Three new biological control programmes for South Africa: Brazilian pepper, *Tamarix* and *Tradescantia*

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Three weed biological control (biocontrol) programmes are described, all of which are considered to be 'transfer projects' that were initiated elsewhere, and on which South Africa has piggybacked its biocontrol efforts. Using knowledge and expertise from international collaborators, South African weed researchers are following a long tradition of transfer projects, which has been a largely successful and practical approach to biocontrol. Two Brazilian weeds, the Brazilian pepper tree *Schinus terebinthifolia* and the spiderwort *Tradescantia fluminensis* are being targeted, along with the Old-World trees *Tamarix ramosissima* and *T. chinensis*. The potential biocontrol agents are described and ranked for the two trees according to what has been discovered elsewhere, while the agent already released against *T. fluminensis* is rated (as poor), and other potential agents are considered. The addition of molecular techniques, climate matching and remote sensing in transfer projects can increase the chance of successful biocontrol and the inclusion of these techniques in the three new programmes is discussed. Transfer projects are a cost-effective and pragmatic way to pick winning biocontrol programmes.

Key words: *Schinus terebinthifolia*, transfer projects, *Tamarix ramosissima, Tamarix chinensis, Tamarix usneoides, Tradescantia fluminensis.*

INTRODUCTION

South Africa has a long history of weed biological control (biocontrol) that from the outset has taken advantage of so-called 'transfer programmes', in which expertise and knowledge developed elsewhere in the world is imported and employed against a common enemy – a shared target weed. In this way the early pioneers of South African weed biocontrol successfully cut their teeth on a variety of cactus weeds, giving credibility to the technique (Moran *et al.* 2005; 2013), and convincing successive governments to support this type of research for the public good. This piggyback approach has served South African biocontrol well, over more than 100 years, and goes some way to explain why South Africa is among the top five of the world's leading weed biocontrol nations (largely ranked by the number of agents released), and the only developing nation cooperating (while sharing agents) with the USA, Canada, Australia and New Zealand (Schwarzlander *et al.* 2018).

Other aspects of South Africa's invasion history are reflected in the three projects presented in this paper, two of which are aimed at invasive

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