

**FOLIAGE PLANT ACCLIMATIZATION**

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Acclimatization or acclimation may be simply defined as the adaptation of a species from one environment to another. Our NASA moon explorers had to adapt to a totally new environment when they landed on the moon. They did this by taking their old earth environment with them by means of their million dollar life support systems.

This is an extreme example of acclimatization. Man has adapted to more friendly environments by not quite so extreme measures. The oil field workers on Alaska's north slope have had to adapt to 60 or 70°F below zero temperatures and 24 hours of darkness. Again they have compensated by taking their old environment with them in the form of shelter and other protective devices.

Unlike our space pioneers and oil workers the subject of our presentation today—foliage plants—cannot take their environment with them. They must adapt to the new environment where they are to be located.

What we are doing is moving plants from the production areas of high light intensity where conditions for growth are essentially ideal to areas of low light intensity, relatively dry atmospheres, and warm temperatures. Many of these plants can withstand very high light intensities as we see by this *Schefflera actinophylla* growing in Hawaii. Here are some *Philodendron* growing on the Pali drive (slides shown).

Modernization of production facilities in the Apopka, Florida, area has resulted in an accelerated growth schedule for many of the plants we use. Thus previous production practices have a great influence on how the plants are handled in the final environment.

Plants that are sun-grown are by necessity going to require higher light levels in interior environments than shade-grown plants. *Codiaeum variegatum* is one of the highest light-requiring plants we use.

Maybe much of the success of the old-time growers was due to their production facilities that provided a great amount of acclimatization as the plants were growing—as opposed to maximized production schedules we now use and then have to apply additional time in shaded areas to partially acclimate plants before they are sent north.

Two major factors important to plant survival are light intensity and duration.

Here are schefflera that have been held at 10 to 13 and 16 hrs daily. These are from a low light—100 foot-candles from cool-white fluorescent lamps as opposed to 200 foot-candles. This next slide graphically illustrates the results obtained. You can see that 100 foot-candle intensity has not resulted in an increase in growth, whereas plants under the 200 foot-candle intensity have resulted in a linear increase related to the length of day used.

In subsequent studies we found we could maintain scheffleras at a minimum level of 25 foot-candles, however the life of these plants was severely shortened since the light intensity was below the light compensation point.

Even though the producers are doing some acclimatization, it is still necessary for southern-grown plants to be further acclimated to our northern environment. This may be done by the wholesaler, many of them are making efforts to have plants in a finalized condition for sales, or you may have to do it yourself.

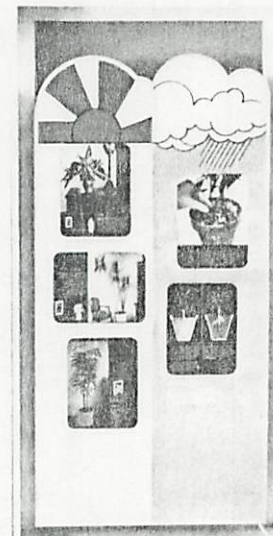
The interim lighting would be idealized where you could have a greenhouse environment of 1500 to 2000 foot-candles during the brightest part of the day and use

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**EASTER LILY LEAF SCORCH***(continued from page 1)*

Recommended nutrient levels for lilies are:

nitrates	30-35 ppm
phosphorus	3-4 ppm (1-2 ppm for 'Croft')
potassium	25-30 ppm
calcium	150-200 ppm
pH	6.8-7.2
soluble salts	less than 150 mhos

A soil test once a month during forcing will enable you to keep a check on nutrient levels and to adjust your fertilization program as needed.

**Peat-Lite Mixes**

Table 1. Peat-lite mix for lilies for 1 cubic yard\* of mix.

12 bu	shredded German #3 or Canadian Sphagnum peat
6 bu	vermiculite (#2 of #4 horticultural grade vermiculite, etc.)
6 bu	horticultural perlite
5.5 lb	ground calcium limestone**
5.5 lb	dolomitic limestone**
1 lb	superphosphate (for all cultivars including 'Croft')
1 1/4 lb	ammonium nitrate
3 oz	wetting agent (Aqua-Gro, Triton B-1956, etc.)

Addition of trace elements is not necessary for lilies.

\* Amounts recommended allow for some shrinkage that occurs in mixing, so final volume equals 1 cu yd.

\*\* Long Island growers with acid water supplies should consult their Cooperative Extension agent to determine if higher rates of limestone may be required.

It is recommended that lilies be grown in clay pots for greater stability or that clean sand be added to the peat-lite mix for greater weight. A mixture of 2 : 1 : 1 by volume of peat moss, vermiculite, perlite, and clean sand will add enough weight to prevent the pots from tipping. (Sand weighs about 100 pounds per cu. ft.)

Growers using a peat-lite mix for lilies for the first time should do so on a small scale to gain experience. Consult Cornell Information Bulletin 43, *Cornell Peat-Lite Mixes for Commercial Plant Growing* for detailed information on the preparation, use and management of peat-lite mixes.

**Fertilization Program**

Maintain nutrient levels with a regular fertilization program beginning when shoots emerge from the soil.

**Fertilizing weekly:** Use 3/4 pound of potassium nitrate and 1 1/2 pounds of calcium nitrate per 100 gallons of water every two weeks or alternate these materials weekly at rates indicated for each until buds are 1/2" long, then use only calcium nitrate at 2 lb/100 gallons of water weekly until plants are sold.

**Fertilizing at every watering:** If a fertilizer injector is used and fertilization is done at every watering, the recommendation for a 1:100 ratio proportioner is to use 5 ounces of potassium nitrate plus 10 ounces of calcium nitrate per gallon of stock solution. For a 1:200 ratio proportioner, double these amounts. After flower buds are 1/2 inch long, use only the calcium nitrate at 12 ounces per 100 gallons of final solution. With a 1:100 proportioner, use 12 ounces of calcium nitrate per gallon of stock solution.

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natural daylength or an artificially lighted environment with 300 to 500 foot-candles of cool-white fluorescent lamps for 12 hrs daily, 7 days a week.

So far we have spoken primarily about light, intensity and quality and its affect on the plants. Light is really the most important factor to the plants' survival. However, there are other things we should keep in mind.

High soluble salts levels in soil from southern-grown plants must be leached. The leaching should be done as soon as the plants are received. Accelerated growing schedules assure these plants being high in salts so leach them. Also do not fertilize these plants for 2 to 3 months unless a soil test shows the need.

Other factors that can lead to reduced plant quality.

a) Too long in shipping box. Unpack them immediately upon receipt. They may have been 5 days on the road without light. We don't know how long these plants can go without light and not be damaged. Some people say 7 to 10 days is the maximum. I consider that too long. Unpack them, get them into light so they can start to recover.

b) Plant shine compounds—don't overdo it with these materials. They tend to plug the pores (stomates) of the plants and impair growth.

c) Pesticides—know which ones can be used without damage to the plant. Many foliage plants are subject to injury from pesticides.

d) Cold damage enroute or in the greenhouse. Avoid cold water for watering purposes. Don't use ice cubes for foliage plants.

e) Air pollution—faulty exhaust systems on transports, improperly functioning heaters in greenhouses.

f) Fluoride toxicity—one-quarter part per million may cause damage on many plants of the lily family. Water, perlite, peat moss, superphosphate, all may supply unwanted quantities of fluoride.

**IN SUMMARY.** For best results try to find out the conditions under which the plants have been grown and acclimatized prior to receipt. If the grower has done some acclimatization and the wholesaler some additional, then you may have only a little to do. If they have not done anything then you, in fairness to your customers, will have to do the job. Keep in mind the factors we have discussed and apply them accordingly.

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