COASTAL FRUITGROWERS' NEWSLETTER

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INSIDE

Dear Growers

Welcome to the Winter edition - which is slightly late as we have had to change over to a new desktop publishing program.

In this issue look for the comprehensive report on a recent citrus nutrition workshop held on the North Coast. There's a lot of general information in the report which is useful for all fruit growers.

On page 14 there's some good information on stonefruit pruning. If you need to work out fertiliser application rates see the article on page 22.

Also check out the "What's On" section on page 27.

Happy reading

Sandra Hardy

NSW DEPARTMENT OF PRIMARY INDUSTRIES

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For the new DPI website go to www.dpi.nsw.gov.au

North Coast Citrus Nutrition Workshop Report

Sandra Hardy, NSW Coastal Cittgroup Coordinator and David Huett, Research Scientist, NSW DPI, Alstonville.

In May, North Coast citrus growers met to discuss the analysis results of recent leaf tissue samples. The workshop focussed on general principles of nutrition, interpretation of the leaf tissue results and strategies for matching plant nutrient requirements with fertiliser applications. The workshop was lead by Dr. David Huett, NSW DPI Research Scientist at Alstonville who has extensive experience in plant nutrition. This report is a summary of the presentation, results and discussion.

General Nutrition Principles

The nutrient requirements of plants fall into two categories. The nutrients required in large amounts are referred to as major (macro) elements and include nitrogen, potassium, phosphorous, calcium, sulfur and magnesium. Nutrients required in much smaller amounts are referred to as minor (micro) elements and include manganese, zinc, iron, boron, copper and molybdenum. The following information is a summary of some of the key issues associated with each element in citrus trees. Table 1 summarises the typical deficiency and toxicity effects in citrus as well as the relative mobility of each element in the plant and soil.

Major nutrients

Nitrogen (N) affects the photosynthetic rate of leaves, influencing production of carbohydrates and proteins which in turn control growth rates. Nitrogen is needed during periods of rapid growth, when trees are flowering and during the mid to late stages of fruit growth (late Stage 1 & Stage 2). Adequate nitrogen is required for consistent high yields. It also has a big impact on fruit quality. Table 2 summarises the effects of excessive nitrogen, phosphorous and potassium on citrus fruit quality parameters.

Nitrogen is mostly held in the soil organic matter and is readily leached. It is limiting in most soils, although soils with a high clay content tend to have higher amounts. Nitrogen is best applied in small amounts throughout the year, especially in areas of high rainfall or in sandy soils.

Potassium (K) plays an important role in plant metabolic processes including photosynthesis, protein synthesis, sugar production and fruit formation. Potassium is the main element in fruit and it has more effect on fruit quality than any other element (Table 2). It also affects fruit size and low levels usually mean smaller fruit. Potassium has a key role in water efficiency and cell potassium levels regulate the opening and closing of the leaf

Table 2 : Effects of excessive NPK on fruit quality

Element	As levels of the element increase it increases:	As levels of the element increase it decreases:
Nitrogen Adverse effects of high N are more marked when P is low	rind thickness rind coarseness juice acidity % soluble solids (slight)	% juice content TSS/acid ratio TSS/tonne vitamin C content
Phosphorous Balance between N and P is important for good fruit quality (N:P = 15-20:1 for oranges)	% juice content TSS/acid ratio TSS/tonne	rind thickness rind coarseness juice acidity % soluble solids (slight) vitamin C content
Potassium (N:K = 2:1 for oranges)	rind thickness rind coarseness juice acidity vitamin C content	% juice content TSS/acid ratio

pores known as stomata. It can therefore affect the plants ability to withstand the effects of drought. Trees require potassium in similar amounts to nitrogen.

Although most soils contain adequate potassium, only a small amount is available to plants. Sandy soils and those with a low cation exchange capacity have little ability to store potassium and high application rates can result in wastage due to leaching. In these soils potassium is best applied in small frequent applications.

Phosphorous (P) has a key role in plant processes that require energy, including photosynthesis, respiration, cell division and enlargement. Phosphorous also affects fruit quality and the right balance of nitrogen to phosphorous is important for good fruit quality. Excessive amounts of phosphorous can be detrimental to root growth especially in acid soils.

Many Australian soils are low in phosphorous however demand for phosphorous by citrus crops is also relatively low. Historically there has been a tendency to over-apply phosphorous in citrus orchards, so applications should be linked to leaf analysis results. Optimum soil moisture is also important for good phosphorous availability.

Calcium (Ca) is the major component of cell walls and is important in root growth and function. Demand for calcium is high during periods of rapid growth, especially the early stages of fruit growth when cells are dividing. Citrus trees contain more calcium than any other element and the demand for calcium is 2-3 times that of phosphorous. Successful calcium uptake requires a good water supply to the tree as it is taken up and moved around the plant in the water system (xylem).

Photo 1: Magnesium deficiency

Calcium availability is affected by soil pH and is reduced in acid soils. Calcium is immobile in the plant and accumulates in old leaves.

Magnesium (Mg) is essential for the production of chlorophyll in plant leaves and is therefore important for photosynthesis. Demand for magnesium is similar to that of phosphorous. Magnesium availability is reduced by a low soil pH (acid soils). Magnesium deficiency is commonly seen in citrus orchards and can be treated with foliar sprays (Table 3).

Sulfur (S) is a component of amino acids, vitamins and enzymes. Most sulphur is held in the soil organic matter and deficiencies are not common. Sulfur availability is reduced by high soil pH.

Minor nutrients

These elements are required by the plant in much smaller amounts and in NSW it is common to find deficiencies of zinc, manganese and iron in citrus orchards. Deficiencies can be recognised by leaf symptoms which appear first in the young leaves. (Photos 1-3). These minor nutrients are immobile in the plant and cannot be easily transported from the old leaves to the new growth. Deficiencies of these elements are normally rectified by the use of foliar sprays which if required can be applied to the newly expanded growth flushes in spring and summer. For information on foliar sprays see Table 3.

Photo 2: Zinc deficiency

Zinc (Zn) is involved in metabolic processes. In NSW zinc deficiency is a common occurrence in citrus orchards, especially in alkaline and acid coastal soils. Excessive phosphorous levels can also accentuate a zinc deficiency.

Table 1: General guide to plant nutrients in citrus

Element	Deficiency Symptoms	Excess Symptoms	Movement in the Plant	Movement in the Soil	Other Information
Nitrogen (N)	Found first in **old leaves.** Pale green-yellow leaves. Stunted growth, thin foliage cover & dieback of twigs. Poor fruit set & fruit size.	Promotes luxurious vegetative growth. Poor fruit quality & shorter storage life. Fruit thick-skinned large, puffy, delays colour break and increases regreening.	Mobile	Mobile	Most N is contained in the soil organic matter. Effects of too much N worse when P is low. There is an antagonistic effect between N & P.
Phosphorus (P)	Found first in **old leaves**. Dull bronzed green leaves which shed readily. Reduced flower formation. Misshapen fruit, open centres, thick coarse rinds.	Decrease in fruit size.	Mobile	Immobile	Soils high in clay fix more P. Optimum soil moisture conditions promote more available P. Most available in range 6-7. Too much P can result in deficiencies of Fe, Zn and Cu. In alkaline soils P forms insoluble compounds with Ca and Mg and in acid soils with compounds of Fe, Mn and Al.
Potassium (K)	Found first in **old leaves**. Slower tree growth, small leaves, and heavy leaf fall. Fruit small, thin skinned, colours early, splits easily, more creasing. Severe deficiency causes heavy fruit/ flower drop.	In oranges delays colour break, increases rind thickness, and regreening.	Mobile	Mobile in sandy and organic soils	High pH induces a deficiency. K can outcompetes and reduce uptake of Mg and Ca. Low soil temperature reduces availability and uptake of K. Optimum soil moisture needed for K uptake. Waterlogged of dry soils reduce K uptake. K is held tightly in clay soils.
Sulfur (S)	Found first in **young leaves**. Small pale green-yellow leaves with lighter veins.		Immobile	Mobile	High pH induces a deficiency. Most S held in the soil organic matter.
Calcium (Ca)	Found first in **young leaves**. Stunted roots, fruit quality problems.	Reduction in availability of trace elements. Iron chlorosis.	Immobile	Immobile	Deficient in low pH (acid) soils often associated with high Al and Mn levels. Heavy applications of K induce deficiencies, especially in acid soils. Ca is taken up and moved around in the plant in the water system. Too high or low humidity can reduce Ca uptake.
Magnesium (Mg)	Found first in **old leaves**. Yellowing towards apex of leaves with a triangular area remaining green at base. Defoliation, twig dieback and poor root growth.		Mobile	Attaches to organic matter and clay particles.	Frequently deficient in coastal sandy soils and deficiency more acute when N levels low. Uptake is also reduced by high potassium levels. Mg has a synergistic effect on Zn & Mn and a Mg deficiency accentuates deficiencies of these two elements.

Table 1 : General guide to plant nutrients in citrus

Copper (Cu)	Found first in **young leaves**. Dieback of twigs. Dark brown gum pockets on young shoots. Rind can be brown, with gum stained areas, split fruit.	Stunted growth. Toxic to plant roots, especially small feeder roots.	Slightly mobile	Mobile in acid soils.	Dependent on pH, organic matter content, presence of Al, Mo & Fe. Becomes unavailable as pH rises above 7.0 Excess induces Fe deficiency. Deficiencies common in sandy soils. Copper can depress leaf Zn and Mn levels.
Zinc (Zn)	Found first in **young leaves**. Creamy white to yellow blotches in leaves. Small, narrow leaves. Retarded terminal growth, reduced leaf size. Small twigs die.		Immobile	Mobile in acid soils.	Becomes less available as pH rises or in soils with high P. There is an interaction between Zn and P, and high levels of one element reduce the uptake of the other. Deficiencies can occur when soils are cold & wet due to poor root growth. Can depress Mn leaf levels.
Manganese (Mn)	Found first in **young leaves**. Mottled pale green leaves, reduced cropping and growth. Intervienal yellowing.	Bright yellowing on leaf edges (old), dark brown tar spots on leaves.	Immobile	Mobile in acid and water-logged soils	Soil moisture affects availability. Toxicity common in high rainfall areas, organic, acid or waterlogged soils. Becomes unavailable as pH rises above 5.5 and deficiencies may occur with imbalances of Ca, Mg and Fe. Increases the availability of P and Ca.
Iron (Fe)	Found first in **young leaves**. Chlorosis of leaves, stunted abnormal growth. Tips/margins and veins stay green longest.		Immobile	Mobile in waterlogged soils.	Deficiency trigged by high pH, excessive P, lime or bicarbonate levels and wet cold soils. High Fe levels can induce a Mn deficiency. Soil organic matter an important source. P.*trifoliata* rootstock is more sensitive to iron deficiency than sweet orange, rough lemon or Troyer citrange.
Boron (B)	Found first in **young leaves**. Lopsided fruit heavy fruit shedding & yellow leaf veins. Fruit grey to brown with gum pockets throughout rind & flesh.	Yellow, dead leaf tips, leaf fall and dieback.	Immobile	Mobile	Optimum in pH 5-7. Soil organic matter an important source. Dry periods and over liming can induce a deficiency. Easily leached.
Aluminium (Al)	Stunted root growth. Lack of root hairs			Immobile	As pH rises above 5.5 Al solubility increases. Fixes P. Al toxicity common in acid soils.
Sodium (Na)	Found first in **old leaves**.	Leaf burn, leaf fall & dieback		Mobile	A problem in alkaline soils. Na ions displaced by Ca.

Manganese (Mn) is another element commonly deficient in citrus orchards. Deficiencies most often occur on soils with a high organic matter content and when soil pH rises above 7.0. Also an excess (toxicity) of manganese can be a problem in very acid soils (<5.0) especially when they are damp or poorly drained.

Photo 3: Manganese deficiency

Boron (B) is important in protein formation, the growth of pollen tubes, seeds and cell walls. Boron deficiency is not common in NSW and application should be linked to leaf analysis results as citrus is sensitive to an excess of this element.

Iron (Fe) is used to produce chlorophyll and deficiencies are common in calcareous soils with a high pH. Iron deficiency can also be induced by high phosphorous levels in the soil.

North Coast Leaf Analysis Results

Figures 1 & 2 and Table 4 show the results of the seven leaf samples taken from North Coast citrus orchards. Of the seven samples, six were Tahitian limes and one was a navel orange. Soils in the

Table 3: Foliar sprays for treating micronutrient deficiencies in citrus

Nutrient	Treatment	Application Rate	Comments
Magnesium	Magnesium nitrate	1kg/100L	
	or Magnesium sulphate plus Calcium nitrate	1kg/100L 1kg/100L	Mix magnesium in half full vat then add calcium while agitating, then top up tank
Zinc	Zinc sulphate heptahydrate (23% Zn)	150g/100L	
Manganese	Manganese sulphate	100g/100L	500g of urea can be added to improve uptake
Zinc & Manganese	Zinc sulphate plus Manganese sulphate	150g/100L 100g/100L	

Source: Citrus Nutrition. R. G. Weir & R. Sarooshi. 1991 NSW DPI. Agfact H2.3.11

Table 4: Percent of Leaf Samples in each nutrient concentration range

Element	Deficient	Marginal	Adequate	High	Toxic
Nitrogen	72	-	28	-	-
Phosphorous	-	-	14	86	-
Potassium	-	-	72	28	-
Sulfur	28	-	72	-	-
Calcium	-	42	42	14	-
Magnesium	-	-	100	-	-
Sodium	-	-	100	-	-
Copper	-	-	14	-	86
Zinc	86	14	-	-	-
Manganese	28	44	28	-	-
Iron	-	44	28	28	-
Boron	14	-	72	14	-

region are predominately red Ferrosols, which are typically deep well structured soils with a good water and nutrient holding capacity.

One of the challenges with limes growing in a subtropical region, is the potential for continuous growth flushes, multiple flowerings and several crop stages on the tree at the one time. Trees are therefore actually undergoing different growth phases simultaneously, which makes working out a fertiliser strategy a bit more tricky.

The Standards used to interpret leaf analysis results (Table 5) have largely been developed using information from citrus varieties (such as oranges) bearing one main crop a year. For limes these Standards should be used as a guide in association with other information such as trends in yield, fruit quality and size and the visual health of trees.

For the major elements, the results showed that most samples (72%) were deficient in nitrogen. However, the orange nitrogen standards are probably a little too high for limes. If the grapefruit standards are used, only 14% of the samples would indicate a nitrogen deficiency. Leaf nitrogen levels can vary from year to year and are influenced by seasonal conditions and crop load. At the time samples were taken the main crop was being harvested (harvest is from February to May). Supplies of nitrogen are stored in the soil organic matter and most soils only contain small amounts, so nitrogen needs to be applied regularly. In sandy soils and high rainfall areas such as those on the coast nitrogen is best applied in small amounts frequently to avoid losses from leaching. When nitrogen is applied to the soil as urea, high amounts can also be lost to the atmosphere through volatisation if it is not washed into the soil within 2-3 days. Although leaf levels were low there were no obvious deficiency symptoms visible in the trees.

Most samples had adequate levels of phosphorous (86%). This is quite a common occurrence in coastal citrus orchards where regular annual applications of superphosphate or blended fertilisers with a high P content are normal practice. It was suggested that applications of

phosphorous could be reduced and levels monitored with annual leaf analysis.

Potassium and magnesium levels were adequate in nearly all samples.

Levels for calcium were variable with 42% marginal, 42% adequate and 14 % in the high range. Low levels of calcium could be a result of low soil pH, low soil calcium levels or an imbalance with magnesium. The sample with a high level of calcium was a result of incorrect leaf sampling.

Calcium is not easily moved within the plant and tends to accumulate in leaves as they age. Therefore old leaves tend to have high levels of calcium.

For the minor elements all samples had low levels of zinc. A high proportion of samples had marginal to deficient levels of manganese and marginal iron levels. All these nutrients can be affected by soil pH. It was recommended that 1-2 foliar sprays of zinc and manganese be applied annually and monitored using leaf analysis. Foliar sprays

Figure 1: Leaf analysis results for the major elements

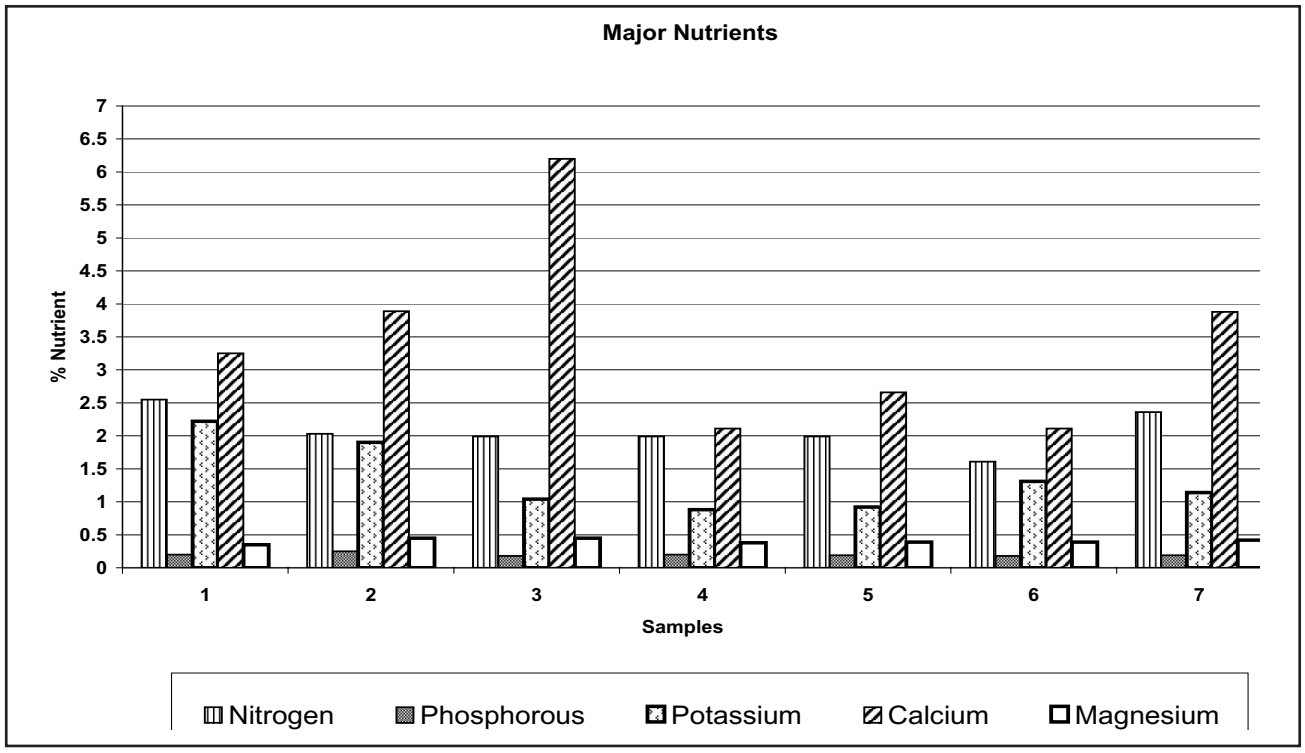
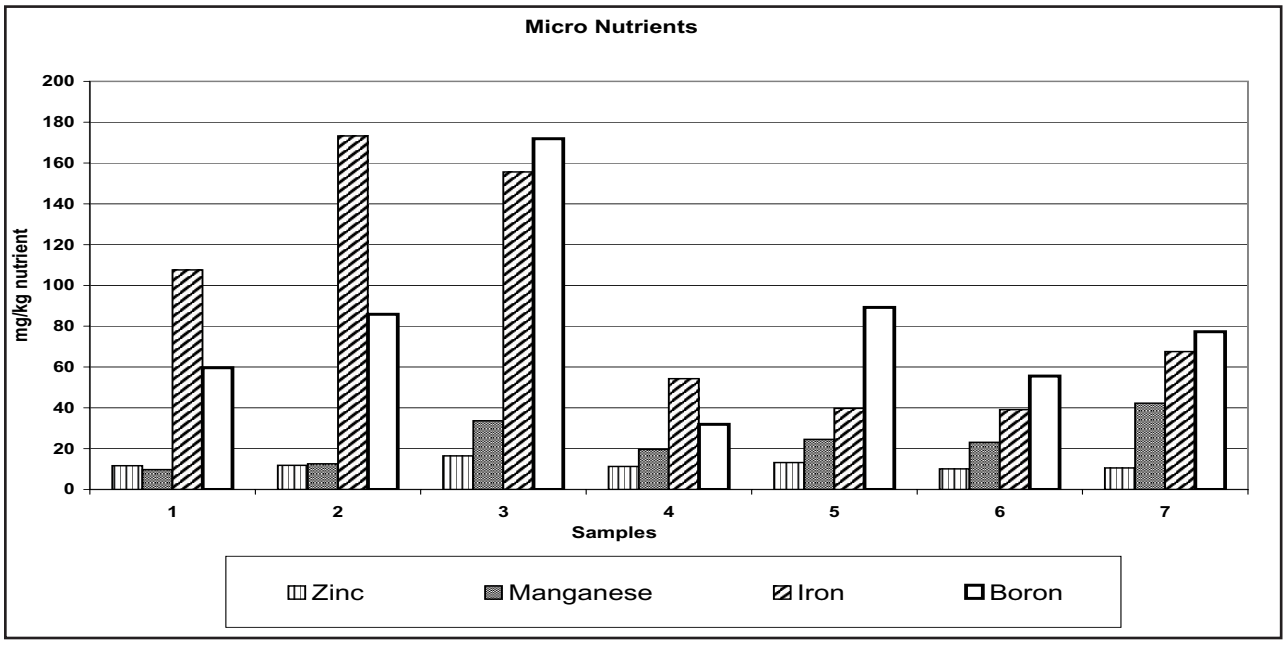


Figure 2: Leaf analysis results for the minor elements



of micronutrients have not been normal practice in these orchards. On most soils, zinc deficiency cannot be corrected by a soil application whereas a foliar application gives a rapid response.

Tools for Developing a Fertiliser Program and Matching Applications to Tree Growth Stages

The amount of nutrients required by he tree is dependent on a range of factors including: tree age and size, crop load, variety and rootstock, soil type and climatic conditions. To develop a fertiliser program you can use a range of tools, including: leaf and soil analysi

Soil and Leaf Analysis

Soil and leaf analysese are useful tools for assessing nutrient levels. Samples for analysis must be collected correctly and be representative of the block. Soil analysis gives you information

Table 5: Citrus Leaf Analysis Interpretation Guide

	Concentration Range				
Element	Deficient	Marginal	**Adequate**	High	Toxic
Nitrogen % Range [A] Range [B]	<2.2	2.2-2.3	**2.4-2.6** **2.4-2.8**		
Phosphorous % Range [A] Range [B]	<0.09	0.09-0.11	**0.12-0.16** **0.14-0.18**	0.17-0.25	>0.25
Potassium % Range [A] Range [B]	<0.4	0.4-0.69	**0.7-1.5** **1.0-1.5**	1.6-2.3	>2.3
Sulfur % Range [A]	<0.14	0.14-0.20	**0.21-0.4**	0.41-0.5	>0.5
Calcium % Range [A]	<1.6	1.6-2.9	**3-6**		>7.0
Magnesium % Range [A] Range [B]	<0.16	0.16-0.25	**0.26-0.6** **0.3-0.7**	0.7-1.2	>1.2
Sodium % Range [A]			**<0.16**	0.17-0.25	>0.25
Copper mg/kg Range [A] Range [B]	<3	3-5	**6-10** **6-15**	11-15	>15
Zinc mg/kg Range [A] Range [B]	<16	16-24	**25-80** **30-100**	81-300	>300
Manganese mg/kg Range [A] Range [B]	<16	16-24	**25-80** **25-100**	81-300	>300
Iron mg/kg **Range [A]** **Range [B]**	<36	36-60	**61-120** **60-120**	121-200	>200
Boron mg/kg Range [A] Range [B]	<21	21-30	**31-100** **50-150**	101-260	>260

A - Source: Plant Analysis: An Interpretation Manual. D J Reuter & J B Robinson. 2nd edition 1997. CSIRO
B - Source: Fruit Size Management Guide: Part 1. Australian Citrus Growers 2003

about what nutrients are present in the soil at the time of sampling, but it does not tell you what is available to the plant. Testing your soil is especially important prior to planting out a new block and should be repeated every 3-5 years to monitor soil pH, organic matter levels, cation exchange capacity (CEC), the calcium/magnesium ratio and level of other nutrients. Maintaining a soil pH of between 5.5 and 6.5 will usually mean fewer problems with the availability of micronutrients.

Leaf analysis provides a snapshot of the nutrient levels in the leaves at the time of sampling, reflecting what the plant was able to extract and store. Regular plant analysis every 1-2 years allows you to more accurately monitor the nutrient status of your trees and assess and fine tune a fertiliser program. Major changes to your fertiliser program should not be based on the results of just one leaf analysis.

For leaf analysis it is very important to select the right leaves for analysis as the mineral composition of leaves is significantly affected by leaf age and the presence of any fruit on the shoot. Select a representative sample of leaves which are healthy, mature (5-7 months old) from the middle of non-fruiting extension growth. Leaf samples for citrus are normally taken in late February–March.

Crop Nutrient Removal Rates

Crop nutrient removal rates are an estimate of the amount of nutrients removed from the tree in the fruit. They can also include estimates of the amount of nutrients lost by leaching and through leaf fall and pruning. They are a starting point for estimating how much of each nutrient needs to be replaced annually. If the nutrients aren't replaced, the mining of the soil will reduce nutrient availability over time and this can be difficult to correct. Tables 6 and 7 contain information on crop removal rates for citrus.

General Crop Fertiliser Recommendations

Information generated from fertiliser trials can provide base data on the amount of nutrients required by trees. These general recommendations are normally provided on a district or regional basis to take into account local soil and climatic conditions. They are another tool to assist in developing a fertiliser program.

Matching Applications to Growth Stages

The nutrients required for growth, flowering and fruit production, actually have to be present in the tree when they are needed. Soil applied fertilisers

Table 6: Removal Rates per hectare for Oranges producing 20t/ha
(Based on the Orange Crop removal Charts produced on the ACG website from information provided by M.Treeby and R. Storey, CSIRO.

Nutrient	N	P	K	Ca	Mg
Leaf & fruit (kg/ha)	64	8	45	70	9
Fruit (kg/ha)	36	3	33	12	3
Total (including losses from leaching & fixation)	78	11	54	82	12

Table 7: Removal Rates per tonne for citrus producing 56t/ha
(From the Australian Soil Fertility Manual. J.S. Glendinning, CSIRO. 1999)

Nutrient	N	P	K	Ca	Mg	Cu	Fe	Mn	Zn	B
Yield of 56t/ha	kg/t					g/t				
Orange[1][2]	***1.8***	***0.2***	***1.9***	0.72	0.22	0.6	0.3	0.8	1.4	2.8
Mandarin[1]	1.83	0.16	2.05	0.5	0.11	0.6	2.6	0.4	0.8	1.3
Lemon/Lime[1]	1.64	0.16	1.73	0.47	0.13	0.3	2.1	0.4	0.7	0.5

[1] Halliday D.J., Trenkel M.E and Wichmann W. 1972 IFA World Fertiliser Manual International Fertiliser Industry Association Paris.
[2] Moody P. 1993 Qld.DPI Nutrition in Horticulture Workshop, Unpublished data.

(depending on the form of nutrient present) usually have to be applied 4-6 weeks prior to when they are required in the plant. For foliar application or fertigation systems the nutrients can be applied much closer to the time they are required in the tree.

Citrus trees go through a cycle of growth phases annually. These growth stages include several leaf flushes (mainly in spring, early-summer and autumn), several root flushes (mainly in spring and autumn), and the fruit development stages from floral induction through flowering, fruit set, fruit growth and maturation. These different stages require an adequate supply of certain nutrients. Table 8 outlines application times for N, P and K with reference to the key growth stages.

Fertiliser Programs

The aim of a fertiliser program is to provide adequate supplies of the right nutrients to the trees when, and if, they are needed. Fertiliser programs are not set in concrete and need to be regularly monitored and adjusted. The amount of fertiliser required is dependent on a range of factors including: tree age and size, crop load, variety and rootstock, soil type and seasonal climatic conditions.

Managing tree nutrition is a dynamic process and your fertiliser program needs to be assessed annually. Keeping records of application rates and times, fruit quality and yield, seasonal conditions and previous soil and leaf analysis results are essential in managing a fertiliser program and achieving good tree nutrition.

A fertiliser program should never be based on just one years worth of data, but based on information over a number of seasons. Keeping good records enables you to see trends over time and compare application rates and timing to tree growth, fruit quality and production levels. Adjustments to your fertiliser program should be made gradually. If changes need to be made, try not to vary application rates of the major nutrients by more than 30% annually.

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- *Fruit Size Management Guide Part 1*, ACG 2003.

Table 8: Application times for N, P and K for navel oranges

Growth Stage	Nutrients Required (% of annual requirements)
Budswell	Nitrogen (40-50%)
Pre-bloom	Phosphorous (100% if banding, 50% if fertigating) Potassium (30%)
Spring and Summer flush	Foliar magnesium, zinc and manganese if required
Stage 1 Fruit Growth (Nov/Dec)	Nitrogen (25%) Potassium (30-50%) Phosphorous (fertigation- 50% at monthly intervals)
Stage 2 Fruit Growth (after final fruit drop)	Nitrogen (25%) Potassium (30%)

Extracted from the Fruit Size Management Guide Part 1, ACG 2003.

Stonefruit Pruning

Phillip Wilk, District Horticullturist, NSW DPI, Alstonville.

Background

The primary aim of peach and nectarine production is to produce a tree structure that is efficient at capturing sunlight and ultimately in producing fruit. Too often the tree is efficient at capturing sunlight but this then results in vegetative growth at the expense of fruit production.

A stone fruit tree's ability to convert sunlight to fruit production is highly dependent on the amount of light reaching the lower canopy which is a reflection of the tree shape.

Peach and nectarine trees are highly sensitive to shading. Young buds and shoots are easily killed by low light levels reaching the lower canopy. This causes the most productive parts of the tree to move higher up in the canopy and a dead zone results around the lower parts of the tree.

Pruning is one of the necessary operations for deciduous fruit growers that can modify a tree's shape. It is an important step in producing highly productive stone fruit trees and high quality fruit. Pruning is the first stage of thinning flowers.

Low chill stone fruit trees however are slightly different in the number of times they are pruned than stone fruit trees in cooler regions.

The main reason for this is the very high growth rates that trees experience over the spring and summer in coastal areas.

It is therefore necessary to remember that trees must be pruned over the winter, summer and pre harvest (spring) to produce high quality fruit in the following season.

Pruning Strategy

Trees that are one year old should be approximately two metres tall. The main aim now is to encourage new fruiting wood (laterals) and a main frame work (leaders) on the tree.

The overall strategy of pruning is to grow a tree whether palmette or vase that will fill an orchard space. The pruned tree needs to provide a framework to hang fruit evenly spaced so they will receive equal light. Stone fruit trees bear fruit from last season's wood.

Pruning in the sub tropics is usually performed with the earliest varieties first with subsequent later varieties being done in harvest order.

Prune trees three times throughout the season (spring, summer and winter). It is better to do a number of light summer and spring prunings than one heavy pruning. Heavy pruning causes strong upright growth in new wood.

Spring pruning

Prune trees about one month before harvest, generally from early September to mid September depending on variety. The aim is to open up the canopy to allow light and spray to penetrate easily to the fruit. This is a light pruning only.

At spring stage:

- Prune out the strong upright growth in the centre of trees to allow light to enter. Leave some small weak laterals to protect trees from sunburn.
- Top trees to the framework height (palmette) or reaching height (vase).
- Remove all strong upright watershoots.
- Remove all suckers (Okinawa generally 'suckers' more than coastal peach).

Summer pruning

Do your summer pruning two to three weeks after harvest. Early varieties need to be pruned first which usually begins around mid to late November.

Summer pruning allows light to penetrate the tree canopy. This is especially important for growers with tall palmette trees. This ensures good flower bud development and induces new fruiting wood close to the main leaders for next season.

At summer stage:

- Remove strong watershoots in the centre of the tree. Leave weak laterals to protect from sunburn. Many will be removed in winter.
- Top trees to the framework height(palmette) or reaching height(vase).
- Do not allow strong upright wood in the centre of the tree to develop into heavy branches.

Where new young laterals have been produced on old wood remove it to the required height or reach. Encourage new growth on old wood by cutting out spent wood to a stub of two to three buds. This will generate new growth in the coming months and fruit next season.

- Remove dead shoots and all sucker growth within 500mm of the ground.

Winter pruning

The main purpose of a winter pruning is to remove a part of the fruiting wood produced throughout the season. It is the main pruning time and may be a chance to reduce the overall height or framework of the tree. This reduces the amount of fruit and flower thinning required later.

Early varieties can be pruned from April-May onwards provided the weather is cold enough. Pruning too early in the season may encourage an early out of season flowering.

At winter stage:

- Remove strong secondary growth that are competing with the main leaders (piggybacks).
- Remove strong watershoots not required.
- Top trees to the framework height (palmette) and reaching height (vase).
- Remove sucker growth within 500mm of the ground.
- Remove every second or third lateral.
- Tip laterals over 400mm long to remove excess flower buds.
- Leave short sturdy fruit spurs.
- Prune any strong upright growth especially lower down in the canopy.

How do I know how much or little to prune?

For mature palmette trees 4-5 years or older. One would expect 5-6 trays/tree which equals 5000-6000 trays/hectare. This equates to approximately

150 -160 pieces of fruit (25 count size or bigger) per tree.

If a tree has four tiers or main leaders on either side of the central leader then there are eight sections producing fruit. Therefore each leader needs to be able to hang (160 ÷ 8) about 20 pieces of fruit.

One lateral can hang one or two pieces of fruit. Therefore pruners only need to leave about 10-12 good laterals on the main leader for each tier.

For mature vase trees 4-5 years or older.
One would expect at least 8 – 10 trays per tree but preferably 12 trays which equals 4000 -5000 trays/ha. This equates to approximately 200-250 pieces of fruit (25 count size) per tree. If there are 4 main leaders per tree then each leader needs to hang 50-60 pieces of fruit. One lateral can hang one or two pieces of fruit. Therefore each main leader needs to be pruned so there are approximately 30-40 laterals having at least two flower buds each.

Cropping potential of younger trees (This relates to trees under 5-6 years old)

How many fruit should be left after thinning?

The best indicator is trunk circumference.

1. Early season 6-7 fruit/cm of trunk circumference
2. Mid season 8-9 fruit/cm of trunk circumference

Measure the tree butt circumference at 400mm above the ground

Example: Circumference is 20cm
If it is early = 6-7 fruit/cm
= 6 × 20
= 120 fruit

Leave 2 laterals for every 3 fruit and we need 120 fruit = 120 ÷ 3 × 2

= 80 laterals

Therefore we need to leave 80 laterals during winter pruning to get 120 pieces of fruit.

Tips to keep in mind

Remember that time and labour (picking, packing, pruning, thinning) are the most expensive parts of your production costs. Any method that minimises the labour component in any of the above operations needs to be adopted to reduce these costs.

1. Prune laterals to a strategy that minimises the number of fruit, flowers and times they need to be thinned.
2. Count the number of laterals needed to produce a known fruit volume.
3. Many growers have used the palmette system of tree training as it maximises the number of trees under netting. The site slope also affects this decision.
4. Many growers have moved away from the 'tall palmette' system to the 'mini palmette' as they can then harvest, thin and prune whilst on the ground. This saves on the need for expensive equipment and more flexibility with these operations. The smaller tree also means that row spacing can be reduced which increases the number of trees per hectare.
5. Many growers are using pneumatic pruning equipment to save time. The benefit needs to be weighed against the costs of the equipment.

News in Brief

♦ New draft law released for plant products industry

Food S@fety Bytes from the NSW Food Authority reports that the NSW government has released a draft regulation designed to help ensure the continued safety of key segments of the state's fruit and vegetable industries.

The draft plant product regulation is the first of its kind in Australia and is specifically designed for businesses that provide products from five key areas: fresh cut fruits, fresh cut vegetables, vegetables in oil, unpasteurised juices and seed and bean sprouts.

Under the draft regulation, these businesses will be required to establish food safety programs based on Hazard Analysis and Critical Control Point (HACCP) principles, with specific elements designed to address traceability, hygiene and overall food handling. Copies of the Regulation and supporting documentation is available at www.foodauthority.nsw.gov.au/hot-issues.htm or by phoning 1300 552 406.

News in Brief

♦ The 'Go for 2&5' Campaign

Extracted from the 'Go for 2&5' website at www.gofor2and 5.com.au

The 'Go for 2&5' campaign is part of theAustralian Government's new package *Building a Healthy, Active Australia*. This four year package will invest $116 million in addressing declining activity and poor eating habits among Australian children, and aims to provide families with reliable, practical and consumer friendly information on the importance of physical activity and healthy eating to maintain a healthier lifestyle.

The 'Go for 2&5' ™ campaign will help Australian parents to encourage their children to increase daily consumption of fruit and vegetables.

Key objectives

- Raise awareness of the necessary combination of healthy eating and physical activity to promote good health in children.
- Raise awareness of the need to eat 2 serves of fruit and 5 serves of vegetables each day as part of a healthy diet.

Increase the proportion of Australian adults and children who eat the recommended serves of fruit and vegetables each day (please refer to Fact Sheet on Fruit and Vegetable serves).

More information is on the website at www.gofor 2and5.com.au

♦ Avocado grower levy consultation coming soon

Extracted from Guacamole Vol. 1 No. 1.

During August 2005 twelve grower consultation meetings will be held across Australia. These meeting are to discuss possible changes to levies on avocados. The Avocados Australia (AAL) Board has discussed the issues and is seeking direction from all growers on any proposed changes.

National avocado levies have been in place since 1991 (R&D) and 1992 (marketing). The marketing levy has not changed in its 13 years (15 cents) and the last R&D levy change was 7 years ago in 1998 (8 cents).

The other areas for discussion are, when our levies were originally implemented there was no processing sector for avocados, now there is and the Board would like to propose a decrease for processing avocados. The other area for explanation and discussion is the new Plant Health Australia "Emergency Plant Pest Response Levy".

It is proposed that meetings in NSW will be held in: Stuarts Point, NSW Central Coast, Mildura, Tweed Area, Alstonville.

For more information go to www.avocado.org.au

Report on the Low-Chill Stone Fruit Breeding 2004-2005

Bruce Topp and Dougal Russell QLD DPI and Phillip Wilk, NSW DPI.

Extracted from the Low Chill StoneFruit Grower, March 2005.

After a cold 2004 winter the flowering at Maroochy Research Station at Nambour was heavy and even. We estimate that Nambour received about 300 chill units in 2004 and consequently all our material produced heavy crops. Our controlled pollinations in July 2004 produced a new population of 4,500 hybrid seedlings of peach, nectarine, plum, apricot and cherry but with the majority being peach and nectarine. These new seedlings have been planted in a netted enclosure at Maroochy Research Station and are expected to produce their first crop in 2006.

Approximately 30 new selections were propagated from seedlings we evaluated in 2004. One of the outstanding selections was a nectarine with excellent eating characteristics. It will be distributed for grower testing in winter 2005. Also of interest from the 2004 season was a range of 15 peach and nectarine peento selections that have a characteristic flat shape (also called saucer or doughnut fruit). These ripen in sequence from mid October through to early December and have a range of yellow and white flesh, and melting and non-melting flesh textures.

A new generation of hybrids will be produced in 2005 with our continued primary selection trait being for high eating quality.

Acknowledgement: This research is in part funded by *Horticulture Australia Ltd, Summerfruit Australia Ltd, Low Chill Australia, and Growcom.*

Monitoring Pesticide and Cadmium Residues in Fresh Fruit and Vegetables 2002-2005

Sandra Hardy, NSW DPI, Gosford.

NSW Agriculture and Sydney Markets Limited (SML) continue to fund the Pesticide Residue Survey which was started in 1989. Between 1989 and 2001, more than 97.5% of all samples met the MRL standard. Following is a brief summary of the results from the Pesticide and Cadmium Residues Monitoring Program in horticultural commodities distributed through the Sydney Markets from February 2002 to February 2005.

Some 1497 samples, comprising 48 different fresh fruit and vegetables, were purchased from Sydney Markets between February 2002 and February 2005. The samples were analysed for residues of 28 pesticides with some samples also tested for the heavy metal, cadmium. Pesticide residues were either absent or complied with the Maximum Residue Limit (MRL) in 97.6% of samples. Only 36 samples (2.4%) contained pesticide residues which exceeded the MRL, with another seven samples with residues between 50% and 100% MRL. Of the 207 samples analysed for the heavy metal cadmium, one (0.5%) was above the Maximum Permitted Concentration (MPC) for cadmium.

	Fruit	Vegetables	Total + % of total
Number of samples	679	818	1497
Number of samples with no detections	530	636	1166 (77.9%)
Number of samples with detections	155	176	331 (21.1%)
Number of chemical residues detected	180	207	387
Number of residues > Limit of Detection to 50% of MRl	163	173	336
Number of samples over MRL	9	27	36 (2.4%)

Winter Yellows: A Common Occurrence This Season

Sandra Hardy, NSW Department of Primary Industries, Gosford.

The incidence of winter yellows is sporadic and can occur in any region in Australia. It is more common in years when good growing conditions continue late into autumn. Trees 2-5 years old carrying no crop and which have made vigorous growth in late summer/early autumn are most often affected.

Symptoms are expressed as a yellowing of the youngest foliage in late March and April with the onset of cool temperatures and short days. Yellowing on leaves starts adjacent to the midrib and spreads along lateral veins until most of the leaf becomes yellow. The amount of yellowing is normally restricted to the late summer/autumn leaf flush but in young trees can include all leaves. In severe cases leaves fall. The yellow tissue is heavily stocked with starch.

During winter, the root system of affected trees becomes depleted of stored starch and roots can die. In spring as temperatures become warmer, trees gradually recover and the foliage re-greens. Some young trees may not recover if the amount of root death during winter has been substantial.

Central Coast Citrus Statistics

Sandra Hardy, NSW DPI, Gosford

Information from the Australian Citrus Growers (ACG) levy funded "National Planting Database and Crop Forecasting" project has provided the status of current citrus plantings for the Central Coast of NSW. These statistics are an update on the last crop statistics which were collected by NSW DPI back in 1996. It must be noted that the statistics collected by NSW DPI between 1992 and 1996 were probably not as accurate as those collected in the latest ACG survey.

The table below outlines the changes in plantings since 1992 and shows that citrus plantings have declined substantially in that time.

Year	1992	1994	1996	2004	% Decline since 1992
Total area (ha)	1021	985	962	525	49
Total no. of trees	521 300	510 100	499 250	297 900	43
No. of growers	188*	186*	174*	68	64
Navels (ha)	331	341	328	192	42
Valencia (ha)	377	374	362	144	62
Lemons (ha)	242	224	231	175	28
Other (ha)	40	40	37	14	65

* This number included growers who had small non-commercial citrus plantings

Harvesting and Pre-Pack Handling Tips for Citrus

Peter Taverner, SARDI

Extracted from the Packer Newsletter, Vol. 79, June 2005.

The winter harvest is in full swing and packing for the USA program is progressing as fast as possible. We are all trying to reduce our losses by diligent use of fungicides and good cold storage. However, it is worth reflecting that the major cause of mould infection and rind injury is still poor harvesting techniques.

As the season progresses, and as fruit drops, there will be an increase in mouldy fruit lying under the trees. Packingshed staff should be encouraging growers to follow good orchard hygiene. Unfortunately, much of this work, such as pruning to remove twigs and ensure good air flow or spraying with 'stop drop' to hold fruit on the tree, needed to be done earlier in the season. However, growers can still ensure that fruit susceptible to splitting is harvested early and that no fallen fruit is included with tree harvested fruit.

Hygiene is part of the solution: Mould spores may be there, but they need an injury site for infection to occur. Hence, all citrus should be handled carefully to reduce the risk of injury, and, subsequently, infection.

Fruit injuries can be caused by:

- Clipper cuts
- Long stems
- Carelessly pulled fruit
- Dead twig punctures
- Ladder bruising
- Finger nail scratches
- Squeezing fruit in the picking bag against the ladder
- Dropping the fruit
- Sand or dirt on the fruit
- Dirty or rough surfaces on the bins
- Jolting bins over rough roads

To minimize injuries pickers should keep their fingernails short or wear gloves. They should also be taught the correct 'snap' picking method. Turgid fruit are best for the 'snap' picking method. However, highly turgid fruit can also be susceptible to oleocellosis. Delay picking during cold and wet conditions to avoid rind injury.

During dry conditions, a different problem can occur. Wilted fruit are prone to 'plugging', and the injury is then a perfect site for infection. Rough picking of soft fruits will also result in a high degree of 'plugging'.

After picking, care should be taken not to bruise or drop fruit. The bins should be clean and free of any rough surfaces.

Always drive trailers loaded with bins slowly. If road surfaces are not smooth, use the minimum tyre pressure to cushion the ride.

When the grower aims to handle his fruit like 'eggs' then the packer must have the packingshed in good condition. A well-designed shed is the first step to good hygiene. The receival bay, fungicide dip and fruit hopper should be in a breezeway, and separated from the main packing area by a wall. Keep the receival area clean and in good order. In addition, pallets or bins of stored or rejected fruit should not be placed near the receival area.

All fruit received must be treated with a fungicide within 24 hours of harvest. This can be done by treating with a fungicide in the packingline or using a postharvest dip or drench in the receival area. Using a postharvest dip or drench allows more flexibility to hold fruit prior to sorting. This may be useful if you suspect that the fruit was picking during periods of high oleocellosis risk.

(This article is based on the Harvesting Section of the Citrus Handling Guide, written by Barry Tugwell).

Rind damage due to olleocellosis

National Harvest Labour

Extracted from Fruitwise, No. 57 Autumn 2005.

The National Harvest Labour Information Service helps growers and jobseekers find each other.

For many vegetable and fruit growers, sourcing reliable labour at peak harvest times can be one of the most difficult tasks. Help is at hand with the introduction of the National Harvest Labour Information Service (NHLIS). The service has been introduced to alleviate harvest labour problems by mobilising people from areas that have finished harvest to regions where they are desperate to complete harvest.

The NHLIS is supported by three key links:

- The National Telephone Service that has a free call number 1800 062 332. This service runs from 8am to 8pm (EST) weekdays throughout the year.
- The Harvest Trail Website, www.jobsearch.gov.au/harvesttrail that provides comprehensive information about harvest opportunities in all states of Australia.
- The National Harvest Guide provides extensive information about harvest work opportunities and locations, working conditions, transport options and accommodation arrangements in key harvest regions across Australia.

Please call 1800 062 332 to order your free copy of the National Harvest Guide, register your labour requirements, or simply to find out further information about the National Harvest Labour Information Service.

Fertiliser Calculatons

Carol Rose, Extension Agronomist, NSW DPI, Kempsey

(Based on Agnote DPI 296, Fertiliser Calculations)

The following simple calculations will allow you to accurately determine how much fertiliser to put on your soil.

Before applying fertilisers of any type, you should assess the nutrient content of your soil, and understand that other factors - soil type, soil depth, current pasture or crop type and previous paddock history - need to be considered as well.

Units

Often a recommendation talks about units of a nutrient (eg phosphorus). A unit is the same as kilograms of that nutrient (eg 1 unit P is 1 kg P). But this is not the same as a kilogram of a fertiliser.

N:P:K:S

Fertilisers contain different amounts of nutrients, affecting the amount of the fertiliser you need. The nutrients are often written on the bag or packing slip as percentages, or as N:P:K:S (nitrogen: phosphorus:potassium:sulfur).

Example:

Single superphosphate is 0:8.8:0:11. This means that in 100 kg, there is no nitrogen, 8.8 kg phosphorus, no potassium and 11 kg sulfur.

Calculating the amount of fertiliser required

This information can be used to calculate the amount of a fertiliser needed for a given amount of a nutrient:

Calculation A

Amount of fertiliser kg/ha = kg/ha nutrient ÷ % nutrient in fertiliser x 100.

Example: You need 20 units (kg) /ha of phosphorus (P) and you plan to use single superphosphate with 8.8% P.

Apply Calculation A

Amount of superphosphate required (kg/ha)
= 20 kg/ha P ÷ 8.8 P x 100
= 227 kg/ha

Calculating the amount of nutrient applied

You can reverse this calculation to work out how much of a nutrient you are applying.

Calculation B

Amount of nutrient (kg/ha) = Amount of fertiliser (kg/ha) x % nutrient in fertiliser ÷ 100

Example: You plan to apply 125 kg/ha of single superphosphate.

Apply Calculation B

Amount of P applied (kg/ha)
= 125 kg/ha x 8.8 P ÷ 100
= 11 kg/ha P

Calculating the cost per single nutrient

You should select fertilisers for the nutrients they supply, what your soils lack and what your plants require. If only one nutrient is deficient, compare fertilisers on the cost of that nutrient. Use the following calculation to compare the price of that nutrient.

Calculation C

Price per kg nutrient
= Price per tonne ÷10 ÷ % nutrient

Example: Paddock has high nutrients except nitrogen (N).

Apply Calculation C

Urea @ $410/t ÷ 10 ÷ 46% N
= $0.89/kg
DAP @ $580/t ÷ 10 ÷ 18 % N
= $3.22/kg

Calculating the cost for more than one nutrient

You can use a range of fertilisers, including blends, to apply the same amount of nutrients. For the fertilisers you are considering, work out the rate you would have to apply to get the nutrients required (calculation A), then use calculation D to work out the cost per hectare. When a fertiliser has two or more of the desired nutrients, use the nutrient in least supply in the fertiliser for the calculation for rate.

Calculation D

Cost per ha = cost/tonne x rate kg/ha (from A) ÷ 1000

Example: In the paddock you need 20 kg/ha N and 20 kg/ha P.

Option 1: Urea (46:0:0:0) and single superphosphate (0:8.8:0:11)

Apply Calculation A

Rate urea
= 20 (units N) ÷ 46 (%N) x 100
= 43.5 kg/ha urea

Rate single superphosphate
= 20 (units P) ÷ 8.8 (%P) x 100
= 227kg/ha super

Apply Calculation D

Cost per ha Urea
= Urea @ $410/t x 43.5 kg/ha ÷ 1000
= $17.84/ha

Cost per ha single superphosphate
= super @ $262/t x 227 kg/ha ÷ 1000
= $59.47/ha

TOTAL cost per ha = $77.31 /ha

Option 2: DAP (18:20:0:1.6)

Apply Calculation A

Rate DAP
= 20 (units N) ÷ 18 (%N) x 100 (note: use nutrient in least supĀply)
= 110 kg/ha DAP *(will also supply 22 units of P)*

Apply Calculation D

Cost per ha
= DAP @ $580/t x 110 ÷ 1000
= $63.80/ha

TOTAL cost per ha = $63.80 /ha

Other Questions to Consider

Choosing the fertiliser to use should not just depend on price. You should also consider:

- **Response to fertiliser:** Do you need fertiliser? For example, clover fixes its own nitrogen so does not need N application; native pastures are adapted to low phosphorus and may not respond to fertiliser application.
- **Availability:** Is the fertiliser you are considering available in your area, or at the time of year you want? Factor in freight costs.
- **Availability of nutrient:** Consider if the nutrients in the fertiliser are slow-release or rapidly available.
- **Handling:** Can your machinery apply the necessary rates? Can you handle small bags or one tonne bags? Blends, while often more expensive, can be easier to handle. If hiring someone to spread the fertiliser, what are the associated extra costs? Does that affect the fertiliser choice?
- **Timing and Placement:** Fertilisers should be applied so the nutrients are available during the plants' main growth period. But do you or the contractors have the time? Plan for spreading! Does this fertiliser need to be incorporated?
- **Side Effects:** Some fertilisers are more acidifying than others and should be used sparingly on low pH soils. Some fertilisers may contain heavy metals or salts; how much is safe? Is the fertiliser highly leachable? What precautions should be taken? What is the risk of erosion, and of fertiliser and soil contaminating waterways? Use buffer zones around waterways.

The examples used are only a sample of the possible fertilisers that could be used in the scenarios given, and do not indicate a preferance by NSW Department of Primary Industries. The prices used are only examples, and farmers should use current fertiliser price and spreading costs when calculating their fertilising costs.

♦ Quality Assurance Update

Joe Ekman, NSW DPI, Gosford.

There is much hype and misunderstanding about EUREPGAP in industry. System impact is largely restricted to EU-focused commodity supply chains but some parties in industry are doing their best to whip up "EUREPGAP fear/fever". A guidelines document prepared under the National Food Industry Strategy (NFIS) – Food Safety and Quality Systems Initiative is designed to raise awareness of what EUREPGAP is and provide some guidance on issues for system implementation. A copy is available from the DAFF website at: www.daff.gov.au/corporate_docs/publications/pdf/food/eurepgap_guidelines.pdf

Security Sensitive Ammonium Nitrate: New Regulations

Information extracted from the Workcover website at www.workcover.nsw.gov.au

On 25 June 2004 the Council of Australian Governments (COAG) agreed to a national licensing system to limit access to Security Sensitive Ammonium Nitrate (SSAN). Each state and territory will introduce legislation and/or regulations to give effect to the COAG agreement.

The new laws are to be introduced under the Explosives Regulation 2005 to control the transport, storage and handling of SSAN.

SSAN means ammonium nitrate, ammonium nitrate emulsions and mixtures containing more than 45% ammonium nitrate (excluding solutions). It includes calcium ammonium nitrate, and fertilizer blends containing more than 45% ammonium nitrate.

These guidance notes apply to primary producers. The following SSAN related activities conducted by a primary producer must only be conducted under the authority of a licence:

• purchase;

• transport;

• storage;

• use.

A SSAN licence for primary producers may be a multi-purpose licence authorising some or all of these activities.

Usually, primary producers will only be authorised to store and use SSAN on their own properties, and will not be authorised to supply or on-sell SSAN to others. However, primary producers may be authorised to purchase, store and spread ammonium nitrate fertilizers for other primary producers who do not wish to obtain a licence. Primary producers would, in this instance, become a fertilizer spreading service, and advice on appropriate authorisations should be sought from Workcover in NSW.

Usually, primary producers will only be authorised under the multipurpose licence to transport up to and including five tonnes of SSAN in a non-stop journey. Regulatory authorities may authorise a primary producer to transport more than 5 tonnes under the multipurpose agricultural use licence. This will be on a case-by-case basis, and a primary producer would need to submit details of the proposed transport arrangements (quantity usually transported, type of vehicle, route etc).

If the transport of SSAN involves stops in which the vehicle is left unattended then such activities will need to be explicitly authorised under a separate licence to transport SSAN.

Transport of SSAN must also meet safety requirements and a separate driver's licence under state or territory explosives or dangerous goods legislation may be required, depending on the product transported, its quantity and form.

These guidance notes describe the minimum requirements for the majority of primary producers using SSAN. In certain circumstances the regulatory authority may require additional security measures. This is most likely to be where an explosion in situ could result in substantial casualties, such as where large quantities of SSAN are stored near population centres or public facilities.

The requirements in other applicable legislation or codes of practice remain in place and require the full attention of primary producers storing and transporting SSAN.

How do I get a licence?
In NSW you should apply to Workcover, phone 131 050 or email contact@workcover.nsw.gov.au.

How much will licences cost?
The cost and duration of licences will vary slightly from state to state. In NSW the cost for a 5-year licence will be a nominal fee of $250.00, excluding the cost of police and ASIO checks for individuals.

Further information is available on the Workcover website @ www.workcover.nsw.gov.au. In the search window type in security sensitive ammonium nitrate.

Australian HomeGrown

Information extracted from the Australian Home Grown website at www.australianhomegrown.com.au/index.html

About Australian HomeGrown

The HomeGrown campaign was initiated in recognition of the growing volume of unlabelled country-of-origin food products and the increasing challenges for clear unambiguous identification of Australian grown food products.

What is HomeGrown?

HomeGrown is a logo which identifies food products that are or are made with 100% Australian grown food products.

Australian HomeGrown Limited (AHG) is a not for profit organisation, set up for the wider benefit of Australian Agriculture. Funds raised from the licencing of the HomeGrown logo will be used for administering the Code of Practice and the promotion of the HomeGrown logo domestically via a National advertising and public relations program.

AHG aims to drive the value of the HomeGrown logo through a sustained and intensive publicity campaign. The logo will continue to be strongly supported in media.

The HomeGrown campaign will enable Australian food producers to differentiate their product in the marketplace through distinctive Australian origin labelling.

Organisation Structure

Industry Member Companies

Comprising grower associations and primary industry bodies/companies, who will also be eligible to be Board members and thus maintain control over the strategic direction and integrity of the AHG logo. Not more than two Industry Member Companies shall represent each respective industry, additional industry representatives may be entitled to be Members at Large.

Members at Large

Comprising licensees, who are growers or food manufacturers or other parties who the Board determines, meet the Code of Practice conditions to use the AHG logo. The cost to licensees of using the trademark is likely to be based on turnover.

Board of Directors

The objective of directors of AHG is to solely promote Australian grown produce and Australian origin agricultural goods, as well as adhere to the Australian HomeGrown Code of Practice.

Board of Patrons

The Board of Patrons (BOP) is an Advisory Board to provide insight to AHG and its Board of Directors, industry trends and expectations and ongoing development and promotion of the HomeGrown campaign to ensure its success over the long term.

About the HomeGrown Logo

The HomeGrown logo will become an important marketing tool for the Australian Food Industry. When a product carries the HomeGrown Logo, consumers can be certain the produce is 100% Australian grown.

The HomeGrown logo will be protected under the Trade Marks Act. Only products licenced by AHG may use the logo in accordance to with the Code of Practice.

AHG research, undertaken in May 2004, conclusively illustrated that Australian consumers and main grocery buyers will choose products carrying this Trade Mark and may even be prepared to pay a possible premium price.

The logo provides a point of differentiation for products and adds value to existing and new Brands. Most of all, by using the logo, it makes it easy for consumers to identify produce that is 100% Australian grown, allowing them to exercise their preference for buying Australian.

The AHG Logo will become the most recognised 'Australian origin' symbol on our food shelves. It is the aim of AHG that the HomeGrown logo will enjoy a 90% recognition level amongst Australian consumers within 12 months of the trade mark launch.

The logo gives consumers confidence that the products carrying the mark meet the legislated criteria for AHG produce.

Frequently asked Questions and Answers

How is Australian HomeGrown different to Australian Made or Australian Made and Owned?
Australian HomeGrown is the only logo that guarantees a product is 100% grown, farmed or fished in Australia.

What about processed produce?
Yes as long as the key ingredients are 100% Australian grown, farmed or fished produce. Each endorsed product goes through strict testing measures to ensure the product is wholly grown, farmed or fished in Australia.

Will the Australian HomeGrown logo feature on all produce from Australia?
We are actively encouraging all Australian producers to come onboard Australian HomeGrown. The Australian HomeGrown logo will only appear on produce that has joined the not-for-profit organisation as a licensee and has passed the strict accreditation process. Each endorsed product goes through strict testing measures to ensure the product is wholly grown, farmed or fished in Australia.

What does it cost a producer to join the Australian HomeGrown organisation?
The cost of participating in the campaign and the right to display the Australian HomeGrown logo is linked to turnover and can range from $500 to $100,000 per annum.

When will other supermarkets carry the labelled Australian HomeGrown produce?
All Australians will be able to buy Australian HomeGrown labelled produce mid-2005 when the campaign is rolled out across Australia.

Join HomeGrown

Farmers, producers and manufacturers of 100% Australian grown food can become licensees and be part of the HomeGrown movement.

There will be two main licence categories:

1. Industry members - grower/manufacturer representative organisations.
2. Manufacturer/grower members - companies who produce, grow or distribute 100% Australian produce.

To become a licensee, you will need to undergo an auditing and accreditation process and be quality assured.

Licensees will operate under a Trademark Licence Agreement (which incorporates the AHG Code of Practice) which sets out how you can use the logo, and tells you how AHG plan to promote both the logo and the HomeGrown movement for the benefit of licensees.

To join, you can either contact AHG or complete the expression of interest form online or download and send to AHG.

Current Industry Members

Current Industry Members of Australian HomeGrown Limited are —

Apple and Pear Australia Limited
Australian Egg Corporation
Australian Citrus Growers Association
Australian Garlic Industry Association Inc
Australian Honey Bee Industry Council
Australian Mushroom Growers Association Limited
Australian Prawn Farmers Association
Ausveg Limited
Biological Farmers of Australia
Cattle Council of Australia
Cherry Growers of Australia Inc
Dairy Australia
Horticulture Australia Limited

For more information contact
Australian HomeGrown Limited
Level 7, 99 Queen Street, Melbourne VIC 3000
Phone - 03 9600 4464, Fax - 03 9642 8824
Email - info@australianhomegrown.com.au

Websites

- **Agriculture Network Information Centre (AgNIC)**

Started in 1995, the Agriculture Network Information Centre (AgNIC), is part of a collaborative alliance between various libraries and extension programs at different universities and other institutions. This partnership is designed to bring quality agricultural information to those parties and to the general public as well.

Go to www.agric.org/agnic/index_html

What's on

- **30-31 July**
  Organic Expo Sydney, Darling Harbour

Australia's first major expo, created for both the public and trade, highlighting the excellent certified organic and environmentally friendly products and services (collectively known as eco-ganics) that are currently available.

For more information contact: Lena Smeaton 0413 043 287, Mary Hackett 0414 306 689 www.organicexpo.com.au, phone 02 9451 4747.

- **27-29 August**
  2nd Australian Farmers' Markets Association National Conference, Albury, NSW

The two-day conference will deliver leadership and practical information, celebrate business achievements, set new horizons and establish networks.

- **20 July**
  Information Night for Olive, Vineyard and Pasture Growers, 7.00pm, Mittagong RSL Club

Please RSVP by 13 July for catering purposes.

For further information call Peter Vella on 0408 409 903 or Alan Merriman on 0408 267 728.

- **11 and 12 August**
  SMARTtrain Chemical Application, Camden and Windsor

The 2 day course costs $305 GST free.

For enrolment and information contact Maryke Archbold-Hession, NSW DPI, Camden phone 02 4640 6333 or 0408 492 039 email maryke.hession@agric.nsw.gov.au.

- **30 July**
  Cut Flowers: What's NEW in Pest & Disease Management? 1.00-5.00pm

5th Annual information day for cut flower growers at Dural Country Club.

For more information contact Bettina Gollnow, NSW DPI phone 02 4640 6437 or Alan Merriman, Organic Fertilisers phone 02 4773 4291 or 0408 267 728.

What's new in publications

- **Outlook for Agriculture**

The Australian Bureau of Agricultural and Resource Economics' (ABARE) annual national Outlook conference was held recently in Canberra. Papers from the conference are available at www.abare.gov.au/outlook/index.html

- **New On-Farm Food Safety Guidelines available**

The new version brings in new information and new issues that have developed since the first version was produced in 2001. The publication is available on the HAL website www.horticulture.com.au and click on 'Links and Publications' in the fine print under the main information box. It's also available in hard copy at no charge while stocks last by contacting Danika Houghton at Horticulture Australia Ltd, danika.houghton@horticulture.com.au,
fax 02 8295 2399 or phone 02 8295 2340.

- **Broadleaf Weed Seedlings of Temperate Crops and Pastures**

Identifying broadleaf weed seedlings at the early seedling stage is vital for crop and pasture management and protection. This easy-to-use field guide illustrates broadleaf weed seedlings at their most susceptible stage for control, before they have competed with crop or pasture. It describes 95 broadleaf weeds, and associated crop and pasture species, with colour pictures.

112 pages. $30.00 plus postage and handling.

For details and orders, telephone (02) 6391 3994 or email **bookshop@agric.nsw.gov.au**

- **Lime Grading Guide**

Lime Grading Guides (coloured, A4 posters) are now available from the Tableland Marketing Project, $11 plus postage.

Contact Kay Amesbury on 07 4092 5451 or kay.tedc@bigpond.com

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COASTAL FRUITGROWERS' NEWSLETTER

The Coastal Fruitgrowers' Newsletter is a quarterly publication distributed in Spring, Summer, Autumn & Winter. It is available free to all commercial fruit growers in the Sydney Basin, Central Coast, Hunter Valley, South Coast & North Coast areas.

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