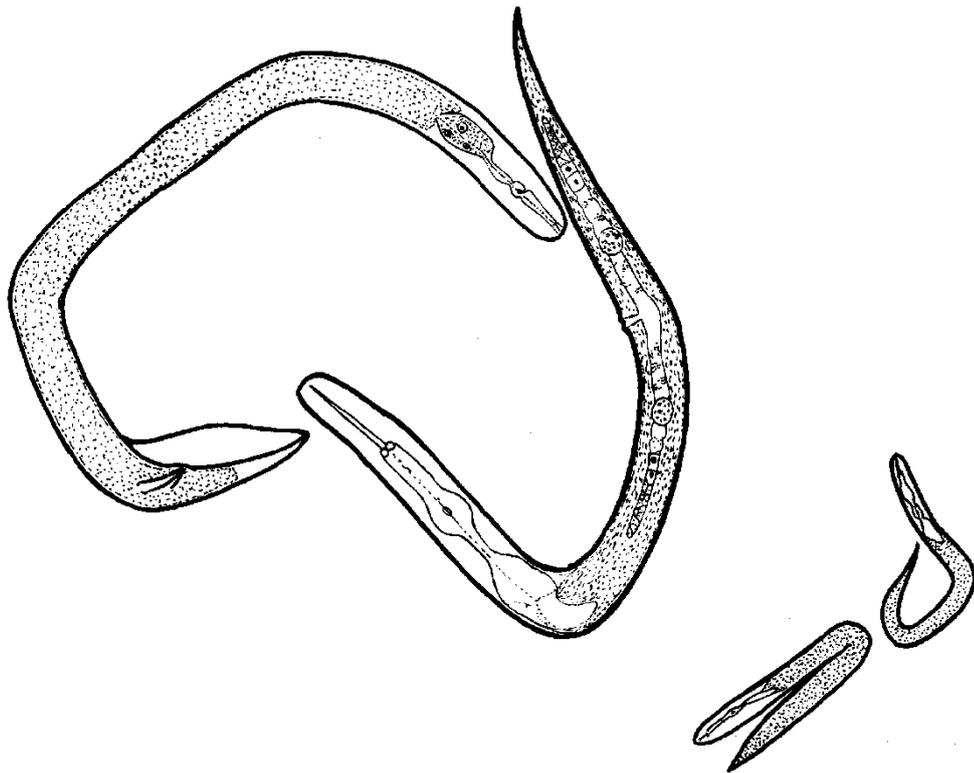


AUSTRALASIAN NEMATODOLOGY NEWSLETTER



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From the Editor

It is with great admiration that I assume the role of ANN editor from Kerrie Davies, who has done a fantastic job over the last ten plus years in keeping us up to date with the nematological happenings of AAN members.

Thank you to everyone who has contributed to this issue of ANN. I encourage all readers to make a contribution, which may include regional news, announcements of new research projects, colleagues, visitors, students etc., research reports, conference or workshop reports, new publications, abstracts of recently submitted/accepted PhD theses, conference or workshop announcements and photos. Contributions will be accepted at any time throughout the year so please forward articles and reports as they occur, with the deadline for the next issue around mid-December 2017.

I look forward to receiving your contributions for future issues and keeping you up to date with the regional news of our AAN members.

Rebecca Zwart

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Association News

FROM THE PRESIDENT

As I struggled to find time to write something of potential interest to nematologists, I was reminded of how busy everyone seems to be these days. If anyone has found a solution please let me know! Until the solution to not enough time is found, I hope people will take the time to attend meetings and communicate with other nematologists. There are few enough of us, it seems a shame not to take the few opportunities that there are.

The most immediate nematology meeting is APPS and its associated workshop in Brisbane at the end of September. The nematology workshop is immediately after the main meeting, and is hosted by Rebecca Zwart and Kirsty Owen with John Thompson at USQ in Toowoomba. A general meeting of the Association will be held along with the traditional nematology dinner on the Thursday evening preceding the workshop. Watch for notification of the place and time.

Remember that there are student grants to attend this and other nematology meetings. There is no set application form. Just send me an email to me with where you want to go, why it will benefit you, and how much funding you would like.

A reminder that ideas and suggestions for the next international congress of nematology programme should be sent to me. The congress is in 2020 in Nice, in the south of France, so worth serious consideration. Contact me.

Finally thanks to Rebecca Zwart, the new editor of the newsletter for stepping in. Thanks also to Kerrie Davies for her many years of tireless editorial work and hounding of contributors (mainly me!). Thank you also to Sue Pederick who has stepped in to Catherine Linsell's role as Treasurer.

For those of you who have not heard yet, our former newsletter editor Kerrie Davies is actually very serious about REALLY retiring. The joke I tell is Kerrie talking away at one of the courses we run and saying she intended to work on something WHEN SHE RETIRED. It's hard to believe, but Kerrie ALREADY WAS technically retired at the time, and has been for about 15 years. So the upcoming nematology workshop, in either Suva or Adelaide, really will be her last. See elsewhere in this newsletter for details.

Mike Hodda

Regional News

NEWS FROM SOUTH AUSTRALIA

The University of Adelaide

Kerrie Davies continues to work through her list of jobs to be done before she leaves nematodes behind for a full retirement. Looks as if that is about two years away now, but it may be longer! The two papers describing new species and morphospecies of *Ficophagus* from figs from Central America were finalised and published in 'Nematology', leaving one describing fig nematodes from eastern Australia to be completed. The manuscript describing flies and nematodes from galls on *Leptospermum* (a new host genus for fergusoninids and fergusobids) has been accepted. Work continues on two other *Fergusobia* papers. Several other projects will probably remain uncompleted, i.e., unpublished – which bothers Kerrie but she doubts she has the energy to write them up.

Recent publications

- Davies, K.A., Taylor, G.S., Ye, W., Makinson, J.R., & Adair, R.J. (2017). First record of *Fergusonina* (Diptera: Fergusoninidae) and associated *Fergusobia* (Tylenchida: Neotylenchidae) forming galls on *Leptospermum* (Myrtaceae) in Australia, with descriptions of new species. *Insect Systematics & Evolution* in press.
- Davies, K.A., Ye, W., Kanzaki, N., Bartholomaeus, F., Herre, E.A., Esquivel, A., & Giblin-Davis, R.M. (2017). Four new species and five morphospecies of *Ficophagus* (Nematoda: Aphelenchoididae) from *Ficus* subgenus *Urostigma* sect. *Americana* (Moraceae) in Central America. *Nematology* **19**, 427-461. DOI: 10.1163/15685411-00003059
- Davies, K.A., Ye, W., Center, B., Kanzaki, N., Bartholomaeus, F., Herre, E.A., Esquivel, A., & Giblin-Davis, R.M. (2017). Two new species and three morphospecies of *Ficophagus* from *Ficus* subgenus *Pharmacosycea* (Moraceae) in Central America. *Nematology* **19**, 351-374. DOI: 10.1163/15685411-00003055

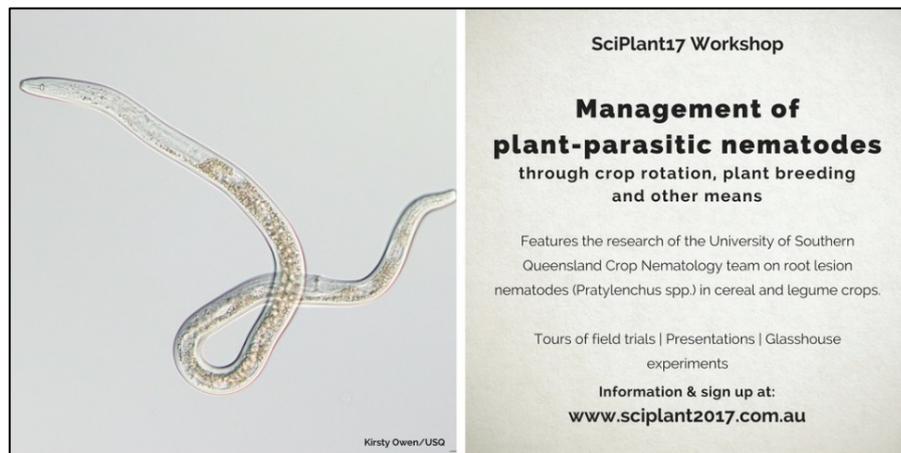
Kerrie Davies

NEWS FROM QUEENSLAND

University of Southern Queensland

The highlight for the USQ Crop Nematology team so far this year was a trip to India to conduct a workshop on root-lesion nematodes. Details of the two week trip are given later in newsletter on page 9. Rebecca Zwart had the opportunity to enthuse a group of Year 10 high school students about nematology in a USQ outreach day at a local high-school.

Rebecca Zwart, Kirsty Owen and Jason Sheedy are organising a workshop on management of plant-parasitic nematodes following the upcoming 2017 “Science Protecting Plant Health” conference (Brisbane 26-28th September 2017). Participants will be transferred by bus from Brisbane to Toowoomba after the closing session of the conference on 28th September 2017 and returned to Brisbane in the afternoon of 29th September 2017 following the workshop. A general meeting of AAN will be held during dinner on Thursday evening in Toowoomba. We hope to see you all there and encourage you to present your latest research findings at the workshop. See page 14 for more details.



Kirsty Owen and Ros Reen are also organising field trips to the grain production region of the Darling Downs and northern NSW horticultural production areas as pre- and post-conference tours. We look forward to showing you the many delights of warm, sunny Queensland. For more information please see the conference website: <http://sciplant2017.com.au/workshops-field-trips#field-trips>

In social news, congratulations to Neil Robinson on his marriage to Pippa last month. We are also pleased to announce that Yujuan (Jady) Li's baby arrived safely on 23 May 2017 - a beautiful, healthy boy called Quintus Ryan Xu.

Recent publications

Thompson, J.P., Rostad, H.E., & Whish, J.P.M. (2017). Survival of root-lesion nematodes (*Pratylenchus thornei*) after wheat growth in a vertisol is influenced by rate of progressive soil desiccation. *Annals of Applied Biology* **170**, 78-88. DOI:10.1111/aab.12316

Thompson, J.P., Rostad, H.E., & Whish, J.P.M. (2017). Survival of root-lesion nematode *Pratylenchus neglectus* during progressive soil desiccation after growth of wheat in a vertisol. *Biology and Fertility of Soils* **53**, 357–366. DOI 10.1007/s00374-017-1184-2

Rebecca Zwart

NEWS FROM WESTERN AUSTRALIA

Murdoch University, SABC

The Murdoch University Plant Biotechnology Research Group has two main parts, plant nematology/entomology and plant virology. The plant nematology section continues to be very active in the areas of:

- Biology and diagnostics of plant nematodes
- Genomics and transcriptomics of root lesion nematodes
- Molecular basis of nematode-plant interactions (effectors, vital genes)
- Commonalities in mechanisms of plant parasitic nematodes and sucking insects (aphids)
- Host-induced gene silencing for pest control (HIGS)
- Spray-induced silencing for pest control (SIGS)
- Updating Gene Technology Regulations to take account of new technologies like genome editing and targeted mutagenesis, and the history of safe usage of GM crops/foods.

Some specific topics are indicated by the PhD student projects and publications below.

PhD students

- Akther, Jebin. Stability and heritability of RNAi in generations of transgenic plants and nematodes
- Khot, Sameer. Bioinformatics identification and functional characterisation of parasitism effectors of root lesion nematodes (*Pratylenchus thornei* & *P. zaeae*). (Joint supervision with Dr John Fosu-Nyarko).
- Adeel, Muhammad. Comparing the effectiveness of processed and unprocessed dsRNA in triggering gene silencing of nematode and insect pests.
- Maqsood, Maria. Towards understanding common mechanisms of nematode and aphid effectors for plant parasitism.
- Rathinasamy, Malathy (writing up). RNA processing in plant parasitic nematodes. (Joint supervision with Dr John Fosu-Nyarko).
- Rahman, Silvee (writing up). Development and application of a rapid method to test plants for RNAi-based resistance to nematode and aphid pests of economic importance to crop plants. (Joint supervision with Dr John Fosu-Nyarko).
- Farhana Begum (writing up). Biology and molecular characterisation of a root lesion nematode conspecific to *Pratylenchus curvicauda*.
- Naz, Fareeha (submitted). Effective delivery of gene silencing triggers to plant pests. (Joint supervision with Dr John Fosu-Nyarko).

PhD students and completions

- Bilgi, Vineeta (2016/17) Using RNAi to confer host resistance to aphids. (Joint supervision with Dr John Fosu-Nyarko). (Responding to Examiners' comments).
- Harshini Herath (2016/7). Comparative and functional analysis of the splicesome units of the cyst and root lesion nematodes.

Recent Publications

Fosu-Nyarko, J. & Jones, M.G.K. (2016). Advances in understanding the molecular mechanisms of root lesion nematode-host interactions. *Annual Reviews of Phytopathology* **54**, 253-278. <https://doi.org/10.1146/annurev-phyto-080615-100257>

- Iqbal, S., Fosu-Nyarko, J. & Jones, M.G.K. (2016). Genomes of parasitic nematodes (*Meloidogyne hapla*, *Meloidogyne incognita*, *Ascaris suum* and *Brugia malayi*) have a reduced complement of small RNA interference pathway genes: knockdown can reduce host infectivity of *M. incognita*. *Functional and Integrative Genomics*, **16**(4), 441-457. DOI: 10.1007/s10142-016-0495-y
- Bilgi, V., Fosu-Nyarko, J. & Jones, M.G.K. (2016). Using vital dyes to trace uptake of dsRNA by green peach aphid allows effective assessment of target gene knockdown. *International Journal of Molecular Sciences* **18**, 80. DOI:10.3390/ijms18010080.
- Harikrishna, J.A., Othman, R.Y., Mispan, M.S., Iqbal, S., Han, Y. & Jones, M.G.K. (2017). Mini review: Biosafety of RNA silencing and genome editing technologies in crop plants: Malaysian and Australian research perspectives *Asia Pacific Journal of Molecular Biology & Biotechnology* (in press)
- Smiley, R.W., Dababat, A., Iqbal, S., Jones, M.G.K., Maafi, Z.T., Peng, D., Subbotin, S. & Waeyenberge, L. (2017). Cereal Cyst Nematodes: A Complex and Destructive Group of *Heterodera* Species *Plant Disease* (In press, online from 1 July 2017).
- Jones, M.G.K. (2017). New strategies to control nematode and aphid pests of grain crops. GRDC Grains Research Updates 2017, 4 pp, refereed article.
- Jones, M.G.K. (2017). New Breeding Technologies: Potential for crop improvement and Current Regulatory Status. GRDC Grains Research Updates 2017, 4 pp, refereed article.
- Fosu-Nyarko, J., Iqbal, S. & Jones, M.G.K. (2017). Targeting nematode genes by RNA silencing. Chapter 10 in 'Plant Gene Silencing: Mechanisms and Applications' ED T Dalmay, CABI International, pp 176-192.
- Jones, M.G.K., Wylie, S.J. & Milroy, S. (2017). New breeding technologies and opportunities for the Australian vegetable industry. Review for HIA.

Other activities

- Jones, MGK. Ausbiotech Ag & Foodtech Symposium 2-3rd August 2016, Brisbane, Invited Speaker.
- Jones MGK (2016). Murdoch University submission on the Review of the Gene Technology Regulations Act 2001.
- Jones, MGK. Global Entrepreneurship Community 2016 'Reimagine the Future of Entrepreneurs' Kuala Lumpur Convention Centre, Malaysia, 8-9th December 2016: invited speaker.
- Jones MGK. Ausbiotech Ag & Foodtech Symposium 29-30th August 2017, Adelaide, Organising Committee.

Mike Jones

NEWS FROM VICTORIA

Horsham

A soil-borne disease symposium convened by Grant Hollaway, Alan McKay, Steve Simpfendorfer, Rob Loughman and Luise Sigel was held in Sydney during February 2017. This symposium showcased the work conducted under a number of national and state based GRDC projects on nematodes and other soil-borne diseases. This provided an excellent opportunity to document research conducted over the last four years. Numerous papers were written by Grant and Josh for this symposium.

The Victorian 2017 season has had a wet start, with our final nematode trials being sown as we write this report. A total of 21 trials have been sown across seven trial sites in the Victorian Wimmera and Mallee. The trials are assessing *Pratylenchus thornei* and *P. neglectus* yield losses and resistance in pulses, canola and cereals and *Heterodera avenae* yield losses and resistance in cereals. Less trials were sown this year with the program gradually winding down as projects are coming to an end, with the focus on data analysis and writing.

A new GRDC CCN (*H. avenae*) fact sheet was released for the Southern and Western grain growing regions earlier this year. There were several radio, newspaper and television interviews conducted following its release. The focus is now moving towards updating the root lesion nematode fact sheet with the new information developed under the national nematology program.

Joshua Fanning and Grant Hollaway

NEWS FROM CHINA

Farman Ali is coming to the close of his one-year research program at Anhui Academy of Agricultural Sciences, Hefei, Anhui, China. He is going back home next month to resume his University job at Abdul Wali Khan University, Mardan, Pakistan.

Just before going back home, he published part of the research he conducted in New Zealand at the University of Otago. The title and link to full text are given below.

Recent publications

Ali, F. & Wharton, D.A. (2017). A survey of entomopathogenic nematodes from Otago, New Zealand, with the first record of *Steinernema kraussei* (Steiner, 1923) (Rhabditida: Steinernematidae) from the Southern Hemisphere. *New Zealand Journal of Zoology*. DOI: 10.1080/03014223.2017.1322620
<http://www.tandfonline.com/eprint/89UiMCrur82H9p5hAVEj/full>

Farman Ali

Research Report

OCCURRENCE OF A ROOT LESION NEMATODE SPECIES CLOSELY RELATED TO *P. CURVICAUDA* IN THE WA WHEAT BELT

Farhana Begum, PhD student

(Supervisors: Shashi Sharma, Mike Jones, John Fosu-Nyarko)

Murdoch University

Nematodes in soil samples collected from Pingelly were extracted with a mist apparatus, and were present at 12 nematodes/g soil. The nematodes were grown in glasshouse host range trials with 61 different species and cultivars, and after 10 weeks were again extracted from roots and soil using the mist apparatus. Typical lesions were evident on some host plant roots. The most susceptible plants (RF>1) included, wheat, barley, sorghum, millet; legumes were moderate to poor hosts, with some pasture plants and lupins poor hosts.

Morphological and molecular analysis of these nematodes was undertaken, and specimens were also sent to Dr M. R. Siddiqi in the UK for additional morphometric analysis.

The nematodes were identified as a species of *Pratylenchus*, but the morphometric measurements differed from those reported for other *Pratylenchus* species in WA, notably *P. quasiteriodes*. The morphometric analyses both in Perth and by Dr Siddiqi, backed by molecular data on sequences of the ITS regions from different individual nematodes, indicate that these nematodes appear to be conspecific with *P. curvicauda*. In fact, *P. curvicauda* has previously been identified from soil samples in WA (Siddiqi et al, 1991), so these results add to the complexity of root lesion nematodes and their management in the WA wheatbelt.

Workshop Report

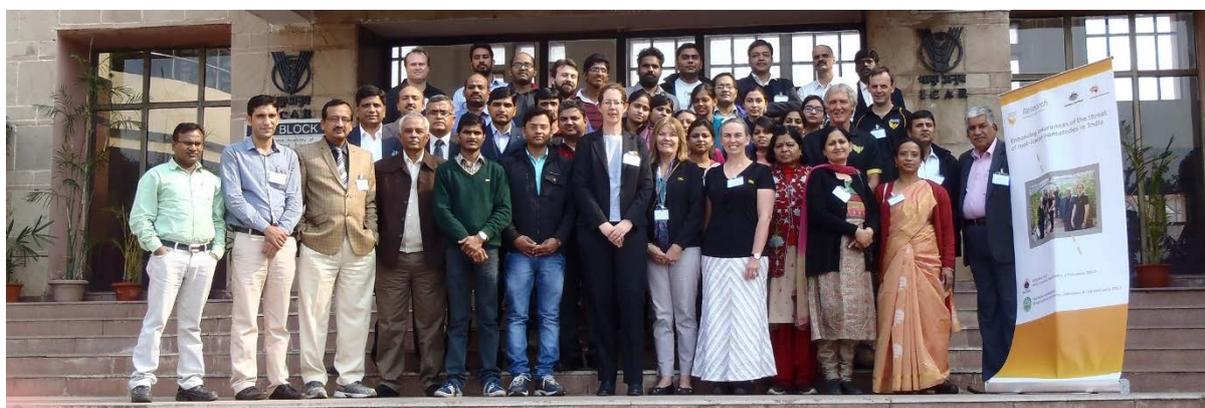
ENHANCING AWARENESS OF THE THREAT OF ROOT-LESION NEMATODE IN INDIA

In February, six members of the University of Southern Queensland's Crop Nematology group, Rebecca Zwart, Kirsty Owen, Jason Sheedy, Neil Robinson, Tim Clewett and Roslyn Reen, travelled to India as part of a project funded by the Australian Government through the Australia-India Council of the Department of Foreign Affairs and Trade. Rebecca drew on her 8.5 years of living and working in India to successfully organise and lead the group on a two week tour, which including visiting ICRISAT in Hyderabad, conducting a seminar day in New Delhi, organising a 5-day workshop in Jabalpur, Madhya Pradesh, and culminated in a visit to the Taj Mahal.

Pratylenchus thornei has emerged as a serious constraint to chickpea production in India. However, awareness of the threat of yield losses from root-lesion nematodes (RLN) in India remains low because the symptoms are often over looked and confused with drought stress and/or nutrient deficiencies, and there are no clear indicators of infection such as root galling caused by *Meloidogyne* spp.. With the agro-ecological environment of Madhya Pradesh (the heart of the chickpea growing region of India) similar to the sub-tropical grain region of eastern Australia in terms of soil type, cereal and pulse crops grown and pests and diseases attacking these crops, sharing our research experiences to overcome these challenges was of mutual benefit to both countries.

The objectives of the project were to (a) raise awareness of RLN (b) showcase the research of the USQ Crop Nematology group on RLN (c) build skills and capability for RLN research in India and (d) bring together Australian and Indian nematologists to discuss research strategies and opportunities for future collaboration.

A one day seminar was held at the National Academy of Agricultural Sciences Complex in New Delhi in partnership with the Indian Agricultural Research Institute (IARI), on 3rd February 2017. Forty-one participants from seven states of India (Delhi, Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Andhra Pradesh and Telangana) attended the Seminar Day in New Delhi and included nematologists, plant pathologists, plant breeders, molecular biologists and students. Representatives from three international research organisations based in India (CIMMYT, ICRISAT and AVRDC - The World Vegetable Centre) also attended.



Participants of the one day seminar in New Delhi.

From 6-10th February 2017, the USQ Crop Nematology group held a 5-day practical training workshop hosted by Jawaharlal Nehru (JN) Agricultural University in Jabalpur, Madhya Pradesh. Twenty-two participants from five states of India (Madhya Pradesh, Uttar Pradesh, Delhi, Rajasthan and Telangana) attended the workshop and included seven nematologists, two plant pathologists, five extension agronomists/plant pathologists and eight students. None of the workshop participants had worked previously in international collaborations.



Participants of the 5-day workshop at JN Agricultural University, Jabalpur, India.

The workshop consisted of technical presentations, field tours and practical laboratory activities. During the field tour we visited the RLN and chickpea breeding trials at the JN Agricultural University farm, ICAR Directorate of Weed Research and the Borlaug Institute for South Asia (BISA) – Manegaon field station, Jabalpur.

Questionnaires completed by the project participants captured a change in perceptions with 78% of participants strongly agreeing and the remaining 22% agreeing that their awareness of RLN increased following the seminar day and workshop. The practical sessions of the 5-day training workshop were very well received, with great interest in methodology and technical aspects of our research. Technical capacity for RLN research in India was significantly increased as an outcome of the project with 94% and 6% of participants strongly agreeing and agreeing, respectively, that they have confidence in using the practical skills that they learnt during the workshop. All of the participants responded that the Whitehead tray nematode extraction method demonstrated was very useful (none of the participants had seen this method previously). All participants indicated that their skill level in the following areas had increased: (a) identification of symptoms caused by RLN, (b) collection of soil and root samples from the field (c) extraction and counting of the number of nematodes in soil and root samples (d) identification of species of RLN (e) establishment of mass cultures of RLN and (f) establishment of statistically valid glasshouse and field trials.

The USQ Crop Nematology group returned to Australia with a new appreciation for the land of contrasts, blue skies and the potential width of lanes on highways!

Rebecca Zwart

Short Course 2017

NEMATODES IN CROPPING SYSTEMS: IDENTIFICATION & TECHNIQUES 2017

This document is to give information on the course currently scheduled for:

University of The South Pacific, Laucala Campus, Suva, Fiji, 27th November-1st December 2017.

A draft timetable for the course is below. The content and particular nematodes discussed in the various sessions will be varied to suit the expressed interests of participants. Participants are encouraged to bring specimens or material (subject to local quarantine restrictions) for study and discussion during the course.

The presenters will be:

Dr Mike Hodda, CSIRO

Dr Kerrie Davies, University of Adelaide

Dr Sunil Singh, University of The South Pacific, Alafua Campus, Samoa

The cost of the course is AUD2000 (excluding GST).

The course costs cover all materials (microscope slides etc), plus a manual, and morning and afternoon teas, but not breakfast, lunch or dinner, accommodation or meals. Some local transport MAY be available by arrangement with local participants. International participants can be met at the airport if desired.

The workshop requires 9 participants to proceed.

For further enquiries or to book a place, please email the course coordinators:

mike.hodda@csiro.au or sunil.singh@samoa.usp.ac.fj

Once confirmed, payment details will be forwarded. Payment can be by Credit card or invoice, but will be required prior to the course commencement.

No particular accommodation is suggested or recommended, but low-cost student accommodation at the University should be available, in addition to hotels of various standards. Cost for this option is about AUD100-130 per day for meals and accommodation.

Why Nematodes?

Nematodes are the most numerous multi-celled organisms on earth. Soil nematodes are of great importance to cropping systems: they can significantly reduce plant yields; they are biocontrol agents of invertebrate pests; and they recycle soil nutrients. Recent work suggests that they have potential as bio-indicators of soil health. They are frequently encountered in quarantine work.

Specialised knowledge is required to handle and identify nematodes. This course provides the skills and information needed to confidently handle nematodes in a wide variety of situations. It includes sampling, collecting and preparing nematodes for identification, using keys and other tools for identification, as well as the background information needed to deal with nematodes.

Is this Course for You?

The workshop suits researchers and professionals working in agriculture, quarantine, green keeping, and soil biology, who need to understand the principles and practice of handling soil, plant and insect nematodes. It will provide hands-on experience in sampling, extraction, specimen preparation, culturing, diagnosis, and identification. There will be opportunity for interaction with experts in the field. Participants should have a degree which includes biology, agriculture, or soil science or have appropriate work experience to undertake the workshop. Less experienced participants can be supplied with recommended reading material prior to the workshop.

Course Presenters

Dr. Mike Hodda (National Research Collections Australia & Biosecurity Flagship, CSIRO, Canberra), Dr. Kerrie Davies (School of Agriculture, Food & Wine, The University of Adelaide) and Dr Sunil Singh (Biology Discipline, University of The South Pacific) will conduct the workshop. The presenters have almost 100 years of experience researching nematodes between them, have described numerous species, have research experience in the entire field from pure science to practical applications. They have many years teaching experience to both graduates and undergraduates, and together have studied most taxonomic groups of nematodes over much of the Australia-Asia-Pacific Region.

Course Content

- Sampling and extraction
- Preparation of specimens
- Microscopic techniques
- Ecology and physiology of nematodes
- Identification of free-living, plant parasitic and entomophilic nematodes
- Molecular methods
- Management & Control
- Culturing (if requested)

Nematodes to be Considered

<i>Anguina</i>	Seed & Leaf Gall Nematodes
<i>Aphelenchoides</i>	Bud, Leaf & Foliar Nematodes
<i>Bursaphelenchus</i>	Pine Wood Nematode
<i>Ditylenchus</i>	Stem & Bulb Nematodes
<i>Globodera</i>	Potato Cyst Nematodes
<i>Helicotylenchus</i>	Spiral Nematodes
<i>Hemicycliophora</i>	Sheath Nematodes
<i>Heterodera</i>	Cyst Nematodes
<i>Heterorhabditis</i>	Insect Biocontrol Nematodes
<i>Meloidogyne</i>	Root Knot Nematodes
<i>Morulaimus</i>	Australian Sting Nematodes
<i>Paratrichodorus</i>	Stubby-Root Nematode
<i>Pratylenchus</i>	Root Lesion Nematodes
<i>Radopholus</i>	Burrowing Nematodes
<i>Scutellonema</i>	Spiral Nematodes
<i>Steinernema</i>	Insect Biocontrol Nematodes
<i>Tylenchorhynchus</i>	Stunt Nematodes
<i>Tylenchulus</i>	Citrus Nematode
<i>Tylosorus</i>	
<i>Xiphinema</i>	Dagger Nematodes
Tylenchida	Minor Plant Parasites
Rhabditida	Microbial-Feeding Nematodes

Mononchida..... Predatory Nematodes
Dorylaimida..... Omnivorous Nematodes
Areolaimida Omnivorous Nematodes
Actual list depends on participants interests.

Course Delivery & Materials

This is designed as a laboratory-based, hands-on course supported by lectures and discussion. The workshop will be held in laboratories and lecture rooms on the Laucala Campus of the University of The South Pacific, Suva, Fiji. A practical manual containing outlines of topics covered, recipes for specific techniques, a key, a glossary and a bibliography of suitable references will be provided at the beginning of the course. Participants are encouraged to bring fixed material which they may wish to work on.

Course Fees

The workshop fee will be \$2000 (AUD, excl GST where applicable). The fee is payable after notification that a minimum number of participants has been met. On acceptance registration, an invoice will be sent, which can be paid by Money Order, cheque payable to “CSIRO, Nematode Identification” (ABN 41687119230), credit card, or direct transfer via BPAY. The fee covers participation, the handbook and the provision of consumables such as fixatives, slides, and culture media. Tea and coffee and a course mixer will also be provided. Travel costs, accommodation, and meals are not included in the fee. The workshop requires 9 participants to proceed.

Accommodation/Meals

A variety of food outlets are available around the venue. Please indicate on the form if you require details from the workshop co-ordinator. Participants should make their own accommodation arrangements. The coordinators can supply lists of potential accommodations, with both low-cost student accommodation at the University and hotels of various standards nearby.

For more Information

Dr Mike Hodda mike.hodda@csiro.au ph (02) 6246 4371
Dr Sunil Singh sunil.singh@samoa.usp.ac.fj

Helpful Information for the Organizers

It will help the organizers adjust the course to participants’ interests and experience if the following information is provided.

University or other Tertiary Education: institution, degree, subjects with approx. dates?

Experience in nematology?

Main interests in particular aspects of plant, insect or soil nematology?

Other queries or preferences?

Workshop

MANAGEMENT OF PLANT-PARASITIC NEMATODES THROUGH CROP ROTATION, PLANT BREEDING AND OTHER MEANS

Date: 29th September 2017

Location: Toowoomba

Cost: \$300 per attendee (does not include accommodation in Toowoomba on Thursday night)

Max. no of participants: 20

Summary

Plant-parasitic nematodes are important constraints to crop production worldwide. This workshop will feature the research of the University of Southern Queensland's (USQ), Centre for Crop Health, Crop Nematology team on root-lesion nematodes (*Pratylenchus* spp.) in cereal and legume crops. Participants will be transferred by bus from Brisbane to Toowoomba after the closing session of **Science Protecting Plant Health 2017** on 28th September 2017 and returned to Brisbane in the afternoon of 29th September 2017 following the workshop.

The workshop will begin at the Crop Nematology team's field research site at Formartin (70 km west of Toowoomba) and participants will inspect experiments on pre-breeding, field resistance and yield loss in wheat, chickpea, faba bean and field pea and National Variety Trials for wheat and barley. After lunch, workshop participants will return to Toowoomba for a series of seminars. Workshop participants will have the opportunity to present new developments in the field of nematology and exchange ideas. Nematology students are encouraged to present outlines and results of their projects. The workshop will conclude with afternoon tea and a tour of the USQ Crop Nematology glasshouse experiments.

Presenters

The workshop is organised by Rebecca Zwart and Kirsty Owen from the USQ Centre for Crop Health, Crop Nematology team. The Crop Nematology team, led by Professor John Thompson, is experienced in researching integrated nematode management options that sustainably reduce root-lesion nematode populations and improve crop yields.

Registration

Register to participate in the workshop online at the **Science Protecting Plant Health 2017** website <http://sciplant2017.com.au/workshops-field-trips#workshops-2>

Contact Rebecca Zwart at rebecca.zwart@usq.edu.au for further details.