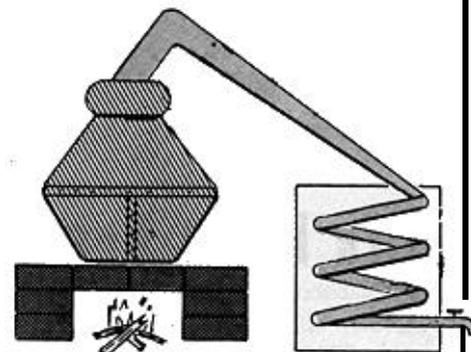


# Making Alcohol to Run Your Car



Alcohol has been hinted as a renewable fuel of the future, so being low on funds, I decided to see if I could design, construct and operate a low cost still. Needless to say I did.

The finished product was very simple, me believing in the KISS formula, (KEEP IT SIMPLE STUPID).

The first problem that I encountered was how was I going to make a fermenter that would make me a large volume of fermented material. (Alcohol's made by converting simple sugars to the good substance).

I solved this very easily by obtaining a second hand 150 gallon tank (140). The material that I used to ferment was green wheat straw with head.

## Starting the brew

I set up the tank in the back yard at my house near Bendigo. I have a shed where the tank fits in and I can keep the temperature pretty constant not too hot and not too cold. (NOTE) any book on home brewing will explain how to pick the location - that's what I did.

Crop	Ethanol Yield (l/l)	Crop Yield (t/ha)	Alcohol Productivity (l/ha)
Cassava	168	30	5100
Sugar Cane	89	85	7600
Sugar Beet	100	40	4000
Fodder beet	50	110	5500
Wheat	320	1.25	400
Corn	340	3	1000
Barley	300	1.5	450
Potatoes	110	25	2750

Next I went to my mate's place who has acres and acres of the raw material, wheat straw, this material has a reasonable sugar content. I got heaps of it and fed it through an old grain crusher until I had about 400 litres of the stuff, mainly liquid, a great green colour. I then placed this in the tank, topped the tank up with water and added yeast which I got from a winery at Heathcote. The only thing that I did to the tank while it was fermenting was occasionally take the scum off the top. After about two weeks it had stopped bubbling (fermenting) and I got the brew assessed and it was 14% ALC/VOL which wasn't too bad.

## Stilling

The still was made out of a 44 gallon drum which I picked up off the side of the road, welded four legs on it and attached a pipe out of the top of it. (see Figure 1)

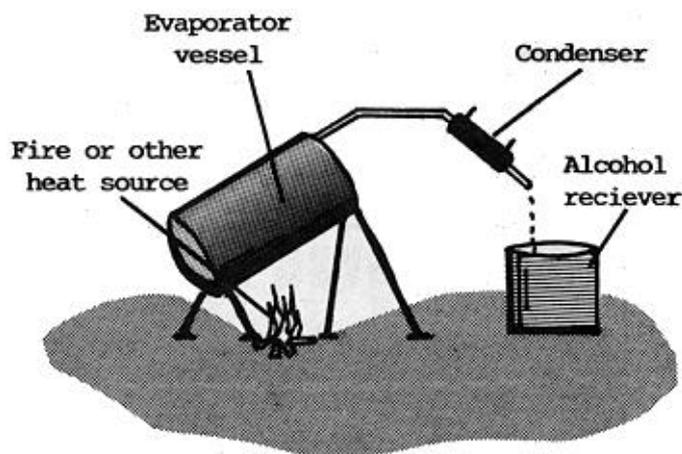


Figure 1. The basic still is made out of a 44 gallon drum and some pieces of copper pipe.

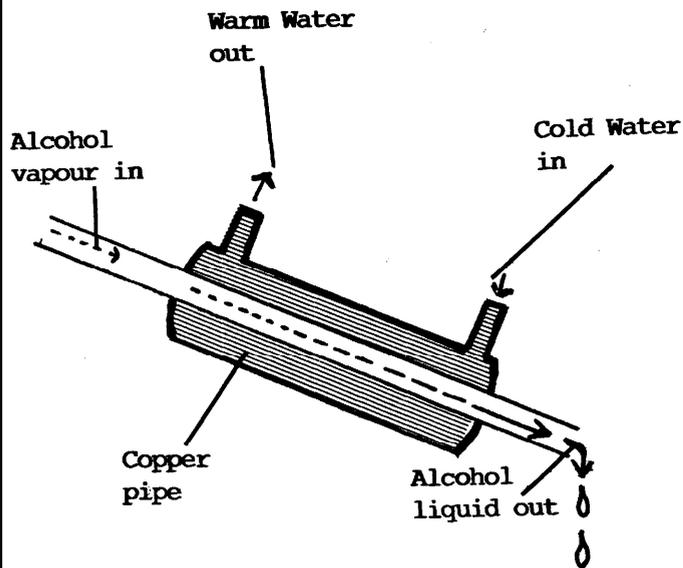


Figure 2. The condenser for the still is made of two copper pipes with the outer pipe acting as a water jacket cooling the hot alcohol vapour,

From the pipe I fed it down through pipes which were connected to a water jacket. (see Figure 2)

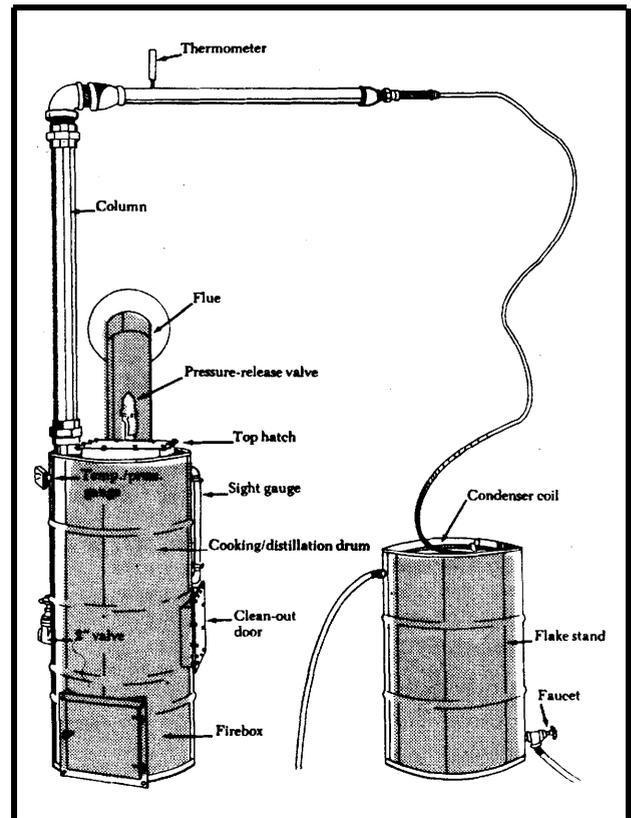
I fitted the still up with a plastic bucket leaving all the unwanted scum in the tank. I lit a fire under the 44 gallon drum and heated up the brew slowly. You don't boil it like water or you will get a brew containing water and alcohol not pure alcohol as intended. So the idea is just keep it under boiling and only the alcohol evaporates leaving all the unwanted sludge in the still, which you just throw away. After a bit of trial and error, you get the hang of it.

Out of the 400-450 litres I distilled I got about 50 litres of pure alcohol, a word of warning here, don't drink it or you will go blind, but I have seen blokes put caramel food colouring in it and call

it whiskey, I've seen 'em next morning and they don't look real bright.

#### What I did with it

I tried running my Morris 1100 on it, I used to start it with petrol and then run in on the mix at 4 litres petrol/6 litres alcohol but after about 20 litres it started to effect the motor. I haven't pulled it down yet but I suspect valves! However, a mate of mine runs his unleaded 323 on it and he has no problems, although he had to have a few adjustments made to the motor.



A more sophisticated 55 gallon still complete with distillation column and gauges to indicate what is going on.

**Advantages - Disadvantages**

You can mix up to 25% water in the alcohol and as long as you keep it stirred up it will run.

However, if you have petrol and alcohol together, they don't stay together very long, they separate. The whole thing cost me about \$60 to set up.

At the moment, if you can get the raw material for nix and you are a reasonable handyman (you don't need lots of tools), you can turn it out for between 7-9 cents per litre. If you have to buy anything, it is just not worth it.

If anyone needs more info, I don't care if you ring us, it's your 20 cents. Telephone number is (054) 32 2214, name is Gary Newman.

Editors comment.

We dug around and came up with the following information which is likely to be of interest to readers.

Fuel alcohol can be used as a blend, (often referred to as gasohol) or by itself. Few changes are necessary to the vehicle with blends of up to about 20%. When alcohol is being used by itself a number of modifications are necessary. These include an increase in the compression ratio to 12:1, modifications to the carburettor and distributor calibration as well as the tuning.

The need for these modifications can be traced back to the different characteristics of alcohol. Ethanol has a higher octane rating than even super petrol, but at the same time only 62% of petrol's energy content. Alcohol needs more heat to vaporise and this is the major reason for the high compression ratio,

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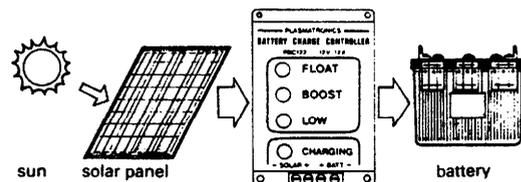
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