Fungus and Relative Humidity

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The environment in propagation units is ideal for fungi to grow—nice warm temperature and high relative humidity (RH). At the same time it is difficult to use fungicides in a propagation unit. Therefore, cuttings have to be free of fungal diseases by good care of the stockplants. Under normal conditions in a greenhouse, should there exist a high RH, climate computers are able to control it—this is not the case in a propagation unit.

Fungi grow small hyphae, 4-6 µm in diameter, that develop into mycelium. In order to grow, fungi have to absorb water so that nutrients can move into the hyphae. If transpiration is too high, the hyphae dry out and die. Therefore, from the fungi's point of view it is not the RH but transpiration and subsequent condensation which controls its growth.

It takes some time to get used to considering evaporation instead of RH as controlling the growth of fungi. Even in a greenhouse with 100% RH, evaporation\transpiration occurs because some areas are warmer and others are cooler. Therefore, water will move from the warm to cooler areas. At lower RH values, evaporation increases when air moves. Evaporation requires energy, and water will evaporate from the warmest areas and condense in the colder areas. This is why greenhouses are cooled during ventilation.

If a greenhouse is to be controlled by evaporation one must measure RH and air movement. This may prove difficult to do, but will ensure new and better use of the climate computers.

Photosynthesis in Cuttings During Rooting

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It is well known that a large variation exists among plant species in their ability to utilize light for growth. Most of these variations are caused by genetic differences where some plants (shade plants) are light saturated at very low levels of irradiance, while others are not light saturated at naturally existing light conditions. Because plants generally grow close together with many overlapping leaves, light saturation is seldom observed under normal growing conditions.

Cuttings are different. They often only have a few leaves, and not having a root system, are unable to absorb water. To compensate for the lack of roots, mist propagation and enclosed plastic are used to ensure a high relative humidity in the environment surrounding a cutting during rooting.

A high level of irradiance causes a high carbohydrate production.

This carbohydrate is normally used for growth in an intact growing plant. In a cutting growth has ceased, and this leads to carbohydrate and starch accumulation in the leaves. Such an accumulation may lead to the destruction of the chloroplasts which we observed as photobleaching.

We have shown with *Hibiscus* cuttings, that the best light conditions for rooting occurs at an irradiance level just above the light compensation point. At this light intensity, respiration almost equals photosynthesis and the build up of carbohydrates is very slow. This is the light condition that a shade plant normally likes best. As soon as the cutting starts to make roots and bud break is observed, the cutting again becomes a normal intact plant, and it will require those optimal environmental conditions for normal growth.

Production of Seedlings

Bent Petersen
Frisa Plants

A/S Frisa Plants is a producer of annual (summer) plants for gardens and pot plant nurseries. All production is based on seed propagation—this places seed quality, germination, and vitality at the center of production.

All seeds are germinated in flats with one seed placed in each cell. Therefore, it is of utmost importance that seed quality is the best. Fungal diseases occurring during germination may be caused by pathogens on the seed. To ensure the proper fungicide treatment after sowing, all seed lots are tested for the fungus/fungi they may be carrying. Immediately after sowing, the flats are treated with the fungicide required to control any fungal problems identified on the seeds. The flats are placed in a mist room for one day and then into the propagation room with or without light as needed. For most seeds the best germination is observed in the light (10 to 20 W m^2). The young seedlings are shaded the first few days after germination.

Kalanchoe blossfeldiana

Knud Jepsen
A/S Knud Jepsen Nursery

A/S Knud Jepsen Nursery was founded in 1963 and today consists of two production units with an overall yearly production of more than 10 million *Kalanchoe blossfeldiana*. Most production is for export with Germany being the major market. The latest addition to the nursery, 19,000 m^2 in size, is run by the most advanced greenhouse control equipment available today. Because of this, plants are only handled when they are propagated and at the time of sale.

A cornerstone of production is quality and research. Two full-time staff members are assigned to research. This ensures that production is utilizing the latest techniques and new cultivars are introduced regularly. We have our own plant