aab news

Ash Dieback

NEWSLETTER No. 79
Summer/Autumn 2013

Welcome to aabnews Issue 79...

AAB Council met on 26 June 2013 at the Three Ways Hotel, Mickleton

The June Council is the meeting at which the main programme of conference for the following year is approved and is preceeded by a meeting of the Conveners of the Specialist Groups to discuss the meeting proposals and ensure that any opportunities for links between groups or with other organisations are fully in place. Council welcomed Rob Carlton as Convener of the Cropping and the Environment Group and Roy Kennedy who is currently Deputy Publications' Officer to their first Council meetings. Council approved applications for membership from 21 new applicants and noted the breadth of interest amongst applications for membership. We look forward to working with these new members in the months and years to come. There has been an on-going review of conference publications. At this meeting Council confirmed the status of the *Aspects of Applied Biology* series as a key conference-linked output of the Association. Council has established a sub-group, chaired by the Programme Secretary Nigel Halford, to develop and evaluate proposals for the use of *Aspects* as a web-based publication, in addition to its role as a printed conference publication. If you have any ideas for work in this area and/or would like to get more involved in this sub-group, please contact us via the Email: gensec@aab.org.uk. Council also noted that conference attendees numbers, even for well -established conference series, were often only half those achieved in the past. This is a reflection of the continuing difficult financial circumstances for scientific research in the UK. Conference organisers are therefore asked to give more attention to the need and business case for all conferences even where they are part of a series. A broad conference programme was approved for 2014. A particular highlight will be the multi-disciplinary conference which is being organised as part of the centenary celebrations of the *Annals of Applied Biology*. Council received reports on publications. Both these journals have now signed up to new 'green' open-access policies in line with all those in place for all the Wiley-Blackwell journals. Members should note that *Plant Biotechnology Journal* will move to online only publication from 2013. The AAB continues to invest in the development of the new fully open access journal - *Food and Energy Security.* Usage statistics of the published papers in FES are good and higher than for some established journals in the sector; however, paying submissions were still below target. Review of the statistics shows an international exposure, but with a lower recognition and usage in the UK than expected. Please consider publication in *Food and Energy Security* for your high quality and high impact original research on agricultural crop and forest productivity to improve food and energy security. Council were pleased to note that the finalised accounts for 2012 are now ready to go to Clere's (our approved auditors) for final inspection. The full Annual Report for members will be sent out with the Agenda and other papers for the Annual General Meeting. Council discussed the Agenda for the AGM and confirmed their nominations for vacant Honorary Officer posts. The AGM will be held at Innovation Farm NIAB alongside the conference "Crop breeding over 10,000 years"; we look forward to interesting discussions on the work of the AAB there.

-Elizabeth Stockdale

Annals of Applied Biology
An international journal of the aab

Celebrating 100 years of
1914 – 2014

MORE INFORMATION COMING SOON

9-11 December 2014

***Annals of Applied Biology* Centenary Conference - Sustainable Intensification**

A three day conference at *The Olde Barn Hotel, Marston, Lincs*

see our web site for more details

Report from Farming Systems Design Workshop – 6 March 2013

The AAB Farming Systems Design Workshop in Newcastle in March 2013 discussed the need for a core group of researchers to focus on the analysis and design of farming systems in the UK. While many existing organisations and groups in the UK see farming systems as part of their remit there is no umbrella group or united voice for farming systems research. A group such as this would have a number of roles including networking, influencing the research agenda, highlighting and building consortia for funding opportunities, data and resource sharing (experimental/analytical). The group would need to be both interdisciplinary and cross a range of agricultural systems and scales. The remit could encompass a wide variety of traditional land uses but also be forward looking e.g. vertical farming. We propose that this would be a working group under the AAB but liaising with BSAS/BES/AES/BSSS/Permaculture Association/ Farm Woodland Forum/IAGRE and others as appropriate. The group does not need a formalised structure but one model suggested was using the format of the UK Weed Liaison group.

The group's first activity would be to run a discussion session at the Rethinking agricultural systems in the UK conference in December with the purpose of thinking about UK based activities and opportunities to link into the European Community of Practice launched by ESA.

-Prof. Christine Watson

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If you have any **ideas** for conference topics and/or would like to get more involved in developing the scientific programme for a meeting then please get in touch via your group or:

Email: gensec@aab.org.uk

Group committees are now developing the proposals for the conference programme for 2014.

Food and Energy Security...

Brazilian plant Physiology Meeting (9-12 Sept, Pocos de Caldas, Brazil)

Three of the Food and Energy Security Editors including Editor in Chief Prof Martin Parry were present at the Brazilian Plant Physiology meeting from 9-10 of September in Pocos de Caldas. Bill Davies gave a talk on 'Making a journal indispensible to researchers and teachers' and Martin on 'Creating new journals and moving society journals to the market place' in order to create a buzz surrounding the AAB's newest journal. Prof Ricardo Azevedo Chaired the session after giving his paper on 'Addressing oxidative stress by toxic metals: what's up to the future,' earlier in the afternoon.

The talks and participation were tremendous, with very good and positive feedback overall from the conference delegates.

The team succeeded in getting good visibility both for the journal and Wiley. During the talks and in the presentations they made sure FES and Wiley were easily seen. With Ricardo Azevedo taking some 20 printed *Annals* issues to show and give away at the stand along with the other jounals.

Food and Energy Security is a fully open access journal which is published in association with Wiley Blackwell. You can find out more about the journal by visiting www.foodenergysecurity.com. To submit your article please find the author guidelines on the same page. AAB Members recieve an article processing discount of 20%; please select this option when submitting your manuscript.

Ash Dieback:

Description
Chalara dieback of ash is a serious disease of ash trees caused by a fungus called *Chalara fraxinea* (*C. fraxinea*), including its sexual stage, *Hymenoscyphus pseudoalbidus* (*H. pseudoalbidus*). The disease causes leaf loss and crown dieback in affected trees, and usually leads to tree death.

Threat
It is potentially a very serious threat. It has caused widespread damage to ash populations in continental Europe, including estimated losses of between 60 and 90 per cent of Denmark's ash trees. We have no reason to believe that the consequences of its entering the natural environment in Britain would be any less serious. Experience on the Continent indicates that it kills young ash trees very quickly, while older trees tend to resist it for some time until prolonged exposure causes them to succumb as well.

Susceptible species
Chalara fraxinea is especially destructive of common ash (*Fraxinus excelsior*), including its 'Pendula' ornamental variety. Narrow-leaved ash (*Fraxinus angustifolia*) is also susceptible. Chalara dieback of ash is particularly destructive of young ash plants, killing them within one growing season of symptoms becoming visible. Older trees can survive initial attacks, but tend to succumb eventually after several seasons of infection.

Spread
Local spread, up to some tens of miles, may be by wind. Over longer distances the risk of disease spread is most likely to be through the movement of diseased ash plants. Movement of logs or unsawn wood from infected trees might also be a pathway for the disease, although this is considered to be a low risk.

Outbreak stage
Ash trees suffering with the infection have been found widely across Europe since trees believed to have been infected with this newly identified pathogen were reported dying in large numbers in Poland in 1992. These have included forest trees, trees in urban areas such as parks and gardens, and also young trees in nurseries. In February 2012 it was found in a consignment of infected trees sent from a nursery in the Netherlands to a nursery in Buckinghamshire, England. Since then it has been found in young ash trees in a number and variety of locations in Great Britain, including urban landscaping schemes, newly planted woodland, and more nurseries.
In October 2012, Food & Environment Research Agency (FERA) scientists confirmed a small number of cases in Norfolk and Suffolk in ash trees at sites in the wider natural environment, including established woodland, which do not appear to have any association with recently supplied nursery stock. Further finds in trees in the wider environment have since been confirmed in a number of places, mostly on the eastern side of England and Scotland, and mostly concentrated in the south-eastern region of England. In May 2013 the first wider-environment case was found in south-west Wales, which is the farthest west site in Britain that a wider-environment case has been confirmed. (Map on front page of AAB News).
C. fraxinea is now being treated as a quarantine pest under national emergency measures and any suspected sighting must be reported.
Hundreds of staff from government agencies checked ash trees across the UK for signs of the disease during early November 2012. It was one of several actions to emerge from a meeting of the Government's Emergency Committee, COBR, chaired by Environment Secretary Owen Paterson.
Because ash trees have many genetic variants and occur all across the UK, they come to leaf at different times. In general, they come into leaf later in spring than many other trees, often as late as the end of May. So if an ash tree does not have any leaves on it in April and May, it does not necessarily mean that it is diseased or dying, but by mid-June all healthy ash should be in full leaf. The leaf symptoms of Chalara dieback of ash are best observed in August and September because in autumn infected leaves can be confused with leaves that are naturally changing colour.
Ash trees are starting to break-bud and will produce new growth some time in May, and we expect the vast majority to develop normally.
Ash is traditionally one of the last tree species to flush, sometimes taking as long as six weeks to do so. Some ash trees will break-bud, or flush, earlier than others, and some buds will produce flowers rather than new shoots. Trees in the colder north flush later than trees in the warmer south. Some variation will be more apparent in older trees.
Some shoots on ash trees will fail to flush altogether, while others will flush normally before showing signs of ill-health or dieback later. These events might mean that the trees are damaged in some way, but shoot death and dieback in ash trees can have a number of causes.
We are very grateful for the many reports we have received. We are working through these, and are sorry that we might are not able to respond to each one individually. However, every one of them will be assessed, and for each report we will:

- prioritise action according to our existing knowledge of the disease's distribution and

threat to our National heritage?

- decide it isn't Chalara dieback of ash; or
- ask for more information, which might include asking for photographs; or
- arrange for someone to do a further investigation on site.

The disease does not spread via spores from the fungus during the winter, so we have the time to carefully examine all the reports.

Managing infected trees

You are not required to take any particular action if you own infected ash trees, unless we or another plant health authority serves you with a statutory Plant Health Notice. You should, however, keep an eye on the trees' safety as the disease progresses, and prune or fell them if they or their branches threaten to cause injury or damage. You can also help to slow the spread of the disease by, where practicable, removing and disposing of infected ash plants, collecting up and burning, burying or composting the fallen leaves.

Advice and guidance

The science

Government scientists have set out the most up-to-date understanding of the disease. Their assessment agreed with the earlier Pest Risk Analysis carried out in August, and concluded that:

- the spores are unlikely to survive for more than a few days
- spore dispersal on the wind is possible from mainland Europe
- trees need a high dose of spores to become infected
- spores are produced from infected dead leaves during June to September
- there is a low probability of dispersal on clothing or animals and birds
- the disease will attack any species of ash
- the disease becomes obvious within months rather than years
- wood products would not spread the disease if treated properly
- once infected, trees can't be cured
- not all trees die of the infection - some are likely to have genetic resistance

Scientists are working with their counterparts in other countries to learn from existing and emerging research and practical experience in combating the disease in other countries. They are also approaching companies with proposed treatment solutions for Chalara to rapidly evaluate their research.

Our Forest Research agency is part of a consortium awarded £2.4M research funding to gather an in-depth understanding of the ash dieback fungus and to provide genetic clues about the natural resistance of some ash trees to attack.

Consortium Q&A - science of chalara

Key scientific facts

Origins

Ash trees were first recorded dying in large numbers from what is now believed to be this newly identified form of ash dieback in Poland in 1992, and it spread rapidly to other European countries. However, it was 2006 before the fungus's asexual stage, *C. fraxinea*, was first "described" by scientists, and 2010 before its sexual stage, *Hymenoscyphus pseudo-albidus*, was described. It is believed to have entered Britain on plants imported from nurseries in Continental Europe. However, now that we have found infected older trees in East Anglia, Kent and Essex with no apparent connection with plants supplied by nurseries, we are also investigating the possibility that it might have entered by natural means. These include being carried on the wind or on birds coming across the North Sea and English Channel, or on items such as footwear, clothing or vehicles of people who had been in infected sites in Continental Europe.

Pest Risk Analysis

A full Pest Risk Analysis (PRA) on *C. fraxinea* was published in May 2013. (The document title uses the name of the sexual stage of the fungus, *Hymenoscyphus pseudoalbidus*).

This followed consultation on and publication of a Rapid Assessment of the Need for a Detailed Pest Risk Analysis in 2012.

Import and movement restrictions

To prevent further spread of the disease in Britain a Plant Health Order prohibits all imports of ash seeds, plants and trees, and all internal movement of ash seeds, plants and trees.

- DEFRA September 2013

International Advances in Plant Virology meeting held at the SportsPark, University of East Anglia, Norwich from 25-27 September 2013

George Lomonossoff presenting Jenny Robel with the poster prize on behalf of Roger Hull and right: Christina Dickmeis, winner of the Harrison Prize for the best platform presentation

This meeting was a continuation of the Advances in Plant Virology series of scientific meetings that are organized by the Virology Group of the AAB and take place at about every eighteen months. These meetings are not themed (apart from being related to plant virology) and aim to encourage PhD students and young researchers to present their work and to build-up contacts within the professional virology field. The meeting in Norwich was very well attended, with sixty seven delegates attending. From these, thirty six were UK-based, with the remainder coming from twelve other countries, principally Germany, Greece, the Netherlands and Italy. The long-distance travel "prize" was claimed by two students from Brazil.

The programme included thirty seven presentations, most of them short talks but also including three longer talks from Invited Speakers. These were Dr George Lomonossoff (John Innes Centre, Norwich), who talked about the development and use of Cowpea mosaic virus as a tool for nanobiotechnology, Dr Isabelle Jupin (Institute Jacques Monod, Paris), who described the role of ubiquitination in the replication process of Turnip yellow mosaic virus), and Dr David Karlin (Oxford University), who described in a very instructive and entertaining way the best methods and practices that should be used for bioinformatics analysis of virus protein structure/function.

Among these talks were seventeen presented by PhD students, describing research on a wide range of viruses in both fundamental and applied areas of plant virology. This is perhaps the largest number of student talks we have ever had at one of our meetings, and the high quality and confident delivery of these talks was a particularly pleasing aspect of this meeting. A similar number of posters were also presented, so that virtually all of the attendees at the meeting were able in some form to describe and discuss their work with the other attendees.

As is traditional at these meetings, a prize for the best student talk was decided upon and presented by Professor Bryan Harrison (and his hand-picked team). The winner of this competition was Christina Dickmeis from Aachen, Germany, who described her experiments to improve the utility of *Potato virus X* as a gene expression vector. Hadrien Peyret (John Innes Centre, Norwich), who described his work using viruses to produce vaccines in plants, was also commended for the high quality of his presentation.

Unfortunately, due to personal reasons, Dr Roger Hull was unable to attend and present the prize for the best student poster. George Lomonossoff took over the role of poster judge and, with the help of his "team", selected Jenny Robel (Humboldt University, Berlin) as the winner of this competition. Jenny's poster described her work to detect the EMARAV virus in new tree species from the Sorbus genus.

The UEA SportsPark was a very modern and attractive venue for the meeting, providing us with a meeting room and tea/coffee and lunches all in the same location. For the conference dinner we visited the Vista restaurant on the UEA campus who provided us with good food and wine and an excellent relaxed atmosphere to encourage conversation between all the delegates. The dinner was so good that I even received praise for the food from one of the Italian contingents. In fact, everyone at the meeting seemed to enjoy themselves immensely, and we will have to work hard to ensure that our next meeting reaches the same standards.

-Stuart MacFarlane
Virology Group Convenor

ROBERT W HOWE DSc: *Born – 1934 ; Died - 2013.*

Robert William Howe was born in Kent and gained a scholarship in 1934 to study Biology at Imperial College, London. After graduation he started work at the College's field station in Slough. Robert was one of the founding members of the internationally famous Pest Infestation Laboratory (PIL) set up in 1940, under the jurisdiction of the Department of Scientific & Industrial Research. PIL was transferred in 1959 to the control of the Agricultural Research Council and in 1970, was 'gifted' to the Ministry of Agriculture Fisheries and Food, when it was renamed the Pest Infestation Control Laboratory (PICL), affectionately referred to by its staff as 'Pickle'.

The Laboratory was originally set up to investigate attack by insect, mite and fungal pests on harvested crops and other food products at all stages of storage and processing, a function which broadly remained the same over the years.

The remit of the Biology Department of PICL was to undertake basic research on the ecology, physiology and habits of a wide range of beetles, moths, mites and fungal pests, and so produce information critical to the development of effective control methods. Robert led the section dealing with overseas problems. He spent 1948-50 in Nigeria and later made visits to the USA and Australia.

Dr Don Griffiths observes that when he joined the Biology Department, Robert (known as Bob) was a senior member holding a rarely awarded merit promotion at the rank of Senior Principal Scientific Officer, for Bob was an outstanding researcher with a special bent towards statistics and mathematics, a gift not within the capacity of too many biologists. His forte was to have the ability to develop methodologies and then carry out painstaking experiments on these small insects. The raw data so produced he used to construct life history profiles, from which, with his special abilities, he would produce mathematical models which were capable of assessing and predicting their life-styles.

By nature Bob seemed to prefer to be a 'loner', not interested in heading a large team. His group invariably consisted of a few technical support staff undertaking, with live insects, the experiments initiated by Bob's ideas, together with a continuous chain of young researchers whom he selected and then encouraged to register, with his support, for a PhD degree at one of the nearby London University Colleges.

A recommendation from Bob ensured their acceptance, for he automatically became their chief advisor and guide up to the point of the completion and submission of their thesis. Imperial College, London, was always a willing co-operator. There were at least eight doctorates successfully completed at Slough under his patient and understanding direction. He was not only a gifted Doctor of Science, but also a kind considerate and approachable person. Anyone could knock at his door for advice, be welcomed, and go away uplifted.

For most of his career IT technology had yet to take off. Complex multifactorial calculations had to be undertaken on mechanical, and later electrical calculating machines. Graphs and diagrams had to be drawn by hand, likewise manuscripts were hand written; then exposed to the trials and tribulations of the typing pool! But, despite these time consuming activities, Bob's ideas always seemed to reach the fruition of publication, as his record shows.

What more could he have achieved with today's magic machines?

When the Head of Department, Dr Maurice Solomon, retired in the early 70's, Bob was appointed as his successor. Under his leadership departmental meetings concentrated on science, acting as much as it was possible, as forum for the discussion of the Department's research programme. However, with the style of Civil Service management becoming more bureaucratic Bob was less comfortable. In 1979 Margaret Thatcher reduced the retirement age for Civil Servants, including scientists, from 65 down to 60; Bob was then 63 and opted for retirement but he continued his enthusiasm for science for many years.

Bob had an extraordinary range of abilities and at the start of his career had been tempted to become a professional cricketer. He later regularly played for the Slough Town Football Club. He was certainly happy with his decision to choose science, where he excelled in the application of mathematical solutions to biological problems and made a unique contribution.

Unfortunately Bob's wife Theda died three years ago; he is survived by a brother, sister, two daughters and four grandchildren.

-Dr Don Griffiths, colleague
& Dr Janet Shapiro, sister

IPM: Pushing back the frontiers
at the Olde Barn, Marston, Lincs, on 15-16 October 2013

There can be no doubt that the EU Sustainable Use Directive will impact on everyone involved with crop production and crop protection in the UK over the next few years. The overall objective of the Directive is to ensure that pesticides are used sustainably by reducing the risks and impacts of use on human health and the environment and encouraging the development and introduction of integrated pest and disease management (IPM). In short this will mean the replacement of broad spectrum pesticides with alternative approaches and techniques. The Directive requires the general principles of IPM to be implemented by professional pesticide users by 1 January 2014. In reality, this can only be achieved by the cropping sectors that were already using IPM when the Directive was announced. The UK's National Action Plan (NAP) for the implementation of the Directive has been prepared by the Chemicals Regulation Directorate (CRD) with strategic oversight by Defra.

Given the urgency for the implementation of the NAP, there can never have been a more appropriate time to draw together and pool the expertise of people currently involved with IPM. The Association of Applied Biologists (AAB), which has over 280 members with a special interest in IPM, organises an annual gathering of the IPM community at which policy makers, experienced researchers, young scientists and practitioners can detach themselves from their usual day-to-day pressures and totally immerse themselves in the subject. The recent 2013 conference, entitled 'IPM: Pushing back the frontiers', was organised in partnership with the International Biocontrol Manufacturers' Association (IBMA) with the specific aim of addressing issues associated with the implementation of the UK's NAP. The event attracted over 90 delegates from many different backgrounds.

Adrian Dixon, Head of Policy Implementation at CRD, provided legislative and policy background to the NAP and explained how IPM would be handled within the Plan. He also described changes to the UK biopesticides scheme announced in July 2013 and wider developments including the UK Agri-tech Strategy and the development of the UK strategy on innovation in crop protection. Dr Paul Sopp (Vice-Chair IBMA UK), who responded on behalf of the biocontrol manufacturers and distributors, welcomed the Plan and acknowledged that CRD had been working under difficult conditions due to funding cuts. However, the industry was disappointed at the lack of detail in the Plan and considered the promotion of IPM to be unclear and unambitious. In particular, Dr Sopp stated that future R&D needed to be more focused on applied issues and indicators of success must be more clearly defined.

Prof Toby Bruce (Chair of AAB IPM Group) provided a UK research community perspective on the NAP. He stressed the need for the development of robust alternative control measures prior to the restriction of broad spectrum pesticide use. In most cases, the alternative measures are either not available or require considerably more development to reach the same level of efficacy as the pesticides they are intended to replace. Prof. Bruce welcomed the announcement of the Agri-tech strategy and hoped that it would tackle the need for innovation in crop protection.

Dr Sopp had commented that biopesticide development was still being held back by a regulatory system designed for chemicals. Dr Alison Hamer, who is a national expert on biopesticide regulation, provided a comprehensive guide to biopesticide regulation and registration in the UK within an international context. Dr Henrik Brodsgaard (Danish Ministry of the Environment) then presented a contrasting story from Denmark where the government's strategy for pesticide reduction already includes new regulations, advisory services, training, research, information transfer and a subsidy scheme for alternative pesticides. This is generally seen as a model for the rest of Europe.

Growers of protected edible crops, such as tomato, sweet pepper, cucumber and aubergine, have used IPM for over 40 years in the UK and now operate some of the most advanced IPM programmes in the world. Dr Rob Jacobson described the history of IPM in UK glasshouses and the forces that have driven growers down this route. He stressed that IPM is a knowledge-based system that requires a thorough understanding of all components as well as topical information based on crop monitoring to aid decision making. The IPM programmes include biological, physical and cultural techniques integrated with careful use of target specific chemicals. Dr Jacobson highlighted difficulties encountered by the protected crop industry and thereby provided guidance to other farmers and growers who are about to embark on this journey. He also stressed the complexity and additional costs of IPM and urged policy makers to have realistic expectations of what can be achieved without restricting the availability of home-grown

produce and causing an escalation in prices.
Chris Wallwork (Agrii) works as an agronomist within the crop protection industry and currently specialises in field vegetable and salad crops. He explained why these crops pose a very different set of challenges to glasshouse or fruit crops. For example, weeds present a much greater threat and non-chemical controls can be both challenging and expensive. Furthermore, many of the pests and diseases attack the marketable parts of the plants for which there is a 'zero damage' tolerance. Chris described a range of traditional techniques which are now supported by technological developments such as disease forecasts delivered via smart phone, vision guided hoes and spot sprayers. Although monitoring techniques have improved, he emphasised that it is still important to go and look in the crop because pests and diseases don't always behave according to the textbooks! Chris stressed that the new strategies would also be reliant upon the continued availability of suitable chemical options.
There is a common misconception that IPM is simply an alternative term for biological control but this could not be further from the truth. While biological agents often provide the backbone of an IPM programme, they also draw on cultural and physical techniques, all integrated with target specific chemical pesticides and biopesticides. A total of 20 speakers described the development and implementation of a wide range of techniques including opportunities for genetic modification, conventional plant breeding, incorporation of plant extracts and semiochemicals, optimising the use of parasites and predators, and novel methods of distributing biopesticides. Several speakers considered methods of integrating such techniques with conventional pesticides. In addition, Dr Steve Ellis and Dr Sarah Kendall (ADAS) clearly illustrated the importance of understanding economic damage thresholds and explained why doing nothing is often the best financial option. Abstracts of all the technical papers are available via the AAB and HDC websites.
There were several open discussion sessions during the conference at which delegates debated issues relating to the implementation of the NAP. Difficulties which may be encountered by new IPM practitioners and messages for policy makers are summarised in the text boxes. There is little doubt that this annual AAB conference has become the primary IPM event in the UK. Details of the 2014 conference will be announced shortly. The events have been over subscribed in recent years and we strongly advise you to register your interest as quickly as possible to secure a place.

Messages for policy makers …..

- Do not under estimate the complexity of IPM
- Seek input from experienced practitioners at the planning stage
- Target specific pesticides which will still be required
- Apply a sensible time frame for implementation in new situations
- Provide adequate resources for R&D to develop alternative control measures
- Work on the customers' expectations in terms of quality and cost of produce

A few tips for newcomers to IPM …..

- Staff training is vital
- Know the full range of primary and secondary pests that you will have to combat
- Establish a full armoury of compatible products before you start
- Include 'safety nets' in the form of second line of defence products
- Anticipate higher production costs and discuss the implications with customers
- Never relax - always be prepared for the next challenge!

The author

Dr Rob Jacobson is an independent consultant with over 25 years experience of successfully implementing IPM programmes in protected edible crops.

www.robjacobsonconsultancy.co.uk

The author would like to thank Phil Walker, Toby Bruce and Carol Millman's team at the AAB Office for their part in organising the conference. We are also grateful to BASF, BCP Certis, Fargro, HDC, Koppert UK, Russell IPM and Syngenta Bioline for financial support

Chris Wallwork, Horticulture Technical Manager at Agrii, who stressed the importance of regular crop monitoring

"IPM is difficult to implement fully in outdoor crops. I've attended this conference for several years as it is the only event focused specifically on IPM. The chance to discuss with scientists, policy makers and practitioners provides a unique perspective on this developing area. Good IPM brings together a range of technologies and techniques and the event provides a forum to consider them all."

A WARM WELCOME to our New Members elected 26 June 2013

Mr Femi D Akande, PhD Student at Crop Centre, University of Warwick, research aims to utilise viral vectors to express genes involved in initiating enhanced crop and fruit yield, increased seed number and flowering time earliness in commercially viable crops, with special interests in plant physiology & crop improvement and virology

Dr Minshad A Ansari, Honorary Research Fellow at Swansea University with a special interest in biological control.

Miss Laima Antanaviciute, PhD Student at University of Reading with special interests in biological control and plant physiology & crop improvement

Dr Kevin Austin, Head of sustainable land management at Welsh government in Aberystwyth, with special interests in cropping & the environment and food systems

Dr Ian J Bingham, Senior Researcher in Crop Physiology, SRUC Edinburgh with special interests in cropping & the environment and plant physiology & crop improvement

Ms Hannah L Denniston, PhD Student designing wildlife habitat indicators for intensive grassland at Teagasc, Ireland with special interests in biological control, cropping & the environment, food systems, pesticide application and plant physiology & crop improvement

Miss Frances Dixon, at Welsh Government, Aberystwyth with special interests in cropping & the environment and food systems

Prof John H Doonan, Director at The National Plant Phenomics Centre (NPPC) Aberystwyth University with special interests in plant physiology & crop improvement, phenotyping, genetics and plant development

Mr Kevin L Frediani, Curator of Plants and Gardens Paignton Zoo Environment Park Devon, with special interests in cropping & the environment, plant physiology, controlled environmental agriculture and sustainable horticulture systems

Dr Michael Glemnitz, Senior Scientist at Leibniz Centre for Agricultural Landscape Research, Muencheberg, with a special interest in cropping & the environment

Miss Juliane Hahn, PhD Student on microbial processes in a restored peatland at University of Rostock, with special interests in applied mycology & bacteriology, biological control and cropping & the environment

Dr Rosa Lozano-Duran, Post Doctural Researcher at The Sainsbury Laboratory Norwich Research Park, with a special interest in virology

Dr Vravara Maliogka, Lecturer of Plant Virology School of Agriculture University of Thessaloniki Greece with a special interest in virology

Mrs Ann Naylor, Compliance Officer at Hadlow College, Kent with special interests in cropping & the environment, food systems and plant physiology & crop improvement

Ms Anisha Parmar, Post Graduate Research Scientist at Nottingham University, Leicestershire

Mr Thomas Passey, PhD Student working on apple scab at East Malling Research with a special interest in applied mycology & bacteriology

Dr Mahfuz Rahman, Teacher at West Virginia University, USA with special interests in applied mycology & bacteriology, biological control, pesticide application and plant physiology & crop improvement

Dr Mark Robbins, Director of Edgiock Consulting Redditch, with special interests in cropping & the environment, biomass crops, biodiversity and sustainable land use

Dr Jane Shaw, Researcher in plant virology at The James Hutton Institute with an interest in virology

Mr James Trounce, Lecturer in Crop Production and Agronomy, University of East Anglia with special interests in applied mycology & bacteriology, biological control and plant physiology & crop improvement , food systems, nematology, pesticide application, plant physiology & crop improvement, virology and plant soil interactions

Miss Noemi Van Bogaert, PhD Student at ILVO, with special interests in biological control, plant physiology & crop improvement and virology.

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CALENDAR OF EVENTS

2013

2-3 December	**Positive plant microbial interactions: their role in maintaining sustainable agricultural and natural ecosystems** Forest Pines Hotel, nr Brigg, North Lincolnshire (AM&B Group)
10 December	**Advances in Nematology** Linnean Society of London, Piccadilly, UK (Nematology Group)
18-19 December	**Rethinking Agricultural Systems in the UK** St Catherine's College, Oxford (BES Agricultural Ecology, Forest Ecology & Computation Ecology Groups/AAB)

2014

8-10 January	**International Advances in Pesticide Application** Oxford Spires Hotel, Oxford, UK (Pesticide Application Group)
29-30 January	**Wheat Breeding 2014: Tools, targets & progress** Rothamsted Research, Harpenden, Herts, UK (PP&CI Group)
1-3 April	**Pollinators in Agriculture** Courtyard by Marriot, Brussels, Belgium (CATE Group)
16 April	**Advances in Cider Technology** Pershore College, near Evesham, Worcestershire (AM&B Group)
16-18 June	**Breeding for Climate Change** University of Leeds (Multidisciplinary/University of Leeds)
18-20 June	**Climatic Uncertainty - Its Impact on Agronomic Decision Making** University of Leeds (CATE Group)
9-12 September	**5th International Symposium on Biofumigation** Harper Adams University, Newport, Shropshire, UK (HAU/Nematology Group)
25-26 November	**Crop Protection in Southern Britain - Precision Decisions for Profitable Cropping** Peterborough Arena, Peterborough (CATE Group/AICC, AIC, BCPC)
16 December	**Advances in Nematology** Linnean Society of London, Piccadilly, London (Nematology Group)

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