

Evaluation Report for Category B, Subcategory 3.11, 3.12 Application

Application Number: 2014-1131
Application: Changes to Product Labels – New Pests, New Site or Host
Product: Storox
Registration Number: 27432
Active ingredients (a.i.): Hydrogen Peroxide
PMRA Document Number: 2494950

Purpose of Application

The purpose of this submission was to register a new use pattern for Storox, containing hydrogen peroxide, as a post-harvest treatment for fruits and vegetables to manage spoilage and decay caused by fungus and bacteria. Storox is to be added to wash water or used in fog tunnels for the post-harvest treatment of stored food and feed. Storox is also to be applied as a foliar spray treatment to greenhouse tomatoes.

Chemistry Assessment

It was determined that a chemistry assessment was not required for this application.

Health Assessments

Hydrogen peroxide, readily breaks down to oxygen and water upon contact with moisture in the environment or via enzyme catalyzed processes. Therefore, it is expected that acute toxicity endpoints are most relevant to the assessment and mitigation of any potential occupational and bystander risks from the use of Storox.

Storox is expected to be slightly acutely toxic via the oral route, of low acute toxicity via the dermal route, and of moderate acute toxicity via the inhalation route. It is also expected to be moderately irritating to the skin, severely irritating or corrosive to the eyes, but not a skin sensitizer.

Although the wash water and fog tunnel uses of Storox will result in workers handling more hydrogen peroxide on a daily basis compared to previous uses of the Storox, they will be exposed to the same concentration of hydrogen peroxide in the end use product concentrate (27% w/w), and the concentrations of hydrogen peroxide in the wash water and fog tunnel aerosol fog will be very low (i.e., 0.295–0.589% w/w) compared to other common uses of hydrogen peroxide (e.g., 3.0% in topical antiseptics). Precautionary statements on the Storox label include advice on not breathing vapours, avoiding contact with skin, eyes, and clothing, as well as recommended personal protective equipment (PPE) including eyewear, protective clothing, and NIOSH-approved respiratory protection.

It is expected that these statements and PPE will mitigate any potential exposures and risks of eye, skin, and respiratory irritation during mixing/loading of the end use product, application of the end use product via wash water, clean-ups, and repairs. Inhalation exposures and risks will also be mitigated by label advice on keeping workplace airborne hydrogen peroxide levels below local workplace exposure limits and using respiratory protection if exposure limits are exceeded. For applications via the fog tunnel, ocular, dermal or inhalation exposures and risks are expected to be negligible because the tunnels are enclosed stainless steel chambers that are controlled from the outside.

Post application activities consist of unloading and packing treated produce. These activities are performed after the produce is allowed to dry and any residues of hydrogen peroxide are likely to have decomposed. Also, a precautionary statement on the Storox label advises against entering into treated areas until residues are dry. Consequently, it is expected that post-application exposures and associated human health risks will be negligible.

No potential bystander exposures are expected as wash water and fog tunnel application of Storox occur indoors or in covered protected areas and the label advises against entering into treated areas until residues are dry.

Since hydrogen peroxide readily decomposes to oxygen and water upon contact with moisture in the environment or via enzyme catalysed processes in plants, residues of hydrogen peroxide on or in treated fruits and vegetables are expected to be negligible, no metabolites of concern are expected to be formed, and it is not necessary to specify a maximum residue limit (MRL). Similar to previously registered food uses of Storox, the new uses are not expected to result in any residues that could pose a risk to any segment of the Canadian population.

Environmental Assessment

It is not expected that the use of Storox as a post-harvest treatment for fruits and vegetables or as foliar spray treatments to greenhouse tomatoes would result in any additional environmental risk given that the use pattern is the same as for registered products (e.g. Zeritol, registration number 29508).

Value Assessment

Hydrogen peroxide is a well-known general biocide with a broad range of uses including medical and agricultural applications. Ten efficacy trials conducted between 2003 and 2012 were submitted to demonstrate the efficacy of Storox at concentrations ranging from 1-2% on a range of crops including tomatoes, potatoes, oranges, melons, lettuce, carrots, apples, and peppers. Adequate levels of efficacy were demonstrated from applications made by both wash water and fogging treatments. Although some trials assessed sensitivity of certain organisms to Storox that are not plant pathogens (e.g. *Listeria innocua*), these results were useful in demonstrating the general biocide activity of the product on fruit and vegetable surfaces. The value of the use pattern was deemed to have been supported.

Conclusion

Following review of the application the PMRA approved the amendment to the Storox label to include use as a post-harvest treatment for fruits and vegetables to manage spoilage and decay caused by fungus and bacteria and for use as a foliar spray treatment to greenhouse tomatoes.

References

PMRA

Document Number

Reference Title

- 2408514 2014, Storox-10.2.2, Part 6 & Part 7-23march2014, DACO: 10.2.2,6.1,6.2,6.3,7.1,7.4
- 2408530 2014, Exposure 5 2-Storox-23march2014-washwater-final, DACO: 5.2
- 2408511 2014, 27432-Storox-E-23march2014-label-washwater-final, DACO: 1.1.1
- 2408515 2014, Storox-10.2.3.1, 10.3.1- summary washwater. DACO: 10.2.3.1,10.3.1
- 2408516 2012, Evaluation of Storox for the Control of Alternaria Fruit Rot in Tomato, 2012, DACO: 10.2.3.2(D),10.3.2(B)
- 2408517 2012, Evaluation Storox for the Control of Bacterial Soft Rot and Fusarium Dry Rot in Potatoes, 2012, DACO: 10.2.3.2(D),10.3.2(B)
- 2408518 2012, Assessment of SaniDate 5.0 and Other Chemical Sanitizers against *Listeria innocua* on Cantaloupes, 2012, DACO: 10.2.3.2(D),10.3.2(B)
- 2408520 2012, OxiDate and Residual H2O2 and PAA After Pre-harvest Sprays on Produce, DACO: 10.2.3.2(D),10.3.2(B)
- 2408522 2010, Evaluation of Storox as a Post-Harvest Application on Fresh Processing Tomatoes to control *Salmonella enterica* serovar Typhimurium using the Smart Fog Tunnel System , 2010, DACO: 10.2.3.2(D),10.3.2(B)
- 2408524 2010, Evaluation of Storox as a Post-Harvest Application on Tomatoes using the Smart Fog Tunnel System, 2010, DACO: 10.2.3.2(D),10.3.2(B)
- 2408526 2007, Evaluation of Storox as Post-Harvest Treatment On Vegetables and Fruits, DACO: 10.2.3.2(D),10.3.2(B)
- 2408527 2008, Evaluation of Storox as a Water Treatment In Post-Harvest Wash Tanks, DACO: 10.2.3.2(D),10.3.2(B)
- 2408528 2003, Evaluation of Storox for the Control of Pathogens Causing Post-Harvest Spoilage and Decay in Apples, DACO: 10.2.3.2(D),10.3.2(B)
- 2408529 2005, An Assessment Of Methods To Clean Citrus Fruit Surfaces, DACO: 10.2.3.2(D),10.3.2(B)

PMRA

Document Number

Additional information used

- 2505946 1993, European Centre for Ecotoxicology and Toxicology of Chemicals Joint Assessment of Commodity Chemicals No. 22: Hydrogen Peroxide, ECETOC, DACO: 12.5.4
- 2505949 2003, European Chemicals Bureau, European Union Risk Assessment Report, CAS No. 7722-84-1, EINECS No. 231-765-0, Hydrogen Peroxide, 2nd Priority List Volume 38, EUR 20844 EN, DACO: 12.5.4
- 2505951 1993, Reregistration Eligibility Document for Peroxy Compounds, United States Environmental Protection Agency, DACO: 12.5

ISSN: 1911-8082

**8 Her Majesty the Queen in Right of Canada, represented by the Minister of Public Works and Government Services
Canada 2015**

All rights reserved. No part of this information (publication or product) may be reproduced or transmitted in any form or by any means, electronic, mechanical photocopying, recording or otherwise, or stored in a retrieval system, without prior written permission of the Minister of Public Works and Government Services Canada, Ottawa, Ontario K1A 0S5.