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The development of 'spore water' on Kangaroo Island for rapid spread of bridal creeper rust fungus

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Summary

An overview is given of the development and use of 'spore water' on Kangaroo Island, South Australia. Spore water is a solution of spores of the bridal creeper rust fungus, *Puccinia myrsiphylli*, which is sprayed onto bridal creeper, *Asparagus asparagoides*, using standard pesticide application equipment. It has been found to be a very successful, non labour-intensive method of introducing biological control into the bridal creeper populations.

Introduction

'Spore water' is a solution of rainwater and viable bridal creeper rust fungus (*Puccinia myrsiphylli* (Thuem.) Wint.). The rust is an effective seasonal biological control, and both this control vector and bridal creeper (*Asparagus asparagoides* (L.) Druce) are native to southern South Africa. The rust fungus is one of a small number of biological control vectors specific to bridal creeper (see Morin *et al.* 2006).

The rust fungus was first distributed to South Australian Animal and Plant Control Officers and delegates in August 2000. In spite of being effective, the initial method to spread the rust fungus amongst bridal creeper infestations with pots of infected plants and cuttings of infected shoots proved to be extremely time

consuming and financially expensive for paid staff and volunteers, and it was also taking too long to see positive results. Once a small area (<1 m²) was inoculated, it was taking another two or three bridal creeper growing seasons for rust fungus to spread several metres from the inoculation sites into new areas.

A quicker way to spread rust fungus was investigated. Trials were conducted in autumn 2003 to test spore water, comparing different weights of rust fungus infected bridal creeper shoots in a specific volume of rain water. Applications in winter 2003 on the Kingscote coastal foreshore found that spore water was a quick and cost effective way to spread rust fungus across the bridal creeper-infested landscape.

From then on, it has been our intention to spread the word (about spore water) as well as the rust fungus as far and as wide as possible across areas of Australia affected by bridal creeper.

What is spore water?

Spore water is a different way to spread a biological control. It is made by washing bridal creeper leaves infected with rust fungus with rainwater, and adding this concentrated mix to a clean spray unit containing rainwater.

It has proven necessary to always use rainwater as the chemicals in mains water and minerals in bore water would adversely affect the rust fungus spores. It is necessary to have a clean tank, lines and spray gun as otherwise residual pesticides may also adversely affect the rust fungus spores. Spore water solution also needs to be kept gently agitated during the spray operation to keep the spores suspended.

Rust requires humidity as well as mild temperatures to establish. It was not always humid when the spore water was sprayed out, so the spray jet was angled so that spore water landed into sheltered and warmer areas.

How to make spore water

A method is given at the web site: http://www.weeds.org.au/docs/BC_How_to_make_spore_water.ppt

Advantages of using spore water

Spore water is not an herbicide, uses rain water and the rust fungus is specific to bridal creeper. Hence it can be sprayed over any areas of native vegetation, forests or orchards infested with bridal creeper with no off-target damage.

Spore water can be sprayed when the day is mild or cold, when it is windy or just breezy, or when misty rain is falling and even a few hours before rain is expected. However, weather conditions will affect the establishment rate of the rust fungus. Any sized spray unit can be used, from a hand held two litre pump action unit a fixed wing crop duster aircraft.

Where was spore water sprayed and how successful has it been?

On Kangaroo Island, spore water has been sprayed on over 250 km of roadside vegetation, farm shelterbelts, coastal verges and other areas where bridal creeper is growing (Figure 1). Spore water has been

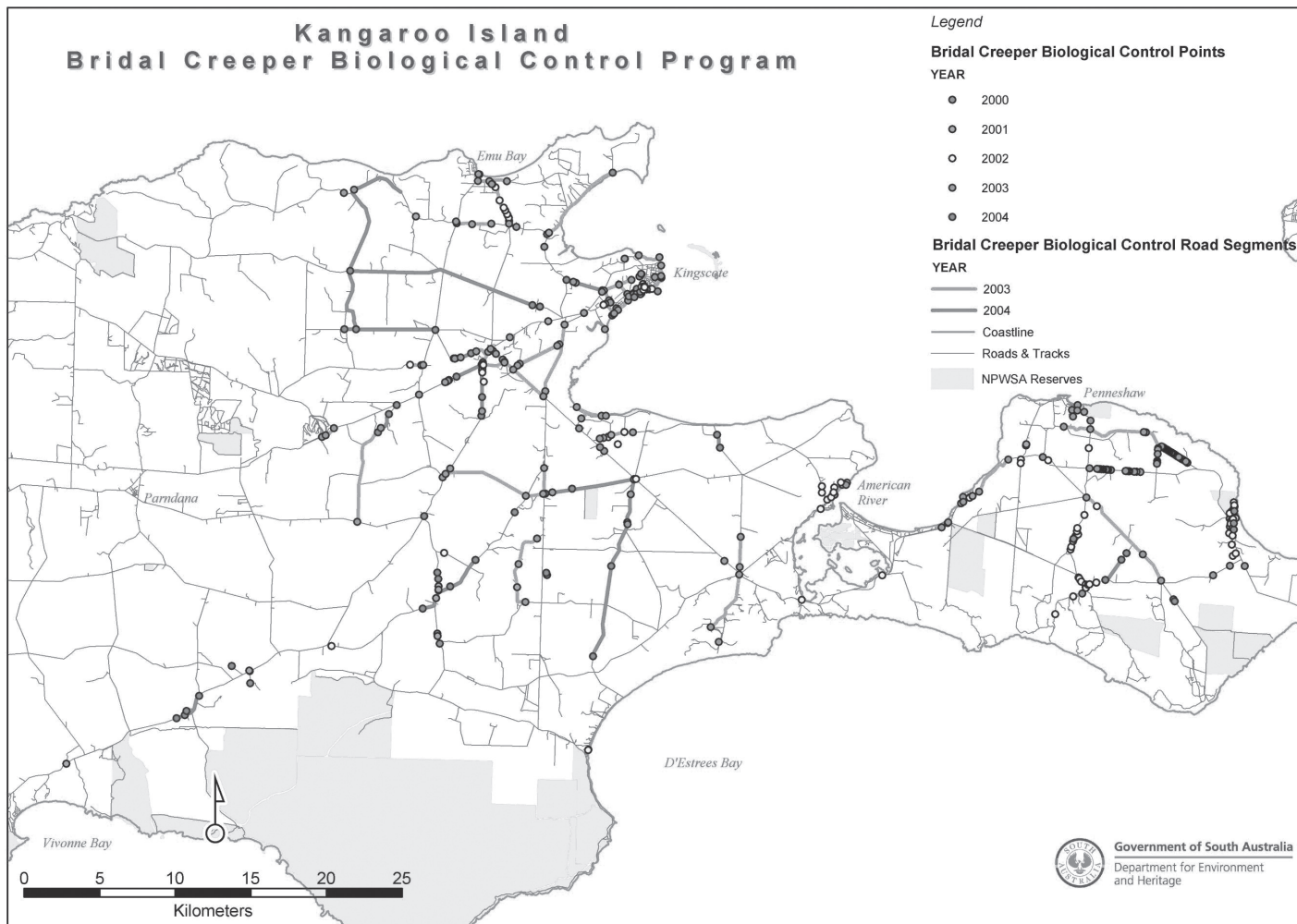


Figure 1. Releases of bridal creeper rust fungus on Kangaroo Island.

applied by spray gun or mister during August and September in 2003, 2004 and 2005.

Annual monitoring has proven that bridal creeper rust fungus has been successfully introduced to the areas treated with spore water. In warmer and moister areas with good wind movement, natural spread of rust fungus has also been very successful. Seasonal monitoring since 2001 shows that rust spores have spread naturally >10m into immediate areas and up to 4 km from the original inoculated sites.

How have we spread the word about spore water?

Funding through grants in winter 2004 enabled us to conduct practical workshops on Kangaroo Island and mainland South Australia. Fourteen workshops were held at which a total of 282 persons attended.

The Australian Pesticides and Veterinary Medicines Authority has declared that a permit is not required for the preparation and use of spore water. However, precautions should be taken to avoid inhaling spores from infected leaves and spray mist.

The Victorian Department of Primary Industries is undertaking further scientific research into the effectiveness of spore water.

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