Obituary: Professor H. R. Wallace—distinguished nematologist and plant pathologist 1924–2011

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H.R. (Harry) Wallace was born on 12 September 1924, in Lancashire, England. During World War II, he served in the Royal Navy. He subsequently trained as a zoologist and then studied wood-boring beetles for his Ph.D., which he received from the University of Liverpool. In 1952, he joined the School of Agriculture at the University of Cambridge and began working on nematodes, studying seasonal emergence and the effects of soil structure, particularly aeration, on hatching in *Heterodera schachtii*. Whilst at Cambridge, Harry Wallace had extensive discussions with Sir James Gray, Professor of Zoology, which led to his work on locomotion in nematodes, commencing soon after he moved to Rothamsted Experimental Station (now Rothamsted Research) in 1955. However, Harry Wallace also continued to investigate the effects of environmental factors on hatching and infectivity of juveniles, including attraction to roots, particularly in *Heterodera* spp. and *Ditylenchus*

dipsaci. For some of these studies he worked collaboratively with Audrey Shepherd and Jack Hesling. At Rothamsted he also supervised Cliff Blake's Ph.D. project on *Ditylenchus*. In 1960, he was awarded a D.Sc. from the University of Liverpool.

In 1962, Professor W.R. (Buddy) Rogers visited Rothamsted and encouraged Harry Wallace to move to Australia. He arrived at the then new CSIRO Division of Horticulture in Adelaide, where Alan Bird was already employed, in 1963. There as Chief Scientist he concentrated his efforts on *Meloidogyne javanica* and continued his work on environmental factors affecting movement of infective juveniles, studying the development, hatching and survival of eggs. He also became interested in factors affecting reproduction of *M. javanica*, and the effects of the nematode on its hosts. Seymour Van Gundy (University of California, Riverside, CA, USA) spent a sabbatical with Harry Wallace and Alan Bird in 1966, and collaborated with them on a study of ageing and starvation in juveniles of *M. javanica* and *Tylenchulus semipenetrans*.

In 1971, Harry Wallace was appointed to the Chair of Plant Pathology at the Waite Institute, The University of Adelaide. Whilst this meant he had to make contributions to undergraduate teaching and an increased administrative load (and hence less personal time for research), it also meant that he had Ph.D. students and that he could broaden his research interests. He continued his work on root-knot nematode and its effects on photosynthesis and nutrient demand in host plants. One major study, with Brian Stynes, involved the use of a synoptic approach to assess the relative importance of various environmental factors on the growth and yield of plants. With Frances Reay he investigated the susceptibility to and effects of *M. javanica* on various native plants and investigated the biodiversity of nematodes associated with the Australian bush.

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In 1965, he published a review paper (Wallace 1965) that was important in crystallising ideas about the direction to be taken for research on the cereal cyst nematode (CCN), *H. avenae*. It set out the issues to be resolved before growers could be provided with ‘recommendations based on scientific facts relevant to Australian conditions’. The ten key research topics he listed were: *i*) the distribution of the nematode in Australia, especially in areas outside South Australia and Victoria; *ii*) an estimate of losses in yields; *iii*) the influence of environmental conditions on survival, dormancy, hatching, infection and population increase in relation to the Australian climate; *iv*) the factors in different soil types affecting distribution and abundance; *v*) the taxonomic status of Australian populations of *H. avenae* and whether different races existed; *vi*) host preferences of different populations and races; *vii*) changes in population density with season, soil type and crop locality; *viii*) the relationship between crop damage and nematode population density under different environmental conditions; *ix*) the testing of wheat varieties for resistance to the nematode; and *x*) the use of nematicides in badly infested areas. It is a tribute to his insight that within 2 years of arriving in Australia and having no experience with CCN he was able to present such an astute plan of action. All of Harry Wallace’s suggestions were acted upon and CCN is now managed through a combination of resistant and tolerant varieties and crop rotation. He gave practical support to Alan Dube’s (Department of Agriculture, later SARDI) group, providing space in the Hannaford building (also known as the departmental Field Laboratory) on the Waite campus. Without this support, Dube’s group could not have developed as it did, delivering significant contributions to South Australia and Australian agriculture through work on CCN, *Anguina* and later *Pratylenchus*.

One of Wallace’s great strengths was his ability to write with clarity and enthusiasm. He was able to integrate, effectively summarise, critically examine and review large amounts of information (Wallace 1968, 1978a, 1978b, 1989). He published extensively and his first book, *The biology of plant parasitic nematodes* (Wallace 1963), was based on his studies on cyst nematodes in England during the 1950s, and examined the effects of factors such as soil structure, soil moisture, temperature and aeration on hatch and nematode motility. His ideas on many aspects of plant nematology gradually evolved as he came to recognise the ecological complexity of cropping systems. Since nematodes were only one of many factors contributing to plant disease, his later papers considered the effects of nematode/environment interactions on the reproduction of *M. javanica* and on the growth of the host plant (Wallace 1966, 1969, 1971). From these studies he concluded that, in a given ecological situation, nematode numbers and environmental factors affected

nematode reproduction but host tolerance and numerous environmental stresses influenced the response of the plant to nematode attack. This theme was expanded in *Nematode ecology and disease* (Wallace 1973), which should remain required reading for any student of plant nematology. Wallace outlined the various ways that nematodes caused damage to plants, considered the way plants responded to nematode infection and discussed the environmental factors that influence both nematodes and their hosts. He pointed out that disease problems in the field were complex, that nematodes were only one of many factors (both biotic and abiotic) contributing to the problem, and suggested that a multidisciplinary approach was needed when diagnosing diseases and developing strategies to reduce losses caused by a disease. Later papers provide a detailed example of the use of such an approach to determine the relative importance of various environmental factors on the growth and yield of wheat in South Australia (Stynes et al. 1979, 1981). He has been described as a thinker who inspired generations of nematologists (Stirling et al. 2008) and plant pathologists. He became a member of the Australasian Plant Pathology Society in 1976.

Professor Wallace was a particularly able administrator. On most days, his desk was cleared by lunch time, and the door to his office was then opened—a signal to everyone that he was available for advice, discussions and counsel. In this way, he helped and influenced countless people, including undergraduate and postgraduate students and academics. During his tenure at Adelaide University he also held key positions as Chairman of the Academic Board, Acting Director of the Waite Institute, and Acting Vice-Chancellor. Even Sir Thomas Playford, former Premier of South Australia, dropped in to discuss disease problems in his cherry orchard. Harry Wallace was a kind, gracious, thoughtful man, of great generosity and tolerance and he also assisted many of his staff and students overcome their personal problems. He was a great teacher and caring human being as well as an excellent communicator. This, together with his enthusiasm and insight, meant that he was much loved. In 1975, Professor Wallace was elected a Fellow of the Australian Academy of Science.

After his retirement, he busied himself with environmental matters, particularly related to a natural wetland system at the mouth of the River Murray known as the Coorong. This scenically beautiful region is of great cultural significance to the Aboriginal people and an important habitat for many animals and waterbirds. Prof. Wallace was a founding member of the Friends of the Coorong, a committee member from 1990–1994, and President from 1994–1997. He collated a herbarium for the Coorong region, which won the South Australian Department of the Environment’s Best Public Education

Award in 1996. He was also an active member of the Friends of the Parks Inc., which supported National Parks. He served as a member of various government committees, including the Upper South-East Water Conservation and Drainage Advisory Committee (1996), the Coorong National Park Community Reference Group (2006), and the Coorong Consultative Committee (member 1992–2005, Chairperson 1996–2004).

Professor Wallace was an active sportsman and ran marathons in his middle-age. He followed both tennis and rugby closely. He and Margaret were happily married for 60 years, and had two daughters, Amanda and Sally. He died on 26 July 2011, aged 86 years, after a short illness.

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