

## ACCLIMATIZATION

The indoor environment, unlike the typical environment from where the plant was produced is characterized by:

1. lower light levels
2. dryer air
3. more variable temperatures - sometimes too high, sometimes too low

In order for indoor plants to succeed in this "new and different" environment, they must have the ability to **acclimatize**. "Acclimatization" means: the adaptation of a plant to a new environment. The adjustment or adaptation to this new environment occurs gradually and often one sees distinct changes in the plants as they become conditioned to this new environment.

### **\*loss of green leaf color and leaf drop**

Most plants sensitive to acclimatization are "foliage plants" and some common ones are:

1. Weeping fig (we know more about this plant than any other)
2. Aglaonemas
3. Diffenbachias
4. Dracenas
5. Shefflera (Australian Umbrella Tree)
6. Brassia (Related to Australian Umbrella Tree)
7. Crotons

### FACTORS INVOLVED IN ACCLIMATIZATION:

#### I. Relative humidity

Failure to provide adequate levels usually results in symptoms such as:

1. leaf margin burn
2. rapid drying of the medium
3. wilting (sometimes irreversible)
4. leaf drop

#### II. Fertilization

High N levels can decrease the ability of plants to acclimatize normally. Newly purchased plants should not be fertilized for a minimum of 4-6 weeks (sometimes 2-3 months) after purchase.

#### III. Light

Light is the most important factor, accounting for more than 2/3 of the total acclimatization. Light levels in a typical home may be at a level as low as 200 footcandles, but many plants produced at high light levels can acclimatize to new low light levels, but it will take time.

Large Weeping Fig specimens (which may be valued at more than \$5000 per plant) are commonly acclimatized prior to being moved to their new location because the interiorscape contractor cannot afford to have these plants developing yellow leaves and experiencing leaf drop.

Growers will often acclimatize them in a holding facility before they are sold by a process called “shade-conditioning”. These plants would then undergo leaf dropping before they are sold, with the new leaves formed being "shade leaves". These "shade leaves" are better able to adapt to lower light levels that typically are found in the new environments the plants will reside in.

Some differences typically seen in plants and plant structures growing under high light levels (Nonacclimatized) vs. those growing and conditioned to low light levels (Acclimatized).

#### High Light

1. smaller leaves

In the case of Weeping fig, high light leaves are about 1/2 or less leaf area compared to low light leaves. However, high light plants tend to have more leaves than low light plants. So, total leaf area will usually be about equal, therefore, photosynthesis will not be compromised.

2. thicker leaves

Leaves on high light plants are often twice as thick (due to extra leaf cell layers) as on leaves of low light plants. Thicker leaves are able to endure higher light and heat levels w/o being stressed. Thinner leaves are better designed for maximum light interception.

3. yellowish-green leaves

Low light leaves are richer in chlorophyll in order to maximize light reception and utilization.

4. more vertical leaf orientation

Apparently vertical orientation protects high light plants from stressful light levels, while horizontal or leaves positioned at right angles to sunlight maximizes light reception under low light levels.

5. shorter internodes with more leaves overlapping

#### Low Light

1. larger leaves

2. thinner leaves

3. dark green leaves

4. more horizontal leaf orientation

5. longer internodes with less leaves overlapping

Overlapping leaves are probably a protective mechanism for high light plant.

Less leaves overlapping in low light plants allows more available light to reach interior of plants and strike more lower leaves.

6. higher light compensation point

6. lower light compensation point

Higher the light, the higher the photosynthesis and greater growth. In low light plants, photosynthesis cannot keep up with the high usage of "stored energy". Lower LCP in low light plants ensures that energy consumption (respiration) will not outpace energy production (photosynthesis).

7. thicker stems

7. thinner stems

In Weeping fig, this difference in stem thickness appears to be due to levels of carbohydrates produced and the fact that low light plants are kept in shaded greenhouses or shade houses where there is reduction in stem stress as a result of lack of wind exposure.

## ACCLIMATIZATION STEPS

When a plant is moved from high to low light, it becomes stressed because photosynthesis is reduced. Since it has been accumulating reserves of energy, it can draw on these reserves immediately, but they don't last forever. The higher the room temperature, the faster the reserves become depleted, so it is best to place plants in cooler rooms, especially at night to help the plant conserve.

Generally within 1-2 weeks, the plant will start to acclimatize to lower light in the home and start to produce new foliage, with different characteristics than the existing leaves, while also possibly losing older leaves.

All plants have a lower limit of toleration and if the new light level is too low for them to acclimatize in a certain amount of time, they may not properly adjust, and eventually decline and even die.

## IMPROVING ACCLIMATIZATION

If purchasing a new plant or suspect a plant has not been adequately acclimatized, or if bringing a plant indoors after keeping it on a sunny deck or porch all summer, to better insure its survival in the new environment one should:

1. Place the plant under a light level that is higher than the light level of its final intended location.
2. Extend the daylength to 16 hours of light to further enhance photosynthesis (use artificial light for additional hours needed).

About 2-4 weeks in these conditions are sufficient.

It is unwise to move plants abruptly back to high light situations after complete acclimitization because some severe symptoms may occur: foliage produced under low light and moved to high light \*may burn, \*turn very pale or even \*turn brown.

When a plant is moved to a higher light level (as out to a patio in summer), make the move gradually  
For instance:

- 1) move the plant closer to a window for a period if it has been in the interior of the house.
- 2) then, move it outside in a northern exposure for a period.
- 3) and lastly, to the final location.

If a light meter is available, observe the following practice:

Plants should be moved in one step to a location with no more than **10 times** their original light intensity.  
So, if your plant has been growing in 100 footcandles, then the next safe step should not be more than 1000 footcandles .

Good judgment and experience are the keys to success in acclimatizing plants.