Increase Summer Air Movement in Greenhouses For Foliage Plants

The summer is always a difficult season for low-light tolerant foliage plants since recommended light intensities range from 700 ft. c. for Aglaonema simplex (Chinese Evergreen) to 2000 ft. c. for Sansevierias and peperomias. Higher light intensities cause the familiar leaf scorch resulting from increased leaf temperatures. It has been reported the heat loss from leaves increases when the rate of air flow is increased from 0 to 4/10 of one mile-per-hour. Five greenhouse-grown shade-requiring plants, Saintpaulia ionantha (African Violet), Philodendron cordatum, Sansevieria trifasciate, (Snake plant) Codiaeum aucubaefolium (Croton) and Begonia semperflorens (Fibrous Rooted Begonia) were grown at the recommended light intensities for each plant and 2500 and 6000 ft. c. at wind velocities from 0 to 4.4 mph.

Plants of each species were placed at several locations in a horizontal funnel-shaped wind tunnel. A 24-inch exhaust fan was installed in the 4 square foot opening at the narrow end with a 64 sq. ft. opening at the broad end. Plants within the chamber were exposed to wind velocities of 0.45, 0.60, 3.2 and 4.4 mph daily from 6 a.m. to 8 p.m. The study was conducted in July and August. Temperatures of air and leaves were measured using copper-constantan thermocouples and were recorded on a potentiometer.

The results showed that the air-to-leaf temperatures were reduced in half at both 2270 and 6685 ft. c. intensities by moving the air at 0.45 mph in the chamber. For example, an African violet plant exposed to 1600 ft. c. had leaves 3.2 degrees warmer than the air

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around them. When the light intensity was increased to 2270 ft. c. the leaf became 5.7 degrees warmer than the air. If the air movement over the African violet leaf was increased from 0 to 0.45 mph then the leaves were only 2.7 degrees warmer than the surrounding air at 2270 ft. c. and the normal injury at this intensity did not occur. Similar results were found for the other foliage plants tested.

No additional leaf cooling was found from increasing air velocities above 0.60 mph. Improved plant quality (larger leaves, shorter internodes, better variegation and more rapid growth) was found for philodendron, sansevieria and croton at higher light intensities with increased air movement to 0.45 and 0.60 mph. when compared with plants at recommended intensities.

Therefore, some foliage plant benefits from summer pad-and-fan greenhouse cooling could in-part be from reduced leaf temperatures resulting from the increased air movement.

W. J. Carpenter

Sincerely yours,

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