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## CHEMICAL TREATMENTS: SOUTH AFRICAN - OBSERVATIONS

### Chemicals cocktails may prove to be a temporary solution:

- Pesticides and fungicides have a limited effect. These may reduce the rate of re-colonisation in lightly infested trees, but have not proven effective at eradicating PSHB from infected trees. (1)
- Specifically, the use of Imidacloprid (implicated in bee colony collapse disorder and banned for outdoor use in the European Union) will have too much of a negative impact on the environment. (2)
- Treatment will need to be applied annually or every 6 months (for the rest of the life of the tree). (1)
- Some treatments and chemicals are harmful to trees and, if applied too often, may damage or kill the tree, as well as the surrounding ecosystem. (1)
- Insects develop tolerance and resistance to chemicals, and as such a structured programme for rotating treatments needs to be conducted over time. (1)
- Trees may be killed by repeated chemical applications. (1)

(1.) [https://www.capetowninvasives.org.za/images/PSHBorer/PSHB\\_-\\_Management\\_Protocol\\_28\\_05\\_2019\\_v3.pdf](https://www.capetowninvasives.org.za/images/PSHBorer/PSHB_-_Management_Protocol_28_05_2019_v3.pdf)

(2) <https://e360.yale.edu/features/beetle-mania-the-nasty-insect-that-is-killing-the-trees-of-johannesburg>

**Widespread & ongoing chemical treatments will likely become too expensive for homeowners & the City. - and the toll on the environment is incalculable.**

## CHEMICAL TREATMENTS: CALIFORNIA

### Latest Californian research suggests that the use of pesticides and fungicides have a limited effect.

- Pesticides should only be applied to trees with low to moderate levels of infestation; applications should not be made on non-infested trees because no preventative treatments have been reported, nor is it likely that applications to heavily infested trees will "rescue" these trees from (PSHB) (1)
- None of the individual pesticides or pesticide combinations examined were effective at curbing the number of new attacks for the entire 6 months that treatments were tracked. Newly emerged (fusarium). tend to re-infest the maternal tree more often than taking flight and finding new host material (personal observation). It is likely that the majority of new attacks on each tree arose from newly emerged beetles re-attacking the maternal tree, rather than from new beetles colonizing the tree from other host material. Therefore, the increase in attacks over time most likely indicates that the pesticide treatments were unable to inhibit beetle larvae from completing development and establishing new galleries. (2)
- (PSHB) beetles can be difficult to control with pesticides because of their cryptic habits (actively laying eggs year-round, and active throughout the sapwood). Ingestion of wood by PSHB is limited, and beetles spend little time on the tree surface. This may limit the beetle's interaction with pesticides. However, due to the severity of the impact of this (PSHB) on a wide variety of tree species in southern California, immediate management options, including pesticides, are needed. (2)
- The combination of a systemic insecticide, a contact insecticide, and a fungicide provided the best control; we used emamectin benzoate (systemic insecticide), bifenthrin (contact or spray-on insecticide), and metconazole (spray-on fungicide) for this combination. Ongoing research needs to be done. (2)

(1.) Mayorquin JS, Carrillo JD, Twizeyimana M, Peacock BB, Sugino KY, Na F, Wang DHKabashimo JN, Eskalen A

Chemical Management of Invasive Shot Hole Borer and Fusarium Dieback in California Sycamore (*Plantus racemosa*) in Southern California  
Published in Plant Disease, 2018, 102:1307-1315. <https://doi.org/10.1094/PDIS-10-17-1569-RE>

(2) Jones ME, Kabashima J, Eskalen A, Dimosn M

Evaluations of Insecticides and Fungicides for Reducing Attack Rates of a new invasive ambrosia beetle (*Euwallacea* Sp., Coleoptera: Curculionidae: Scolytinae) in Infested Landscape Trees in California  
Published in Journal of Economic Entomology 110(4): 1611-1618, July 2017

**Widespread & ongoing chemical treatments may increase the phytotoxicity of the tree, and eventually lead to its death.**