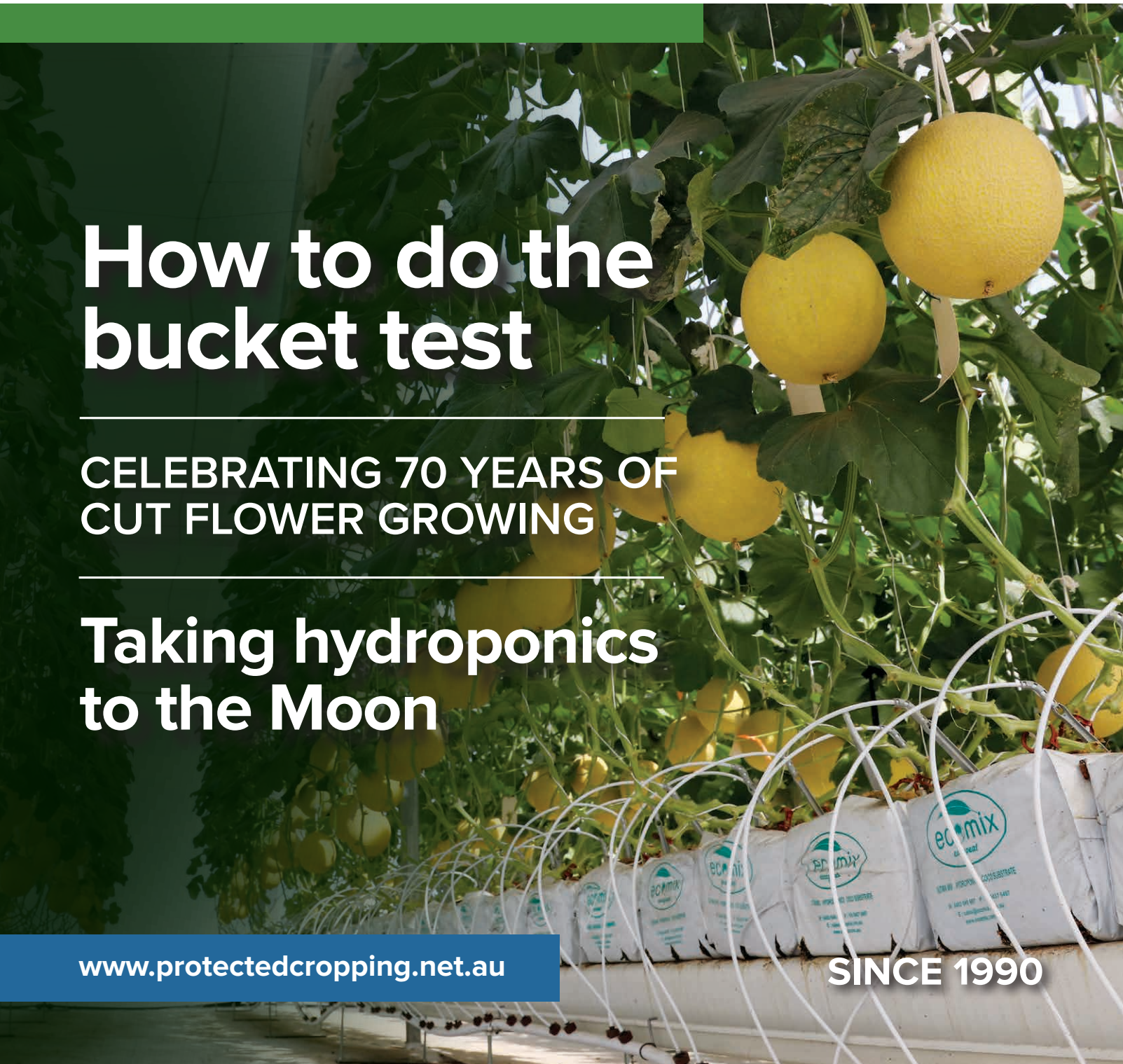
Volume 19 Winter 2024

SOILLESS AUSTRALIA

Protected Cropping Australia Industry Trade Magazine

PCA



How to do the bucket test

CELEBRATING 70 YEARS OF CUT FLOWER GROWING

Taking hydroponics to the Moon

www.protectedcropping.net.au

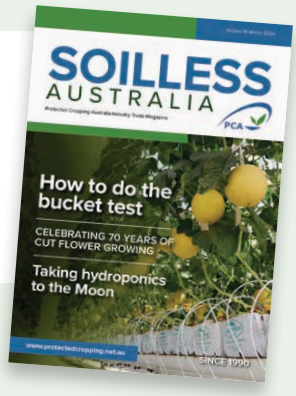
SINCE 1990

contents

FRONT COVER

Melons growing hydroponically in Far North Queensland. Learn how to better manage your system with a simple bucket test.

Read the full story on page 22.



Like us on Facebook

ISSN 2209-3567

DISCLAIMER

Soilless Australia is published by Protected Cropping Australia Ltd
ABN 40 153 372 635

All editorial matter and opinions expressed in this newsletter are those of the author. The PCA does not accept or assume liability or responsibility for any loss or damage resulting from the correctness of such information. The publishing of advertisements does not imply the endorsement of those products or services. All ads must comply with the Trade Practices Act and state regulations.

Any correspondence concerning the magazine should be sent direct to the editor: editor@protectedcropping.net.au

Inquiry finds need for better balance between suppliers and supermarkets

The relationship between supermarkets and suppliers is in the spotlight. Photo Adobe Stock.

The Senate has supermarkets in the spotlight as they investigate the need for regulation to strengthen the position of suppliers.

Australia's federal government is inquiring into the power wielded by Australia's supermarkets over suppliers and consumers as both groups speak out against excessive prices and unfair supplier contracts.

The Senate inquiry is examining the Food and Grocery Code of Conduct, which is a voluntary code signed by Australia's four major supermarkets Coles, Woolworths, Aldi and IGA.

In his Interim Report, the inquiry's Chair, Craig Emmerson, said he recognised "a heavy imbalance in market power between suppliers and supermarkets in Australia's heavily concentrated supermarket industry".

What about greenlife?

Nursery industry representatives through industry national body Greenlife Industry Australia (GIA) are calling for the inquiry to be widened to include hardware giant Bunnings, a major retailer of plants in Australia.

Bunnings Group Limited, trading as Bunnings Warehouse or Bunnings, is an Australian household hardware and garden centre chain owned by Wesfarmers since 1994. Bunnings has stores in Australia and New Zealand.

As of April 8, this request had been refused although members of the nursery industry were invited to speak before the Senate. Growers Karen Brock from Brocklands and Peter Smith from Boomeroo, who were suppliers to Bunnings, fronted the Senate to share their experiences noting that the long-term relationship with Bunnings had not been positive.

Karen Brock, Brocklands Nursery in Tasmania has raised concerns about the relationship between growers and hardware giant Bunnings.

Peter Smith, Boomaroo.

"We supplied plants to Bunnings for a total of 13 years," said Karen. "In all this time, we succeeded in negotiating only one price increase, which meant that we were selling plants at a loss for much of the time."

Peter Smith likened doing business with Bunnings as standing on the edge and being in an abusive relationship. He told the Senate Inquiry he was sharing his story to help secure the future of the Australian greenlife industry and support those growers who continue to supply to Bunnings.

However, Chair Craig Emmerson, suggests the greenlife industry develop its own code with Bunnings.

Jo Cave, CEO of Greenlife Industry Australia, is continuing to urge those in the nursery and garden industry to fill out an anonymous online survey for GIA and to sign a petition against the power of large retailers. See the survey at:

https://www.surveymonkey.com/r/WC86TXW or sign and share the petition at: https://lnkd.in/gjt8TxfN. Find more information at: https://lnkd.in/gjecwgZk.

Jo Cave has set out her view on the need to widen the inquiry in 'Last word', page 42.

It's time to do a bucket test!

Knowing your fertigation system and the nutrients you deliver to soilless crops helps you to grow better. Here's a simple test that you can do today starting with a bucket. Dr Elio Jovicich explains what to do.

Growers and crop advisers working with protected cropping need to know that fertigation systems are operating correctly to assure high productivity. Fertigation is the method of nutrient application in which fertilisers are injected through an irrigation system and delivered to plants (Figure 1).

In soilless-grown crops most essential nutrients for plant growth and production need to come from the nutrient solution delivered through fertigation. Regularly checking and understanding your fertigation system increases your confidence for making changes to the nutrient solution delivered to crops.

Monitoring fertigation is key

The bucket test is a simple hands-on test that you can perform next to your fertigation system (Figure 2). The test involves preparing a nutrient solution yourself from the existing concentrated solutions in your fertigation system, taking some measurements in that solution and making comparisons between a prepared solution and targeted nutrient concentrations, and what your fertigation system is delivering. This will let you know if the dosing of nutrients is within acceptable ranges of concentrations that you have planned to deliver to crops (for example within 15 per cent below or over targeted values for nutrient concentrations and electrical conductivity and pH).

Figure 1 - Specialty melons in soilless systems fertigated via drip irrigation in a crop evaluation north Queensland.

Recipe for success

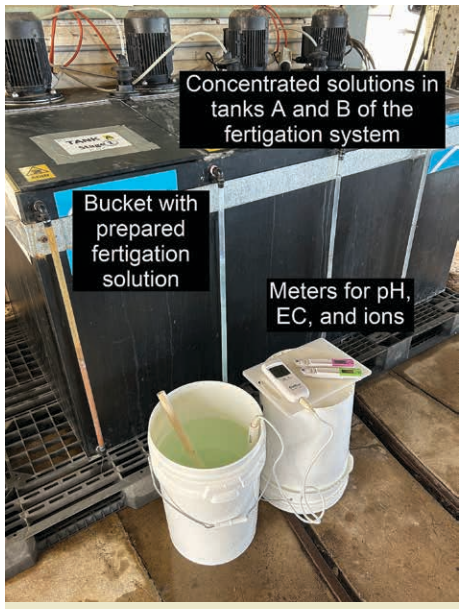
Fertigating soilless crops for healthy productive crops is not guess work. In this article we assume you already know the desired target nutrient concentrations in the solution that are to be delivered to the root system at each irrigation event. Targeted nutrient concentrations depend on crop species and developmental stage; environmental conditions; and whether you are promoting vegetative or generative growth or encouraging fruit quality attributes. You must also have considered the irrigation water quality and any pH adjustments that may be required when preparing the nutrient solution. An optimum pH in the delivered solution will create conditions that will make nutrients available to plants. You followed a recipe that includes soluble fertilisers with known nutrient formulations, and you measured the amounts correctly when preparing concentrated solutions.

Dosing nutrients to plants

Nutrient dosing systems can be different, but their principles of operation are similar. Nutrients will come from the soluble fertilisers added at specific amounts, mixed with water, and stored in tanks. To save time and not have to mix fertilisers regularly, solutions are first prepared at high nutrient concentrations for example, 100 times stronger to what the plants require.

There are chemistry principles that will apply when fertilisers are kept concentrated, some fertilisers can be mixed in the same tank, others are best kept in separate tanks. The basic fertigation system has two tanks, A and B, these store the concentrated nutrients. A third tank may be present containing an acid or a base used to adjust the pH of the diluted solution. Dosing units in the fertigation system (for example proportional injectors, dosing pumps or Venturi injectors) are adjusted or programmed to make the correct dilution (for example 100 times dilution), which is then sent to fertigate the crops.

Figure 2 - The simple bucket test.



WHY DO A BUCKET TEST?

The bucket test will allow you to:

- **check that the fertigation system is working properly,**
- **pinpoint issues in the nutrient dosing system, and**
- **identify setpoint values for the fertigation controller.**

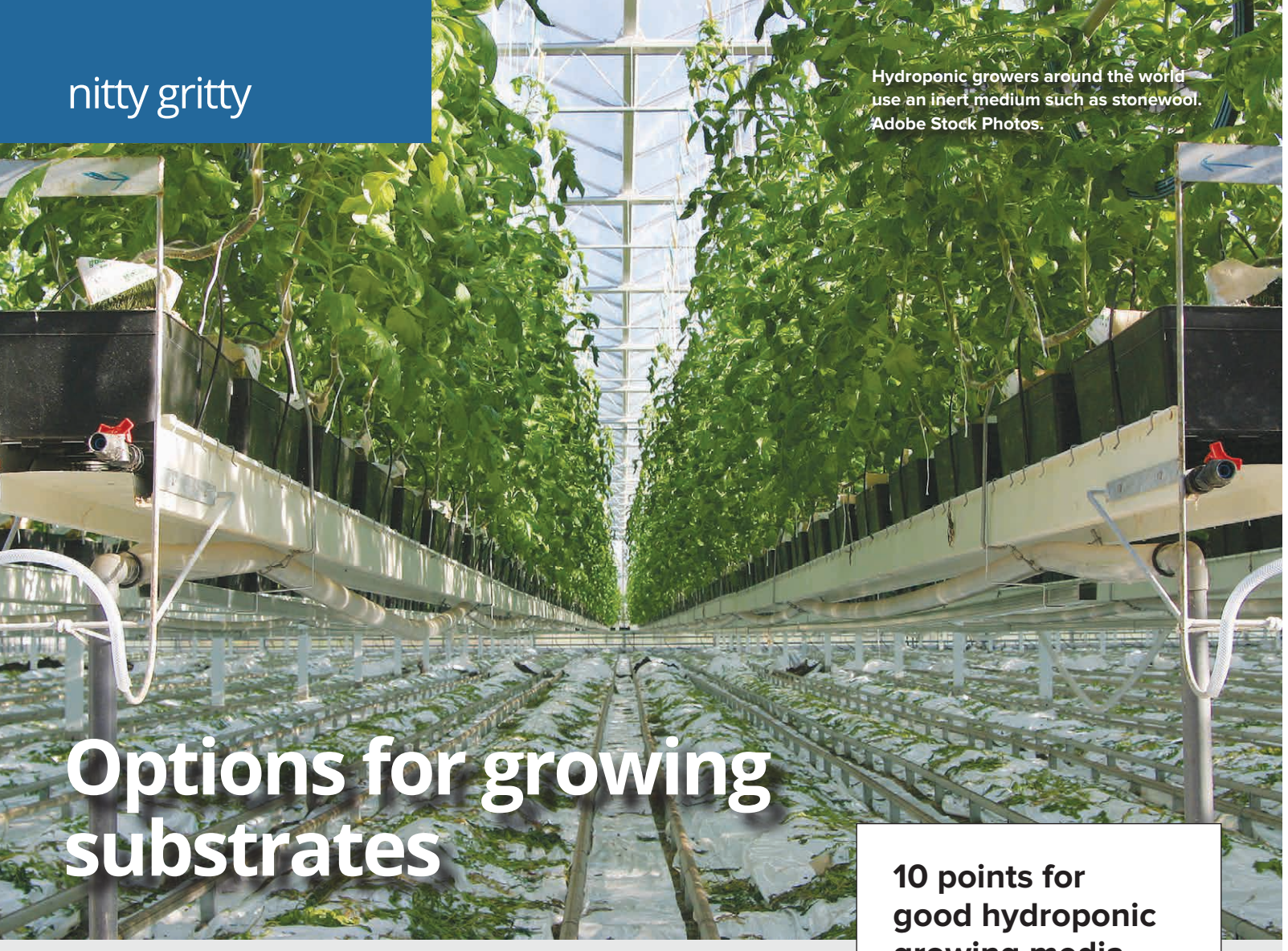
If the final fertigation solution is measured and key parameters such as pH, electrical conductivity (EC), and nutrient concentrations of ions like NO_3^- and K^+, deviate from what was planned it means that one or more issues are occurring between the point where fertilisers were mixed and the dosing system. The bucket test will help you check and resolve these issues.

So what is the bucket test?

The bucket test replicates, on a small scale, the solution that would be made by the dosing system in your fertigation system. In a bucket, you will be adding volumes of concentrated solutions from A and B tanks to water at the planned rate of injection in the dosing units, and any required volume of acid (Figure 2).

Two aspects are critical in the test: that volumes of all liquids are measured accurately; and that hand-held meters are calibrated to ensure they measure correctly. Once A and B solutions are added and the mixture stirred then the nutrient solution parameters like pH, EC, and concentrations of ions such as NO_3^- and K^+ can be measured.

Repeat measurements at least three times, note them down and calculate the averages.



Hydroponic growers around the world use an inert medium such as stonewool. Adobe Stock Photos.

Options for growing substrates

In each issue of *Soilless Australia*, Tony Bundock addresses issues facing growers in the protected cropping industry. In this article he looks at sterile substrates.

The process of hydroponic growing basically revolves around the growing of crops in a single medium and applying a balanced fertiliser recipe through a metered irrigation system. The move away from soil enables growers to start their crops with a sterile substrate that has a known capacity in terms of water holding capacity and drainage potential.

The growing substrate that is utilised is largely a personal choice for the grower, and theoretically a grower can grow his or her crop in any chosen substrate.

Substrate properties and generic target qualities

The amount of pore space of media is a critical physical characteristic that influences water and nutrient absorption and gas exchange by the root system (Sahin et al. 2002).

The substrates listed below are used most commonly in the industry and have the following qualities:

Sawdust

Sawdust has been widely used as a growing substrate for a number of years and was one of the original substrates utilised in the early days of hydroponic growing. It was a popular choice with growers in areas with wood processing industries, because of its low cost, high moisture retention, and high availability.

Many growers have looked to use sawdust as a constituent (normally less than 50 per cent) in mixtures rather than being used as a stand-alone growth medium. However, sawdust is prone to gradual decomposition that leads to unfavourable substrate physical properties

10 points for good hydroponic growing media

Choice of growing media should ideally meet a number of criteria:

- Uniformity
- Durable (medium to slow rate of decomposition)
- Pest, disease and weed free
- 60 – 70 per cent total porosity (space within the solid material)
- 30 – 60 per cent water holding capacity (WHC)
- 10 – 30 per cent air filled porosity (AFP)
- Known cation exchange capacity (CEC)
- Free from salts (low soluble salt level)
- pH within the range 5.5 – 6.5 and/or can be adjusted easily
- Easy to transport, handle and available locally