



TOMATO TOPICS



Know-how for Horticulture™

NEWS and INFORMATION
FOR THE PROCESSING TOMATO INDUSTRY

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2008/09 Season Update

Harvest commenced this season just after Australia Day, with the first processing occurring on the 28th January at Echuca. From the 12th March rain fell for a few days to varying levels across the industry. This did hold up harvest in some areas, but processing was able to continue in Echuca.

The processing tomato region experienced a long period of high heat in late January. This saw temperatures across much of the area reach above 40°C for 8 days out of 11 consecutive days. During this time crops at Darlington Point were being harvested and some of the later crops in Victoria were in flower. The full impact of this high heat on the industry is not known at this stage but will unfold towards the end of harvest.

At the time of writing this the industry was approximately 50-60% through harvest, based on area. The initial outlook of a total of 240,000 tonnes for the Australian industry is still considered achievable, with some early crops yielding higher than expected. Brix levels in crops harvested to date have also been higher than expected.

From the March edition of Tomato News it has been estimated that during 2009 40 million tonnes of tomatoes will be processed worldwide. This estimate includes forecasts from California which were presented in December 2008, doubts are now expressed due to concerns over irrigation allocations, amongst other issues. The 40 million figure also includes an estimate from China whose

forecasts currently seem to correspond more to processing capacity than actual production intentions. Taking these into consideration it is still felt that 40 million tonnes world wide is achievable.

At the end of 2008 the world production of processed tomatoes seemed to be insufficient (36.5 million tonnes processed), being approximately 1 million tonnes short. Currently available stocks are virtually nonexistent. Studies have also indicated that worldwide consumption is growing regularly and solidly. This will help balance the predicted production with consumption.

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NSW Machine Harvest Cultivar Trial

(Tony Napier, NSW DPI)

A large machine harvested variety trial was in a furrow irrigated crop near Darlington Point. The trial was direct seed on the 19/9/08 as two rows per bed (width 1.8 m) at a seeding rate of approximately 110,000 seeds/ha and watered up on 28/9/08. The trial was machine harvested 127 days after first irrigation on 4/2/09 with the varieties ranging from 76 to 91% red fruit. Seven varieties were evaluated which were replicated four times on plots 270m by one bed. The varieties varied in earliness. As a result an early assessment was conducted on the 29/1/09 to determine percentage red and brix, by taking a 10kg sub sample from each plot. At this time a 4m length was hand harvested from the H 2206 plots due to its high level of red fruit.

On the 4/2/09 the trial was machine harvested. The yield results are shown in Table 2.

Results show that H 7204 was the highest yielding variety with 97.5 t/ha of fruit. The variety with the highest percentage of SS was SPS 669-6 with 5.65%. The highest yielding variety of TSS was ENP 113 with 5.14 t/ha.

Table 1: Hand Harvest 29/1/09

		% Red	Yield	Brix
H 2206	Rep 1	90.0%	95.9	4.83
H 2206	Rep 2	85.6%	108.2	4.73
H 2206	Rep 3	96.2%	88.5	5.27
H 2206	Rep 4	93.6%	76.0	5.73
Average		91.4%	92.15	5.14

Variety	% Red	% Green	% Rotten	fruit size (g)
H 7204	91.4%	5.2%	3.4%	50.7
H 2206	89.9%	3.7%	6.4%	38.0
ENP 113	89.2%	1.0%	9.8%	52.6
H 3002	87.6%	4.9%	7.5%	52.2
Early Magnum	81.8%	10.9%	7.3%	49.9
SUN 6366	78.3%	10.3%	11.4%	48.7
SPS 669-6	76.3%	12.4%	11.2%	61.7

Table 3: Fruit size and Maturity at Machine Harvest

From the percentage red data obtained on the 29/1/09 H 2206 was the fastest maturing variety. At the time of machine harvest H 7204 contained the highest number of red fruit, perhaps due to some of the red fruit in H 2206 beginning to break down. SPS 669-6 appeared to be the slowest maturing variety by having 76.3% red fruit at harvest, and containing over 12% green fruit. Although this variety did contain a similar level of green to rotten fruit, possibly indicating poorer holding. SPS 669-6 also produced the largest fruit size with an average of 61.7 g/fruit. H 2206 produced the smallest fruit size with an average of 38.0 g/fruit.

ENP 113	Rep 1	79.3%	5.13
ENP 113	Rep 2	80.9%	5.40
ENP 113	Rep 3	84.2%	5.27
ENP 113	Rep 4	83.0%	5.47
Average		81.9%	5.32

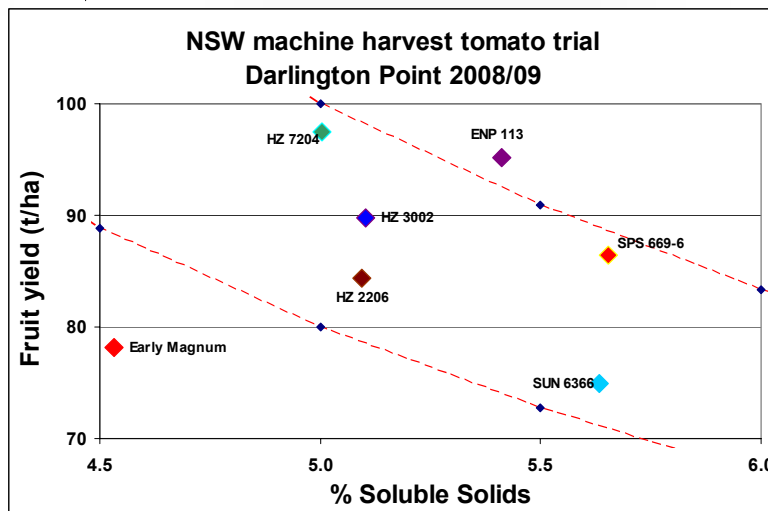
These results will be statistically analysed with a more detailed report included in the 2009 Australian Processing Tomato Grower magazine.

H 3002	81.5%	5.63
SPS 669-6	66.3%	5.70
Sun 6366	72.3%	5.73
Early Magnum	83.7%	5.00
H 7204	86.0%	4.97

Table 1 demonstrates that H 2206 is considerably earlier than the other varieties. This variety is known as a 100 day variety and is considered a good holder, especially if soil moisture is maintained. This variety also had a smaller vine with a curled leaf. Fruit did appear to be more exposed.

Variety	Yield (T/ha)	SS (%)	TSS (T/ha)	fruit size (g)
ENP 113	95.2	5.41	5.14	52.6
SPS 669-6	86.4	5.65	4.89	61.7
H 7204	97.5	5.00	4.88	50.7
H 3002	89.8	5.10	4.59	52.2
H 2206	84.4	5.09	4.29	38.0
SUN 6366	74.9	5.63	4.22	48.7
Early Magnum	78.2	4.53	3.54	49.9

Table 2: Machine Harvest Yield Results



Nutrient Uptake History

Doris Blaesing (RMCG)

Graph 1 shows the fluctuations of nitrogen and potassium levels over the past 6 seasons. Given similar nitrogen application rates, high and low levels are usually due to weather conditions. Cold or dry conditions lead to low mineralisation rates from organic matter and thus reduced nitrogen availability to crops. Warm weather and good soil moisture due to rain improve mineralisation and nitrogen uptake. Rain during summer would have the greatest effect unless large rainfalls lead to nitrogen leaching past the rootzone.

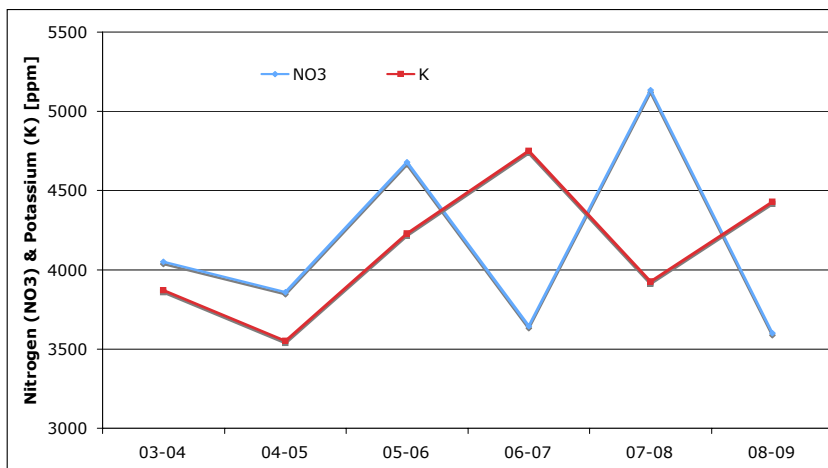
Given the same fertiliser inputs, Potassium uptake is influenced by soil moisture and temperature. Cold, dry conditions reduce uptake. Uptake also is impaired in saline (high soil sodium and Chloride) or sodic high (soil sodium) conditions. Then, sodium (Na) is taken up, replacing some of the Potassium. These conditions are more prevalent in dry years when winter rains do not flush out the salts (Na and Cl) and salinity of irrigation water may also increase due to low water levels in rivers and use of bore water.

Graph 2 shows the fluctuation of phosphorus, Calcium and Magnesium uptake over the past six seasons. P uptake is overall constant at an average of around 200 ppm.; 200 – 300 ppm is a good level. Phosphorus is very important for early crop establishment, especially root growth. It also is involved in all energy transfer processes in the plant and therefore important throughout the season. Traditionally, phosphorus has been applied with the base fertiliser, often weeks ahead of planting. Some soils fix phosphorous so that at planting, and during the season, available P may be suboptimal for optimum yield and soluble solids. P base dressing as close as possible to planting, pop-up P and P fertigation throughout the season can be used to keep P-levels up. The later two approaches are advisable under saline or sodic soil conditions when chloride and or sodium levels are high. These conditions affect root function and thus P uptake.

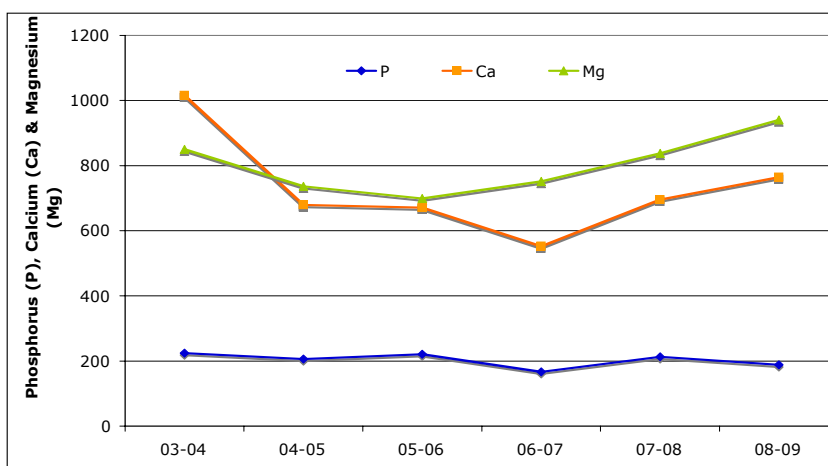
The drop in Calcium uptake from 2003-04 to 2006-07 may be due to an increase in sodium, which is apparent from data shown in Graph 3. Sodium replaces Calcium on the exchange sites in the soil, making Ca less available to plants. The slight increase in Ca uptake after 2006-07 may be due to an increased use of Ca nitrate and other Calcium fertilisers. During the season it is important to use soluble Ca sources. Lime and Gypsum contain relatively little soluble Ca with good plant availability. Calcium Nitrate, Calcium Thiosul-

fate and similar products work well with fertigation. High Ca availability is important for root heath, structural stability and to prevent blossom end rot.

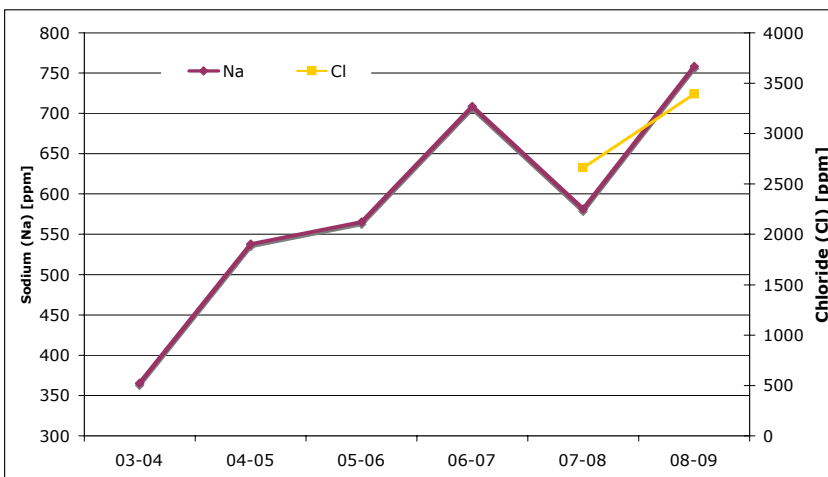
Graph 1 – Average Nitrogen (N) and Potassium (K) uptake 2003 -2009



Graph 2 – Average Phosphorus (P), Calcium (Ca) and Magnesium (Mg) uptake 2003-2009



Graph 3 – Average Sodium (Na) and Chloride (Cl) uptake 2003-2009

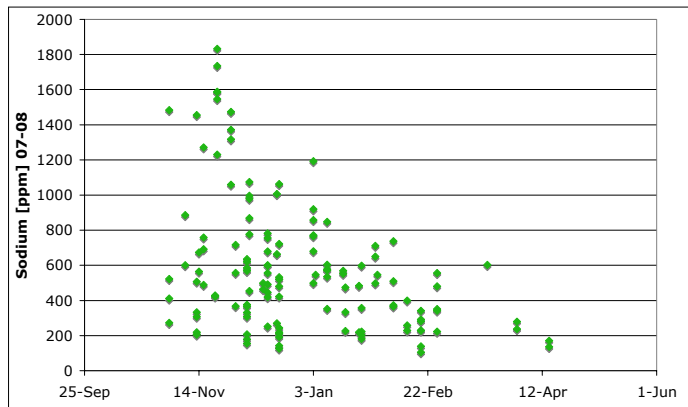


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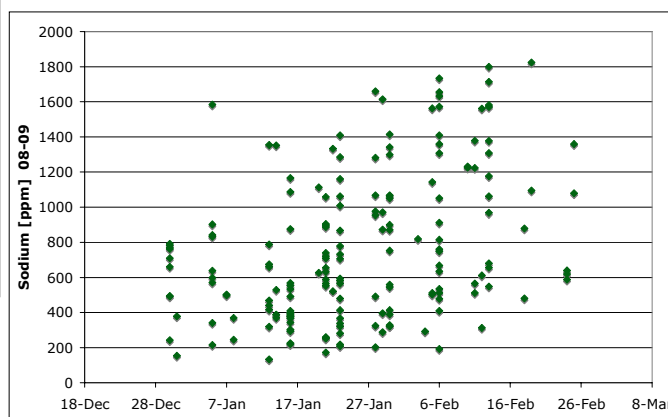
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Graph 3 shows that sodium levels were lower in 2007-08 than in the preceding and following seasons. This is most likely due to the relatively high, unseasonable rainfall experienced in early 2008. This would have leached some sodium from the rootzone. Graphs 4 and 5 show that sodium uptake dropped in 2007-08 with all levels at or below 600 ppm from mid February onwards. This trend was not observed in 2008-09; data suggest a slight increase of Na uptake during that season.

Graph 4 – Sodium uptake during the 2007-08 season showing an overall drop



Graph 5 – Sodium uptake during the 2008-09 season showing an overall slight increase



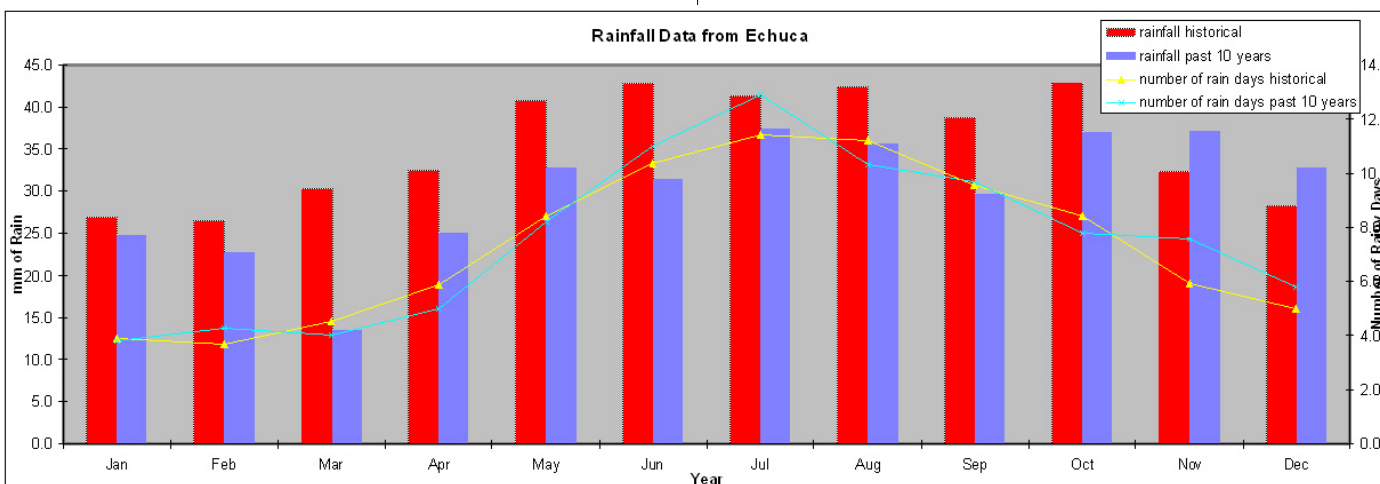
Salinity Impact on Processing Tomatoes

In addition to fertigation, irrigation water itself may add some salts to the soil. The main salts which are detrimental to crops are sodium (Na) and Chloride (Cl). Under normal conditions and seasons these salts are often leached through the root zone with winter rain, especially the Chloride. During the past 10 years 7 years have fallen below the long term average total rainfall (1881-2008) for Echuca. As a result, the movement of water beyond the rootzone, called leaching would have been limited, resulting in the accumulation of salt within the rootzone. Without regular leaching, rootzone salinity can slowly increase, depending upon the salinity of the irrigation water. In dry years the irrigation water salinity tends to increase due to low water flows and lack of flushing of rivers and streams.

A sample of irrigation water was collected from an irrigation channel near Shepparton. The electrical conductivity of this water was 70 $\mu\text{S}/\text{cm}$, and contained 45 ppm TDS (total dissolved salts). This water is of high quality and very suitable for all uses. Under “normal” successive years this water would not be of any concern, but under the restricted leaching environment we have been experiencing the impact may be surprising.

For example, if water with an electrical conductivity of 800 $\mu\text{S}/\text{cm}$ is used then approximately 0.5 tonnes of salt are added to the rootzone per megalitre of water. Therefore using the channel water which was tested, approximately 44 kg of salt is applied/ML. As most processing tomato crops use a mini-

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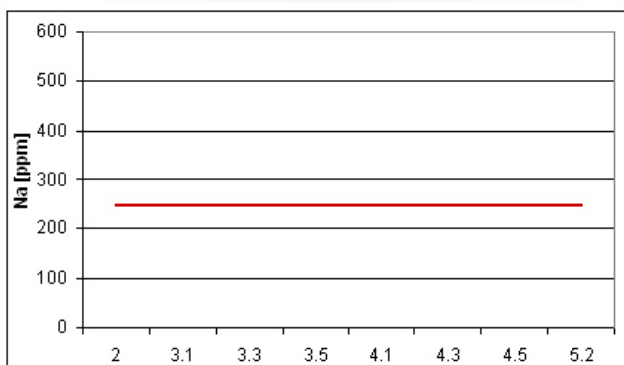
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imum of 5 ML/ha, the quantity of salt applied per year, by irrigation water only, would be in the vicinity of 220 kg/ha. If the impact of fertilisers is considered on top of that then this quantity of salt would be expected to be higher again.

Under drip irrigation systems, irrigation water is applied to a small volume of soil. That means the above quantity of salt is actually applied to a smaller volume of soil, which is the wetted area.

Under normal conditions, the roots of most plants exclude sodium (Na^+) and chloride (Cl^-) salts when taking up water, which may also result in their gradual increase in concentration in the soil if no leaching occurs. Above a certain threshold the plants ability to do this decreases and these ions will be taken into the plant.

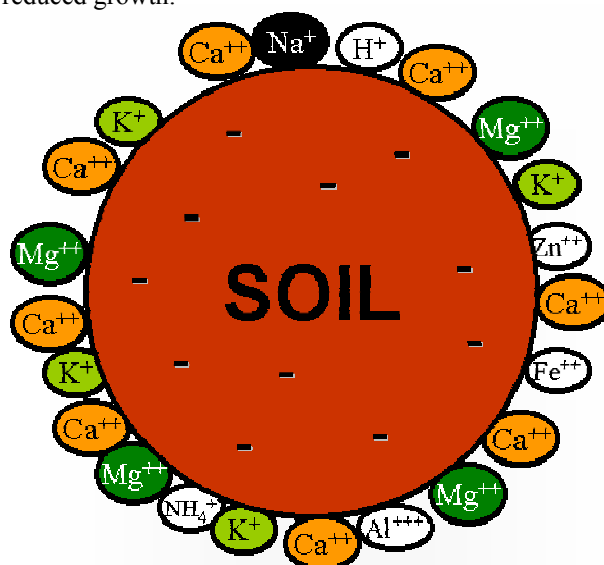
During past seasons the sodium level in the sap has been tested when processing tomato petioles are sent for sap analysis. Based on previous season's results the following graph was established, with the horizontal axis demonstrating crop growth stage. This season, many petiole samples have contained Na levels well in excess of what is shown in this graph. Ideally the Na level should not be above 250 ppm; although, it seems that tomatoes can cope with higher levels of up to 1000 ppm if K and P nutrition is sufficient.



Sodium may reduce potassium, magnesium and calcium uptake by the crop. Potassium regulates the opening and closing of the stoma by a potassium ion pump. Since stomata are important in water regulation, potassium reduces water loss from the leaves and increases drought tolerance. Potassium deficiency may cause necrosis or interveinal chlorosis. Magnesium may not be an issue as saline or sodic soils often are high in Mg.

Calcium (Ca) is an essential building block of cell walls, providing structural strength to plants, and also forms relatively high concentrations in the cell solution, especially in growing points. This is why deficiency symptoms appear at growing points as obvious with blossom end rot. If blossom end rot is a problem it indicates that other growing points, i.e. shoots and root tips will be affected. Calcium is taken up by water and relies on transpiration for transport, hence weather conditions that reduce transpiration also reduce calcium uptake. As a rule, lime and gypsum may not provide sufficient Ca to the soil solution for fruit production. This applies especially to

sites affected by salinity, sodicity and high soil magnesium (Mg) levels. Calcium regulates transport of other nutrients into the plant and is also involved in the activation of certain plant enzymes. Calcium deficiency results in stunting and reduced growth.



Cations are held by negatively charged particles of clay and humus called colloids. Colloids consist of thin, flat plates, and for their size, have a comparatively large surface area. For this reason they are capable of holding enormous quantities of cations. They act as a store of nutrients for plant roots. As plant roots take up cations, other cations in the soil water replace them on the colloid. If there is a concentration of one particular cation in the soil water, those cations will force other cations off the colloid and take their place. These cations which have been forced off the colloid are very susceptible to being leached or drained away in the soil water, if not taken up by plants.

If additional calcium fertilisers are applied then the calcium ion can more easily replace sodium (Na) rather than the potassium (K) on exchange sites in the soil, thus allowing more potassium (K) to enter the plant. The additional potassium enhances the crop's water use efficiency, and improves disease resistance and soluble solids production.

Salinity also reduces Phosphorus (P) uptake as it affects root efficiency. Fertigation with liquid fertilisers during the season will be effective. It also is important to apply the base P as close to planting as possible and use pop-up P.

Under low annual rainfall conditions it is important to remember that sodium levels on the soil particle within the wetted area around the drip emitter may gradually increase. This in turn can impact upon the ability of the plant to take up other essential nutrients such as potassium, calcium and phosphorus. If these nutrients are applied to the wetted zone then they can displace the sodium from the soil particle, thus increasing the ability of the plant to absorb potassium and calcium.

Reference

<http://www.dpi.nsw.gov.au/agriculture/resources/soils/salinity/crops/saline-irrigation>



UPCOMING EVENTS

Soil Field Day with Doris

Thursday 2nd April

If you are interested in attending please contact

Liz (lizmann@aptrc.asn.au or phone 0427 857 578) by Friday 28th March 2009

If there is insufficient interest this day may be cancelled.

Sustainable Farm Families - Part 2

For all people who participated in the first part in April 08

Tuesday 7th April 2009 and Wednesday 8th April 2009

The program in 2009 is a 1 full day and ½ day on the second day (finish at lunch time).

Nutrient Management Workshops with Doris

Doris will be conducting regional small group meetings the week beginning the 27th April 2009. These meetings will enable Doris to assist growers in interpreting their fertigation program and associated results from the current season. All growers and agronomists are invited to attend. Please contact Liz for additional information

Tomato Forum 2009

Friday 1st May 2009

Starts at 8:45 am.

Also includes a proposed Afternoon 9 Holes of Golf

And Dinner at Oscar W's starting at 6:30pm

For more details: lizmann@aptrc.asn.au

Irrigation Australia 2009 National Conference

Swan Hill, 18th - 20th October 2009

<http://www.irrigation.org.au/index.cfm?/events/irrigation-australia-2009>

Maximising Nutrient use Efficiency and Improving Soil Health in the Processing Tomato Industry

DAFF - Caring For Our Country Grant

Ash Martin and Tim Cavagnaro from the Soil Ecology Laboratory at Monash University have been collecting soil and root samples from processing tomato farms from across northern Victoria over the last couple of months. We are using these samples to assess the role of beneficial soil fungi which can improve plant growth, nutrition and yields. These associations, called arbuscular mycorrhizas, are increasingly recognised as an important part of sustainable farming systems around the world. To better understand the role of mycorrhizas in processing tomato production, we are also analysing a wide range of soil properties including pH, salinity, texture, strength, moisture, plant available phosphorus, nitrate, ammonia,

carbon and a range of other important nutrients. We will also be comparing methods of soil phosphorus analysis to see which test gives the most accurate measure. This data when combined with farming systems information will provide one of the most complete pictures of what is happening belowground in processing tomato farm soils. If you have any questions relating to this new research program, please don't hesitate to contact us (tim.cavagnaro@sci.monash.edu.au).

Doris Blaesing through this project has also conducted the sap monitoring work during this season. The results from these will be discussed in small groups in late April

G-MW Update March 09

As of the 10th March 2009 approximately half of the allocated water in the Goulburn Murray System was to be delivered. The end of the irrigation season is set at the 15th May. This is a higher percentage that what has been experienced in previous seasons.

G-MW also mentioned at the meeting on the 10/3/09 that across the system an additional 8ML of water is require to ensure 10ML is delivered on farm.

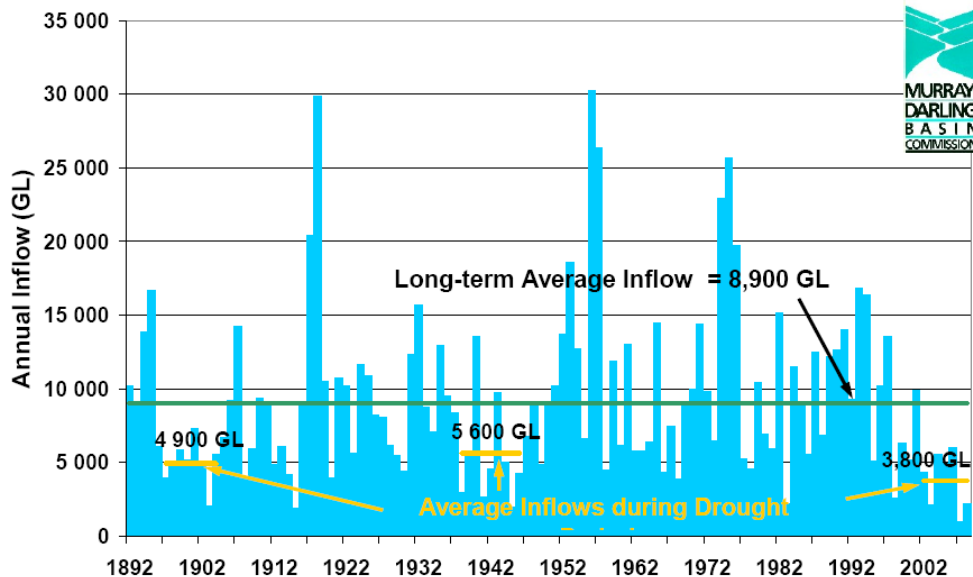
At the end of this irrigation season no system reserves will be available for next season. Hence, next season's allocations will be entirely dependant upon inflows during the winter months.

It was also mentioned that there is potential for a delayed start to the 09/10 season, although G-MW will assess needs and deliver carryover where possible. Growers are encouraged to contact their Area Officer for early season water needs.

Following the recent bushfires in the catchment are the comment was also made that in the short term there may be an increase in inflows, while in the longer term the inflows may decrease as vegetation grows. Approximately 1/6th of the productive catchment area was burnt.

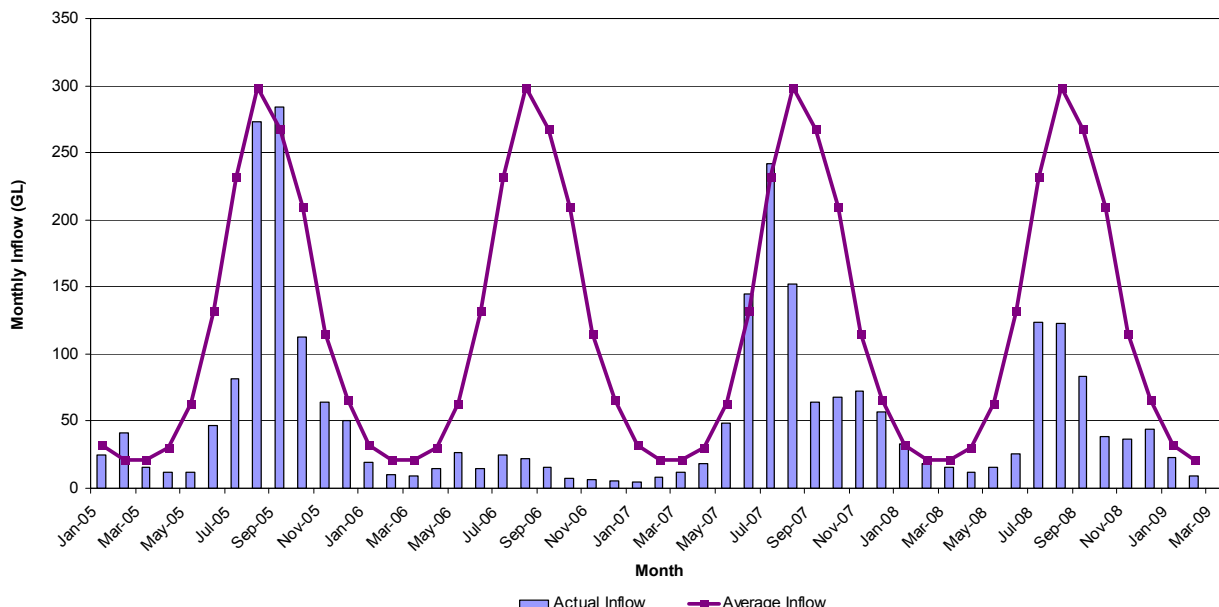
At this stage the 2009 Outlook is:

Figure 1. Murray system annual inflows (excluding Darling inflows and Snowy releases)



	17/08/2009	15/10/2009	15/02/2010
Wet	90%	100%	100%
Average	35%	82%	100%
Dry	0%	25%	48%
Scenario D	(If last 11 years are used to predict future inflows)		
Wet	48%	76%	100%
Average	1%	43%	63%
Dry	0%	0%	4%

Inflows to Lake Eildon as at 28 February 09



2009 Updated Economic and Fiscal Outlook

Small Business and General Business Tax Break

The Government will provide an additional \$2.7 billion temporary tax break to small and other businesses to boost business investment.

Small businesses will be able to access the tax break for assets costing \$1,000 or more. For all other businesses, the asset threshold is \$10,000.

The tax break provides an additional tax deduction for assets acquired from 13 December 2008 to 30 June 2009, where the asset is also installed before 30 June 2010. The deduction will be equal to 30 per cent of the asset's cost.

For assets acquired between 1 July 2009 and 31 December 2009 and where they are installed ready for use before 31 December 2010, the deduction is 10 per cent of the asset's cost.

Questions and Answers

Who will be assisted?

Taxpayers that carry on a business will be able to claim the tax break in the form of a bonus tax deduction.

When and how can it be claimed?

The core provisions of the uniform capital allowance in Subdivision 40-B of the Income Tax Assessment Act 1997 (ITAA97) will provide the framework for determining which assets are eligible and who is entitled to claim the bonus deduction. This approach will reduce complexity and compliance costs for businesses.

The allowance will take the form of a tax deduction on top of the usual capital allowance deduction able to be claimed for the asset as part of the taxpayer's income tax return.

What kinds of assets will qualify?

Assets that are eligible will be tangible depreciating assets used in carrying on a business, for which a deduction is available under Division 40 of the ITAA97.

Further, the tax break will be available for new expenditure on existing assets as well as for new assets. The assets must be used in Australia.

A minimum expenditure threshold of \$10,000 will also apply, except for small business entities which only have to meet a minimum threshold of \$1,000.

Draft legislation to implement the investment allowance will be released for public consultation later this month.



ETgage Parts

If anyone requires spare parts for their ETgage for next season or would like to purchase a new one please contact Liz ASAP, an order will be placed by Easter for any spare parts etc.

Please email (lizmann@aptrc.asn.au) or phone 0427 857 578

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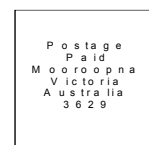
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