PLANT AND SOIL NEMATODES

THE CONTINUING SPREAD OF SOUTHERN STING NEMATODE (*IBIPORA LOLII*): ONE OF THE BEST EXAMPLES OF BIOSECURITY FAILURE IN AUSTRALIA

Southern sting nematode, by far the most destructive nematode pest of turfgrass in Australia (see Fact sheet PSN 027), was first found in the Newcastle region of NSW in the 1970s. This sheet covers the biosecurity failures that have allowed the nematode to spread around the country in the last fifty years.

Initial introduction

Ibipora lolii was originally detected in soil samples from the Islington Bowling Club, Newcastle in 1975, and later described by Siviour and McLeod (1979). However, further studies suggested the nematode is not a native species, as it was not detected in undisturbed natural habitats in the sandy coastal soils in the Newcastle region. Also, molecular studies indicated that is not closely related to genera in the same family that are only found in Australia (Stirling et al. 2013). As Newcastle is a major port and several species of *Ibipora* have been described from Brazil and Puerto Rico, the most likely scenario is that *I. lolii* came from South America and was introduced to Newcastle before or soon after the Second World War.

Movement to Western Australia

Observations in the 1970s (Siviour and McLeod 1979) indicated that *I. lolii* was widely distributed in the Newcastle region and was causing extensive damage, particularly to bowling greens and putting greens. In 1971, the 'National Park' strain of couch grass was discovered and propagated at the National Park Bowling Club in Newcastle. This new strain was taken to Perth in the late 1970s and planted at more than 100 bowls clubs. Within ten years, *I. lolii* was causing severe damage and the nematicide fenamiphos was being widely used as a control measure (Stirling et al. 2013). Thus, the decision to allow turf infested with *I. lolii* to be introduced into Western Australia was the first of many poor judgments made by state biosecurity authorities.

Infestation of turf farms and continuing spread in Western Australia

There are more than 500 sports fields managed by municipal councils in the Perth metropolitan area, and kikuyu (*Pennisetum clandestinum*) is the dominant grass on those fields. A systematic survey undertaken in 2015 showed that 51% of those fields were infested with *I. lolii*, with population densities in localised areas of some fields high enough to be causing severe damage (Ruscoe et al. 2021). The reason for the widespread distribution of *I. lolii* is that turf farms selling kikuyu were infested with the nematode. Unfortunately, the state biosecurity authority did not establish a sting nematode detection protocol for turf farms and did nothing to prevent farms from selling infested turf.

Continuing spread in New South Wales

Southern sting nematode is a major problem on turf in NSW and managers of turfgrass facilities regularly submit samples to diagnostic laboratories to determine whether the nematode is responsible for the poor growth of the turf they are managing. Results from these samples indicate that *I. lolii* is widespread in the coastal region from Coffs Harbour to the south-eastern suburbs of Sydney and is occasionally found in samples from bowling greens in the north and west of NSW. This ever-increasing distribution has occurred because the state biosecurity authority has not warned the public about this pest, has not provided information on its distribution within the state, and has not prepared guidelines on how to minimise the chances of introducing *I. lolii* to a new area.

Infestations in other states and continued spread

A paper by Nambiar et al. (2010) indicated that *I. lolii* had been detected at a limited number of locations in Victoria and South Australia. However, results from diagnostic samples continue to show that new infestations are occurring in both states. For example, the main sports venue in Melbourne (the MCG) is infested with *I. lolii* and in 2018, a new infection was found at a golf club in a Melbourne suburb. Similarly, a golf club south of Adelaide was found to be infested in 2023. Again, biosecurity authorities have shown no concern. For example, when Agriculture Victoria was told that *I. lolii* had been found on a golf course in Melbourne, The Chief Plant Health Manager responded that the "nematode is not a biosecurity issue as it has been previously reported in Victoria"

Southern sting nematode at the Gabba

The Grand Final of the Australian Football League (AFL) is normally played at the Melbourne Cricket Ground (the MCG) but because of quarantine restrictions due to the Covid pandemic, the 2020 final was played at the Brisbane Cricket Ground (the Gabba). However, small rolls of turf from the MCG turf nursery were brought to the Gabba and laid at the three player entrances so that 'players could step on the hallowed turf as they ran onto the ground'. This turf was infested with *I. lolii* and so it was removed, the infested sites were fumigated, and nematicides were applied in an attempt to eliminate the nematode. Results initially suggested the eradication program had been successful, but later sampling indicated that it had failed, and so the Gabba is currently the only Queensland location known to be infested (Stirling et al. 2021, 2023).

When advised that *I. lolii* had been introduced to the Gabba, the following response was received from Queensland Biosecurity: "There is little point in taking action because *I. lolii* already has a wide distribution in other states and territories; has been established for many years; could be easily spread through the movement of infested soil and plant material; and movement of turf or associated equipment or machinery may have been occurring from infested areas for many years".

Should *Ibipora lolii* be listed as a priority pest by biosecurity authorities?

Australian biosecurity authorities have ignored *I. lolii* for more than 50 years, and although it will be impossible to prevent further spread, state-based agencies should attempt to slow the spread because the nematode is a threat to many agricultural industries.

- Yields of sugarcane are likely to be reduced if *I. lolii* becomes established, as the nematode multiplied to damaging levels in a pathogenicity experiment in pots (Stirling et al. 2013).
- Experience in Western Australia has shown that kikuyu, an important pasture grass in some regions of Australia, is severely damaged by *I. lolii*
- The host range of *I. lolii* has not been determined, but as sugarcane and kikuyu are good hosts, it may be able to damage other pasture grasses, and crops such as wheat, barley, oat, sorghum, and maize
- Other crops may also be threatened, as a closely related nematode in the USA (*Belonolaimus longicaudatus*) has a very wide host range and is a serious pest of many crops including cotton, peanut, and citrus (Ruscoe and Stirling 2021)

Consequently, Australian biosecurity authorities should do the following.

- Recognise *I. lolii* as a 'priority pest'
- Produce educational material on *I. lolii* which shows the damage it can cause and explains how turf practitioners and farmers can minimise the risk of spreading the nematode to new locations
- Use results previously obtained by private and government-funded nematology laboratories, and data obtained in an ongoing surveillance program, to map the distribution *I. lolii* within Australia
- Fund research aimed at determining the host range of *I. lolii* and its pathogenicity to crops that are grown in sands and sandy loam soils, as those soils are ideally suited to the nematode

Literature cited

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Fact sheet PSN 052. Updated 28 February 2023

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