

# Getting the Most Out of Your Fertilizer Investment



FERTILIZERS

---

## **Fruit Growers Victoria Conference**

16<sup>th</sup> August 2018

By: Mandy Coulson, Steven Thomas & Jamie McMaster

SLTEC Fertilizers

Tongala Victoria

## About this presentation

- Introduction
- Fertilizer Origins & Approaches to Orchard Nutrition
- Crop Nutrient Demand – Whens it needed?
- Balancing Act
- CRAFT
- Oils aint oils....when it comes to Fertilizers
- Take Home Messages



## About this presentation

- **Introduction**
- Fertilizer Origins & Approaches to Orchard Nutrition
- Crop Nutrient Demand – Whens it needed?
- Balancing Act
- CRAFT
- Oils aint oils....when it comes to Fertilizers
- Take Home Messages





## Starting SLTECs Journey Factory site 2005 & 2015



## Our Manufacturing Base, Our Place

Principle Operations: 2055 Finlay Road, TONGALA VIC 3621



# Our Manufacturing Base, Our Place

Principle Operations: 2055 Finlay Road, TONGALA VIC 3621

Mixing Tank 1, Established 2006



Mixing Tank 3&4, Established 2018



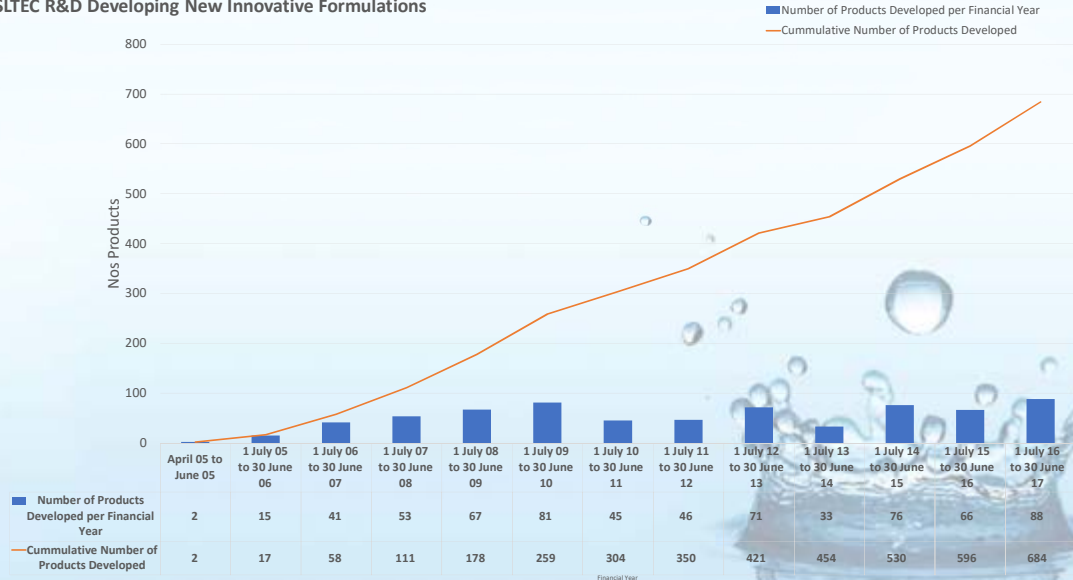
# SLTEC Freight Solutions





## SLTEC Strong Focus on R&D Yields Unique Formulations for Key Crop Sectors

SLTEC R&D Developing New Innovative Formulations



## About this presentation

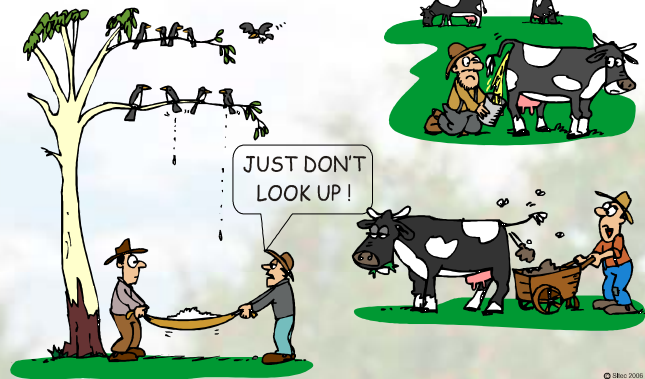
- Introduction
- **Fertilizer Origins & Approaches to Orchard Nutrition**
- Crop Nutrient Demand – Whens it needed?
- Balancing Act
- CRAFT
- Oils aint oils....when it comes to Fertilizers
- Take Home Messages



## Fertilizer Origins

- Pre WW2 most nutrient sources were low analysis organic based
- With the green revolution came industry and chemistry to concentrate and value add nutrients; Urea, Ammonium Nitrate, High Analysis Phosphates
- Fluid fertilizer technology emerged in the USA in the early 1960's and today represents 50 to 70% of all fertilizers consumed in California

### Evolution of Fertilizer



### Origins of Fertilizer

## Bales of Manure (Poo) Loaded



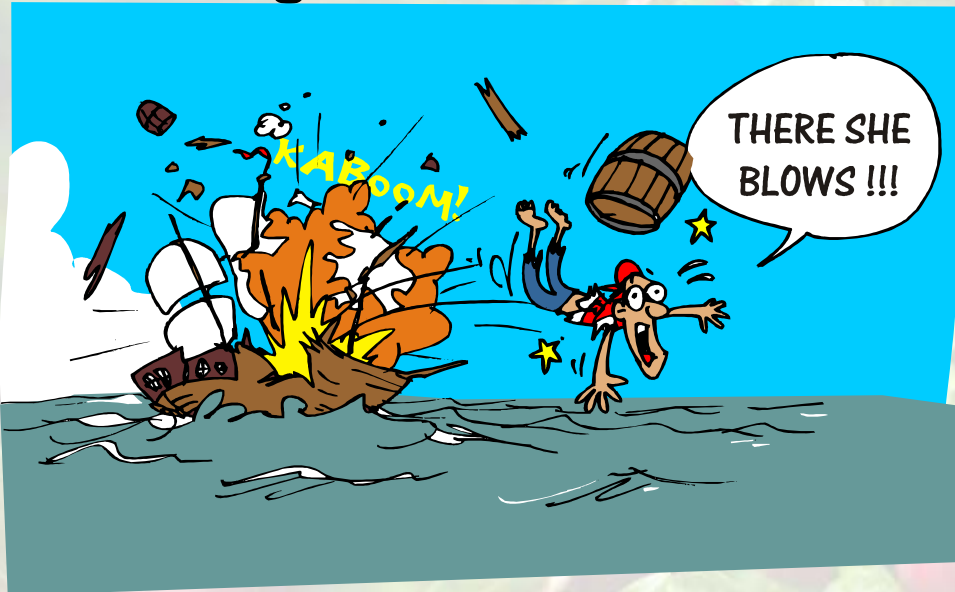
Origins of Fertilizer

# Bales Wet, Methane Produced



Origins of Fertilizer

# Methane Ignites and Boom!





Origins of Fertilizer  
The beginnings of Good & Bad Practice



Origins of Fertilizer  
Ship High In Transit







## Progressive Approach to Orchard Nutrition

- Nutrients in your soil are like fuel in your car, they run out and need to be replaced
- Unlike fuel, some nutrients take time to buildup and become plant available – Calcium for example
- Potassium is often thought to be in abundant supply in the Goulburn Valley Soils however continuous mining and export deplete soil reserves
- Balanced nutrition, healthy soil organic carbon and soil biology take time & hard work to get right – there are no silver bullets or magical fixes
  - Establishing an orchard is the MAJOR chance we have of deep soil profile amendments
- Within Season Changes to your nutrient management program can have flow on impacts to crop performance in coming years (positive and negative)
- In irrigated horticultural situations water management plays a key role to balanced nutrition
  - Crops imbibe water, they don't eat nutrients
  - Where the water goes, the nutrients flow
  - Use of Israeli Phytech Technology provides an example of how to combine nutrient management (Crop Growth, Fruitlet Development with Water Management)
- Next Generation Fertilizers are combining nutrients, biostimulants and microbiology in single product applications

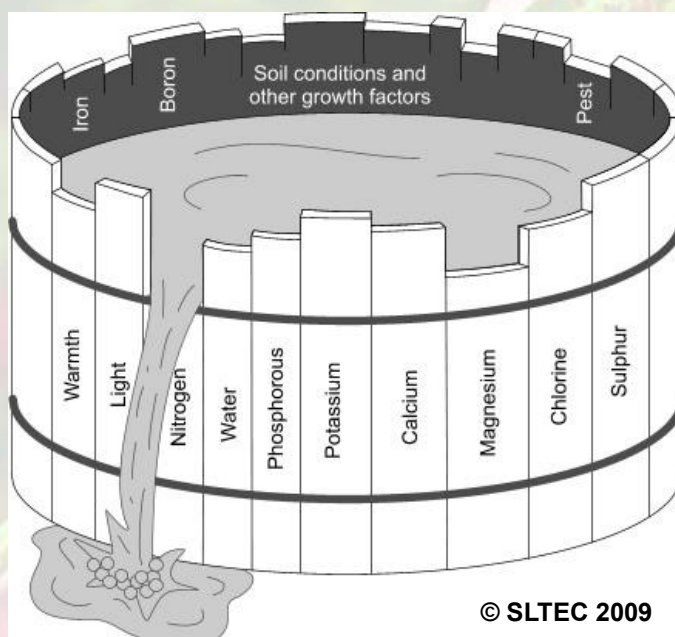


## About this presentation

- Introduction
- Fertilizer Origins & Approaches to Orchard Nutrition
- **Crop Nutrient Demand – Whens it needed?**
- Balancing Act
- CRAFT
- Oils aint oils....when it comes to Fertilizers
- Take Home Messages

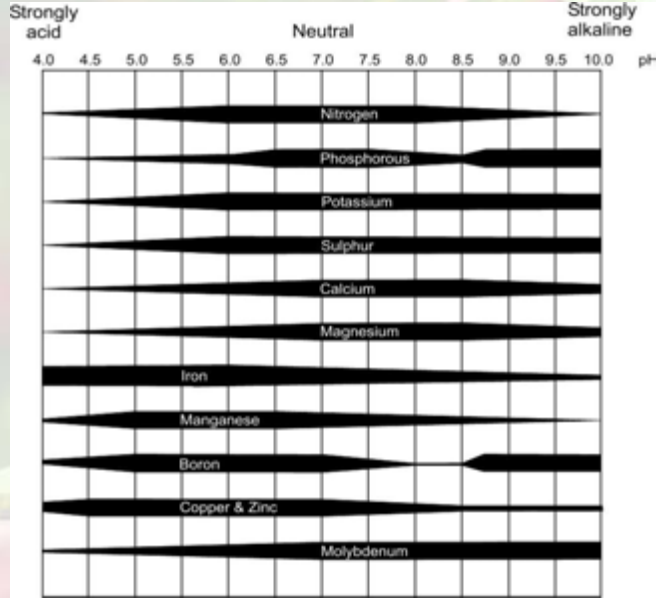


## Law of the Most Limiting Impacting Yield





# Soil pH & Nutrient Availability Inorganic Soils



## Soil pH

An interpretative guide to soil pH and possible amendments  
(Apples & Pears - Establishment)

pH <sub>1.5</sub> CaCl <sub>2</sub>	3.6	3.9	4.4	4.9	6.0	6.9	7.3	
pH <sub>1.5</sub> Water	4.5	5.0	5.5	6.0	7.0	8.0	8.5	
Rating	Extremely Acidic	Very Strongly Acidic	Strongly Acidic	Moderately Acidic	Slightly Acidic	Slightly Alkaline	Moderately Alkaline	Strongly Alkaline
Action	Lime @ 20 t/ha	Lime @ 10-15 t/ha	Lime @ 7.5 t/ha	Lime @ 5 t/ha	Lime @ 2.5 t/ha	No Action Required	Check Soil Zinc Status	
Rating	1	2	3	4	5	0	7	6



Source: Modified from Peverill et al 2001 & State Chemistry Laboratory of Victoria, 1995

## Soil pH

An interpretative guide to soil pH and possible amendments  
(Apples & Pears - Bearing)

pH <sub>1.5</sub> CaCl <sub>2</sub>	3.6	3.9	4.4	4.9	6.0	6.9	7.3	
pH <sub>1.5</sub> Water	4.5	5.0	5.5	6.0	7.0	8.0	8.5	
Rating	Extremely Acidic	Very Strongly Acidic	Strongly Acidic	Moderately Acidic	Slightly Acidic	Slightly Alkaline	Moderately Alkaline	Strongly Alkaline
Action	Lime @ 7.5 t/ha	Lime @ 5 t/ha	Lime @ 2.5 t/ha		No Action Required		Check Soil Zinc Status	
Rating	1	2	3	4	5	6	7	8

Source: Modified from Peverill et al 2001 & State Chemistry Laboratory of Victoria, 1995



## Perhaps a mindset shift required?

### Hazard or Risk Identified:

*Same rate, applied the same way for the past 80 years, cant be sustainable*

### Key Message:

- Nutrition is a key to sustainable horticulture
- Diagnostic tools and research helps guide fertilizer recommendations
- Rates and forms applied need to reflect the crop requirements, the inherent soil fertility, the prospective removal rates and other environmental parameters (soil pH etc)
- Blanket rates lead to yield and quality penalties and environmental impacts

### Sustainable Alternatives:

- Use diagnostic tools to determine nutritional inputs required – soil tests are a great start





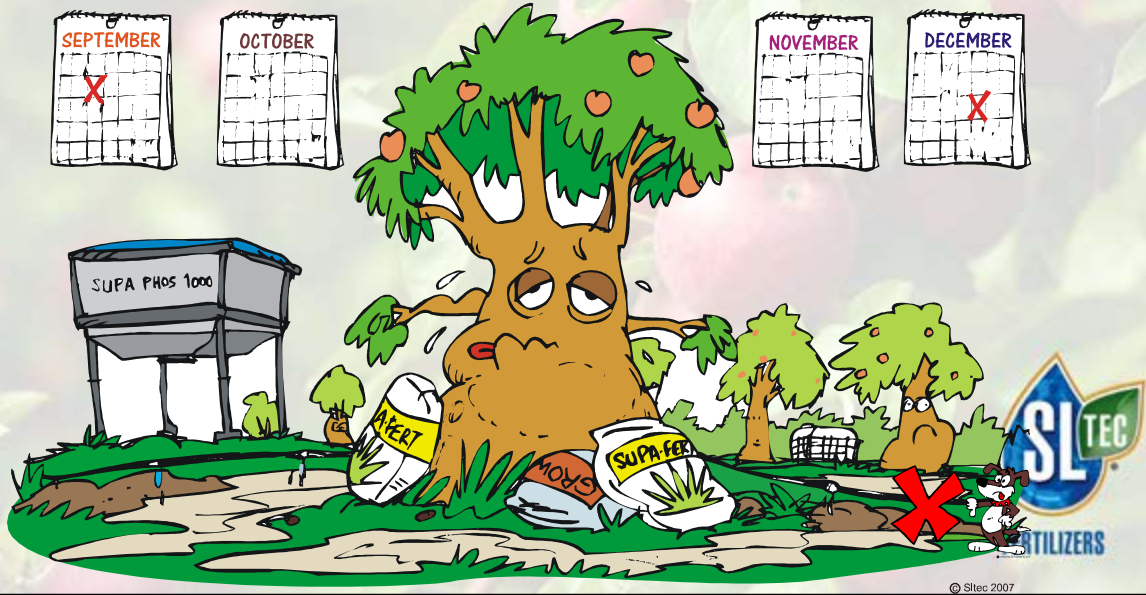
### Humans feeding in large amounts infrequently, waste food - inefficient



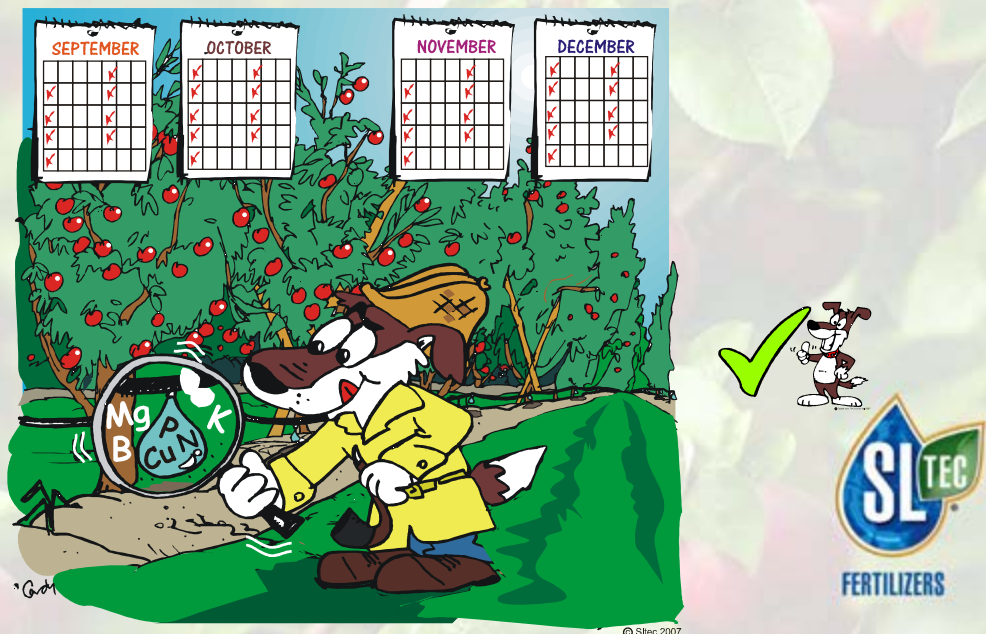
### A little more often keeps us healthy, fit – now that's sustainable!



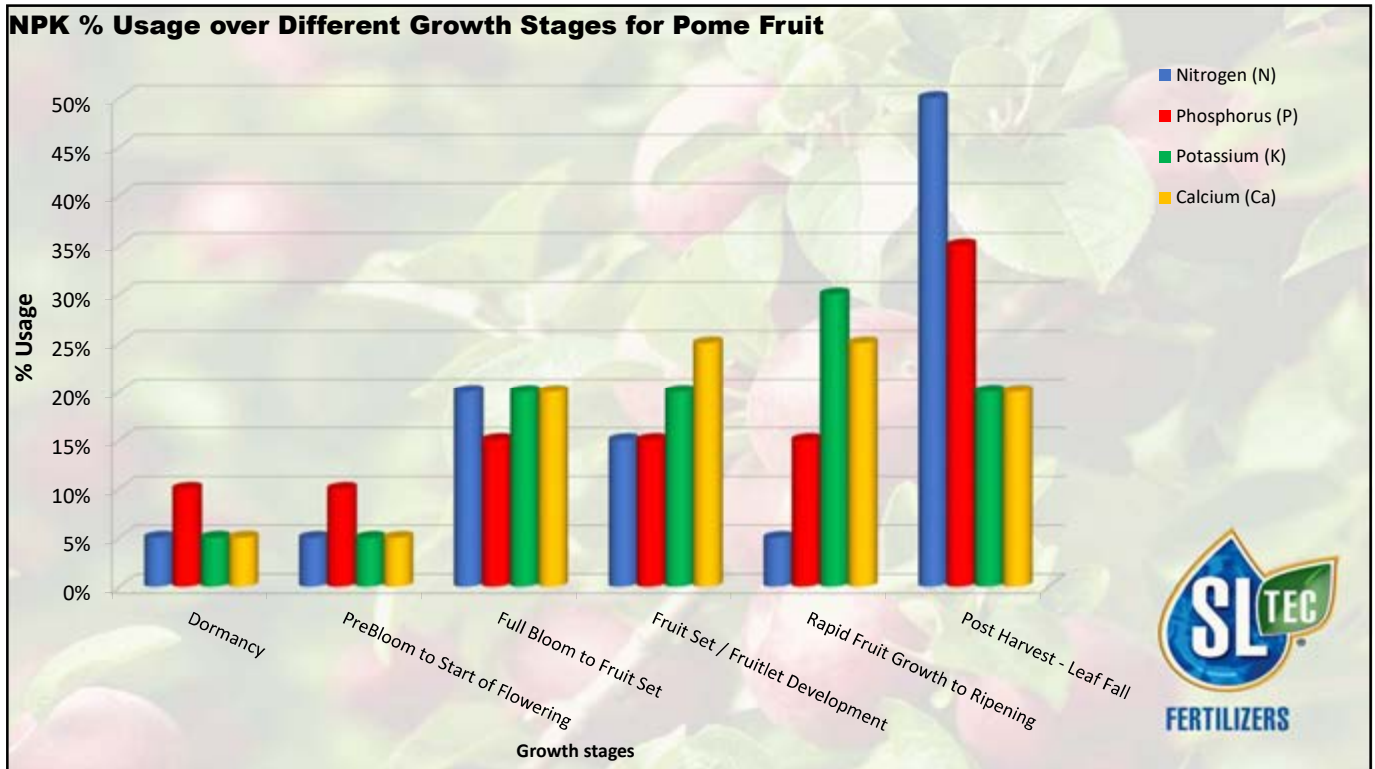
**Traditional banded or broad cast applications provide infrequent “luxury levels”, resulting in inefficient use**



**Fertigation & Foliar Treatments enables small applications as crop demand requires**







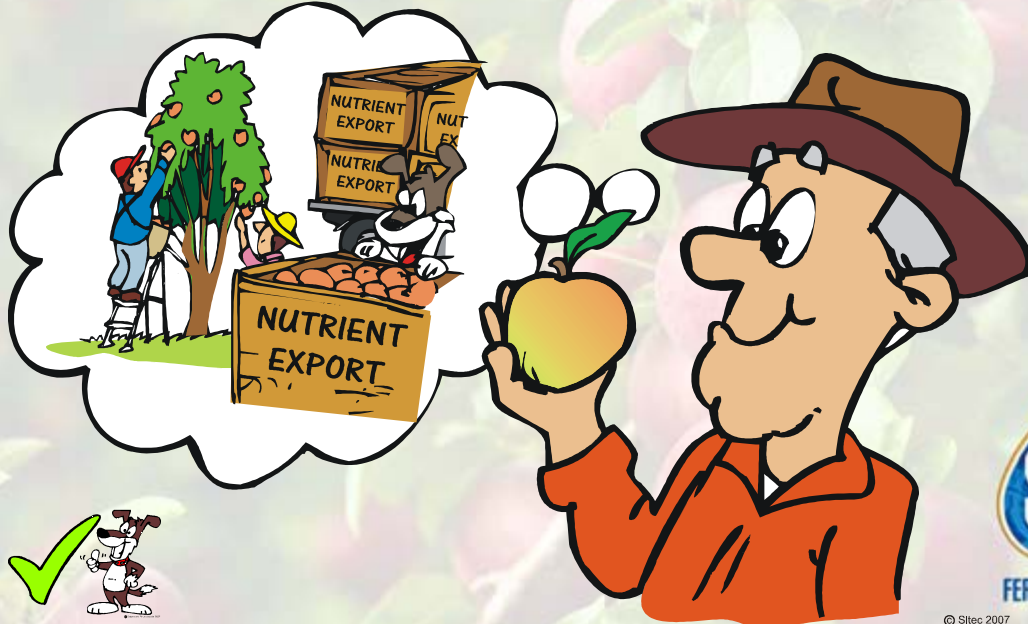
## About this presentation

- Introduction
- Fertilizer Origins & Approaches to Orchard Nutrition
- Crop Nutrient Demand – Whens it needed?
- **Balancing Act**
- CRAFT
- Oils aint oils....when it comes to Fertilizers
- Take Home Messages



# Estimating Nutrient Removal

Based on published removal rates, crop history & target yields



# Examples of Nutrient Removal Data

**Typical Nutrient Removal Figures Based on Local & Global Data**

Produce Type or Part	Study Location	Crop Yield (t/ha)	Moisture Content (%)	Mean Nutrient Concentration in Harvested Product (kg/t FW)						Reference source and comments
				N	P	K	S	Ca	Mg	
Apple	Aust	38		0.503	0.128	1.306	0.033	0.047	0.048	Average from various* D Blaiesing, RMCG - Huon Fruit Growers Trials 08/09
	Tas	Approx 50		0.42	0.11	1.19	0.05	0.07	0.07	
Cherry	Aust		78-85	0.8-1.9		2.0-2.8		0.14-0.3	0.07-0.12	Wills et. al. (1983) EP=90%
	Tas	12		1.71	0.23	2.28	0.1	0.16	0.13	D Blaiesing - 08/09 RMCG - Huon Growers Group (Lapin and Simone Cherries)
	Tas	10		2.12	0.25	1.92	0.08	0.14	0.14	SLTEC trial 2012
	World			1.22	0.20	1.72	0.09	0.12	0.09	Average from various*



# Cherry Nutrient Removal Example



## Cherry Nutrient Removal per Pallet

	Weight (kgs)	Nos Boxes / Pallet			Total / Pallet	Weight for 10 Pallets (kgs)
Export Cherry Nutrient Removal	5	92			460	4600

## Kg Nutrients Removed in 10 pallets

	N	P	K	S	Ca	Mg
kgs Removed	7.866	1.058	10.488	0.46	0.736	0.598

## Removal kg / Ha Fruit Harvested (15 t/ha Crop)

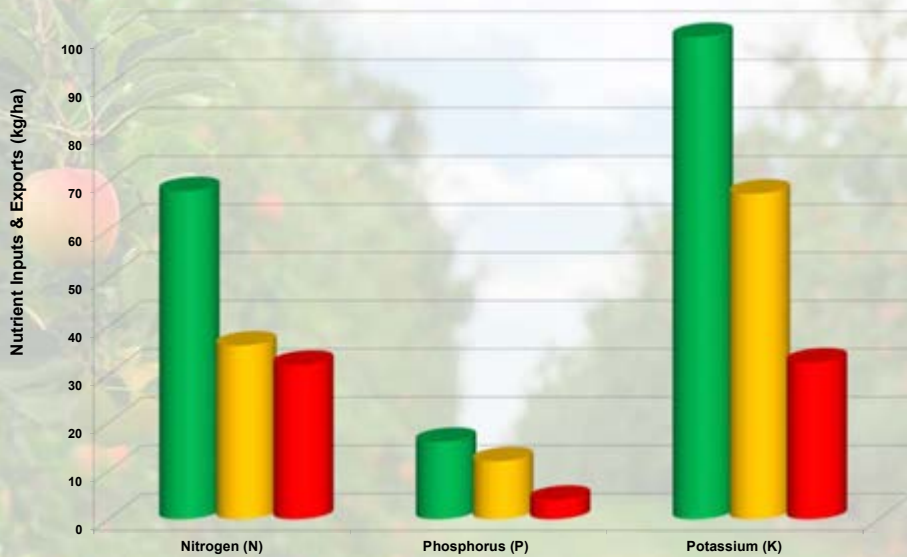
	N	P	K	S	Ca	Mg
15T / Ha	25.65	3.45	34.2	1.5	2.4	1.95



# Nutrient Import:Export

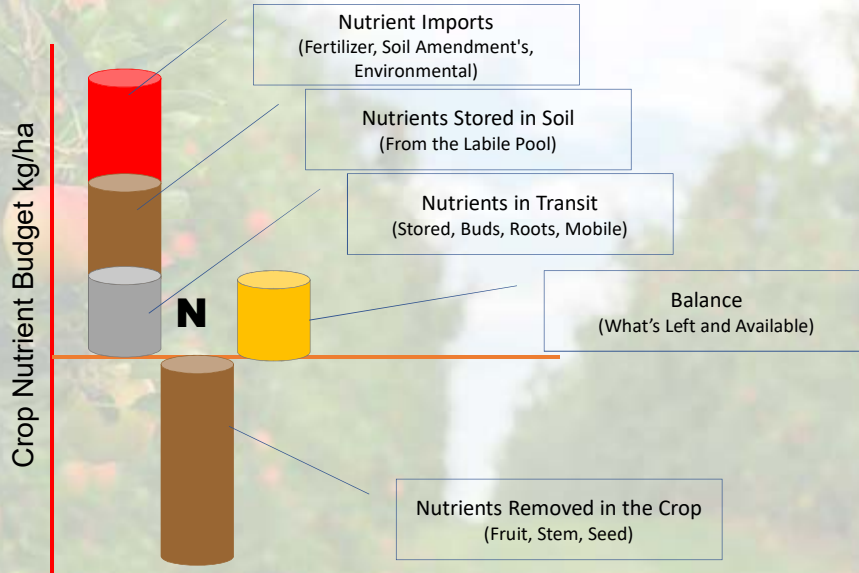
Nutrient Input / Export Balance (Cherry) (15 t/ha)

■ Inputs (I) (kg/Ha) ■ Export (E) (kg/Ha) ■ Balance (kg/Ha)

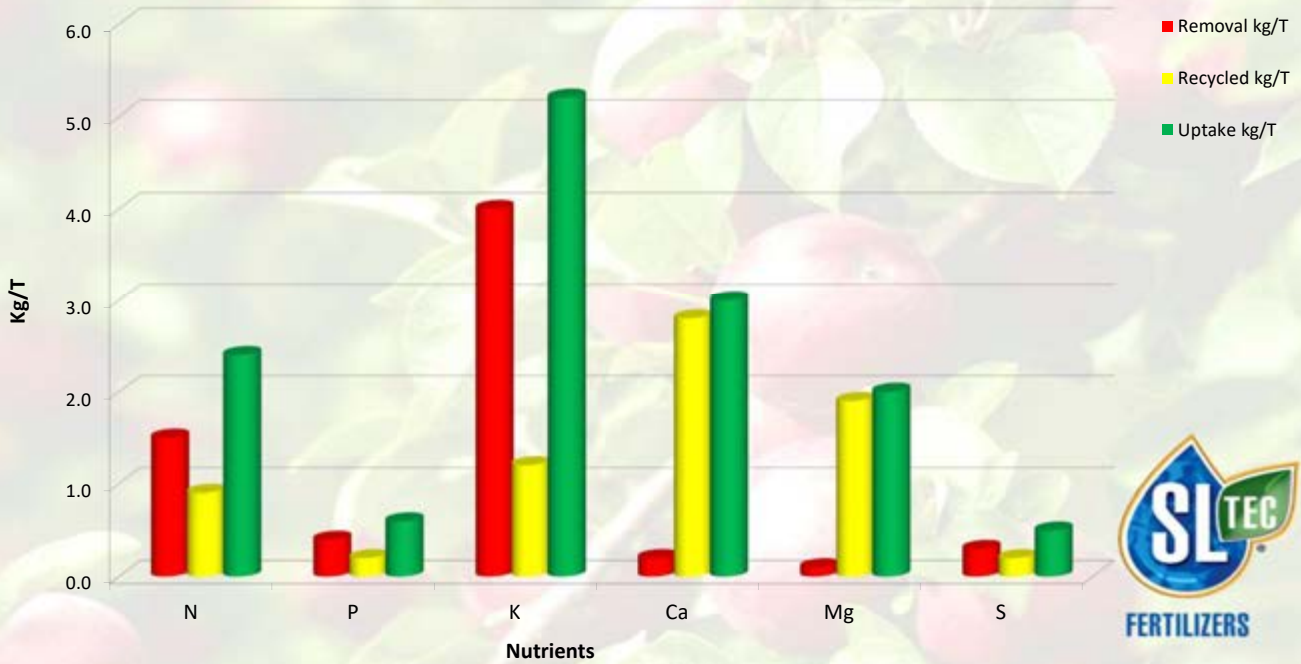




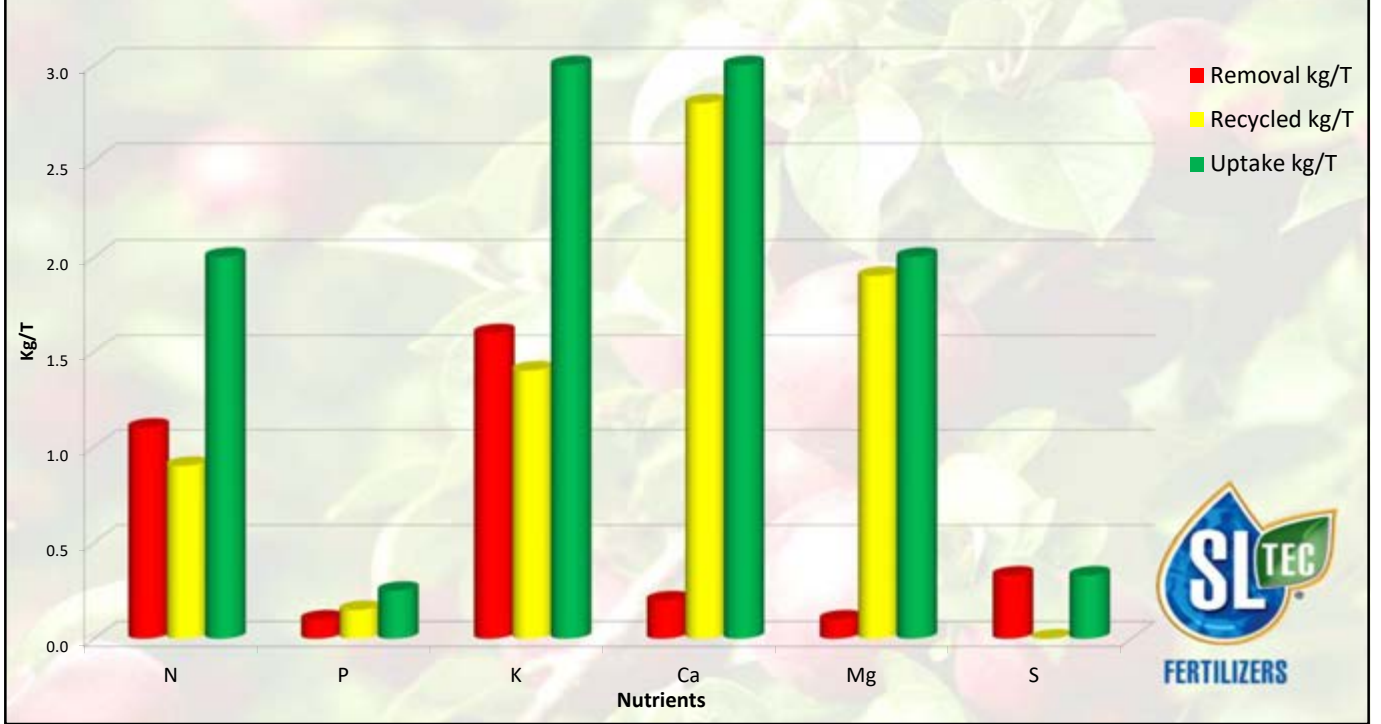
# Getting the Balance Right



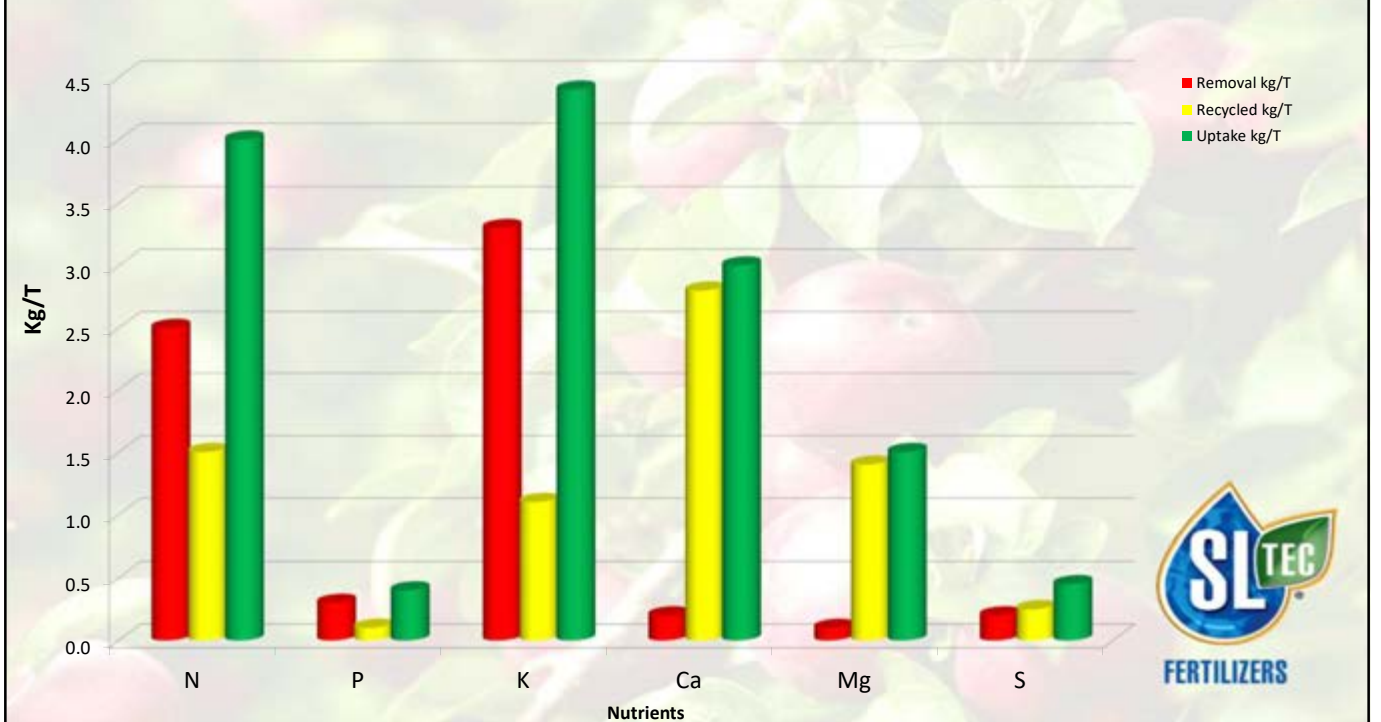
## Nutrient Uptake, Recycled & Removal for Cherries



**Nutrient Uptake, Recycled & Removal for Pome Fruit**



**Nutrient Uptake, Recycled & Removal for Stone Fruit**



## Summary of the Nutrient Cycle for 14 year old peaches (kg/Ha)

Amounts of Nutrients Removed from Soil by 14 year old peaches (kg / Ha)

Permanent	N	P	K	Ca	Mg
Fruit	57	8.7	87.7	2.7	2.5
Top Growth	7.8	0.9	2.5	7.8	0.9
Root Growth	11.6	2.7	6.3	5.7	1
<b>Total</b>	<b>76.4</b>	<b>12.3</b>	<b>96.5</b>	<b>16.2</b>	<b>4.4</b>

Nutrients Removed from Soil but Ultimately Returned

	N	P	K	Ca	Mg
Fruit Drop and Thin	21.5	2.7	24.2	2.1	1.2
Leaves	28.9	2.7	66.2	83.6	17.8
Prunings	18.1	2.1	9.6	24.2	2.1
<b>Total</b>	<b>68.5</b>	<b>7.5</b>	<b>100</b>	<b>109.9</b>	<b>21.1</b>

Based on a yield of 33.6T / Ha

Source: Rogers et al 1955 Proc. Am. Soc. Hort. Sci. 66 : 7-12



## Taking a longer term view of nutrition?

- Nutrition decisions for orchards require a balanced longer term view of historical practices, yields, soil fertility & health and plant tissue analysis trends
- Reactive decisions often waste \$\$\$, deliver undesired impacts on vigour and quality and lead to unnecessary environmental losses
- Fluid fertilizer technology, being water based, enables nutrient ratios to be custom formulated to meet specific crop growth stage demands
  - Experience shows that large application of single nutrient fertilizers can alter the balance of other nutrients – meaning other nutrients become unavailable to the crop, some times for extended periods – hence it's a Balancing Act!
  - High levels of potassium in the soil can suppress the availability of other nutrients, especially calcium and magnesium.





## Taking a longer term view of nutrition?

- Integration of biostimulants and biological products such as Bacillus, may assist in improve soil health, root system development and crop quality
  - However remember that soil organic carbon and available calcium are the central drivers to healthy orchard soils
  - Improving these takes time and disciplined focus
  - Biostimulants don't in their own right meaningfully raise organic carbon/matter levels, they help cycle healthy aerobic biology and stimulate rhizosphere interactions and healthy root development



## Nutrient Balance References

- (1) Australian Soil Fert Manual - Price CSIRO 2004 - 3rd Ed
- (2) A Manual for Producing Stone Fruits in Tasmania - Tas Dept Prim Industry 2001
- (3) Estimate based on figures from Fruitfed Manual NZ 1985
- (4) International Plant Nutrition Institute 2010
- (5) Blaesing RMCG - 08/09 (Lapin / Simone Sweet Cherry) - Huon Fruit Growers Group.
- (6) Azarenko - 2002
- (7) <http://plants.usda.gov/npk/>
- (8) Estimate based on figures from Fruitfed Manual NZ 1985
- (9) Thomas and Corden (1977)
- (10) Wills et.al (1983) / Wills (1987)
- (11) D. Reuter and A.Beech (unpub data) for marketed whole fruit analysis
- (12) Taylor and van den Ende (1970) Skin and flesh
- (13) Taylor and van den Ende (1970) Endocarp
- (14) McPharlin (pers. comm.)
- (15) B.Goldspink (pers.comm) Edible portion
- (16) D Blaesing, RMCG - Huon Fruit Growers Trials 07/08
- (17) D Blaesing, RMCG - Huon Fruit Growers Trials 08/09
- (18) 1999 IDFTA meeting in Hamilton Ontario Dr. Wolfgang Drahorad
- (19) North Carolina State University 2008
- (20) Lailiang Cheng, Cornell University, Geneva, New York. (from GoodFruitGrower Aug 2010)
- (21) Dierend et al 2000
- (22) Removal data for pome fruit (J.Glenninning pers.comm.)
- (23) P. Moody (pers. comm.) and DPI Nutrition Workshop 1993
- (24) Gurney (1937). Edible portion.
- (25) Sparrow and Temple-Smith (1988)
- (26) P.Jerie (pers.comm)
- (27) Tisdale, Nelson 1985
- (28) Mikhail, E - "Understanding & Achieving Optimum Soil Balance - The Mikhail System" - 2009
- (29) Plant Analysis : An Interpretation Manual, D.J. Reuter and J.B Robinson, Inkata Press, 1986
- (30) Nutritional Disorders of Plants, W Bergmann 1986
- (31) Nutrient Deficiencies and Toxicities in Crop Plants, W.F. Bennett, 1983
- (32) Incitec Analysis Systems Soils Manual 1997
- (33) 2004 - Greg Reid, Soils Advisory Officer, John Dirou, Horticultural Officer - NSW Agriculture
- (34) [www.dpi.nsw.gov.au/agriculture/resources/soils/testing/interpret](http://www.dpi.nsw.gov.au/agriculture/resources/soils/testing/interpret)
- (35) Christoph Kessel - Horticulture Crop Nutrition / OMAFRA
- (36) Nutrient Deficiencies and Toxicities in Crop Plants, W.F. Bennett, 1983
- (37) M Veens pers comm 2018
- (38) Neilsen and Neilsen 2003 / 2005
- (39) Neilsen and Neilsen - Summerland, BC 2003
- (40) Neilsen and Neilsen - Int Fertigation Symposium 2005
- (41) Azarenko et al 2003 (OSU)
- (42) Aust Cherry Manual 2011 / Boucher - A Manual for Producing Stone Fruits in Tasmania
- (43) Dr. M Whiting (pers. comm.)
- (44) Lang MSU 2009 - Cherry Fertilization and Nitrogen Needs
- (45) Meier, U.; H. Graf, et al (1994). Nachrichtenbl. Deut. Pflanzenschutzd. 46: 141-153.
- (46) Rogers et all 1955 Proc. Am. Soc. Hort. Sci. 66:7-12
- (47) Bergmann et al (1981)
- (48) Brown and Bail - Aus Fruit Grower (Nov 2008)
- (49) H Schneider NRE / ISIA Cobram VIC.
- (50) Goh and Haynes - Nutrient Inputs and Outputs in Commercial Orchards, NZ Journal of Crop and Hort Sci / Exp Ag, Vol II, No.1



## About this presentation

- Introduction
- Fertilizer Origins & Approaches to Orchard Nutrition
- Crop Nutrient Demand – Whens it needed?
- Balancing Act
- **CRAFT**
- Oils aint oils....when it comes to Fertilizers
- Take Home Messages



## CRAFT

Hazard or Risk Identified:

*Too many fertilizer recommendations made by agronomists lack the basic elements of CRAFT presenting risks to the grower, the crop and the wider environment*

Key Message:

- Getting the 5 elements of craft correct is a BASIC fundamental for all nutrient related decisions

Sustainable Alternatives:

- Participate in a SLTEC Sustainable Nutrient Management Training Course and learn about how to practically apply CRAFT to nutrient decisions



**C**HOICE of fertilizer product



**R**ATE of application



**A**PPPLICATION method



**F**REQUENCY of application

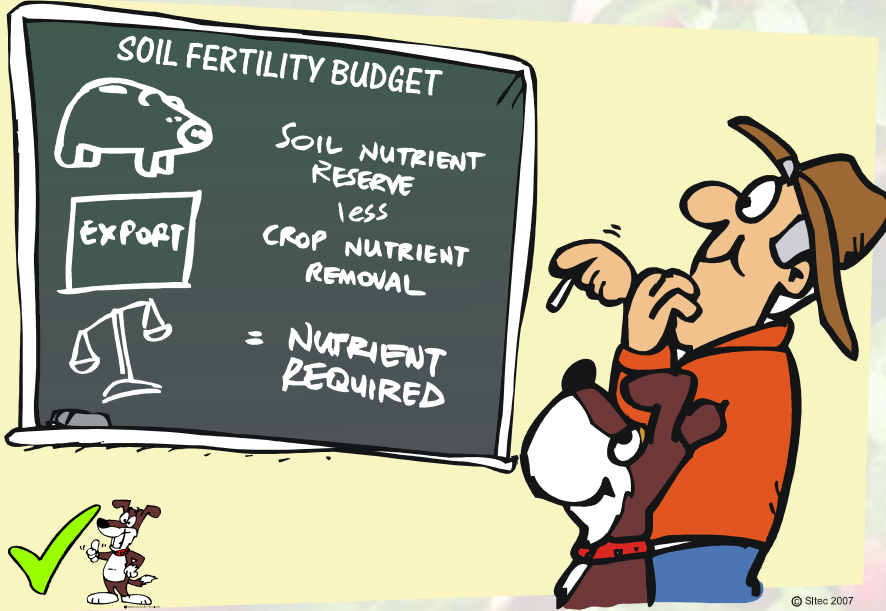


**T**IMING of application



# Preparing the budget

Based on soil tests, crop history, target yields & nutrient export



# Developing the plan

Balancing the demand, implementing CRAFT





## CRAFT - C

### CHOICE of fertilizer product



- Selecting the right type and form of nutrients
  - Chelated Trace Elements?
    - What form best suits your soil and crop situation – soil pH dependent
  - Solid blended products versus liquid nutrition
  - How the property is set up and the key agronomic issues we are trying to address



## CRAFT - R

### RATE of application



- What's the overall rate of each nutrients required over the season given the current soil balance, estimated crop demand and climatic factors



## CRAFT - A



- The application method will impact the efficiency in which the nutrients actually reach the crop and give the desired response/outcome
- Banded applications may give a targeted tree line application however in drier seasons, its only the areas of soil frequently wet with irrigation water that result in a net uptake of nutrients from the soil.
- Crops don't eat fertilizer or nutrients, they adsorb nutrients via water uptake through their root systems.
- Foliar applications also need to be considered and integrated with fungicide sprays etc



## CRAFT - F



- Given the overall rate or amount required of key nutrients or biostimulants for the coming season or growth period, what's the frequency of application to give the most efficient crop response possible?



## CRAFT - T

### TIMING of application



- Given the growth periods for the crop, and the nutrient demand for each growth period, what's the best timing strategy for the key nutrients required?



## About this presentation

- Introduction
- Fertilizer Origins & Approaches to Orchard Nutrition
- Crop Nutrient Demand – Whens it needed?
- Balancing Act
- CRAFT
- **Oils aint oils....when it comes to Fertilizers**
- Take Home Messages







## Getting what you pay for in Australia's Fertilizer & Biostimulant Industry

- There are a growing number of providers of fertilizer & biostimulants that aren't members of Fertilizer Australia and who don't comply with the [National Code of Practice for Fertilizer Description and Labelling](#)
- You have the right to seek clarification about manufacturers claims, if the product says it has 38% Calcium w/v, its not unreasonable to expect that's what your going to get.
- How do you know? How can you check?



## Components of the Fertilizer Label that Should Be There!

**Baseline Plus**

**FERTILIZERS**

**Guaranteed analysis**  
We welcome independent testing

**Labelling Standards**  
Labelling follows standards set by the "National Code of Practice for Fertilizer Description & Labelling"

**GUARANTEED ANALYSIS**

Nitrogen (N)	11.8% w/v
N as nitrate	0.02% w/v
N as urea	11.7% w/v
Phosphorus (P)	4.8% w/v
Potassium (K)	13.6% w/v
Sulphur (S)	2.0% w/v
Magnesium (Mg)	0.20% w/v
Manganese (Mn)	0.006% w/v
Zinc (Zn)	0.01% w/v
Copper (Cu)	0.005% w/v
Boron (B)	0.02% w/v
Iron (Fe)	0.01% w/v
Fulvic Acid	0.01% w/v
Humic Acid	0.3% w/v
Fish Emulsion	0.4% w/v
Kelp	0.4% w/v
Molasses	0.4% w/v
Specific Gravity @ 20°C	1.01
pH	7.5 to 8.5

PLUS Chelated Trace Elements & Biostimulants

GG0009

10 to 40 L/ha, at planting (band) 10 to 100 L/ha of water (dependi 25 to 80 L/ha, at planting (when l the side or below the seed), with water (depending on crop). 50 to 200 L/ha as a directed soil : planting or banded under canopy: L/ha water, or irrigated in after ag (depending on crop).

Typical Foliar Application Rate 2 to 15 L/ha Horticulture use 200 to 2,000 L/ha Broadacre use at least 100 L/ha w

**GUIDING PRINCIPLES**  
Before using Baseline Plus, seek a agronomic advice via SLTEC's Ball services and dealer agronomist w

Soil analysis combined with plant analysis are recommended to assi informed decision about which pe your crop, soil and general enviro conditions.

Fertilizer can burn and or damage

**SLTEC**  
FERTILIZERS

## Components of the Fertilizer Label that Should Be There!

**Baseline Plus**

**FERTILIZERS**

**Specific Gravity**  
Is a great way to check that you got what you paid for

**pH Range**  
Is stated on all product labels

**GUARANTEED ANALYSIS**

Nitrogen (N)	11.8% w/v
N as nitrate	0.02% w/v
N as urea	11.7% w/v
Phosphorus (P)	4.8% w/v
Potassium (K)	13.6% w/v
Sulphur (S)	2.0% w/v
Magnesium (Mg)	0.20% w/v
Manganese (Mn)	0.006% w/v
Zinc (Zn)	0.01% w/v
Copper (Cu)	0.005% w/v
Boron (B)	0.02% w/v
Iron (Fe)	0.01% w/v
Fulvic Acid	0.01% w/v
Humic Acid	0.3% w/v
Fish Emulsion	0.4% w/v
Kelp	0.4% w/v
Molasses	0.4% w/v
Specific Gravity @ 20°C	1.01
pH	7.5 to 8.5

PLUS Chelated Trace Elements & Biostimulants

GG0009

10 to 40 L/ha, at planting (band) 10 to 100 L/ha of water (dependi 25 to 80 L/ha, at planting (when l the side or below the seed), with water (depending on crop). 50 to 200 L/ha as a directed soil : planting or banded under canopy: L/ha water, or irrigated in after ag (depending on crop).

Typical Foliar Application Rate 2 to 15 L/ha Horticulture use 200 to 2,000 L/ha Broadacre use at least 100 L/ha w

**GUIDING PRINCIPLES**  
Before using Baseline Plus, seek a agronomic advice via SLTEC's Ball services and dealer agronomist w

Soil analysis combined with plant analysis are recommended to assi informed decision about which pe your crop, soil and general enviro conditions.

Fertilizer can burn and or damage

**SLTEC**  
FERTILIZERS



# Hydrometer Example



- The specific gravity of a fluid fertilizer tells you the density or concentration of the salts
- A hydrometer is an instrument typically made of glass that measures the specific gravity of fluids
- Specific Gravity of Fertilizer =  $\frac{\text{Weight of fertilizer}}{\text{Weight of water}}$  and is expressed in kg/L (w/v)
- Water has an SG of 1.0 kg/L, Calcium Nitrate = 1.5 kg/L, UAN = 1.32 kg/L



## Components of the Fertilizer Label that Should Be There!

GUARANTEED ANALYSIS	
Nitrogen (N)	11.8% w/v
N as nitrate	0.02% w/v
N as urea	11.7% w/v
Phosphorus (P)	4.8% w/v
Potassium (K)	13.6% w/v
Sulphur (S)	2.0% w/v
Magnesium (Mg)	0.2% w/v
Manganese (Mn)	0.005% w/v
Zinc (Zn)	0.01% w/v
Copper (Cu)	0.005% w/v
Boron (B)	0.02% w/v
Iron (Fe)	0.01% w/v
Fulvic Acid	0.01% w/v
Humic Acid	0.3% w/v
Fish Emulsion	0.4% w/v
Kelp	0.4% w/v
Molasses	0.4% w/v
Specific Gravity @ 20°C	1.31
pH	7.5 to 8.5

**Trace Elements**  
Stated form of trace elements

**(12-5-14-2)**  
PLUS Chelated Trace Elements & Biostimulants  
GG0009

10 to 40 L/ha, at planting (banded 10 to 100 L/ha of water (depending on crop), with water (depending on crop).  
25 to 80 L/ha, at planting (when the side or below the seed), with water (depending on crop).  
50 to 200 L/ha as a directed soil - planting or banded under canopy L/ha water, or irrigated in after ag (depending on crop).

Typical Foliar Application Rate  
2 to 15 L/ha  
Horticulture use 200 to 2,000 L/ha  
Broadcast use at least 100 L/ha w

**GUIDING PRINCIPLES**  
Before using Baseline Plus, seek agronomic advice via SLTEC's Ball services and dealer agronomist w

Soil analysis combined with plant analysis are recommended to assist in decision about which pr your crop, soil and general enviro conditions.

Fertilizer can burn and or damage





## Components of the Fertilizer Label that Should Be There!

**Baseline Plus**  
(12-5-14-2)  
PLUS Chelated Trace Elements & Biostimulants

**APPLICATION RATES**  
Typical Fertigation (via irrigation systems)  
Application Rates:  
Apply at 10 to 80 L/ha toward the end of the irrigation shift. Know your injection lag times and allow adequate time, following the injection of the product, to flush the irrigation system out with clean water, including all mainlines, submainlines and lateral delivery systems.

Typical Application Rates  
Planting, Directed Soil Spray):  
10 to 40 L/ha, at planting (banded with seed), with 10 to 100 L/ha of water (depending on crop).  
25 to 80 L/ha, at planting (when banded >20mm to the side or below the seed), with 10 to 100 L/ha of water (depending on crop).  
50 to 200 L/ha as a directed soil spray, prior to planting or banded under canopy, with 500 to 400 L/ha water, or irrigated in after application (depending on crop).

Typical Foliar Application Rates:  
2 to 15 L/ha  
Horticulture use 200 to 2,000 L/ha water  
Broadacre use at least 100 L/ha water

**GUIDING PRINCIPLES**  
Before using Baseline Plus, seek appropriate agronomic advice via SLTEC's Balanced Agronomy services and dealer agronomist network.

Soil analysis combined with plant tissue (or SAP) analysis are recommended to assist in making an informed decision about which product best meets your crop, soil and general environmental conditions.

Because climatic and soil conditions, application methods, irrigation and management practices are beyond the control of Sustainable Liquid Technology Pty Ltd and cannot be foreseen, Sustainable Liquid Technology Pty Ltd accepts no responsibility whatsoever for any commercial damage, loss or other result following the use of this product, whether used in accordance with directions or not, subject to any overriding statutory provision and provided that such liability under these provisions shall be limited to the replacement of the goods as supplied or the rendering again of the services that are provided. The buyer accepts and uses this product subject to these conditions.

**PRODUCT INFORMATION**  
**PRODUCT STORAGE**  
Keep material in a cool, dry, well ventilated area, away from direct sunlight, between 10 to 30°C. Store product in suitable containers made from material such as stainless steel, high density polyethylene and fibreglass. Fluid fertilizers can be corrosive to material such as brass, copper, zinc or alloys of these metals. Clean equipment after use thoroughly with clean fresh water. Use SLTEC's Fert Tank Cleaner to rinse fertilizer tanks and transfer systems. Baseline Plus is recommended for use within 6 months from dispatch date.

**WARNING & SAFETY INFORMATION**  
**WARNING:** Do not swallow. The spray from this product may act as an irritant. Avoid inhalation and contact with the eyes and skin. Wear rubber gloves and appropriate eye protection when handling the product. See the product MSDS for more information, [www.sltec.com.au](http://www.sltec.com.au)  
**WARNING:** This fertilizer contains biuret. It is not recommended for repeated foliar applications on horticultural crops.

**IMPURITIES**  
Biuret 21.7 g biuret/kg N

**Application Rates**  
Clear rates for a variety of applications

**SLTEC FERTILIZERS**

## Components of the Fertilizer Label that Should Be There!

**Baseline Plus**  
(12-5-14-2)  
PLUS Chelated Trace Elements & Biostimulants  
GG0009

Horticulture use 200 to 2,000 L/ha water  
Broadacre use at least 100 L/ha water

**GUIDING PRINCIPLES**  
Before using Baseline Plus, seek appropriate agronomic advice via SLTEC's Balanced Agronomy services and dealer agronomist network.

Soil analysis combined with plant tissue (or SAP) analysis are recommended to assist in making an informed decision about which product best meets your crop, soil and general environmental conditions.

Fertilizers can have hot and dangerous contents and nature.

thoroughly with clean fresh water. Use SLTEC's Fert Tank Cleaner to rinse fertilizer tanks and transfer systems. Baseline Plus is recommended for use within 6 months from dispatch date.

**WARNING & SAFETY INFORMATION**  
**WARNING:** Do not swallow. The spray from this product may act as an irritant. Avoid inhalation and contact with the eyes and skin. Wear rubber gloves and appropriate eye protection when handling the product. See the product MSDS for more information, [www.sltec.com.au](http://www.sltec.com.au)  
**WARNING:** This fertilizer contains biuret. It is not recommended for repeated foliar applications on horticultural crops.

**IMPURITIES**  
Biuret 21.7 g biuret/kg N

**Batch Number & Date**  
Each product can be traced back to its place of origin and manufacture date

**Batch No. or Tank Number & Date:** \_\_\_\_\_

**Dispatch Date:** \_\_\_\_\_

**1000 L**

PO Box 44, 2003, Finlay Road  
TONGALA VICTORIA 3421  
P: 1800 768 224 P: 03 9599 1365  
E: [enquiries@sltec.com.au](mailto:enquiries@sltec.com.au)  
ABN: 612 340 755 78 ACN: 113 670 269  
[www.sltec.com.au](http://www.sltec.com.au)

9 834 17521 0006981

**SLTEC FERTILIZERS**

## About this presentation

- Introduction
- Fertilizer Origins & Approaches to Orchard Nutrition
- Crop Nutrient Demand – Whens it needed?
- Balancing Act
- CRAFT
- Oils aint oils....when it comes to Fertilizers
- **Take Home Messages**



## Key Messages

- Balanced nutrition requires a long term strategy and takes time to achieve
- Diagnostic tools including soil analysis (0-15 cm and subsoil), annual plant tissue analysis, and nutrient budgets linking inputs:exports are vital in developing an overall nutrient plan for your orchard
- CRAFT will assist in delivering the nutrients at the right time and in the right place for maximum benefit
- A focus on soil fertility and health and the introduction of biostimulants and beneficial biology can improve crop health and quality of fruit
  - As explored with The Humate Project, Dr Sally Bound, Tas Institute of Ag. 2018

# Thankyou

## Contact Details:

Free Call: 1800 768 224

Phone: (03) 58 591 323

Fax: (03) 58 591 363

PO Box 43, TONGALA VICTORIA 3621

Email: [enquiries@sltec.com.au](mailto:enquiries@sltec.com.au)

Web: [www.sltec.com.au](http://www.sltec.com.au)



© Sltec 2006