

Water at the RPA. What does the future hold?

Introduction.

Climate scientists tell us that we can expect more extreme weather events in future. Hot dry summers interspersed with areas of very low pressure and torrential downpours may well become the norm. Whether or not there is immediate cause for concern about the supply of water at the Paddocks Allotment site, climate change will almost certainly prove challenging to both commercial growers and plot holders alike. The small "Water Group" that was set up in Spring 2019 has attempted to look at how we might respond to these challenges.

The System Now.

The principal form of irrigation on the site is the lifting of ground water by means of twenty seven hand pumps. The pumps are maintained by a team of volunteers at an annual cost of something in the region of £100-£150.

The water itself is the accumulation of rainwater that has seeped through the layer of topsoil and the substrata of sand and ballast, to sit on top of a deeper layer of impermeable clay. The lower end of our pump bores are in what is known as the "saturation zone" and this, the water table, is our precious reservoir of water. The Environment Agency do not charge us for this water, an abstraction licence only being required for water in excess of 20 cubic metres daily.

Keeping the cast iron pumps in good working order is relatively straightforward; what is happening underground less so. Fluctuations in the water table, varying depths of bores and differences in the aggregate that the pipes are sitting in all mean that some pumps work better than others, and that some will dry up from time to time.

For all of the occasional problems, the pumps have served the allotments well for many years. How well they will cope with an increase in the likelihood of hot, dry summers and the possibility of a falling water table is open to question. We may well have to revisit this matter at a future date but for the time being the existing twenty seven pumps do provide an adequate, if not always entirely dependable, supply of water.

Is mains water an option?

It is certainly true that most allotment sites have mains water and an Association of Public Service Excellence report tells us that 86% of local authority sites are "on the mains" (APSE State of the Market Survey 2018. Local Authority Allotment Services). There are probably historical reasons why the RPA site was never provided with mains water but there seems no practical reason why this service could not be installed now. The principal stumbling block is the question of cost. No attempt was made to obtain more than a ball park figure for the work but assuming that Thames Water were responsible for laying the pipes from the road into the site, and a private contractor did the work on the site itself, the total capital outlay would come to some £38,000 including VAT (see Appendix 1 for a more detailed breakdown of costs). On top of the capital outlay there would of course be a metered water bill to pay, perhaps as much as £1,000 p.a. Mains water might be a convenient service to have on site, but it would not come cheap.

Water Harvesting.

Walking around the site, it seems surprising how many sheds have not been equipped with guttering and a water butt – surprising because water harvesting, collecting rainwater from shed roofs, is one of the simplest and most cost effective ways of providing an additional supply of water (see Appendix 2).

Water conservation.

Opinions differ regarding just how much water is needed for different plants but a few points seem to be beyond dispute. To encourage deep rooted plants an occasional thorough soaking is far better than the more frequent surface sprinkle that we are sometimes tempted to go for. In order to help water retention on our light, free draining land it is essential to get as much organic matter into the soil as possible. This organic matter can take the form of well rotted stable manure or garden compost. It can be worked into the soil in the traditional manner or, if you are a no till grower, spread on the surface as a mulch.

Another thing well worth looking at is incorporating green manure into your crop rotation, both as a cover crop, and after it has been chopped down, as another source of organic matter (see Appendix 3).

Conclusions.

Growing conditions are likely to get more difficult in future and for this reason it will be essential for plottolders to stay as well informed as possible on all aspects of water usage and water conservation on the site.

Our pumps have many years of service left in them but a falling water table during periods of drought may mean that some pumps will fail.

Water harvesting is likely to be even more important in future. We feel that there should be a real drive to increase the level of harvesting on the site. Ideally, every shed should be equipped with guttering and a water butt. With their large roofs, the seed store and lock up buildings have great potential for rainwater harvesting but this resource is currently under-used. A new array of water butts for the seed store building has now been installed.

Plottolders will make their own decisions about the matter of water retention/conservation but the most successful growers will certainly be putting as much organic matter as possible into their soil.

While there are no plans to install mains water at the moment, this is something that may well have to be revisited in future years. It must be clearly understood however, that the costs involved could only be met by a considerable increase in rent.

APPENDIX 1

Estimate of Thames Water charges to bring mains water onto the site.

Connection charge.	£4,500
7m of pipe in road.	£4,060
3m of pipe in footpath.	£1,590
Water Meter installation.	£900
Infrastructure charge.	<u>£1,400</u>
TOTAL	£13,968 VAT included.

Estimate of Cascadia Water charges for work on site.

600m of entrenched plastic pipe @ £25 per metre	£15,000 plus VAT
To supply and install 20 standpipes @ £250 each	<u>£5,000 plus VAT</u>
TOTAL	£24,000 VAT included

APPENDIX 2

Rainwater Harvesting

Last year's summer was the joint hottest since records began and this year has been another record breaker with the UK's hottest ever July day.

At the RPA we are very lucky to have water onsite but the 2018 heatwave put real pressure on our pumps, with several of them failing completely.

With average global temperatures creeping up, it is very likely that heatwaves will become more frequent in future. So perhaps it is time to look more seriously at harvesting and storing rainwater for use over the summer months.

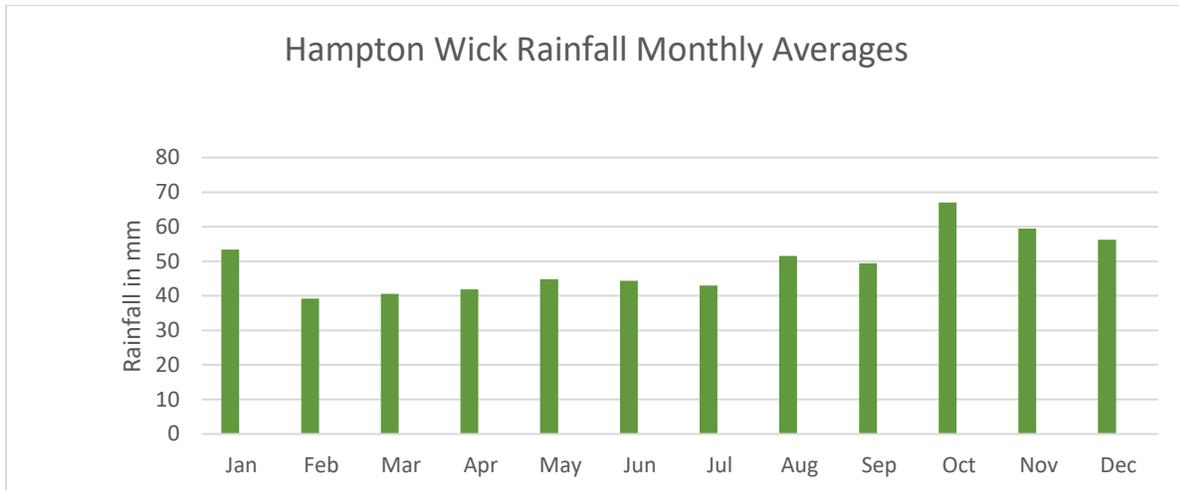
So how much rainwater can we collect?

A surprising amount. All you need is a shed or any kind of roof on your plot. A five by seven foot shed gives you a rain collecting area of just over 3 square metres.

According to the Met Office, the average rainfall in Hampton Wick is 590mm per year. A quick calculation shows that this means you could collect enough water to fill nearly eight water butts over a year.

rainfall in mm x shed area in sqm=litres of rain harvested
e.g. 590mm x 3.2sqm=1906litres

Unfortunately, the majority of this rain falls out of the growing season when we are not watering. You would need five water butts to store it all. But between May and September, when your plants are thirsty, there is still on average 230mm of rain, enough to fill three water butts.



Source: Met Office, based on 30 year average between 1981 and 2010 for Hampton Wick

For practical reasons and cost, most people would opt for one or two water butts. You can pick up a 250litre water butt including a stand, tap and connectors for around £50.



FACT: On 10th June 2019, a month's worth of rain fell in just one day. It was 56mm according to a local rain gauge. On a standard sized plot (about the size of a tennis court) that's enough rain to fill 56 large water butts!

Depending on what kind of roof you have, you will need one or two lengths of guttering and some round downpipe, fittings for the guttering plus a few clips and screws to fix it to the shed (this should all cost around £20-30).

There are various different ways of connecting the guttering to the water butt, depending on your set up, and how neat you want it to look. (The committee is available to advise you.)



With your butts in place and properly connected, you can start harvesting rainwater. Once you have a substantial quantity of water stored you can reap the rewards. Even with a small shed, you can start the season with two full water butts, enough to fill up 50 watering cans. During the summer your water butts will get a regular top up. That means fewer trips to the pump, and the ability to fill your watering can just by turning on the tap.

Tips on using your water butts.

- Leaves and debris can quickly clog up the pipes and diverters. Test them regularly by tipping a bit of water into your gutters and checking it arrives in the water butt.
- Cover your water butts with a lid to prevent birds and squirrels falling in.
- To prevent disease spread, clean your butts every year by emptying them completely, rinsing them and letting them dry out.
- Don't hoard your water, use it. Your butts should be empty at the end of the growing season. Any water still left is effectively wasted.
- If you don't have a shed, you could build a roof over a compost bin or create a rain roof just for collecting water.

APPENDIX 3

Economical Watering Practice – some tips and suggestions.

Preparing the Soil for Better Water Retention: Best done in Autumn/Winter by digging in organic matter (well rotted compost/manure). Mulch (compost, manure, even cardboard) provides a protective layer reducing evaporation.

When to Sow and Plant: As early as possible in the season. April showers time is ideal.

Sowing and Planting out: When planting out, ensure that the pots or plugs containing seedlings are well watered before planting and when the plant is in the newly dug hole, fill this with water before replacing the soil. Plant a little lower than the surrounding soil so that water collects in the puddle and actually sinks in.

When sowing seeds, water the seed drill before sowing.

Time of Day to Water: Early in the morning on dull days or at the end of the day on hot days will reduce evaporation.

Economical Watering: Water the stem bases beneath the foliage canopy, leaving the surrounding soil dry (this helps limit weed problems). Do not water foliage as this encourages mildew.

Loosen the soil round plants to prevent water running away when the ground is like concrete.

How often to Water: It is better to under rather over water. On our drought prone soil, water established plants every 10 to 14 days (this is a general guide). Some "experts" actually believe that once fruit and vegetables have germinated safely or been planted out, they are best left alone to work harder for moisture and send down roots deeper into the soil. Indeed some of our plot holders do not water at all and achieve good growing results!

How Much to Water: Water thoroughly to a depth of 30cms/1ft. Frequent watering of just the surface is ineffective.

Vegetables in Periods of Drought: Again opinions differ but the following are recommendations mostly from the RHS.

- Carrots, beetroot, parsnips and other root crops are relatively drought tolerant and should survive at least 2 weeks without water.
- Salads and other leafy veg like spinach need water. Chicories, endives and chards are likely to require less water than lettuces or spinach.
- Peas, broad and runner beans need water at flowering time; French beans are less sensitive to some dryness.
- Onions, shallots and leeks need only to be watered when they are establishing.
- Amongst brassicas, cabbage and calabrese are less vulnerable than sprouts and

cauliflowers; turnips are deeper rooting and more drought resistant than swedes.

- Courgettes need constant moisture through to harvest. Marrows, pumpkins and winter squash may benefit from watering but in practice often produce fair fruit from minimal watering. Trailing types need less water.
- Aubergines, sweet corn and tomatoes need water. There is a school of thought that recommends less watering of tomatoes as they mature and contends that this reduces splitting.
- Potatoes may benefit from watering at flowering or every 10-14 days once the tubers are marble sized. Several ploholders do not water potatoes at all and achieve good results.
- Most herbs enjoy dry conditions.

Sources: Royal Horticultural Society. The National Allotment Society. realmensow.co.uk. quickcrop.co.uk allotment-garden.org.

For more information on green manure see: <https://www.allotment-garden.org/composts-fertilisers/green-manure-guide-to-sowing-growing-green-manure/>