Saturation or Desiccation? Discussion of the Significance of Humidity Control, Measurement Devices, and Procedures for Humidification and Dehumidification. (Z08-tibbitts042402-Oral)

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Abstract:

Humidification is required in most controlled environments to provide a good plant growing environment. This is needed because controlled environments are commonly more arid than the outside growing environment. This aridness influences growth by controlling cell turgor, which in turn directly regulates cell enlargement and stomatal opening. The aridness results because the cooling coils remove the heat generated by lamps and constantly condenses moisture from the recycling air mass. Even during the dark, chamber atmospheres have a significant moisture deficit because cooling is required to remove heat from motors within the chamber. The aridness is best defined as saturation vapor pressure deficit (VPD). Problems in maintaining effective VPD control with research at varied temperature levels will be discussed and also problems from high irradiance, high humidity, and air movement. Humidification is commonly provided by different types of atomizers. Deionized water must be used to avoid salt accumulation. Sensors for control and measurement will be discussed.

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