



## PANAMA DISEASE TROPICAL RACE 4 RESEARCH UPDATE

### Disinfectant trials

New research compares disinfectants, shedding light on their effectiveness in killing the fungal spores that cause Panama disease, when used in wash-down facilities, footbaths and dips. This document provides guidance regarding the most appropriate disinfectants to use to help prevent the spread of Panama disease tropical race 4.

Department of Agriculture and Fisheries (DAF) Plant Pathologists Peter Trevorrow and Kathy Grice tested five categories of disinfectants and sanitisers against *Fusarium oxysporum* f.sp. *cubense*, the fungus which causes Panama disease.

*Note: This research was completed using Panama Race 1 (R1) spores as a proxy for Panama disease tropical race 4.*



Department of Agriculture and Fisheries (DAF) plant pathologists Peter Trevorrow and Kathy Grice conducting the disinfectant trials.

### Results

- Quaternary Ammonium (QA) compounds containing 12% (120g/L) didecyl dimethyl ammonium chloride (DDAC) active ingredient were effective against the spores that cause Panama disease. This included chlamydospores, the longest-lived type of spores.
- Readily available products, registered as disinfectants and containing 12% DDAC were effective.
- When soil was present in the trial sample, equivalent to 1kg of soil in 20L of disinfectant solution, they were effective at a dilution rate of 1:100 (1%) in water. QA products containing 12% DDAC were effective with a contact time of a few seconds (the amount of time it takes to walk through a foot bath) and up to 24 hours which was the longest contact time tested in the trials.
- QA products containing less than 12% DDAC were not effective when in contact with spores for a few seconds in a 1:100 (1%) solution.

The detergent based products did not destroy Panama disease fungal spores. They suppressed spore growth for just a few days.

The test results indicate these products are best used to help remove dirt from vehicles, equipment and machinery, and should not be used as a disinfectant.

In addition to the QA compounds, four other categories of disinfectants and sanitisers were tested - biocides, bio-flavonoids, an oxidising agent (bleach) as well as undefined/detergent products.

The oxidising agent was not as effective in destroying the spores that cause Panama disease as the QA compounds.

The Biocides had some effectiveness but at lower dilution rate of 1:10 (10%) and/or longer contact times. Trials are continuing into the bio-flavonoids and the undefined/detergent products.

### Clean first, then disinfect

Despite the QA compounds containing DDAC being effective with some dirt in solution, clods of dirt are not penetrated.

This means disinfectant cannot make contact with any spores enclosed within a clod of dirt. Any build-up of soil or mud must be removed before treatment of equipment, machinery, vehicles and footwear etc. This includes removal of dirt compacted into the treads of footwear and tyres.

If there are any concerns about the impact of QA compounds, a rinse step should also be considered after the appropriate contact time as stated on the product label.



The removal of dirt is an essential step prior to disinfection using a QA product.

### Drive-through dips

Samples from drive-through dips on the Atherton Tableland in Far North Queensland were assessed for effectiveness against R1 fungal spores.

In one case, the dip containing a 12% QA product had been used for three to four weeks without a recharge and remained effective.

**Note:** Tested dips were located in the Tablelands where there is typically lower rainfall. In areas of high rainfall, steps need to be taken to prevent dips from becoming diluted and to avoid capturing soil or plant material.



DAF Plant Pathologist, Peter Trevorrow sampling a dip on the Atherton Tableland. Photo: Kathy Grice

### Further information


Detailed results are available by emailing Peter Trevorrow [peter.trevorrow@daf.qld.gov.au](mailto:peter.trevorrow@daf.qld.gov.au) or Kathy Grice [kathy.grice@daf.qld.gov.au](mailto:kathy.grice@daf.qld.gov.au).

Please note, further research into the effectiveness of disinfectants in destroying the fungal spores that cause Panama disease is being completed.

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