

Information for prospective participants

Nematodes in cropping systems: identification & techniques 2019

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

University of Adelaide, 2nd to 6th December 2019.

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 Dorota Porazinska, University of Florida

The cost of the course is AUD2000 (excluding GST) or AUD2200 (including 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. Please send expressions of interest as soon as possible, and definitely before the end of September 2019.

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

mike.hodda@csiro.au

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 there are a number of hotels of various standards available nearby. A list will be sent closer to the course.

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. For the first time, molecular methods will be covered in some detail.

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 Location

This course is being held in Adelaide, close to the southern grain region, grape-growing areas, and vegetable production. Nematodes from other crops and places in Australia, New Zealand and elsewhere will be treated during the course, but through fixed material. There are direct flights to Adelaide from most Australian capital cities.

Course Presenters

The workshop will be conducted by:

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. Dorota Porazinska (Institute of Food & Agricultural Sciences, University of Florida).

The presenters have almost 100 years 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, the USA, Europe and Africa.

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>Hemicylichophora</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>Tylodorus</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 at the Waite Campus of the University of Adelaide. 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 credit card, or many other means (Money Order, cheque payable to "CSIRO, Nematode Identification" (ABN 41687119230), direct transfer or 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 Kerrie Davies Kerrie.davies@adelaide.edu.au

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?

1. Monday 2 December

0900	lecture	introduction to course, housekeeping what is a nematode and what is not a nematode? (MH)
1000	lecture	nematodes and their basic anatomy (KD)
1100	morning tea	
1130	lecture	nematode physiology and implications for quarantine, survival (KD)
1230	lunch	
1330	practical	sampling plant and insect nematodes from a variety of situations on campus (agricultural & native), set up some extractions (KD + MH + DP)
1500	afternoon tea	
1530		continue practical
1700	Finish	

2. Tuesday 3 December

0900	Lecture	nematode ecology: distribution(MH)
1000	morning tea	
1030	Practical	complete extraction of nematodes from samples taken Monday using other methods if required, viewing, counting (MH + KD + DP)
1230	Lunch	
1330	Lecture	nematode ecology: trophic and other groupings (MH)
1430	Practical	identification of major trophic types of nematodes (MH)
1500	afternoon tea	
1530		continue practical (MH)
1700	Finish	

3. Wednesday 4 December

0900	Lecture	sampling background and theory, sampling for different purposes, bait selection (MH)
1000	morning tea	
1030	Lecture	population dynamics (KD)
1130	Practical	mounting and examination of nematodes (KD)
1300	Lunch	
1400	Lecture	reproduction, hatching, life cycles, host ranges (KD)
1500	Practical	preparation of nematodes for microscopic examination, fixing and mounting (MH + KD + SS) rapid methods, lactoglycerol, processing (KD)
1800	Finish	

4. Thursday 5 December

0900	Lecture	phylogeny, evolution and systematics to order level (MH)
------	---------	--

0930	lecture	Nematode disinfestation (MH)
1000	morning tea	
1030	Lecture	nematode systematics and identification of species (MH)
1130	Practical	identification of nematode species, characteristics of major pest species in Australia (Root Knot Nematode, Cyst Nematodes, Root-Lesion Nematode, Spiral Nematode, Dagger Nematode, Stunt Nematode, Pine Wilt Nematode, other entomophilics, and non-pathogenic species) (MH + KD + DP)
1230	Lunch	
1330	Practical	self-paced examination of nematodes (MH + KD + DP)
1500	Lecture	Species in plant-parasitic nematodes: the genus <i>Pratylenchus</i> , <i>Radopholus</i> & <i>Aphelenchoides</i> (Root Lesion, Burrowing & Leaf Nematodes) (MH)
1530	Lecture	Species in an Entomophilic nematode: the <i>Schistonchus</i> group (Fig Wasp Nematodes) (KD)
16000	Lecture	Molecular species identification (DP + MH)
1900	informal course dinner	local restaurant

5. Friday 6 December

0900	lecture	major pest genera, soil-dwelling pests of plants (KD)
1000	morning tea	
1030	lecture	Movement and dispersal of nematodes, hygiene and quarantine (MH)
1100	lecture	major pest genera, insect associates and pests of aerial parts of plants (KD)
1200	practical	identification of unknowns, revision as necessary, specific topics requested by participants (MH + KD + SS)
1230	lunch	
1330		continue identification
1400	practical	identification of unknowns, revision as necessary, specific topics requested by participants (MH + KD)
1500	lecture	Molecular identification of nematodes in mixtures (DP + MH)
1600	Practical	self-paced examination of nematodes (MH + KD + SS)
1700	course close, evaluation	Presentation of certificates
1730	finish	