A message from our Chair

Matthew Plunkett • *PCA Chair*

A very warm Happy New Year to all our members, corporate partners and subscribers.

I hope the Christmas New Year period has given everybody the chance to spend some precious time with family and friends.

As we enter the third year of the COVID-19 pandemic, I am constantly amazed at the resilience of our industry to supply products and services to meet our customers' needs both here in Australia and abroad.

All our members are grappling with constantly changing rules regarding close contacts and isolation after being exposed to a positive COVID-19 case, various state border restrictions/changes, limited supplies of Rapid Antigen Test (RAT) kits, labour shortages, supply chain disruptions, and the various logistical and transport issues that have been ongoing since the pandemic began.

The PCA welcomes the recent announcement around changes to isolation rules for critical workers being able to attend work who submit a negative COVID result but previously had to isolate due to being a close contact of a positive case.

Despite these constant challenges, I hope the New Year has started with a renewed sense of hope and optimism that we can learn to live with the virus whilst taking the necessary precautions to protect our staff and ourselves.

The PCA have been communicating regularly with other Peak Industry Bodies to ensure that these and other issues facing the horticulture sector are being communicated within all levels of Government.

Vaccination rates and the administering of booster shots are increasing and hopefully the various policy announcements made last year around the opening of the international borders and a dedicated Agriculture Visa will ease labour shortages over the course of this year and beyond.

The PCA is in discussion with the Australian Government, Hort Innovation and other industry partners about funding to implement the Australian Protected Cropping Strategy (2021-2030) that was announced late last year.

Targeted Research, Development and Extension (R, D &E) will be crucial to ensure this strategy can address and prioritise investments that help our industry to grow sustainably. Investing in our people and encouraging our Next Gen Leaders are front and centre in ensuring the success of this strategy.

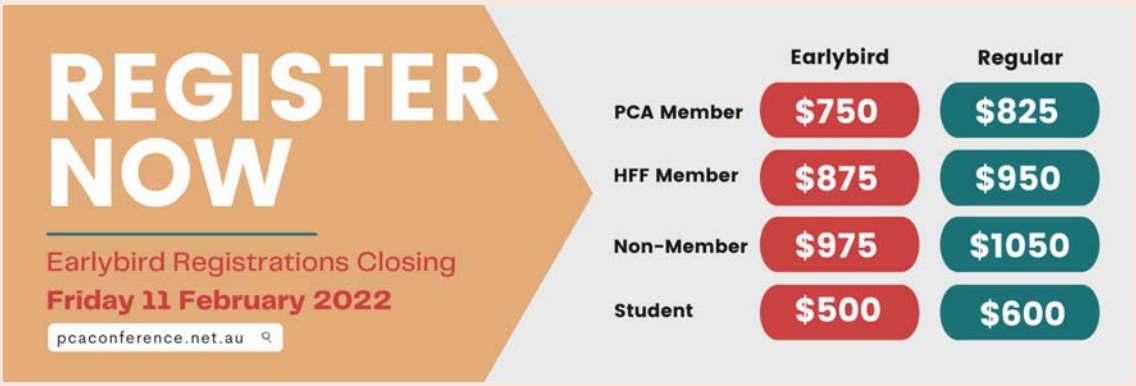
In the end, our growers and businesses must be profitable to invest in new markets, people and technologies that are fit for purpose. Promoting horticulture at every level as an exciting, rewarding and dynamic career pathway has never been more important.

The PCA will continue to advocate, in partnership with other Peak Industry Bodies and our partners to assist with removing and/or limiting barriers that are holding our industry back.

This year, there is much to look forward to including our conference which is only a little over 2 months away. I encourage you all to set aside some time, if possible, to get away to beautiful Coffs Harbour and reconnect with friends and colleagues within our industry.

Please stay safe and have a great month.

Click here to download copy of newsletter



The PCA Board would like to extend our warmest welcome and good wishes to our new members.

Student Member

Yi-Hsuan Wu, Western Sydney University

We look forward to many successful years together!

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HFF 2022 Conference Launch

The Victorian Hydroponic Farmers Federation will be hosting a launch of their 2022 conference on **Thursday the 24th of February**.

This will be an evening event and will take the form of a buffet meal with networking and socialising (at the prescribed distance!), as well as some entertainment. One of the speakers will be Sheree Marris. If Sheree had her choice, she would have gills instead of lungs, a breath hold to rival the sperm whale and a sparkly green mermaid-esque tail. Since she doesn't she spends most of her time blowing bubbles and developing innovative marine environmental projects that bridge the gap between science and the public. A marine biologist, Adjunct at James Cook University, speaker and commentator Sheree is one of Australia's most passionate and dynamic science communicators sharing her quit whit and humour of the natural world through radio, regular TV appearances on The Project and Studio Ten and documentaries. She's also a former Young Australian of the Year and award-winning author with several publications including KamaSEAtra – Secrets of Sex in the Sea, a humorous read about the unique reproductive methods of sea creatures and the parallels they share with humans.

Keeping some sort of control of the event, and also hosting a quiz night will be well known celebrity host —Brian Nankervis. For nearly four decades, Brian Nankervis has made Australians laugh. And that's not an easy task because we're a pretty tough crowd.

Tony Bundock • *PCA Deputy Chair*

Of course, it helps that he has many talents – poet, performer, writer, producer and one of the country's best MCs. Originally best known for his character Raymond J. Bartholomeuz, an eccentric beat poet who was extremely popular during the 1980s and 1990s and made regular appearances on Hey Hey It's Saturday. Brian has frequently appeared as himself on television and stage and was the regular warmup man and audience wrangler for The Panel and Thank God You're Here. In 2005, Brian co-created the SBS music trivia game show RocKwiz, which he also appears in as adjudicator and co-host alongside Julia Zemiro. In 2012, Brian hosted Pictures Of You for Channel 7 and since 2016 he has co-hosted The Friday Revue on ABC Radio.

"It's a real thrill to be able to go back to planning events for our members once again", said President John Elford.

"Covid has certainly taken its toll on all of us across the past two years, and it will be great to meet up with everyone on a face to face basis", said John.

The event will be happening at the Atura Hotel in Hallam, Victoria commencing at 7:00pm. For further details please call ASN Events on 03 8658 9530

Brian Nankervis

Sheree Marris

Temperature Integration (TI) to buffer against rising energy costs

By Graeme Smith

Introduction

The cost of energy is fast rising globally that I suspect is due to ever dwindling supplies, poor chain management and certainly some profiteering, and is affecting a wide range of industries with our protected cropping industry not immune with strong impacts on our cost of production and viability that is already significant in greenhouse, especially semi-closed, and vertical farm systems.

Our modern controlled production systems, even with tighter management of energy consumption, are also affected

Temperature Integration (TI) to buffer against rising energy costs (cont.)

by rising costs therefore it is prudent to consider alternate solutions that are practical, reliable, controllable and achieve a significant reduction in energy with little to no affect on crop yield, hence TI (temperature integration) could be considered.

Conventional 24hour temperature control

Conventional greenhouse control systems normally allow for a wide range of time periods over a typical 24hour day, with many allowing ramping up and down into and out of these periods and their target setpoints can be influenced by many variables to steer our crops for enhanced yield, quality and produce uniformity, however in a challenging paradigm of increasing energy costs we should turn to the basic crop production principles on the integration of plant physiology (how crops grow and what effects their growth), with environmental management. (a growth blueprint)

24hour temperature sum (24t)

A key principle for all growers is to track their 24hour temperature (24t) to ensure it closely matches the amount of light energy received by the plants each day, the so-called radiation sum or DLI. Along with CO2 levels, these parameters are very important in terms of plant growth and development by following a well-known 'blueprint for growth' profile in terms of these measured values.

Instantaneous temperature, or temperature of a plant at any given moment is important in terms of sugar production (photosynthesis) or transpiration rates, whereas the 24hour temperature sum influences the development rates and architecture of a plant (e.g. producing 3 leaves, then a flower truss, then 3 leaves, etc, in a tomato plant)

n.b. For plant development, the average temperature is generally more important than the instantaneous temperature

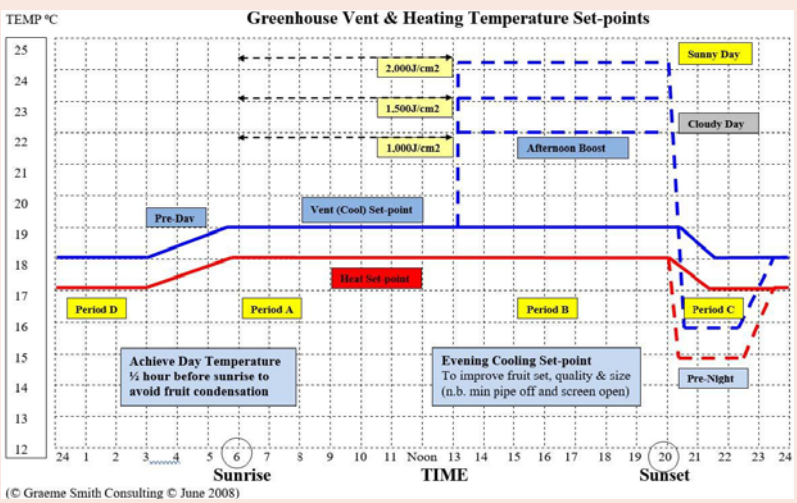
Both humans and plants respond to circadian rhythms and plants have a special function whereby they adapt to an average 24t sum over an extended period and they typically respond to periods of around 7days.

The practical application of this average 24t sum could allow a grower to repair a broken boiler that is down for say 2 or 3 days, therefore the 24t sum is lower, increase the 24t sum for the next 2 or 3 days to fill-in the lost temperature profile, and the plant will continue as if nothing happened in terms of plant development as the 24t sum is normal and on target over a 7-day period. n.b. there are bandwidth limits as to how cold or hot the plants can get over this period!

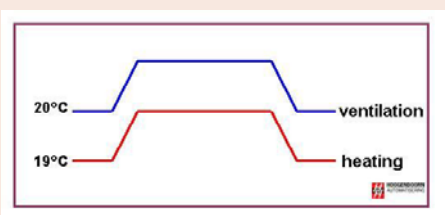
TI can exploit this plant development profile by varying the daily and nightly temperature highs and lows yet maintain an optimum 24t sum resulting in maintaining plant development rates with no decrease in production.

Conventional daily temperature management

The following chart describes a typical daily heating and ventilation temperature profile a greenhouse grower may follow to steer their crops using 4 time periods and some ramping with various influences on temperature setpoints based on accumulated light or other climate factors



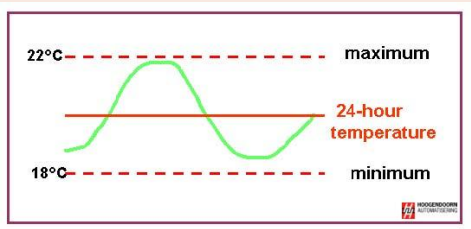
Or in a far simpler way, could look like the following;



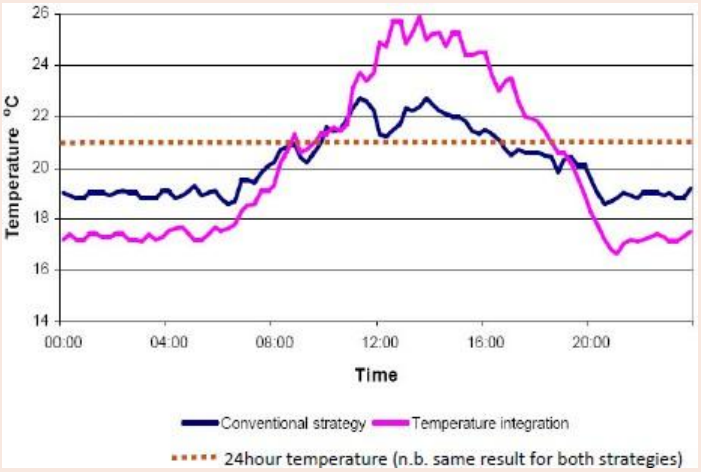
Temperature Integration (TI) to buffer against rising energy costs (cont.)

TI daily temperature management

TI temperature control simply introduces a fixed day/night maximum and minimum temperate target and may deliver the following example temperature profile (Image c);



Employing a TI strategy, we target the 24t sum and in a more sophisticated scenario, a grower may deliver the following example temperature profile with TI compared to a conventional strategy (Image d)



TI allows a higher bandwidth of maximum and minimum temperatures yet results in exactly the same 24t sum to maintain consistent plant development rates.

TI has no fixed heating temperature per period, has an adjustable deviation range that results in less energy demand (lower night heating), less day ventilation (higher CO2 efficiency), reduces any energy peaks and improves production scheduling.

To optimise TI, a climate screen (preferably energy type) and scheduled weather forecasting is recommended with a climate computer to track your 24t sum on a continual basis to target an adjustable temperature bandwidth (low to high) of 40 – 80C.

Potential energy savings

In practical use, a bandwidth of 40C can deliver an energy saving of ~5 - 10%, and a bandwidth of 80C, can deliver an energy saving of ~10 - 20%, all with no harmful effects on the crop!

TI Summary

To summarise TI – temperature integration,

• For plant development, the average temperature is generally more important than the instantaneous temperature

• Crops respond to the average temperature sum of ± 7 days

• Temperature can deviate more than 200 degree-hours• TI has no fixed heating temperature per period

• Lower heating demand at night (energy savings), higher ventilation temperatures during the day (higher CO2 efficiency)

• Temporary temperature deviations can be accepted (adjustable deviation range 40 - 80C)

• A screen and scheduled weather forecasting is recommended with a climate computer to track and target 24t sum to match radiation sum

• Modern climate computers have a 'TI' software setting to automate this tracking and control process (requires setpoint programming)

• TI has no harmful effects on the crop!

Conclusions

Temperature Integration (TI) has the significant ability to save growers from 5 – 20% energy to improve viability, increase CO2 efficiency to lift yield and not adversely affect the crop therefore could be considered by growers as part of their enhanced 'blueprint for growth' pathway to improved production and provide a buffer against rising energy costs!

The many hats of Tony Bundock

Tony Bundock • *PCA Deputy Chair*

PCA Deputy Chair Tony Bundock wears a number of hats in his life, one of which is that of a volunteer firefighter. Tony's been a volunteer for the past 31 years and has seen his fair share of fires and incidents which have included being heavily involved in the Black Saturday fires down to getting cats out of trees!

However, his latest move has seen him become a fully accredited Airbase Manager.

"The role sounds very glamorous, but you are basically responsible for logistics across an airbase which includes everything from ensuring aircraft have enough fuel to making sure there is toilet paper in the toilets!" said Tony.

The new volunteer role can see Tony deployed across the state of Victoria at fairly short notice to work on remote sites.
"As always, it's a team effort, and I work with some amazing people from all walks of life who are there for the sole reason of protecting life and property" said Tony.

The types of planes that operate from these bases are usually fixed wing water bombers as well as helicopters. The aircraft use large amounts of fuel with the fix winged aircraft using around 280 litres of fuel and hour up to the aircrane helicopters that consume 2000 litres of fuel per hour! The planes can be loaded with either water or foam retardant.

"It's certainly a different view on firefighting to be involved in this side and to see just how many people are required to keep an airbase running - the role is certainly challenging, but very rewarding" added Tony

Water bombing aircraft

Keeping it in the family—Tony and his wife Karen (who is also a 30 year firefighter!)

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