

TOMATO TOPICS



**Hort
Innovation**
Strategic levy investment

**PROCESSING
TOMATO FUND**

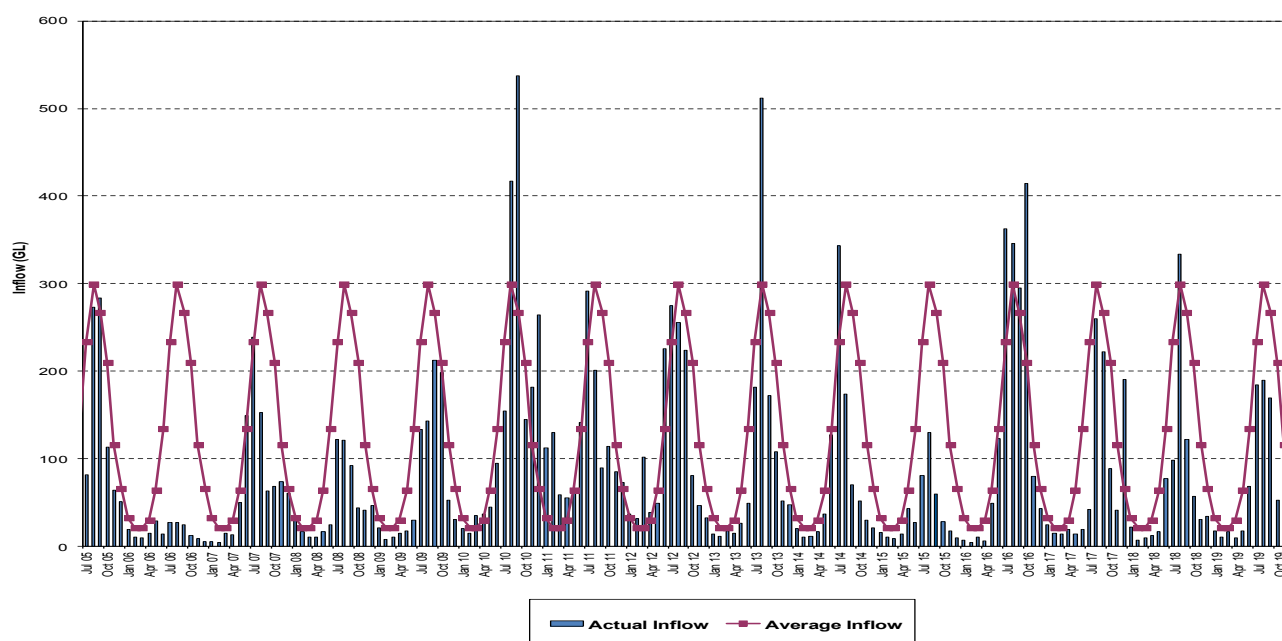
NEWS and INFORMATION
FOR THE PROCESSING TOMATO INDUSTRY

ISSN 1038-3522

DECEMBER 2019

VOL. 29 NO. 4

Inflows to Lake Eildon
July 2005 to December 2019



Inside This Issue

	Page No
<i>Weekly Irrigation Requirement service</i>	2
<i>Soilborne Diseases publication</i>	2
<i>Irrigation Field Day report</i>	3
<i>Plant Biostimulant Study</i>	4
<i>Cultivar trial site summary.....</i>	6
<i>New Labour Agreement</i>	8

CLIMATE OUTLOOK:

With 2019 declared the warmest and driest year on record for Australia, it is a relief to finally see some change in the weather patterns affecting the continent. Two major drying influences, a positive Indian Ocean dipole (IOD) and a negative phase of the Southern Annular Mode (SAM), have both decreased at the start of 2020, producing more neutral forecasts for rainfall over coming months. However, given the summer heat and dry landscape, temperatures are likely to remain above average.

Source: Bureau of Meteorology

Weekly Irrigation Requirements\$ Summary - Driving Water Productivity

A weekly update has been developed by Rob O'Connor, Senior Irrigation Officer with the Department of Jobs, Precincts and Regions in Echuca, providing 'reference evapotranspiration' (ETo) information to assist farmers with their irrigation scheduling. While primarily targeting flood and spray irrigators, these figures could also be used in managing drip irrigated crops.

A representative table of data from the service is shown below.

Location	ETo (mm)	Rain-fall R (mm)	ETo - R (mm irrigation required)	Average ETo (mm /DAY)	Required Surface Irrigation Interval (Days)	Spray irrigators will need to apply (mm)
Deniliquin	62	2	60	8.9	6	60
Kyabram	53	0	53	7.5	7	53
Tatura	51	0	51	7.3	8	51
Kerang	60	0	60	8.6	7	60
Echuca	57	0	57	8.2	7	57
Yarrawalla	59	0	59	8.4	7	59
Numurkah	54	0	54	7.7	7	54

The information is provided in a weekly email, with an attached scheduling tool and other topical irrigation information, which can be viewed online at <http://extensionaus.com.au/irrigatingag/>. You can also follow on [Twitter](#) and [Facebook](#)

Or simply reply email to robert.oconnor@ecodev.vic.gov.au to subscribe.

New Publication: Soil-borne diseases in vegetable crops – A practical guide to identification and control

Soil-borne diseases present an ongoing challenge to the Australian vegetable industry, with an estimated \$120 million in losses annually.

The Soil Wealth and Integrated Crop Protection team (funded under the Vegetable Industry Levy) has published a practical guide to identification and control of soil borne diseases in vegetable crops. The book is divided into chapters based on vegetable crop families. Each chapter contains information on the identification and control of the major soil-borne diseases for each crop.

Each chapter covers:

1. How to identify the most common soil-borne diseases affecting vegetable crops in Australia and conditions which favour disease
2. Summary of the methods available for control.

For more information or copies of *Soil-borne diseases in vegetable crops: A practical guide to identification and control*, contact AHR on 02 8627 1040, or email Dr Gordon Rogers gordon@ahr.com.au, or call Carl Larsen on 0419 622 393 or email carll@rmcg.com.au

JANUARY 2020 IRRIGATION FIELD DAY

Under our TM17000 project funded by Hort Innovation, this year's Irrigation Field Day took place on 23 January. The planned pre-Christmas field day at Boort had been cancelled due to extreme heat, and this field day was also adversely impacted by severe wet weather. As a result, two of the planned field inspections were not possible.

A total of 57 people left on the bus for Deniliquin, the group comprised of growers, agronomists and Kagome Foods field, marketing and production staff. The first stop was to view and hear about the '130 hectare trial' being conducted by Netafim and Kagome Farms, centred on a thin-walled, low-pressure, low flow, single-use tape system. D'Arcy Kirkhofer, NSW Farm Manager from Kagome Farms described the system and talked about what had gone well, and about the challenges the trial system had thrown up.

There was a question and answer session fielded by Andrew Pollard from Netafim and Chris Taylor and Matt Wright from Kagome. Alex Schultz, Research Development Officer and Don Griffin, Technical Assistant from Soil & Water R & D, NSW DPI discussed the various field sensors which have been installed at nine sites across the growing districts for the APTRC Soil Project. This project is looking at the correlation between canopy size (and yield) and water availability and use with a links to initial raw data being made available to all growers.



The group then bussed on to an adjacent block where the farmer Lachie Danckert had planted a cotton crop, incorporating a bankless channel style of furrow irrigation which optimised irrigation uptake and recovery. Again, Lachie talked about the agronomics and economics of the crop system and fielded questions from the group. Both heading to and coming from the trial sites, there were a series of on-board oral presentations, including:

Andrew Shields from G-MW about dam inflows and water use within the GMID;

Bryce Merrett from Heinz about the actions being taken to secure seed for Australia following the AQIS and US crackdown on contaminated, imported seed. This subject has potential to adversely impact the Australian industry;

Daryll O'Neill, General Manager Sales from Kagome Foods talked about the market challenges the company faced in selling products into a competitive market;

Brad Free, General Manager Factory from Kagome Foods talked about the ways in which the factory production system was influenced by the varieties and quality of tomato intake; and

Matt Wright, Field Manager from Kagome Foods talked about the seed mixes being trialled to provide the factory with a tomato intake that would more closely meet customer needs.

Each of the growers was interviewed after the tour about the value they had gained from the trip. The Netafim trial was a hot topic of conversation, being compared to their own systems, and they especially felt that the on-board presentations had been interesting and valuable. Instead of travelling 'empty miles' there had been a good opportunity to hear about a wide range of matters that influenced the industry.

The Field Day was followed by an Industry Dinner, which provided another great opportunity for stakeholders to build the relationships that have been so valuable in assisting continuous industry development. Our appreciation goes to Netafim, SLTEC and Campaspe Irrigation for their commercial support, to Kagome staff for their active input, and to Jason and Kellie Fritsch for hosting the dinner event at their home.

The Efficacy of a plant biostimulant to control soil borne pathogens causing root decline in processing tomato plants

Hanyue Feng, University of Melbourne Honours Student

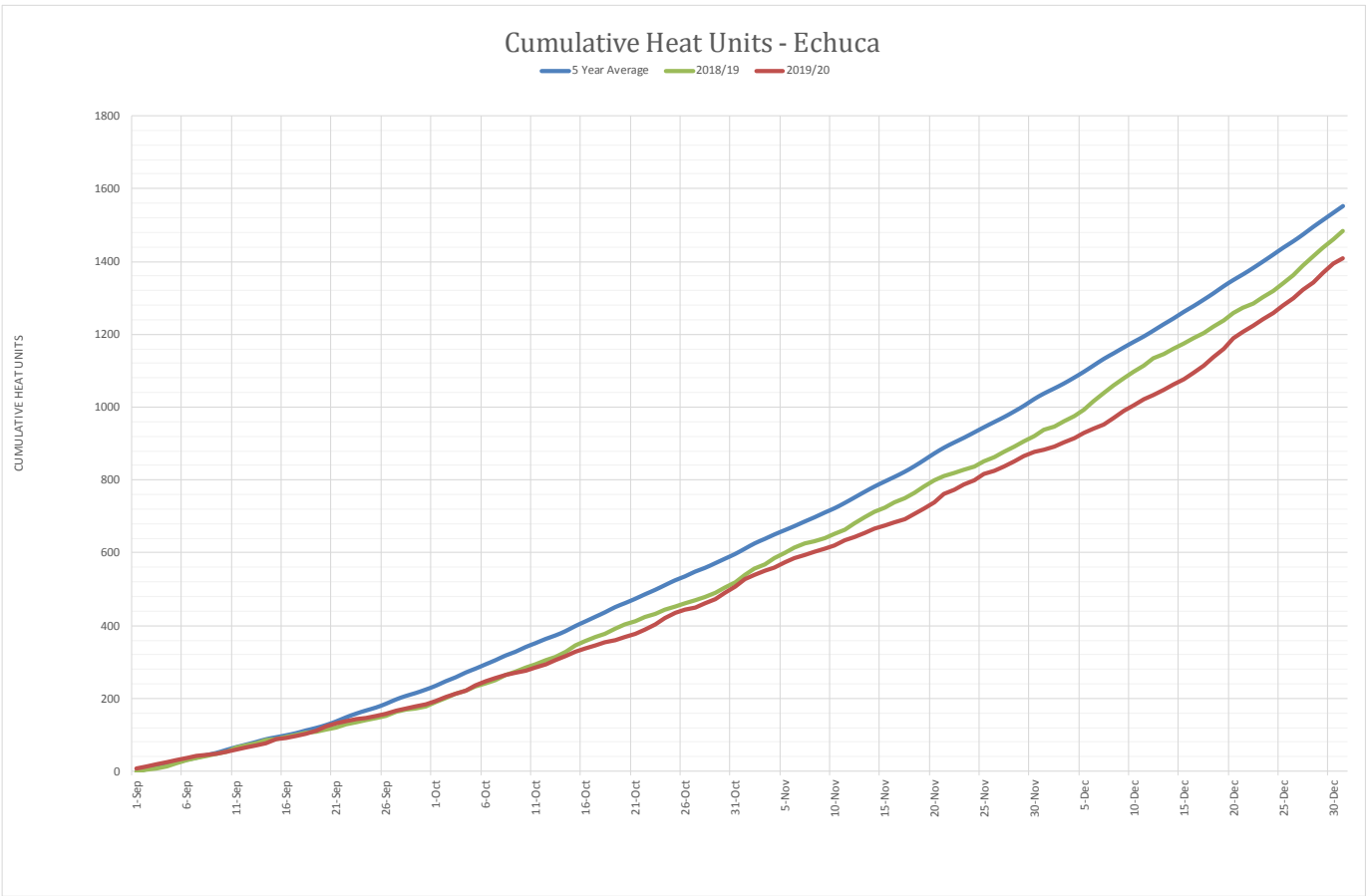
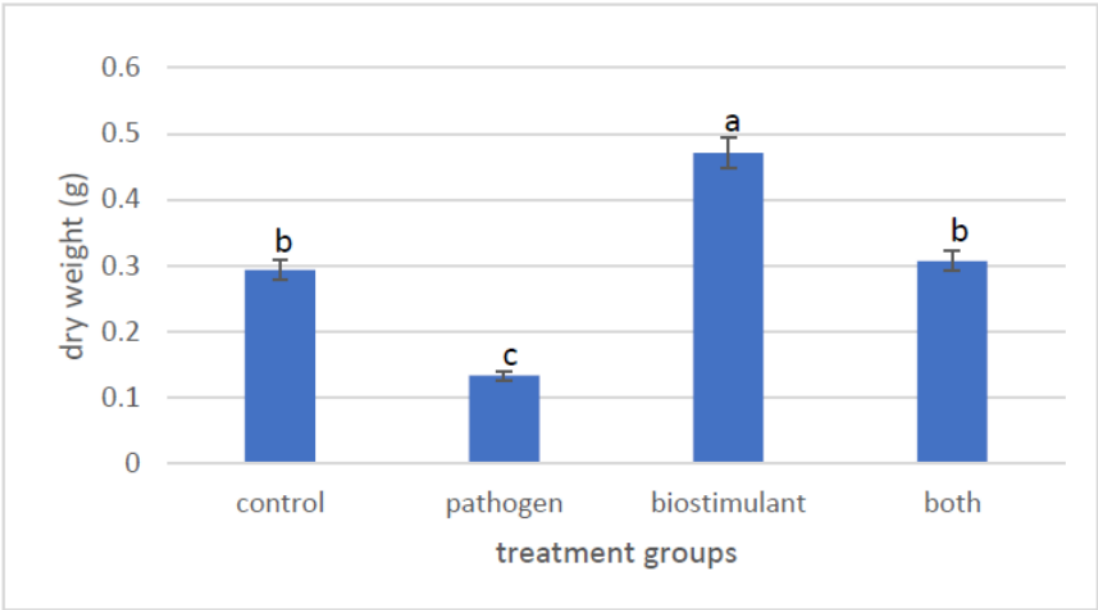
Diseases caused by soil-borne pathogens have become a serious problem in processing tomatoes, resulting in yield decline and reduced profitability. The use of conventional chemical-based treatments has been effective yet the side effects are also significant. It is therefore important to discover and develop biological disease control methods as part of an integrated disease management (IDM) program in order to improve plant health, and thus achieve better growth and production. Biostimulants have been recognised for their stimulative effects on plant growth and nutrient uptake, but their inhibitive effects against soil borne pathogens and disease development on host plants have not been extensively studied. The objective of this research was to assess the efficacy of a commercial plant biostimulant – NutriSmart - to prevent root disease development by *Pythium irregulare* and *Fusarium oxysporum*. The specific aims were to test if the biostimulant would be able to enhance plant health and suppress disease development on young processing tomato plants.

In pot trials, tomato plants treated with biostimulant achieved the highest biomass production in terms of both root development and above ground height. In treatments that included *P. irregulare* or *F. oxysporum* inoculum in the soil with the biostimulant, plants also showed significantly higher root production (eg. Figure 1) and above ground height than those treated with pathogens only. The growth of plants and rate of disease development varied between the two pathogens. The glasshouse pathogenicity tests were repeated to obtain consistent results. Pre-treatment of seedlings with biostimulant had a negative effect on root development in the bioassays, which may have been due to plants being exposed to too high a concentration of biostimulant. The majority of the active microbes in the NutriSmart biostimulant were determined to be bacterial species such as *Bacillus megaterium*, *Bacillus subtilis* and *Massilia brevitalea*, together with fungal species *Penicillium* and *Rhizopus*, which confirmed the commercial product information. Biostimulant solution inhibited the *in vitro* mycelial growth of *P. irregulare* and *F. oxysporum* through competitive exclusion due to the growth of biostimulant microorganisms. Antibiosis or inhibition of growth by toxic secondary metabolites was not observed. Autoclaved-sterilised and filter-sterilised biostimulant solutions did not inhibit *Pythium* or *Fusarium* mycelial growth. The result confirmed that the mode of action of the biostimulant was due to biological activity and not due to secondary metabolites.

In conclusion, applying NutriSmart biostimulant to healthy young processing tomato plants increased their growth and performance, with significantly enhanced root production and increased above ground height. Moreover, using the biostimulant as a potential disease control method might also be achievable since the plants treated with both biostimulant and pathogens did not display any disease symptoms or loss of production, even though pathogens were still re-isolated from the roots. Results from *in vitro* toxicity tests suggested that the beneficial microorganisms from the biostimulant may have a stimulative effect on host plants, rather than inducing direct inhibition of pathogen growth. However, the mechanisms of biostimulation on host plants are not yet fully understood. Further studies are necessary to understand the interactions between host plants, pathogens and the rhizosphere microbiome. In addition, more molecular and genomic based works are needed to fully understand the mechanisms of biostimulation on plants.

The author gratefully acknowledges the support of Barmac Australia Pty Ltd in the conduct of this study.

Figure 1: Mean data of root dry weight of processing tomato cultivar H3402, 4 weeks after inoculation with *P. irregular*e and biostimulant in the glasshouse pathogenicity test. Error bars represent 95% CI of the means, columns that do not share the same letter are significantly different ($P < 0.001$)



Cultivar Trials for 2019/20

Cultivar trials for the current season have been established as described in the following tables, which list the cultivars/mixes and sites where they are planted.

Table 1: Replicated Trials

	Early	Mid season				Mid Season			Mid Season		
	Transplants Machine Harvest	Transplants - Machine Harvest				Direct seed - Machine Harvest			Transplants - Nearest Neighbour - Hand Harvest		
	Kagome - Jennisons 6	Marrone	Kilter ATRI7	Rorato's Yacca Drip	Weeks Bickleys	Lehmann Sinnotts	Henry	Wakeman	Kagome Plantation	Kagome Bassetts	Kagome Danckerts
H1015	✓	-	-	-	-	-	-	-	-	-	-
SVTM 9000	✓	-	-	-	-	-	-	-	-	-	-
H1175 mix	-	✓	✓	✓	✓	-	-	-	-	-	✓
H1311	-	-	-	-	-	-	-	-	-	-	✓
H1428	-	-	-	-	-	-	✓	-	-	-	-
H3402	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
H3402 mix	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
Kagome H1311 mix	-	-	-	-	-	✓	✓	✓	-	-	✓
SPC H1311 mix	-	-	-	-	-	-	✓	-	-	-	-
STVM 9003 mix	-	-	-	-	-	-	-	-	-	-	✓
SVTM 8011	-	-	✓	-	✓	-	-	-	✓	✓	-
SVTM 9003	-	✓	✓	✓	-	✓	✓	✓	✓	✓	-
UG124	-	-	-	-	-	-	-	-	-	-	✓
UG16112	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UG16112 mix 1	-	-	-	-	-	-	-	-	-	-	✓
UG16112 mix 2	-	-	-	-	-	-	-	-	-	-	✓
UG16112 mix 3	-	-	-	-	-	-	-	-	-	-	✓
UG19406 mix	-	✓	✓	-	✓	-	-	-	✓	✓	-

H = Heinz

SVTM = Seminis

UG = United Genetics

H3402 50:50 = 60% H3402 + 40%

H2401

H1175 Mix = 50% H1175 + 50% H3402

Kagome H1311 Mix = 37% H1311 + 63% H3402

SPC H1311 Mix = 16% H1311 + 84% H3402

SVTM mix = 50% SVTM 9003 + 50% UG16112

UG19406 mix = 60% UG 19406 + 40% UG 16112

UG16112 mix 1 = 50% UG16112 + 50% H1311

UG16112 mix 2 = 50% UG16112 + 50% H3402

UG16112 mix 3 = 50% UG16112 + 50% UG18806

Table 2: Observational Transplant Trials

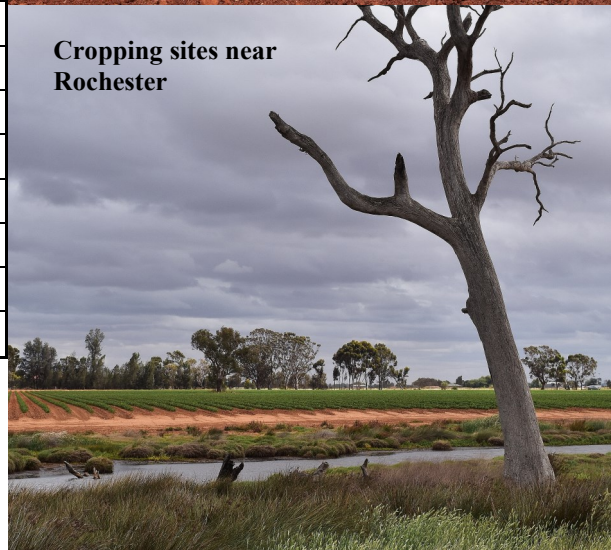
	Observational Transplant Trials				
	Early		Mid season		
	Kilter Organics	Kilter NPDE6	Kagome Plantation	Kilter ATRI7	Weeks Quarry Park
H1014	✓	-	-	-	-
H1015	-	✓	-	-	-
SPS 270-6	✓	✓	-	-	-
E15M.70077	-	-	✓	✓	✓
HMX - Zafra	-	-	✓	✓	✓
HMX 58811	-	-	✓	✓	✓
HMX 615558	-	-	✓	✓	✓
HMX 61P4228	-	-	✓	✓	✓
SPS 303-9	-	-	✓	✓	-
SVTM 9015	-	-	✓	✓	✓
SVTM 9019	-	-	✓	✓	✓
SVTM 9020	-	-	✓	✓	✓
SVTM 9023	-	-	✓	✓	✓
SVTM 9024	-	-	✓	✓	✓
SVTM 9025	-	-	✓	✓	✓

Kilter NPDE6 trial discontinued

E = Enza Zaden

HMX = HM Clause

SPS = South Pacific Seeds

**Cropping sites near Rochester**

USDA: acts to protect U.S. from ToBRFV

On November 18, 2019, USDA's Animal and Plant Health Inspection Service (APHIS) announced it is taking immediate action to prevent the introduction of tomato brown rugose fruit virus into the United States and protect U.S. tomato and pepper production worth more than USD 2.3 billion annually. These measures also afford protection against the significant damage ToBRFV could cause to processing tomato crops, as already decided in some countries after the virus was detected in Belgium, China, Italy, Greece, Germany, Mexico, the Netherlands, Jordan, Turkey and the UK. The virus was detected and eradicated from a California tomato greenhouse in 2018. Tomato brown rugose fruit virus can cause severe fruit loss in tomatoes and peppers. It is easily spread through the use of contaminated tools, hands, and plant-to-plant contact. It was first reported in tomatoes in Israel in 2014.

Seed, transplants and fruit of tomato and pepper from countries where the virus exists will all need to be tested and certified to be free of disease (or inspected at point of origin in the case of fruit) before entry is allowed into the United States.

Source: Tomato News

Note: These measures are also restricting the availability of tomato seed to the Australian industry, as US seed companies produce much of their seed in countries including China. They are now moving production to places such as India, that currently remain free of the virus. Ed.



Australian Government

Department of Home Affairs

Horticulture Industry Labour Agreement

From 1 January 2020, businesses in Australia's horticulture industry will be able to apply for the new Horticulture Industry Labour Agreement. The Horticulture Industry Labour Agreement increases access to skilled and semi-skilled migrant workers for the horticulture industry, where appropriately qualified Australians are unavailable.

What can a Horticulture Industry Labour Agreement be used for?

The Horticulture Industry Labour Agreement can be used by Australian employers for the following:

- Sponsor overseas workers for the Temporary Skill Shortage (TSS) (subclass 482) visa for a total of 31 approved occupations.
- Sponsor overseas workers for permanent residency under the:
 - Skilled Employer Sponsored Regional (SESR) (subclass 494) visa program with a permanent pathway to a Permanent Residence (Skilled Regional) visa (subclass 191) available after three years; or
 - Employer Nomination Scheme (ENS) (subclass 186) visa program after a three or four year transitional period on a TSS visa—three years for approved Skill Level 1-3 occupations and four years for approved Skill Level 4-5 occupations.
- Access the following concessions to standard skilled visa requirements:
 - Discount of up to 10% on the Temporary Skill Migration Income Threshold (TSMIT) where it is demonstrated that equivalent Australian workers do not receive annual earnings of \$53,900.
 - A broader range of monetary payments (e.g. regularised overtime) and non-monetary benefits (e.g. accommodation) can be counted as guaranteed earnings.
 - For the TSS visa—overseas workers must score at least IELTS 5.0 overall, and at least IELTS 4.0 in each individual component score. For the ENS and SESR visas—overseas workers must score at least IELTS 5.0 overall, and at least IELTS 4.5 in each individual component score.
 - Overseas workers can be up to 50 years of age when they apply for an ENS or SESR visa.

A full summary of approved occupations, terms and available concessions is attached.

How do I apply for a Labour Agreement?

Horticultural industry employers will be able to submit an application to the Department of Home Affairs. On-line labour agreement request forms are available in IMMI Account.

Where can I get further information about labour agreements?

See the Department's website: <https://immi.homeaffairs.gov.au/visas/employing-and-sponsoring-someone/sponsoring-workers/nominating-a-position/labour-agreements>

Email: labour.agreement.section@homeaffairs.gov.au

Horticulture Industry Labour Agreement - Terms and Concessions

Approved occupation	ANZSCO Code or nearest equivalent	ANZSCO Skill Level	Positive Skills Assessment	TSMIT Concession	English Concession	Permanent Pathway
Irrigation Designer/ Manager	234111*	1	Yes	Yes	Yes	Yes
Agronomist	234112	1	Yes	Yes	Yes	Yes
Entomologist	234518*	1	Yes	Yes	Yes	Yes
Horticulture Grower	070499*	1	Yes	Yes	Yes	Yes
Protected Cropping Grower	070499*	1	Yes	Yes	Yes	Yes
Horticulture Research & Development Officer	132511*	1	Yes	Yes	Yes	Yes
Mechanical Engineer	233512	1	Yes	Yes	Yes	Yes
Horticulture Farm Manager	070499*	1	Yes	Yes	Yes	Yes
Quality Assurance Manager	139914	1	Yes	Yes	Yes	Yes
Biosecurity Officer	311399*	2	Yes	Yes	Yes	Yes
Facility Plant Manager	149913*	2	Yes	Yes	Yes	Yes
Facility Supervisor	070499*	2	Yes	Yes	Yes	Yes
Maintenance Electrician	341111*	3	Yes	Yes	Yes	Yes
Fitter and Welder	323213	3	Yes	Yes	Yes	Yes
Agriculture Technician	321212*	3	Yes	Yes	Yes	Yes
Mechanic	321211*	3	Yes	Yes	Yes	Yes
Senior Nurseryperson	362411	3	Yes	Yes	Yes	Yes
Nurseryperson	362411	3	Yes	Yes	Yes	Yes
Nursery Supervisor	362411	3	Yes	Yes	Yes	Yes
Truck Driver	733111	4	Yes^	Yes	Yes	Yes
Mobile Plant Operator	721111	4	Yes^	Yes	Yes	Yes
Fork Lift Driver	721311	4	Yes^	Yes	Yes	Yes
Irrigationist	841999	5	Yes^	Yes	Yes	Yes
Irrigationist Assistant	841999	5	Yes^	Yes	Yes	Yes
Horticulture Section Manager	070499*	5	Yes^	Yes	Yes	Yes
Section Supervisor	070499*	4	Yes^	Yes	Yes	Yes
Production Horticulture Supervisor	070499*	4	Yes^	Yes	Yes	Yes
Production Horticulturist	070499*	3	Yes^	Yes	Yes	Yes
Machinery Manager	149913 or 149999*	4	Yes	Yes	Yes	Yes
Machinery Supervisor	149999*	4	Yes	Yes	Yes	Yes
Cold Storage Manager	149999*	3	Yes	Yes	Yes	Yes

Note: Labour market testing requirements for the standard TSS and SESR visa programs will need to be met.

* Where an occupation in the table above does not exist in ANZSCO, the closest equivalent occupation available under ANZSCO has been utilised. Where no close equivalent exists, code 070499 is used with the relevant skills/qualifications specified under the terms of each Labour Agreement.

^ Skill and qualification requirements will differ from those stipulated in ANZSCO and will be specified under the terms of each Labour Agreement.

Please note that a further document outlining the key points of this agreement for growers is available on request from aptrc.idm@gmail.com

Website rebooted (take 2)!

At last, the new APTRC website is almost up and running! Following a series of set-backs, including the software developer breaking his arm, we are currently loading the site to provide key information to all industry stakeholders. Archived industry publications and a database of research results will be included. When it's up, please visit the site, and give us your comments and any suggestions on how to improve it. Stay tuned.....



UPCOMING EVENTS

*The Annual Industry Forum and Dinner
May 28th
At the
Moama Bowling Club*

*15th World Processing Tomato Congress
March 15-19, 2020
San Juan, Argentina*

For details of international events see www.tomatonews.com

ACKNOWLEDGMENTS:

This project [Australian Processing Tomato Industry Capacity Building Program (TM17000)] has been funded by Horticulture Innovation Australia Limited with co-investment from Australian Processing Tomato Research Council Inc. and funds from the Australian Government. "Tomato Topics" is a quarterly newsletter compiled and edited by the Industry Development Manager, APTRC Inc., P.O. Box 2293, SHEPPARTON, VIC 3632. E-mail: aptrc.idm@gmail.com

Opinions expressed in "Tomato Topics" are not necessarily those of the APTRC unless otherwise stated.