

Invasive Fire Ants in Australia

Solenopsis invicta

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Photo credit: Australian Invasive Species Council

Abstract

There is a great deal of concern in Australia about the invasive fire ants that are threatening regions in Queensland and beyond and the threat has received widespread media coverage. The Red Fire Ant, *Solenopsis invicta*, is one of the most invasive pest species in the world. It reproduces rapidly, has dietary flexibility, readily out-competes local species and has benefited from human mediated transport to new locations where there are few natural predators. This South American ant species has invaded North America, Europe, several Asian countries, and Australia. It is a voracious and aggressive predator, that kills or displaces most animals near its nest site. It builds nests in a wide variety of environments, including human housing where it can damage the fabric of the building and the electrical systems. As well as being a significant economic threat, it is also a medical threat. In areas significantly affected by the ant, about 50% of the human population receive stings each year. About 3% of humans are allergic to its sting and may require hospital treatment once bitten. There have been multiple fatalities in some areas that it has invaded, including the USA.

It is a commonly held view that the popular press exaggerates issues to sell their service to a gullible public. So, with that as a frame of reference, readers might be sceptical about the media articles about invasive Red Fire Ants that are advancing across Queensland, Australia.

There are three main themes to the popular press stories:

- a) the threat is very serious indeed;
- b) government entities are not doing enough to respond; and
- c) there is little hope of eradication of the pests.

We examine each of these three themes and compare the popular press descriptions with the reality in the Australian context.

A critical examination of the scientific evidence shows that the press outlets are not exaggerating the seriousness and, if anything, are understating the magnitude of the problem. The response by governments in Australia has been one of the most determined eradication efforts in the world, however it has been dogged by bureaucratic delays and inadequate funding. There is still some hope of eradication - but the window of opportunity is closing fast.

The seriousness of the threat

With characteristic restraint, the UK's Guardian media outlet, claimed that the ants are a "social menace, swarm aggressively and inflict a sting that can itch for an hour".

The Sydney Morning Herald (SMH), quoting Andrew Cox, the head of Australia's Invasive Species Council, was more direct and described it in terms Australians can relate to. *"They will take over open areas, grassy areas, and you won't be able to walk around with thongs anymore for large parts of Australia."* SMH quotes Reece Pianta, a spokesperson for the Invasive Species Council, *"A fire ant invasion will be worse than the cane toad. They will decimate our native wildlife and cost the economy billions."*

The reality seems every bit as grave as the media are claiming. A report in 2016 put the cost at A\$1.65B per annum (Wylie & Janssen-May 2017). This was updated in a government report in 2021 to A\$2b per annum. This doesn't seem at all far-fetched given the experience in the USA; a report commissioned by the FDA assesses the actual costs in the southern states of the USA at US\$6.7b p.a. (Lard et al. 2006). The list of cost elements includes medical treatment, damage to assets and crops, and control efforts.

These assessments put no numbers on the loss of native species. Australia's rich wildlife is at considerable risk. In areas where fire ants have flourished, a wide variety of local species are comprehensively wiped out or displaced. The ants will kill small mammals, reptiles, nestling birds and arthropods. Larger animals are displaced, leaving areas silent and lacking wildlife.

Are Government entities doing enough?

The Australian government response is said to have been the most determined and well-funded eradication program in the world. However, the funding still falls well short of the amounts that were required to ensure success. The government's own report describing those spending requirements and the funding shortfalls, was not immediately made public, only emerging for public scrutiny two years after it was written. The funding has been characterised by disagreements between federal and state bodies and delays have stymied many of the program activities.

After all the delays and bureaucratic machinations, it seems likely that there will be funding increases in 2025. The question is whether that is too little and too late!

Is there hope of eradication?

Some scientists hold out some hope that the Red Fire Ants can be contained and eventually eradicated. One positive sign is that the efforts to raise public awareness has resulted in an increase in reporting of nests.

Some treatment methods seem to be having an impact, including targeted nest destruction and effective baiting methods. Two types of bait are in use – one with an insect growth regulator (IGR) consisting of s-methoprene or pyriproxyfen, and the other with a fast-acting insecticide. The IGR is more suitable for urban and sensitive environments and is applied through a granular bait, sized to be

attractive for the fire ant workers to take back to the nest. The IGR baits work by sterilising the nest's queens and preventing juveniles from maturing into adults, resulting in the collapse of the colony – a process that takes 3 to 4 months.

There are also new treatment methods under consideration. Ants use resource recruitment pheromones in laying a trail to a food resource. These pheromones are unique to each species of ant and allow foragers to communicate the location of food to other ants. Recent work has identified the precise pheromones used by *S. invicta*. It has been shown that application of these pheromones as an aerosol, disrupts the ant foraging and ability to return to the nest with food. It is hoped this will provide a way to reduce nest size and viability where baiting is deemed to be an unsuitable method. (Xu et al. 2023. Suckling et al. 2010).

Despite these positive aspects of the eradication efforts, many commentators are not filled with confidence. Dr Brian Heterick of Curtin University is pessimistic. Writing in the media outlet, The Conversation, Heterick says, “*The prognosis for controlling this pest is grim. It has super-colonies and is adaptable in terms of food, nest sites and multiple queens (in some, but not all colonies). On top of that, identification and detection are difficult.*”

The evidence seems to support Hendrick's prognosis. The popular press seems most concerned that the ants will spread down the coast from Queensland into New South Wales towards Sydney, threatening the population centres and tourist resorts along the coastline. However, what is uppermost in scientists' minds is one of the methods by which ants expand their distribution - by floating down rivers on debris. A countrywide infestation would be inevitable if the ants were to enter the Murray-Darling River system. The river system extends from Queensland across much of

New South Wales, into Victoria and onto South Australia and takes in a large part of Australia's prime agricultural lands.



Until recently, such a spread westward didn't seem imminent. After 20 years of effort to contain the pest, the invasion is still largely held with an 80 km wide biosecurity zone around Brisbane – with some success in dealing with fresh incursions outside that area, in Sydney and Perth. However, the ants have recently breached the biosecurity zone around Brisbane and two nests were found in Toowoomba, west of the Great Dividing Range and close to the fringes of the Murray-Darling Basin.

If the Toowoomba outbreak isn't contained, it would be easy to see the ants extending their range from there to the headwaters of the Murray Darling system. If the ants get into the sparsely populated Murray Darling basin, the attempts at eradication will have failed. They will then threaten the main agricultural centres of the country, with devastating economic impacts. At the same time such a widespread infestation would mean disaster for many native species.

All it might take is an unfortunately timed weather event: a flood carrying an undetected nest into the headwaters of the river system. After the Toowoomba outbreak, such a scenario is now alarmingly plausible.

On balance then, Heterick's pessimistic prognosis is justified. But we cannot give in – the consequences of failure are enormous. The key is adequate government funding for continued efforts – and a great deal of luck in avoiding a chance event that undoes all the previous eradication work.

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