February 2025

ASSOCIATION OF APPLIED BIOLOGISTS

Newsletter

***President*: Dale Sanders FRS, PhD**

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Our Mission

"to further the application of biology to the production of food, materials, and energy, and for the maintenance and improvement of the earth's environment"

AAB Quick Links

AAB Council

AAB Conference Calendar

AAB Conference Services

AAB Specialist Groups

AAB Early Career Professional members (AAB ECP) eligible for FREE Online registration to *ANY* AAB-organised hybrid event, AAB ECP non-members pay a nominal fee (£5) for access and also gain free membership!

AAB Events

Abstract Deadlines Approaching!
Registrations Open!

In-person registration closes March 8th

Abstract Submission closes March 30th!

INTERNATIONAL CONFERENCE ON ARABIDOPSIS RESEARCH
ICAR
GENT
2025

Preliminary Schedule launched!
Abstract Submission closes March 17th!

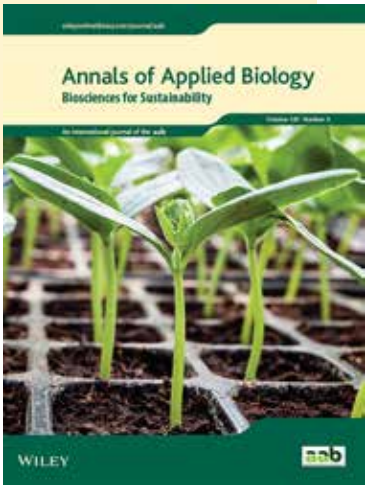
Abstract Submission Open!

Abstract Submission Open!

Satellite Meeting at BSPP Plamnt pathology meeting on:

Disease Management in Practice: Supporting UK Agriculture

Annals of Applied Biology
Biosciences for Sustainability



Update from Annals of Applied Biology

Annals is owned by the Association of Applied Biologists and as such all the journal revenue returns to the scientific community through organisation of events in relevant topic areas.

The March 2025 edition of Annals is now available.
https://onlinelibrary.wiley.com/toc/17447348/2025/186/2

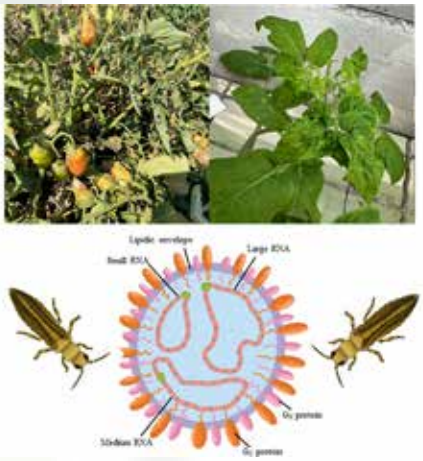
All articles in this edition are Open or Full Access! Please take a look!

Highlight: DESCRIPTIONS OF PLANT VIRUSES

Tomato spotted wilt virus (*Orthotospovirus tomatomaculae*), a cyclically occurring threat to crop production worldwide

Tiberini *et al*

Full Access Article
https://onlinelibrary.wiley.com/doi/10.1111/aab.12977



Apply to join ‘Annals of Applied Biology’ Editorial Advisor group.

During the the first months of 2025 AAB-owned ‘Annals of Applied Biology’ is changing it’s Editorial system. We are shifting from the current ‘Senior Editor-Associate Editor-Reviewer’ system to a more streamlined ‘Senior Editor- Reviewer’ system.

As part of this change we are recruting people to join a group of Annals ‘Editorial Advisors’. Members of this group will be listed on the Annals website. We understand that many people contribute to the scientific community by reviewing research articles so we hope that by joining the Annals ‘Editorial Advisors’ that you will specifically undertake some of those reviews for a society-owned, not-for-profit journal. Editorial Advisors will be asked to review up to 3 Annals articles each year, so it won’t be an onerous task.

Please contact AAB Executive Officer Geraint Parry (geraint@aab.org.uk) if you’d like to be considered as a member of the Editorial Advisor group. AAB Council and the Annals Editorial team will then assess whether you will be a good candidate for the role.

Launching a new Special Issues of Annals associated with an upcoming AAB meeting on ‘Legumes in Science and Practice’

This special issue will be guest edited by Dr Emily Guest and Dr Charlotte White, who are part of the organising team for the upcoming meeting.

Submission deadline: November 30th 2025.

Still accepting submissions for Annals Special Issue on ‘Agricultural Biotechnology in the Era of Genome Editing’

This special issue is guest edited by Dr Kubilay Yildirim and Dr Musa Kavas, who were part of the organising team for the AAB-PlantEd meeting on Plant Gene editing that took place inn Samsun, Turkiye in October 2024..

Submission deadline extended to June 1st 2025.

RSB Plant Health Series: The importance of plant health in One Health

A Royal Society of Biology Plant Health Series event, taking place on **Wednesday 5th March** from 14:00-15:00 via Zoom.

Keynote speaker Sarah Brunel, Implementation and Facilitation Unit (IFU) lead at the International Plant Protection Convention (IPPC) will be discussing global standards and strategies to mitigate the spread of plant pests and diseases.

This will be followed by an opportunity for audience Q&A and discussion.

Register to attend this free event at http://www.rsb.org.uk/onehealth and direct all queries to Ellie Barrand at events@rsb.org.uk or on 020 3925 3444.

Royal Society of Biology

STEM in Parliament

3 March 2025

Sitting dates:

- The House of Commons has returned from recess and will now sit until 8 April.

Select Committee inquiries:

- Antimicrobial resistance: addressing the risks , Public Accounts Committee closes **13 March 2025**

- Industrial transition in Scotland, Scottish Affairs Committee, closes **27 March 2025**
- Building support for the energy transition, Energy Security and Net Zero Committee, closes **8 April 2025**
- Revisiting the nuclear roadmap, Energy Security and Net Zero Committee, closes **8 April 2025**
- The cost of energy, Energy Security and Net Zero Committee, closes **8 April 2025**
- There is still time to suggest ideas for topics for the Science, Innovation and Technology Committee to put "under the microscope". The deadline to submit your ideas is **Monday 24 March 2025.**

Royal Society of Biology

POSTNotes:

- Community based climate change approaches
- Addressing the links between climate change and nature loss
- Green education, training and employment
- STEM skills pipeline**:** this POSTnote will identify technical skills, such as data analysis, programming, engineering design, and laboratory techniques that may be important in addressing the UK's challenges, such as climate change, healthcare innovation, and digital transformation. The deadline to submit a contribution to the STEM skills pipeline POSTnote is **21 March 2025.**

The Climate Change Committee has now released its report on the Seventh Carbon Budget, which you can find here. The Committee believes this target, whilst ambitious, is deliverable, as long as action is taken promptly.It anticipates that some of the UK's service-based economy will see little impact, but sectors such as oil and gas, and farming will undergo significant change.

The Animals in Science Committee (ASC) is reviewing how the animals in science sector currently develops, shares and uses leading practice for replacement, reduction and refinement (the 3Rs), and collecting evidence to inform its recommendations on how this culture might be improved. Send your feedback to asc.secretariat@homeoffice.gov.uk by 5pm on Sunday 23 March 2025.

Government announcements:

DSIT have re-launched the Science and Innovation Network, which will now be known as the Science and Technology Network (STN). The full press notice is available here.

RSB in Parliament:

Voice of the Future is taking place this year as a webinar on Monday 17 March, with the Science Minister, Shadow Science Minister and members of the Science, Innovation and Technology Committee. If you're interested in joining the webinar, do get in touch.

Susie Rabin

Associate Director of Communications & Public Affairs

020 3925 5607 074 9891 3757 susie.rabin@rsb.org.uk

Analysis of plant science higher education reveals mixed provision which falls short of delivering national priorities

A new article from the Society of Chemical Industries Horticulture Group throws a disturbing light on how the Higher Education (HE) sector is failing to provide graduates with skills required to deliver food security in the years ahead. The research article by Trinder et al. (1) describes a systematic analysis of "plant" courses offered by UK Higher Education Institutions (HEIs) looking at their content and reveals an absence of any agreed curriculum. More disturbingly the analysis shows how little plant biology most graduates on the "plant courses" will encounter and illustrates how specific skills gaps identified in over a decade of governmental (and other) reports are not being met.

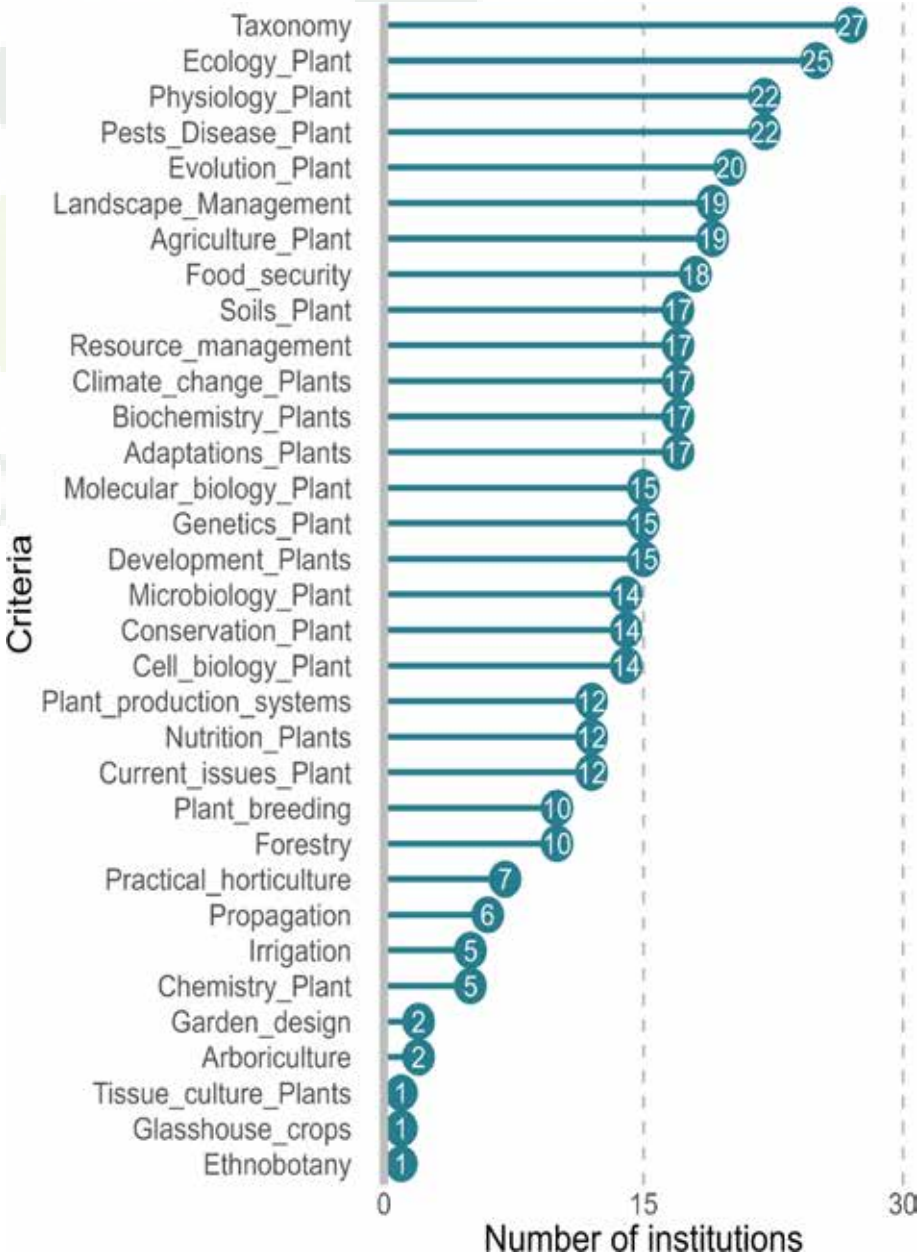
Using information in the public domain the authors investigated in detail those courses that self identify as teaching about plants- in short a sub-category of degree courses (127 degrees from 32 institutions) that advertise as teaching about plants and so would be expected to have a significant proportion of their teaching and modules devoted to plant biology.

Analysis of these degrees revealed that the majority of teaching is of non-plant content and that where plant topics are taught this is usually in a module of mixed content with non-plant subject matter. The analysis reveals that each module on average covers 3 subject areas. The research throws a light on how skill gap subject areas identified over the last decade in reports such as by the Foresight Commission (2), are represented in the curricula.

For example: Soil Science is taught on 49 courses delivered by 17 institutions and represents 0.87%* of total teaching across the degrees

Plant Pests and Diseases are taught on 72 courses delivered by 22 institutions and represents 1.66%* of total teaching across the degrees
Plant Physiology is taught on 62 courses delivered by 22 institutions and represents 1.37%* of total teaching across the degrees

If delivery across these "plant degrees" is poor the authors report that UCAS searches made at the same time identified 182 biology courses of which only 26 (one 7th) identified as delivering plant topics and were included in the overall analysis.



Number of institutions running courses that contain at least one module with some teaching on the specified plant-related topic. Number shown in circle is the total number of institutions. Figure taken from [1]

This suggest that 6 out of 7 biology degrees do not teach any plant biology, and the 26 identified and analysed in the study delivered the least overall teaching of plant topics of the degrees investigated.

The authors conclude that if these plant based skills are as important as a decade of reports suggest, then a new approach to ensuring we meet these skills gaps is required.

The research was sponsored by the SCI Horticulture Group who are working with industry and academics to develop a way forward. They invite all interested parties, especially industry representatives, to register their interest in being part of these consultations at: https://www.soci.org/interest-groups/horticulture/education-review-programme-survey

*Percentages calculated from Supplementary information provided in Trinder et al. (1)

(1) Trinder S, Heaven T, Luberti M, Read S, Scanlon A, Gauntner C, Forsyth A, and Foster A (2025) Analysis of plant science higher education reveals mixed provision which falls short of delivering national priorities. JSFA Reports
doi: 10.1002/jsf2.70001
https://scijournals.onlinelibrary.wiley.com/doi/10.1002/jsf2.70001

(2) The Government Office for Science. Foresight: The Future of Food and Farming. 2011 Available from: https://assets.publishing.service.gov.uk/media/5a7bf9f840f0b645ba3c5efe/11-546-future-of-foodand-farming-report.pdf

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https://hortnews.com/magazine/the-vegetable-farmer-magazine-print-online-subscription/

Partial biofumigation potential practical option for PCN control

The latest advances in nematode management were highlighted at the Advances in Nematology conference, which was organised by the Association of Applied Biologists (AAB) and held at the Linnean Society on December 5, 2024. Dr Heather Briggs reports

PCN Cysts on roots.

Dr Matthew Back, Reader in Plant Nematology at Harper Adams and A Fellow of the AAB, spoke about recent research into practical options for potato cyst nematodes (PCN) control.

Partial biofumigation can be an effective tool for managing (PCN) populations for growers who are unable to take a biofumigant crop through to maturity, revealed Matt. "We believe this is because glucosinolates are leached from the roots," he said. "This means that there is a possibility that growers may simply just have to grow a biofumigant crop to achieve the suppressive effect on PCN."

Reviewing some of the newer studies that have established the role of biofumigation in filling the gaps in managing the pest in both ware and seed crops, he looked beyond the use of chemical control and varietal resistance. "Biofumigants – which are usually brassicas such as Indian mustard and oilseed radish – are usually planted in late July and grown for around 10-14 weeks before reaching early flowering. At this point, the biomass is macerated to maximise production of the active substances, and the brassica residues are then rapidly incorporated into the soil," explained Matt.

"The action of maceration releases secondary metabolites (products of the plants metabolism), known as glucosinolates." Glucosinolates are broken down by myrosinase (an enzyme found in separate plant cells to glucosinolates) in the presence of water, to produce isothiocyanates (ITC) and other volatile compounds, which are biocidal and suppress soil-borne pests such as potato cyst nematodes (PCN). Some ITCs are more effective than others, but all

PCN Field damage.

PCN damage to crops.

function by indiscriminately binding to proteins and amino acids, he added.

A number of plants from the Brassicaceae family (which includes cabbage, radish and cauliflower) produce glucosinolates, and some have higher concentrations than others. Indian mustard is one of most effective species but despite doing extremely well in the summer, is highly susceptible to frost.

"As a result, the timing for fitting biofumigants into the rotation can be problematic for many growers, however, partial biofumigation provides another option." This method is based around the secretion of glucosinolates in root exudates by growing biofumigant plants. The glucosinolates are then broken down by myrosinase produced by soil borne micro-organisms (bacteria and fungi) to cause the release of ITCs.

"Oilseed radish, for example, is not particularly effective as a biofumigant, but it has a large root network and produces different types of isothiocyanates as root exudates and these have a biocidal effect on PCN."

He went on to note that there are several types of volatile gases which are useful in biofumigation of PCN, and volatiles derived from sinigrin and gluconasturtiin glucosinolates are the most useful for PCN management.

Research is currently exploring and measuring microbial enzyme activity, and its effects on glucosinolates in the soil and ultimately PCN egg viability, reported Matt, adding that another study is looking at root architecture and how that affects the production of glucosinolates and also glucosinolate degradation to rank performance levels.

"The next step in research will be to work out how we can increase glucosinolate concentration in root exudates. This may be through the use of hormones such as methyl jasmonate which are known to have an effect on glucosinolate production in brassicas."

At the event, Matt revealed that PhD student Francis Kawalya is undertaking a project to evaluate how to optimise partial biofumigation, and this will provide more important information for potato farmers. He went on to emphasise that there is more and more evidence of partial biofumigation within field experiments. When compared to the traditional method, partial biofumigation offers greater flexibility within crop rotations.

"In addition, if your biofumigant crop goes in later, chopping and incorporating biomass into the soil in a wet November may not be beneficial for soil structure and health, as well as the costs of using the machinery, so leaving the work to the roots may be a better option for some growers."

Nonetheless, PCN is a complex pest, and Matt always advocates using an integrated approach that stacks different control strategies for an overall effect. "A well thought out crop rotation brings about natural decline in PCN populations because it provides no food for them, although the cysts can remain viable in the soil for up to twenty years. Other important activities growers can undertake are biofumigation, good volunteer control, the use of trap crops, and also soil amendments such as chitin."

Further potential management methods include companion planting, which is already being done in vineyards, seed priming and seed coating. There are biological treatments which show good potential but still require further development for growers to really benefit from them, and growers need to be access right information to make the most of them. ◆

Getting the most from traditional and partial biofumigation

- Check whether the soil-type is suited to biofumigants.
  - High organic matter soils, e.g. peat soil, lead to great sorption of ITC and reduced biofumigation efficacy
- Ideally soil should have a pH above 5.5.
  - A low pH soil results in lower production of isothiocyanates and greater production of nitriles that are less effective in biofumigation.
- Check for a previous history of brassica pests and pathogens.
  - The slime mould that causes club root can infect many biofumigant crops such as Indian mustard. Oilseed radish is generally unsusceptible to the disease.
  - Cabbage root fly can infect Indian mustard, white mustard and oilseed radish.
- Check which biofumigant species have the right type of glucosinolates for your need
  Indian mustard produces high quantities of sinigrin (2-propenyl glucosinolate) in their leaves, stems and roots.
  - This glucosinolate produces allyl isothiocyanate which is generally considered to be toxic to a wide range of pests and pathogens.
  - Oilseed radish produces a glucosinolate called gluconasturtiin in its roots which produces an aromatic isothiocyanate with high levels of toxicity.
- For traditional biofumigation it is important to carefully place brassicas in the rotation so they can be drilled while soils are still warm and daylight hours are long; crops sown in June after an early-harvested crop will do better than those which are sown later in the season.
  - The same advice applies to partial biofumigation but there is potentially greater flexibility as the material is not chopped or incorporated.
- Destruction should be done as soon as flowering starts.
- In traditional biofumigation we need to aim for maximum damage to the crop, using flails to release the active components (ITC).
  -Also, ensure immediate incorporation into the soil.

Dr Matt Back.

Association of Applied Biologists
Membership 2025

We are writing to encourage you to join AAB in 2025

Join a commmity of 1000 professionals who work across all areas of Applied Biology and work toward improving agricultural productivity!

AAB membership has significant financial benefits, especially for early career professionals (ECPs).

2025 Membership fees:

Regular members: £65
Early Career Professional members: £22
(anyone within 5 years of finishing full-time education; bachelor or graduate study including career breaks)
Retired members: £33.50

Membership benefits:

- Reduced fees for ALL AAB events. Regular members pay £100 and ECP members pay £50 **LESS** than equivalent non-members to attend AAB in-person events. ECP members can join events as an online delegate for free.
https://www.aab.org.uk/events/

- 20% discount on Article Publishing Charges when publishing to Plant Biotechnology Journal

- ECPs are eligible for travel grants to any AAB event (up to £350)

- All members are eligible for Carer grants (up to £500)

- Consideration for Fellowship of AAB (F Appl. Biol.) after seven years of continuous membership

- 30% discount for online purchase of 'Aspects of Applied Biology'

- Reciprocal 50% reduction in membership fees with the Royal Society of Biology, the Society of Experimental Biology (TBC) and British Society of Soil Science (TBC).

- Invitation to contribute events and job opportunities to the monthly AAB newsletter circulated to 3500+ scientists

- Opportunity to join an AAB Specialist Group, which determine AAB activities.

- Applied Plant Pathology
- Biocontrol and IPM
- Food Systems
- Nematology
- PlantEd Gene Editing
- Soil and Root Biology
- Applied Tree and Forest Biology
- Cropping and the Environment
- Horticultural Quality and Food Loss
- Pesticide Application
- Plant Physiology and Crop Improvement
- Virology

Professor Dale Sanders, AAB President

Dr Geraint Parry, AAB Executive Officer

www.aab.org.uk/membership

The AAB News Hub

A dedicated section for generic news content which may be of interest to our members and associates. These articles may range from current events, blogs, or discussion topics right the way through to some professionally published content. We are more than happy to receive additional content from our readers. If you come across an article or a newspaper column which you think would be of interest to our members please feel free to send it to John (john@aab.org.uk)

Mice seen giving 'first aid' to unconscious companions (New Scientist)

Time can move both forwards and backwards at the quantum scale (New Scientist)

Is a broken jet stream causing extreme weather that lasts longer? (New Scientist)

How one farm is testing multiple carbon-capture tricks all at once (New Scientist)

World's glaciers melting faster than ever recorded (BBC)

Fog harvesting could provide water for arid cities (BBC)

The asteroid hits and near-misses you never hear about (BBC)

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