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May 2022

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**Reminder: We are open still, looking forward to all those busy shedders attending soon.**

Hi to all our members. Covid is still (with Ukraine) at the top of most peoples thoughts. It all depends on your experiences and point of view as to how serious we view it. Some members are still very wary of being or getting exposed to the virus. The country has opened up to overseas visitors and a lot of the restrictions have been lifted. The shed has been open throughout, we have followed the restrictions as they ebbed and flowed. ***This is just to remind members we are open and keen to build up attendance again.***



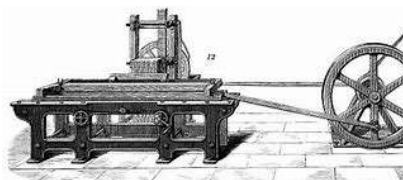
## **Great News**

Our project, "***Upgrade Vital Equipment***", has been allocated funding of \$2,000.00 through the **Tawa Community Funding** of the **Wellington City Council**.

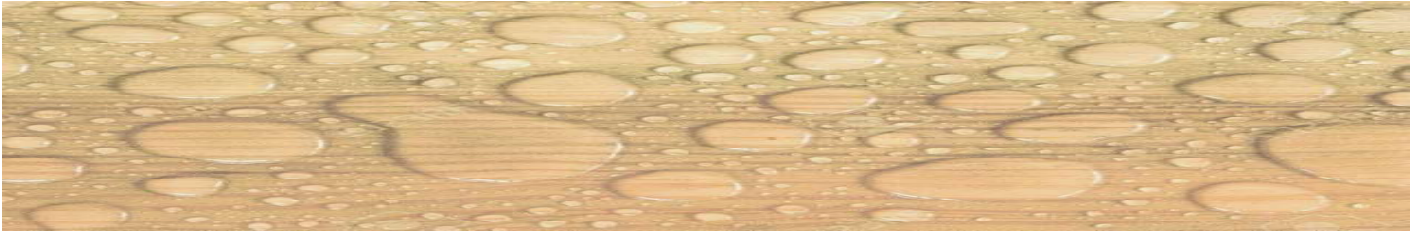
This funding is a significant contribution towards the purchase of professional grade equipment to further enable Tawa MenzShed's role as a part of the vibrant Tawa community.

We will use these funds to purchase a new band saw and a new compound drop saw to replace current items which have shown that they do not live up to expectations.

Tawa MenzShed are deeply grateful for the support of **Tawa Community Board**. We will publish pictures to show off our new toys once the purchases have been made.



There is a need for our members to understand the very nature and how wood behaves. To that end Jack Fry has kindly allowed our shed to have access to his presentation he gave to the then National Association of Woodturners at Putaruru many years ago - but all still relevant today. This knowledge will help us when using our range of woodworking tools and machinery at home or the shed. This is being presented in our N/letter in 3 parts.



## **Introduction**

## **Part 1 of 3**

## **J FRY**

Last Year the Tawa Menzshed bought a bench saw called a Stop Saw. This saw has electronics that if, when the saw is running, a person puts their hand anywhere near the blade a cartridge jams into the blade stopping it within, so they say, microseconds thereby saving that person from having a bad accident. When this happens it ruins the cartridge and blade which costs \$200 to \$300 to replace but it does save fingers. Unfortunately this action also happens when wet or multisalt treated wood is sawn. The shed's committee were very concerned about the cost of replacing the blade when wet wood was cut and declared that wet wood should not be used on the saw. The question then arose as to what is wet wood and one member said "when it had a moisture content greater than 2 to 4 %"

At that point I said at 2 to 4% moisture content the piece of wood was close to self ignition and went on to talk about free water, absorbed water, multisalt treated wood etc. As committee members did not understand all these terms I decided to talk about water and wood using this paper which I gave to the then National Association of Woodturners at a conference at Putaruru many years ago.

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## **WOOD DRYING**

The chemical and physical properties of wood are very complicated and not fully understood. A recent N.A.T.O Science Committee Conference listed the avenues of research yet to be covered to fully understand the properties of wood. A sizeable list. Wood was described as a cellular, polymeric anisotropic material, quite a mouthful. When you study some of the scanning electron microscope photographs produced by Meyland and Butterfield you will realise the complex structure of wood. Many cells of different shapes, sizes going in different directions and each having a specific function in the growth and stability of the tree.

## **Moisture in wood**

To simplify matters for this paper, let us consider the major cell structure of a tree being represented by a bundle of drinking straws. In a living tree these straws would be almost full of water which is used to transport nutrients, cell building materials and waste products. The water is also used to cool the leaves by perspiration. The straw walls would also be swollen with water that lubricates or plasticizes the structure so that the tree can bend and sway to absorb sudden loads imposed by wind gusts etc.

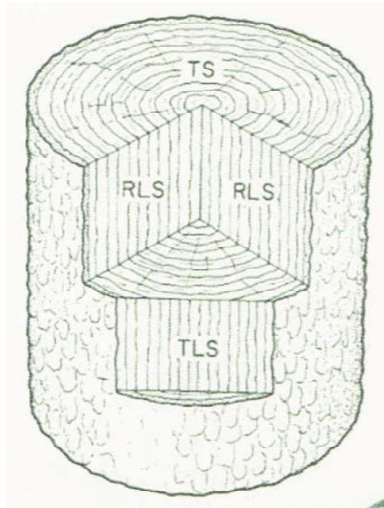
## **Free water**

Once the tree is felled the water in the straws evaporates away. The evaporation occurs mainly through the cut ends but should the bark be removed evaporation will occur there but more slowly. Water can pass sideways through these straws by a series of interconnecting holes or pits.

Whilst this water, the free water, is evaporating, the piece of wood will not shrink or crack. Once the free water has gone then the water in the walls, the absorbed water, commences to evaporate and our problems begin as the wood shrinks and cracks.

# Materials and methods

The photographs used in this text were obtained on a Cambridge Series II scanning electron microscope. Cubes of wood about 3-4mm per side were cut from air-dried blocks of various trees. These were first softened by boiling in water before the final surface cuts were made by hand using a new razor blade for each surface. The cubes were then mounted on standard stubs, transferred to a high vacuum evaporating unit lightly coated first with carbon and then with approximately 40 nm of gold palladium while being rotated at about 150 rev/min. The specimens were then examined in vacuum dry state in the column of the and microscope.



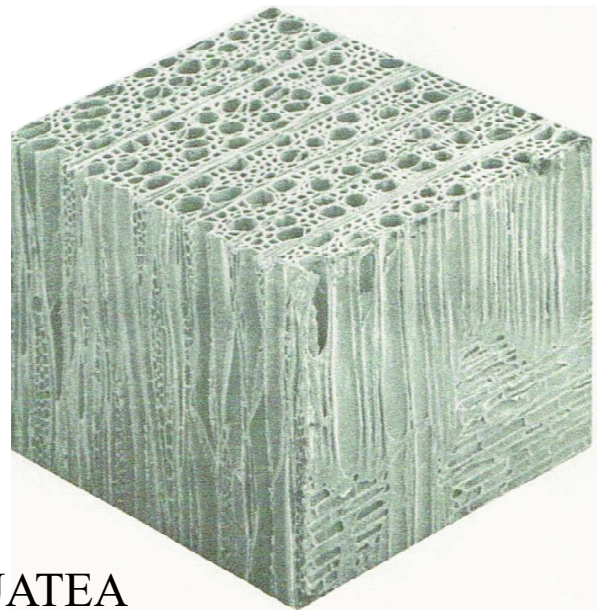
**Figure 1.**

This line diagram illustrates the three principal planes in which wood is normally viewed or sections cut in order to study its structure.

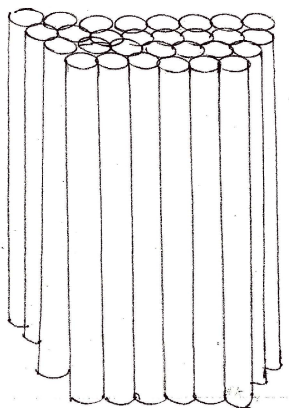
**TS**, transverse section; **TLS**, tangential longitudinal section; and **RLS**, radial longitudinal section. Tangential are truly tangential over only small areas, the area becoming more significant the larger the diameter of the stem being examined.

**Figure 2.**

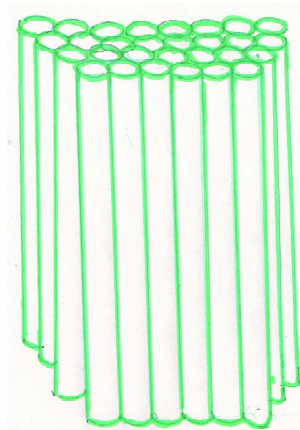
A block of wood cut from *Laurelia novae-zelandiae* A. Cunn. showing the transverse plane to the top, the tangential longitudinal plane to the left and the radial longitudinal plane to the right. (x 68)



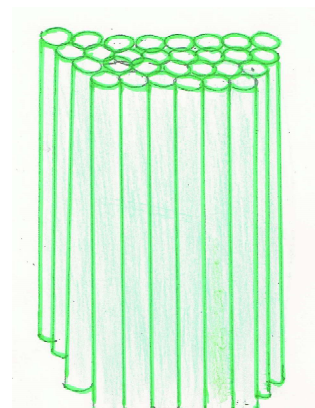
## LAURELIA NOVAE ZELANDIAEPUATEA



A BUNDLE OF DRINKING STRAWS  
REPRESENTING HE CELLS IN WOOD



CELL WALLS ONLY FILLED WITH  
WATER AT THE INTERSECTION  
POINT



THE CELLS AND CELL WALLS FILLED  
WITH WATER

## Intersection point

The commencement of the evaporation of the absorbed water generally happens about a moisture content of 30%. This is called the intersection point when shrinkage commences and continues with the evaporation until the moisture in the wood reaches an equilibrium with the moisture in the surrounding air. At this stage the wood is said to have reached an equilibrium moisture content.

## Moisture control

At this stage it would be appropriate to discuss moisture content (M.C.) and equilibrium moisture content (E. M.C.)

Moisture content is a measure of the total weight of free and absorbed water as a percentage of the weight of dry wood. It can be measured in many different ways but the most common methods are electrically with a meter measuring resistance or dielectric constant or by weighing and drying in an oven.

The “oven—dry” method is the more accurate and simpler method and not affected by the specie of wood. A piece of wood is weighed, dried in an oven at 102 C and reweighed. Drying and weighing stages are repeated until a constant weight is obtained.

The moisture content is calculated as follows:

$$\frac{\text{Initial weight} - \text{“Oven—dry” weight} \times 100\%}{\text{“Oven—dry” weight}}$$

Most living trees have moisture contents around 90% when freshly felled. This means that 10 Kg of green wood will contain 4.75 Kg of water. Some species have moisture contents of 200% where the weight of water is double that of the dry wood.

**Table 1** shows the moisture contents of a range of New Zealand grown timbers.

**TABLE 1:** Basic density and green moisture contents of some timbers grown in New Zealand

Species	Basic density k g/ fi13	Moisture content %	
		Heartwood	Sapwood
<b><u>Indigenous softwoods</u></b>			
Kahikatea	390	100	160
Kauri	480	100	145
Matai	540	115	130
Miro	510	125	140
Rimu	490	130	140
Tanekaha	530	110	120
Totara	410	160	180
<b><u>Indigenous hardwoods</u></b>			
Beech, hard	570	100	110
Beech, mountain	520	90	120
Beech, red	490	110	130
Beech, silver	470	80	120
Hinau	570	100	
Kamahia	510	75	
Kohekohe	440	110	
Maire, black	830	45	
Mangeao	510	95	120
Pukatea	380	120	135
Rata, southern	860	50	
Rewarewa	560	85	
Tawa	584	75 (mixed white)	
<b><u>Exotic softwoods</u></b>			
Douglas fir	380	45	145
Macpocarpa	422	65	145
Radiata pine	425	40-45	150
Redwood	330	18	220
<b><u>Exotic hardwoods</u></b>			
Blackwood, Aust	590	95	
Chesnut, Spanish	430		
E.regnans (ash group)	470	130	
E.saligna (gum group)	600	100	
Oak, European	580	75	
Robinia	670	50	
Walnut, black	550	105	

**Table 1a**

Basic Density and Green Moisture Contents of some Timbers grown in New Zealand.

Specie	Basic Density kg/m3	Moisture Content	
		Heartwood	Sapwood
Kahikatea	390	100	160
Kauri	480	100	145
Matai	540	115	130
Rimu	490	130	140
Totara	410	160	180
Silver Beech	470	80	120
Black Marie	830	45	
Rewarewa	560	85	
Radiata Pine	425	40-45	150
Redwood	330	180	220

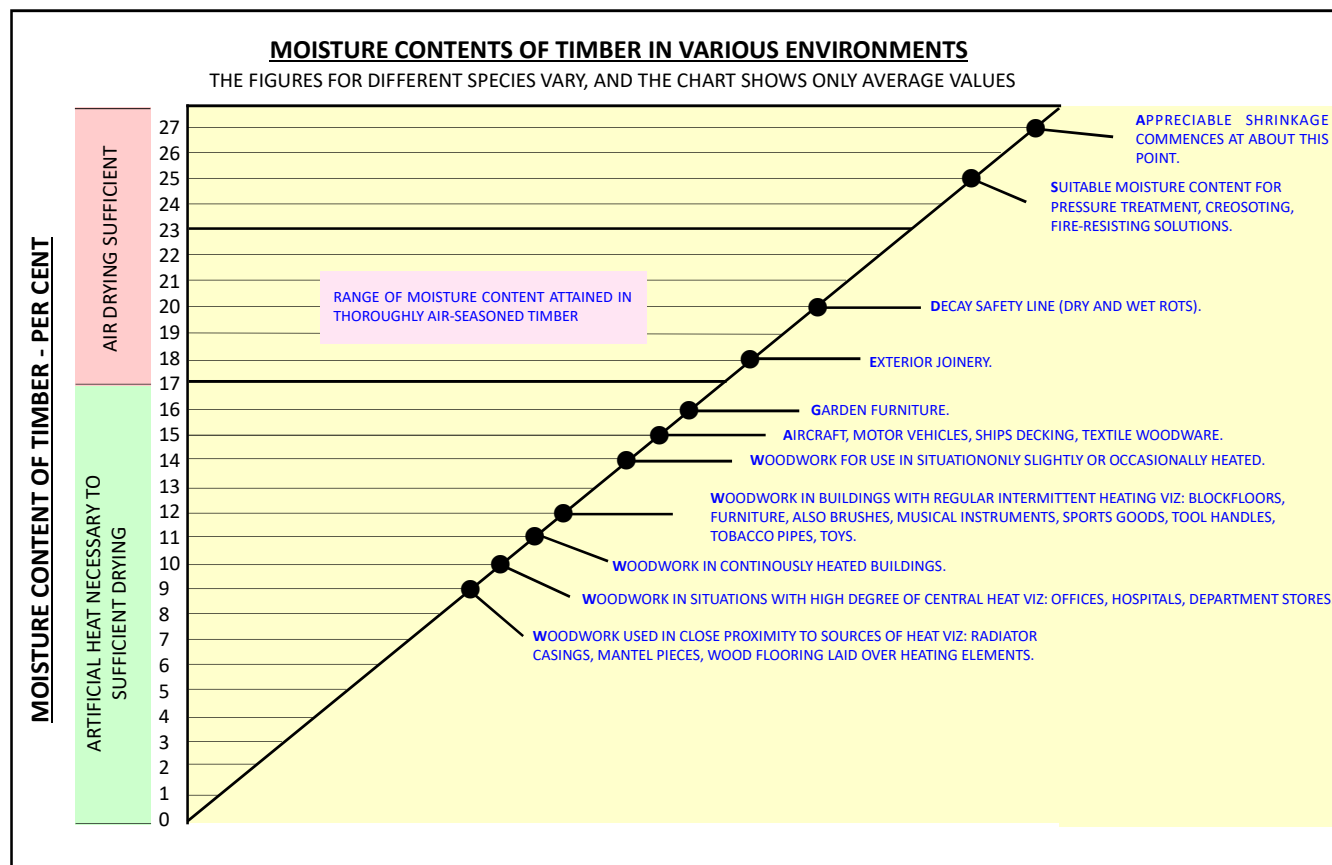
## Equilibrium moisture content

Dry wood always contains some moisture except when it is oven—dry. Wood is hygroscopic, it will gain or lose water to reach an equilibrium with its surrounding atmosphere.



Wood used in an exterior situation has an equilibrium moisture content of about 18% but this will vary within species, within seasons of the year and the colour and type of surface coating. Inside a building the E.M.C. will generally be lower with figures of 10% to 14% again dependant on species and the heating inside the building.

**Table 2** shows a few examples of E.M.C.'s of New Zealand woods.

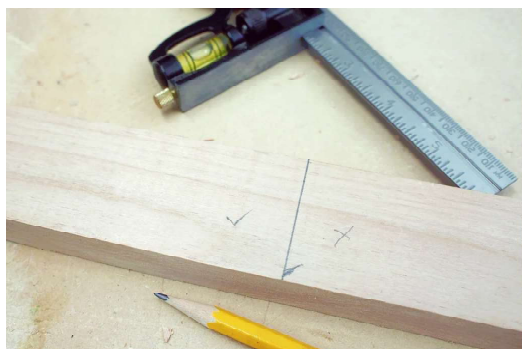


## Tips for the beginner



When measuring material to be cut you will find it helpful to put a little tick mark of the side to cut on. This simple action saves countless time remeasuring and helps account for kerf, the thickness of the blade you are cutting with.

Kerf is the divergence between the left and right sides of the saw teeth, and any cutting will result in some loss of wood that is turned into sawdust. If you just cut directly on the marked line the blade kerf would eat into your measured piece, causing your cut to be inaccurate. This may not seem like a big deal, but if you've ever had a project be a 1/8" out of measurement you know how frustrating this can be.



The solution is to measure your piece and make a small tick to one side of the measured line, indicated which side to cut on. Once measured, line your blade up to the line with the blade on the ticked side, so that the kerf will be on one side of the line and not into your measured area. If you ever work with a buddy and are dividing labor this is a great trick to keep each other informed of the areas to cut.

Use this every time it's a great habit to fall into.

Nick Crocker and several others were presented with a challenge - and they rose to the occasion:

A while ago, before Xmas, Teresa turn up at the shed one Tuesday with a chest of drawers that needed some restoration, and asked if it was something we could look at. Being keen to help out if there is a need, and being interested in wood; especially of the old variety, we offered to have a go. We did check there was not any urgency for completion (it is good to try and shed any suggestion of deadlines).

The back panel was missing, as well as back cross-rail (due to borer attack), and one drawer bottom was missing. See picture of back, with newly rail fitted. The bottom drawer panels scraped on cross rails when opening the drawers; this is regularly seen in drawers with thin bottom panels, especially where heavy items have been packed in the drawers.



Older well built drawers of this size, usually have a timber rail across them for strength, dividing the bottom panel. To follow this idea, we glued some 60 x 10 Rimu battens under drawers, screwed to back panel (just seen in picture). This flattened & strengthened drawer bottoms. A panel of 6 mm hardboard was fitted to one drawer, bevelled at its' edges, so it can slide into the existing slots. Hardboard was used to refit a back panel.

The exterior and drawer fronts were scraped & lightly sanded, after removing hardware. A portion of this had been started, although it seems enthusiasm had waned. Perhaps, a reminder that sometimes things are easier when we do them together as a team. A few of us helped out, but decent credit goes to Graham, who also completed the Cabot's finish with a fine Scotch pad & polish.



The finished item looks good; as it would have done years ago, although we did not try to remove all signs of age & use. "It was lovely to see the chest of draws as I had once remembered looking at them" Teresa is said, so we have a good result.

□

*This is a project for our shed undertaken by Joey Cabrera, This allows us to “Brand” our products with our own Logo.*

## **Electro-Etching for Copper Branding Iron**

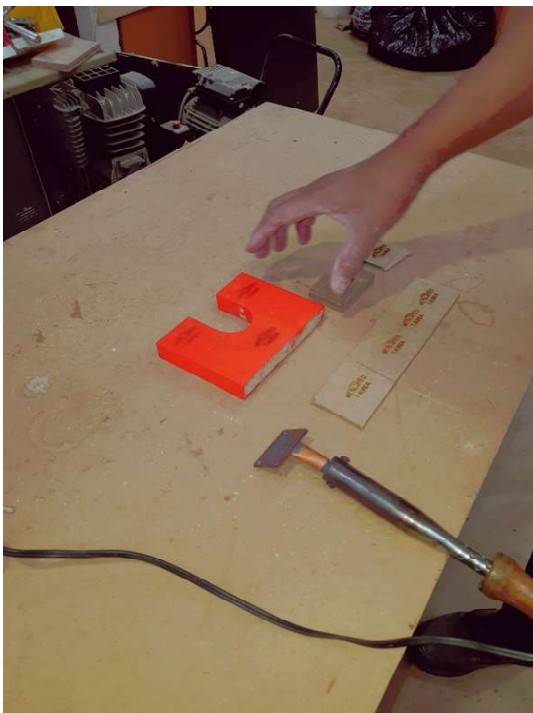
### **Materials and Tools**

- 1 piece of copper plate to be etched (at least 2mm thick)
- 2 print of the image on paper
- 3 masking media, such as oil-based paint for metal
- 4 exacto knife
- 5 12v lead acid battery charger
- 6 piece of iron as sacrificial anode (I used an old circular saw blade)
- 7 salt and vinegar
- 8 tap water

### **Procedure**

1. Cut the copper sheet to size with a hack saw or angle grinder.
2. Clean the copper plate and remove any oil or grease using very fine sandpaper and methylated alcohol or any degreaser. Avoid touching copper plate with bare hands to minimise contaminating the plate.
3. Mask the entire copper piece either by dipping or with a paint brush.
4. Cut the printed image\* to the size of the copper piece and adhere the image to the copper using the paint as adhesive. Ensure the first layer of the mask (3. above) has dried before adhering the image to the copper.
5. Allow the “glued” image to dry. Using exacto knife, trace-cut the image on the copper making sure the cut penetrate through the masking media. Using the exacto knife, scrape off the area of the paper and the mask to expose the parts of the copper you want the etching to remove.
6. The copper plate is now ready for etching. For the etching procedure, I referred to <https://www.youtube.com/watch?v=IFaSt03wTd0&t=115s>
7. Allow approximately 10 hours to etch the plate completely.

\*I used MSWord to adjust the size and get a “mirror” (reversed) print of the image. □





This is a story from one of our younger, newer members Neil Dalphin. One of a number all due to Gary Beecroft Tawa College involvement. This is great to see it blossoming and drawing young, enthusiastic woodworkers to our shed - and further becoming members. Gary must be pleased also. As well as enjoying himself, the tables are great too.

*"I've been a MenzShed member for almost a year now – I heard about it through the Tawa College woodworking course that Gary runs. Woodworking on Sundays is often one of my highlights of my week – being able to make things with my hands feels like an important diversion from a 9-5 job that has a lot of sitting at a desk and looking at computer screens. My partner commissioned these side tables for the ends of our couch, to stop me putting my coffee cups on the floor. The main wood used is European Beech from City Timber. The table tops were too wide to fit into our planer in one go, which is why I split them and then re-joined with the stripe of sapele."* □



## Firewood For Sale.



We're now into Autumn and so its time to check your firewood stocks for winter. The Tawa Menzshed are again promoting their fundraising project to sell banana boxes of firewood to assist with the shed development and as a service to ro the community.

Can Menzshed members please help spread the word to neighbours and circle of friends who may have wood burners.

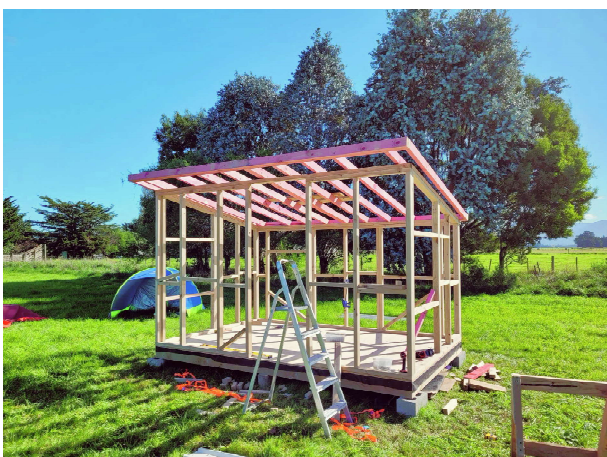
Banana boxes of firewood sells for \$10.00 each which includes delivery within Tawa. The firewood comprises cut-up pallets, and off-cuts from other Menzshed activities.

To place an order please contact Richard Herbert on 027 445 5942, or email [herbert.r@xtra.co.nz](mailto:herbert.r@xtra.co.nz) Payment either on delivery or to the Menzshed bank account 02 0552 0040123 00. Please reference "your surname" "firewood" "your address" □





## What you can achieve when you are young and keen?



..... some pics from another of our younger members - I think also through Garys college woodwork class. Ben Chambers who has done some sterling work building our "Mud Kitchens" and also on our committee.

Sadly for us he has decided on moving over to the Wairarapa. To that end he has purchased a piece of land and will build his future home on it.

He starting from scratch, nothing on it. Well the week before Easter he planned to go over and build his own Menzshed???

He took his tent and other essentials, I think in only three days the pictures below tell their own story.

Really well done Ben.

Isnt there some sort ceremony we should be performing when all clad and windows and doors in? ☐

### This was a picture put up on the Johnsonville

Memories site - they look after there tools there:

