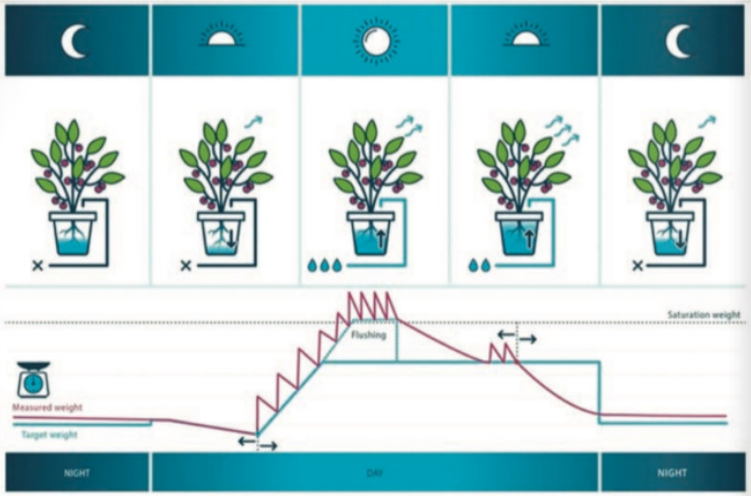
regions are increasingly being affected by climate change, population expansion and migration," explains Priva's Kathryn Smethurst. "To mitigate these factors, we need to treat water as the precious resource that it is and prove to the supply chain that we are being accurate, cost effective and sustainable in the way that we use water for feeding the world."

Even though water availability is less of an issue in the UK than some other countries, there is more pressure from the retailers to provide sustainability evidence and pressure from government concerning water abstraction and usage. "This requirement from the market led Priva to develop our Vialux M-line UV disinfection system which is used for re-circulation, saving the grower expensive fertilizers and water. At the same time, our innovative control strategy, the Moisture Balance Module, ensures precise and timely irrigation which contributes to a higher production and crop quality," continues Kathryn.

"The Module can automatically determine exactly the right start and stop time for irrigation dependent on the needs of the crop itself. Throughout the course of the day the system automatically regulates itself to the changing conditions. It works on three important influences: the quantity of water evaporated, the desired amount of drain water and the water content of the substrate. This means that the crop gets exactly the right quantities that it needs, no more and no less. Irrigating on guesswork leads to over-watering and poor conditions for root development; the Moisture Balance Module solves this problem.

It supplies the most optimal irrigation strategy. The result is higher crop quality, less water and less fertilizer usage."

The Eii controller from E&TS automatically adjusts irrigation frequency based on weather conditions.



The Priva Water Balance module helps schedule irrigation based on crop requirements.

Another important measurement for accurate irrigation scheduling is evapotranspiration rate, and the Evaposensor from Electronic & Technical Services Ltd (E&TS) provides an electronic output based on the rate of evaporation from the leaf, so it can be used in irrigation scheduling. Also aimed at improving irrigation efficiency is the EvapoIrrigation Interface+ (Eii) which automatically adjusts irrigation frequency based on weather conditions. "It is particularly appropriate for small to medium-sized enterprises and takes the guesswork out of deciding when to irrigate," explains E&TS Founder John Walker. "The key feature of the Eii is its ability to integrate evaporation rate over time. It triggers irrigation when accumulated evaporation reaches a user adjustable target value."

Despite the benefits of automatic irrigation scheduling, some growers may prefer to take a more hands-on approach. Darran Grieveson comments, "For those growers that prefer a manual system but require more informed decision-making utilising data and insight, the Metos range of sensors is vast and easily integrated together into one online dashboard. Through an existing API protocol, the data from Metos can also be uploaded to the Talgil system."

In terms of efficiency savings, he points out that, "In a scenario where water availability is licensed and fully utilised, if you reduce water use by 10%, you can expand your growing area by the same percentage. Equally, if your water source is expensive, then there are straightforward savings to be made. However, for me, it is really about increasing yield and improving quality traits."

The pressure on water sources is also seeing a significant move to rainwater harvesting, not only on permanent structures but also for field scale Spanish tunnels he adds. "Mains water is largely trouble free, although it can have very high bicarbonate levels, requiring pH modification. Borehole water is usually very clean, as clean as mains water, but as well as high bicarbonate levels, it may have high levels of iron too. Rainwater is the best for the plant but will definitely need to pass through a fine physical filter and may need to be treated using chemicals or UV, depending on the application method and nature of the crop. All water sources need to be analysed before use so that the correct treatment can be put in place."

Water treatment is often required where rainwater harvesting is used [Senmatic].

Water application is the final piece of the irrigation puzzle, and even here efficiency is a key consideration. "Rotomation have been very busy with installations of boom irrigation this winter and spring, and our boom irrigation specifications have recently changed," says the company's Philip Ashton. "We have seen a trend for glasshouses to be built both longer and with wider bays, and this reduces the overall cost per hectare when installing booms. The new model of booms can run in greenhouses up to 300m long by 16m wide.

"A recent installation was for a block of nine bays, 226m long x 9.6m wide. This means that the operator only needs to programme nine bays instead of around twenty had they been 100m lengths. Elsewhere we recently installed another block of booms at Ball Colgrave's nursery where the bay width was 13m, watering plug trays on rolling benches."

Philip points out that a lot of the installations that the firm is currently carrying out are for customers who have previously purchased booms and have seen the benefits of the evenness of watering along with the labour saving of carrying out this task. "Programmes can be set to give different amounts of water to any section of the glasshouse depending on the crops requirements at any particular time. Multiple water supplies can be automatically switched between, in order to use feed or clean water for example," he says. "Customers can also apply chemical at different rates, using the booms instead of a conventional sprayer. This again saves greatly on labour, particularly expensive overtime labour." ■