

A Solar-powered Springwater Irrigation System

Our plot is a private allotment site with no mains water. The site is on a fairly exposed slope and gets very dry from the drying winds. We needed an irrigation system and fortunately there is a spring on the allotment site which seems to be perpetual, but is 100m away and maybe 15m down. There is no mains electricity, so the obvious way to move the water up to our allotment was a 12V pumping system charged by a solar panel.

The easy bit was choosing and installing a solar panel. Maplin Electronics had a sale on at the time for a 10W solar panel for £40. This is fitted on the south facing wall of the shed.

The panel is connected permanently via an optional regulator to one of two secondhand car batteries. These can sometimes be obtained for free by asking nicely at a local garage or even at the dump! Whenever needed one battery is carried down to the spring together with the pump. A piece of hosepipe around the battery handle makes it easier to carry.



Finding a good water pump was more difficult. An oscillating 12V pressure pump was initially bought on eBay and this proved something of a disappointment since it was very slow and got rusty if not disassembled and dried after each use. Not recommended. The second pump obtained was much faster, cheaper and didn't get wet inside. It is a rotary type pump "12v Submersible Water Pump 20 LPM - Caravan / Motorhome" from eBay for £14.99 + £2.95 postage – a much higher flow than the normal 10 L/minute of this type of pump.

The pump is connected to the car battery, then plugged into a long hosepipe (3 x 30m lengths connected together) and then submerged in an old sink "reservoir" at the spring. The pump is capable of pumping water some 12-15m up and 100m away to an old bathtub situated at the top of our allotment and can fill this in about 1hr.

The upper bathtub has a permanently attached hose system which can provide a gentle flow just using siphon pressure (since our allotment is on a slope), and even drive a sprinkler inside the Polytunnel at the bottom of the allotment in this way. The hose system also has a second pump of the same type as is used to pump the water up. This is connected to one of the two batteries and can provide a powerful hose spray or drive the sprinkler anywhere on the allotment. Usually both pumps are used at the same time – filling the bathtub from the spring at the same time for irrigating the plot from it.



Technical stuff: An electrical multimeter is essential when using a solar powered system. When choosing a possible car battery reject anything that is below 10-11V as it is probably too far gone. Don't use the battery for pumping whenever it gets below about 12V - recharge it first or it might be damaged. The regulator stops the battery from becoming overcharged and can be dispensed with (in the UK anyway!) if the battery is manually disconnected from the panel when it goes above 14V. It was obtained from a pound shop but can be obtained from Maplin or eBay.

The solar panel is mounted at an angle of about 55° to the vertical, which a search revealed was best for our latitude in the summer when the system is most needed. The pump uses 3-4 Amps and so can run for many hours from a single charge of a typical 60-70 Ah car battery. The solar panel provides 0.7 Amp peak as a comparison, but runs for many more hours per day than the pumps and so can usually manage to keep both batteries sufficiently charged. The car battery can also be charged at home using a car battery charger if there is insufficient sunshine.

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