

Trees in South Africa are under attack. Why it's proving hard to manage

By [Trudy Paap](#)

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More than two years have passed since the detection of what is arguably the most damaging tree pest ever to arrive in South Africa: the [polyphagous shot hole borer](#) (*Euwallacea fornicatus*). The beetle kills trees and there are no proven remedies.



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The beetle is now present in nearly all parts of the country and in more than [100 tree species](#).

An invasion of this magnitude should have elicited a rapid response and the development of a strategic action plan. But that hasn't happened. South Africa has never had to deal with a tree-killing pest of this importance before. In addition, the country has limited resources and there has been confusion about which government department should take responsibility. As a result, there hasn't been a coordinated response to deal with the pest.

The tiny polyphagous shot hole borer beetle is 2mm in length and native to Southeast Asia. It has a symbiotic relationship with three species of fungi, including *Fusarium euwallaceae*. The fungus is a food source for the beetle and its larvae, but can kill susceptible host trees.

The list of host trees in South Africa continues to grow. Not all of these support the whole life cycle of the polyphagous shot hole borer. But it's been found to breed in [25 species](#) (both exotic and indigenous trees).

The greatest impact has been in urban environments such as [Johannesburg](#). It has been detected on backyard avocado and roadside weedy acacias, but not yet in commercial orchards or plantations. The only commercial crop it's been detected on is pecan trees.

In [California](#) and [Israel](#), polyphagous shot hole borer went on to damage the avocado industry as well as trees in natural ecosystems. There are concerns that this could happen in South Africa too.

But it hasn't yet been declared an agricultural emergency plant pest and no formal response has been triggered. Based on the Israeli and Californian experiences, it could clearly still pose a threat to economically important crops in South Africa.

The proactive thing to do would be to list the beetle as an emergency plant pest.

Gaps in the system

South Africa is good at managing pests in agricultural settings. This falls under the Department of Agriculture, Land Reform

and Rural Development, specifically [Plant Health Early Warning Systems](#). Where a pest is deemed an emergency plant pest, the South African Emergency Plant Pest Response Plan provides for a rapid response to prevent establishment, spread and coordination of communication between government agencies, academia and plant industry professionals.

For example, detection of the [Fall Army Worm](#) (*Spodoptera frugiperda*), a quarantine pest of maize and sorghum, triggered a rapid and coordinated response overseen by the national government. Provincial departments, academic institutes and industry stakeholders have been working together on aspects ranging from monitoring, training and diagnostics to pesticide registration, legislation and enforcement.

The Department of Environment, Forests and Fisheries provides for listing of invasive alien species that threaten biodiversity, through the [National Environmental Management: Biodiversity Act](#).

The pest risk analysis for polyphagous shot hole borer (the process by which listing is facilitated) has been submitted, but the listing is yet to be finalised.

The country's laws also place a "duty of care" on all land owners (private and public) to control invasive species on their land. They also require all levels of government – from municipal through to national – to develop monitoring, control and eradication plans for land under their control.

But systems designed for the agricultural or natural environment sector aren't helping the management of a beetle that's wreaking havoc on trees in towns and cities.

This is also clear in how the country manages [invasive species](#). It does this well when it comes to weeds and larger animals. But forest pests are barely represented.

Another major challenge is that the borer beetle is particularly hard to [manage](#) because of its mating system, wide range of hosts and ability to survive in felled wood for many months. On top of this, heavily infested reproductive hosts become "reservoirs" of beetles, threatening the health of adjacent trees.

Read more: [The spread of shothole borer beetles in South Africa is proving tough to control](#)

Current best practice recommends removal of heavily infested trees in which beetles are breeding. [Infested wood](#) should be disposed of appropriately at designated dumping sites to reduce the risk of spread.

But in the absence of a national strategy to guide municipalities, responses to the pest have varied. [Cape Town](#) has perhaps led the way with a coordinated city response to the recent invasion in Somerset West. In conjunction with its Invasive Species Unit, the city has developed a management protocol. As one of the more recent areas to be invaded, it's perhaps had the benefit of being able to better prepare for the arrival of this pest and learn from the experiences of other municipalities.

Research from [California](#) suggests chemical control may have an application in protecting individual high value trees. But this shouldn't be seen as a [silver bullet](#).

In South Africa's case, various research efforts are underway to shed more light on the beetle and its impact. For example, a unit at the University of Pretoria, the Forestry and Agricultural Biotechnology Institute has been involved in surveillance and monitoring of the pest.

The multi-disciplinary and multi-institutional [Polyphagous Shot Hole Borer Research Network](#) has recently been established. With members from ten different academic institutes, the network aims to align and coordinate research efforts by researchers from institutions across the country.

Now with funding made available by the Department of Environment, Forests and Fisheries, further research can be conducted under the framework of this network, to underpin science and data-based management advice.

But a great deal still remains to be done. South Africa would do well to reflect on how it's responded so far.

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ABOUT THE AUTHOR

Trudy Paap is a Postdoctoral Fellow Forestry and Agricultural Biotechnology Institute, University of Pretoria.

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