

# bamboo

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**Gigantochloa**  
**Rachel Carson**

**Bamboo**  
**Treatment**  
**Workshop**



**BAMBOO SOCIETY of AUSTRALIA inc.**  
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# Phyllostachys Species



Young *Phyllostachys nigra* culms turning black.

The NSW Department of Primary Industries has now declared all *Phyllostachys* Bamboo a class 4 weed in parts of NSW. The declaration states: *The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.* We have an ongoing conversation with the Department to see how farmers can grow this important renewable resource.



*Phyllostachys aurea*.



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# Inside this Issue

- 4 Bamboo & Ferro Cement Domes**  
*From Chris Brown*
- 8 Shoot Sales Summary**  
*With Durnford Dart*
- 9 Bamboo at Camp Creative**  
*From Kirsten Daly*
- 10 Bamboo Treatment Workshop**
- 13 Thai Green Chicken Curry**
- 14 *Bambusa ventricosa kimmei***
- 16 2015 Bamboo Sculpture Contest**  
*at Akoostik Festival in Wingham, NSW*
- 18 Bamboo Technology Internship**  
*From Bellingen, NSW*
- 20 Feature Property**  
*Thomas Lindley's at Burringbar, NSW.*
- 24 *Gigantochloa Rachel Carson***  
*By Lennox Muller*
- 27 Indonesian Bamboo Search**  
*By Lennox Muller*
- 29 Bamboo Fungus**
- 30 What The...?**  
*Mysteries of the bamboo world.*
- 32 Bamboo built Froute Pod**  
*From treehugger.com*

## Reader Contributions

We would love to publish your bamboo experiences. Send to Mark McCarthy at: [editor@bamboo.org.au](mailto:editor@bamboo.org.au) if you would be interested in sharing your information on bamboo growing, managing, building or cooking. Photos should be sent as attachments when emailing.



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*Bambusa vulgaris*  
*cv Vittata*

## From the President

On the 17th January the Bamboo Society held a Bamboo Treatment Workshop at Kaye Woods' property Byron Bay Bamboo in Tyagarah, NSW with 35 people attending. The workshop was to demonstrate a treatment from Indonesia called *Freemite* with the owner of *Freemite*, Thiery, flying in to do the demonstration. We would like to get an accredited standard for bamboo treatment in Australia and this was the first step towards that. We now have a supply of this product available, contact me for more details at:

[cutloose013@bigpond.com](mailto:cutloose013@bigpond.com)

We are also working towards getting an accredited horticulture course specialising in Bamboo with the help from Thomas Lyndley from Bamboo Creations working towards achieving that goal.

In October we will be holding our second Bamboo Sculpture Contest, with a total of \$4750 prize money and bamboo workshops held in conjunction with the Akoostik Festival in Wingham NSW. Akoostik is a 3 day music festival with great music and food, to be held on 16th, 17th and 18th October with camping available. We will also be holding our AGM on the Sunday at 10 am at the festival and then there will be a trip to Mark's property to look at what he has done with bamboo. For the first contest we had 12 entrants, some from interstate and we are hoping for more this year. There is more info on the Sculpture Contest in this magazine.

With thanks to Munir, the new web site is now up and running and membership is now due for this year, renewal can be done on the web site and by being a member you are helping to promote the bamboo industry in Australia.

Bob Gretton from W.A. had 12 years on the board, 5 years as editor and 6 years as president and it is because of people like him the Australian Bamboo Society is still growing strong. Now is a very exciting time for the Bamboo industry in Australia as there is a lot happening and to be on the board is very fulfilling. If you think you have something to offer the Bamboo Industry we would welcome you to join the board.

**Jim Mahoney**  
President BSA



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# From the Editor's Desk

I have only recently heard about the passing of Lennox Muller, a Bamboo Society Life Member and a major contributor to the Bamboo Society's Newsletters from 2001.

In the 1990's Len travelled throughout Indonesia, collecting bamboos and importing them into North Queensland. He introduced 89 species and clones. One was the striped culmed *Gigantachloa* with long, narrow leaves, he named *Rachel Carson*, after the author of Silent Spring. The clones of this bamboo came from a single wild plant grown near Jambi, Sumatra.

Len wrote extensively about his travels, these were regularly featured by the Bamboo Society over a number of years. When I joined the Bamboo Society, I would visit Jim Mahoney and pester him for old copies of the Bulletin, to read more about Len's adventures.

Len was often critical of the work of some taxonomists who tended to label unrecognisable species as *Bambusa*. He respected the writings of Professor Wong, who authored Bamboos of the Malay Peninsula.

Len was convinced that the Australian bamboo, then named *Bambusa moreheadiana*, was not a *Bambusa*. Professor Wong agreed and reclassified it into its own genre. It is now named *Mullerochloa moreheadiana* after Len.

I have included his bamboo search story on page 27 in this issue.

We start this issue off with an article by Chris Brown, on bamboo and cement dome structures. I met Chris at the 2014 Sculpture Contest and was fascinated by what he was doing.

**Mark McCarthy**  
Editor



*Gigantochloa*  
*Rachel Carson*





# Bamboo/Ferro Cement Shell Structures

## Building Monolithic Shell Structures Using Bamboo

By Chris Brown

My main field of interest over the last 14 years has been “light weight compound curved shell structures” or dome shaped structures. They are lightweight because they rely on very thin structural composite material external skins over a core of structural foam, mostly polyurethane spray foam. I hold an Australian patent for a method of building lightweight sandwich shell structures utilising “glass fibre reinforced concrete” (GRC) structural skins over a core of high density polyurethane foam.

Bamboo post and beam construction has been around for a long time and there are examples of using bamboo as reinforcement in concrete in various Asian countries. About 2 ½ years ago I was introduced to using bamboo as a building material in a rather unconventional way.

Towards the end of 2011 I came into contact with Britta Slippens who wanted to build a boutique mini resort on land in Lombok. One thing led to another and I was introduced to Wolfgang Widmoser, an Austrian Architect living in Bali who not only loved dome structures but was also very familiar with the use of bamboo as a building material.

My interest in alternative construction led me to learn more of the enormous potential and wide range of uses of bamboo.

Britta commissioned Wolfgang to design the first stage of her resort located on the side of a relatively steep hill overlooking beautiful Mentigi Bay in Lombok. What was really interesting to me was that the dome structures would be built using bamboo to achieve a shell structure.

Over the next 12 months I became an avid fan of the project watching it's progress day by day until completion

all the time looking forward to actually visiting the site and getting to know more about using bamboo as a building material in the way it has been used in Lombok.

My passion for dome shaped shell structures has always been around a number of key factors:

- The dome shape is inherently strong
- Shell structures are inherently strong
- Composite materials contribute to high strength and light weight
- All three produce an incredibly efficient structure
- My belief that survival will become the biggest issue for all of us on this planet as temperature rises and extreme conditions and events become more common and even the norm.
- The kind of houses we would need in the future would need to be much stronger than they are today and we had to learn to be more efficient and sustainable in the systems and materials that we use.

Many of the material systems that I had been developing and working on were high-tech solutions requiring various degrees of sophistication in their composition and application. This meant that the materials were expensive and often required expensive equipment for their manufacture, delivery and application. Some of these materials although extremely efficient in their final performance are also derived from toxic materials and processes.







### *The More I Understood About Bamboo the More Fascinated I Become.*

Having tracked progress of the Mentigi Bay project I eagerly awaited the day when I together with Cornelia and Ben (my partner and our son) visited Wolfgang and Britta in Bali and Lombok. We enjoyed the privilege of staying in the beautiful Bamboo, Mesh and Render domes at Mentigi Bay for a few days. It was a special experience.

Dome shaped structures inherently possess a unique purity of feeling and is probably why people who live in dome houses or multi-dome houses don't want to return to living in a rectangular buildings. I would have been happy to stay at Mentigi Bay for ever.

### *The Byron Bay Bamboo Mesh and Render Dome*

Not long after Wolfgang kicked off the first of several domes in Lombok I schemed with a sculptor friend to build a Bamboo Mesh and Render dome on her property high in the hills behind Byron Bay. Tracy, as the owner of the property made some conditions. It would have a dual purpose. It would be a guest sleep out as well as a fire bunker capable of being sealed and withstand a raging bush fire.

Byron Bay dome illustrates the creativity and flexibility of the system. It was also largely built by a group of people who have had little or no previous building experience. This project, without formal engineering was designed to be considerably stronger than an above ground structure and the exposed part of the shell is covered in a layer of material capable of handling a blast furnace.

Byron project is a work in progress as Tracy continues to finish the amazing landscaping around the structure.

Using Bamboo in This Way is Highly Accessible and Affordable

Where labour is cheap or plentiful this system makes it possible to build very strong and durable structures for homes and shelter and any part of the world using cheap, readily available materials.

Wolfgang and Myself have collaborated to produce a guide which details the way each of us went about the construction of the domes using Bamboo. The Guide covers two projects with a pictorial and textural illustration of the methods used.

I am passionately driven to provide solutions for housing and shelter that are affordable and effective for the



long term and which is scalable in terms of structural and thermal performance. The system described within the guide refers to several research papers on bamboo as a reinforcement in concrete and also ferro cement construction.

I intend developing a design standard for using bamboo in this way and I expect to follow through with the development of this in 2015 beginning with a project with Bond University School of Architecture who will design and build a bamboo mesh and render dome shell on the Gold Coast campus. This opportunity opens the doors to simultaneous materials property testing in the process of developing a standard.

Hands on courses are being planned for 2015. To obtain a copy of the guide, find out more about course dates and locations or anything else to do with dome shell structures and engineering please visit the website at <http://www.domeshells.com.au>

This magazine is a great resource and my door is open to collaborating on the development of use of bamboo as a building material both as a bamboo/ferro cement system and also the incorporation of bamboo charcoal in render materials for achieving insulation.







## Building with Bamboo Mesh & Render

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## BUILD A DOME SHELL STRUCTURE

using Bamboo Mesh and Render



Christopher Brown and Wolfgang Widmoser





# Shoot Sales Summary for Spring and Summer 2014/15

With Durnford Dart

All indications of a traditional wet season were established following a frosty winter followed by an extremely hot spring. Fortunately the wet started off with good rain in mid-November followed by steady rain in December, a downpour in January and a major flood (450mm in 2 days) in February.

For the first time in many years the bamboos are going ballistic, new edible shoots powering out everywhere on most of the species with up to 35 new shoots on our 20 year old *Brandsii*, 20 on *Latiflorus* and good quantities on *Asper*, *Oldhamii*, *Beechyana pubescens* & *Balcooa*.

Unfortunately this has led to a glut of edible shoots in the Sydney markets with prices down to \$2 Kg which is far less than the cost of production. Since the cost of harvesting has exceeded that of the market price efforts

were made by my daughter Rebecca to merchandise locally. Some success has been achieved with selling both whole fresh shoots and 1 Kg punnets of prepared raw shoot to premium Asian restaurants.

Even though difficulty was experienced selling the total shoot crop, this growth spurt has resulted in an abundance of culms that will be used for mulch and charcoal production.

The mulching press has been commissioned and when we finally get suitable bags we will be adding 25 Kg bags stock to the cubic metre bulker bags we presently sell.

Chemical analysis is in progress for both the mulch and charcoal to see why plants thrive when used as a soil additive or mulch in the garden.



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# Bamboo at Camp Creative

By Kirsten Daly

Bamboo has become a new addition to the 60+ courses at Camp Creative, a week-long festival of creative courses held in Bellingen NSW for over 30 years.

In 2014, *The Bello Bamboo Company* were asked to provide a Bamboo Craft course and this year we introduced a refined program of both hands-on learning and tours of bamboo groves which are abundant in the Bellingen region.

Three years ago, I was sitting in a course myself, learning about bamboo from an experienced bamboo artisan from Bellingen, who had studied the art for over five years, with top bamboo and landscape artists in Japan.

We wanted to offer a way to learn about this most eco-friendly and natural material that grows abundantly in Australia - and is renewable. A way to make and create more eco-friendly products for our homes and gardens without having to go to the shop is important for more people today as they try to live more sustainably. So for Camp Creative, we chose the title "Bamboo for an Eco-future".

Tony, an attendee in January 2015, had this to say:

"I had a great time. It's good to do something entirely new and different. I do a Camp Creative course every couple of years. I did the stained glass course the year before last and produced a pair of panels for a bookcase door. This year I chose the bamboo course because I like working with wood and other materials and I already have a range of tools. Also, we have some different varieties of clumping bamboo on our property and they have grown to such an extent that I would like to use them for practical purposes.

The course was very helpful as I gained experience in working with bamboo which I had not done previously. It is quite different to working with wood, but there are similarities as well. I also wanted to get some information on harvesting and treating bamboo prior to use.

Bamboo is fascinating stuff as it can be used in all sorts of applications from building materials to furniture, small artistic pieces and even for scaffolding. I like working with bamboo and now that I have some skills and knowledge, I intend to harvest my own and use it as often as possible."



Tony created this delightful coffee table. It has *Aurea* running bamboo species for its legs, fired with a heat gun to draw out its wax and to vary its beautiful golden colour. It has *Latiflorus* clumping bamboo as the table top using a technique I learned in Bali and Thailand which is a traditional way of slitting the underside of the bamboo to create matting, walls and flooring. It turned out beautifully, I must do more of this myself!

*Latiflorus* has a beautiful range of colour as it dries from orange to light to dark brown... and the effect is stunning. I make sure that attendees have correctly treated and dried bamboo to work with. I wasn't given this opportunity and my own three-day project was moldy and had bora beetle damage within 12 months. This is something really important to learn, so bamboo gets a good name, not one that makes people give up quickly, because they didn't cut at the right age and time and didn't treat it properly.

The *Bamboo Society of Australia* recently ran a workshop on a more eco-friendly treatment method and are trialing it. Bora salts are a natural salt treatment method. We will keep you informed as we gain more test results.

**For more information about The Bello Bamboo Company go to: [www.bellobamboo.com](http://www.bellobamboo.com)**

**For further information about Camp Creative go to: [www.campcreative.com.au](http://www.campcreative.com.au)**



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# Bamboo Treatment Workshop

*Bamboo Society workshop held at Kaye Woods' property at Tyagarah, NSW*

Thierry Cayot agreed to come out from Bali to give a talk on Freemite, the bamboo treatment he developed using natural ingredients including neem, chilli, garlic, camphor and other plant extracts that act as natural pesticides. He has a facility in Kuta, where he treats poles for local construction. The two main species used for building are *Dendrocalamus asper* and *Gigantochloa apus*.

The culms are cut and allowed to dry for two to four weeks, to lower the moisture content. The centre of the nodes are then knocked out with a steel rod and culms placed in concrete tanks filled with the Freemite solution. The amount of time the bamboo remains in the solution depends on the wall thickness. *Apus* being relatively thin-walled, takes a day for the treatment to penetrate. While the thick basal sections of *asper* may take three days to treat.

The poles are then dried in the sun. Freemite does not change the colour of the culms and does not affect any coating applied as a finish.

I went with Jim Mahoney to collect Thierry from the airport and on the drive back to Kaye's, it was easy to see that Thierry had a passion for bamboo. He talked about changing the image from being a poor man's building material, that had to be replaced regularly, to a material that would last a lifetime and be an eco friendly product. Freemite can be used on plants to repel insects and has been used by a hotel in Bali to stop an infestation of ants.

The lecture was held in a yurt that Kaye had workshopped earlier in the year, run by Donald Corben, of Bamboo Yurts.

Thierry stated that freemite is a stable emulsion that contains a nano-extender that has a high binding rate, so the treatment offers high penetration and protection. It kills termites by destroying their digestive system, after eating the treated starch.







*Above: A Restaurant under construction in Sumbawa, using bamboo poles treated with Freemite.*

*Right: The 30 or so eager participants in the treatment workshop.*



*Below: Kaye's yurt in beautiful surroundings.*

*Opposite page: Treatment bay and treated poles, ready to build.*





Thierry said we would have to do some testing to check whether our species of borer were affected in the same way as the ones in Bali.

One question that was asked, was could Freemite be used in the absorption method (cutting a culm in the grove and placing a bucket of solution under the cut). He said he had not tried it, he uses the submersion method to guarantee full penetration.

Jim had set up a marquee with magazines and information and on a table I saw these three bamboo knives. I asked where they had come from and I was directed to a small tent under a clump of *Gigantochloa apus*, where Sam had set up a small workshop. It was great to see a quality product being made locally.

Jim disappeared for a while and I found him making a Thai curry for lunch, It was very popular and I saw him writing out the recipe to give to people, so I have included the recipe on the opposite page.

After lunch, we had a tour of Kaye's property, where there are a lot of very mature clumps and I will feature the property in the next issue. We assembled at her storage rack, where we were shown bamboos treated in various ways, including Borax treatment.

A few of us are testing the Freemite treatment and will publish results in future issues. ■



**Above Top: Hand made splitting and finishing knives.**

**Above: Kaye Woods showing the poles she sells, treated with Borax.**

**Left: Sam using a bow-lathe to turn a piece of *Bambusa tulda* into a knife handle.**





### Ingredients

300g Chicken sliced  
 300g Bamboo Shoot, sliced and boiled  
 1 cup Eggplant, sliced  
 1 cup Green Beans, sliced  
 1/2 cup Red Capsicum, finely sliced  
 1/2 cup Sweet Basil leaves  
 400ml Coconut Cream  
 2tbs Soy Sauce  
 1tbsp Green Curry Paste  
 1tsp Salt  
 1 1/2 tbs Palm Sugar  
 2tbsp Cooking Oil  
 Sweet Basil Leaves for garnish

## Thai Style Green Curry

Saute curry paste in oil over medium heat until fragrant, reduce heat and gradually add half the coconut cream, a little at a time. Stir until a film of green oil surfaces.

Add chicken and continue cooking for five minutes. Add remaining coconut cream, salt, soy and sugar. Bring to boil over medium heat.

Add eggplant and cook until tender, then add bamboo shoot, beans, sprinkle basil and red capsicum over and turn off heat.

Serve with steamed rice.







## *Bambusa ventricosa kimmei*

(common name *Striped Buddha Belly*)

Origin:	China
Average Height:	Between 2 and 12m depending on conditions
Minimum Temperature:	-9c

A fast growing, drought tolerant bamboo which has a very bushy growth habit with a small bright green leaf.

It is easy to maintain and responds well to pruning. To keep it small and bushy, remove any large shoots in autumn and let smaller ones grow on.

An ideal hedging species.

During the 1990's, many species of bamboo were introduced into Australia. Sometimes the same species was introduced by different people. *Dendrocalamus asper hitam* was introduced three times, all of these clones came from the same parent plant, so were identical. But this is not always the case.

*Bambusa ventricosa kimmei* was introduced at least twice, but they were not the same. Form A, when denied water and nutrients, will develop swollen internodes. Form B, under any conditions, will remain straight or have slightly zig-zag culms. To add to the confusion, if Form A is grown in rich soil with plenty of water during the shoot season, it will develop only straight culms.

It is impossible to tell, from a nursery plant, whether it is A or B. It may take a few years for the culm and rhizome system to develop enough to produce the swollen culms when conditions are poor. Like its parent plant *ventricosa*, this is a very tough bamboo, tolerating harsh conditions – the worse the conditions, the better it looks. The swollen internodes reduce the height of the culms, as the nodes grow closer together, to the extent that this bamboo is an ideal candidate for bonsai.

For best results with Form A, sit the plant on top of poor soil and build up some rich soil around it. This will help it develop a strong rhizome system. Then, after a couple of years, stop all fertiliser and it should begin to develop swollen internodes. A thick layer of straw mulch can act like a thatched roof and repel any water from the plant. If there is a wet shooting season, and straight culms develop, these should be removed.

*Kimmei* resembles another bamboo – *Bambusa eutuldoides* var. *viridi-vittata* (China Gold). Especially Form B with its straight growth habit. The new culms of *kimmei* start green and then turn yellow, while *viridi-vittata* are yellow from the start.





*Bambusa ventricosa kimmei* Form A.  
Lower branches have been removed and any straight culms which developed during a wet season, have been cut out.



*Bambusa ventricosa kimmei* Form B.  
Growing only metres away from Form A, in the same soil, the culms have grown straight and tall.

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# AGM and Sculpture Contest

Each October splendid sounds mingle with the stunning surroundings when the Wingham Akoostik Music Festival delights travellers. This three day musical feast of local and travelling musicians has relocated to the Agricultural Showgrounds, facilitating an ever growing array of performers, workshops, quality food and market stalls. This grassroots festival has been awarded Community Event of the Year and Regional Flagship status as a key tourism event on the NSW annual calendar. The essence of the festival is creativity and originality.

Local and international performers deliver entertainment across three stages. This year's line-up boasts Joe Camilleri and the Black Sorrows, The Backsliders (featuring Rob Hirst), Bill Chambers, Harry Hookey, Holly Who and many more. The relaxed festival environment allows up close and personal encounters with the artists.

Guests have the opportunity to partake in workshops with acclaimed musicians, so bring your guitar or djembe drum with you. The camping facilities enable guests to prolong the festival atmosphere, enjoy happy hour jam sessions around the campfire and all that the wider Manning Valley has to offer.

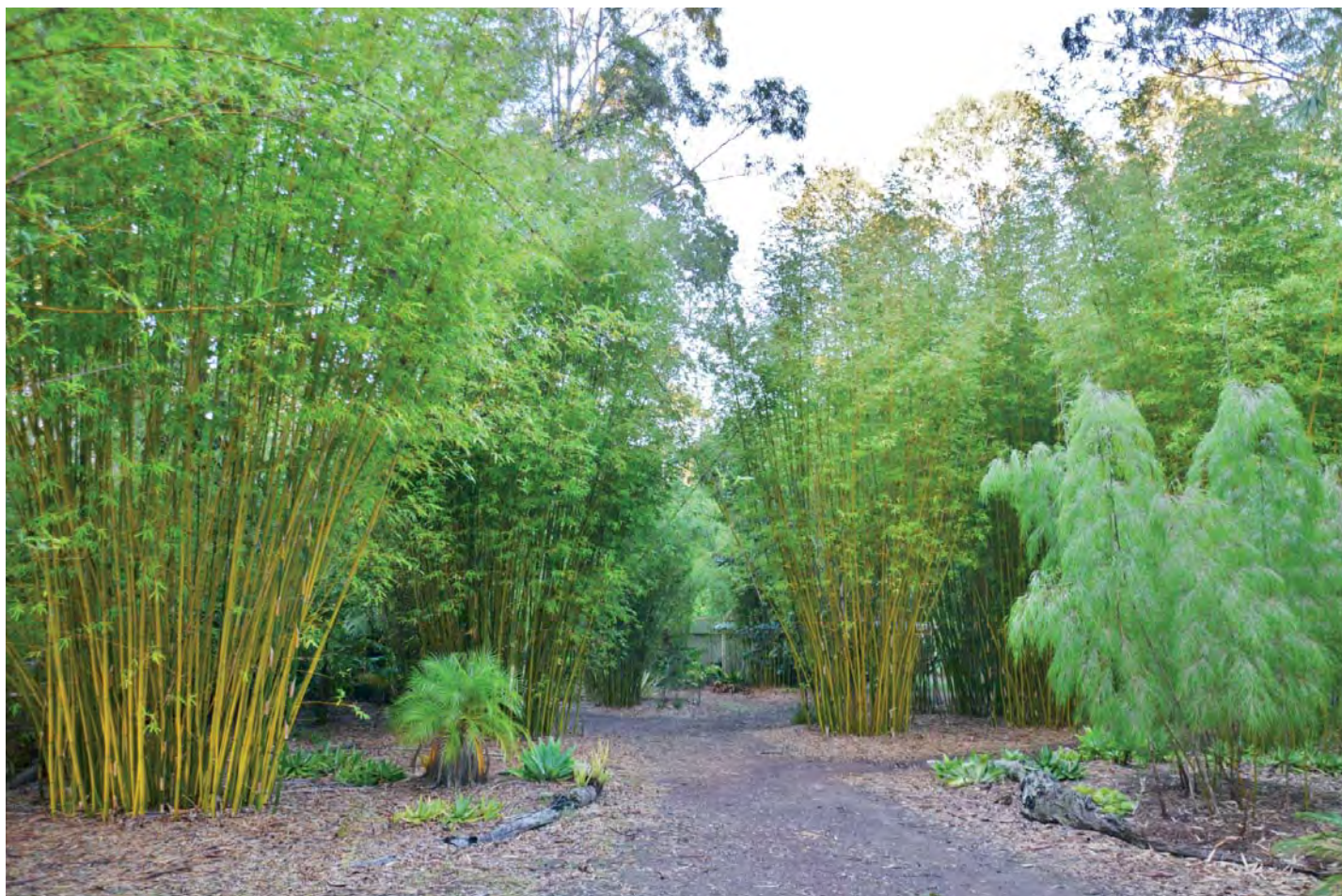
Donna Carrier

The Bamboo Society had a stand at the last Akoostik Festival where we were entertained by good music all weekend - the line-up looks just as good this year.

For those setting up their sculptures, there is plenty of on-site camping with amenities and we will have a camp kitchen set up from Thursday 15 October.

Sculpture contest entry forms can be downloaded from the BSA website. All enquiries call Kaye 0400 696 264.

This years AGM will be held at the AkoostiK Festival under the big blue marquee with red and white bunting, at 10am on Sunday 18 October, then it's a half-hour trip down the highway to Failford Road for a tour of Mark's bamboo gardens at 2pm - look for the Bamboo Society Flag.







# Bamboo Technology Internship

By Davis Demillo

A bamboo construction technology internship was conducted by the Bello Bamboo Company during November and December 2014. The majority of works undertaken were located in a rural residential property in Kalang, Bellingen, with some minor projects requiring travel to Coffs Harbour and Woodford in Queensland. The works were primarily conducted under the supervision of Company Director, Ms Kirsten Daly, plus a weekend with architects Cave Urban to assist with the construction of the Woven Sky project at Woodford Festival.

The host company was chosen due to Ms Daly's primary interest in exploring bamboo as a sustainable building material, its characteristics, joining methods and treatment.

## *Use of Bamboo as Sustainable Building Construction Material*

In week one, it was learned that bamboo is scientifically classified as a grass rather than timber, the bamboo culms mature and gain peak strength after approximately 7 years, where they are cut for treatment and construction. Because bamboo grows faster and regenerates when compared to trees used for logging (over 25 years), it is considered to be more sustainable and provides a viable alternative to unsustainable deforestation practices.

A video documentary from the Bamboo Building Forum held in Bali, attended by architects, builders and companies from around the world, demonstrated the use of bamboo for construction of a residence. Bamboo has been used successfully as the main structural material for houses or small buildings in Central and South America, South East Asia/Indian Sub-continent and the Pacific Islands, where it is abundant and better understood.

## *Internal and External Applications for Buildings*

In terms of building construction material, bamboo has been widely used for structures such as bridges, dams, low level residential and commercial buildings, gazebos, etc. The large diameter culms (or individual poles) are used for structural support and can be joined together to create column supports, beams and rafters. Smaller diameter bamboo culms are split in half, flattened and joined together to create flooring, veneers, wall panels. Bamboo can also be split to create overlapping roof shingles, eaves and gutters.

Bamboo fibres have also been manufactured as laminated bamboo (lamboo) products to create beams, rafters and furniture. Extensive research is being conducted by the Future Cities Laboratory of the Singapore-ETH Centre into bamboo composite products, manufactured by extracting fibres and combining them with other materials to increase strength. These composites can be produced in various forms and applications include walls, flooring, supports and beams for roofing.

## *Bamboo Preservation and Treatment*

After cutting, the bamboo poles are dried to ensure that moisture is removed to prevent shrinkage and it takes longer to dry than freshly cut timber. Fresh bamboo is not used for building purposes and can be susceptible to attacks by insects and fungi during this time. To maximise the preservation and treatment process, the poles are kept elevated with no direct contact with soil where ground-borne insects may be present. This is usually done in a warehouse or shed with plenty of ventilation. It is not recommended to dry bamboo poles in direct sunlight, as cracking or splitting may occur. The poles are rotated every 15 days for uniform drying.



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This process can take anywhere from 6-12 weeks. Kiln-oven drying is also possible to reduce the drying time, but increases the chances of splitting. This process is usually used on bamboo that is already split for other applications.

Due to the starch present in fresh bamboo, it is susceptible to attacks by beetles, borers and termites. Boric acid is used for treatment whereby the salts are absorbed by the bamboo. However, as this is a non-fixing type preservative, it may leach out of the bamboo when wet and is not recommended for outdoor use due to its toxicity. Fixing type preservatives such as copper, chrome, arsenic (CCA) or copper, chrome, boron (CCB) are also used in a similar fashion to timber. A teleconference was arranged with a couple of chemical engineers associated with Bello Bamboo from France and Indonesia who are currently exploring natural and non-toxic/hazardous products for the treatment of bamboo.

### *Splitting and Joining Methodologies*

Various techniques were taught regarding the splitting of bamboo for use as roof shingles (as applied to the mini project in Coffs Harbour Botanical Gardens and garden shed) using a splitter and mallet. The bamboo halves overlap each other to prevent ingress of water through the roof.

In terms of joining, bamboo end poles to be joined in a t-junction along the length of a column or beam are cut with a 'fish-mouth' shape. The overlapping fish-mouth joint, which can be cut at various angles, is bolted through the other pole and the nut is placed in the opposite end. In some cases, where the structure is temporary, a hole is drilled through the poles and wire is threaded through to fasten the pieces together.

Bamboo has nodes (horizontal lines when the pole is standing vertically), which are a key structural

component in ensuring that splits do not occur. Any bolts or fasteners placed within a pole need to be close to a node, where the highest strength and least potential for splitting can occur. Joints and cuts are also placed near the nodes for similar reasons. Double rafters can be created, with two pairs of poles placed next to each other (with a bamboo mat in between to avoid sliding) and lashed together using wire.

### *Design and Construction Projects*

Participation in The Woven Sky project (a woven bamboo structure) and building a structure for the temporary mesh area was conducted under supervision of the Cave Urban Architects and Taiwanese bamboo artisan Wang Wen-Chi, for the Woodford Festival in Queensland. This involved an additional weekend sorting bamboo poles for use in these structures and learning various techniques of joining and lashing poles together. These projects also used timber poles as main structural supports based on approvals from engineers and Council requirements, which reflected the lack of understanding by regulators on bamboo construction technology.

### *Limitations for Use in Australia*

There are currently two ISO standards for bamboo:

- ISO 22156:2004 (Bamboo -- Structural design)
- ISO 22157-1:2004 (Bamboo -- Determination of physical and mechanical properties)

These standards are considered to be international, however, due to the limited understanding of bamboo as construction material in continents such as Europe, Australia and North America (where it is not as abundant as other countries), they have not been certified as part of the Building Code when compared to timber.



# Feature Property

**This Issue's feature property is Thomas Lindley's Bamboo Creations at Burringbar, NSW.**

While attending the treatment workshop, we visited the property of Thomas Lindley at Burringbah in NSW.

Thomas was growing flowers for the export market. He planted bamboo to protect the beds from the wind. It did such a great job, he realised it's potential, so grew more and more, he now only grows bamboo.

A pathway leads down to a creek on the southern side of the property where *Bambusa lako* (Timor black) is used along the path to stabilise the bank.

Purple Water Hens and Water Dragons can be seen amongst the lush vegetation along the bank. At the eastern corner of the property, coming up from the creek, a stand of *Guadua angustifolia* rises with its distinctive well spaced culms and white-ringed nodes.

*Bambusa dolichomerithalla* ►  
New culms are light green with a dark stripe,  
maturing to gold

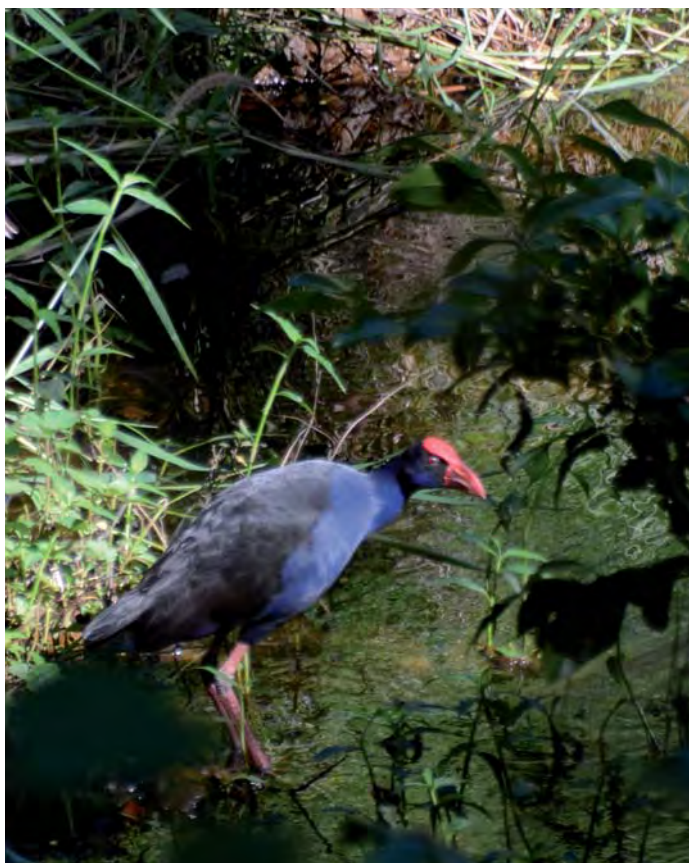




*Bambusa lako*  
(Timor Black) ▶



*Guadua angustifolia* ▶









Thomas has created some good examples of hedges and screens. *Bambusa multiplex* cv *Stripestem Fernleaf* was planted in a row, then pruned to a formal hedge, the end left untouched to show its natural shape. *Bambusa guangxiensis* with the tops cut at three metres, makes a good informal hedge. Planting *Bambusa chungii*, normally an open clumping species that can grow to 10m, has been planted close together to create a thick screen. Culm diameter and height will be reduced when planting this close, with culms only reaching 6m.



*Top Left: Bambusa multiplex* cv *Stripestem Fernleaf*.

*Bottom Left: Bambusa guangxiensis*.

*Right: Bambusa chungii*



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# Gigantochloa Rachel Carson

By Lennox Muller

Reprinted from Bamboo Society Newsletter Vol 4 No 1 April 2002

Photos by Mark McCarthy

*Gigantochloa Rachel Carson* is a medium-sized clumping bamboo suitable for tropical gardens as a neat ornamental. The shoots and elongating young culms display spectacular and unusual sheaths which are green with broad bands of light yellow on both edges and with a narrow white band on the edges of the blade of the culm sheath. The culms are green, striped with white or light green and near the bases of the culm the stripes can appear pinkish, depending on light conditions.

Culms are up to 8m high, with diameters of up to 7cm, striped copiously with white/pale green on the lower third of the culm, which has completely smooth, non-waxy and non-hairy internodes.

Culm sheath body, when fresh, is thickly covered on the abaxial surface with black/dark brown detaching hairs. It is green with broad (3cm wide) light yellow stripes on either margin, plus a couple of narrower yellow stripes closer to the centre. Auricles are low, smooth, purplish/dark brown, with no bristles. Ligule is 2mm high at the ends, and 7mm high near the middle, where it is curved upwards. It is denticulate, with wider denticules at the ends than in the middle. The whole edge of the ligule is bordered with bristles between 4 and 10mm long, the shorter ones near the middle. Blade is lanceolate, spreading, and abscises when dry. When fresh, the blade is green bordered with a 5mm wide band of pink/light yellow, slightly undulate, with an area of non-detaching

black hairs near the midline on both adaxial and abaxial surfaces. It has an obvious line of bristles on its edge up to 1cm long near its junctions with auricles. In many bamboos, auricles and blade appear to be one structure, with a line of abscission between this structure and the body of the sheath. It is often impossible to find a dividing line between what is blade tissue and what is auricle tissue. The classification of culm sheath by its parts, and the terminology associated with them needs re-examination, especially as taxonomists and bamboo growers place more reliance for identity on vegetative structures rather than flowers, which are frequently impossible to obtain.

Plants of this bamboo in cultivation in Australia and America, originated from a single plant growing wild near Jambi, Sumatra, found on one of my bamboo







A four year old  
*Gigantochloa Rachel Carson*



searches and imported to Australia on 16 April 1993. Jambi is the capital city of Jambi Province of Indonesia and is located just south of the equator, stretching from the mangrove swamps of the eastern side of the island to the high mountainous, volcanic spine of Sumatra in the west. Its jungles shelter some of the few remaining Sumatran tigers and an astonishing diversity of bamboos. It is separated from the Malay Peninsula by the Strait of Malacca, which was forested land as recently as 5-6000 years ago, when the sea level rose to about its present level at the end of the last Ice Age. Much of Sumatra's flora is shared by Malaysia, Java and Borneo – all lands of the great Sunda Shelf, one of the richest areas of biological diversity in the world, especially in bamboos, rattans, palms and timber producing and fruiting plants. It's a vast Garden of Eden.

Rachel Carson was the writer of *Silent Spring*, the first book which alerted the whole world to the dangers of over-use of farm and environmental chemicals. She advocated biological control of pests (or a do nothing approach, if chemical warfare was ineffective or actually made the problem worse). When the book appeared, chemical manufacturing companies reacted angrily and tried to discredit her work. They called it sloppy and badly researched, neither of which was true in the smallest degree. Miss Carson sent a well-formulated message to the world and it was received with goodwill by those who care for Planet Earth's survival as a fit place for all creatures to live. Even by planting a single bamboo, and by not using garden chemicals, we will each have made a positive contribution.

This bamboo is given the status of 'clone', rather than species, because it is derived from a vegetative propagule of a single wild plant of unknown parentage and unknown reproductive behaviour. No other wild plants of this bamboo have been found, and the original wild plant may no longer exist. It is appropriate that this bamboo, which was almost lost to the world, should be named for Miss Carson.



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# Indonesian Bamboo Search

By Lennox Muller

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## Part One: Getting Our Bearings

Up until about 1985, Australians were mostly dependent for their bamboo on the efforts of one man – Jim Wertz of Mirkwood, near Mosman, NQ, who began seriously collecting and importing bamboos over ten years before that. A few others such as Peter Pal of Mount Molloy, Rollo Campbell of Tiaro and Andy Lewkowski in WA were also getting into imports. Later Durnford Dart of Eumundi, Hans Erken of Wadeville, NSW, also began importing bamboos to be added to Australia's bamboo gene pool. It's not an easy business and all of these and more, deserve acknowledgement of their individual roles.

In 1985 I started collecting bamboos and soon found that my leaning was towards the good, clean culms of giant *Gigantochloa* and the graceful lines of *Schizostachyum*. They were not easy to get, but a few were available. Peter Pal had already imported *G. atter* and the yellow form of *Schizostachyum brachycladum* and *S. jaculans*. Rollo Campbell had already imported the green form of *S. brachycladum*. Andy Lewkowski had imported a bamboo which looked like a strain of *G. ridleyi*, which he had listed as *G. maxima*. He also had the true *G. atrovioleacea*, but it wasn't for sale. Jim Wertz had *G. atter*, *G. apus*, *G. pseudoarundinacea* and the Indonesian type of *Dendrocalamus asper* – the majestic *bambu betung*. Acquiring all of these superior bamboos became an obsession. I asked Jim for a plant of his *Gigantochloa pseudoarundinacea*. He said "Have you got anything to exchange?" Well, I didn't, so I decided to get it from Indonesia.

### The Great Indonesian Cultivars

The decision made, Laurie Smith, my partner, designed a quarantine house at Mount Mirinjo Farm and we got going on our project to import the prime useful bamboo clones of Indonesia, most of which I had already seen on my travels. I call them clones, because on many Indonesian islands, all bamboo is produced by planting a limited number of bamboo types by simple vegetative means. No bamboos are propagated by seed, and certainly not by tissue culture, because the demand for plants by farmers is satisfied by ordinary macropagation. Wild seedling bamboos just have to take their own chance for survival in the remaining areas of forest, or on the verges of cultivation. Nobody cares much about them at all, apart from a few taxonomists. The cultivated *Gigantochloa* clones of Indonesia have a sporadic flowering habit and seldom set seed. The seeds for most of them are unknown.

I had already studied Bahasa Indonesia at Salatiga, Central Java in 1981 and 1982 and practised the language by writing to many Indonesian penfriends. All the available botanical reports on *Gigantochloa*, *Schizostachyum* and *Dendrocalamus*, all of the publications on Bamboo in Bahasa Indonesia – they became my sole reading fare. Some were good, some were bad, some were just plagerised, including the mistakes. I compiled a bilingual word list for bamboo botanical and craft terms. Laurie and I had Mount Mirinjo Farm, 100 hectares set in the rainforest of Far North Queensland, a place for growing the plants we imported, so it was feasible to introduce a large collection of new bamboos. They sure take up some room. We need to plant six of each to ensure survival through frequent cyclones.

### Finding Goes Subardjo Again

I left Jakarta to go beyond Semarang to Watupawon, the native village of my good friend Goes Subardjo, who had returned there to take up farming after becoming disenchanted with his job with British American Tobacco in Jakarta. He had come to see the smoking habit as self-inflicted wanton destruction. I had written to Goes and he found what he thought was bambu gombong, a very special clone of *Gigantochloa pseudoarundinacea*, but said there was something funny about it. There was. It was actually an undescribed bamboo, not *gombong*. We had certainly made a good start. Thus began a deep friendship with this Javanese man who drove vehicles for me on collecting trips, studied bamboo identification himself and propagated and looked after my bamboos, and those he collected, for four years.

Watupawon could not be reached by most vehicles and it had only dirt roads made in the black soil. A few villagers owned motorbikes, but not many. The houses were traditional Central Javanese houses, some with bamboo walls and rafters, but the better houses were constructed of teak or the wood of the jackfruit tree. Many had whitewashed walls to deter termites. Watupawon was an impoverished village, but it was quiet at night and there was no electricity. The only television set played videos of Indonesian dancing and culture, and apparently the people preferred them. We went for a walk at night to visit Pak Martono, the local school inspector, and the only traffic was a few very quiet Brahman cattle. Each household lit a light at the roadside fuelled with coconut oil – that was the street lighting system. There were no dogs barking, Muslims don't keep them.





## Setting up a Nursery in Jakarta

Later that year, Goes had to sell his farm in Watupawon on account of the severe *el nino* episode which prevailed at the time. Huge areas of Kalimantan were ablaze, the largest forest fires in historical times. He went back, reluctantly, to Jakarta, and eked out a living selling organic compost and custom-printed match books for hotels. Like all Muslims, he is fatalistic, but he never gives up hope that Allah will help him to survive. He still gave money to beggars in the street. I wrote to him and suggested that he could help me in the bamboo search, and he agreed. He said graciously that the work of looking after plants is what his soul craved. I went to Jakarta and we began work. We bought some planter bags, some coarse sand and supplies of the nearest thing we could get to peatmoss, which was a material composed of lichen, algae and miniature ferns gathered from the trunks of trees in high altitude areas.

Thus, set up, we hired a car and began collecting in West Java. We potted the plants and I went home to Queensland. In six months time a good collection of bamboos would be ready for import, Goes would have something to live on and support his wife and child, but his future would still be precarious. He took other jobs, sold goods on commission, took up multi-level marketing a shonky business, but some people are sucked into it. Employers cheated him of commission and wages.

Jakarta is a hell-hole for honest men without power. The part-time job I offered Goes no doubt helped him along, but it wasn't a career. I kept wondering where life would take him. In the meantime, he was my living bridge with Indonesia. You can't just race in blind and help yourself to things in another country. You have to be reasonable and polite and pay your way. When we were away from Jakarta, looking for bamboos, I would wake at night to see Goes praying on the floor, that I would be granted success and satisfaction and not be disappointed.

Goes and I worked for four years and collected and imported 89 new bamboos. I haven't heard from him since the civil unrest in Java. It would be nice if he could someday see those 89 bamboos which now grace Mount Mirinjo Farm. ■



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# Bamboo Fungus

About 12 months ago a photo turned up on the Bamboo Society Facebook Page. It showed a green culm with black markings – with the question “does anyone know what this is?” There were no replies at the time I saw it.

A few months later, I photographed a clump of *Dendrocalamus latiflorus* with the same markings. It was developing on culms older than one year and they were in the centre of the clump, and not affected by the sun. When I asked around, I was told it was a fungus which had an effect on the growth of the clump, and that some people were cutting it out and burning it.

Has anyone else had experience with this?

**Editor**



**Above & Left:** The strange black markings under the skin, not to be confused with the sunburn on the outside of the surface of the *Dendrocalamus asper* below.



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# What The...?

*This page is for any strange anomalies that occur in your bamboo.*

Rick Warwick sent this photo of a *Bambusa membranacea*, where the new culm had been damaged and branches were forming from the last node - he called it a Dragon Claw.

*Editor:* Something that is becoming more common as we bring these tropical bamboos further south, *membranacea* is a late shooting bamboo and often, an early cold snap will kill off the tip of the new shoot before it reaches full height and heavy branches will form from the last node.



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*Dendrocalamus minor* var. *Amoenus* has a very shallow root system. This one was growing in a deep, rich soil, in amongst other tall bamboos. Avoid growing this one in the open or in areas subject to strong winds.



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# Bamboo built *Froute Pod* is made for stylish camping

By Kimberley Mok on  
Design / Sustainable Product Design  
at [treehugger.com](http://treehugger.com)

Some of us may be planning camping trips or looking forward to doing things in the garden. Some may like high-tech tents, or erect yurts out in the backyard. Enter the *Froute Pod*: perfect for a glamping (“glamorous camping”) or temporary backyard gazebo, studio or meditation space, this beautiful, bamboo-framed tent was inspired by the flowery forms of nature.

Designed by Melbourne-based company *Giant Grass*, the *Froute Pod* is intended as a semi-permanent structure, to be raised off the ground on a platform, to protect inhabitants from ground moisture (recycled pallets were used in this demo). *Giant Grass* founders are architects and Munir and Mittul Vahanvati, both of whom have extensive experience with bamboo building. They explain:

“Our design approach is based on using bamboo in its most natural form and exploring various possibilities whilst retaining the overall integrity of the material. We create our designs by carving, cutting and splitting the hollow cylindrical bamboo culm.”

The *Froute Pod* is based on an octagonal plan of 3 metres (118 inches) wide, the pod’s interior rises to a height of 2.4 metres (94 inches) tall. It can fit a double bed inside, and the waterproof canvas-clad pod has two flaps that be opened up like petals, creating a connection with the outside, and also making the structure a bit more flexible in its potential uses. There’s also two round windows and a small central skylight to illuminate the interior.

Though the *Froute Pod* is not made as a lightweight type of tent, its flat-pack design does make transport easier, and the designers say that it can be assembled within 45 minutes by two people.





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