

GROWING YOUR OWN HOUSE ?!

by Hilary Fuerst

There has been a lot of misconception over the last sixty-odd years about a very useful plant, and until recently, with the appearance of hemp-fibre clothing in Australia, most people have known very little about industrial hemp's uses and benefits. As well as its use as a clothing fibre, hemp may be used for its nutritious food value, bioremediation capabilities, carbon-sequestration, hemp plastics and as a building material. Most of us can relate to wearing a comfy hemp shirt, but actually growing and building a family-size house out of hemp is way out of our realm of experience.

Klara Marosszeky of Australian Hemp Masonry Company and Paul Benhaim of <http://www.TheHempConsultant.com> are on a mission to change that. Klara and Paul are eager to introduce this emerging industry to any interested owner/builders, professionals in the construction industry and prospective growers of industrial hemp. They are keen educators, and between the two of them, have a wealth of knowledge and experience that they are happy to share. The first weekend in September, they hosted a hemp building workshop in Byron Bay -- hopefully the first of many -- which I was fortunate enough to attend as a guest of The Owner Builder magazine.

As a prospective owner/builder, I have long been interested in alternative, sustainable building materials. It is important to me that I use a building method that minimises my impact on the environment. My goal is to use recycled or renewable materials that produce the least amount of carbon in both their production and transport. Of course, cost is a factor as well -- it's got to be cheaper than the current costs of construction, which are higher than most people can afford.

Overseas, I had experimented with building small structures (chook houses, sheds) using straw bales, cob, and mudbrick with pretty good success and general satisfaction. In talking to like-minded owner/builders in

Australia, however, the standard warning is that those building methods are susceptible to white ants. Apparently, white ants will readily travel through straw bales, cob and mudbrick to reach the tasty timber components of buildings. In addition, some other native insects will drill holes into muds and mortars to nest and lay their eggs. Several people I've met who have built with 'sawcrete' have highly recommended that material for various reasons. I'm really not comfortable with the 'crete' part though - in addition to being averse to the smell of cement, I'm not keen on being surrounded by a fairly toxic substance that will 'off gas' into my living space for a number of years. I'm wary of concrete walls that don't breathe, and I dislike mould. In addition, the extremely high energy usage that it takes to produce and transport cement really doesn't sit well with my conscience.

Hemp masonry has been used in other countries such as Switzerland and the U.K., and in Japan there is a hemp building which has been standing for centuries. I'd heard that hemp construction was being implemented here in Australia, and through the inquiries I made locally, it all sounded really positive. Industrial hemp farming has finally been legalised in NSW, so the fibre can be sourced fairly locally. Hemp fibre, when mixed with lime, is a strong, white ant repellent, non-toxic, fire resistant and renewable material. The hemp building method sounded really promising, and I wanted to learn more!

The hemp building workshop hosted by Klara and Paul was held at Starseed Garden Nursery in Byron Bay on 4th September. The workshop was the first of its kind and well attended - the expected number was around a dozen but over 50 interested people showed up! The morning half of the workshop was held indoors in the fantastic 'Tea House' at the nursery, then in the afternoon we were split into groups and had hands-on experience outside, mixing and constructing hemp walls for the retro-fit of an old pumphouse on the property.

(I must take a moment to remark on the Starseed Garden Nursery itself - it alone was worth the trip to Byron. The nursery is built on the

grounds of an old commercial piggery, and creative use has been made of the barns, pits, and outbuildings. All materials in the garden and surrounds appeared to be re-used or recycled, and some ingenious walkways, ponds and growing methods are used. Even the concrete manure pits are used for growing water plants. It's heartening to see what was once an industrial farm transformed into an inventive and ecologically mindful business venture.)

In the morning session of the workshop, we started with each attendee introducing themselves and telling how they came to be interested in hemp building. Amongst the group, I counted four people interested in growing industrial hemp, ten owner/builders, one architect, two engineers, and eleven professional builders! It was great to see that many people who are already in the building industry showing interest in hemp construction -- and heartening to know that even professional builders are ready to think outside the box!

Paul gave a brief overview of his involvement in the hemp industry. Paul is recognized internationally for his hemp research and development, has published several books on industrial hemp and its uses, and has specific interests in hemp as a food source and in hemp plastics. He pioneered the hemp food and hemp plastic industries in Europe in the 90's. Paul is the self-described computer geek in the troupe, and spends the bulk of his time indoors writing, conducting research and marketing.

Klara is the outdoor hands-on person, and has been instrumental in establishing the hemp industry in NSW. She gave us an overview of her journey from the little lightbulb that appeared over her head to the development and employment of the final product that she is now using. She became interested in industrial hemp because she recognised its varied uses and benefits, and envisioned the hemp building industry as a sustainable, socially conscious business. She noted that hemp produces an enormous fibre biomass, far greater than forestry and in a much shorter period of time. Hemp can be farmed sustainably without the use of

fertilisers or pesticides, and it sequesters large amounts of carbon during its growth (in fact, it continues to take up carbon from the atmosphere when used as a building material). The plant also has the capacity to remediate polluted soils, and she cited examples of where it's been used for that purpose.

After playing around with mixing whole hemp fibres and various binders, Klara took her ideas to her brother Marton, who has an extensive background in construction technology and management. At NSW University, Marton helped her to develop a blended binder based on hydrated lime (readily available in Australia) that is mixed with the whole hemp fibres and clean sand to form a lightweight, strong material that not only meets building standards, but is also environmentally responsible and economically viable. The final product that they have produced for the market consists of two pre-measured bags, the first containing the hemp fibre and the second containing the binder. The builder supplies the sand, and by mixing the three parts with a bit of water, produces masonry for the infill of framed walls. Marton was also present at the workshop, and spoke briefly about the technical properties of hemp masonry, its soundness and stability as a building material.

Klara then introduced us to the process of growing and harvesting hemp fibres for use as building material. The average owner/builder, providing they do not have a prior drug conviction, can get a licence in NSW to grow industrial hemp (which does not contain enough THC to be of any illicit use). Industrial hemp can be grown in just about any soil, requiring minimal fertiliser and no pesticide application. She explained that the hemp plant is a fast grower, producing large amounts of fibre in a short turnover period. It is possible for an owner/builder to grow enough hemp, in one crop, on one hectare of land in 3-4 months to build a 135 square metre house and a small shed.

Our hosts then opened up a question and answer session, and for the better part of an hour the questions were flying thick and fast! Paul, Klara

and Marton fielded inquiries openly, and answered every one with professionalism and thorough knowledge. These people obviously knew their stuff -- we never heard 'we'll have to get back to you on that....' By the end of the morning, all the attendees were quite excited by the whole premise of hemp construction, and anxious to get our hands dirty.

After a delicious lunch hosted by the nursery, we were all lectured on the importance of using personal protection equipment such as masks, safety glasses and gloves, when mixing and handling hemp masonry. The lime in the mix is caustic, and can cause irritation to skin and eyes.

Klara and Paul then split us into two groups. The first group busied itself with the mixing of the hemp masonry. The pre-measured sack of fibre was emptied into a drum-type mixer and dampened slightly with water. The bag of binder was then added slowly as the drum turned, to coat the fibre evenly. Clean sand was the final addition, and after thorough turning and mixing, what we wound up with was a slightly damp, fluffy mixture that smelled like wet hay. It's fluffiness accounts for it's enormous insulating value, as well as making it light and easy to work with. Klara explained that the working time with hemp masonry is much longer than with concrete mixes, so we were in no hurry. There was plenty of time for each participant to have a play with the mixing, learning how it should look and feel, and the best ways to get the desired result.

Meanwhile, the second group was over at the old pumphouse, learning how the shuttering was constructed and applied. Although a metal frame structure may be used, Klara recommended that the metal be coated with protective paint. Hemp masonry 'breathes', allowing air and moisture to pass in and out of it -- this is great advantage when you're talking of alleviating mould problems, but it could cause corrosion or rust if the metal is not protected. Klara prefers to see a wood framed structure, with the hemp masonry used to completely encase the frame, thereby protecting the wood from fire and white ants. To this end, the shuttering or formwork is built so that it sits several centimetres away from the frame inside and

out. Klara fills in about 60cm (just over half a metre) in height at a time, pressing the mixture down into the shuttering, then allows the hemp to cure overnight before moving the shuttering upwards on the wall for the next run. The walls are generally about 20cm thick, and the final result on the old pumphouse looked really beautiful, with no timber showing. When completely cured, the walls may be rendered with a finer fiber for a smoother finish. Any type of render and/or paint can be used, as long as it's breathable.

Everyone at the workshop had a chance to try their hand at both the mixing of the hemp masonry and the infilling of the walls. The wheelbarrow between the mixer and the pumphouse was constantly on the move, and in short order we had completed the first run on the walls. All the while, Klara and her right-hand woman, Deb, were earnestly answering our questions and keeping us working and learning. It was a really busy and satisfying afternoon.

In reflecting on the workshop as I journeyed back to my home in the hills, I attempted to weigh the pros and cons of building with hemp masonry from the perspective of an owner/builder. I could only summon up two (sort of) negative aspects of building with hemp. Ideally, a building masonry would be load-supporting, and eliminate the need for a wood or metal frame. Hemp masonry is not dense enough to be load-bearing, *but* it is that same lightweight, air-filled aspect that gives hemp its superior insulation quality and breathability, which are features for which I will happily make the trade-off. That said, it no longer really mattered that it wasn't load-bearing. The other issue was that the licensing and monitoring hassle of a small-scale hemp crop sounded like it may not be worth it. If I wanted to grow hemp on a large scale -- to harvest, process and sell the crop on to someone else -- then the costs and hassle would be worthwhile. In my situation, where I really would need very little fibre by comparison (and have no way of processing it), I could more easily just buy the pre-measured hemp and binder from Klara. So, any weak arguments against building with hemp were pretty well squashed.

As for the positive aspects, they were numerous -- and satisfied most, if not all, of my self-imposed requirements. Ecologically speaking, hemp is sustainable, renewable, local, has a low carbon footprint and is high carbon-sequestering. I could sleep peacefully in my hemp house knowing that I'd actually left a zero- or negative-carbon footprint in the growing and building of it. Hemp masonry meets building standards, is fire-resistant, non-toxic, breathable and repels white ants. The cost is manageable too, and building may be done in stages if funds are not always available.

The upshot is -- I am definitely a hemp construction convert! Someday, when my house plans are ready to become reality, the Australian Hemp Masonry Company will be getting an order from me.

To learn about the next workshop, purchase hemp fibre or binder, or learn more about hemp construction and hemp products visit:

<http://www.TheHempBuilder.com> or <http://www.hemp.co.uk>