



# **WATER USE IN HORTICULTURE**

## **A PRACTICAL GUIDE FOR COMMERCIAL GROWERS IN WALES**

## ABOUT THIS GUIDE

Whether irrigating fruit, vegetables, shrubs or flowers in fields or nurseries and other controlled environments, horticulture has high water requirements.

Good water management is vital to maintain yields, ensure quality, stay ahead of legislation and keep production costs down. This is commonly done by combining mains water use with abstracting, collecting and recycling water. However, these alternatives also generate costs due to storage and treatment needs that should be factored into decision making.

This guide contains information and practical tips to help commercial growers in Wales consider how to use water wisely, both now and in the future.

It is one of a suite of guides being published as part of the Tyfu Cymru online Knowledge Hub.

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## SECTION 1: USING WATER RESPONSIBLY

Water is crucial in horticulture, but it's availability is becoming increasingly scarce due to our changing climate and an increasing demand on this natural resource.

Welsh Government legislation exists that puts a range of requirements on all farm businesses in Wales; **The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021** requires planning and record keeping to monitor the use of fertiliser, compost and manure to prevent impacts to water quality from excess nitrogen and phosphorus.

Growers that abstract their own water as an alternative to mains supply will need an **abstraction licence** from Natural Resources Wales if this is more than 20 cubic metres a day.

Approaches to prevent flooding, water pollution that work with natural processes to drain away surface water and support water quality and biodiversity, are collectively referred to as **Sustainable Drainage Systems (SuDS)**. All construction work in Wales with drainage implications of 100m<sup>2</sup> or more are required to have SuDS to manage on-site surface water. Approval by a SuDS Approval Body (SAB) applies whether the construction requires planning permission or not.

At the time of writing, the Welsh Government are consulting on the new **Sustainable Farming Scheme** due to launch in 2025 that will introduce a new system of farm payments. This will support commercial growers to lower their carbon footprint and help improve the natural environment.

Costs for using mains water are increasing and pumping water is an activity that uses energy that, unless from renewable sources, emits carbon. These are both reasons why good water management can save money, reduce carbon and help avert the impacts of the climate crisis.

## SECTION 2: GOOD WATER MANAGEMENT

A water management plan can equip commercial growers with the practical know-how to become more water efficient in their operations, whilst enabling them to plan more effectively for the future.

### 1. How much water and at what cost?

A useful place to begin is to identify each water source and how much water you use from each one. Common water sources include; mains water, water abstracted from springs, rivers or bore holes, ponds or on site storage for collecting and re-using water.

Setting up a regular routine to record meter readings, ideally on a month by month basis, will enable you to monitor the amount of water you use and see any fluctuations in water use and costs. Doing this can help you to identify immediate problems such as blockages or leaking pipes, as well as helping you prioritise where you might focus your effort to take-action save water and money over the longer term.

#### Calculating the true cost of the water you use.

These costs will be specific to your operations and how much water you use.

The costs of water you use can be calculated from the amount you pay to your water supply company, plus how much you pay if you have an abstraction license.

Other costs arising from pumping, storing and treating water, as well as any maintenance time, can also be useful to factor in.

Recycled water that has been collected and stored, such as from rain and ponds, isn't metered and usage can't be accurately recorded. However, by estimating how much you use over the same time frame as metered water may also help you understand where savings can be made.

### 2. Where do you use water?

After you have found out much water you use the next step is to identify where you use it. This can be done by reviewing your process and any equipment that uses water. Some questions to consider are:

- **Do you need to use as much water as you currently do?** For example, can you reduce the frequency of watering, can simple fixes be made to leaking equipment or hose pipes left running?
- **Does the activity need to use high quality water?** Can re-cycled water that has been collected and stored, such as from rain and ponds, be used instead of clean water that has been treated or comes from the mains?
- **Does the activity need water at all?** Sometimes things are done in ways they always have been and it maybe that different methods could be used that don't require water. Brushing instead of hosing down the yard for example.

Water is essential for horticulture and is used at each stage of the production cycle, from growing to washing and getting produce to market. By considering each stage you can identify where the biggest savings can be made - often at no cost or low cost.

“Using the natural slope of the hillside at Dingle Nurseries means the water doesn’t sit in the beds in the winter and rot the roots of the plants, it also doesn’t permeate into the ground and can be channelled into the drains and redirected to irrigation pools, recycling water efficiently and preventing any run-off. This is a small change that’s made a huge difference to productivity.”

Jerry Joseph-Meade, Derwen Garden Centre

### 3. Draw up an action plan

Once you have identified how much water you use and where you use it the next step is to begin to draw up an action plan.

This should include your priorities and targets you set for water and cost savings, as well as who is responsible for implementing each action. This plan should be kept up to date and the best way to do this is to review it regularly, ideally on an annual basis. By communicating the savings you make and rewarding successes will help you gain support and raise awareness of your good practice.

Water use Action plan template

What actions will you take to manage and reduce water use?	Person assigned to drive improvements	Review date	Use Red Amber Green Rating to set priorities
eg. Water use is regularly monitored and recorded			
eg. Reduction targets are in place			
eg. On site systems are installed to capture, <u>store</u> and reuse water			



## SECTION 3: PRACTICAL TIPS FOR BEST PRACTICE

Many water efficiency steps can be done at no cost or low cost. Below we have compiled a list of some practical tips recommended by commercial growers.

- Leaks can be expensive in terms of the water that's wasted and the costs of finding and fixing them. Most above ground leaks in water pipes and equipment such as pumps, taps, hoses, seals and fittings can be easily spotted with regular visual checks.

If leaks happen below the ground they can be more difficult to find and can require specialists to fix them. One practical tip is to record meter readings at regular intervals during times when you would not normally be using water. If your meter readings show that water has been used during these times it's a good indicator that you have a leak.

- Water is often used for washing produce such as fruit and vegetables before sending to customers, this water can be collected and recycled for reuse in activities that don't require such a high quality of water. Catch trays can be fitted beneath cleaning areas and potting tables to collect this water.

- Rainwater harvesting is one of the simplest and oldest methods of collecting and storage of water. It involves redirecting and storing rainfall via gutters and pipes. It can be particularly advantageous to commercial growers that have buildings with large roof areas, greenhouses and poly-tunnels, and is commonly supplemented with mains water.

### What quality of water do you need?

Collected rainwater will contain traces of environmental pollutants, animal and bird faecal matter and vegetation, such as leaves and moss. There may also be a risk of contamination from the roof and drain structures to consider, such as asbestos or lead.

Harvested rainwater is suitable for root zone watering, such as hydroponics, trickle irrigation systems and ornamentals. It is not suited to overhead irrigation systems on edible salads or fruit products. There are strict hygiene regulations for the quality of water to be used in direct contact with food, requiring the water to be treated to drinking standards.

### Source: Environment Agency

- When irrigating try to grow trees, shrubs and plants that are native or most suited to your location, and schedule watering to account for soil moisture and evaporation, for example at night time. Avoid irrigating when it is windy to prevent drift. Use boom rather than gun irrigation for large areas and drip irrigation to target water to the plants and not in between them.

“Where possible drip irrigation is far better. It only uses about 10% of the water used in overhead irrigation. The plants can be given an exact amount of water each day – we water trees 3 times a day amounts are increased in the hottest weather.

The water has to be free of particles that would block the nozzles and so is filtered twice. I think the only drawback with drip irrigation is if a nozzle is blocked its hard to tell until the plant wilts.”

**Andy Joseph, Dingle Nurseries**

“We use an automated gravity fed irrigation system for feeding and watering the chilli plants made by Auto Pot. This is operated by a series of valves that senses when the plants need feed and water. It produces no waste water or run off leakage.”

**Owen Rosser, Pembrokeshire Chilli Farm**



## SECTION 4: ACKNOWLEDGEMENTS AND FURTHER READING

Every effort has been taken to ensure the information contained within this guide is accurate and current at the time of writing. Inevitably things do change – technology advances, new innovations happen, legislation changes. Commercial growers in Wales face unique challenges and many have individual needs so we hope that this guide can be used alongside your own research to help you take-action to use water wisely, both now and in the future.

This guide is one of a suite of practical guides that **Tyfu Cymru** are developing for the industry, these are freely available online at: <https://www.tyfucymru.co.uk/knowledge-hub/>

The following web resources are also provided to help you on your way. Click on the links to access these external websites.

### Policy and legislation

- The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021: guidance for farmers and land managers can be accessed here: <https://gov.wales/water-resources-control-agricultural-pollution-wales-regulations-2021-guidance-farmers-and-land>

- This link to Natural Resources Wales has guidance on obtaining a water abstraction license: <https://naturalresources.wales/permits-and-permissions/water-abstraction-and-impoundment/find-out-if-you-need-a-water-abstraction-or-impoundment-license/?lang=en>

- This link to a Welsh Government Advice Note provides simple guidance on the drainage proposals for small agricultural buildings, coverings and surfaces requiring approval by a SuDS Approval Body (SAB) prior to construction: [https://gov.wales/sites/default/files/publications/2021-03/advice-note-sab-applications-for-agriculture-roofs-and-yards\\_1.pdf](https://gov.wales/sites/default/files/publications/2021-03/advice-note-sab-applications-for-agriculture-roofs-and-yards_1.pdf)

- This links to information from the Welsh Government about the Sustainable Farming Scheme: <https://gov.wales/co-design-sustainable-farming-scheme-wales>

### References and sources of information

A huge variety of articles are available online, some useful ones are listed below:

- Rainwater Harvesting: an on-farm guide, Environment Agency: [http://www.ecosystems-direct.co.uk/uploads/documents/Rainwater%20Harvesting%20on%20Farms\(2\).pdf](http://www.ecosystems-direct.co.uk/uploads/documents/Rainwater%20Harvesting%20on%20Farms(2).pdf)

- Water Management: Key Actions for Farmers, Environmental Agency: [https://www.cfeonline.org.uk/cfe/publications/key-actions-for-farmers\\_core\\_doc\\_2016-final-2/](https://www.cfeonline.org.uk/cfe/publications/key-actions-for-farmers_core_doc_2016-final-2/)
- Water quality for agriculture, FAO.org: <https://www.fao.org/3/t0234e/t0234e01.htm>
- Water regulations for farmers, AHDB: <https://ahdb.org.uk/knowledge-library/water-regulations-for-farmers>
- Water use in greenhouse horticulture: efficiency and circularity, EipAgri [https://ec.europa.eu/eip/agriculture/sites/default/files/fg27\\_mini-paper\\_water\\_2019\\_en.pdf](https://ec.europa.eu/eip/agriculture/sites/default/files/fg27_mini-paper_water_2019_en.pdf)
- Auto Pot Watering Systems: <https://autopot.co.uk/>

**Note:** We cannot take responsibility for links to external websites.

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