4-Right irrigation designs, right irrigation products, right irrigation installation, right irrigation maintenance to maximize the benefits of green areas at long term.

Reasons to irrigate green areas in urban environments

The growing concerns for the effects of global warming, amplified by historic drought conditions in 2022 in many places across the globe contribute to further intensifying of the discussion on competing water uses in urban areas.

Irrigation of public landscapes and private gardens are often among the first to be highlighted for excess use of water and regarded as luxury we can no longer afford.

At the same time, we also well understand and agree on the need for a greener environment in our cities. Architects and urban planners are rushing to develop buildings and planning models which appreciate many health and environmental benefits of urban green space, as well as socioeconomic benefits of urban landscaping in alleviating adverse effects of urbanisation.

Nothing can live without water. Irrigation systems are therefore not a luxury, but a necessity to sustain plant survival and growth. The reality is, we observe longer periods without rain even in countries where plants historically relied on regular natural precipitation and mild summer temperatures.

“Is brown the new green” cannot be the right question and should not be the future we are ready to accept. The right question is how we balance available water and how consistent we can be in planning and managing the irrigation systems to eliminate excess water use and provide the right amount of water when it is needed.

Challenges of installing and maintaining irrigation systems in urban areas

The irrigation industry is continuously innovating and developing ever more efficient products and solutions for minimizing irrigation water use, but their true benefit can only be achieved with proper design, installation and above all, with proper operation and maintenance of complete irrigation systems.

In many cases the construction and maintenance of public green areas are in the hands of private companies which compete in public tenders focusing mainly on financial parameters and time schedule considerations. While tender process itself is inevitable there are many ways to achieve optimal balance of costs, quality, and long-term sustainability without jeopardizing the transparency of the process.

The concessions that are often made to reduce investment cost of irrigation systems have direct long-term implications on water consumption.

For example, the concessions in pressure regulation solutions can result in more than 30% higher water consumption. Spray head nozzles designed to operate at 2 bar of pressure will thus use 25% more water if working at 3 bar of pressure.

Not only will this affect system hydraulics and result with varying pressure on nozzles on the same lateral line, but it will also affect droplet size and the designed spray pattern, thus eventually disturbing the overall application uniformity.

Concessions in nozzle selection, placement and precipitation rate harmonization will always result with uneven water distribution. Because the areas receiving less water will become primary criteria when adjusting irrigation run time, the areas with better coverage will inevitably have to receive more water than required. Usual water waste on systems with poorly designed nozzle coverage can go up to more than 40%, with additional adverse effects on soil structure and plant development.

Real life situations always bring about the need for compromise, but it is of critical importance that concessions in design and installation of irrigation systems are made in the manner which will avoid significant water waste and allow for future system improvement and upgrade.

The path to improved water conservation in irrigation of public landscapes therefore leads to a few important points:

- Educate to elevate competence level among all shareholders (from planners and landscape architects to irrigation professionals and end-users).
- Uphold standards, regulation, and certification in design, installation, and maintenance of irrigation systems.
- Develop contracting frameworks which bind both contractors and clients to measurable outcomes in terms of system performance and water conservation.

Achieving better landscapes with less water - basics of irrigation system efficiency

While selection of plant material and landscape designs in general have primary impact on irrigation water requirement, there are several important principles related particularly to irrigation systems with direct impact to improved water management.

- Always give priority to the use of lowest water quality available. Look for possibilities to maximize the use of harvested rainfall, reclaimed water, retention pond water or underground water before using potable water source.
- Pay attention to irrigation system design with the use of appropriate irrigation methods and products, sound system hydraulics and high levels of system efficiency.
- Ensure proper supervision of irrigation system installation to maintain designed system parameters and specified product features and to prevent operation maintenance problems that may arise from substandard installation.
- Pay special attention to proper irrigation scheduling (appropriate run times and cycle frequency) and adjust system output as frequently as possible to changing weather requirements.
- Keep the irrigation system in good operating condition and avoid most common causes of water waste such as broken heads and nozzles, bent or grown-in sprinklers, damaged driplines, and similar.

- Make sure to winterize the system in a timely manner and carry out all due repairs if needed during spring system startup.
- Explore affordable ways for system improvement and retrofit to maximize the system efficiency and minimize water waste.

Irrigation industry solutions for improved irrigation efficiency and water conservation in urban areas

Irrigation manufacturers and other irrigation professionals continuously work on improvements in product performance and development of new tools, services, and practices for irrigation water conservation.

Among the long list of water saving features already incorporated in product design of many irrigation products some specific products and solutions stand out for their specific capacity in eliminating water waste and elevating irrigation efficiency.

Among drip irrigation equipment the list would include pressure compensated driplines, driplines with check valve incorporated in a dripper, subsurface driplines with root intrusion prevention, and the most recently invented responsive drip systems which release water only when plants are ready to absorb.

In the category of turf spray heads and rotors the list should outline the pop-ups with pressure regulated stems, matched precipitation nozzles for pop-up rotors, rotary nozzles with matched precipitation across different nozzle sizes, spray heads and rotors with flow-stop features which reduce water waste in case of vandalism.

Irrigation controllers are getting smarter with connection to weather forecast, web-based remote programing and flow monitoring, improved flow-management features and user-friendly irrigation control applications for smartphones and tablets.

Multiple multisite irrigation management software solutions and web-based platforms are developed and constantly improved to provide irrigation managers with powerful tools to optimize and monitor system performance and reduce labour requirements in operation and maintenance of public and large commercial landscape irrigation systems. Most of those systems can integrate weather and soil sensing equipment for further system adjustment and fine-tuning.

With growing pressure on available water resources and inevitable strengthening of EU regulatory framework for irrigation water use, the European Irrigation Association will stay committed to disseminate the valued contribution of irrigation industry to responsible management of irrigation water and will continue to educate stakeholders towards use of available technologies for minimizing water use while improving our green spaces.