

TOMATO TOPICS



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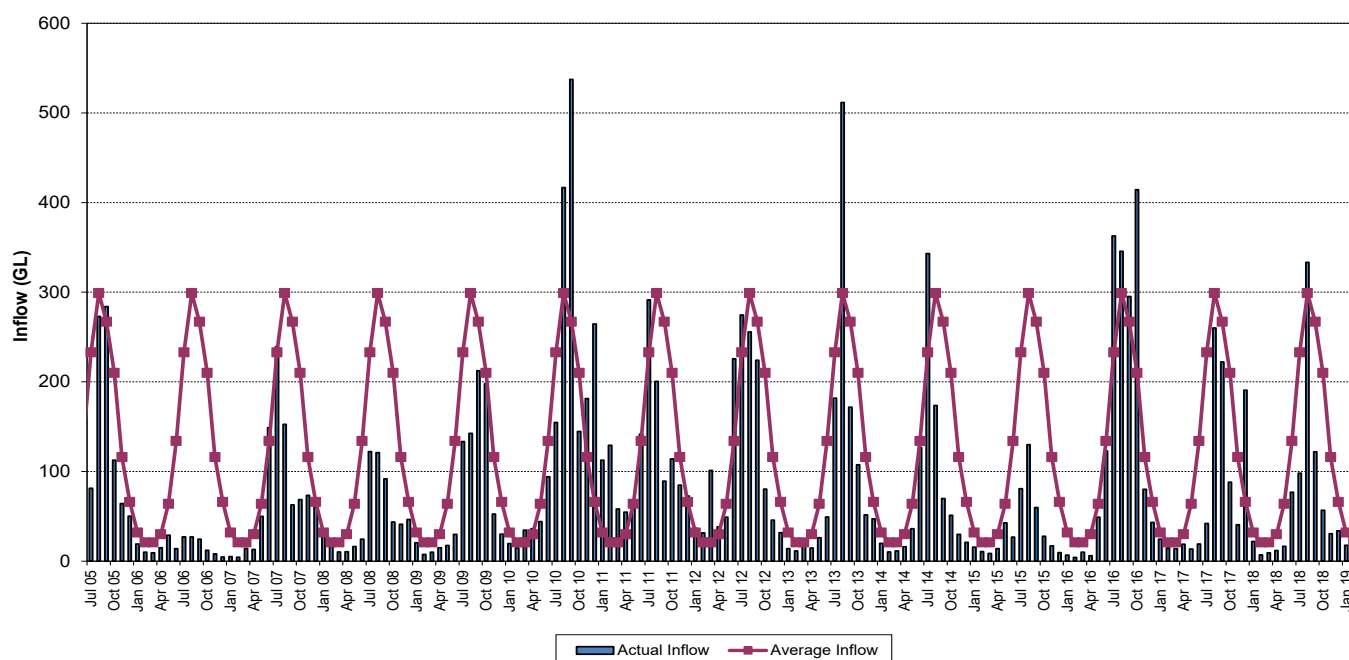
NEWS and INFORMATION
FOR THE PROCESSING TOMATO INDUSTRY

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Inflows to Lake Eildon
July 2005 to February 2019



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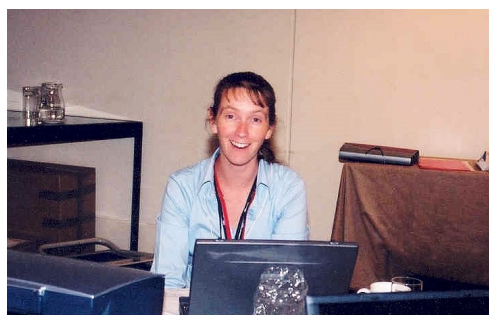
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TONNAGE AND CLIMATE:

The Australian yield forecast for 2018/19 now stands at 221,500 tonnes, down on earlier estimates and reflecting exceptionally hot conditions during January plus early pressure from bacterial diseases.

The current climatic outlook over the next six months is for a weak El Nino event to decay over winter. Prospects thereafter are unclear, but climate models suggest conditions across northern Victoria will be drier and warmer than average. (Sources: BOM/Agriculture Victoria)

FAREWELL LIZ—THE END OF AN ERA



Common knowledge by now, but Liz Mann is leaving the position of Industry Development Manager and it would be remiss not to recognise her significant contribution to the industry during the nearly twenty years she has held the position.

Liz started work with the APTRC during the 1999-2000 season, following on from Lauren Thomson. Lauren had been a great contributor to industry development as the first IDM, and there was concern about a successor being able to fill her shoes. In the event, Liz was a standout candidate in the interview process and, as we know, went on to provide the industry leadership and support that built on Lauren's work and helped to take it on to new heights (weather events allowing). All this during a time when the industry has changed dramatically while still being at the cutting edge of global competitiveness in one of the most challenging growing environments.

From an industry perspective, Liz hit the ground running in 1999 and proved to be a highly motivated and knowledgeable IDM, with a network that stretched across the globe. She was not scared of hard work and put the hours in to get the job done to best effect – including having the minutes completed by the time a meeting came to its close. In addition to the technical contribution she made to R&D, Liz did a great deal to foster positive industry relationships, with growers and processor staff having many opportunities to meet and discuss technologies, processes and seasonal conditions.

Liz quickly formed strong friendships across the industry and was instrumental in helping individual farm businesses meet challenges and take up opportunities; particularly through funding grants following floods, or grants which helped businesses to develop. Her initiative around the On-farm Irrigation Efficiency Program, funded through the Australian Government's Sustainable Rural Water Use and Infrastructure Program was taken up by almost every processing tomato grower at the time, and the effects of that work benefited the industry for years. She led a Women in Horticulture group to South East Asia to encourage alternative sources of income for tomato growers; she led a young growers group to Kununurra which helped local discussion networks; she hosted international visitors and was a leading organiser of the Melbourne World Congress. And the list goes on.

Liz will continue her farming interests in the region and will no doubt remain in contact with her many industry friends. She has the skills, knowledge and experience that will not see her short of work and we offer her our best wishes for the future. Her contribution to the industry has been outstanding.

Perspectives on Tomato Disease Occurrence, Management and Research Ideas

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During the week of 18 February, I visited several processing tomato farms with Liz Mann to learn about production and disease occurrence in Australia, thereby expanding my knowledge while also sharing what I know about tomato diseases. In the USA I have been conducting applied research and extension activities on managing diseases of fresh market vegetables and basil with Cornell University, the Land Grant University (LGU) in New York. Every state has at least one LGU. My work supports the LG mission by generating information useful for growers. I have been working for 30 years at a Cornell facility on the eastern end of Long Island, which is the land extending eastward from New York City. This is also one of the most valuable agricultural production areas in NY reflecting soil quality and long growing season, as well as a popular place to live. My extension activities include diagnosis and providing information to growers through presentations at grower meetings, web postings, and publications.

Bacterial speck was the main disease seen in the Australian farms visited. Leaves, stems, and fruit were affected. Symptoms of big bud and Tomato Spotted Wilt Virus (TSWV; aka bronze wilt) were also observed at many farms. Fusarium root rot and suspect symptoms of bacterial canker were also seen. Speck is the most common bacterial disease of fresh market tomato on Long Island. Canker is less common but can cause more loss. TSWV also occurs. Several other diseases and disorders also occur. I have posted photographs and information about these at <http://blogs.cornell.edu/livegpath/gallery/tomato/>.

Managing speck starts with managing potential sources of the pathogen. This is the first step for disease management generally with the exception of some, like powdery mildews, caused by pathogens that produce propagules. These spores can be dispersed long distances by wind, so the source is not manageable. Splashing water is an important way that cells of bacterial pathogens, including those causing speck and canker, are moved. Consequently, bacterial pathogens almost exclusively are moved only within a planting and between adjacent plantings by rain or overhead irrigation, thus bacteria in splashing water is not an important initial source of the speck pathogen for a planting. Most Australian growers I visited reported seeing a lot of speck symptoms following several days of rain in December, illustrating the importance of rain in creating favourable conditions for pathogen infection and spread. An important potential initial source of the speck pathogen for a farm is infected transplants. The pathogen can also be seed borne. The acid extraction process for seed can be very effective at killing bacteria associated with seed.

If the pathogen is inside the seed then hot water treatment of seed is needed. Both procedures have been recommended and can be used together. These may not be completely effective, and a very low frequency of contaminated seed in a lot can be sufficient to cause a major outbreak. It is clearly best to get seed with low probability of having been contaminated before treatment. When purchasing seed, ask what practices are used when seed is produced to minimize chance of contamination, whether the seed is tested for this and other pathogens and also if it was treated to control seed borne pathogens (*Note: all seed entering Australia should be fully treated – Ed*). Transplants can also become infected while being grown at a nursery, either from other tomato seedlings being grown there, from contaminated planting material, greenhouse benches if these were not kept clean and disinfected, or from weeds that were not adequately managed. Bacteria causing speck can survive for a year or more on structures and non-host plants, through the production of a protective biofilm. It is prudent to ask a nursery producer about the practices being used to

prevent disease development. There is potential for substantial spread of bacterial pathogens in a nursery setting with overhead watering because plants are so close together. Once speck or canker have developed in a planting, crop debris left in the field can be a source of the pathogen for subsequent plantings, so crop rotation is an important management practice.

On-farm activities to manage speck include reducing plant susceptibility, avoiding bringing the pathogen in on equipment, minimizing pathogen spread, controlling the pathogen directly, and controlling bacteria surviving on the farm between cropping periods. Reduce plant susceptibility by selecting resistant varieties. It is important to realize that resistant varieties generally do not completely prevent the disease from developing and pathogens can evolve to overcome host resistance. Thus it is important to use additional management practices. Actigard® is a plant activator which induces resistance in plants. It has been demonstrated to be effective for speck in tomato in the USA. Unfortunately, Syngenta recently decided to stop marketing this product in Australia, hopefully only temporarily. Other fungicides target the pathogen directly. Options are limited and bacterial plant pathogens are notoriously difficult to suppress with fungicides partly due to their rapid multiplication rate and the lack of products with high inherent activity similar to what modern fungicides have for some fungal pathogens. Starting applications before symptoms develop, and maintaining a regular spray interval, are considered critical for potential success. Adding to the challenge is the fact bacteria are able to develop resistance to copper, which has been the main agent used for management. A moderate degree of copper resistance (aka tolerance) was found in all bacterial speck pathogen isolates examined through a study conducted in 2015-17 - with most isolates from Queensland plus some from New South Wales and Victoria. Tank mixing Mancozeb® with copper can increase copper efficacy by increasing the amount of copper ions in solution. Copper products differ in amount of biologically active copper. In an evaluation of treatments for speck conducted in the USA, disease severity was higher in tomato sprayed with an older copper formulation (Kocide 2000®) than in tomatoes that were not sprayed at all! Reasons for this include copper resistance in the pathogen, copper killing beneficial bacteria or fungi present that were providing some suppression of the speck pathogen, and moving the pathogen around on equipment or via the force of the spray during the application process. High pressure sprayers are not recommended because the force of the spray not only can move bacteria, especially when there is some leaf wetness at the time of the application, but minor injury to foliage from the force of the spray creates wounds bacteria can use to enter plant tissue. Serenade Opti® is a new product labeled for speck control in Australia. It also has contact activity so high spray volume is recommended when applying it or copper to maximize coverage.

While looking at Australian processing tomato plantings, it was noticed that speck appeared to be more severe along sprayer rows indicating the pathogen most likely was being moved on parts of the sprayer touching foliage. A way to avoid this is to not plant sprayer rows to tomatoes. Not cleaning and disinfecting a sprayer after using it in a crop with speck before using it in a healthy planting on the same or another farm is a means to spread the pathogen. Other shared equipment, such as transplanters, could also play a role in dispersing the pathogen. Using subsurface rather than overhead irrigation is an important management practice for bacterial diseases already being implemented for another reason (water conservation). Removing and destroying crop debris after harvest is another important control practice for speck. Also, not planting tomatoes consecutively in the same location. The speck pathogen can become established on weeds, living on the plant surface without infecting; so it is advisable to manage vegetation around production fields before planting tomatoes.

Increasing knowledge about the epidemiology of the speck bacteria occurring in Australian processing tomato farms, which there are now research methods to address, could inform a more targeted management program. It is now possible to examine the DNA of pathogens thereby distinguishing individuals. Bacteria reproduce asexually thus there is not the degree of variation in their populations as there is in a sexually reproducing population, for example humans. If the primary source for a farm is speck bacteria surviving

there, then the bacterial population should be similar from year to year on that farm and different from other farm populations. A follow up step to this finding could be to look at bacteria occurring on other plants to see if the speck pathogen can be found there. If a nursery is an important source of speck bacteria, then populations will be similar on farms obtaining plants from the same nursery. If sharing equipment among farms is an important way that bacteria are being moved, then these farms will have similar pathogen populations. When comparing bacterial populations between farms it will be important to consider all potential sources of the pathogen and strive to select farms that enable focusing on one source. For example, it will be more informative to compare farms for which the only commonality is a shared sprayer, with seedlings of different varieties grown at different nurseries and no other shared equipment.



Speck symptoms on tomato stem, leaf and fruit.



2018/19 Observation Cultivar Trials

Twelve new cultivars [as described in last June's Tomato Topics (Vol 28(2))] were planted out in observation plots at two sites this season. Both sites were nearing harvest when assessed in mid-February (See Table below). As well as field notes on plant and fruit characteristics, indicative yield estimates for the highest scoring lines were taken from 2 metre plots at Kagome's Jennison site. It was pleasing to see that a number of these cultivars – most of which are in commercial production elsewhere in the world – demonstrated enough promise to warrant further trial in Australia. Larger, machine-scale trials are planned for the best lines next season.

Sites:

- 1 – Kagome, Jennison – Transplanted. Good yield and bush development, well concentrated.
 2 – Carinya (Geltch) – Transplanted. Smaller plants and a bit of disease, but a good trial nearly ready for harvest

Yields calculated on harvest of a single indicative 2m plot – and included all fruit. (Green and rotten total <10%).

Results:

Seed Company	Trial line	Comments (combined over both sites)	Indicative yield t/ha (Site 1 only) [SS%/pH]	Rating* Site 1/2
<u>Site 1 Control</u>	Heinz 3402/2401 mix	Medium-vigorous vines covering the bed well but exposing some fruit to a bit of bleach. Some fruit in the furrows but overall good yield. Firm, egg-blocky pear shaped fruit, medium size. <10% green.	160.6 [4.9/4.49]	7.5
<u>Site 2 Control</u>	Heinz 3402/2401 mix	Very good vine, med/vig on the bed, a little bit of bleach but ok. Good yield, Medium-small, firm, plum-egg fruit.		8
		Note that a second control row, beside the trial at Site 2, produced a smaller vine and seemed more prone to leaf disease – although yield still good. May be Hz 1175?		6.5

Enza Zaden	E15M 70088	Large vine that can fall open, secondary growth on top at site 1. Mid-season, dark foliage, yield ok, fruit firm medium-large blocky plum-eggs, colour variable, core at site 1. Bit of breakdown and bleach also		5/5.5
	E15M 70084	Medium vine, tall and falling open. Medium/firm blocky plums, some breakdown evident. Lacking yield.		3/4
	E15M 70077	Spreading m/v vine, medium-dark foliage, on the bed. Concentration and yield good – looks early (Site 1). Very firm, solid fruit with thick walls and good colour although a bit of core at site 1 and a bit puffy at site 2. Medium blocky plum-egg shape. A little foliar disease at both sites.	147.0 [4.5/4.51]	6.5/7
HM Clause	HMX 58811	Medium-vigorous vine falling open with fruit breakdown evident in the assessed rep – better in other reps. Medium sized blocky plum-pear shaped fruit. Very firm, colour ok although a bit puffy at site 1. Not bad at site 2 although cover still an issue.	155.3 [5.0/4.37]	5/6.5
Seminis	SVTM 9000	Medium vine on the bed looks early – good concentration. Bit of foliar disease at both sites. Firm, medium sized, blocky egg-plum-pear shaped fruit – some dimpled, good colour. Puffy at site 1. Yield good. Lack of EFS could be a problem.	166.6 [4.6/4.41]	6.5/7
	SVTM 9003	Medium-compact vine, smaller dark leaves providing good cover. Good yield of medium-large blocky plum-pears. Medium firmness, thick walls and colour ok but a bit puffy and a few radial cracks evident at site 1.	202.3 [5.7/4.36]	6/6.5
	SVTM 9007	Upright spreading vine that can flop open (site 2) – not so bad at site 1. Dark foliage – looks to be a bit later. Firm, small-medium plum-pears. Colour ok, core at site 2. Average yield and some canker evident at site 2.	162.3 [4.8/4.53]	6/5

Seed Company	Trial line	Comments (combined over both sites)	Indicative yield t/ha (Site 1 only) [SS%/pH]	Rating* Site 1/2
	SVTM 9008	Vigorous vine that can open up, fruit bleach and breakdown evident at site 1. Vine much better at site 2. Very firm medium blocky eggs. Some splitting at site 1. Not worth the risk despite appearance at site 2.		4/7
	SVTM 9015	Medium/vigorous vine on the bed, a bit upright. Yield ok-good, medium sized blocky eggs, very firm – and a touch hollow. Touch of bleach and breakdown evident. Colour ok and good concentration.	182.0 [4.9/4.43]	6.5/7
	SVTM 9016	Medium-vigorous tall vine a bit floppy in places. Dark foliage. Yield ok, some greens at site 1. Very firm, medium large blocky plum fruit with a slight dimple. Holding. Yield and vine?		5.5/6.5
SPS (Site 1 only)	272-6	Bush on bed with some good cover and larger leaves. Large egg-plum fruit, colour and firmness ok. Looks a bit later, although some breakdown evident also. Not enough yield.		4
	306-7	Good cover although vine a bit tall/floppy – variable. Fruit medium-large, some pointy with a bit of bleach. Firm, blocky plum-pears, Colour ok but a bit puffy. Good concentration – looks a bit early. Yield down a bit. Too open and breaking down in some spots.		4

*Ratings are a score out of 10, based on a visual assessment of the vine and fruit, taking account of vine type, cover, severity of any plant or fruit disease, fruit holding, concentration and yield.

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Trial plot harvesting at Jennison site



ToBRFV – a new biosecurity threat to tomatoes.

Tomato brown rugose fruit virus (ToBRFV) is known to naturally infect tomatoes, capsicums and chillies, and to be able to overcome plant resistance. Plant symptoms include leaf chlorosis, mosaic and mottling, and also deformation, spotting and wrinkling (rugosing) of fruit, making it unmarketable.

Largely affecting glasshouse crops, the virus was first detected in Israel in 2014, spreading to Jordan (2015), Mexico, Germany and California (2019), and most recently to Italy (Sicily) and Northern Palestine (2019). The virus is considered to be seed-borne, although it can also be transferred through movement of infected plant parts - on tools, machinery or people.

The virus has NOT been detected in Australia, and is considered not to be present here. If it were to enter Australia, control options are currently limited to destruction of infected plants and strict hygiene measures. The Commonwealth Department of Agriculture and Water Resources have implemented a response plan involving a phased introduction of testing and treatment, to ensure all tomato and capsicum seed entering Australia is free of the disease. All foreign seed sources are being viewed as potential threats.

Further information can be found at [www.eppo.int/ACTIVITIES/ Plant Quarantine/Alert List Viruses/ Tomato Brown Rugose Fruit Virus](http://www.eppo.int/ACTIVITIES/Plant%20Quarantine/Alert%20List%20Viruses/Tomato%20Brown%20Rugose%20Fruit%20Virus).



UPCOMING EVENTS

***2019 Australian Processing Tomato R&D Forum
Thursday June 13th
Venue to be confirmed***

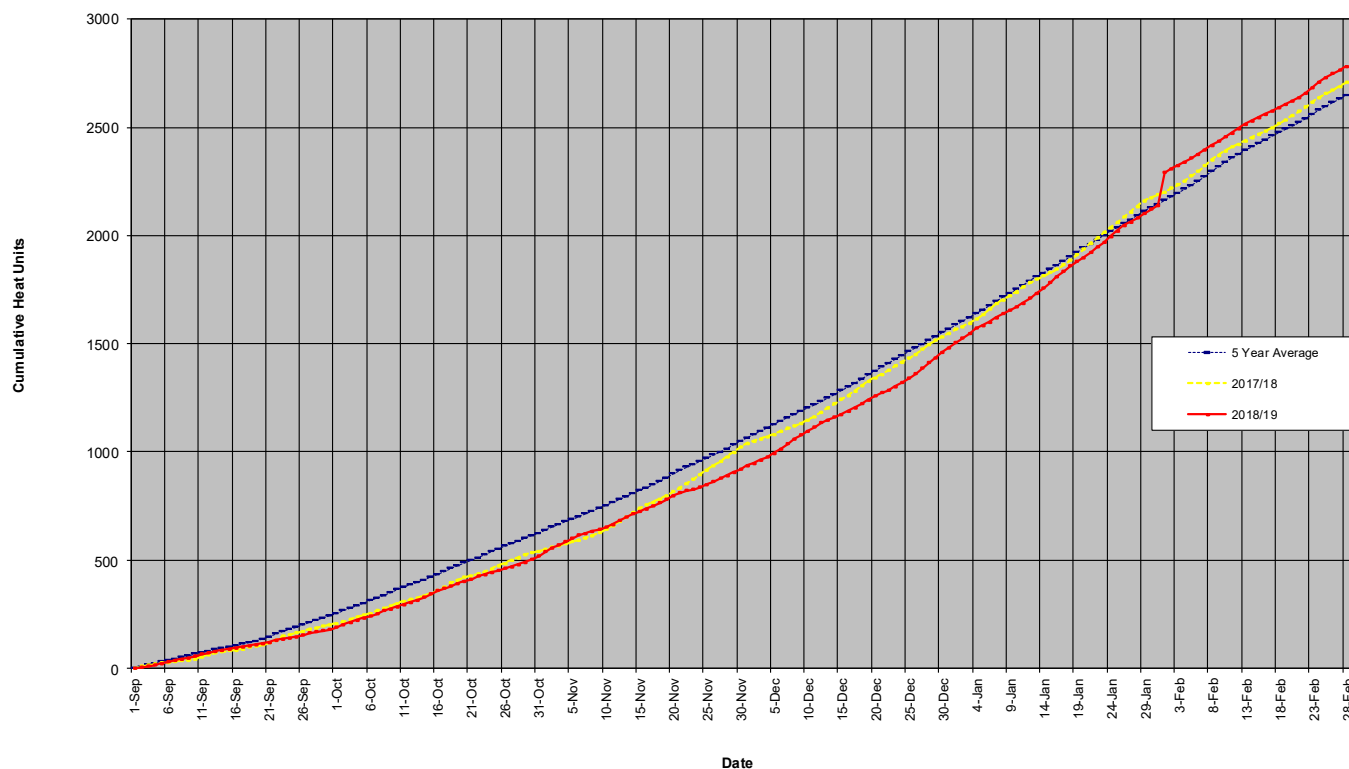
***International:
The Tomato News Conference
May 16-17
Avignon, France***

***14th World Processing Tomato Congress
March 15-19, 2020
San Juan, Argentina***

For details of international events see www.tomatonews.com

Seasonal Heat Units for Echuca compared with last season and the long term average,

Cumulative Heat Units - Echuca



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

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