



Failure of an attempt to eradicate southern sting nematode (*Ibipora loli*) from the Brisbane Cricket Ground (the Gabba)

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Abstract

When the Grand Final of the Australian Football League (AFL) was played at the Brisbane Cricket Ground (the Gabba) in October 2020, small rolls of turf from Victoria were laid at the three player entrances. This turf was infested with southern sting nematode (*Ibipora loli*) and so it was removed, the infested sites were fumigated, and nematicides were applied in an attempt to eliminate the nematode. Results published in September 2021 indicated that this appeared to have been successful, as *I. loli* was not detected in a post-treatment monitoring program. This paper reports results from an ongoing monitoring program which show that the eradication program was ineffective. Consequently, the Gabba is currently the only Queensland location known to be infested with *I. loli*. The paper finishes by listing the biosecurity issues that should be addressed to prevent further spread of the nematode.

Keywords *Ibipora loli* · Southern sting nematode · Biosecurity · Turf · Sports fields · Nematode monitoring

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-19 pandemic, the 2020 final was played at the Brisbane Cricket Ground (the Gabba). Prior to the final, a decision was made to transfer some small rolls of turf from the MCG turf nursery to the Gabba so that players could step onto some of its 'hallowed turf' as they ran onto the ground. Samples collected on the day after the Grand Final showed that these rolls were infested with southern sting nematode (*Ibipora loli*) (Stirling et al. 2021).

Although it is usually impossible to eliminate a plant-parasitic nematode after it is introduced to a new area, an attempt was made to eradicate the nematode because 1, *I. loli* is the most damaging nematode pest of turfgrass in Australia (Ruscoe and Stirling 2020); 2, the infested turf had only been laid in three very small areas between the

fence and boundary line; and 3, it was thought that this was the first introduction of *I. loli* into Queensland.

The eradication program, which is described in detail by Stirling et al. (2021), had three components: 1, removal of the introduced turf and the soil immediately below it; 2, incorporation of Basamid (940 kg dazomet) granules to a depth of 10 cm followed by irrigation and the placement of a plastic cover on the soil surface to minimise fumigant loss; and 3, application of non-volatile nematicides in the first 12 weeks after the fumigated area was replanted (three applications of abamectin followed by two applications of fluopyram).

Initial results suggested that the eradication program had been successful, as *I. loli* was not detected in multiple samples collected 2 weeks after the infested sites were fumigated, and 2, 4 and 6 months later (Stirling et al. 2021). The final sample in that study was collected on 31 May 2021, but because it is difficult to detect very low numbers of a particular nematode, the monitoring program was continued. Thus, samples were collected every six months to check whether *I. loli* had reappeared at the infested sites or had moved onto the oval. On 14 January 2022, a 22 mm diameter sampling tube was used to collect twenty cores to a depth of 15 cm (about 2 L of soil) from the 3 m x 1 m rectangle at each of the player entrances where infested rolls of turf had been laid. The remainder of the oval was also sampled

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Table 1 Number of *Ibipora lolii* detected at three player entrances at the Gabba in 2022

Entrance	Location*	No. <i>Ibipora lolii</i> /200 mL soil		
		14 January 2022	27 June 2022	8 December 2022
Lions	Inside	11.3	2.8	9.0
Lions	Outside	-	2.0	6.3
AFL away	Inside	0.0	0.4	11.5
AFL away	Outside	-	0.2	10.8
Cricket	Inside	14.6	0.4	0.0
Cricket	Outside	-	1.4	0.0

*Inside refers to the area where infested turf was laid. Outside is the surrounding area 1 m wide

in the same way as previously, with 20 cores being collected from the north-west, north-east, south-east, and south-west sections of the playing surface.

On 27 June and 8 December 2022, the oval was sampled in the same way, but as *I. lolii* had been detected at some of the player entrances in the previous sample, two samples were collected from each entrance. The first (termed 'inside') was from the 3 m x 1 m rectangle where infested rolls of turf had been laid and the second (termed 'outside') was from the 1 m wide area that surrounded this rectangle. Nematodes were retrieved by placing ten 200 mL sub-samples of soil on a tissue-covered mesh basket in a tray, saturating the soil with water, incubating the samples for three days at 25 °C and then sieving the nematode suspension twice on a 38 µm-aperture sieve (Whitehead and Hemming 1965).

When the soil collected from each player entrance in January 2022 was processed, *I. lolii* was not detected at the AFL away entrance (referred to as entrance 2 by Stirling et al. 2021). However, adults and juveniles of *I. lolii* were detected at the Lions and Cricket entrances (entrances 1 and 3, respectively) at counts of 11 ± 2 and 15 ± 2 nematodes/200 mL soil, respectively.

In June and December 2022, *I. lolii* was found at all player entrances and was also detected outside the area where the infested turf had been laid. However, numbers remained relatively low and were quite variable (Table 1).

These results show that the attempt to eliminate *I. lolii* from the Gabba was unsuccessful. However, it is not clear why this occurred. The most likely reason is that the chemicals applied did not move far enough down the soil profile to kill nematodes at depth. Dazomet is considered a soil fumigant but its breakdown product (methyl isothiocyanate) does not move readily in the gaseous phase, while the two non-volatile nematicides are relatively immobile in soil.

Results of samples collected from four locations on the oval in January, June, and December 2022 showed that numbers of plant-parasitic and free-living nematodes were much the same as those obtained by Stirling et al. 2021 (data not shown). As *I. lolii* was not detected in any of these samples, the fact that the nematode is beginning to spread beyond the

initial points of introduction raises concerns about whether it will cause above- or below-ground symptoms as it moves from the boundary and colonises the oval. Although the turf in the player entrances is currently in good condition and shows no signs of nematode damage, the impact of *I. lolii* in a major sports stadium has never been formally assessed. Consequently, it remains to be seen whether damage will be severe enough to affect the playing surface.

Given the findings of Stirling et al. (2021) and the observations reported here, the Gabba is currently the only Queensland location where *I. lolii* is known to occur. Consequently, groups, organisations and industries that could potentially be affected by the nematode (e.g. turf growers, sporting associations, and the grains, sugarcane, and horticulture industries) need to work with the government to raise awareness of the pest and minimise the chances of *I. lolii* being spread to other locations within the state. A turf disposal protocol should also be established so that when the oval is refurbished or the Gabba is upgraded for the 2032 Olympic Games, all the soil and turf that is removed is taken to landfill.

Conflict of interest The authors declare that they have no conflict of interest.

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