

# **GROWING SUCCESSFULLY AND SUSTAINING THE LAND**



CASE STUDIES OF GOOD PRODUCTION, ENVIRONMENTAL  
PRACTICE and INNOVATION BY LOCAL PRODUCERS

## **BYRON SHIRE SUSTAINABLE AGRICULTURE STRATEGY**

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## **ACKNOWLEDGEMENTS**

The case studies have been compiled by Joanne Walsh of Walsh Environmental Management Services, in collaboration with the case study participants. It has been a pleasure to talk with each of the participants and I thank each person for their time, patience and enthusiasm for telling their story.

**Cover photo:** Dave Forrest's property at Federal

## TABLE OF CONTENTS

INTRODUCTION .....	1
PORK PRODUCTION .....	3
SUGAR CANE .....	6
ORGANIC MACADAMIA NUT AND RAINFOREST FOOD PRODUCTION .....	9
LOW CHILL STONE FRUIT .....	13
RAINFOREST FOODS .....	16
MACADAMIAS .....	19
BANANAS .....	22
BEEF CATTLE PRODUCTION .....	25

## ***INTRODUCTION***

Each piece of land has its own unique features. Each producer approaches production and land management in his or her own distinct way. It is clear there is no one 'recipe' or standard approach to production and land management for a particular enterprise or piece of land. The case studies demonstrate this.

The producers in the following case studies come from diverse backgrounds and experiences. They range from second and third generation farmers to those who have come to farming after other careers, completely unrelated to agricultural production.

What these producers have in common is a passion for what they do and for doing it well. These case studies provide real life examples of how the Shire's farmers intrinsically link production and natural resource management considerations in their every day operations for better environmental and production outcomes.

### **PRODUCTION SYSTEMS IN BYRON SHIRE**

The main and emerging enterprises in Byron Shire are the following

#### **Animal production**

Housed

Pigs

Poultry

#### **Grazing**

Beef cattle

Dairy cattle

#### **Horticulture**

Macadamias

Bananas

Avocados

Low chill stone fruit

Coffee

Herb and vegetable production

Nursery

#### **Broad acre**

Sugar cane

#### **Others include**

Bush foods

Oils and essences

Mixed enterprises

The case studies included here cover producers working in the following enterprises

- John Singh and pork production,
- Kevin Archibald and sugar cane,
- Dave Forrest and organic macadamias and native raspberry production,
- Ray Hick and low chill stone fruit,
- Greg Trevena and rainforest foods and value adding,
- Rex Harris and macadamias,
- Peter Molenaar and bananas, and
- Ken Murphy and beef production

For each production system this document provides

- a snap shot of the industry and standards for good practice and environment management; and
- the individual case study

It is envisaged that further case studies will be added to this document over time.

## ***PORK PRODUCTION***

According to Tweed-Richmond Rural Lands Protection Board data for 2002 there are 21 properties (with greater than 10 pigs) in the Shire with a total of 5202 pigs, including 500 breeding sows and gilts. Value at slaughter in 2000/01 was \$1.7 million (ABS).

The majority of piggeries use conventional water based production systems. Nevertheless, deep litter housing systems now form a significant part of the Australian pig industry, and will probably continue to increase in the short to medium term<sup>1</sup>.

Guidelines and other initiatives for the environmental management of piggeries include:

- Kruger, I., Taylor, G. & Ferrier, M. *Effluent at Work*, Australian Pig Housing Series. (NSW Agriculture, 1995)
- ANZECC & ARMCANZ *Effluent Management Guidelines for Intensive Piggeries in Australia* (June 1999)
- Environmental Management Plan (EMP) for Piggeries

A training package for practical environmental planning and monitoring has been completed by Australian Pork Ltd and is available for producers. It is designed to equip piggery managers with the skills to develop and implement an EMP based on risk assessment principles.

The major environmental issues for piggeries generally include odour and effluent management.

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### **JOHN SINGH, BYRON BAY PORK, COORABELL**



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<sup>1</sup> Payne, H; van Barneveld, R & Chenoweth, V. Alternative housing systems in Australia (2002) Proceedings of Update 2000 Australian Pork Limited Conference

### ***Byron Bay Pork***

John Singh has been raising pigs at Coorabell for 28 years. He also operates other piggeries in the Shire and manages pigs for other pork producers.

In 2000, John Singh, together with business partner Ian Brazier, commenced a new pork venture at Coorabell targeting opportunities for high quality Australian pork in Asia.

John and Ian trade as “Byron Bay Pork” and their speciality is 100% purebred BerkShire pigs. BerkShire pork is considered by many to be the “Rolls Royce” of pork. It is a fine textured marbled pork with ‘magnificent’ eating qualities.

Byron Bay Pork’s pigs are processed at the Northern Cooperative Meat Company’s Booyong Abattoir in Byron Shire. Booyong is an AQIS (Australian Quarantine and Inspection Service) registered plant with a well-established reputation in major domestic and export markets.

Byron Bay Pork upgraded from a conventional intensive piggery housing system to a straw based dry bed system because of the improvement in animal welfare and pig performance.

Dry sows are housed in large sawdust and straw floored sheds that can be opened or closed to take advantage of the seasonal changes and the prevailing weather. By the way, these pigs have one of the best views of the Bay in the Shire.



The deep litter beds consist of a compacted road base covered with 15 cm of sawdust topped with barley straw. Feed and drinking points are outside the shed. The pigs access the feed and water through openings in the walls. This, ensures water and food do not come in contact with the straw bed.

The pigs enjoy living in the straw-bedding environment, playing with and often eating the straw and displaying their natural behavioural tendency to "nest".

The sheds are cleaned out 3-4 times a year. Each clean out produces about 100 m<sup>3</sup> of material that is used as a soil conditioner on horticulture enterprises in the Shire.

According to John and Ian, changing to the dry bed system has had a number of advantages (below).

- Significantly less water usage over conventional systems
- Reduced odour to very little odour at all because of reduced effluent generation
- Happier, healthier pigs with bigger litter size and increase in birth weights
- Cheaper to operate

John and Ian still operate conventional systems in their other piggeries, but they say they would use dry bed systems in any new operations.

## ***SUGAR CANE***

There are 18 sugar cane growers in Byron Shire covering an area of approximately 750 ha. The Sugar Milling Cooperative was formed when growers purchased the three NSW mills in 1978. The cooperative nature of the industry has great advantages for developing an industry-wide approach to production and environmental issues.

The growing of sugar is not cultivation or pesticide intensive. Each planting of sugar cane provides two to three crops, with the first harvest after 2 years. As such only once in every 5 –6 years is land cultivated prior to the establishment of the new crop. Generally only at the planting of a new crop is pesticide use required for the management of black beetle.

Many of the by-products of the milling process are utilised. The fibre (bagasse) from the cane is used to fire the mills' boilers. Mud extracted from cane juice and fly ash from the boilers are mixed and recycled onto the farms as a soil conditioner and fertiliser. Another by-product, molasses, is sold to farmers as a valuable feed supplement for dairy and beef cattle.

The major environmental issue for sugar cane production in the Shire (and the region) has been the management of acid sulfate soils (ASS). The industry recognised the importance of being proactive about ASS management and worked closely with government, local authorities and research bodies to develop *Best Practice Guidelines for Acid Sulfate Soils* and establish a self-regulation approach to managing the issue.

Part of this process included the individual assessment of each of the 700 sugar cane farms in the region for ASS and development of individual farm plans for ASS management including drainage management. This has led to drains becoming shallower, use of laser levelling for improved drainage and drains being filled in.

The NSW Sugar Industry was awarded the RiverCare 2000 Gold Award in 1998 for their project "Reducing the Outflow of Acid Sulfate Soils in NSW Canelands". These awards recognise the highest standards of work carried out by community, education and business groups to improve water quality and river restoration

The industry has been also been researching techniques for green harvesting to reduce burning.

The industry has developed a self-assessment workbook called *COMPASS* so that farmers can assess their performance in all areas of production and environmental management.

Additional information for growers include *Soil Management for Sugarcane* (NSW Agriculture 1999) [www.agric.nsw.gov.au](http://www.agric.nsw.gov.au)

(information sourced in part from Sunshine Sugar website [www.nswsugar.com.au](http://www.nswsugar.com.au))

## KEVIN ARCHIBALD, MULLUMBIMBY



Kevin has lived in the Mullumbimby area since the early 1950s. His parents grew bananas at Palmwood and also operated a small piggery there. The property where Kevin now grows sugarcane was first bought in the 1970s as grazing land and for grain production for the piggery. Grazing continued on the property until the 1980s.

Kevin had been working as a cane cutter at Crabbes Creek when the Condong Mill expanded and Kevin decided that sugar cane farming was a viable proposition. Kevin now grows sugar cane on 80 ha at Mullumbimby.

Kevin has been involved in the industry program for sampling and assessment of ASS on sugar cane properties. ASS is not a major problem on his property and where problems existed these were 'engineered out' by filling in the deeper drains and making others shallow and therefore above the ASS layer. Management of the drains is done in accordance with the industry's best practice guidelines.

Kevin understands his property very well. He knows where different soils are located on the property, generally coinciding with different levels of the land. The soil changes from a fairly heavy clay to a loam across the property. Kevin uses different sugar cane varieties that are suited to the different environmental conditions. He uses 10–12 varieties of the 20 approved varieties for the area. According to Kevin the additional advantage of using a number varieties reduces the risk of the 'monoculture effect'.

Kevin finds he only needs to use insecticides, for black beetle, once every 5 – 6 years, prior to the establishment of the new crop of sugar cane. Similarly, cultivation is only generally required in preparation for the new crop. Mill mud is also spread at this time, providing nutrient and organic matter for the new crop.

Rats can be a major problem in sugar cane fields. They are best managed by keeping the drains and headlands free from grass seed by spinning or mowing, or spraying if necessary. According to Kevin it is important to stop the grass from seeding because the rats need the protein in the seed to breed. Keeping the grass from seeding keeps the rats from breeding!

Kevin sees the retention of trash as positive for maintaining organic matter in the soil, though there can be problems with this in the more low lying areas where it can remain wet and cold and prevent the cane from 'ratooning' – reshooting and growing again.

The soil-testing regime for pH and nutrients is triggered either by crop visual assessment and/or at the time of crop renewal.

Burning, when required, is carried out only under the most appropriate conditions such as at night or evening when prevailing winds are suitable.

Kevin has found that by understanding and managing the natural features of his land, particularly the soils and elevation, it has made management more practical and provided him with better financial returns as a result.

## ***ORGANIC MACADAMIA NUT AND RAINFOREST FOOD PRODUCTION***

Organic farming is agricultural production without the use of synthetic chemicals or genetically modified organisms. Soil is central to this system of farming with soil health critical in producing products without the use of artificial fertilisers and pesticides. Organic farming emphasises a holistic farm management approach, where rotations and animals play an integral role to the system.

Organic certified produce means that it has been grown organically as well also harvested, prepared and transported in systems that guarantee that the produce is not contaminated in any way. Organically produced foods mean that the product has been produced in accordance with organic production principles from farm gate to the retail outlet. To guarantee the product is organic it must be labelled as 'certified organic' with the registration number and certifying body's name.

The National Standard for Organic and Biodynamic Produce is the minimum standard for agricultural products and foods to be exported as organic produce. AQIS administers the National Standard. This standard is used as a domestic market regulator and all major markets require products to be certified.

Accredited certifying bodies are licensed by AQIS. These bodies include Organic Herb Growers of Australia, National Association of Sustainable Agriculture (Australia), Biological Farmers of Australia Cooperative and Bio-dynamic Research Institute.

According to NSW Agriculture, annual growth in the domestic organic retail sector has been in the vicinity of 20–30%. However, some wholesalers of organic fruit and vegetables have recently reported a 60% increase in turnover in the past 6 months.

It is the fastest growing niche food market opportunity in most developed countries in the world, including Australia and Australia's current and potential trading partners according to Queensland Department of Primary Industries.

The Tweed Richmond Organic Growers Association is the local growers group. It has been instrumental in establishing the Rainbow Markets, the organic markets held weekly in Lismore.

(information derived in part from the websites of NSW Agriculture and Queensland Department of Primary Industries)

## DAVE FORREST, FEDERAL



Dave Forrest has always been interested in organic production and growing native produce. Starting in 1978 with a small goat herd supplying specialist cheese, milk and yoghurt to health food stores from Lismore to Kyogle and Murwillumbah he now grows native raspberry, macadamias and coffee as well as Davidson Plums, along with a range of other fruits such as paw-paw and bananas.

Dave and the family also do some value adding, marketing under the name 'Organic Forrest'. The produce includes macadamia butter, native raspberry and Davidson plum jam and coffee and it is all certified organic, audited by the Biological Farmers Association Australian Certified Organic.

Prior to Dave and his partner buying the property at Federal in 1978, the property had been a dairy and then ran beef cattle. When they took over the property there were only 4 large native trees and acres of weeds. Using the goats to clear the camphors and other weeds on a paddock-by-paddock basis, Dave and his partner set about to reforest the property.

### *Reforestation*

Initially 10,000 eucalypts were planted for a potential resource but primarily for the local environment. At the time there were no native rainforest tree stock in nurseries and plant establishment techniques were not well understood. Dave recalls that local reforestation associations were formed to source species from the wild and to work on developing and improving plant establishment techniques.

At the time State Forests had a seed bank at Coffs Harbour and was helpful in supplying seed. At that time availability of supply was limited to 14 different varieties of eucalypts, Hoop pine and Bunya only.

Over the next five years a wider range of species became available and nursery practices improved. Dave has subsequently established another

25,000 native trees that he says are now providing a good habitat for beneficial insects, animals and birds.

### *Production*

Dave put in the first 200 macadamia trees in 1985. He now has 1600 trees, up to 16 years old. In 1989, he started growing the Atherton Native raspberry. Until the drought of 2002/03 there was up to 3 ha of raspberries under production. These were the only successful commercial plantings of native raspberries in Australia (and the world!). Dave primarily sold on the conventional market through Sydney with some very limited sales to local hospitality markets.

In the early years the raspberries provided the cash flow to set up the infrastructure for the macadamias. Nevertheless, at full production the raspberries provided a similar return to the macadamias. Unfortunately, the drought decimated the raspberries and Dave is now moving to develop his interest in coffee production.

### *Managing the farm*

According to Dave, organic production is about soil health, and biodiversity, and integration of all aspects of the farm. For example, the raspberries were seen as a 'short term crop' to make use of the land under and around the young macadamia trees but the berries also provided shade for the soil and thus maintained soil moisture for the macadamias. They also acted as a 'weed mat' keeping weeds down where otherwise they would grow. Once the macadamias trees matured the berries were removed and under tree management included establishment of a ground cover and use of compost.

Soil health is maintained by the use of compost and mulch. Dave makes compost from chicken litter and sawdust and macadamia husks are also used as mulch, though not for macadamias. According to Dave, good quality compost allows the myriad of soil organisms to flourish and develop healthy soil, while also improving the physical condition and mineral balance. These changes are incremental and continuous and gradually reduce the need for inputs, don't leach nutrients into groundwater and creeks and make the soil more resilient to erosion. NSW Agriculture testing has shown Dave's soil to be healthier than conventionally managed farms tested in the region.

A major issue for macadamia production is the loss of groundcover under mature trees. Bare soil is easier to harvest from but is prone to erosion so maintaining a good ground cover is important. Dave manages this by pruning trees to let in sunlight and uses ground covers that are shade tolerant and no herbicides. He also maintains inter row vegetation and slashes this for mulch seasonally.

Pests and disease are controlled by a variety of means including plant management through maintaining biodiversity on the property and keeping healthy plants. According to Dave by providing biodiversity you provide a range of habitats for range of beneficial organisms that can help compete with those organisms that affect production. By keeping your

plants healthy, supported by healthy soil, they are also better able to fight any disease, just like humans.

Dave also uses biological control release programs as part of his pest control program. He uses organisms that are predators of pest insects. For example he releases Lacewing that lays eggs in newly hatched larvae of pest caterpillars. To keep these 'beneficial' bugs in the area they need a good supply of nectar. The varieties of native species that are part of the extensive plantings on the property provide this. Disease causing fungi are managed by inoculating and feeding natural microbes into the trees, thus competing with the pathogens, without using poisons.

Grazing animals are also part of the integrated management of the farm. Dave has kept sheep and goats to manage ground cover, recycle nutrients and kept the weeds under control, without the use of chemicals.

According to Dave, in production horticulture, soil, microclimate and biodiversity are key factors in sustainable current and future production. The relationship with consumers of that production is also critical to financial success. Being a certified organic grower audited to a set of worldwide standards ensures that the production systems are environmentally sound, the produce is nutritious and that there are no harmful chemical residues. This allows consumers to support farmers, who make the extra effort and expense, to be financially sustainable as well.

Dave believes industrial agriculture is heavily reliant on the continuing use of chemical pesticides and chemical fertilisers which are energy expensive and dangerous to produce and use, pollute the local environment and produce 'virtual' foodstuffs with residues of these materials. He says as a graduate horticulturalist, he has been aware of the many problems that regulated chemicals pose to farming families.

Dave says, " we live integrated into the farming environment, swim in and drink the water from the farm and roof catchment, so I cannot risk harm to my family and neighbours from the use of these chemicals. We farmed this way before organic certification gave the opportunity to partner with consumers, and we are able to make as good a living as those using chemicals, so why use them?"

## ***LOW CHILL STONE FRUIT***

There are 22 low chill stone growers in Byron Shire producing both nectarines and peaches, on approximately 40 hectares. Production is generally based on the red soils of the hinterland areas of the Shire. The main areas of production are Bangalow, Tyagarah, Coorabell, Myocum and Mullumbimby.

The average size of a farm is 2 – 5 ha with 2-3 ha being a viable size for an enterprise. 1000 – 1000 trees are planted per hectare depending on whether palmette or vase shaped trees.

The main issues for stone fruit production in the Shire are rural residential encroachment and associated complaints regarding noise and spraying, flying fox and bird predation and the use of netting, use of chemicals particularly for fruit fly control for market access, and access to water.

There are currently no specific guidelines for the industry. NSW Agriculture produces an annually updated Orchard Plant Protection guide. The Low Chill Stone Fruit Association has produced a Spray Calibration Kit and conducts chemical users courses for all growers.

The industry promotes the use of netting as the only viable long-term approach to management of fruit bat and bird predation.

Use of a inter row cover crop is recognised as industry best practice to prevent soil erosion.

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### **RAY HICK, HEAVENLY VALLEY FARM, BANGALOW**



### **Heavenly Valley Farm**

Heavenly Valley Farm is a 36 ha property located on the Pacific Highway just south of Bangalow. When Ray purchased the property in 1991 there was only 1100 stone fruit trees and the rest of the property was open paddock. It had been an orchard for 25 years and before that it was a dairy farm. The turnover of the orchard in 1991 was \$30,000.

Heavenly Valley Farm today has 3500 peaches and nectarines (2000 mature trees and 1500 less than 2 years old) on approximately 8 ha and is fully netted. There are also 500 lime trees, 150 lemons, 500 mangoes, and 300 imperial mandarins and 1000 macadamias, the latter are not yet producing.

The orchard is irrigated, there are packing sheds and graders and it is now a viable enterprise grossing in excess of \$200,000 annually and supporting three families.

When Ray bought the farm he was not a farmer. He came from a business background and his philosophy was that this was a business and margins had to be addressed. Though he was intimately involved in the reshaping of the property he initially had a manager running the orchard for 5 years. In 1997 he decided he either needed to sell the orchard or retire and 'take it on seriously'. Ray, as he puts it, opted for 'the lifestyle change'.

Ray commenced to do a stock take of the output of the orchard by looking at the volume and size of the fruit and therefore the return. When he took it over it produced only small fruit and he recognised the future was in producing bigger and better fruit. This approach coupled with establishment of the lime and lemon orchards has enabled him to employ a manager and another employee on a full time basis, rather than the latter seasonally.

He also invested in infrastructure such as netting, packing sheds, fruit graders and cool rooms and developed a 3-year business plan with budgets.

Most importantly, according to Ray, he also seriously set about to understand how the orchard worked and why certain things were done. He took what he calls 'the shop floor approach'. Heavenly Valley Farm's approach to production is systematic. The whole orchard is assessed tree by tree to determine how much fruit per tree will be produced for the season and this then determines the pruning regime and the number of laterals per tree which then determines both fruit number and size.

Ray says if you understand the output that the tree is capable of then you can manage the orchard accordingly. It is simply about understanding the business - how trees produce- and knowing how to influence it.

Ray keeps records of the orchard management regime and statistics of annual production. He has realised the benefits of improving tree management by the steady increase in the price per tray of fruit.

The operation obtained Quality Assurance Certification under ISO 9002 including HACCP in 1999.

In terms of land management practices Ray's philosophy is that you are not doing good business if you are not also managing your natural resources.

Ray has attended NSW Agriculture's Waterwise on the Farm workshops and completed an Irrigation Drainage and Management Plan to upgrade and expand his irrigation systems to make it more water efficient.

In relation to chemical use he is required to carry out a specific program for fruit fly in order to access the Victorian markets. Ray has attended the Chemical Users Course, keeps a chemical use diary and sprays when atmospheric conditions are conducive eg; appropriate wind direction and speed.

Soils are tested on an annual basis for production purposes. A combination of conventional fertiliser and organic soil conditioners, such as worm castings are applied. The latter is utilised to help build up the biological activity of the soil.

When he took over the property much of it was infested with lantana and there was some serious erosion in the front paddocks. The lantana and other weeds have been slowly removed and property border plantings with rainforest trees. One part of the property still holds a small remnant of the Big Scrub.

Potential under tree erosion issues are managed by the use of hay bales when removing or putting in new trees, under tree areas are mulched and grass is maintained between rows.

Ray is currently developing a *Code of Practice for Responsible Farmers* to be used by his marketing group in the first instance. The best management practices cover planning and planting a new block to how to dispatch fruit to market as well as water, waste, soil and biodiversity management, amongst others.

## ***RAINFOREST FOODS***

There are 4 producers of rainforest foods in Byron Shire producing on 3-4 ha. These properties are located at Goonengerry, Possum Creek, Nashua and Federal.

Over 40 edible plants/plant products naturally exist in Byron Shire. Native foods have no overseas competition and are seen as new, interesting and uniquely Australian.

Native plants can also be used in the production of essential oils for perfume, medicinal and culinary industries and are alternatives for imported oils.

Crops grown include riberry, Davidson Plum, finger limes, small leaf tamarind, lemon aspens and lemon myrtle.

These plants have the advantage of being local species ideal for local conditions and can generally be grown free of chemicals.

Byron Shire is an important hub in Australia for native food production and marketing.

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### **GREG TREVENA AND RAINFOREST FOODS**



Greg Trevena is passionate about rainforest foods, their production and marketing.

Greg's company values are

- |                |                                                                                                                  |
|----------------|------------------------------------------------------------------------------------------------------------------|
| Flavour        | To produce the most wonderful, satisfying and unique flavours which originate from the rainforests of Australia. |
| Affordable     | To produce products that are priced affordably and realistically.                                                |
| Choicest Fruit | The secret to any good food product, Rainforest Foods uses only the freshest, ripest fruits.                     |

- Plantations            Fruit is exclusively sourced from rainforest plantations, leaving remnant rainforests alone.
- Chemical Free        To encourage plantations that mimic nature as much as possible by avoiding man made chemicals, sprays and irrigation.

Rainforest Foods began with current owner Greg Trevena experimenting with fruits from rainforest trees in and around the Byron Bay area in the mid 1990's. Fruits were collected on the basis of advice and suggestions from local people who had 'played around' and consumed the various fruits for many years, some of their knowledge was also sourced from local indigenous knowledge.

In April 1998 Rainforest Foods commenced its own plantation just 20kms from Byron Bay. The plantation was planted to supply the company with the fruit it required and also to demonstrate to others a natural, attractive alternative to food crop production. The plantation has never used man made chemicals or irrigation, also the plantation attempts to mimic nature by avoiding monoculture and instead a mixed plantation has been planted which is closer to how you would naturally find the trees in the wild.

Rainforest Foods commenced officially trading in late 1998, and within a few months its flavours were recognised by the local media, and not long after that by the national newspaper "The Australian".

Greg now sources rainforest foods from other growers in the Shire and beyond.

Rainforest Foods website\* details the range of products and a description which include

- Riberry Jam (Lillipilli jam) - like boysenberry and ginger
- Riberry Chutney - excellent on BBQ meats, seafood and as a dip
- Davidson Plum Jam - for those that don't like overly sweet jams
- Davidson Plum and Sweet Chilli Sauce -great for meats, satays, dips, seafood
- Rainforest Raspberry Jam - better than normal raspberry jam
- Macadamia Butter - a healthy alternative to peanut butter
- Lemon Myrtle (Herb) - one of the most beautiful herb fragrances ever!
- Lemon Myrtle Honey - a honey above normal honeys
- Small Leaf Tamarind Jam - people who like tangy, tart flavours will love this jam
- Finger Lime Marmalade - if you like marmalades, you'll love this one.

Greg has another range of products called Rainforest Delights, which include

- Lemon Myrtle Soap
- Lemon Myrtle Shower Gel
- Lemon Myrtle Body Lotion
- Lemon Myrtle and Macadamia Massage Oil
- Lemon Myrtle Body, Room and Pillow Mists

Greg says that after 5 years of business and marketing he has found that his products have sold very well in Byron Bay, the Shire and the Northern Rivers area. He believes they have sold well locally because locals are aware of the uniqueness of the plants to the Shire and they often buy them as gifts for people outside the Shire.

He says they also sell well with tourists who come to the area looking for unique products as souvenirs.

Greg recognises the difficulty in developing the products beyond the local area because of the size of his production and ability to market in distant locations due also to the size of his business. Nevertheless, the export market is beginning for Rainforest Food products and Greg hopes this will provide an opportunity to spread the word about Byron Shire's unique local produce.

Greg thinks that an effective tool for marketing his products and those similar would be a Thursday Plantation type of facility, which would be a focus for locals and tourists alike providing tours of plantations or trees in the wild, a place to consume local native produce and to buy products.

Greg's greatest fear is the potential loss of these unique plants that cannot be found readily in other parts of Australia and of course nowhere else in the world.

According to Greg the cultivation and production of rainforest foods and their products is still an infant and fragile business that needs much more research and development if it is to survive.

\*the information above has been derived in part from the Rainforest Food website [www.rainforestfood.com.au](http://www.rainforestfood.com.au) with the permission of Greg Trevena

## ***MACADAMIAS***

According to the ABS 2000/01 Agriculture Commodity Census for the Shire, there are 71 macadamia producers with 297,970 trees. 2,073,067 kg of nut was produced in the Shire from 60 growers with a market value of \$4.75 million.

According to the industry farm sizes range from 3 to 150 hectares with an average size of about 15 ha and a viable size of about 25 ha. The majority of farms are located in the Federal and Bangalow areas. There are 4-5 processors in the Shire with one company processing nuts from 215 producers in the north coast region.

The main environmental issues for the industry have included pesticide use, noise and soil erosion. Industry research and development has focused on land use practices such as management of soil to minimise erosion, integrated pest management and the selective use of chemicals.

There has been substantial research into the use of shade tolerant groundcovers that assist in the prevention of soil erosion and a demonstration site for soil erosion techniques has been established at Alstonville in cooperation with NSW Agriculture. In relation to integrated pest management (IPM), four-day courses in IPM at TAFE have been developed for the macadamia industry. The industry believes a significant number of growers use some form of IPM such as sampling for bugs and spraying hot spots rather than spraying as a routine operation.

NSW Agriculture has ongoing research programs in the areas of groundcover establishment through canopy management, biological control of nut borer parasite and evaluation of groundcovers to minimise erosion.

Guidelines for the industry include


- Code of Sound Orchard Practice
- Code of Practice for Noise Management of On Farm Processing of Macadamia Nuts, "A Good Neighbour Policy" (Draft 2003)
- Code of Practice for the Control of Spray Drift and Use of Chemicals in Macadamia Orchards, "A Good Neighbour Policy" (Draft 2003)

The two latter draft Codes Of Practice have been developed by the Australian Macadamia Society Ltd (AMS), in conjunction with Lismore City Council, NSW Department of State and Regional Development and Planning NSW (now DIPNR) and are available on Lismore City Council's website.

Other documents of relevance include

Agnote DPI – 331 *Reducing soil erosion and other soil degradation in macadamia orchards* (NSW Agriculture, Jan 2003)

Agnote DPI 332 *Amarillo peanut: a perennial groundcover for subtropical orchards* (NSW Agriculture Sept 2002)

(Information has been sourced from NSW Agriculture and )

## REX HARRIS, PICCADILLY PARK, BANGALOW



Piccadilly Park is a macadamia farm of approximately 80 ha located just south of Bangalow. The property is located on the red ferrosol soil or krasnozems.

Rex purchased the property in September 1998 and commenced on a program to remove large areas of camphors, lantana and privet. Following that he embarked on planting 16,000 macadamias, in addition to the 1,500 already established.

Since taking over the property 25,000 rainforest trees – 140 different species – have been planted along riparian zones and gullies. Some 6,000 *Lomandra hystrix* have been planted along creek banks and around dams. Some of the regeneration was funded by National Heritage Trust and done in collaboration with the Big Scrub Rainforest Landcare group.

One of Rex's aims for the property is to provide a large range of rainforest tree species to increase bird life. Currently he believes he has about 40 species but hopes to eventually encourage up to the 100 species or so that are found in the area.

Another of Rex's visions for the property is to provide habitat for Barn Owls and micro bats with the hope that the Owls and micro bats would assist with rodent and insect control. To this end, owl & micro bat boxes have been erected throughout the property, as have other bird boxes that have been built using old Macintosh computer cases.

Currently his pest management program is responsive to actual pest inspections by a IPM Consultant. So far the program has resulted in zero blanket spraying since 2001 and minute hand spraying to less than 10 trees since then.

Rex is also keen on improving the health of the soil at Piccadilly Park by keeping the soil in good balance and increasing soil microbe activity. He

believes healthy soil will ensure products. To date 350 tonnes of basalt rock dust and 160 tonnes of worm castings have been spread, as have applications of lime gypsum and trace elements. He is also working with the Soil Food Web laboratories to utilise soil conditioners produced at the Tryton Groups facility at Lismore.

Approx 100m<sup>3</sup> of compost will be produced each year and a 500 L 'compost tea' brewer has been set up to brew microbe rich teas for soil drench and foliar applications.

Soil is tested regularly for chemical analysis and microbe count. Leaf analysis is also carried out annually.

Rex seeks advice from a range of specialists including soil scientists, entomologists and rainforest regenerators.

# **BANANAS**

According to the 2000/01 Agriculture Commodity census in the Shire there are 28 growers in the Shire producing bananas on 241 ha. Plantation size ranges from 5 – 15 ha. Up to the end of the financial year in June 2001, 6911 tonnes were produced with an estimated value of over \$7M.

The NSW industry is currently going through a period of adjustment, with plantations changing from primarily the Cavendish variety to the subtropical ladyfinger variety. The NSW industry recognises the potential of the subtropical varieties that are better tasting, better looking and require less pesticides<sup>1</sup>. There are opportunities to secure a niche market for the NSW industry.

Bananas have been traditionally grown in the Shire on north facing frost-free slopes, plateaus and hilly outcrops on primarily red krasnozems (ferrosols) and red and yellow podsolic (kurosols) soils. Main areas of production include Palmwood and Mullumbimby Creek. There is a Brunswick Valley Banana Growers Association.

Environmental issues for the industry have been focussed around soil management particularly where plantations are located on steeper slopes, and chemical use.

Industry best practice recommends and encourages growers to maintain soil cover particularly at planting and clearing times. Once the crop is established it produces its own ground cover in the form of banana trash and spent stools. This acts as good ground cover.

The industry, in conjunction with NSW Agriculture, has developed a process for assessing and determining when chemical use is required to manage leaf disease. This process is called The Infection Points Regime. Based on weather station data that is provided weekly in the *Northern Star*, growers can determine whether the preconditions are present or not for fungal leaf disease. This information is presented in the form of infection points that is based on a mathematical formula incorporating temperature, rainfall and humidity. Once the points reach a predetermined threshold growers know that it is time to apply a pesticide.

There are a number of publications that address issues for the industry including

*Growers Guide to Sustainable Production of Ladyfingers Bananas in the Subtropics 2002*, NSW Agriculture  
*Soil Management for Bananas*, NSW Agriculture  
*What do good growers do?* D Peasley

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<sup>1</sup> Baker, Biggs & Peasley (1999) Making a difference naturally. Strategies for a sustainable horticulture industry in the Northern Rivers Region of NSW

## **PETER MOLENAAR, PALMWOODS**



Peter's family has been growing bananas at Palmwood since 1950. Peter took over the plantation in 1980 and has been growing bananas and avocados since then.

The property has approximately 10 ha of avocados and 10 ha of bananas. Peter is in a period of transition with his bananas, as is the majority of the NSW industry. With tougher competition from North Queensland for the standard Cavendish variety of banana, the local industry is moving into the production of subtropical varieties of bananas such as the Ladyfingers. Peter now has predominately Ladyfinger (7.4 ha), 2 ha of Goldfinger, 0.8 ha of the specialty dessert and cooking banana, Red Dacca, and less than 0.8 ha of Cavendish.

Peter's plantation is situated on a north to northeast-facing slope of the escarpment behind Main Arm. Due to the slope and soil types here, maintenance of ground cover is vital, according to Peter, for retention of topsoil and thus long-term viability of production.

Peter keeps banana trash on the ground, laid along the contour, and plants the inter rows with legumes in the first two years of production. All the main roads are concrete to ensure all weather access and to reduce erosion. Roads are on the contour where possible. Peter believes that investing time and energy in maintaining soils will keep them more resilient and this will create a buffer under tougher climatic conditions. Peter believes he saw evidence of this during the last drought where plant health was maintained even under those very extreme conditions.

The additional benefit of course is also that with less soil loss from the site there is less sediment finding its way to the creeks and into the Brunswick River.

Peter carries out yearly soil and leaf tests in order to determine a fertilising program for the following 12 months. He keeps a close eye on the soil pH level (acidity level) to determine if liming is necessary. Where possible fertilisers with a low acidifying effect are used throughout the season. Peter uses some fertilizers e.g. potassium nitrate and calcium nitrate, that actually raise the pH so no liming is required.

Peter has an integrated approach to managing pests and disease. Along with keeping the soil healthy as discussed above and the use of more environmentally friendly fertilizers including organic fertilisers, Peter prevents the introduction of disease to the site for example by the use of tissue culture plants which are clean and disease free.

For the management of banana leaf disease, a fungal disease, Peter uses the Infection Point Regime. Collecting weather station information weekly he tracks the environmental preconditions - temperature, rainfall and humidity. This then helps Peter to determine if pesticide use is required. For other pests he also uses a combination of traps and visual assessment to determine if spraying is necessary. Peter also rotates the use of chemicals so as not to build up pesticide resistance.

When spraying is required Peter notifies his neighbours and sprays under the best of conditions such as low wind conditions that are usually early morning or late afternoon. Peter has a Chemical User Certificate ensuring that he is spraying in the safest and most responsible manner possible.

Peter has a long-term commitment to managing his production to maximize production, minimize environmental impact and maintain good growing conditions. He keeps daily records of his production practices such as pesticide use, use of fertiliser and other soil ameliorants such as lime and, of course, production records.

The operation is in the final stages of obtaining HACCP based quality Assurance Certificate.

Peter is the President of the Brunswick Banana Growers Association and a delegate to the NSW Avocado Growers Association. He is the NSW delegate on the Australian Avocado Growers Federation of which he is Vice President and grower representative on the Research and Development Committee.

## ***BEEF CATTLE PRODUCTION***

According to the information provided by the Richmond Tweed Rural Lands Protection Board for the year 2002/02, there are 638 properties in Shire carrying a total of 18,924 head of cattle, including dairy cattle. There are only 20 properties with greater than 100 head of cattle. Animal production, primarily beef production, still remains the largest land user in the Shire.

Land management issues for cattle production include, soil management, pasture production and overgrazing in particular. Grazing takes place across the Shire on all soil types and terrains, from the coastal lowlands of the Belongil Creek catchment where land drainage and acid sulfate soils can be an issue, to the red ferrosols of Bangalow that are prone to erosion if soil cover is not maintained. Other issues include stream bank erosion associated with cattle access to waterways and loss of riparian zone vegetation due to grazing.

Over stocking is discouraged by the industry and there is an increasing interest and appreciation of the importance of riparian protection where possible and the use of tree shelters for cattle and for the improvement and maintenance of biodiversity on properties.

The industry in conjunction with the CRC for Cattle and Beef Quality are investigating the use of dung beetles as a biological control for buffalo fly.

Information on management practices for cattle production include

- Agfact A2.1.3 *Responsible, sustainable beef production* (NSW Agriculture, June 2000) [www.agric.nsw.gov.au](http://www.agric.nsw.gov.au)
- *Soil management for dairy and beef cattle grazing* (NSW Agriculture, 1999) also available on NSW Agriculture's website
- River and Riparian Management *Fact Sheet 6 Managing Stock* (Land and Water Australia 2000) [www.lwa.gov.au](http://www.lwa.gov.au)

## KEN MURPHY, EUREKA



Ken Murphy runs cattle on the family farm at Eureka. His great grandparents were original settlers to the area in the 1870s. Ken's property is approximately 100 acres and borders Coopers Creek.

The farm was a dairy until 1974 when his father changed to beef cattle. Ken returned to the farm in 1977 after his father's death, bought the farm and has been raising cattle ever since.

Ken makes the point that beef cattle farming on the coast is quite distinct to that in lower rainfall areas in the west of the state. With the higher rainfall the grass grows quicker and you get lots of good growth, but the grass has no 'guts' - it has more moisture than substance. As a consequence, more feed needs to be absorbed to gain the same nutritional level as you would get in the west of the state.

Although you can run more head of cattle to the hectare here, the ability to 'finish' calves on natural pasture is diminished. The result of this is that many of the north coast weaners are sold and shipped out through 'store markets' before winter to be grown out in other areas. Store markets are specific markets for cattle that are not destined for the meat market but are bought to be further grown out

Store markets are held in Casino in April to June. Buyers at the markets are from the west of state and Victoria. A niche market has been developed on the north coast for supplying vealers to markets for either store or meat.

According to Ken, one way to help the lack of nutrition on the coast is to reduce the impact on the pasture by the amount of cattle grazing. This means that stocking rates (cows/hectare) need to be lower. Ken's philosophy is to in fact understock at 1 cow per 3 acres. Low stocking rates allow a build up of a mulch cover to protect the soil, encourage roots

to go deeper to get more nutrients and therefore get better production from each animal. He also says it is important for maintaining the organic matter in his soil.

Ken effectively went organic 7- 8 years ago and when he finds a way to efficiently control weeds on the steeper slopes he will register for organic certification. His philosophy is to use minimum inputs and to be the most efficient with what you have. He believes that if you look after the cattle, they will do the right thing by you. If you tread lightly on the country, it will also be good to you.

Ken clearly understands the limitations of his land and the north coast climate for beef production. Over the years, he has systematically gone about breeding up cattle that are better suited to his country. In 1988, he started breeding with Droughtmaster cattle. The Brahman cross cattle are better foragers and are tick resistant. The last time Ken sprayed for ticks was about 10 years ago.

More recently he has introduced a Charolais bull, which 'thickens up' the cattle giving greater meat content. Also with this cross, he finds the animals have a good temperament. Ken has found that this Charolais Droughtmaster cross is the best mix for his country and the market.

In reality by producing vealers, according to Ken, you are effectively running a dairy farm except you don't collect the milk; you grow the vealers with it. He employs 'creep feeding' i.e. provides a grain supplement to the calves which they have access to it all the time. For mineral supplements, Ken makes his own cowlicks using natural products including seaweed extracts.

Weed control is done by slashing, except he says he still has some difficulty managing the camphors because of the terrain - some areas are too steep to slash, and he has found he still has to use some spraying to knock them back.

Overall, Ken has found that the techniques he has employed for production and land management produces healthier cattle and happy cows are productive cows. Consequently, he usually has a better-finished calf at the cattle sales and gets a better price. The only thing he would like is 200 more acres so he could be a "full time farmer".