

the

Nutshell



May 2012

MPC'S NEWSLETTER FOR MACADAMIA GROWERS

General Managers Report by Steven Lee

Dear Growers,

Welcome to a new season and my first edition of *The Nutshell* as MPC's General Manager.

I'm fortunate to have met many of you as Operations Manager and I'm looking forward to working with you and to the challenges the GM role presents.

So what's new?

To ensure our growers remain profitable into the future we've undertaken several new initiatives this season. All are aimed at improving your farm income and reducing your on-farm costs.

We recognize growers are affected by increased production costs and need solid and stable returns. You also need an industry with a strong, viable future.

No processing fees or penalty for NIS with up to 10%NIH

The main change is that MPC now accepts NIS with up to 10% NIH direct into our delivery area with no processing fees or penalty.

Discussions with growers and our own research revealed that by reducing the need for growers to undertake multiple sorts on-farm (often when trying to avoid reject penalties or chase bonuses), growers can spend too much time, effort and money, making little difference to the quality of the NIS

supplied.

By holding product on-farm there is the potential to increase levels of discolouration and brown centres in nuts. All these factors lead to increased on-farm costs, loss of kernel quality and lower returns. So we thought we should set about improving this situation.

What precisely have we done? We've installed cleaning equipment and new NIS sorting technology to remove obvious reject nuts and will use our kernel colour sorters to remove other defects from kernel streams. Insect stings that are not clearly visible on the shell are a good example of a defect that is difficult to remove as NIS but relatively simple once you've removed the shell. We decided not to use an indirect NIS sorting method for these types of defects; we would rather remove the shell and make the right decision every time.

MacMan Best Practice Group information has shown that a lot of sound kernel is lost through water and hand sorting on-farm. Using our new system this loss is eliminated.

Growers will be delivering a larger quantity of NIS which may contain a few more rejects, so you may see a lower average \$/kg than if you resorted, but remember it's the combination of more kgs delivered and \$/kg (ie the total

dollars) that really drive your bottom line. Too often \$/kg are spoken about in isolation. It's the total \$ returned to farm that really counts.

We are also reflecting current market pricing trends with commercial kernel being paid at premium prices. Again there is a lot of research that shows that reducing storage can help keep discoloration to a minimum.

Quite a few growers have taken advantage of the new system by delivering partially dehusked or unsorted nuts. Most have been pleasantly surprised with the reduced workload on-farm and the low reject levels in laboratory test results. With no reject penalties and commercial paid at premium prices the system delivers on our promise to improve your profitability. (See the article "MPC's New system at Alphadale" for some grower testimonies).

We've instigated these changes to assist our growers to increase their income and shorten the time taken for the kernel to move from tree to being fully protected in a gas flushed, vacuum packed carton in our warehouse. This means better shelf-life and improved eating quality for consumers. A better consumer experience will lead to continued strong demand for macadamias and strong kernel pricing.

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2012 Season Update

The 2012 harvest has been punctuated with periods of wet weather in all growing regions. Whilst this has made harvesting difficult it has highlighted the benefit of harvesting at every opportunity instead of spending a lot of time resorting your NIS in the shed.

Despite the late nut drop and wet weather, the current delivery pattern and crop forecasts indicate that we're in for a reasonable sized crop. The industry forecast is for 37,000t and at this stage there seems no reason to doubt this estimate.

While Kernel quality has been better than the last few seasons, Total Kernel Recovery is down compared to the same time last year. Hopefully we will see an increase in the coming months.

New Industry Standard (33% Usable and 3% Reject)

The AMS recently announced an updated Industry Standard for publishing and reporting NIS prices. The new standard is 33% saleable kernel (premium + commercial kernel) and reject kernel of 3% at 10% moisture. The new standard better matches the real industry average seen over the last few seasons. It gives all in the industry, and those looking to enter, a more transparent view of processor offers and price tables and doesn't build unrealistic expectations. MPC will use this standard.

International Production

Reports from South Africa expect their crop to be 35,000t, up from 30,000 in 2011. The Hawaiian crop is stable at 14,000t. (See *Larry's marketing report for more information on what this means to kernel markets*).

Consolidated Nuts of Australia

The new CNA factory in Bundaberg is almost up and running. It is a tremendous facility with state of the art processing technology and one of the most efficient macadamia drying systems in the world. There will be a bus trip to the Bundaberg region that will include a visit to the new factory in late July for interested growers. If you haven't done so already, please register your interest with Tracey at reception.

2011 in Review

What a season! Despite a short crop and poor quality, MPC managed to deliver our entire contracted kernel to our

customers, no contract defaults and no over commitments. Even with our \$1.50 up front payment, full payment by Christmas for the 4th consecutive year and \$0.30 bonus, we've managed to end the year in a solid financial position. Whilst this wasn't easy, our factory cost reduction programs and continued focus on improving processing efficiencies are paying big dividends and will continue to do so into the future. This coupled with a customer focused marketing approach through MMI is really a recipe for success.

Steven Lee, MPC General Manager

MMI - Sales and marketing Report *Demand and supply well matched this year*

Sales of the 2012 crop are proceeding well with demand in most markets remaining firm.

The Australian crop forecast of 37,000t remains unchanged at this point, although the continuing wet weather in Northern New South Wales is likely to cause some reduction in usable kernel.

The South African crop is predicted to be around 35,000t of NIS although it is believed that up to 30% of this will be sold as NIS to China.

The current lack of kernel throughout the supply chain, caused by reduced availability last year, together with increasing NIS sales to China and ongoing expansion of our markets, should see demand and supply well matched this year.

The increase in kernel availability from Australia this year is proving to be a godsend, enabling us to continue opening new markets.

MMI's increased volume is providing certainty of supply, giving customers confidence to develop new products because they know they can get the quality kernel they need.

Macadamias are available in many more countries and in more products throughout the world than they were ten years ago and the momentum gained in new regions has given the industry growth opportunities.

At industry level, levy funds are being directed to opening new markets and

supporting emerging markets to ensure ongoing demand for our great product. This year the industry is focusing on Korea and Taiwan. MMI is working with the industry, finding customers and supplying kernel into these new markets.

Australian Gold Label

Over the past twelve months we have been working with the AMS and industry to develop a brand that signifies quality. The aim is to ensure our consumers get the best taste experience.

As a result of this process the *Australian Gold Label* brand has been born and is in the final stages of implementation.



Processors who sign up to the *Gold Label* program must meet the audited *Gold Label* standards for production, delivery and customer service that ensures kernel reaches the market in the best possible condition.

The most important factor is that processors must take responsibility for maintaining kernel taste and texture from farm through to consumer. As an industry we ask consumers to pay a little more for macadamias than other nuts because they are rare, unique and delicious. In return we must ensure the kernel they eat lives up to those expectations.

One demonstration of this principle is that the *Gold Label* standard specifies the mandatory use of best before dates on all cartons bearing the *Gold Label* and a mandatory low rancidity level at the time of dispatch.

MMI and MPC have signed up for this important program as have a number of other processors but at present there are still some processors who have indicated that they will not take part in the branding. MPC and MMI believe that providing consumers with the best eating experience is fundamental to building a stable and profitable industry and encourages growers to support us as we are part of this scheme.

Larry McHugh, MMI General Manager

Buying Quality Time — Ethephon and its use on macadamia nuts

By Jim Patch and Kevin Quinlan

Benefits

The use of Ethephon (eg Ethrel) after crop maturity has many potential benefits, including cost savings to growers or the potential for growers to have more time to complete other tasks before the start of the next season.

The cost benefits to the grower go far beyond a reduction in harvest time. The quality of the product harvested and paid for by a processor may also be of higher value, with longer shelf-life than nuts which are retained on the tree or lie on the ground for an extended period of time.

Nuts remaining on the tree for an extended period can suffer from lipid oxidation (rancidity) and a reduction in kernel oil content and kernel value.

By using Ethephon pest and disease management may also be improved in some later falling varieties like A16 and Daddow due to the break produced between mature nut fall and flowering and early nut development of the next season's crop.

The use of ethephon may 'buy quality time', allowing you to complete worthwhile orchard operations before the start of the next season. Some benefits observed by the use of Ethephon include:

- Increase in harvest efficiency
- Reduction in harvest costs
- Improvement in kernel quality
- Improved NIS and kernel value
- Efficiency in harvest timing to suit other orchard operations (e.g. canopy management & surface water management)
- Break between nut drop and flowering of the next crop reducing the potential for insect and/or disease carryover
- Reduction in rodent damage for the ensuing crop

How Ethephon works

The synthetically manufactured Ethephon in products like Ethrel® breaks down in plants to release ethylene, a naturally occurring product that is produced in many plants during their ripening process. In macadamias, the ripening action is centred on the abscission zone in the base of the 'pedicel' (the stem that holds the nut to the rachis/raceme), and to a lesser extent the 'leaf petiole' (base of the leaf stalk where it attaches to the stem/limb of the tree).

The abscission zone in the pedicel is restricted in shape and size and the cells are smaller in size than conventional cells. When Ethylene is applied to these cells, they enlarge, forcing the restricted abscission zone apart, abscising the nut.

Ethephon's break down products are ethylene, phosphate and chloride which are all metabolised by the plant.

There are many factors that affect the success of Ethephon in causing nut abscission including the variety, ambient temperature and the stress levels of the tree.

Past Research

There has been a reasonable amount of research carried out by the Australian Macadamia Industry and Southern African Macadamia Growers' Association into the use of Ethephon in macadamias. Examples include:

- MC 00029 Final Report – 'Investigation of nut abscission and tree shaking'. McConchie, C.A. & Salter, B. Horticulture Australia Ltd. 2005;
- MC 97005 Final Report – 'Control of nut abscission in macadamia'. Turnbull, C, Trueman, S. *et al*, Horticulture Australia Ltd. 2002;
- 'Ethephon as an aid to macadamia harvesting in South Africa'. Penter, M. ARC-Institute for Tropical and Subtropical Crops. Nelspruit South Africa. 2004.

Is coverage important?

Yes. It is thought Ethephon is not translocated by the tree far from where it is applied and therefore it is important to apply Ethephon to achieve good coverage of the nuts. High volume spraying to the point of run off is best.

When applying Ethephon, ensure the inside of the tree and tops are covered to achieve best results.

Do all varieties drop well when Ethephon® is applied?

The simple answer is no! It appears cultivars that naturally have a high nut drop rate have the best response to Ethephon and require the lowest dose rate (e.g. Var.344, 741,246 and 849). Varieties that have a poor drop rate (e.g. A16) do not respond as well to Ethephon and require the highest dose rate to achieve a satisfactory result.

When is the best time to apply Ethephon®?

The time of application is a balance between leaving the application long enough to allow macadamia nuts to reach full maturity and applying while temperatures are still warm enough to get a good response.

If you are planning to apply Ethephon, you should utilise MPC's maturity testing service to determine when nuts have reached maturity. This ensures you get the best financial return from the product.

It is thought temperature, both soil and ambient, affect the efficacy of Ethephon. From observation and research it appears the product is more rapidly metabolised with warmer soil temperatures which may provide a more satisfactory result. A higher rate of Ethephon® may have to be added to a mixture to achieve a satisfactory result as soil temperatures decline. The lowest soil temperature that provides a satisfactory result is not presently available.

It has been found the best results from Ethephon application occurs when natural nut drop has commenced. To get the best result you need to monitor nut drop to determine when to apply the product.

In general, the best results with Ethephon have been observed when it is applied in late March/early April to mid May after nuts have reached maturity. Research has indicated most varieties are mature by end March/early April in the Lismore area of NSW. Nut maturity in Queensland may be slightly

earlier and the Mid Coast region of NSW a little later, so application timing needs to allow for this.

Will stick tight nuts fall after spraying with Ethephon?

No. Ethephon is only effective in living plant tissue. Stick tight nuts are not affected because tissue in the husk is dead. Growers have observed even green husks that have split in the tree will not drop with Ethephon application.

How long does it take for the nuts to drop?

When nuts are mature, it may take from 14 to 28 days after application for nut drop to be completed. In hard to drop varieties like A16, some crop may still drop after this timeframe, but the majority of crop will be down within this period of time. In varieties that shed well naturally (e.g. 344/741), some crop may start to be shed in five to seven days after application and complete nut drop reached by day 14. Because Ethephon will condense nut drop, be prepared to harvest with high nut volumes on the ground.

Does Ethephon increase leaf drop?

Ethephon causes leaves to drop more quickly than usual and in general the higher the rate of application the higher the leaf drop potential. It appears some varieties may be more prone to heavy leaf drop than others e.g. variety 842. Leaves that drop are usually 12 – 18 months old and may have very little photosynthetic input into the tree at that time. Growers have commented leaf drop from A16 trees is a good thing

as it reduces leaf density, allowing more light into the tree.

Research reported a heavier leaf drop in the first year Ethephon was used and reduced leaf drop in subsequent years. It is thought leaves did not fall to the same extent in the second year because there were not as many old leaves left on the tree. Growers have observed leaves that are shed by a tree from an Ethephon® application usually don't equal the quantity of leaves naturally shed annually, especially in variety 246.

Some growers who experienced what they believed was excessive leaf drop, greatly reduced the Ethephon® rate in the following year (e.g. reduced the active by 50%) and experienced far less leaf drop while maintaining a similar quantity of nut drop but over a longer period.

As leaf drop can be affected by application rate, growers intending to use Ethephon should conduct small scale trials to get a better understanding of the quantity required for each variety and their location to get the best balance between acceptable nut and leaf drop.

How long does it take for old leaves to drop?

Leaf drop peak usually occurs about a week to a fortnight after nut drop peak. For example, if nuts drop in 14 days, leaves will probably drop from about day 21 to 28. Varieties 842 and A16 may have extensive leaf drop. Due to increased leaf drop, growers need to be ready to harvest quickly when they

observe heavy nut drop from Ethephon application.

What dose rate best suits my region and varieties? (See below for details).

The use of Ethephon was initially registered and started in macadamias for varieties H2 and Own Choice which have stick tights and late nut drop patterns. The Australian Macadamia Society (AMS) has obtained the current permit for Ethephon use on all macadamia varieties. As part of the permit issued by the Australian Pesticides and Veterinary Medicines Authority (APVMA), growers were required to complete a questionnaire about their experiences with Ethephon on different varieties and submit this information to the AMS. The following information is a summary prepared by MPC from that data covering the years 2004-2007, and MPC acknowledges the assistance provided by the AMS in providing the data for this analysis.

NOTE: The following rates are for products containing 480g/L of active ingredient. If you intend to use a different strength adjust your rate accordingly (see "How do I calculate the dose rate for products that do not contain 480g/L of active").

The TABLE(S) below and over are a guide only and as nut and leaf drop are affected by application rates, growers intending to use Ethephon should conduct small scale trials first to get the best balance between acceptable nut and leaf drop.

Region Bangalow

Variety	Rate range trialled using 480g/L active products per 100L of water	Suggested Dose Rate for 480g/L active products	Nut drop compared to unsprayed control		Leaf drop on a scale of 1 to 10 (1= excessive, 5= moderate, 10= low)	Comments regarding results and rate range used
			14 days	21 days		
A16	125-350	180-250	45%	75%	7	Higher rates used when low volume spraying and low volume spraying gave adequate results
A38	175-350	80-125	64%	94%	7	Quick response. Higher rates used in low volume spraying situation
A4	175-350	80-125	59%	93%	8	Higher rates used in low volume spraying situation
849	350	125-200	66%	92%	7	Higher rate used in low volume spraying situation

Region Alstonville

Variety	Rate Range trialled by growers using 480g/L active products per 100L of water	Suggested Dose Rate for 480g/L active products	Nut drop compared to unsprayed control		Leaf drop on a scale of 1 to 10 (1= excessive, 5= moderate, 10= low)	Comments regarding results and rate range used
			14 days	21 days		
246	125-180	100 -150	57%	80%	5	Variety responds well to Ethephon. Effective at reducing the harvest interval.
344/741	180	80-125	63%	96%	4	Works very well. Can use a lower rate than 180mls and get effective results
814	100-180	80-125	60%	70%	9	Lower rate is as effective as higher rates if good coverage is achieved
842	62-100	80-100	50%	83%	8	Only requires a low rate to achieve nut drop
849	100-200	125-200	40%	66%	8	Higher application rate gave a faster fall of nuts
A16	130-250	180-250	44%	63%	8	Higher rate has been found to give better results. 200-250ml gives approx 80% nut drop within 21 days
A38	100-180	80-125	56%	86%	10	Higher rate gives faster and more complete nut drop
A4	62-125	80-125	38%	57%	10	Higher rate has given faster nut drop. Majority of nuts down in 4 weeks from application

Region Dunoon

Variety	Rate Range trialled by growers using 480g/l active products per 100L of water	Suggested Dose Rate for 480g/L active products	Nut drop compared to unsprayed control		Leaf drop on a scale of 1 to 10 (1= excessive, 5= moderate, 10= low)	Comments regarding the results and rate range used
			14 days	21 days		
A16	100-200	180-250	43%	67%	8	Better results at higher rates
A38	125-200	80-125	60%	87%	7	Works well on A38.

Region Nambucca

Variety	Rate Range trialled by growers using 480g/L active products per 100L of water	Suggested Dose Rate for 480g/L active products	Nut drop compared to unsprayed control		Leaf drop on a scale of 1 to 10 (1= excessive, 5= moderate, 10= low)	Comments regarding the results and rate range used
			14 days	21 days		
A16	100-250	180-250	15%	30%	7	Much better drop at the higher rate. Shortened harvest season considerably
A38	100-250	80-150	55%	80%	5	250ml was found to be too high a rate, caused severe leaf drop

Region Bundaberg

Variety	Rate Range trialled using 480g/L active products per 100L of water	Suggested Dose Rate for 480g/L active products	Nut drop compared to unsprayed control		Leaf drop on a scale of 1 to 10 (1= excessive, 5= moderate, 10= low)	Comments regarding the results and rate range used
			14 days	21 days		
814	90-200	80-125	21%	40%	6	Low volume spraying used at the high rates*.
842	90-200	80-100	32%	55%	6	Low volume spraying used at the high rates*. Response was lower than expected.
849	150-200	125-200	30%	52%	6	Low volume spraying used at the high rates*.
A16	150-300	180-200	11%	21%	7	Poor response. Low volume spraying used at the high rates*.
A38	150-300	80-150	60%	73%		Good results achieved. Low volume spraying used at the high rates*.
Daddow	200	125 -200	15%	26%	8	Better response in the second year used. Low volume spraying used at the high rates*.

*NOTE: Products containing 720g/L of Ethephon are not recommended in low volume spray applications.

How do I calculate dose rate for products not containing 480g/L of active?

There are different active rates of Ethephon in products like Ethrel® and so you need to calculate the correct application rate. Generally suggested rates are quoted for 480g/L of active products. If the recommended rate is 125ml/100L of Ethrel® 480 but the product on hand is Ethrel® 720, you need to change the active rate in the mixture. *The calculation to do this is:*

480/New Active strength x Rate
 e.g. Rate = (480/720) x 125
 = 83.3 mls/100L
 Therefore the rate of Ethrel 720 to use is 83.3mls per 100 litres of water.

Can I use other products to increase the effectiveness of Ethephon?

Yes. It is recommended that a suitable non-ionic wetter (e.g. Nufarm Chemwet® 1000) be added at a rate of 100ml /100 litres of water. The wetter

should be added prior to Ethephon. Read the surfactant/wetter product label for suitability and directions first.

Research was conducted in South Africa by Penter *et al* in 2002;2003 into various spray adjuvants to find if the efficacy of Ethephon can be enhanced by their addition to the spray mix. These adjuvants included wetters, phosphates, urea and combinations of these products. Drop rates were not improved over the use of a suitable rate of non-ionic wetter by the addition of the extra adjuvants.

Tank mixing considerations

It's important Ethephon is thoroughly mixed with water and non-ionic wetter in the spray tank during tank filling and prior to spraying. Adverse results have been achieved if this is not done.

Management considerations

Using Ethephon® may condense your harvest into one major round. It is important you have capacity to harvest, dehusk, store and deliver to the processor in a short period . A rain event or the inability to cope with increased

nut drop has to be taken into consideration when planning the application of Ethephon.

An effective strategy used by growers to reduce the risk of crop loss or not being able to cope with a large volume of nuts in a short time, has been to split their applications over a number of weeks, only applying the product to the number of trees they can harvest and dehusk at weekly intervals.

The plan has to be flexible with allowances made for rainfall events and the ability to harvest/dehusk in a timely manner.

Other reasons to use Ethephon

Ethephon may be a good tool for use in areas where you wish to carry out a special project before you would normally finish harvesting. e.g. tree removal for surface water or light management.

These areas may be sprayed to ensure harvest is completed early, the project work completed and trees have a chance to adjust to the new conditions before the next crop set .

The use of Ethephon to allow major canopy management projects like tree removal to be completed and the remaining trees given time to adjust to the increased light penetration has the potential to reduce yield impacts compared to doing this work later in the year.

In the case of orchard floor drainage works, it allows soil that is moved time to settle and grass to establish before the summer storm season and the following seasons' harvest preparations.

Can Ethephon be used on young trees?

Yes. Ethephon may be used on young trees to remove the need to hand harvest the trees and reduce the cost of harvesting. An application of Ethephon can allow you to use mechanical harvesting as only 1-2 harvest rounds may be required, reducing the cost of harvesting considerably.

Care should be taken to ensure the accurate calibration of an airblast sprayer or hand gun that may be used to avoid over-dosing of the young tree.

Can I use Ethephon on Stressed trees?

Trees under stress may be adversely affected by an application of Ethephon®. The cause of the tree stress may include: water stress (*too much or too little*); excessively hot temperature; mechanical damage (*tree breakage*); insect or disease

damage. Such trees should not be sprayed with Ethephon until they have recovered.

Is the effect of repeated applications in one season accumulative?

Yes. Two applications of 60ml/100 litres of water in one season may have the same effect as one application of 120ml /100 litres of water. It is advisable to conduct a trial on a few trees to determine the correct rate, as you essentially only get one shot per season.

OH&S /Operator safety implications
Ethephon is rated 'Poisonous' and there are a range of precautions needed when using this product. Read the label carefully prior to use.

Will using Ethephon affect next years crop?

Research was conducted on the use of Ethephon on macadamias for three consecutive years by McConchie and Salter in Bundaberg. It was noted that neither cropping nor tree health were effected during this time. Research conducted by Trueman in Australia found a slight improvement in production following the third year of application of Ethephon. Research conducted in South Africa by Penter *et al* has come to a similar conclusion. Penter found there was a slight increase in nut production in the ensuing season after the use of Ethephon which is believed to be the result of improved light infiltration following the shedding of

older leaves due to the application of Ethephon.

Growers experience - John Pretorius

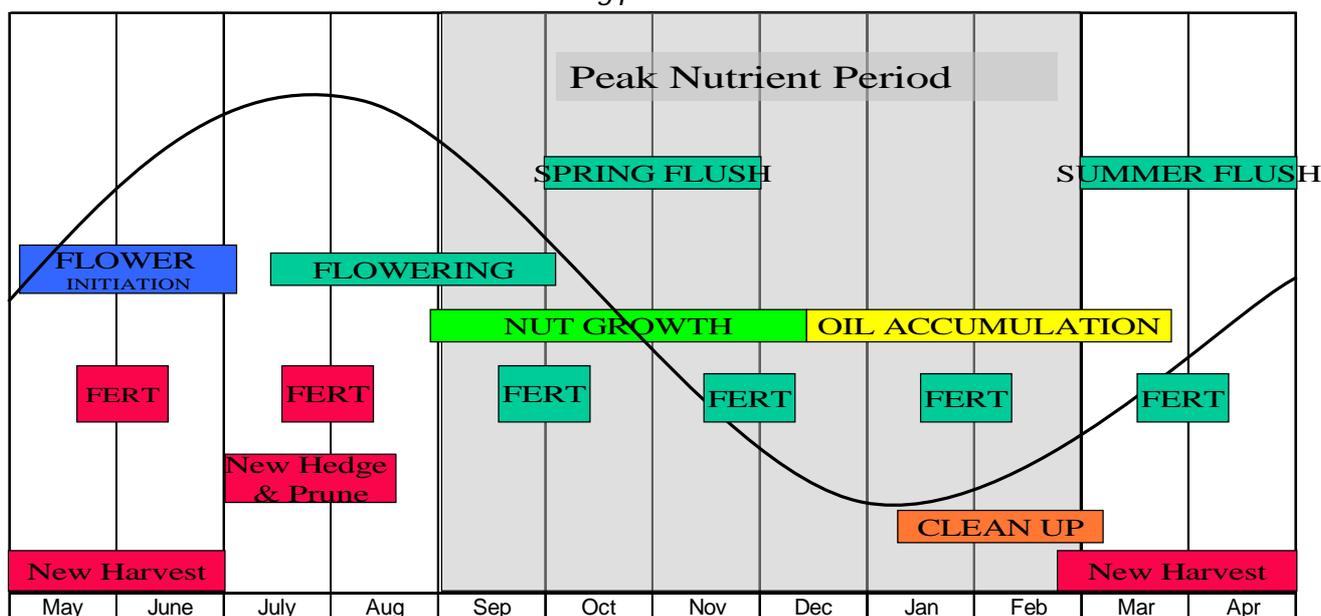
John has been using Ethephon since 2004. His aim is to condense harvest time, ensure A16 nuts drop with reduced stick tight nuts retained and to ensure 'best payments' for his crop by having high quality kernel to sell. Ethephon has been successful at 'Zulumac' and is now a part of regular management practice. Since using Ethephon to condense the harvest time to finish by the end of June, the trees have been given a break before flowering/nut production commences for the next season. Insect, disease and rodent damage has also been minimised as a result of this break.

John now has the time to conduct his canopy /light management operations in July-August, prior to the nut expansion period (September – December) so relieving the competition that exists between vegetative growth and nut growth for essential nutrients as seen in figure 1.

John said he can not detect any effect on the health or cropping ability of his trees that may be attributed to extended Ethephon use.

Ethephon is applied to completely cover all leaves and nuts to 'run off' by an air blast sprayer. John has found that coverage is critical to getting good results.

Figure 1. The crop and farm operations cycle with the use of Ethephon. Notice the Harvest finishing in June and the break this creates before the next flowering period.



The timing of application is determined by the understanding gained about crop maturity through maturity tests conducted by the MPC NIS laboratory.

When the crop is mature and nut drop has commenced, John applies Ethephon to A16s and then to Hawaiian varieties to the number of trees that he knows can be managed by the harvester and dehusking in a few days when the nuts have dropped.

John tries to complete Ethephon applications before the soil temperature drops below 18°C as he believes he gets a better result at or above this temperature.

The benefits resulting from Ethephon® use at Zulumac are many, and include:

- Reduced harvest length and time
- No more harvest rounds per year than when harvesting monthly (See Figure 2)
- Less pressure on dehusking shed
- Less nuts per harvest round - more efficient pick up with a pin wheel harvester
- Improved ability to plan deliveries to the processor

- Last years nuts are not carried over and harvested /wasted this year
- Canopy management conducted in winter
- Break period for trees after harvest before new crop set
- Break period to reduce insect, disease and rodent damage in ensuing crop
- Improved quality
- Above average payments for crop.

Current Rates used

- A16s**
- Ethrel® 480. 200ml/100L water + 10ml Agral 600 (surfactant) @ 6.0L mixture/tree
 - Ethrel® 720. 130ml/100L water + 10ml Agral 600 @ 6.0 L mixture/tree
- Hawaiian varieties**
- Ethrel® 480. 120ml/100L water + 10ml Agral 600 @ 5.6L/tree mixture
 - Ethrel® 720. 80ml/100L water + 10ml Agral 600 @ 5.6L/tree mixture.

And what is John's overall take on Ethephon?

Because Ethephon® has been proven to work so well as part of his present orchard management he feels "very confident to continue using the product in the future".

Grower experience - Rick Paine

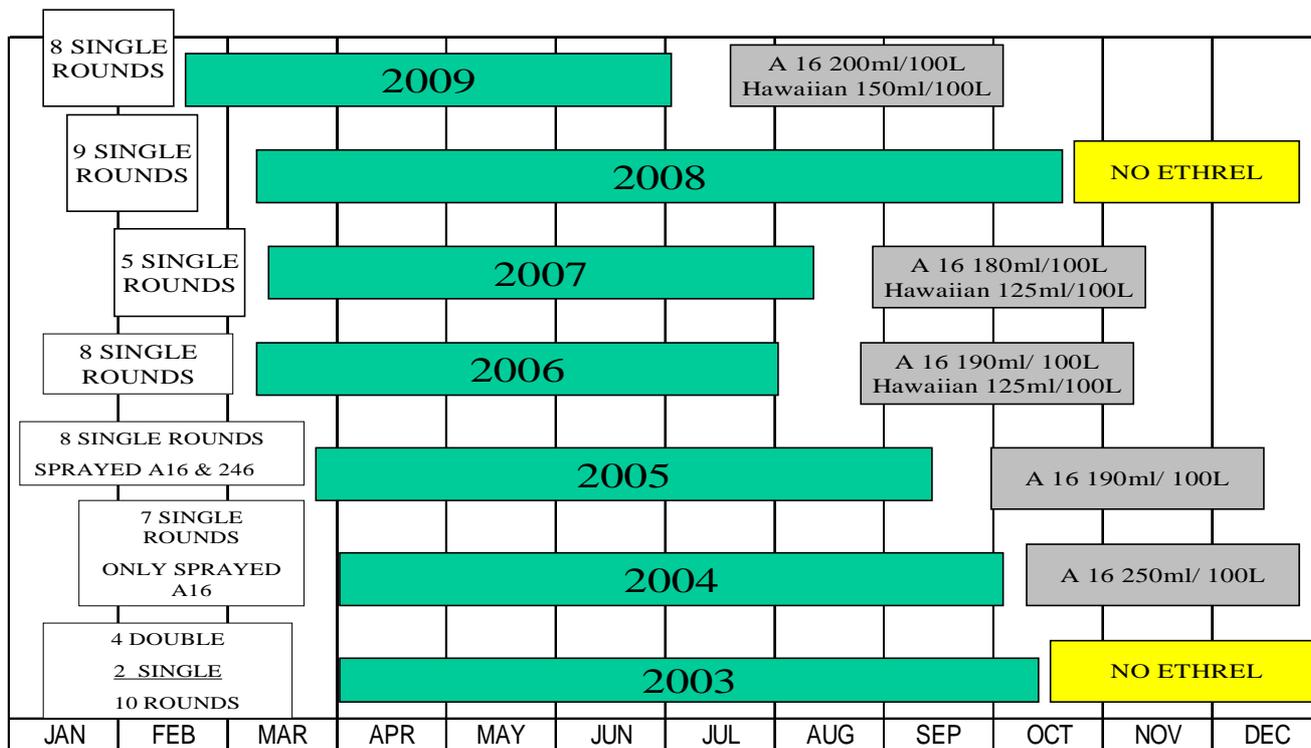
Rick Paine has been using Ethephon® to condense his nut drop and reduce stick tights in A16s for the past eight seasons. He is keen to produce the highest quality kernel from his orchard and knows that nuts which remain on the trees for extended periods loose kernel quality. He has not detected any ill effects on either the health of his trees or in cropping from use of Ethephon.

Rick emphasises it is critical to apply Ethephon at the correct time, at an accurate rate and provide full coverage to achieve success with the product.

Rick ensures the sprayer is calibrated to cover the entire tree including the area inside the canopy and to the top of the foliage.

Rick's airblast sprayer sprays the bottom section of his trees. Thorough coverage is ensured at the top of his tree using SARDI fans mounted on a frame on the

Figure 2. Changes to the harvest length at Zulumac as a result of using Ethephon.



Note: All rates above are for Ethrel® 480

front of the tractor, which positions the fans towards the tree top. The SARDI sprayer is not used when spraying the smaller 849 trees in the orchard.

Maturity tests are conducted by the MPC nut in shell laboratory to ensure nuts are mature and are used to determine the correct timing for Ethephon application. Rick has found if he applies Ethephon spray too early the nuts do not drop.

Rick did not have a good result with Ethephon in 2011 as he believes the nuts matured later than usual and so they had to apply it later than they would normally do. He also believes the soil temperature may have been too low at this time to get a good response.

Rick applies Ethephon to 1000 trees at two week intervals as this is the number of trees that he can manage with his harvesting and dehusking set up with a large volume of nut on the ground. His orchard is relatively flat, so he is able to harvest shortly after rain. He grows a range of varieties including 344, 741, A4, A16 and 849. His priority for Ethephon use is on A16's because of the stick tight nature of the crop and 849's because they drop over a long period and he wants to condense the nut drop.

Rick sprays the A16's soon after the MPC lab results indicate that they are mature. In warmer seasons he has found he can achieve favourable results with the 849's until mid May.

Other varieties are less important as they drop naturally in a more condensed pattern. He does apply Ethephon to these varieties at a reduced rate (see *Table 1 below*) to condense the harvest if there is a project that is to be conducted in these blocks, such as limb removal.

Rick said it is his intention to continue using Ethephon as he has found it to be a very beneficial tool in condensing his

harvest and thus providing savings in on-farm costs and maintaining kernel quality.

MPC's new system at Alphadale— a major step forward for growers

By Kevin Quinlan

With the acceptance of partially dehusked and/or unsorted NIS at MPC's factory, it is timely to look at how the system works and what growers are saying.

Background

MPC's focus on quality is vital for the long-term success of our growers and the industry. It's all about delivering consumers a nut with a smooth buttery taste and good crunch. If consumers have a good eating experience they will want our product, and if they want it, we are on our way to a bright future.

The key to delivering a good eating experience is to get mature macadamias from the tree as quickly as possible picked, dried and stored in a nitrogen flushed and vacuum packed bag.

Moving macadamias quickly through the supply chain improves quality, and by not having to sort nuts and store for long periods on-farm, there are cost savings for growers.

How does it work?

The new system allows growers to deliver a range of product types:

- Harvested and on-board dehusked
- Harvested, on-board dehusked and then rock sorted and dehusked (no sorting)

- Harvested, dehusked and quickly sorted
- NIH to the HWNS that is dehusked only, then sorted at MPC (at a cost of \$0.06/kg of delivered weight)
- NIH to the HWNS that is dehusked and sorted if it has high levels of gross rejects (at a cost of \$0.16/kg of delivered weight).

All of the above types of products must meet MPC's delivery specifications to be accepted.

How does MPC treat my product?

When you make a booking at MPC, Ron asks you what type of product you have to deliver (*partially dehusked, unsorted etc*). This information is used to guide the processes it will need to undergo.

Once received at the factory, an assessment of the product is made and if it looks good then it will be sampled the same way as in past years. The samples will be sent to the NIS laboratory, dried, cracked and the kernel assessed.

If the delivery contains NIH or needs sorting, then the processes required (*trash removal, dehusking sorting etc*) are undertaken. This is performed on large samples to make the system work efficiently.

MPC has invested in new colour sorting technology (*much improved technology*) that removes gross defects very efficiently. These machines are new to the macadamia industry and coupled with the improved kernel colour sorters in the factory, the sorting efficiency has been greatly improved.

Results

Figure 3 shows average total reject levels in consignments for the first three months of the season. You can see the reject levels for 2012 are similar to those of 2009 and considerably lower than 2011.

With most growers now moving to only dehusking and sorting NIS quickly, this is a good result. Figure 3 really highlights why MPC is convinced that our approach is the right way to go.

Why does the new system work?

Growers who have recently delivered their NIS to us with little if any sorting have been surprised at how good their

Table 1. Ethephon Rates used at Rick Paine's farm

Variety	Rate Ethrel® 480 (ml/100L)	Non-Ionic Wetter Rate (ml/100L) (Agral® 600)	Rate of Mixture per ha (L)	Comment
A16	200	12.5	1750	
A4	70	12.5	1750	
849	200	12.5	*1500	*Smaller trees
344	80	12.5	1750	
741	80	12.5	1750	

NOTE: Rates quoted are all for Ethrel® 480

results have been. Why?

There are many reasons, but it comes down to a few key things:

- Growers produce good quality in the paddock and this is being maintained by the speed through the system
- By removing the need to sort on-farm, the possibility of removing good nuts has been removed.
- It is hard to sort NIS to make big changes to the overall returns from a consignment. To reduce your reject level by 1%, you need to remove 30kg of reject NIS per tonne. This is a fairly daunting amount and if you have the quality right in the paddock, will you be removing anywhere near this amount?
- Reduced storage time has reduced the possibility of inducing defects from storage such as discolouration, mould and internal discolouration (Brown centres).

Grower feedback: Kim Wilson – General Manager, Gray Plantations
Gray Plantations owns and manages 25,000 trees in the Lismore area. This season they have chosen to change the way they manage their dehusking and sorting operation as a result of the changes at MPC.

The old way: Previously all nut would be brought in off the harvesters partially

dehusked (*using on-board dehuskers*) and the nuts would be put over a manual rock sorting table (*requiring a person to remove rocks and sticks from the nuts*), dehusked, hand sorted and then put through a water sorter.

On the first round all nuts would be resorted. For the second harvest round onwards nuts would be tested and only resorted if required.

The new way: In 2012 Kim is now bringing in partially dehusked nuts to his shed, running them across a manual rock sorting table, putting them through a dehusker and into the silo. There is now no manual sorting of the nuts after dehusking and no water sorting.

Kim has decided to still put the nuts through his shed for a few reasons:

1. He is unable to ensure the harvesters achieve a dehusking rate of 90% or more;
2. To consolidate nuts for a delivery he needs to put them in a silo and so they need to pass through the shed to do this anyway.

Kim believes the new system is fantastic. "In the past we would have up to three people in the shed working. Now we have one person on the rock table and the nut is going past them much quicker. So that's a big saving to start with."

The worker is in the shed making sure all belts, dehuskers etc are running

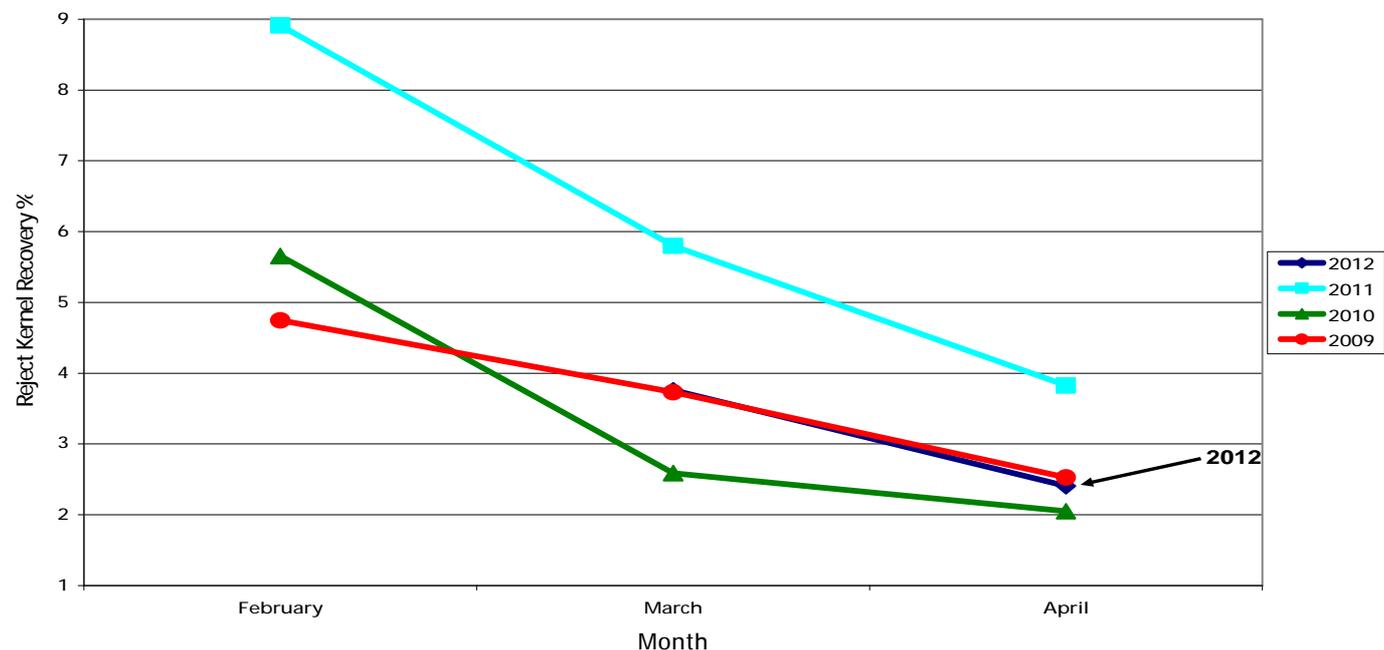
correctly. They are at the rock table, pulling out the biggest rocks and sticks so they don't go through the dehuskers and cause damage.

Major savings: Kim has found there are significant cost savings. "In the past it would cost us about \$0.15/kg to dehusk and sort nuts per kilo at 10% MC. Based on what we have run through this season we are finding it to be around \$0.05/kg. On a 300t crop we are looking at saving \$30,000. This is a huge saving to us."

Changing the way things were done was a real leap of faith for Kim. "I walked past the sorting table the other day and saw heaps of nuts going across. I stopped and started to pull rejects out. I had to tell myself I didn't need to do it anymore and that I should walk away from the shed. Old habits die hard but this a better way of doing things."

To assess the level of nut in husk remaining after the quick dehusk, Kim found a useful way to work it out. "When we first started I thought, there is a lot of nut in husk, way more than 10%. So I stopped the belt, put a lug bin upside down over some nuts (to get a sample) and then counted the NIH and dehusked nuts. I found that what I thought was lots of NIH was less than 10%. After all these years of training ourselves to see the bad nuts on a table and pull them out, to now letting them go, is hard work."

Figure 3. Total Reject levels for first 3 months of the season 2009-2012



And the results? "This season the quality has been really good. Currently we are averaging 2% reject – a good result, considering there is no sorting."

Kim believes the new system has shown that quality is made in the paddock. "Without sorting, to achieve 2% reject is impressive. It highlights if we focus on producing a good quality product in the paddock then there is little we need to do after that point except for harvest it quickly."

Grower feedback: John Gough, McLeans Ridges

John Gough owns and manages his own mixed horticultural crop farm at McLeans Ridges. This season he has tried a few different options and has found that the new system introduced by MPC is the way to go.

The old way: In the past John used to use the traditional dehusk, a quick table sort and then water sort prior to loading nuts into a silo. After the nut had dried down he would bring the product back out and do a final hand sort prior to sending the product to the factory.

The new way: Now the system has changed. "I now bring the nuts in, dehusk them, pull out any that weren't dehusked and any obvious damage on the table. There is no longer a water sorter used and I don't do a second sort".

Like many growers, John was unsure if the new system without sorting would work. "Initially I was a bit skeptical so I tried two ways of dealing with the nuts - putting it through the traditional way of sorting it twice and then I did a batch only sorting it once. When I sorted it twice I pulled out about 20kgs. When I got the consignment results back, it showed there wasn't any real difference in the quality of the nuts either way I put it through my shed."

John has found by focusing on ensuring nuts are dehusked and obvious rejects are removed he can save large amounts of labour. As he has a mix of crops to deal with on the farm, labour management is a major issue for him.

Major savings: John estimates he will save between 60-75% of his labour hours by only dehusking and quickly sorting nuts compared to the old way.

From his experience with other crops John knows the quicker you harvest and

get product to the consumer, or in the case of nuts, dried and into storage, the better the eating quality.

"My priority is now to harvest as quickly as I can. In a wet year when we have small windows of opportunity to get out and harvest, not having to stop to resort nuts is making a huge difference. I'm focusing on harvesting when I can as I know this gives nuts the best shelf-life".

Conclusion

So far we have only received positive feedback about the new ways you can deliver product to MPC.

Often people ask: "Why has it taken so long?" or "Why did we invest in all the dehusking and sorting equipment on farm if you were going to introduce this system?"

The answer is technology. Ten years ago and even five years ago the technology simply didn't exist. Now it does so we are introducing it.

The NIS consignment quality results from growers who are now only dehusking, or dehusking and quickly sorting, are good and no different to what we have seen in other seasons.

It must be remembered that good quality comes from "getting it right in the paddock", and then moving it quickly through the supply chain. As one grower said "You can't make a silk purse out of a sow's ear". I think it's very true for macadamias.

MPC Farm Chemical User Refresher Course

MPC is conducting the 2012 refresher course for all growers and staff who have a certificate that expires at any time during 2012.

Course date: 13th November, 2012.

Venue: MPC Board Room

Time: 8.30am to 12.30pm

RTO: TAFE (Wollongbar Campus)

Cost: \$120.00 to TAFE (Wollongbar Campus)

RSVP: To Tracey at MPC reception on 0266 243900 by 26th October to allow time for TAFE to mail documents to participants. The documents are to be completed and returned at the course.

FOR SALE

Tow beside 2.0m harvester - complete with hydraulic pump and oil tank attached to three point linkage forks. NIH is placed into a field bin positioned on the forks. Attaches to most tractors. Would suit a small orchard. \$5000.00



Trailer—heavy duty, suited to transporting a RobMac harvester, nut bins or similar. 750x16 wheels and HD bearings. Registered. No brakes. \$4000.00



Contact Ross Frederiksen—0414 295 366



Sweeper - Lismore Engineering (Bill Farrell) model, in as new condition. Hydraulically adjustable to 2.5-3.0m past the side of the tractor. \$3500.00



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