Exotic Invasive Ants
A threat to business and our way of life

INTRODUCTION

Exotic invasive ants (EIAs) can have a huge impact on the environment and humans. Invasive ants can have significant negative impacts on animal diversity in natural areas, reduce agricultural yields, can seriously impact human health and have social implications, e.g. changing the way outdoor areas are used and limiting time spent outdoors. As greenlife producers, it is important that nursery managers are aware of ant activity at their property, ensure they are not spread in container plants and report suspicious ant activity. This factsheet is designed to assist production nurseries to recognise ants that may be exotic to Australia.

Odorous house ant, *Tapinoma sessile*, collecting tending scale insects. Photo by Susan Ellis, Bugwood.org.

EIAs are important because they are area pests that can be transported in container plants. In the event that an EIA is detected and a quarantine put in place, businesses will need to meet certain requirements to continue trading. Such requirements could include pesticide applications of plants, pots and growing areas, keeping records and perhaps growing requirements.

There are nine species (or genera) of EIAs considered as a priority species that have been endorsed by Plant Health Committee (Table 1). Other species are also considered a priority but they are either under eradication or are widely established in Australia. There are many other species of ants that are not present in Australia that are not considered high priority. The main reason for this is because they do not have a history of invading new areas and causing economic, environmental or social impacts. Of course, species that are not on this list may still become important invasive pests in Australia.

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TABLE 1. HIGH PRIORITY SPECIES OF EXOTIC INVASIVE ANTS IDENTIFIED BY THE NATIONAL INVASIVE ANT BIOSECURITY PLAN, VERSION 12, APRIL 2018.

SCIENTIFIC NAME	COMMON NAMES & ACRONYMS
Brachyponera chinensis	Asian needle ant
Camponotus pennsylvanicus and other species of *Camponotus* as identified by a pest risk assessment	Carpenter ants
Lasius neglectus	Invasive garden ant
Myrmica rubra	European fire ant
Nylanderia fulva	Tawny crazy ant or Raspberry ant
Solenopsis richteri	Black imported fire ant
Tapinoma sessile	Odorous house ant
Technomyrmex species (excluding *Te. difficilis* and *Te. vitensis*)	Species often misidentified as *Te. difficilis* (difficult white-footed ant)
Tetramorium tsushimae	Japanese pavement ant

GENERAL BIOLOGY AND SPREAD OF EIAs

Most invasive ant species have most of the following biological characteristics:

- They consume a wide variety of food items, are predators, scavengers, often feeding on honeydew produced by sucking bugs.
- They have an opportunistic nesting behaviour, producing nests within or under a large variety of things including, but not limited to, tree bark, compost, forest litter, under rocks, concrete, wood or other items, amongst rubbish, in electrical appliances, underground and some species can move their nest when disturbed or with certain environmental conditions.
- They thrive in human-disturbed environments including pastures, turfgrass, fragmented landscapes and forest edges, amongst household items left outside etc. They also can disperse into natural environments and recolonise human-disturbed areas.
- Their nests can be small and easily moved by people amongst rubbish, plant material including nursery plants, soil, composted media, shipping containers etc. This can result in their spread over relatively large areas before they reach densities that lead them to becoming nuisance pests (and being reported by members of the public).
- Their nests may have a large number of queens (polygyny) and may extend into supercolonies (polydomous).
- They are very aggressive towards other species, but much less aggressive to their own.
- They have the potential to significantly reduce biodiversity in the ecosystems they inhabit.

Pavement ants, *Tetramorium caespitum*

Despite these rather broad biological characters that are shared by many ant species, there are other aspects of their biology that are quite variable. Most notably their daily activity and nesting habits. Furthermore, sometimes different colonies of the same species have important behavioural differences, e.g. some colonies may or may not produce winged queens or have one or multiple queens per colony. These biological characteristics can have important implications in how biosecurity organisations eradicate the ants in question.

DISPERSAL

All ants considered to be invasive have the ability to bud into supercolonies (as mentioned above). As a result, all of the subsidiary colonies must be killed to eradicate the colony. Ant species may spread about 3–500m per year in this fashion.

Many species also produce a winged reproductive stage that can go on nuptial flights and potentially make a new nest up to 5km away. There is also variation between species in the season that nuptial flights occur and the length of time required for a new nest to produce winged reproductive individuals (only 6 months in some species, while others may take over 12 months).

In addition, some species of ants may form ‘rafts’ and disperse over water, e.g. RIFA. Rafting involves a large number of workers carrying queen and immature individuals in a ball, disc or long trail. The immature individuals collect bubbles of air and may be interconnected to form large portions of the rafts. Workers will continually rotate immature individuals and and if they accidentally sink they can collect air bubbles to get back to the surface and try to rejoin the raft. The presence of immature individuals in a raft markedly increases its survival. Rafts may move long distances until land contact is made, perhaps surviving weeks.

All EIAs can potentially hitch hike where nests are built in material that can be transported by people, and this is what gave the common name 'tramp ant'. Obviously, some species are more likely to hitch hike than others with species nesting in building materials, containers and 'rubbish materials' being a higher risk of spread than those that only nest underground.

INVASIVE ANT ACTIVITY

Some species are active with workers foraging on a daily basis throughout the year (or when certain temperature thresholds are met). Other species go into diapause, generally over winter. Diapause is like hibernation, a state of rest in which the nest effectively becomes inactive. The exact period of time that diapause occurs may differ with species; some appear to become inactive related to low temperatures, whereas others are probably linked to day length.

Similarly, some species primarily forage at night and may not forage at all during daylight hours (nocturnal). Others forage only during the day (diurnal) and others may forage during night and day. These traits have implications to the eradication program and businesses within quarantine zones seeking to use inspections as a method to continue trading.

Tawny crazy ant (*Nylanderia fulva*) nest underneath a piece of wood (above – photo by Fudd Graham, Auburn University, Bugwood.org), worker tawny crazy ant (below – photo by Danny McDonald, Sam Houston Sate University, Bugwood.org).

NESTING HABITS

There are many nesting sites common to many EIAs. Most EIAs can readily make nests in human disturbed environments including, but not limited to:

- Under logs, wood, stones, pavers and items placed on the ground that retain moisture
- Within pot plants
- Soil, growing media, compost, leaf litter
- Within electrical equipment, water meter boxes and fire hydrants
- Tree crotches, rotten tree limbs, under palm leaf sheathes
- Underground in grasslands and lawns
- In gardens or environments where aphids are abundant
- Sometimes within walls or termite nests
- Within shipping containers, furniture, vehicles and other items
- Within cracks in paths and next to external walls of buildings
- In fodder and other agricultural products

Honeycomb damage caused within a tree by *Camponotus* sp., carpenter ants (above – photo by Steven Katovich, USDA Forest Service, Bugwood.org). Carpenter ants tending aphids (below – photo by David Cappaert, Bugwood.org).

IDENTIFYING SUSPICIOUS ANTS

Production nursery managers do not need to be able to identify each and every species of EIA. What is important is to be aware of the types of ants normally present at your work place. Sometimes this can be achieved by submitting close up photographs of ants to state departments or museums. Ants that have not previously been seen can then be responded to appropriately, e.g. by sending photographs or samples for identification. A familiarity with ants present will then enable reporting of suspicious ants.

As stated in the introduction, EIAs have the capacity to stop all trading of production nursery businesses that fall into a quarantine zone, which is what happened for red imported fire ant in southeast Queensland. Therefore, it is valuable for businesses to have an ant management plan as part of normal business operation. Part of this plan could include using photos (as mentioned above) to document species encountered at the nursery. This information, combined with ant monitoring data, could then be used as baseline data to support area freedom in the event that a business suddenly is included in a quarantine zone. Be aware that other conditions will probably need to be met but those businesses already familiar with ants and have historical data on ant activity will be in the best position to continue trading as quickly as possible (assuming that EIAs are not present at the site).

If you suspect that you have found ants that are exotic contact your local biosecurity organisation or the Exotic Plant Hotline on 1800 084 881.

White-footed ant worker, *Technomyrmex difficilis*. Photo by: Eli Sarnat, Bugwood.org.

Red imported fire ants of various sizes on a 10 cent coin. Photo by DAF

RIFA nest amongst weeds. Photo by DAF

This document was prepared by Andrew Manners (Agri-science Queensland, Department of Agriculture and Fisheries, Ecosciences Precinct, GPO Box 267, Brisbane QLD 4001) as part of the Hort. Innovation, levy funded project 'Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry' in 2019.