



# TOMATO TOPICS



Know-how for Horticulture™

NEWS and INFORMATION  
FOR THE PROCESSING TOMATO INDUSTRY

ISSN 1038-3522

JUNE 2007

VOL. 16 NO. 2

## Overview of 2006/07 Processing Tomato Season

The 2006/07 processing tomato season proved challenging for all involved. Water allocations on the Goulburn system reached a maximum of 29% at the end of the of the irrigation season. Temporary water sales peaked at \$950/ML on the 14<sup>th</sup> December 2006. The average price for temporary water during the season was \$440/ML, up from an average price of \$57/ML during 2005/06. As a result of the low irrigation water allocations planting area during the 2006/07 season was reduced.

The availability of water for the coming irrigation season is currently an issue. As of the 5<sup>th</sup> July 2007 Eildon contained 410,147 ML, compared to this time last year of 750,796 ML.

### Summary

229,000 tonnes of tomatoes were delivered for processing during the 2006/07 season. This is 21% below last year's intake. The average field yield was approximately 80 tonne/ha.

The average tomato solids level was 5.00% an increase of 0.11% from the previous year. 23 specialist processing tomato growers supplied the tonnes processed during the 2007 harvest in addition to one research farm.

Planted area was approximately 2,860 ha. 68% of the area was drip irrigated and 55% sown with transplants. In NSW approximately 7% of the area was drip irrigated and no transplanting was reported, whereas approximately 94% of the Victorian area was drip irrigated and around 78% transplanted.

2006 imports of tomato products were the equivalent of 178,057 raw material tonnes, an approximate 4% decrease from the previous year. Exports were down again on the previous year to the equivalent of 17,154 raw material tonnes.

The majority of the processed tomato imports during 2006 come from Italy, with a raw equivalent of 90,194 tonnes being imported, predominately as whole peel or pieces. Approximately 28,767 tonnes of raw equivalent of processed tomato products were imported from China, predominately in the form of paste.

### Inside This Issue

	Page
What's In A Soil Test ? For	2
Effective Lives For Assets Used By Farmers In The Vegetable Industry	4
Healthy Soils for Sustainable Farms	4
Upcoming Events	5
Northern Hemisphere Processing Tomato Update	5
Yield and Soluble Solids During the 2006/07 Season	6
Tomato Yellow Leaf Curl Virus (TYLC)	6
Arbuscular-Mycorrhizal Fungi	7
2006 Annual Project Report - CTRI	7
2007/08 Research Program	7
EC Interest Rate Subsidy and Centrelink	8
Drought Resistant Tomatoes	8

## What's In A Soil Test ? – Some Things To Look Out For

RESULT	COMMENT	WHAT TO DO
Organic carbon (OC%) see next page	Multiplied by 2 = organic matter Check OC% against a soil test from 3-5 years back. If OC has dropped, it is a sign of decreasing nutrient & water holding capacity, structure decline and poorer disease suppression, weed pressure may have increased.	Use manure or break crops, rye grass is the most effective in increasing OC, but deep rooting plants e.g. from the brassica family. Mustard or BQ Mulch may be mixed with e.g. oats which have a greater root biomass than brassica plants. In the short term, good quality humic acid products may be beneficial.
pH	The pH measured in water should be about 0.7 higher than the one measured in CaCl <sub>2</sub> . If both measurements are closer together than that, the soil may be saline.	Lime is the best product to raise pH, unless the soil is low in magnesium (Mg). Then, dolomite may be used. If the pH is high (>7.2) consider using acidifying fertilisers as part of your program (e.g. ammonium sulphate, triple super or MAP).
Electrical conductivity (EC) (see below for conversion from one unit to another)	This is an indication of the saltiness of the soil solution. High EC usually is due to high levels of chloride (Cl); sodium (Na) levels will usually be elevated at the same time.  If Cl and Na are not high, a high EC may be due to multiple gypsum applications and thus high calcium (Ca) and sulphur (S) levels.	High EC caused by chloride (Cl) and sodium (Na); Use nitrate to compete with chloride (plants can not exclude Cl when taking up nitrate, both 'look' similar to the plant) Use calcium to compete with Na (the Ca has to be in solution, Calcium nitrate or Calciumthiosulphate are suitable) Alternate between gypsum and lime, even if the pH is high (use acidifying fertilisers – see above).
Nitrogen (N)	N measurements from dry soil give a rough indication on whether levels are low or not. This test does not pick up excess amounts of available nitrate or ammonium.	Use a suitable soil test that uses field fresh soil. Monitor plant levels & vigour, and adjust the fertigation program accordingly.
Phosphorus (P) see below for desirable ranges	The Olsen test is recommended for soils with pH above 7.2. The Colwell test is recommended for soils with pH below 7.2. The Mehlich 3 test is suitable over a relatively wide pH range. A P water extraction gives a good indication of plant available P, but it is not used commonly in Australia. P uptake is reduced under saline conditions P is important for early root development. It does not move in the soil.	Broadcast P fertiliser if overall P fertility of the paddock needs improving; consider single super or triple super if pH is high. For tomatoes, band P fertiliser but avoid MAP or triple super too close to young roots (low pH). Use pop up P with the water at planting. Mono Potassium Phosphate (MKP) is good at raising plant P levels via fertigation, but not so good at raising Potassium (K) levels. When fertigating P, zinc (Zn) uptake may be reduced; use foliar Zn to correct this.
Potassium (K)	Absolute soil levels may be ok in most cases but the percentage of K as part of CEC (cation exchange capacity) can be low, which means additional K is required. High sodium levels reduce K uptake. High plant demand at certain time can lead to occasional K shortage because K is not moved from the soil particles into solution quickly enough. Potassium supply makes plants more water efficient.	Check plant levels. Use K fertigation (potassium sulphate, thiosulphate or nitrate) to improve plant levels, do not use potassium chloride (KCl = Muriate of Potash or MOP), especially if the soil EC is elevated, bore water is used or the channel water is saline and plant Na levels are elevated. Potassium is very important for good fruit sizing. Start applying at the very first sign of fruit set. The demand will be the highest when the crop carries the highest amount of young fruit. Do not mix with Ca products

<p>Cations (calcium, magnesium, potassium, sodium)</p>	<p>Sodium and potassium have been mentioned on the previous page (Potassium, EC). Calcium (Ca) is important for maintaining soil structure and to avoid blossom end rot. Ca from gypsum and lime has to be seen as predominantly a soil structure improver due to the low Ca availability to plants. Soluble Ca is required to control blossom end rot. Ca has to be supplied to the developing cells of young fruit to build cell walls (cell division phase). During fruit sizing, cells expand but Ca is not built into cell walls any more. Magnesium (Mg) levels are often high in Australian soil and there is no economic way of fixing it.</p>	<p>Use calcium nitrate or calcium thiosulphate via fertigation. This may also help in reducing the development of compaction around drip lines. Foliar Ca products may be of benefit at early fruit development.</p> <p>Ca needs to be fertigated from the commencement of flowering (5-10% flowers) onwards to have it there for the young fruit during cell division.</p> <p>If plant levels are low, use apply Mg via fertigation.</p>
<p>Trace elements</p>	<p>Zn may be low in soils used for tomato production. Manganese and iron deficiency look similar. Boron uptake may be low under water stress or heat. It is best applied via foliar products then.</p>	<p>Foliar applications are an efficient way of supplying Zn.</p> <p>Tomato crops may benefit from 1-2 applications of a complete trace element mix, either via fertigation or foliar application.</p>

Soil test type	Soil test ranges					Phosphorus soil tests
	Very low	Low	Marginal	Optimal	High	
Colwell P (mg/kg) sand-sandy loam	<10	10-30	30-50	50-100	>100	
Colwell P (mg/kg) clay-clay loam	<10	10-30	30-70	71-120	>120	
Olsen P (mg/kg)	<5	5-10	10-17	17-25	>25	
Mehlich 3 P (mg/kg)	<10	10-20	20-40	40-60	>60	
Water P (mg/kg)	<5	5-10	10-17	17-25	>25	
Bray 1 P (mg/kg)		<20	20-35	>35		

**Electric Conductivity (EC)**

Conversion table:

dS/m	mS/cm	µS/cm	ppm	millimho/cm	micromho/cm
1	1	1000	670	1	1000
0.001	0.001	1	6.7	0.001	1
0.00156	0.00156	1.56	1	0.00156	1.56

**Organic Carbon (OC%):** A HAL project, study VG99057 by Pung *et al* (2003) to determine soil factors that determine vegetable productivity in Australia showed substantial decline in the levels of organic matter, organic carbon, aggregate stability and beneficial soil microbes in soils that had been intensively cropped. As a result, poor nutrient and water retention and poor root establishments were depressing crop productivity and quality. Soil and / or irrigation water salinity often added to the problem. Soil organic matter is critical in maintaining soil tilth, aiding infiltration of air and water, promoting water retention and reducing erosion. It is an essential food source for soil microbes. High levels of general soil microbial activity were found to suppress diseases caused by soil borne plant pathogens. In addition it has been shown that the higher the aggregate stability the better the structure and the lower the risk of compaction and water logging.

## Effective Lives For Assets Used By Farmers In The Vegetable Industry

<i>Vegetable and cane growing (01230 and 01510)</i>			
ASSET	LIFE (YEARS)	REVIEWED	DATE OF APPLICATION
Chemical spraying assets:			
Generally	10	*	1 Jul 2007
Self-propelled	8	*	1 Jul 2007
Fertilizer spreaders:			
Generally	10	*	1 Jul 2007
Spinner	5	*	1 Jul 2007
General assets:			
Mulchers	8	*	1 Jul 2007
Slashers	8	*	1 Jul 2007
Harvesting assets:			
Harvesters (including cane, carrot, onion, potato and tomato)	10	*#	1 Jul 2007
Trailers	15	*	1 Jul 2007
Planting assets:			
Precision seeders	10	*	1 Jul 2007
Transplanters:			
Automated	7	*	1 Jul 2007
Manual	10	*	1 Jul 2007
Tillage assets:			
Generally	15	*	1 Jul 2007
PTO operated (including rotary hoes and power harrows)	8	*	1 Jul 2007

# this refers to statutory caps of  $6\frac{2}{3}$  years for harvesters and tractors introduced to apply to these type of assets acquired on and after 1 July 2007

### Healthy Soils for Sustainable Farms: Ute Guide

All processing tomato growers should have recently received a publication titled: *Healthy Soils for sustainable Farms: Ute Guide*. This booklet was developed through funding provided by Land and Water Australia, Health Soils for Sustainable Farms Programme and the National Vegetable Levy as part of the EnviroVeg program.

As a part of the project they will also be running one-day infield workshops in each state to help growers to identify and interpret their soil.

If you have not received a copy of the ute guide and would like one please contact  
Helena Whitman,  
Environmental Manager, AUSVEG Ltd.  
pH: 03 5429 5220



## UPCOMING EVENTS

### Nutrigation™ Seminar

Ron Seligmann - an irrigation, fertigation and plant nutrition specialist currently researching plant sciences in Israel.

Leeton, NSW Wednesday 25<sup>th</sup> July

Griffith, NSW Thursday 26<sup>th</sup> July

Shepparton, Vic Friday 27<sup>th</sup> July

Registrations required by 10<sup>th</sup> July, [nutrigation@netafim.com.au](mailto:nutrigation@netafim.com.au)

### 5<sup>th</sup> EMS in Agriculture and 5<sup>th</sup> National On Farm Food Safety and Quality Assurance Conferences

6th-10 August 2007

Hobart

[www.tqainc.com.au](http://www.tqainc.com.au)

### 8<sup>th</sup> World Congress and 11<sup>th</sup> ISHS Symposium on the Processing Tomato

8<sup>th</sup> - 13<sup>th</sup> June 2008, Toronto, Canada

[www.worldtomatocongress.com](http://www.worldtomatocongress.com)

Financial assistance is available for current processing tomato industry levy payers to attend this congress. Please contact Liz Mann for further information.

## Northern Hemisphere Processing Tomato Update (from Tomato News, July 2007)

In Greece, the weather has been good for cultivation. While it was very dry early on, the month of May was wet, especially the last two weeks, so there is now no shortage of water expected this season.

In Portugal, the weather at the end of April and in May has not been as hot as usual. Temperatures are now stable, but with not too much difference between day and night. Currently the crop is looking good and there is enough water.

In southern Italy, the situation is quite good. There has been more rain at the end of May which should mean an end to the drought which was causing concern. In the North, the situation is normal, in line with standard conditions. There was some drought in the spring but water levels have recovered with the recent rains.

In Turkey, after a very dry and mild winter and spring, leading to a water shortage in the country and worries

about sufficient water for tomatoes and other crops, some occasional rains have encouraged farmers to plant tomatoes. The serious drought continues however and if it persists, reductions in yields are to be expected. More recently, some heavy rain and hail affected some areas and badly damaged large areas in the North (Karacabey and Kemalpaşa).

In Tunisia, growing conditions are difficult with many changes of temperature and a succession of periods of heat and rain that could affect yields.

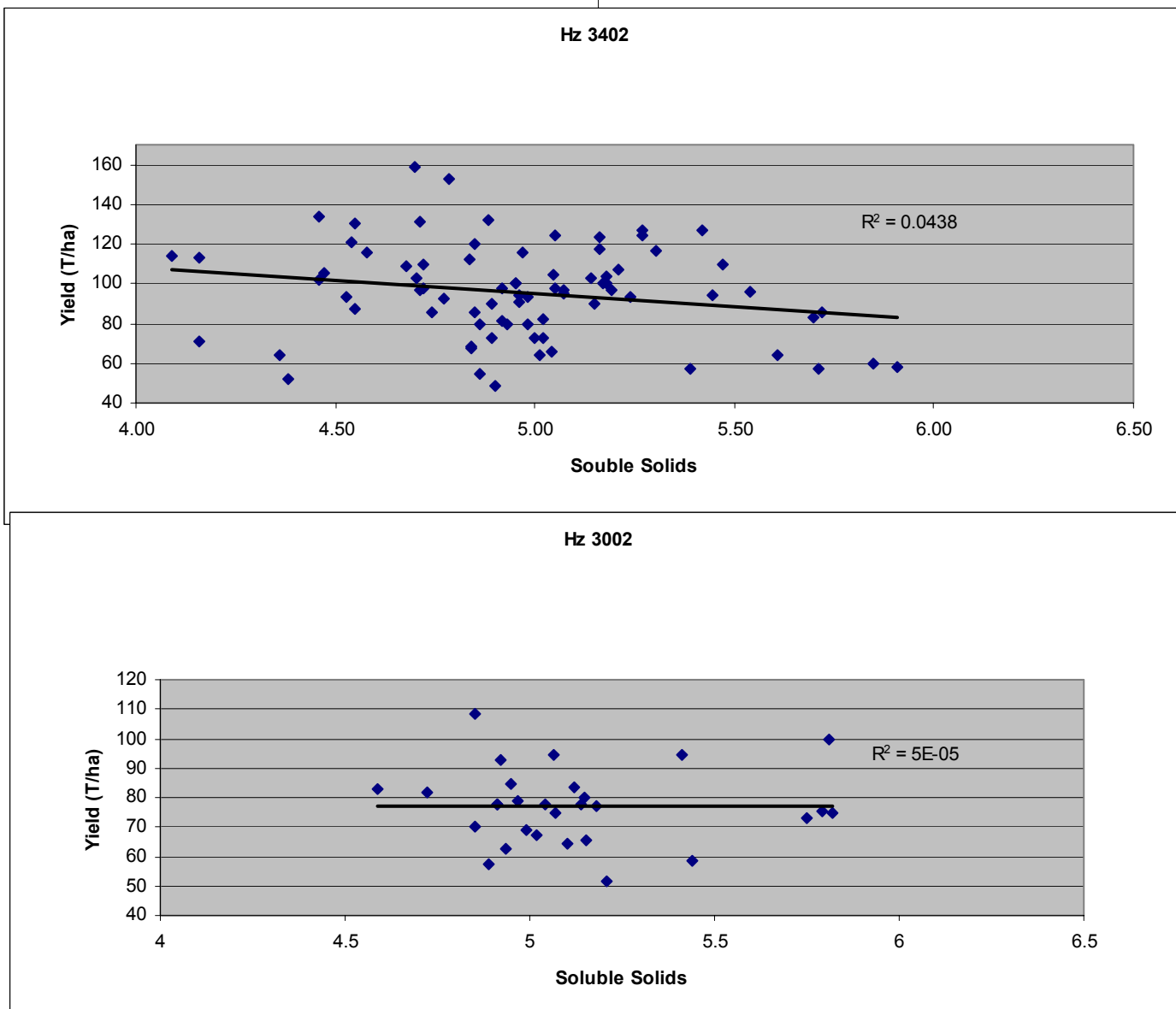
In Spain, heavy rains in all the regions have disturbed later planting operations and some storms have damaged fields. While this should not reduce the size of the overall crop, harvest will be late and in Extremadura there will be some bunched maturation in the second half of August.

France, the weather has been unusual this spring, with some uncharacteristic temperatures, and some variable development in the plants. Some storms (up to 200 mm of water) and hailstorms, mainly in the South-West, but to a lesser extent in the South-East, have caused damage and encouraged the development of bacterial diseases.

## Yield and Soluble Solids During the 2006/07 Season

Yield and soluble solids data for commercial processing tomato crops was collected this season once again from Cedenco and Heinz. This data was then grouped by variety and irrigation type to determine what/if any relationship existed between soluble solids and yield. Only data from drip irrigated crops was included in the following graphs.

These graphs for the 2 most common varieties grown commercially last season show that yield and soluble solids were not related. It is in fact possible to produce a high yielding and high soluble solids crop of Hz 3402 and Hz 3002.



### Tomato Yellow Leaf Curl Virus (TYLC)

Tomato Yellow Leaf Curl became an issue in Queensland during the past 12 months. Although it has not been found in the processing tomato region in Victoria or NSW it is something which may cause considerable

damage to the industry in the future. TYLC virus is transmitted by Silverleaf Whitefly which do not appear to be currently established in Victoria.

California growers are on alert for a "new" viral disease, tomato yellow leaf curl (TYLC), which has the potential to devastate the state's tomato production. The first California discovery of the virus was in Brawley, near the border with Mexico, during March of this year.

## Arbuscular-Mycorrhizal Fungi and Processing Tomato Production

Ashley Martin (University of Adelaide) has recently completed a PhD project which investigated the contribution of arbuscular-mycorrhizal fungi (AMF) to the yield and fruit quality of processing tomatoes, and the potential to more efficiently utilise fertiliser by inoculating tomato seedlings with beneficial AMF.

Initial work found that tomatoes can be readily colonised by AMF indigenous to farm soils in Victoria. Initial results from a glasshouse experiment showed that AM colonisation increased reproductive growth and nutrient status in two relatively high P soils with acidic and alkaline pH. Another trial occurred whereby tomato seedlings were inoculated prior to planting. This trial using inoculated and non-inoculated seedlings confirmed the ability of AMF to increase the yield (by approximately 40%) and nutrient status of two processing tomato cultivars in the field when pre-inoculated, but not when naturally colonised. Colonisation of processing tomatoes with indigenous AMF did not cause any positive growth or yield response when compared with the non-AM (control) reduced mycorrhizal colonisation.

Further work confirming the positive yield and nutrient responses of processing tomatoes to inoculation with AMF and the development of practical methods of integrating inoculation into existing farming practices could result in an increase in the efficiency and sustainability of the processing tomato industry.

Ashley has recently approached the APTRC regarding the continuation of the arbuscular-mycorrhizal fungi (AMF) work. His full PhD report is not currently available to the industry. Upon receipt of the full PhD report a decision will be made by the APTRC regarding funding future work in this area. If you have any thoughts or comments regarding this please contact Liz Mann.

## Eating Out of Home

Australians spend 37 cents of their food and non-alcoholic beverage dollar on eating out of home. The equivalent figure for the United States is 50 cents and New Zealand 30 cents.

Canned tomatoes make up 4% of the 5 top fruit and vegetable products in Australian Foodservice. (Foodservice -HAL workshop)

## 2006 Annual Project Report - California Tomato Research Institute

Copies of the 2006 Annual Research Report from California have been received by the APTRC. The 2006 reports include:

- Determination of the Form and Magnitude of Water Content and Metabolic Activity Profiles Concomitant with Optimum Yield and Soluble Solids
- Evaluation of Agronomic and Environmental Benefits of Low Biomass Cover Crops for Processing Tomato Rotations
- Evaluation of New Fungicides and Application Timing for Blackmold Fruit Rot Control
- Efficacy of New Fungicides and Bactericides for the Management of Tomato Diseases
- Implementation and Validation of a Forecasting Model for Tomato Powdery Mildew
- Epidemiological Analysis of Tomato Spotted Wilt Virus and its Thrip Vector(s)
- Precision Weed Control System for Processing Tomatoes
- Automatic Weed Control System for Transplanted Processing Tomatoes Using X-ray Stem Sensing
- Evaluation of New Herbicides for Tomato Tolerance and Weed Control

If you would like to see the full report of any of these projects please contact Liz Mann.

## 2007/08 Processing Tomato Research Program

The following projects have been approved by the APTRC to continue during the coming season: Cultivar evaluation, conducted by Applied Horticulture Research (Mike Titley). Trials will include:

- Furrow/seed crop in NSW
  - Drip/transplants in Vic
- Nutrition/soil health, conducted by Serve Ag (Doris Blaesing). Doris will be involved in a number of activities including:
- Phosphorus trial with SS Farms, evaluating maintenance rates of P, using a high and low fertility site
  - Doris is available to provide nutrition management assistance to growers

If you are interested in conducting any on farm trials during the coming season on your own farm please contact Liz as there are opportunities to "value add" to your idea with input from Doris, Mike or other support service personnel involved in the industry.

## Exceptional Circumstances - Interest Rate Subsidy and Centrelink Drought Relief Payment

As the processing tomato production region is located in an area which has been declared under Exceptional Circumstances growers may be eligible to apply for some financial assistance.

To date some growers have applied for the Centrelink Drought Relief Payment and are currently receiving up to the maximum payment per fortnight.

In addition some growers have applied for the Interest Rate Subsidy . The Interest Subsidy Support is available for the interest payable on, and associated costs of, borrowings supplied by a commercial institution, vendor or by genuine private arrangements. The level of subsidy is up to 80% of the interest payable on sufficient borrowings to achieve a break even result in the year on which the assessment is based.

If you have not applied for the above and are interested in finding out more information (or have applied and have recently been rejected) and would like assistance in this area please contact Liz Mann (currently also working part time as a Rural Financial Counsellor with RFCS - GMH Agcare).

## Drought Resistant Tomatoes

It appears that the processing tomato region in Australia is not the only production region recently affected by drought.

Italy's recent drought, which has caused parts of the Po river to dry up, has resulted in a team of scientists producing a cross-bred tomato variety that can grow in a quarter of the water that is normally needed. The initial results are promising with some predicted to be on the market in the coming months.

Genetic engineering has also been looking at genetically modifying tomatoes to create breeds which have smaller pores and release less water. This work has been restricted to the laboratory due to the sensitive nature of genetic modification (Tomato News, May 2007).

Researchers in Connecticut in the USA have also been investigating genetically modified drought resistant crop plants. Using a special biological technique they have transferred a gene into a tomato plant which resulted in the development of an increased root system, able to take up water during drought periods and an enhanced ability to recover from water deficit stress (Tomato News, March 2007).

### ACKNOWLEDGMENTS:

Funding from Horticulture Australia Ltd. (HAL) for the Technology Transfer project (TM05007) is acknowledged. "Tomato Topics" is a quarterly newsletter compiled and edited by Liz Mann, Industry Development Manager, APTRC Inc., P.O. Box 2293, SHEPPARTON, VIC 3632.

**Phone: (03) 5825 4633, Fax: (03) 5825 4725, Mobile: (0427) 857-578, E-mail: [lizmann@aptrc.asn.au](mailto:lizmann@aptrc.asn.au)**

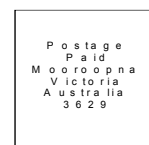
Opinions expressed in "Tomato Topics" are not necessarily those of the APTRC unless otherwise stated.

### Sender:

APTRC Inc.

P.O. Box 2293

SHEPPARTON, VIC 3632



Print Post Approved PP343935/0060

