

Insight Dead wood



Wood warning

Revellers going to AfrikaBurn 2019 in the Tankwa Karoo have been warned not to bring wood from affected areas for artwork or firewood as this could "unwittingly be helping to spread destruction ... the Western Cape is packed with just the kind of species of trees that the [polyphagous shot-hole borer] loves to hop onto and kill".
Picture: Anton Scholtz

A tiny invasive beetle is a threat to SA's mighty trees, say experts — but the City of Joburg is not sure 'this is a big problem'



DEATH OF AN ELDER This box elder in Dunkeld, Johannesburg, was killed by a deadly fungus carried by the shot-hole borer beetle. Picture: Masi Losi

Bored to death

By CLAIRE KEETON

Borer beetle facts

What to look out for

Signs across species differ: thousands of pin-prick holes appear on maples, whose trunks get blackish marks like cigarette burns. On oak trees, a fine sawdust fills cracks in the bark. Plane trees develop brownish stains that can become calloused over time.

Biological control agent

Biological control agent Dr Guy Preston, deputy director of environmental programmes for the department of environmental affairs, said: "We are investing heavily in opportunities to find biological control agents but it will not be a quick process." Microbiologist Wilhelm de Beer said it would take at least three to five years to achieve this. Californian researchers had found a promising wasp but they cannot breed it in the lab.

various stages of decline."

In some "red zones", the warning sign "PSHB" hangs on trees. One street looks like a crime scene, with striped tape wrapped around trees.

Some of the 250,000 trees that have been planted over the past 10 years in the Greening Soweto project are also showing signs of infestation.

Cape Town City's recreation & parks department and the invasive species unit aim to stop the beetle from infesting the city's historic trees.

Zahid Badroodien, the mayoral committee member for community services and health, urged people to inspect trees and report any symptoms.

"If detected soon enough and provided that the infection is in an early stage and on a minor branch, it can be effectively treated," she said.

Once the beetle is entrenched, chopping down "reproductive host" trees, in which beetles successfully breed, is the only way to stop it.

This is distressing for property owners who treasure their trees, which add to the value of their homes. Pointing out an infested giant plane tree with a 30m canopy in Dunkeld, Johannesburg, arborist Neil Hill said the owner bought the property because of it. Hurlingham resident Sonja Carshagen said one of the reasons her family had bought there was because of the beautiful old trees.

Now, she said, "lots of plane trees lining the suburb are looking terrible. This is going to wipe out trees everywhere and affect the aesthetic appeal of the city."

Carshagen said they had cut down a Chinese maple and are trying to treat a big honey locust.

Huge established shade and ornamental trees such as box elders, maples and oaks are the hardest hit so far. Hill said: "What we predict is that vulnerable trees will die out soon. Some will take longer and other infested trees won't die."

"In two to three years you will drive down Jan Smuts Avenue and there will be no more plane trees."

Moodley said some plane trees had shown positive signs of recovery. But De Beer countered: "There is not enough data to support this and I believe the same trees will eventually die if re-infested."

The pockets of infested trees in Joburg are rapidly expanding as hundreds of thousands of beetles can survive for weeks in dead wood, which gets moved and sold as firewood.

For example, the beetle moved about 30km from Sandton to a Lanseria farm after the owner bought firewood. De Beer said: "The firewood was dumped next to an English oak and the oak was infested three weeks later."

Unlike most pests, the beetle can make itself at home in a range of tree species. De Beer said: "They infest trees from more than 50 different unrelated

families including big trees, small trees, thick-bark trees and thin-bark trees.

"What is unique about this beetle is that it can attack many things."

A few urban avocados have signs of infestation, as do pecan trees in Northern Cape orchards. The beetle has severely harmed tree crops, particularly avocados, in the US and Israel over the past decade.

Seven million offspring

Even though some companies are promising chemical cures, nothing has been registered yet in SA and these treatments are all experimental.

Fungicides and herbicides that work systemically have limited impact and, because they would need to be applied repeatedly and on a large scale, could have toxic effects for other species and groundwater.

The beetle was officially discovered in SA in 2017, in the Pietermaritzburg Botanical Gardens, though Hill said there were reports of trees dying in 2016.

In 2012 a specimen was captured in an insect trap in Durban but those involved did not realise what it was, so it was not reported, said De Beer.

For reproduction, the female beetle bores tunnels into trees and can have up to 7 million offspring. They feed on the fungus with which they are associated. This lines the tunnels, which hampers the transport of water and nutrients.

"It is impossible to predict the impact of the beetle on our native trees and in different climatic regions," said De Beer, adding that universities were establishing a response network to research this.

Johannesburg city parks & zoo said on Friday it was meeting with research institutions about the infestation, but due to lack of data it was "too early to classify the outbreak of PSHB in Joburg as a disaster".

Meanwhile, municipalities and residents should start planting resistant indigenous species now to avoid a dystopian landscape in our lifetime.

A gnarled black oak, one of five dead trees on a Johannesburg street, looms like a harbinger of the doom to come when hundreds of thousands of oak, maple and plane trees in the city are likely to die.

An invading beetle and its deadly fungus are a massive threat to some 6 million to 10 million trees in the city's urban forest — and it is not the only metropole in SA to face catastrophic losses.

"We have never had a beetle so devastating in SA," said microbiologist and beetle expert Wilhelm de Beer, who sees it as a national emergency. "There is no way we can eradicate or stop the beetle but we can reduce its impact with proactive management."

Susceptible tree species in George, Knysna, Durban and Pietermaritzburg have already been decimated by the polyphagous shot-hole borer beetle (PSHB) and the fungus associated with it.

The beetle, from Southeast Asia and about the size of an ant, has been detected in every province except Limpopo.

With the loss of trees, temperatures in cities rise, the air is more polluted and lower rainfall is expected, environmentalists have warned.

"My biggest concern is what the beetle and fungus might do to the natural ecosystem. They have already been found in about 35 species of native trees," said De Beer, a professor at the Forestry and Agricultural Biotechnology Institute at the University of Pretoria.

"Not all trees will die," he said. "Jacarandas and white stinkwoods don't seem to be susceptible. Acala thorn trees are among those infested but they seem to be surviving longer. We have found it on three species of yellowwoods, but it doesn't seem yet to be affecting them."

Nevertheless, De Beer said: "Some native trees we are monitoring seem quite susceptible, like the paperbark thorn and coral trees. It has started to move from urban areas into natural areas of the southern

Cape and KwaZulu-Natal."

More than a third of about 300 species attacked by the beetle are susceptible to the fungus, which can kill such as oaks within two years.

Andrea Rosen, co-chair of the Johannesburg Urban Forest Alliance, slammed Johannesburg city parks & zoo for failing to create public awareness of the danger and not tackling the crisis urgently. Johannesburg has the sixth-largest urban green canopy cover in the world.

"We are getting more and more reports of trees dying every week," she said. "The city laid out a strategy in April last year but nothing has happened."

City parks spokesperson Jenny Moodley said: "We are uncertain about the extent of the problem because we have so little data. With just 98 complaints registered so far and another few from the tree app this week, we are unable to conclude that this is a big problem. Some regions have not reported a single complaint."

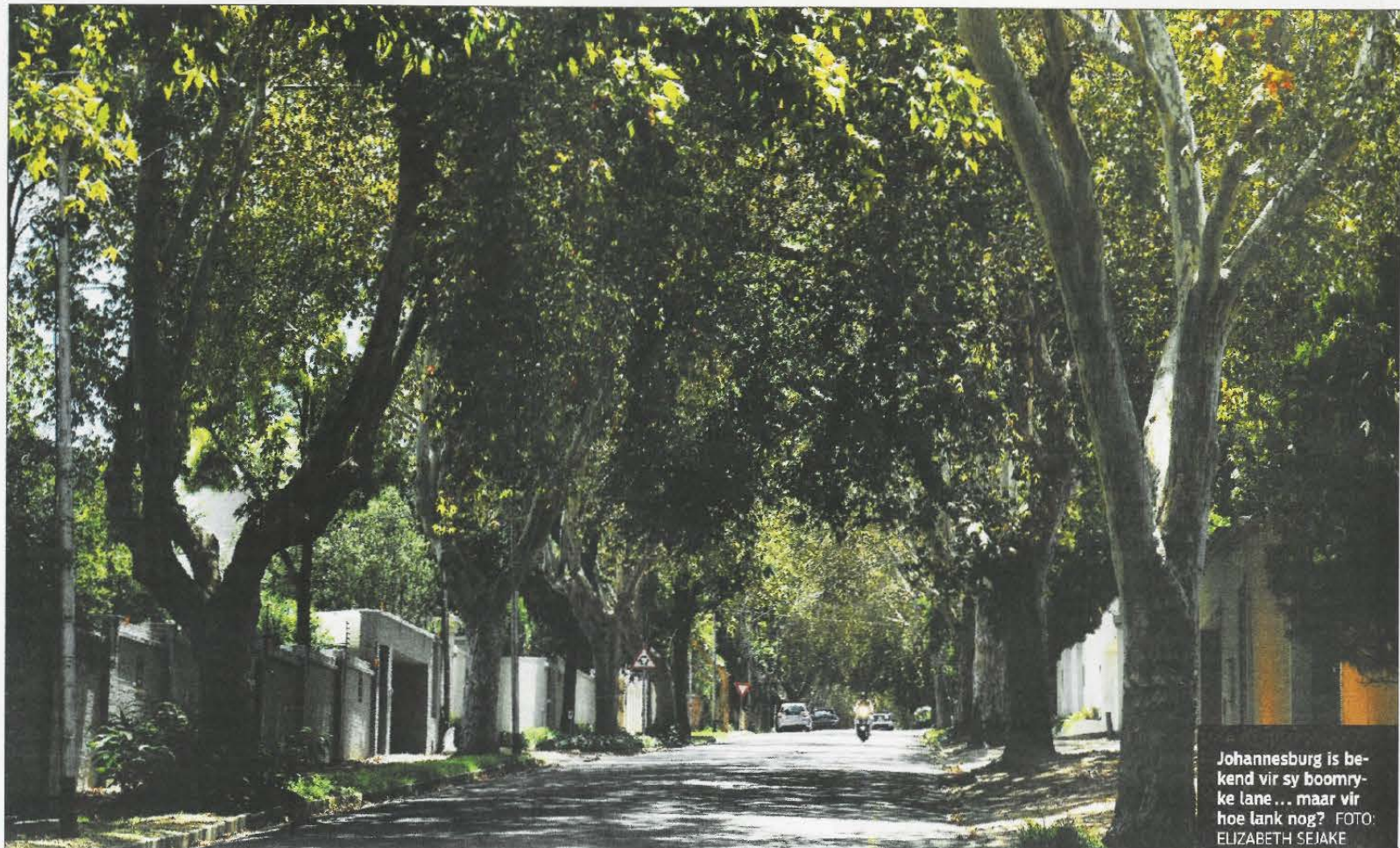
Beautiful old trees

Rosen said residents are still waiting for the city to allocate a dedicated disposal site, report on the extent of the problem and train people to monitor trees.

Moodley confirmed there is no central disposal point and said the city is talking to the Gauteng department of agricultural & rural development about this. Meanwhile city parks has recommended that residents cover dead wood with a heavy plastic sheet and then "the heat under the tarpaulin will help suffocate the PSHB".

Professional tree removal and disposal is costly, burning a tree on site is not an option and tree fellers have nowhere to dispose of infested wood, said Rosen.

"On my own property, and it is not a unique case, we have already removed two Chinese maples and a liquidambar [*Liquidambar styraciflua*], all large mature trees. There are a further five infested trees at



Johannesburg is bekend vir sy boomryke lane ... maar vir hoe lank nog? FOTO: ELIZABETH SEJAKE

Gogga maak vir SA bang



So lyk die stompkopkewer. Dit is 2 mm lank en vernietig Suid-Afrika se bome.

As 'n kuur nie gou gevind word nie, bedreig die stompkopkewer miljoene bome, berig **Suzanne Venter**.

Suid-Afrika kan miljoene van sy bome verloor as wetenskaplikes nie gou 'n manier vind om ontslae te raak van die stompkopkewer nie. Dié kewer, wat hom die afgelope paar jaar hier tuisgemaak het, besmet die bome met 'n fungus wat hulle laat vrek.

Op die oomblik is die grootste besmetting in Johannesburg, Knysna en George. Duisende bome word geraak.

Prof. Wilhelm de Beer van die Bosbou- en Landbou-biotegnologie-instituut (Fabi) aan die Universiteit van Pretoria sê bome op syaadjies en in private tuine, landbougewasse (soos avokado- en pekanneutbome) én inheemse woude is kwesbaar.

"Daar is ook bewyse dat die plaag die Suid-Kaap se inheemse woude aanval."

In dié stadium is Limpopo, Mpumalanga en die Kaapse Skiereiland die enigste plekke waar daar nog nie besmetting gerapporteer is nie.

"Ek was die afgelope week in die Tsitsikamma-woud waar ons twee projekte begin het om die kewer se impak en verspreiding in die woude by George en Knysna te monitor," sê De Beer.

Volgens Jan Hendrik Venter van die departement van landbou, bosbou en visserie, kom die kewer, wat net sowat 2 mm groot is, van Suidoos-Asië en is dit die eerste keer in 2017 in Pietermaritzburg se botaniese tuin opgemerk. "Ons vermoed dis 'ingevoer' saam met houtprodukte en verpakkingsmateriaal."

Die plaag is ook 'n probleem in Kalifornië in Amerika en in Israel.

Die wytie boor tonnetjies so groot soos die punt van 'n pen deur die bas en hout van lewende bome. Hier lê sy eiers en kweek dan 'n Fusarium-fungus as kos.

In vatbare bome kan die fungus verder in die hout versprei en die vaatweefsel blokkeer, wat die boom aftakel en uiteindelik doodmaak. Op die ou end is dit die fungus, en nie die kewer self nie, wat die boom doodmaak.

"In Suid-Afrika weet ons tans van 77 gasheer-boomspeesies vir die kewer, en 20



Só lyk die tonnetjies wat die stompkopkewer binne-in bome grawe om 'n fungus daar te plant en eiers te lê.



Nat kolle op bome en afskilfering is gewoonlik 'n teken dat dit besmet is deur die stompkopkewer. | FOTO: ELIZABETH SEJAKE

hiervan is reprodutiewe gasheer omdat die kewer daarin kan voortplant."

Afhangend van die boomspeesie kan bome binne 'n paar maande of 'n paar jaar vrek. Bome wat blootgestel is aan stresfaktore soos droogte of te veel wind, is meer kwesbaar, sê De Beer.

Dr. Guy Preston van die departement van omgewingsake sê R5 miljoen is opsy gesit vir dringende navorsing.

Standaard-chemiese middels wat gebruik word om sulke peste te bestry, werk nie in dié geval nie, omdat dit net op die



'n Plataanboom wat vol klein gaatjies, so groot soos die punt van 'n pen, geboor is deur die stompkopkewer.

bas aangewend word en nie die boom diep genoeg binnedring nie. Die ideaal is om 'n natuurlike vyand te kry om dit aan te val, maar dit moet nie iets wees wat groter skade aanrig nie.

Volgens De Beer het navorsing in Kalifornië sedert 2003 gewys dat van die chemiese middels wat wel werk, op die lange duur nadelig kan wees vir die boom. "Dit het basies dieselfde effek as langdurige antibiotika-gebruik op 'n mens," sê hy.

In Kalifornië is gevind die doeltreffendste bestuursmaatreël is om die reprodutiewe gasheerbome wat erg aangetas is te verwyder en te vernietig.

"Dié bome moet met 'n masjien opgekerf word in stukkes kleiner as 2 cm. Dié stukkes hout kan dan verwerk word tot kompos. In Kalifornië het gebiede

die wat erg besmet was baie goed herstel nadat die probleem bome verwyder is," sê De Beer.

Preston sê sy departement gaan 22 van dié masjiene teen R400 000 elk koop. "Dit sal landwyd versprei word en ons sal areas uitwys waarheen afgekapte bome geneem kan word om opgekerf te word."

Hy sê mense wat met hout, veral vuurmaakhout, van een plek na 'n ander reis,

Dié loop gevaar

As jy enige van dié bome in jou tuin het is daar 'n kans dat dit deur die stompkopkewer aangeval word. Kyk uit vir tekens soos nat kolle op die boom en klein gaatjies so groot soos die punt van 'n pen. Dis beter sigbaar as jy 'n stukkie van die bas afkerf.

Inheems:

Bosvaderlandswilg
Kuskoraalboom
Waterkeurtjeboom
Fonteinbosboom
Kaapse wilgerboom

Uitheems:

Swarthoutboom
Swartwattelboom
Chinese esdoringboom
Veerresdoringboom
Japanse esdoringboom
Plenk vlamboom
Soetpeulboom
Roelgombom
Louiermagnoliaboom
Avokadoboom
Gewone plataanboom
Moeraseik
Akkerboom/eikeboom
Kasterolieboom
Witwilgeboom

vererger die probleem. "Ouens wat groot bome snoei, kap gewoonlik die hout op en verkoop dit in ander gebiede as vuurmaakhout," sê Preston.

"Een stuk vuurmaakhout kan soveel soos 50 wyfies, wat elk 32 eiers kan lê, bevat. Dit beteken potensieel 1 600 kewertjies van een stuk hout," sê De Beer.

As jy 'n moontlik besmette boom wil aanmeld, kan jy 'n foto en inligting na diagnostic.clinic@fabl.up.ac.za stuur.

Meer inligting oor die plaag is ook by www.fabinet.up.ac.za/psbh beskikbaar.

Een stuk hout kan 50 wyfies bevat.