

Energy Impact Of Choices For Temperature And Humidity Control. (Z08-quiring112524-Oral)

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Abstract:

This presentation will focus on the energy impact of different choices for obtaining specific temperature and relative humidity conditions in growth chambers. Controlled environment chambers and rooms for plant growth require considerable energy for electrical and mechanical functions to provide precise control over a wide range of temperature and humidity program conditions. Whether the chamber has self-contained refrigeration or is connected to a central chiller system, a mechanical cooling process takes place. In phytotrons, coordinated planning of central heating, cooling and ventilation infrastructure can result in significant energy efficiencies. On the other hand, for a small number of chambers, dedicated central cooling plants may not be practical. Consideration will be given to self-contained air-cooled, water-cooled and remote air-cooled refrigeration for these circumstances. Examples of different systems and operating circumstances will illustrate energy considerations when planning a facility. Similarly, control of relative humidity involves the use of energy. Generally, removing moisture has a greater impact on energy consumption than adding moisture. In fact, adding moisture by common evaporative methods reduces energy consumption.

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