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Christmas Island snail search

There are no giant African snails (Achatina fulica) in Australia, thanks to the vigilance of our quarantine authorities. But on three occasions last year, these pests were found on incoming ship cargoes from Christmas Island, a small Indian Ocean island 2300 kilometres north-north-west of Perth, and the source of raw material for much of our superphosphate.

The Phosphate Mining Company of Christmas Island Ltd was seriously concerned. It did not want to be the medium for the pest to become established in Western Australia. Likewise, Commonwealth and State quarantine authorities were also worried. Their record for intercepting pests is excellent, but they acknowledged that the greater the frequency of snail infestation in cargoes the greater the risk of the pest evading quarantine.

All parties agreed that a specialist Department of Agriculture officer should go to Christmas Island to investigate the giant African snail and suggest to the Phosphate Mining Company ways to prevent snails infesting cargo destined for Australia.

As a result, senior entomologist, A. N. Sproul spent two weeks on Christmas Island in January this year, looking at the main infested areas, testing control methods, and recommending ways the island authorities could reduce the risk of snail contamination.

He also distributed fruit fly traps and examined some of the Island's tropical fruit fly infestations at the same time.

Here is a summary of the Christmas Island pest situation, as he found it.

About the snail

As its common name indicates, this snail originated on the African continent. From there, it spread through many of the tropical areas bordering the Indian Ocean, South East Asia, Japan and some of the islands of the Pacific.

A single, fertilised snail can successfully establish a new colony. One snail may lay up to 6000 eggs in its lifetime—which can be as long as nine years. It can aestivate—become dormant—during adverse conditions, and thus survive for years.

In this aestivating state, it can be carried on vehicles, in plant material or any other items which have been in contact with the ground. Thus it could enter a State like Western Australia on plant material, crates, containers, machinery or motor vehicles... and fuel drums.
Most specimens were found entering Western Australia on fuel drums but others were intercepted on a motor vehicle, gas cylinders and a personal luggage container.

Most authorities accept that the Christmas Island colony originated from snails introduced by Japanese forces which occupied the island during the Second World War. It could have been introduced as a source of food, because when properly prepared, it is said to be palatable. But hopefully those who eat this snail know that unless well cooked its flesh can transmit serious human parasites.

**The threat of introduction**

Western Australia has frequent sea and air contact with Christmas Island. About 24 shipments of bulk phosphate a year come to Western Australian ports such as Fremantle, Kwinana, Bunbury and Albany. One in three shipments includes cargo which may carry the snail.

There is also a fortnightly passenger jet service between Christmas Island and Perth.

Drums of jet fuel are brought in from Western Australia to service these aircraft. When emptied, they are stacked in a fuel depot at the airport terminal. Eventually, they are transported back to Western Australia by ship in containers.

While the drums sit at the airport, the snails have the opportunity to shelter on them or on their containers. Other equipment, motor vehicles and objects such as pallets, are potential snail carriers if they are left standing in an infested area before loading on the ship.

Fortunately, there is little prospect of the pest being introduced with bulk phosphate rock, because this is screened, ground to rough granules and dried to 5 per cent moisture with hot air before being stacked in big sheds at the wharf and later dropped by conveyor direct into ships' holds. No snails have been found in any phosphate shipments to Western Australia since the mining operations started on the Island.

Tractors, bulldozers and other machinery are rarely sent from the island to Australia. When they are, the mining company ensures that they are steam cleaned and inspected to get rid of snails or soil.

**Island distribution**

Only a small proportion of the island is infested with giant African snails. The heaviest concentrations are near the airport and its access roads, some of the mining areas, and parts of the residential or settled areas. There are three other light infestations in other parts of the island.
The Island's land crabs eat any soft-shelled snails entering their 'territory'.

A snail seeking shelter under one of the containers.

The snails are found mainly in thickets of introduced acacia which line roads, surround residential areas and disturbed areas such as the airport and mining sites. These thickets can be up to 50 metres wide. They provide food and shelter for huge numbers of snails. Being nocturnal the snails only emerge into the open at night and can be found moving across the airport runway and nearby limestone-paved roads where they are very conspicuous in headlight beams. Few move about during periods of dry weather but during or after tropical rain they become very active and are quite conspicuous in infested patches. By daylight most of them retreat back to the undergrowth.

The undisturbed rain forest seems free of the pests. Possibly one of the reasons for this is the big number of land crabs the island supports. They are found throughout the rain forest, living on decaying vegetation and other organic material on the forest floor, which they keep remarkably clean. These crabs do not permanently settle in disturbed areas where the snails exist but there was good evidence to suggest that any young soft-shelled snails which wandered into the forest were quickly eaten by the crabs.

During the wet season the red land crabs, the most abundant species, migrate in thousands to the ocean to lay their eggs...a spectacular wildlife feature of this island.

Baiting trials

During Mr Sproul's visit, a number of small trials were carried out to test the effectiveness of mesoram baits, in the form of blue Baysol pellets, against giant African snails. These pellets were known to be reasonably resistant to weathering and to remain active for some time, but there was no local evidence that they would be effective against this snail. However, when pellets were scattered along the sides of roads and the airstrip, they killed thousand of snails. During the course of the trials the pellets were also put down on a small area in the forest to test their effect on crabs. Some crabs were seen eating the pellets, and died the following day. However only a limited number were affected. In any case it is unlikely that the forest would be baited if a large scale snail baiting programme were undertaken.

Control measures

As a result of the studies and baiting trials, the following recommendations were offered to the mining company:

- Clear all sheltered material away from the fuel drums and containers at the airport.
- Surround the immediate area with a barrier of snail pellets which should be renewed at monthly intervals or immediately after rain, to lessen the risk of snail contamination.
- Keep the cleared area free of weeds and debris.
- Intensify the inspection and steam cleaning of fuel drums, equipment and other cargo sent with consignments.
- Ensure that certificates verifying the inspection and cleaning are sent to quarantine officers at Fremantle.
- Bait backyards and other parts of the residential areas infested with snails.

Tropical fruit flies

Fruit fly traps set in different parts of the island caught a large number of tropical fruit flies, two of which were identified as serious economic pests, namely Dacus dorsalis, the Oriental fruit fly and D. cucurbitae, the melon fly. These fruit flies do not exist in Australia. Oriental fruit fly maggots were found in guavas, papaws and other cultivated fruits which abound in backyards and abandoned Chinese gardens near fresh water springs. There was too little time to investigate the source of other species of fruit flies which were also trapped.

One specimen of the melon fly was caught in a lure trap, but no cucurbit crops were growing on the island at the time. This fly is also a serious commercial pest in many tropical parts of the world, but is not found in Australia.

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