risk to plant health and 6 is the lowest risk to plant health.

- Trade imports [1]
- Personal imports e.g. in passenger baggage [2]
- Climate change [3]
- Poor awareness of plant pests and diseases [5]
- Low levels of knowledge about good biosecurity practice [6]
- Lack of incentive for organisations and individuals to adopt biosecure behaviours and practices [4]

9. Where do you/your business currently get information on plant pests and diseases from? Please select all that apply.

- Search on the internet myself
- Rely on expert advice e.g. from an agronomist or a plant health inspector
- Information from organisations in the plant health sector e.g. email or newsletter
- from a trade body, levy board, professional organisation, charity, NGO etc
- Industry media e.g. specialist news online
- General media e.g. national or regional newspapers and online news
- Plant Health Information Portal35
- Government websites

- None of the above
- I don't seek information on plant pests and pathogens

10. What information on plant health and biosecurity do you/your business need from government? Please select all that apply.
- Information on emerging pests worldwide
- Information on emerging pests in the UK
- Information on action being taken against specific pests
- Background information on new legislation and why it has been introduced
- Updated guidance on the requirements for imports and exports
- Information on good biosecurity practice
- Information on how to report on notifiable pest and pathogens
- Not applicable
- Other- please explain in no more than 100 words what you would find useful

11. Do you/your business currently feel you have the right information to select suppliers that will supply biosecure stock?
• Yes
a. If you answered yes, what information is most helpful? Please explain in no more than 100 words
• No
b. If you answered no, what information would you welcome that is currently missing? Please explain in no more than 100 words
• Not applicable

12. Biosecurity is a shared responsibility and sharing information is key to success. Would you be willing to engage with others to share information to better protect UK biosecurity? Please select all that apply.
- I would be willing to pass on information to other organisations
- I would be willing to signpost information to others when I become aware of it
- I would be willing to participate in a network of individuals/organisations who share information

13. Do you feel you know enough about plant pests and diseases to be able to trade responsibly and in line with regulation?
• Yes
a. If yes, what information has proved most helpful. Please explain in no more than 100 words
• No
b. If no, what information do you need that is currently missing. Please explain in no more than 100 words
• Not applicable

14. Before you import plants or plant products by post, or in your personal luggage into Great Britain, where would you look for information on import requirements and restrictions? Please select all that apply.
- Gov.uk
- Plant Health Information Portal
- Courier company websites
- Transport websites (e.g. airports/ train stations)
- At transport locations (e.g. airports/ train stations)
- None of the above. I wouldn't look for this information
- Other – please explain in no more than 50 words

15. How important is biosecurity as a consideration when you are deciding whether to bring personal imports of plants and plant products into Great Britain? Please select one option.

- Very important
- Quite important
- Not very important
- Not important
- Not a consideration

16. Do you support the intention to encourage society to play a more active role in helping to protect plant health?

- **Yes**
  - **a. If yes, what do you or your organisation see as the main potential benefit? Please explain in no more than 100 words**
- **No**
  - **b. If no, what do you or your organisation see as the main potential drawbacks? Please explain in no more than 100 words**
- **I don't know**

Yes.

16.1 Greater awareness enables more informed consumer choices and increases public vigilance for threats. Opportunities to raise awareness include: involvement in citizen science projects, general media coverage (beyond speciality press), and online/social media campaigns, e.g. regarding private online trade in houseplants.

16.2 Particular communities may first notice the emergence of a new threat; their engagement could be especially beneficial. For example, professional horticulture growers and importers, farmers, rangers, conservation volunteers, ramblers, gardeners and community groups.

16.3 An efficient, effective supporting technological and professional infrastructure is needed to realise the benefits of involving a wider population in surveillance, e.g. through advising citizen science.

17. In order to raise awareness of the risks to plant health and encourage people to act responsibly, what do you think is the most effective message for use in a promotional campaign? Please rank in order of preference, where 1 would have the most impact and 3 would have the least impact.

- Promotional campaigns to raise awareness of the values of healthy plants [1]
- Promotional campaigns to raise awareness of the threats to plant health [3]
- Promotional campaigns to make people aware of potentially risky behaviours [2]

18. When would messages on how best to protect plant health have the most impact? Please select one option.

- When people are buying plants
- When people are leaving and re-entering the UK for foreign travel
- When people are visiting woodlands and the wider countryside
- When faced with a pest and diseases outbreak on their land or local area
- Other – please explain in no more than 50 words

19. Which learning resources would have the biggest impact in terms of building your own or your organisation's knowledge of plant biosecurity? Please rank in order of preference, where 1 would have the most impact and 4 would have the least impact

- Informal training including webinars covering biosecurity and plant pathology
- Practical training
- Formal education or qualification
- Face-to-face time with Plant Health Inspectors.

20. How can we further enhance the positive contributions of citizen science to plant health? Please rank in order of preference where 1 is the most preferred option and 4 is the least preferred option.

- Encourage more organisations to get involved with projects like Observatree [4]
- Facilitate broader participation by the general public [1]
- Improve accessibility to the data from citizen science projects [3]
- Use the data to support action on the ground [2]

21. Do you already belong to an assurance scheme that requires standards of those wanting to join? If so, which one(s)? Please select all that apply.

- Plant Healthy Certification scheme
- Ornamental Horticulture Assurance scheme (OHAS)
- UK and Ireland Sourced and Grown scheme (UKISG)
- None of the above
- Other, please specify in no more than 25 words

22. If you answered yes to Q21, what benefits has scheme membership brought to your business or organisation? Please explain in no more than 50 words.

23. If you are a supplier, what benefits do assurance schemes need to offer you/your business for you to join or maintain your membership? Please select in order of importance, where 1 is the most important benefit, and 5 is the least important benefit.

- Market access e.g. ability to meet the biosecurity requirements of customers who
- are demanding stock from accredited businesses
- Improved brand reputation
- Access to exclusive member benefits e.g. insurance, record keeping software, stock
- management software, training
- Ability to demonstrate commitment to environment sustainability
- Ability to be able to charge a premium

24. What are the barriers to the growth of domestic production? Please rank the following options in order of importance, where 1 is the most important barrier, and 9 is the least important barrier?

- Market access issues for domestic produce e.g. identification of new markets, lack
- of consumer awareness and demand for domestic produce, logistical issues
- Lack of information for suppliers to be able to predict future demand e.g. lack of
- long-term supply contracts driven by uncertainties of grant schemes and
- infrastructure projects
- Attracting new entrants to the sector.
- Consumer perceptions e.g. price, range, quality
- Innovation and technology availability
- Funding and resources available to implement new technology and innovation e.g.

- financing innovation or financing new product varieties
- Difficulty in sourcing permanent and seasonal labour
- Production overheads
- Competition from overseas suppliers

25. Of the options below, which would be the most effective ways of addressing the main barriers to domestic production that you have identified. Please rank the following options in order of effectiveness, where 1 is the most effective, and 8 is the least effective?

- Promotion activities to increase demand for domestically produced products
- Establishment of collaborative models e.g. producer organisations
- Research and development focused on increasing domestic production
- Use of innovative methods and technology
- Identifying opportunities for growth in export markets
- Ensuring sufficient availability of labour
- Increased use of automation to reduce reliance on labour requirements
- Pre-notification systems to help suppliers and growers predict demand

26. Are there any other opportunities for increasing domestic production besides those indicated in Q25? Please explain in no more than 100 words.

27. Do you think government support for research and development is best focused on short-term, reactive R&D projects to address a particular threat, long-term strategic investment, or a combination of these? Please indicate how much government should focus investment on strategic long-term research below on a scale of 0-100. We will infer that you think the remaining proportion should be focused on short-term reactive R&D projects.

28. In order to remain at the forefront of biosecurity, in what areas should GB be focussing R&D investment over the next five years? Please rank the following options in order of importance, where 1 is the most important and 6 is the least important.

- Risk assessment and horizon scanning [4]
- Inspections, diagnostics, and surveillance [1]
- Management of pests and diseases [3]
- Resistance and tolerance [5]
- Planting and managing for resilience [6]
- Stakeholder responsibilities and actions [2]

29. Please suggest up to 2 priority research questions for the research topics listed below

- Risk assessment and horizon scanning (2 questions; max 50 words)
- Inspections, diagnostics, and surveillance. (2 questions; max 50 words)
- Management of pests and diseases. (2 questions; max 50 words)
- Resistance and tolerance. (2 questions; max 50 words)
- Planting and managing for resilience. (2 questions; max 50 words)
- Stakeholder responsibilities and actions. (2 questions; max 50 words)

30. Are there activities in science, technology or innovation in other sectors (e.g. healthcare) we could learn from? Please explain in no more than 100 words.

30.1 Public health and veterinary sectors could inform processes for: organism identification, tracking/tracing, monitoring, surveillance, data sharing, enhancing interoperability and collaborative research (nationally and internationally), and linking new intelligence to specific increased research activity. The UK cattle tracing system and EU avian influenza surveillance system are examples. These sectors could also provide lessons for education, CPD, and effective ways to promote careers across school ages.

30.2 Combining technologies/datasets can improve predictions and recommendations (e.g. weather, remote imaging, field diagnostic tests, precision farming data). Smartphone use for reporting diagnostic results and receiving recommendations could expand. Machine learning algorithms could generate recommendations (https://doi.org/10.1042/ETLS20200300).

31. How can GB governments better support development, testing and deployment of science and technology advances to enhance biosecurity? Please explain in no more than 100 words.

31.1 Governments should raise awareness within the innovation and technology communities of key questions, challenges and opportunities.

31.2 Devising research with involvement of researchers from different disciplines and end users will help to develop technologies fit for purpose and that meet a need; interdisciplinary research is key to rapid progress. Funding beyond initial research is needed to provide routes to market.

31.3 More professionally trained staff are needed to use, and communicate how to use, technology.

31.4 Resilience requires a multiplicity of approaches, and continued attention on threats that are currently managed, as well as a focus on emerging and emergency threats.

32. What are the biggest barriers to the adoption of new technologies in support of plant biosecurity? Please explain in no more than 100 words.

32.1 Barriers include high capital or running costs, particularly for small agriculture/horticulture businesses, and where monitoring is not mandatory, or its value is not understood.

32.2 Some technologies are unsuitable for farmers or agronomists without further streamlining and training, as extensive protocols must be followed, or data analysis skills are needed to understand outputs. Developing user interfaces that provide actionable results, and including biosecurity considerations in farm management tools could help.

32.3 New technologies may struggle to obtain investment for later stages of research and development necessary before they are ready for the market.

32.4 Lack of standards and interoperability between technologies/platforms hinders adoption.

33. Who should we work with to expand the capability available to support biosecurity research? Please explain in no more than 50 words.

33.1 Co-ordinate with research funders.

33.2 Encourage cross-disciplinary collaboration.

33.3 Enhance research links with EU partners and beyond.

33.4 Join efforts to develop global surveillance systems.

33.5 Enhance university course content.

33.6 RSB programmes support enhancing the school curriculum and building the plant health profession.

33.7 RSB is investigating developing a new risk register with relevant partners.

Annex A – Consultation on additional biosecurity measures for high risk trees

34. How aware are you of the current biosecurity measures in place for the import of high-risk tree species?

a) Not at all aware
b) Slightly aware
c) Aware
d) Very aware

35. How satisfied are you with the effectiveness of the current biosecurity measures in place for the import of high-risk tree species?

- Not at all satisfied
- Slightly satisfied
- Satisfied
- Very satisfied
- Not applicable

36. Please explain your choice for Q35, in no more than 100 words.

37. What factors are you most concerned about with the import of high-risk trees? Please score each factor between 1 and 5, with 1 being the factor you are most concerned about and 5 being the factor you are least concerned about.

- Robustness of surveillance methods in exporting country
- Unknown pest and disease risks
- Robustness of compliance with prescribed pre-export requirements
- Robustness of inspections at point of entry
- Large trees being imported directly to planting sites
- Lack of guidance about risks

38. What do you think are the greatest risks associated with the import of high-risk trees for your business/ organisation? Please answer in no more than 100 words.

39. Please complete the table below to let us know what you think about the measures list above. The table is designed to capture your views on:

- Effectiveness: How effective you think the measure is in enhancing GB biosecurity and preventing pest and disease outbreaks associated with high-risk trees. Please provide a score of between 1 and 5, with 1 being the most effective and 5 being the least effective
- Feasibility: How easily you or your business could implement, deliver and comply with the measure? Please provide a score of between 1 and 5, with 1 being the most feasible and 5 being the least feasible.
- Targeting: Whether you think the measure should be applied to deal with a particular risk. For example, this could include being applied to a specific tree species, pathway, or size of a tree.
- Voluntary or Mandatory: Whether you think the measures should be introduced on a voluntary or mandatory basis?

a) Transport restrictions
b) Growing season inspections in exporting country

c) Pre-treatment or testing of all plants for planting
d) Plants must be grown in protected conditions
e) Prohibiting entry of specified plants
f) Tighter restrictions on imports of large trees with soil and growing media
g) Only allow imports of resistant varieties of plants
h) No imports of trees/plants over a certain size
i) Increasing inspection regime
j) Risk targeting of official import inspections
k) Post-entry quarantine – Absolute Quarantine
l) Post-entry quarantine – Containment under physical protection
m) Post-entry quarantine – Isolation of trees
n) Growing season inspections before onwards sale
o) Post planting inspections
p) Voluntary post planting inspections
q) Record keeping of planting sites

Appendix 1: Member Organisations of the Royal Society of Biology

Full Organisational Members

Agriculture and Horticulture Development Board
Anatomical Society
Association for the Study of Animal Behaviour
Association of Applied Biologists
Association of Reproductive and Clinical Scientists (ARCS)
Bat Conservation Trust
Biochemical Society
British Association for Lung Research
British Association for Psychopharmacology
British Biophysical Society
British Ecological Society
British Lichen Society
British Microcirculation and Vascular Biology Society
British Mycological Society
British Neuroscience Association
British Pharmacological Society
British Phycological Society
British Society for Cell Biology
British Society for Developmental Biology
British Society for Gene and Cell Therapy
British Society for Immunology
British Society for Matrix Biology
British Society for Neuroendocrinology
British Society for Parasitology
British Society for Plant Pathology
British Society for Proteome Research
British Society for Research on Ageing
British Society of Animal Science
British Society of Plant Breeders
British Society of Soil Science
British Society of Toxicological Pathology
British Toxicology Society
Daphne Jackson Trust
Fisheries Society of the British Isles
Fondazione Guido Bernardini
GARNet
Gatsby Plant Science Education Programme
Genetics Society
Heads of University Centres of Biomedical Science
Institute of Animal Technology
Laboratory Animal Science Association
Linnean Society of London
Marine Biological Association
Microbiology Society
MONOGRAM – Cereal and Grasses Research Community
Network of Researchers on the Chemical Evolution of Life
Nutrition Society
Quekett Microscopical Club
Society for Applied Microbiology
Society for Experimental Biology
Society for Reproduction and Fertility
Society for the Study of Human Biology
South London Botanical Institute
The Field Studies Council
The Physiological Society
The Rosaceae Network
UK Environmental Mutagen Society
United Kingdom Society for Extracellular Vesicles
University Bioscience Managers' Association
Zoological Society of London

Supporting Organisational Members

Animal & Plant Health Agency (APHA)
Association of the British Pharmaceutical Industry (ABPI)
AstraZeneca
BioIndustry Association
Biotechnology and Biological Sciences Research Council (BBSRC)
British Science Association
Ethical Medicines Industry Group
Fera
Institute of Physics
Medical Research Council (MRC)
NNedPro Global Centre for Nutrition and Health
Northern Ireland Water
Porton Biopharma
Royal Society for Public Health
Severn Trent Water
Syngenta
Understanding Animal Research
Unilever UK Ltd
United Kingdom Science Park Association
Wellcome
Wessex Water
Wiley Blackwell