



Testing the effectiveness of Sylvatica Bioprotect on baobab trees in Mapungubwe National Park

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Executive Summary

The report evaluates Sylvatica Bioprotect as a deterrent against elephant damage to baobab trees in Mapungubwe National Park, where 10% of the park's population—were killed between 2022 and 2026 and previously effective wire-mesh protection was stolen near the Zimbabwe border. In May 2026, 23 randomly selected trees were sprayed with the product and compared with 21 untreated controls after the dry season; damage frequency and severity were analysed using chi-square and Welch's *t*-tests. Sylvatica Bioprotect proved labour-intensive to mix and apply, repeatedly clogged spraying equipment, produced incomplete coverage. Most importantly, elephants continued feeding on treated bark: 78% of treated trees were damaged, with no statistically significant difference in either the number of damaged trees or the extent of damage compared with untreated trees. The report concludes that the treatment did not effectively protect baobabs under the tested conditions, although a further trial is planned for 2027 using a paint brush to cover the entire stem and determine whether more complete application improves effectiveness.

Introduction

Elephant activity is causing substantial baobab mortality in Mapungubwe National Park. Between 2022 and 2026, elephants killed more than 50 baobabs, representing an estimated 10% of the park's baobab population.

A 2022 study found that wrapping baobab trunks in wire mesh was an effective method of protecting the trees from elephant damage (Fig. 1C) (Venter, 2022). However, because of the park's proximity to the Zimbabwean border, the mesh was stolen from all protected trees near the Limpopo River in the eastern part of the park. Following the removal of the mesh, many of these trees have continued to be heavily utilised by elephants (Fig. 1A), and several have subsequently died (Fig. 1B). Consequently, the baobab population in the northern part of the park remains under significant threat.

Sylvatica Bioprotect is a commercially available product that is claimed to be 100% effective in protecting trees and infrastructure from elephant damage (<https://www.sylvatica.co.za>). According to the company, the product contains “a blend of scent cues that elephants instinctively avoid”, thereby creating a “clear ‘keep-out’ signal that elephants respect” (Fig. 2).

In May 2026, before the beginning of the dry season, 20 kg of Sylvatica Bioprotect product was purchased to test its efficacy on protecting baobab trees in the park.

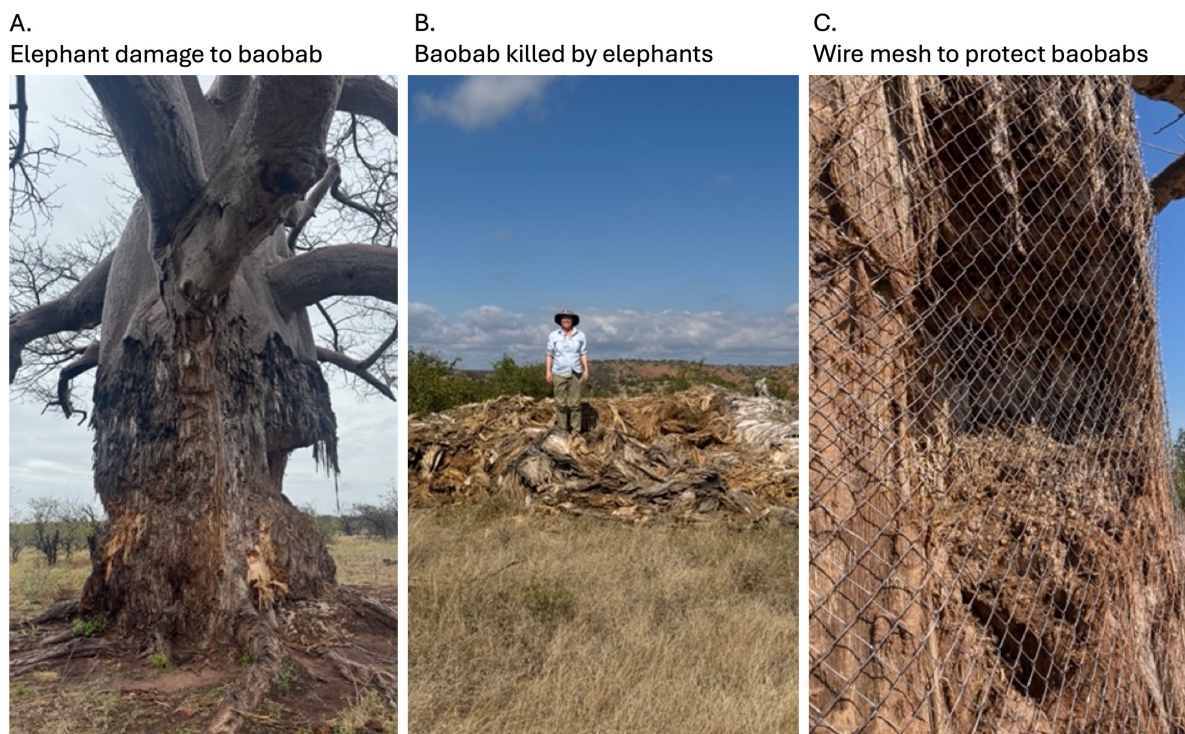


Figure 1. Elephant utilisation of baobabs (A) that can result in the death of baobabs (B). Wire mesh has been shown to effectively protect baobabs from elephants (C), but this mesh is stolen in the northern part of the park close to the Zimbabwe border.

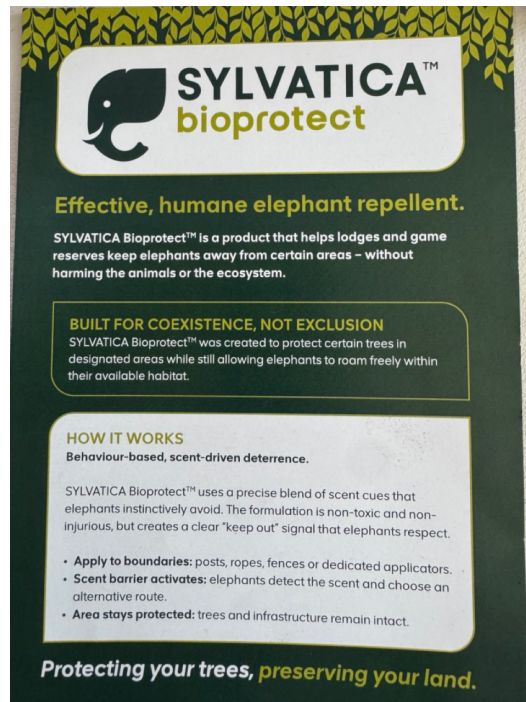


Figure 2. Brochure that advertising Sylvatica Bioprotect elephant repellent

Methods

The product comes as a powder which had to be diluted in water with the instruction to dilute 20 kg of powder in with 250 litres of water. We used 10 litre knapsack pressure sprayer into which we mixed 1.3 kg of powder, following the rate of dilution. Once diluted each baobab was sprayed from ground up to about three meters in height up the stem and around the whole tree. Due to the thickness of the mixture the spray nozzle had to be opened wide to stop the nozzle from clogging, this resulted in the sprayer producing narrow jet of liquid rather than a wide fine mist. The parts of the stem that were sprayed stained a red colour so it was easy to see the extent of coverage.

Twenty three randomly selected trees were treated with Sylvatica BioProtect and twenty one trees were left untreated as control trees. The treated and untreated trees were distributed widely across the northern part of the park with both untreated and treated trees close to one another (Fig. 4).

After the dry season in October 2026 the treated trees and untreated trees were evaluated for damage. The percentage fresh damage to each side of the tree (north, south, east, west) was recorded and then an average of the damage for the whole stem calculated following previous methods (Venter, 2022).

The number of damaged and undamaged untreated trees was compared to the number of damaged and undamaged treated trees using Chi Square statistical test and the extent of damage between control and treated trees was analysed using a Welch's t

statistical test. The data was captured in excel and the statistical tests were performed using GraphPad Prism software.



Figure 4. Position of treated and untreated (control) baobabs in the northern part of the eastern section of the park opposite Zimbabwe.

A.
Red dyed streaks of *Sylvatica*
(and fresh damage after spraying)



B.
Diluting *Sylvatica* in water



C.
Elephant damage 4 months
after treatment with *Sylvatica*

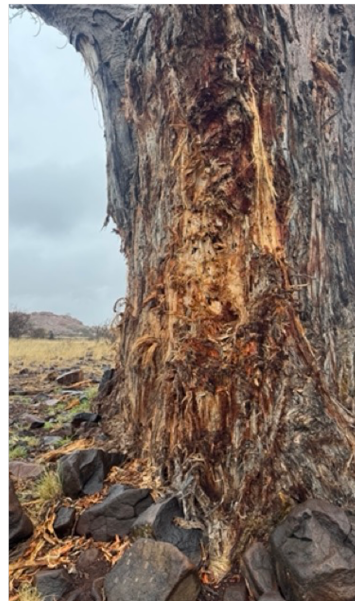


Figure 5. When spraying the trees the treatment left red streaks on the trunk (A). Mixing Sylvatica Bioprotect with water (B). Elephant damage to trunk 4 months after treatment with Sylvatica Bioprotect (C).

Results

There was no significant difference in the number of trees ($\chi^2 = 0.049$, $P = 0.83$) that were damaged and no significant difference in the extent of damage between treated and untreated trees ($t=0.7631$, $df=41.99$, $P = 0.45$) (Fig 5C, Fig. 6).

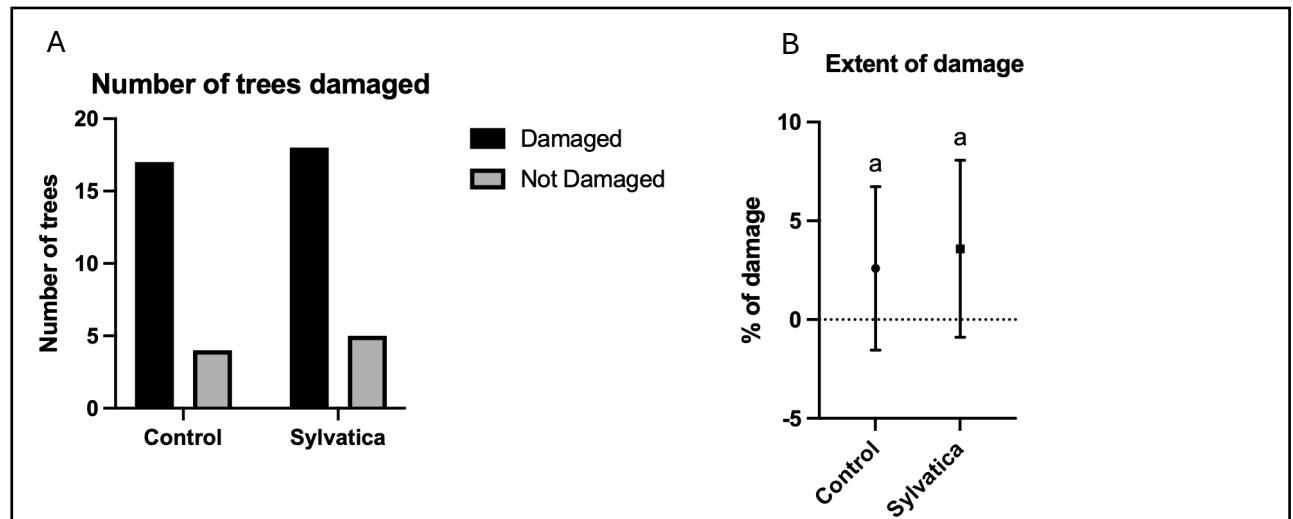


Figure 6. There was no significant difference in the number of trees damaged (A) and the extent of the damage (B) between control (untreated) and Sylvatica (treated) trees.

Discussion

Application of Sylvatica Bioprotect was labour-intensive because the product was difficult to dissolve and its sticky, resin-like consistency repeatedly blocked the nozzle and connecting pipes, which had to be cleared with metal wire every few minutes (Fig. 5B). Although warm water may improve dissolution, fully opening the nozzle to reduce clogging produced a narrow jet rather than a fine spray, resulting in vertical streaks and incomplete bark coverage (Fig. 5A). Applying the product with a brush may provide more complete coverage. The product also stains treated bark, which makes the application area easy to assess, but it can stain clothing and overalls should therefore be worn. Although the sticky coating appeared rain-resistant, its persistence on treated trees should be evaluated over several seasons. Importantly, elephants consumed sprayed sections of bark and continued to damage treated trees, indicating that neither the product's taste nor its purported scent deterrent prevented feeding. These findings should be considered in the context of the relatively low level of baobab damage recorded in 2026: rainfall continued until April, extending the wet season and increasing forage availability during the subsequent dry period, whereas elephant damage is typically greater when grass and other forage are scarce.

Conclusion and recommendations

Sylvatica BioProtect did not effectively protect baobabs from elephant damage: 78% of treated trees showed signs of damage, and the extent of damage differed little between treated and untreated trees.

Despite these findings, efforts to identify an effective method of protecting baobabs in the northern part of the park will continue. Because elephants fed through the sprayed sections of bark, a further trial will assess whether complete stem coverage improves the product's effectiveness. In March 2027, Sylvatica BioProtect will be reapplied to the entire stem using a paintbrush and ladder, and its effectiveness will be evaluated at the end of the 2027 dry season.

Data availability

Available on request from info@baobabfoundation.co.za

Funding

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References

Venter, S. M. (2022). Report on the effectiveness of protecting baobab (*Adansonia digitata*) trees from elephant damage using diamond mesh and fermented elephant dung spray. *Baobab Foundation*.