

Creating an Irrigation Strategy with GroSens

Developing an irrigation strategy is a critical step in growing any crop, to meet the goals of rapid plant development, increased yield, and high product quality. Crop type, temperature, humidity, light spectrum and intensity, CO₂ and air movement all play a role in water and nutrient consumption. Utilizing the GroSens root zone monitoring system allows growers to tailor their irrigation strategy to different plants under changing environmental conditions. By monitoring and adjusting the water content (WC), electrical conductivity (EC), and dry-back in the root zone each day, growers can steer their crop for the desired result. Fine-tuning irrigation volumes, frequencies, and start/stop times to manipulate dry-backs, overall WC, and root zone EC in relation to climate conditions will help maximize crop performance and final product quality.

Sunrise (Lights-On) until First Irrigation (Start Time)

The Golden Rule when deciding on an irrigation start time is “transpiration before irrigation”. This means that the plant should start actively taking up water and transpiring before you start feeding it. Adjusting the start time based on the decrease in WC between sunrise (lights on) and first irrigation allows the plant to start uptaking water before the first irrigation is applied. This method can be manipulated to steer the plant more vegetatively or generatively. Ideally a 1.5% to 2% decrease in WC after sunrise (lights on) should be achieved before the first irrigation of the day.

Irrigation Phase 1: First Irrigation until First Drain (Runoff)

Growers should aim to achieve drain within 1 to 3 hours after the first irrigation has been applied. The number of irrigations it takes to achieve drain and reach peak WC for the day can be as few as 3 and up to 6 depending on the starting WC, substrate size, irrigation volumes, and rest times. Larger volumes per irrigation event, up to 6% of the total substrate volume, can be used to achieve drain faster. Rest times should be adjusted to allow for a 1% to 2% dry-back between each irrigation event with a minimum rest time of 30 minutes.

Irrigation Phase 2: First Drain until Last Irrigation (Stop Time)

The goal of this phase is to maintain control of the EC in the substrate. Growers should aim to reduce EC to its lowest daily value when the light intensity and temperature are at their highest and the plant is working its hardest. This is typically at the midpoint of the day. After the desired WC and first drain is achieved growers can adjust the volume and frequency of irrigation to maintain a consistent WC level in the root zone. This can be accomplished by reducing the volume applied in each irrigation event and adjusting the rest time between irrigations. Rest times should be adjusted to achieve at least 1% to 2% dry-back between each irrigation event.

Irrigation Phase 3: Last Irrigation and Overnight Dry-back until Sunrise

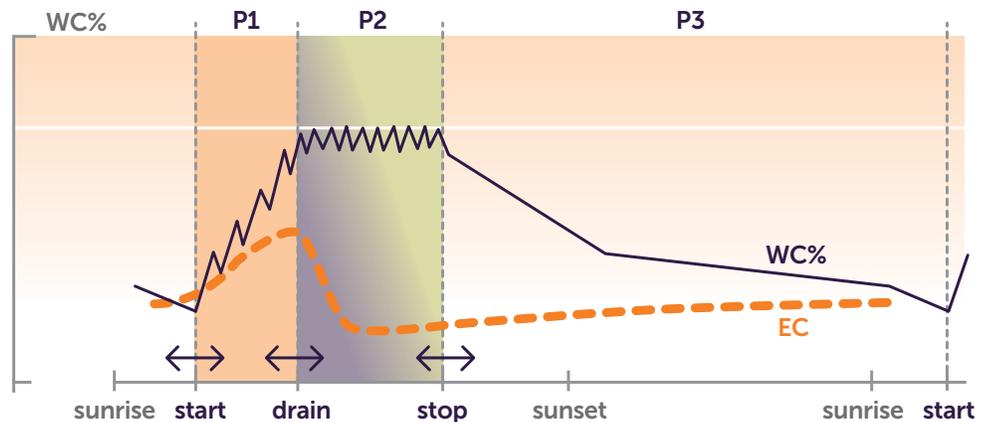
The last irrigation event of the day (stop time) directly affects how much dry-back is achieved before sunset (lights-off) and overnight, playing an important role in plant steering. Depending on the stage of growth, you should aim to achieve 2% to 5% dry-back between the final irrigation and sunset. The dry-back from the last irrigation of the day until the first irrigation of the following day can be 10% to 20+% depending on the need for vegetative and generative steering. Larger dry-backs overnight encourage generative plant growth, while smaller night-time dry-backs encourage vegetative plant growth.

IRRIGATION VOLUMES

Shot Size	% of Substrate Volume
Small	2%
Standard	3%
Large	4-6%

*For drip irrigation. Suggested flow rate = 0.5gph (2 lph)

GENERAL PRINCIPLES WHEN CONSIDERING IRRIGATION



CROP STEERING

Irrigation Start and Stop Times		
Start	0-1 hr after sunrise/lights-on	Vegetative
Start	1-2 hr after sunrise/lights-on	Neutral
Start	2-4 hr after sunrise/lights-on	Generative
Stop	0-2 hr before sunset/lights-off	Vegetative
Stop	2-3 hr before sunset/lights-off	Neutral
Stop	3-4 hr before sunset/lights-off	Generative
	Vegetative	Generative
EC	Lower	Higher
WC	Higher	Lower
Dry-backs	Smaller	Larger

In summary, irrigation strategies should be tailored to the plant variety, climate conditions, and stage of growth. Having the ability to monitor and steer WC, manage EC, and manipulate dry-backs in the root zone can help ensure faster growth, more consistency, and higher quality yields. By utilizing the GroSens system to manage the root zone WC and EC you can reduce waste, optimize production, and ensure product quality.

For more information on Grodan products and using them for optimal crop quality and yield, check out www.grodan101.com.

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