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SANITISERS FOR VEGETABLE SAFETY

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Growers generally recognise that a washing step can enhance the market quality of many fresh vegetable types. Washing can effectively remove soil and other debris. However, in certain circumstances washing can also spread microbes which could cause soft rot or food safety concerns.

This article summarises the findings to-date of Horticulture Australia Ltd. (HAL) project VX99004 which investigates the influence of sanitation conditions on the effectiveness of sanitisers to disinfest vegetable wash water and contact surfaces such as harvesting and handling equipment.



A vegetable washing system using pressure washing and a sanitised water rinse

Sanitisers suitable for wash water treatment are either registered by the NRA (products containing calcium hypochlorite and bromo-chloro-dimethyl hydantoin – BCDMH), have temporary NRA permits (sodium hypochlorite and iodine) or are exempt from registration. Sanitisers manufactured

on site (eg. chlorine dioxide) are exempt from NRA registration, however any residues on the product must comply with the ANZFA Food Standards Code. In Australia, chlorine and BCDMH products are the most popular and when used correctly these are safe and effective water treatments. Other sanitisers eg. Peroxyacetic acid have proven to be more suitable for cleaning wooden and metal contact surfaces.

Our research has shown that sanitisers are capable of destroying up to 95% of harmful bacteria on fresh produce and almost 100% of fungi and bacteria in wash water. However, to maintain the performance of these sanitisers, controlling the organic matter content and the pH may be required.

To maintain an effective level of hypochlorous acid (the main killing agent produced by hypochlorites), the water pH should be kept between 6.5 and 7. This can be achieved by using a buffer which is a chemical additive that stabilises pH. Adding citric acid to the water is another way of decreasing the pH if it is above 7. Hypochlorites (and most other sanitisers) work faster in water at room temperatures than in refrigerated water; longer contact times are needed at low temperatures, because chemical reactions are slower. BCDMH more effectively copes at high pH and chlorine dioxide is more suitable where the organic content of the water is high and difficult to control.

On a metal (aluminium) surface, peroxyacetic acid and calcium hypochlorite at label rates were the most effective against *E. coli*. Chlorine dioxide was the least effective for this purpose. On smooth planed pine (eg. field bin), peroxyacetic acid was the most effective followed by BCDMH, calcium hypochlorite and benzylkonium chloride. Chlorine dioxide at the label rate was ineffective against *E. coli* on wood, under these test conditions. Plastic, being a less reactive surface, is probably more easily sanitised than wood and metal.

In a hydrocooling system, BCDMH reduced the *E. coli* level on broccoli down to one-ten-thousandth of the original level, in 30 minutes. In lab experiments calcium hypochlorite reduced *E. coli* to about one-hundredth of the original level on broccoli and lettuce, within 30 seconds (Behrsing *et al.*, 2000 – *Postharvest Biol & Tech* 19, 187-192).

Workshops on managing vegetable wash water are being conducted in each state during May – June 2002. Contact your state IDO for more information.

For more information, contact Robert Holmes or Paul Harrup (Tel 03 9210 9222).

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Hot Mint

Polygonum odorata



Other names

English: laksa leaves

Malay: daun kesom

Vietnamese: rau ram

Use

Can be eaten raw or cooked. Use in laksas, Vietnamese & Thai dishes, salads or as a garnish. Sharp flavour & soapy aroma.

Quality characteristics

- leaves should be green & free of yellowing, holes & cuts
- leaf tips should not be browned
- overall appearance of stems & leaves should be fresh with no wilting caused by moisture loss
- fresh, pungent aroma maintained
- stem cuts should be clean & free of rots

Postharvest handling

- Low temperature storage slows senescence & rot growth & reduces water loss. Cool to recommended storage temperature (0°C) before packaging. Packaging reduces water loss, provides a barrier to the spread of decay & adds value through improved presentation.
- Modified Atmosphere Packaging reduces respiration rate & therefore slows ageing & yellowing.
- Package 5 bunches in 50µm thick polypropylene bags with oxygen transmission rate of 970ml/m²/day/atmosphere (sealed dimensions of 270x350mm). Do not pack wet mint.



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