Irrigation Controller Features

Irrigation controllers are an integral part of an efficient irrigation system. A well selected irrigation controller can significantly reduce labour costs and improve plant quality, while also reducing water use.
 In their simplest form, irrigation controllers are used to start and turn off an irrigation operation (cycle) but, depending on their level of sophistication, they can also record weather and system data as well as control other systems within a nursery operation.

There are a wide range of controllers available, from simple tap timers to computer controlled, multisite units, capable of controlling irrigation at a number of different sites over a large geographical area. Selecting the appropriate unit for your situation can be a daunting exercise, but careful consideration of your specific site requirements and matching these to the features available on different models can make the selection process easier.

There are many features available on modern irrigation controllers, some of which will be useful and some that won't be necessary for a particular situation. The following are features that are available on a range of irrigation controllers suitable for nursery use.

- Controller types: Tap timers, tap computers, battery powered solenoid valves, AC powered controllers, solar powered controllers, and computer controlled systems.
- Interface: Slide, dial, keypad, touch screen, keyboard/computer mouse.
- Connectivity: Multi-core wire, two wire, wireless.
- Power supply: Battery, solar, mains electricity.
- Memory back-up: Battery, non-volatile memory.
- Number of programs: This depends on the flexibility you need for your system. Different programs on a controller let you run stations on different schedules e.g. full sun vs. shadehouse areas.
- Minimum run times: Are run times in hours, minutes or seconds necessary to achieve the desired schedule e.g. a controller that has run times down to minutes won't be suitable as a mist controller for propagation.
- Manual operation: For operating stations on an as needs basis outside normal irrigation programs.
- Number of start times: Pulse irrigation for drippers requires many more start times than sprinkler systems. A loop cycle could also be used for multiple start times.
- Loop function: For propagation, drip irrigation or frost control. The controller continuously runs a program over a defined period of time.
- Stacking: This feature is used to prevent more stations running than the pumping system can efficiently operate. If the run times for stations from different programs overlap, the controller will delay the later operating program from starting until the earlier stations have finished.
- Syringe cycle: Allows the system to operate all stations in sequence for a brief period, to determine if each station is operating correctly.
- Budgeting function: To allow all times to be adjusted simultaneously by only changing one setting – also known as the percentage function. Useful if using evapotranspiration as a guide in setting irrigation times.
- Weather station control: Linking the controller to a weather station, enabling irrigation to be controlled according to climatic factors e.g. evapotranspiration.
- Turning the system off: On-off key and pause function.
- Valve groupings: Combine and change solenoid groupings to match plant water requirements or turn off empty areas.
- Valves per station: Some controllers can operate two or three solenoids per station.
- Pump start relay: For systems that are not constantly pressurised the controller sends a signal to start the pump whenever a program is activated.
- Rain sensors: Automatically turn off the irrigation system during rain events.

- Moisture sensors: Controlling of irrigation from soil moisture is not considered suitable for pot production but may be useful for in-ground production. The latest development in irrigation controllers, presently being tested as an NGIA funded project, is an irrigation controller that uses a weight based control system to determine when the irrigation needs to be run.
- Other Sensors: Sensors can be used to control other environmental factors e.g. humidity or to cool plants in hot weather.
- Controlling other system functions: Using a controller to backwash filters, inject fertiliser, control pumps and operate disinfestation systems.
- Fault identification: For identification of faulty solenoids or system failure.
- Security: Password protection and lockable housing.
- Protection: From lightning and power surges.
- Reporting: Usage reports on water applied per station, weather conditions measured and system operation information.
- Ease of operation: Basic controllers are easier to understand and program, but don't have the flexibility of more advanced controllers.

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