GROWERTALKS

Paul's Pointers

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Winter Waterland

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Providing irrigation to perennial crops is one of the most important and overlooked aspects of winter greenhouse crop production. All too often growers take irrigation management for granted. It's hard enough to irrigate under ideal growing conditions, but under less-than-optimal conditions, the greenhouses could easily become a "winter waterland." Improperly irrigating perennials during the winter months can have several adverse side effects.

It's very important for growers to adjust their irrigation practices to match the needs of the crops being produced with the environmental conditions they're growing in. Winter production often consists of lower light intensities and cooler temperatures, which combined reduces evaporation, transpiration and plant growth. These conditions greatly reduce the amount of water the plants use each day. It's not uncommon for growers to apply too much irrigation or to irrigate plants too frequently during the winter growing season.

Consequences of over-irrigating

• The most obvious consequence is a saturated or a consistently wet root system. These conditions reduce the air in the root zone, which often leads to poor root health (possibly crown and root rots) and reduced plant growth.

• Frequently watering plants that don't need to be irrigated leads to more "waste" water that's not utilized for plant growth and either creates a more humid environment or simply goes down the drain. Nutrients also can be leached from the containers when too much irrigation is applied.

• Speaking of humidity, irrigation during the winter months inside enclosed structures creates a high humidity environment, which promotes stem elongation, decreases nutrient uptake, reduces plant quality and increases the conditions suitable for many plant pathogens.

• Overhead irrigating plants during the winter leads to periods when the leaves remain wet for long durations. This is conducive for many foliar diseases.

• A large amount of energy is used to dry the floors and to dehumidify greenhouses rather than to provide an adequate environment for plant growth. Watering more than necessary increases the energy costs required to produce the crops.

Irrigation variables

• The current environmental conditions (light levels, temperature and humidity) are the predominate factors influencing the irrigation needs of crops.

• The types of crops being grown (species and water requirements), their age and the types of growth present (plant architecture and canopy) greatly influence how much irrigation is necessary.

• There are a large number of growing mixes being used and each of them has its own water-holding capacity and aeration characteristics. Ideally, the growing mix should have both good water-holding ability and good drainage characteristics.

• The type of irrigation system being used greatly influences the quantity of water being delivered and how much water is wasted with each application.

– Overhead irrigation systems are most commonly used due to their relatively low initial cost and maintenance requirements. There are several drawbacks to overhead systems, such as uneven distribution of water, a high percentage (>70%) of the water applied doesn't enter the root zone, and the architecture of the plant and the crop canopy often reduces the amount of water that reaches the root zone.

– Drip and trickle irrigation systems effectively deliver water to individual containers, greatly reducing the total amount of irrigation applied and reduces "wet" foliage compared with overhead systems.

– Sub-irrigation systems where the irrigation water is recycled are an excellent method of conserving water, as the crops only take up what they need and the water can be re-used. However, without a good sanitation plan, sub-irrigation often increases the occurrence of root rot pathogens from recirculating the irrigation water.

Water application guidelines

Irrigation management requires good judgment to determine when to irrigate and how much water to apply under any set of growing conditions. Proper watering is a learned skill that continues to develop with experience. Understanding the variables listed above and how to interpret them leads to better irrigation decisions and eliminates a lot of problems. Here are some more helpful suggestions for managing irrigation during the winter months:

• Group plants by their irrigation requirement when setting them into the greenhouses. Perennials with silver foliage and succulents require much less water than most other herbaceous perennials; providing the same irrigation frequency and quantity of water will likely result in major crop issues and possibly losses. For this reason, it's beneficial to group plants with similar water requirements together and place them in separate irrigation zones where the frequency and volume of water applied can be properly managed.

• When possible, don't place young crops alongside older plantings unless they can be irrigated independently. Irrigating small plants with the same frequency and volume of water as required by the larger plants may cause delayed rooting and root rot problems.

• In general, plants should be watered before they wilt and the growing mix shouldn't dry out excessively between irrigations. Aim to bring the soil moisture back up to approximately 80% to 90% of the container's capacity following irrigation. To conserve water, promote optimal growth and avoid getting pathogens, it's best to apply irrigation only when it's necessary.

• To avoid foliar diseases, water crops early in the day, allowing the foliage the best chance for drying off quickly and not being wet going into the night. Growers often observe dry (but not wilting) crops in the afternoon; in many instances, these crops can be watered the following morning to avoid wet foliage going into the night. Establish cut-off times where irrigation shouldn't be applied under both cloudy and sunny conditions.

Proper irrigation management during the winter months saves water, reduces runoff, decreases the relative

humidity, prevents diseases from developing and decreases your energy bill. Watering appropriately promotes healthy plant growth while decreasing potential for crop issues. Proper irrigation will keep your greenhouses from becoming a “winter waterland.” **GT**

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