

Identifying cultural, climatic and temporal factors influencing *Striga asiatica* abundance within rice–maize systems in mid-west Madagascar

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Abstract

The parasitic weed genus *Striga* causes huge losses to crop production in sub-Saharan Africa, estimated to be in excess of \$7 billion per year, affecting subsistence farmers who frequently lack access to novel technologies proposed for control. Effective *Striga* management therefore requires the development of strategies utilising existing cultural and management practices. We report a multi-year, landscape-scale monitoring project for *Striga asiatica* in the mid-west of Madagascar, undertaken over 2019–2020 with the aims of examining cultural, climatic and edaphic factors currently driving abundance and distribution. Long-distance transects were established across the middle-west region of Madagascar, over which *Striga asiatica* abundance in fields was estimated. Analysis of the data highlights the importance of crop variety and legumes in driving *Striga* density. Moreover, the dataset revealed significant effect of precipitation seasonality, mean temperature and altitude in determining abundance. A composite management index indicated the effect of a range of cultural practices on changes in *Striga* abundance. The findings support the assertion that single measures are not sufficient for the effective, long-term management of *Striga*. Furthermore, the composite score has potential as a significant guide of ISM control beyond the geographic range of this study.

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