

CONCEPTS OF THE CARE AND HANDLING OF FOLIAGE AND FLOWERING PLANTS

A Course in Design Production

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Professional Certified Florists' Program

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Concepts of the Care and Handling of Foliage and Flowering Plants

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I. INTRODUCTION

Growing plants indoors has become a national pastime. There are many reasons for this increased interest in plants. 1) Plants add a touch of nature to our homes and brighten our indoor surroundings during the long winter months. 2) Large plants may be used instead of furniture. 3) Many people collect plants as a hobby. 4) Growing and caring for plants can be therapeutic by making one feel better and teaching patience and responsibility. 5) Spectacular flowers give one a sense of excitement. 6) Plants provide a challenge to some people by trying to get as many members of a certain group of plants as they can or by growing groups of rare plants. Whatever the reason, the foliage and flowering plant industry is booming and many new types of plants are being introduced to satisfy the demand.

This increase in indoor gardening has helped the florist business to become larger each year. Many times you are asked questions about these plants that you cannot answer. The objective of this course is to help you be able to provide some answers to the questions raised by your customers.

II. THE PLANT'S MORPHOLOGY (anatomy or structure)

The first thing to know about house plants is that they are different from the plants grown outside in the temperate zones. Most of our foliage plants come from tropical climates and are adapted to warmer conditions. Foliage plants respond to the same year around night time temperature (65-75 degrees F) as humans. Tropical plants are accustomed to little seasonal fluctuation in day length and light intensity.

Typical Foliage Plant Conditions

Temperature	75 degrees F average
Light Intensity	75 to 500 foot candles
Day length	8 to 12 hours/day yearly
Humidity	40 to 70%
Soil	Evenly moist
Fertilizer	10-10-10 (or similar)

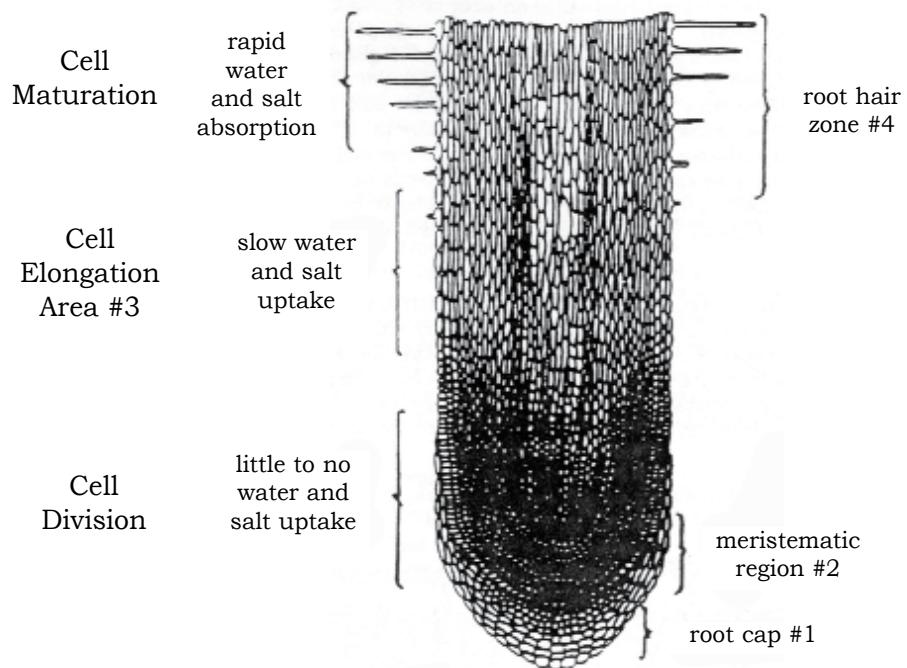
Of course there are many tropical plants which depart from these typical conditions and their special needs must be recognized. You can easily memorize the conditions, but that will not help you answer questions of why, what, when. To understand what is actually happening with a plant, you need a basic understanding of what processes take place. The following should help you understand some of these various processes.

A. Roots

Roots are marvelous organs that are responsible for several processes essential to the growth and development of the plant. When we look at a plant, we see only half of it. The other half is probably just as large as the part you see. Few people are aware of how large a root system is because we hardly ever see all the roots exposed at one time. Roots have three functions: 1) They anchor and **support** the plant, 2) **absorb** water, nutrients and some pesticides, 3) Serve as a food **storage** organ. Even though the root system has four different areas (Fig. 1), water and nutrients are slowly absorbed in the regions of cell elongation and cell division. Water, nutrients, and pesticides are more rapidly absorbed in the region of maturation where the root hairs are located. Root hairs are single cell modifications of the roots epidermis (skin), not true hairs.

These structures tremendously increase the root surface area, thus enhancing rapid uptake of the water, nutrients and pesticides. Because of the functions of the root hairs it is important to keep as many alive as possible. The loss of the root hairs greatly reduces the water and nutrient uptake. The entire root also needs air provided and the proper soil type. If the soil is allowed to become too dry or too wet, the roots and root hairs will wilt and die. When this occurs, the roots can no longer perform the necessary process of absorption and uptake of the vital water and nutrients.

Figure 1. Root Structure



B. Stems

To this point, we have looked at the lower end of the plant and its environment. Now let's look at the above ground portions of the plant. Stems may be upright, trailing or vining. Stems have three functions also: 1) support the plant, 2) store nutrients and water, 3) conduct water and nutrients and water from the roots to the leaf (like a bridge between the underground portions to the leaves). Stems may grow above or below ground and some plants have no obvious stems at all.

C. Leaves

As we move up the plant, the leaf is the next major structure. They are the food factories. The leaf has been partially water-proofed with a wax like coating called the **cuticle** (Fig. 2). The thickness of a leaf cuticle varies greatly among different kinds of plants. Those with a thicker, more complete cuticle are more drought and high light intensity tolerant. There may be some gaps or thin spots in the coating, but generally the cuticle coats the leaf enough to prevent much direct water loss. Under the cuticle is the epidermis, a layer of cells a single layer thick (Fig. 2) The **epidermis** is like the skin of the leaf. There are natural openings in the leaf that perforate both the epidermis and cuticle (Fig 2). They are called stomates. They are found abundantly on the lower leaf surface. However they can also be found to a lesser extent on the upper surface. The **stomates** function in gas and water vapor exchange. These stomates are operated by **guard cells** (Fig. 2) which are the mechanisms for opening and closing the stomates under certain circumstances, such as absence of light or shortage of water. The inner layers are called palisade and **spongy cells** (Fig. 2). Located in this area also are the **chloroplasts** (Fig. 2). These inner layers are responsible for the manufacture of food and the exchange of gases and water vapor. Generally, leaves are flat and oriented toward the light. Leaves often grow larger in low light because the plant needs more leaf surface area to collect light for food production. Other structures that are leaves or considered modified leaves are **thorns and spines**. **Prickles** on roses are growths from the epidermis of the stem.

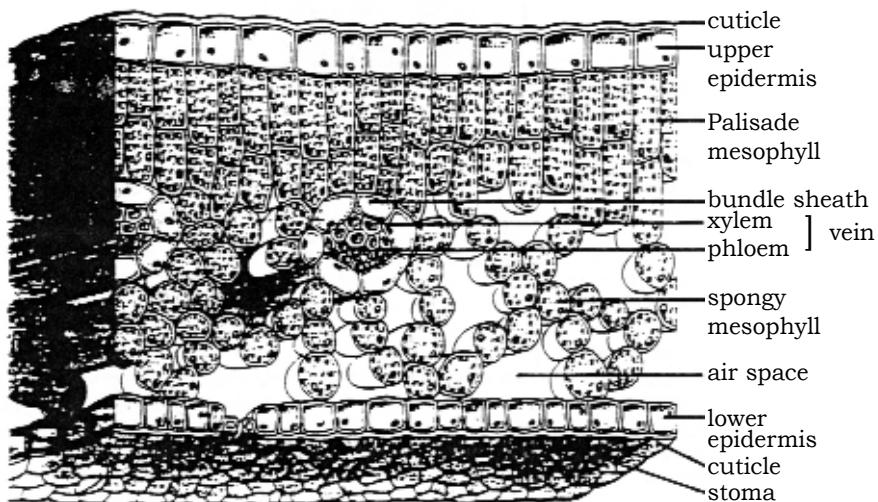
III. THE PLANT'S PHYSIOLOGY (function)

Within all the cells of the leaf are organelles called **chloroplasts** (Fig.2). These chloroplasts contain the green pigment called **chlorophyll**. This is the catalyst that makes the photosynthesis reaction work. **Photosynthesis** is a word composed of two smaller words **photo= light** and **synthesis=putting together**. Thus the word means putting together with light. Green plants are able to manufacture carbohydrate (sugar and starch/food) from raw material taken from the soil and air through the process of **photosynthesis**. This process is the most important process known to mankind. All humans and animals are dependent upon **photosynthesis**. We all require energy to live and grow. This energy is derived from the chemical energy of the food we consume. Ultimately, this leads back to plants, because while humans may consume animals for food, animals in turn must eat plants or other animals which ate plants. Through plants the energy of light (sun or artificial) is trapped and made available to all living things.

A. Photosynthesis

Photosynthesis, which occurs mainly in leaves of plants, uses carbon dioxide and water in the presence of chlorophyll (located in Chloroplast) and light, and transforms them into energy-rich carbohydrates (starch and sugar). This process takes place in the **chloroplast**. Water for photosynthesis comes from the roots, up the stem, to the leaves. Carbon dioxide (from humans breathing and other sources) enters through the **stomates**. **Photosynthesis** occurs and oxygen is released through the **stomates**. Thus helping sustain the level of oxygen in the atmosphere necessary for the continued existence of all life.

Figure 2. Leaf Structure



The product of most interest to us is the **carbohydrate or energy** produced by photosynthesis. Production of this energy is absolutely necessary for plant life. What happens to this energy? Some of it is used in the plant as building blocks for growth. Combined with minerals absorbed from the soil, it becomes new cell walls, chlorophyll, proteins, lipids (fats) or any of the many compounds involved in the plant's growth. It may be used immediately in growth or it may (if not needed) be moved to some other part of the plant for use there or stored until needed, (e.g. humans eat ice cream (carbohydrates). Those carbohydrates are used for growth in children. But for adults those carbohydrates are stored in our bodies as lipids (fat) until they are needed.)

If insects or disease destroy the leaves or parts of them, the photosynthetic area of the plant is reduced. A plant allowed to wilt to the point of leaf loss may not have enough stored energy (carbohydrates) to repair itself. Such plants may die or at the least have reduced growth.

Light is the most important factor in the growth of plants. Plants use the energy of light to convert various raw materials into simple sugars, carbohydrates, and more complex organic compounds. If light is insufficient, the plants will starve, and they cannot be fed artificially. The chemical fertilizers carelessly called "plant foods" are used by the plants to produce food, but they are not food in themselves. More accurately, they are materials used by plants in the food manufacturing process.

Light, then, is absolutely necessary for plant growth. How much is necessary? Interior plants generally do not need full sunlight (they grow on the floor of tropical rain forests) however, most of them would profit from more light than they get. If your plants are not growing properly and you know that the soil conditions and water supply are adequate, light is probably inadequate. Gradually increase the amount of light each day, by moving the plants closer to the window or by drawing the curtains, or by whatever step is available. **DO NOT** place a house plant in full sun after it has been in a dark room for several weeks or it will sunburn (chloroplasts are at the leaf surface to gather as much light as possible, because of the low light). **Acclimate** the plant gradually. Acclimation is equally important from the opposite point of view. Plants that come in from the high light levels at the grower's should be held at medium light levels (500 fc) for three to five weeks (chloroplasts are buried deep in the inner layers of the leaf and must migrate to the surface to collect lower light) before being delivered to the lower light environments of a home or office interior.

B. Light

Understanding light as it relates to plant growth is essential to maintaining attractive plants. There are three variables concerning light and plant growth. They are 1) **Light Intensity** — the brightness of a location where plants will be placed: 2) **Light Quality** — the source of the light: 3) **Light Duration** — the time period during which plants will be exposed to available light.

Light Intensity can be divided into categories for most plants. From a practical point of view, light intensity is the light variable which controls photosynthesis and therefore plant growth. A low-light area is generally more than six feet from windows, where there is no direct light (e.g. bathroom). Medium-light areas are roughly three to six feet from windows (well lighted room). High-light areas are within three feet of windows. (Table 1) As the light is brighter, photosynthesis increases and more food is produced. Most indoor plants require at least medium or high light to maintain their appearance. Blooming plants need high light to continue flowering and keep color. Generally, light intensity is measured in **foot candles (fc)** amount of light every 12 inches — as measured from the source.

Table 1. Light Table

Low light — 75 to 150 fc

Med Light — 200 to 500 fc

Hi-Light — 500 to 1000 fc

Very High — 1000+fc

In the home, 1' from a north window allows 150-200 fc

In the home, 1' from a south window allows 500-900 fc

Incandescent light intensities:

100 watt bulb, 3' away = 40 fc

300 watt spot, 3' away = 180 fc

Fluorescent light intensities:

40 watt tube, 3' away = 40 fc

2 40 watt tubes, 3' away = 200 fc

Light Quality is the color (or wavelength) of light the plant receives. This can be the light from the sun or artificial light. Plants use chiefly two wavelengths for growth — **Red and Blue**. Blooming plants need more red when they are in flower. **Artificial light** can be used to maintain indoor green plants and keep them alive. If artificial light is used to supplement natural light or as the sole source of illumination, daylight or cool-white fluorescent lamps can

be satisfactorily used. They will give a blue-green light. Incandescent lamps give a red light. You can use a broad spectrum fluorescent and that gives both red and blue such as a grow light.

Light Duration (Photoperiod) is the total amount of light a plant receives in a 24 hour period. Duration is a product of light intensity and time. Adjustments can be made for low light areas by extending the length of time of illumination so photosynthesis can continue, (e.g. if a plant receives 200 fc of light for 12 hours per day, it will be receiving a total of 200 fc X 12 hr=2400 fc hours in a 24 hour day. If only 100 fc of light are provided, the light must be on for 24 hours to provide the same total-100 fc X 24 = 2400. If only eight hours of light can be provided, the intensity must be increased to 300 fc X 8 hr=2400 fc.

C. Acclimation

Acclimation (Adaptation) is the adaptation of a plant to a new environment. The climate indoors is characterized by low light levels, dry air, and temperatures that may be too high or too low. Consequently, a better understanding of acclimation and its effects will aid the consumer in achieving greater satisfaction from plants already being grown, while improving the transfer of plants to their new growing environment. Of factors shown to be involved in the acclimation process, light has proven to be most important. Production of most plants is done under high light intensities, yielding a plant poorly equipped to grow and survive indoors, since it is adapted to survival in full sun. High light intensity also induces physiological changes within plant cells and causes the plant to produce smaller, somewhat thicker leaves that are closer together and often lighter in color (Chloroplast movement). To fully understand acclimation, one must understand the **light compensation point (LCP)** of the plant. This is the point at which food production (photosynthesis) is equal to food utilization (respiration). When a plant is existing at its LCP, it will neither grow nor die during the short term. Unless the light is somewhat above the plant's LCP, it will not be able to produce new leaves to replace those lost through aging; thus using stored food reserves. Plants at their LCP without stored food reserves will die as leaves age and become less efficient since they will drop below the LCP and consume more food than they are capable of manufacturing. Leaves of different plant genera have different life spans and this is one reason that some plants survive longer indoors even if they are below required LCP.

Although I have intimated that foliage plants grown under shade were acclimatized, that is not entirely true. Most foliage plants, even if acclimatized, will further increase their level of acclimation after placement in an interior environment. Thus, light acclimatization is an ongoing process and is not complete until every leaf on the plant has been produced under that growing environment. Therefore, it is important to match each plant to its proper light level and occasionally turn pots to provide for even growth.

D. Water

Water is the second most important factor affecting photosynthesis. Water is essential in dissolving some of the minerals from the soil needed by the plant. Also, the plant must use water in the transporting of food made in the leaves to other parts of the plant. Some of the water is lost as it rises to the leaves where it exits as a vapor through the stomates.

Transpiration is the loss of water by any part of the plant body, except roots, although by far the majority of it is through the leaves. More than 90% of the water which enters the roots escapes without being utilized by the plant. Since most of these green plants are adapted to regions where the natural soil is moist, never allow the soil to become completely dry between watering. Watering will vary according to size of plant, stage of growth, relative humidity, temperature, light, potting mixture, air movement and if it is flowering. Let the look and feel of the plant soil at root zone level be your guide in determining if the plants needs water. A wooden pencil is a cheap, simple way to check plant moisture at the root level. **Carbon Dioxide** is another factor affecting photosynthesis. Carbon dioxide is the gas humans and animals release as they breathe. As the amount of carbon dioxide in the atmosphere increases, the rate of photosynthesis increases to a point. The reverse is true also. If there is no carbon dioxide present in the atmosphere, photosynthesis will slow and the plant cannot produce an adequate

amount of food. Scientific research has shown that plants improve the quality of the air we breathe, therefore plants in enclosed rooms (hospital rooms) have a cleaning effect on the air by using the carbon dioxide humans breathe, and giving back usable oxygen.

E. Temperature

Temperature has little effect on the rate of photosynthesis, but it is a major factor controlling the rate of respiration. The temperature should be kept at 70-75 degrees F for daytime and 65-70 degrees F for night time. If temperatures are allowed to drop below 50 degrees F. for an extended period of time or allowed to go above 90 degrees F permanent damage can occur. Avoid placing plants in areas with widely fluctuating temperatures or directly in front of heating and air-conditioning vents. Remove plants from doorways or window sills to prevent cold damage during severely cold winter weather.

F. Respiration

Respiration is the opposite of photosynthesis. Respiration is the plants way of using the food that was made by photosynthesis for growth. Plants and animals use energy in the growth and maintenance process. This energy comes from the oxidation (burning) of food (organic compounds). The captured energy of light is released by means of a controlled burning of food made in the Photosynthetic process. This burning process is called Respiration. During this process food is transformed into simpler substances with the release of energy. Some energy is lost as heat; some energy is used in the movement of food throughout the plant; some of the energy is used for plant growth and development. Respiration occurs in all living cells, both plant and animal. It can occur in the light or dark. No pigment is necessary, but the age and condition of the individual cells affects the rate of respiration. So, as long as food and oxygen are present in a living cell, respiration will occur. Factors which affect respiration are the amount of food stored in the plant and, unlike photosynthesis, temperature is extremely important. At low temperatures little respiration occurs, but as the temperature rises, the rate of respiration rises dramatically.

G. Transpiration

Transpiration is the loss of water in the form of vapor from the leaf. This occurs when the stomates are open (Fig.2). There is direct movement of air into and out of the leaf. With the air, water vapor is also lost. If the air surrounding the leaf is low in relative humidity, the high relative humidity (96-98%) in the intercellular spaces within the leaf (Fig.2) will allow moisture to escape rapidly to the outside. High relative humidity around the leaf will slow this water loss. Other factors affecting the transpiration rate are light, temperature, soil moisture and air movement. Light is necessary for the opening of the guard cells which open the stomates. At night the guard cells close the stomates: thus, reducing the transpiration rate. Wind blowing over the leaf removes accumulated water vapor from around the stomates, effectively reducing the relative humidity on the outside of these openings. This increases the transpiration rate. However, the wind blowing across the leaf surface also cools the leaf, which reduces transpiration. So wind or drafts are factors which may work to either increase or decrease transpiration. It depends upon the velocity and exposure of the plant to the air movement.

It is well known that green and flowering plants help improve the quality of air by utilizing carbon dioxide and releasing oxygen into the air. NASA's research has demonstrated that plants can improve the quality of air inside sealed chambers. The plants remove trace levels of such toxic chemicals as carbon monoxide, formaldehyde and benzene. These chemicals along with hundreds of others, are released from building materials, furniture, electronic equipment, carpets, drapes and numerous health care and personal grooming products. They accumulate in the atmosphere of closed facilities such as energy-efficient buildings.

The exact mechanism used by green and flowering plants to remove indoor air pollutants is not known, but it is being studied.

As I am sure you can see, it is important to know something about the biology of plants. Understanding how environmental factors can be controlled is essential for growing beautiful plants. Also you can answer your questions as well as those of the consumer.

IV. PLANT NOMENCLATURE (Plant Names)

Plants are given names to facilitate communication about them. It has always been important for people to talk about and refer to plants. Since cave man, there have been efforts to learn which plants are used for food, medicine, etc. At first, plants were given short phrase names in Latin, consisting of a series of descriptive words to briefly characterize them and indicate their uses. As more and more plants were discovered, the phrase names became longer to distinguish between plants. This method became very cumbersome and was defeating the purpose of facilitating communication. To correct this, a method of binomial nomenclature (two names) was introduced. It is a 2 part name consisting of the **genus** (noun) and the **species** (adjective). The noun is always capitalized and the adjective usually is descriptive and is not capitalized. This is somewhat similar to your last name = genus and first name = species. Together the binomial is known as the species name.

Many plants have a third part to their name. It is called the **cultivar** or **variety**. For a plant to be given a cultivar name, it has to be especially attractive, exhibit some unusual characteristic different from the species or have been created artificially by hybridization. A cultivar has to be propagated in a way that it does not change the unique characteristics of the original individual; this is sometimes called cloning. Cultivars may be named by their originator. They are given "fancy names", not Latin names. Three such examples are the 'American Beauty' rose, 'Jingle Bells' poinsettia and the tulip 'Christmas Marvel'. Cultivars can be patented just like any invention. When writing the cultivar name with the species name it is located at the end of the scientific name enclosed in single quotes, (e.g. Euphorbia pulcherrima '**Jingle Bells**')

Many species, all of which have Latin names, may also have common names or English names. Sometimes they are merely the Latin names, or they are a translation of the Latin names. In other cases, the common name is a colloquial name which means something to people only in a certain region. In this manner, common names can be confusing (particularly when using common names over wire services). A good example of the confusion generated by common names is the aggregate of common house plants known as "ivies". There are German Ivy (Senecio mikanioides), Swedish Ivy (Plectranthus australis) English Ivy (Medera helix), Kenilworth Ivy (Cymbalaria muralis), Boston Ivy (Parthenocissus tricuspidata) and Grape Ivy (Cissus rombifolia). Each of the different ivies is in a totally different genus and are unrelated. So what does ivy mean? What would you send? Some climbing or twining plant with lobed leaves?

How do we deal with the problem of common names? Most people seem to want to use common names since they seem to be down to earth and popularly understood. However, these names are not necessarily logical or consistent. Also, in one region of the country, a Peruvian Violet might mean Excum affine, but in another region you might be speaking of Streptocarpus speciosa. What would you send to the consumer? Can you see the value of scientific names? By using these scientific names, confusion can be avoided.

There is only one Latin name for a plant. However, plant names sometimes have to be changed because they have been named incorrectly. This is annoying to the lay-person, but it is part of the process of scientific verification of plant identification, and this is an ongoing process. Thus, a plant name can change to a more correct name that has been found for it, or a plant name may change if it is discovered that the plant has been confused with another plant. Botanists occasionally come up with new information that they use to show better relationships of the plants to each other. Their way of expressing this new alignment is to change plants from one genus to another, (e.g. Scindapsus aureus has a new name because the flower of the plant was discovered for the first time- its new name is Epipremnum aureum. Hence, a shift in genus to better identify the plant. This does not happen often, but it can and does happen.)

You can now better understand the reasons for learning scientific names. For those who find scientific names difficult, the best help is to associate the scientific name with plant materials over a long period of time. Start today learning 15 of the most common foliage and flowering plants' scientific and common names. Continue this until you have a working knowledge of them. You will benefit in the long run.

V. BOTANICAL AND COMMON NAMES FOR SOME FOLIAGE PLANTS

Rubber Tree	<u>Ficus elastica</u> 'Decora'
Umbrella Tree	<u>Brassaia actinophylla</u>
Hawaiian Scheffera	<u>Brassaia arboracola</u>
Corn Plant	<u>Dracaena fragrans</u> 'massangeana'
Boston Fern	<u>Nephrolepis exaltata</u> <u>Bostoniensis</u>
Dumbcane	<u>Dieffenbachia exotica</u>
Spath, Closet Plant	<u>Spathiphyllum</u> X <u>clevelandii</u>
Pothos	<u>Epipremnum aureum</u>
Neanthe Bella Palm	<u>Chamaedorea elegans</u> 'Bella'
Heartleaf Philodendron	<u>Philodendron scandens</u> <u>oxycardium</u>
Nephthytis	<u>Syngonium podophyllum</u>
Saddle-Leaf Philodendron	<u>Philodendron selloum</u>
Weeping Fig	<u>Ficus benjamina</u>
Chinese Evergreen (silver queen)	<u>Aglaonema commutatum</u> <u>maculatum</u>
Swedish Ivy	<u>Plectranthus australis</u>

VI. BOTANICAL AND COMMON NAMES FOR SOME BLOOMING PLANTS

Silver Vase	<u>Aechmea fasciata</u>
Reiger Begonia	<u>Begonia</u> X <u>hiemalis</u>
Mum	<u>Chrysanthemum</u> <u>moritolum</u>
Cyclamen	<u>Cyclamen persicum</u> <u>giganicum</u>
Poinsettia	<u>Euphorbia pulcherrima</u>
Hibiscus	<u>Hibiscus rosa-suiensis</u>
Kalanchoe	<u>Kalanchoe blossfeldiana</u>
Easter Lily	<u>Lilium longiflorum</u>
Azalea	<u>Rhododendron</u> <u>hybrid</u>
African Violet	<u>Saintpaulia ionantha</u>
Gloxinia	<u>Sinningia speciosa</u>
Persian Violet	<u>Exacum affine</u>

VII. COMMON HOUSEPLANT PROBLEMS

COMMON SYMPTOM	POSSIBLE CAUSE(S)
Brown or dead leaf tips and margins	Dry air, overwatering, underwatering too much fertilizer; Fluorotoxicity
Wilted leaves	Overwatering (especially if soil is soggy and has algae growing on the surface). Underwatering or plant being underpotted when transpiration is high. High level of soluble salts.
Leaf drop	The gradual loss of lower leaves is normal for many plants. Low humidity, overwatering, over-fertilizing, drafts, changes in environment, insects.
Tall and spindly plants	Low light, temperature too warm, (seedlings especially).
Yellow leaves	Too little light, lack of fertilizer (especially nitrogen), insects.
Flower and bud drop	Change in environment, low humidity.
Poor growth	Lack of fertilizer, overwatering, potbound, high soluble-salt level.
Yellow or brown spots on leaves	Overwatering, too much light.

CAUSE	EFFECTS
Over watering	Leaves turn yellow, leaves wilt, leaves drop off, roots rot off, plant may fall over after roots rot off, soil surface and pol; may be covered with green algae, small gray-to-black fly; (fungus gnats) are present in the soil and fly around when disturbed.
Low humidity	Leaf tips and leaf margins turn brown, leaves turn yellow or brown, leaves may fall off (especially the lower ones) leaves may wilt, buds may drop.
Low light	Plants tend to be tall and spindly, lower leaves drop off flowering plants fail to produce buds or buds may fall off.
Under watering	Leaves wilt, lower leaves drop off.
Too much light	Burned leaves (leaves tend to look grayish or bleached, especially those receiving the most light).

APPENDIX I

COMMON FLOWERING PLANTS — GENERAL REFERENCE

FACTS: Flowering pot plants differ fundamentally from foliage pot plants in that flowering represents a transient stage of the normal plant life cycle. Therefore, the florist needs to be concerned with the dynamics of the flowering process and the conditions that alter it. The successful florist will 1. Purchase flowering pot plants that are at the proper stage of floral development at the time of delivery. 2. Provide a well-lighted, somewhat cooler area for holding and display. 3. Remove all spent blooms and declining foliage. 4. Never allow flowering plants to remain in paper sleeves. 5. Do not permit fruit or other ethylene sources to come near flowering plants. 6. Learn to remove the still useful parts of overripe plants for arrangements, and 7. Keep records of successes and failures for future reference.

AFRICAN VIOLET & GLOXINIA

Common Name: 1. African Violet
2. Gloxinia

Scientific Name: 1. Saintpaulia ionantha
(saint-PAWL-ee-a yo-NAHN-ta)
2. Sinningia speciosa
(sin-IN-jee-a spes-ee-OS-a)

FACTS: These two flowering plants are considered together because they belong to the same large plant family of showy tropical flowers called GESNERIADS. They are both available year-round. Colors are white, pink, purple, blue and bicolors. The Gloxinia comes in the color red also. Light-Bright indirect light or partial shade (75-250 fc). Usually do well under artificial light.

Temperature — Optimum daytime temperatures are 70-75 degrees F. Nighttime minimum temperatures are 60-65 degrees F. Does not tolerate temperatures below 55 degrees F. If exposed the new leaves will curl downward and new growth will be stopped. Humidity should be fairly high.

Water — Keep soil uniformly moist but not wet. Avoid splashing water on foliage. Very cold water can cause yellow blotches on the leaves.

Fertilizer — Fertilize every 1-2 months with a complete fertilizer.

Problems — Leaves can develop yellow spots if warm water is allowed to dry on the foliage in the sunlight. Yellowing foliage can be caused by too much light. However, African Violets need strong light to flower.

Lasting Quality — African Violets will flower continuously with sufficient light. Individual flower clusters last 3-6 weeks in favorable conditions. Successive clusters provide 8-10 weeks of continuous color. Gloxinia's individual blooms last 4-6 days each, opening in succession and so providing continuous color for 2-4 weeks. Gloxinias will flower for several months with adequate light.

Insects — Cyclamen Mites, Aphids, Thrips and Mealy Bugs are some problems. Wash or spray with warm soapy water or use rubbing alcohol. If necessary use a registered insecticide spray.

Disease — Crown rot and Gray Mold can be problems if good air circulation is not provided. Destroy all infected tissue and let soil dry more between waterings.

Uses — Wonderful houseplants for longtime enjoyment.

AZALEA

Common Name: 1. Azalea

Scientific Name: 1. Rhododendron hybrid
(ro-do-DEN-dron)

Facts: Year-round, with excellent supplies in the natural flowering period of January to April. Colors are white, pink, salmon, red, purple, variegated pink and white and red and white. Becoming even more popular.

Light — Bright indirect light (150-250 fc).

Temperature — Optimum daytime temperatures 60-70 degrees F. Nighttime minimum 50-60 degrees F. Cool temperatures, especially at night, are essential.

Water — Moist is key-NEVER ALLOW TO DRY OUT.

Fertilizer — No additional fertilizer is needed while Azaleas are flowering.

Problems — Flowers will burn in direct full sunlight. New pale growth may extend beyond the flowers pinch out these young shoots if they cause the plant to look misshaped.

Lasting Quality — Individual flowers last 5-10 days, depending on variety and temperature as well as other environmental factors. Plants flower for periods of two to eight weeks.

Insects — Scale insects, Leaf Miners, and White Flies can be problems. Spray or treat plants with warm soapy water or a registered insecticide for the particular insect.

Disease — Rhizoctonia Blight can cause leaf drop, blackened patches on the stem. Cut off affected parts destroy badly infected plants.

Uses — These Florist Azaleas are very popular as a pot plant for decorating all interior spaces. But these plants are not bred to be planted outside.

BEGONIA

Common Name: 1. Begonia — Reiger Begonia, Christmas Begonia

Scientific Name: 1. Begonia x hiemalis
(beg-OHN-ya hie-MAL-is)

FACTS: Reiger Begonias are a favorite with interior plantscapers. They give year around color except in northern regions. The colors are various shades of orange, red and pink.

Light — Bright indirect light(150-250 fc) or more. Full sun in winter move to sunny location in the winter months.

Temperature — Optimum daytime temperatures are 60-70 degrees F. Nighttime minimum 55-65 degrees F.

Water — Keep soil uniformly moist but not wet. Do not allow medium to become 'bone' dry.

Fertilizer — Fertilize every month. Slow-release fertilizer applied by grower is useful in providing additional long-lasting nutrition.

Problems — Flowers will drop if indoor temperatures exceed 80 degrees F. Stems become soft and will rot in moist humid atmosphere; improve air circulation and allow soil to dry slightly if this starts to happen.

Lasting Quality — Each flower last 5-7 days or longer, and is replaced by others through the 8-10 week flowering period.

Insects — White Fly, Aphids and Mealy Bugs are the major insect problems. Wash with warm soapy water or spray with insecticide registered for use against the insect the plant has.

Disease — Powdery Mildew and bacterial leaf spot are the major disease encountered. Improve air circulation and reduce humidity. Also destroy badly infected foliage.

BROMELIADS

Common Name: 1. Silver Vase
2. Striped Blushing Bromeliad

Scientific Name: 1. Aechmea fasciata
(IKE-may-a fa-see-AHT-a)
2. Neoregelia carolinae 'Tricolor'
(NEE-o-REH-geel-ya try-kul-or)

FACTS: Bromeliads are among the most tolerant of indoor plants, surviving shade,, without making new growth. While many types are grown for their foliage alone, the flowers also are spectacular and long-lasting.

Light — Partial shade to bright indirect light (75-250 fc). Tolerates shade (25-75 fc) for up to 6 months.

Temperature — Optimum daytime temperatures 70-80 degrees F. Nighttime minimum 55-65 degrees F. Bromeliads are not hardy — avoid exposure to temperatures lower than 40 degrees F.

Water — Soil may partially dry out between waterings. Usually, it's best to water the soil just as for other plants. Let soil dry out between waterings.

Fertilizer — Fertilize every 2 months.

Problems — Loss of pigment results from insufficient light. Handle with care to avoid breaking leaf tips.

Lasting Quality — Bromeliads will thrive indefinitely in good conditions and with proper care. The bloom will last 4-6 months in the interior.

Pruning — None needed, except for removal of crowded offshoots and faded flowers. In most varieties, the mother plant will slowly decline and die after flowering and producing offsets; prune out the dead parts just above the soil line and allow offsets to fill in.

Flowering — Bromeliads usually flower naturally when they attain maturity (2-3 years). They can also be induced to flower by applying ethylene-forming chemicals, or simply by enclosing the plant in a plastic bag with a ripe apple for 7-10 days. Flowers will appear 1-2 months after this treatment.

Insect — Scale Insects, Root Mealybugs and Spider Mites are the major insect problems. Wash plant with warm soapy water or rub scale off with fingernail. For Root Mealybugs, the plant can be drenched with a registered insecticide.

Diseases — No real problems, may develop leaf spots if too humid and/or poor air circulation.

Uses — Color in interiorscapes, desk top plants, small rock gardens.

CHRYSANTHEMUM

Common Name: 1. Pot Mum or Chrysanthemum

Scientific Name: 1. Chrysanthemum morifolium
(kris-ANTH-em-um mor-i-FOL-ee-um)

FACTS: Chrysanthemum is the second most popular flowering plant. The Poinsettia is the first. There is a wide variety of forms, sizes and colors in today's chrysanthemums. All have been developed because of individual traits of tolerance, color, form, or habit to suit current styles and the indoor climates. The pot mum is available year-around. The colors include almost any color you want and several flower types are also available. Many growers sell plants when the flowers are not fully developed to at least 1/3 open. Under dark conditions they will not open. Allowing flowers to be half open prior to sale will permit full development of the flower after sale. When buying plants, look for full compact plants. Avoid tall, narrow plant forms or those that are staked and tied.

Light — Bright indirect light (150-250 fc) keep out of direct sunlight.

Temperature — Optimum daytime temperatures are 60-75 degrees F. Nighttime minimum 55-60 degree; F. Will tolerate as cool as 40-45 degrees F. Cooler temperatures will promote longer shelf life.

Water — Keep soil uniformly moist but not wet. However, mums are very forgiving so, if allowed to dry out and watered they will return to normal with a little leaf edge burn.

Fertilizer — No additional fertilizer is needed.

Problems — Leaves turn yellow and flower centers become black with insufficient light; flowers will continue to open in bright indirect light, flowers may be burned in direct full sunlight.

Lasting Quality — Flowers last up to 3 weeks, depending on variety as well as temperature and other environmental factors.

Insects — Aphids, spider Mites and Leaf Miners are the major insects on mums. Wash with or spray with warm soapy water several times. If all else fails use an insecticide registered for use against the insect and registered for use on the mum.

Disease — Bacterial Leaf Spot-discard plant. Not usually found on pot mums.

Uses — All purpose.

CYCLAMEN

Common Name: 1. Cyclamen

Scientific Name: 1. Cyclamen persicum giganteum
(SYK-lam-en PER-sic-um jy-GANT-eh-um)

FACTS: Cyclamen have been hybridized to many large flowered forms, as well as, smaller, scented varieties (not all smaller flowers are scented). Cyclamen are available year-around, however, they are cool weather plants. Fall through spring. The greatest demand is from October to February. The colors are white, and shades of pink, lavender, purple and red. Does not tolerate hot weather very well.

Light — Bright indirect light (150-500 fc)

Temperature — Optimum daytime temperatures 60-65 degrees F. Nighttime temperatures 50-55 degrees F. The plant suffers in hot dry air. Unless it can be kept in a cool room, it will degenerate from excessive wilting and failure of flower bud to develop.

Water — Keep soil uniformly moist but not wet, prefers humid air. Never allow to dry out completely.

Fertilizer — Every 2-3 weeks apply a complete fertilizer while flowers continue to develop.

Problems — Rotting weakened stems. Sudden yellowing of some leaves will occur 1-2 days after plant is allowed to wilt from lack of moisture. Shriveling and drying of flower buds may occur in insufficient light and or excessive temperatures, or following wilting due to drought.

Lasting Quality — Individual flowers last 2-3 weeks depending on temperature and other environmental factors. Each plant produces a profusion of blooms which provide color for 2-4 months.

Insects — Cyclamen Mites are the major insect; new leaves and flowers are distorted and curled. The only treatment is a registered miticide.

Disease — Crown Rot and Bacterial Soft Rot are the major concerns. Provide good air circulation, remove diseased tissue and plants and drench with a registered fungicide.

Uses — As a Christmas and Valentine pot plant.

HIBISCUS

Common Name: 1. Hibiscus

Scientific Name: 1. Hibiscus rosa-sinensis
(hi-BISS-kus- Ro-sah sin-EN-sis)

FACTS: Hibiscus can be obtained year-around. However, they are most abundant in the spring and summer. They come in single and double flowers in beautiful colors of pink, red, yellow, orange and white plus hybrids in subtle pastels. Plants are continuous bloomers, but remember that one or two flowers a day will probably be peak production. They are outdoor plants, not to be grown indoors.

Light — Direct bright light: at least 500-1,000 fc. A sunny east, south or west window is ideal. Abundant light is the main requirement for constant bloom(at least 4 hours a day).

Temperature — Optimum daytime temperatures are 65-85 degrees F. Nighttime minimum of 55-60 degrees F. Hibiscus cannot tolerate low nighttime temperatures. DO NOT ALLOW temperature to dip below 55 degrees F. or plant may become chilled and blooming will stop.

Water — Keep soil evenly moist, not too wet or dry. Moderate to high humidity (40% or more) is beneficial.

Fertilizer — Feed with a flowering plant fertilizer (high in phosphorus) all year. Follow directions on fertilizer label.

Problems — Leaves and flower buds will drop if soil dries out severely or remains soggy for an extended period of time. Also, if kept in drafts of hot air they will drop. They are very sensitive to ethylene gas as low as 0.5 ppm. Unsleeve immediately and do not store with fruits and vegetables.

Lasting Quality — Flowers last only one day. With proper care. buds appear year-round on new growth. While blossoms are fragile, plants are sturdy and long-lived.

Insects — Spider Mites are the major concern. Wash and spray plant with warm soapy water several times in 2-3 weeks. Or, use a registered miticide every 5-7 days.

Diseases — None to be concerned about.

Uses — A different pot plant for all purposes.

KALANCHOE

Common Name: 1. Kalanchoe

Scientific Name: 1. Kalanchoe blossfeldiana
(ka-LAHN-ko-ay bloss-feld-ee-AHN-a)

FACTS: Kalanchoe are excellent decorator plants; they provide good, long-lasting color for indoor decoration. After the flowers have faded the plants have continued value as a succulent green plant. They are usually free of insect pests. Kalanchoes are available year-round with best supplies in March-September. The colors are scarlet red, pink, salmon, oranges, yellows and creamy-white shades.

Light — Full sun or bright indirect light.

Temperature — Optimum daytime temperature 65-80 degrees F. Nighttime minimum is 60 degrees F.

Water — Let soil dry out between thorough waterings. New hybrids require more water and are less sensitive to over watering than older varieties.

Fertilizer — No fertilizer is needed while Kalanchoe is flowering.

Problems — Sensitive to Ethylene, maintain good air circulation.

Lasting Quality — Flowers last from 2-6 weeks, depending upon temperature and other environmental factors. Flowering heads taking on a bi-color effect indicates too low light.

Insects — Mealy Bugs can develop sometimes. Wash with soapy water.

Disease — Crown Rot and Powdery Mildew can be a problem. Improve aeration of soil and air circulation to help control. Avoid water on the foliage.

Uses — An excellent decorator plant for interiorscapes.

LILIES

Common Names: 1. Easter Lily
2. Hybrid Lily
3. Oriental Lily

Scientific Name: 1. *Lilium longiflorum*
(LILL-ee-um lonj-i-FLOR-um)
2. *Lilium*
(LILL-ee-um)
3. *Lilium speciosum*
(LILL-ee-um spe-si-O-sum)

FACTS: Available March, April and May. Easter lilies come in white. The Hybrid lilies can be found in various colors white, pink, orange, yellow and red. Remove anthers in the flower before their pollen stains the petals.

Light — Bright indirect light or full sun (250 fc)

Temperature — Optimum daytime temperatures 70-75 degrees F. Nighttime minimum are 55-65 degrees F.

Water — Let soil dry partially between thorough waterings.

Fertilizer — None needed while in flower.

Problems — None

Last Quality — 7-14 days depending on temperature, number of flower buds per stem and other environmental factors. Removing the pollen also helps prolong the life of the flowers.

Insects — Aphids can be a minor problem. Wash off with warm soapy water.

Disease — Gray mold can cause leaf spots or flower buds to turn brown. Improve aeration and reduce humidity.

Uses — The Easter Pot plants. The other lilies can be used for Mother Day as well.

PERSIAN VIOLET

Common Name: 1. Persian Violet, Exacum

Scientific Name: 1. *Exacum affine*
(x-acum A-feene)

FACTS: This round, bushy, compact plant offers a profusion of delicate lavender blossoms with bright yellow stamens surrounded by small bright green waxy leaves. It is one of the very few fragrant plants available in the floral industry. The fragrance can be very strong even to the point of excessive in a confined space such as a hospital room.

Light — Keep in high light (500-1,000 fc)

Temperature — Optimum daytime temperatures are 75-80 degrees F. Nighttime minimum temperature is 60-65 degrees F.

Water — Keep uniformly moist

Fertilizer — To keep plants blooming a complete fertilizer will help. Apply every two weeks.

Problems — Low-light conditions will cause flowers to fade.

Insects — Mites and worms can be problems. Control with a spray of warm soapy water or a registered insecticide.

Diseases — Gray-Mold caused by too much fertilizer. Discard infected plants.

Uses — One of the few pot plants that has a fragrance.

POINSETTIA

Common Name: 1. Poinsettia

Scientific Name: 1. Euphorbia pulcherrima
(you-FORB-ee-a pul-KER-i-ma)

FACTS: A native of Mexico, the Poinsettia has become the traditional Christmas plant and the number one pot plant in the U.S. Recent introductions of new varieties with improved qualities have made it possible for Poinsettia to be enjoyed in the home for several months. Poinsettias have in the past been falsely accused of being toxic. Research has proven that the plant is NOT HARMFUL. "Points" come in a variety of colors, shapes and sizes Pixie, Traditional, Standard, Trees (Miniature and Standard) and Hanging Baskets. They are available from October through December. Colors range from pink to red, white, white with bicolor, pink, pink with bicolor yellow, and others will be released soon. The bracts are actually vividly colored leaves. All varieties have small yellow true flowers in the center called cyathia.

Light — Place in an area where there is sufficient natural light to read fine print. (150-250 fc).

Temperature — Optimum daytime temperatures 70-75 degrees F. Nighttime optimum 55-65 degrees F. Tell customers not to place on top of T.V. or VCR because of the increase in temperature will dry the soil out very quickly.

Water — Put plant in a waterproof container to protect furnishings and water plant thoroughly when soil surface is dry to the touch. Remembering to discard the excess water. The key is to KEEP THEM MOIST at all times. Do not allow them to become dry.

Fertilizer — A liquid indoor plant fertilizer at the time of purchase and at monthly intervals throughout the life of the plant.

Problems — A dry Poinsettia with wilting foliage can usually be revived: immerse pot in tepid water for 20 minutes or until bubbles stop rising, then allow to drain while plant regains turgidity. Avoid getting any water on foliage. Droopy foliage may occur when plant has been in a dark cool place, or sleeved for more than 24 hours. Place plant in lighted area. Hopefully, it will revive in a few days. Poinsettia's are extremely sensitive to ethylene. To help prevent problems unsleeve plants immediately and avoid storing with fresh fruits or vegetables. Maintain good air circulation. Protect plants leaving the store from exposure to cold temperatures. Only a few seconds of freezing temperatures or chilling wind may kill the plants.

Lasting Quality — Cyathia (yellow structures in center) mature and shed pollen in 2-4 weeks. The colorful bracts may persist in good condition for several months when given proper care.

Insects — White Flies are the major insect problem. If a puff of white 'smoke' arises from the plant when it is moved these are white flies. Be careful not to leave water on bracts. If you use a registered insecticide make sure it can be used on poinsettias that are in bloom.

Disease — Botrytis Blight on bracts or Corynespora Bract and Leaf Spot are the major problems that can be encountered in the florist shop. Increase air circulation, remove infected plant parts and discard.

Uses — The Christmas pot plant.

SPATHIPHYLLUM

- Common Name:** 1. Spath, Peacelily, Closet Plant
2. Mauna Loa
- Scientific Name:** 1. Spathiphyllum x clevelandii
(spa-thih-FILL-um klev-LAND-ee-eye)
2. Spathiphyllum x clevelandii 'Mauna Loa'
(spa-thih-Fill-um klev-LAND-ee-eye mana-Lo-a)
- FACTS:** This is one of the most attractive as well as the most free flowering of all interior plants. It has attractive dark green, glossy lance-shaped leaves. The leaves range in size from eight to fifteen inches long. The large white flowers will remain attractive for several weeks in an indoor environment 'Mauna Loa' is a very popular easy to grow dwarf that produces many 5 inch long white flowers.
- Light** — Medium to high light levels are best, but the Spath will grow under low light (no direct light) conditions but flowering will be reduced.
- Temperature** — Optimum daytime temperatures are 65-80 degrees F. nighttime optimums are 60-80 degrees F. Temperatures below 55 degrees F. can cause damage.
- Water** — Needs to be keep uniformly moist. However, it is a very forgiving plant and will recover from severe neglect. But there will be leaf damage if this is allowed to happen very often.
- Fertilizer** — Fertilize every 2 months with a complete indoor plant fertilizer.
- Problem** — With heavy watering leaf spots will develop.
- Pruning** — Remove old yellowing leaves at the base of the plant. Also "dead head" spent flowers.
- Insect** — Few insects bother this plant. However, mites, mealy bugs and scales can occur. Wash with warm soapy water to remove.
- Disease** — Leaf Spots, blight and Anthracnose can occur. Keep foliage dry and improve air circulation.
- Uses** — The Spaths are used both as small container plants when young and as floor specimens as they mature to larger sizes. Because of their rich green color, consistent texture and low height, this plant is often used as 'facing' plants in front of groupings of larger specimens.

IX. APPENDIX II

COMMON FOLIAGE PLANTS — GENERAL REFERENCE

FACTS: Most foliage plants are natives of the tropics, but they are generally adaptable to indoor culture. They vary in ability to endure neglect, abuse, and abnormal conditions. Florists should familiarize themselves with the common and botanical names as well as the characteristics of the most commonly used plant species — their habits of growth, their soil requirements, and the amount of light they need to maintain a healthy green color. With this knowledge, florists will be able to help customers choose plants to satisfy their particular requirements.

CHINESE EVERGREEN

- Common Name:**
1. Chinese Evergreen
Painted Droptongue
 2. Silver Evergreen
Silver King
Silver Queen
 3. Golden Evergreen
 4. Chinese Evergreen
- Scientific Name:**
1. Aglaonema crispum
(ahg-la-oh-NAYM-a KRIS-pum)
 2. Aglaonema commutatum maculatum 'Silver King' and 'Silver Queen'
(ahg-la-oh-NAYM-a kom-rnoo-TAHT-um ma-koo-LAHT-um)
 3. Aglaonema commutatum 'Pseudo-bracteratum'
(ahg-la-oh-NAYM-a SU-doe-brak-tay-AHT-um)
 4. Aglaonema modestum
(ahg-la-oh-NAYM-a mo-DES-tum)

FACTS: In broad outline, the Chinese Evergreen resembles that of Dieffenbachia. Some grow almost in the shape of trees, while others are low growing and shrubby. The leaves are variegated. Some species develop colorful berries. A.modestum is the hardiest of all the species and is the oldest and most basic member of the commercially important group. Aglaonema are excellent interior plants.

Light — Deep shade to bright indirect light (25-250 fc). Aglaonema are tough and very tolerant of poor lighting.

Temperature — Daytime optimum 70-75 degrees F. Night time minimum 60-65 degrees F.

Water — Keep soil uniformly moist but not wet.

Fertilizer — Fertilize every 2 months with a complete indoor plant fertilizer.

Problems — NONE — tough plants

Storage — Store at 60-70 degrees F. and 65-85% humidity. Aglaonemas are very tolerant of low storage temperatures, (below 50 degrees F.) however plant will lose lower foliage and develop a dull color. Most species and cultivars will tolerate 10 days in storage without light and maintain quality. After 14 days, considerable foliage loss will occur. Plants can be stored indefinitely at 50 fc or more.

Pruning — None required

Lasting Quality — Aglaonema will last indefinitely in good conditions and proper care.

Insect Control — Usually not bothered

Disease Control — Bacterial leaf spot (Pseudomonas) will develop under damp humid conditions. Keep foliage dry; improve air circulation and remove infected tissue for the area.

Uses — Filler plants in planters or as ground covers in large mall areas. They are excellent table or desk plants or as a large single specimen plant.

DIEFFENBACHIA

- Common Name:**
1. Giant Dumb Cane
Tropic Snow
 2. Exotic Dieffenbachia
Prefection
 3. Spotted Dumb Cane
Rudolph Roehrs
- Scientific Name:**
1. Dieffenbachia amoena
(dee-fen-BAK-ee-a a-MO-EEN-a)
Dieffenbachia amoena 'Tropic Snow'
(dee-fen-BAK-ee-a a-MO-EEN-a Tropic Snow')
 2. Dieffenbachia exotica
(dee-fen-BAK-ee-a EGS-of-i-ka)
Dieffenbachia exotica 'Perfection'
(dee-fen-BAK-ee-a EGS-of-i-ka 'Perfection')
 3. Dieffenbachia maculata
(dee-fen-BAK-ee-a mak-yoo-lata)
Dieffenbachia maculata
(dee-fen-BAK-ee-a mak-oo-lata 'ROO-dolf RO-ERS)

FACTS: Dieffenbachia is said to be at the top of the most popular foliage plants. For more than a century, about 20 species have been in cultivation from which new, constantly improved cultivars have been produced. Leaves are usually glossy, leathery and vary in size and color depending upon variety. Height varies from 2 to 10 feet, depending upon cultivar. The common name of Dumbcane comes from the fact that sap from the plant parts contains an ingredient that can cause swelling in the mouth and throat if eaten.

Light — Partial shade to bright indirect light (75-250 fc)

Temperature — Optimum daytime temperature 70-75 degrees F. Nighttime minimum 60-65 degrees F.

Water — Soil may partially dry out between waterings.

Fertilizer — Fertilize every 3 months with a complete soluble indoor plant fertilizer.

Problems — Lower leaves tend to die as new ones open at the top of the cane; this can be minimized by ensuring that sufficient light reaches all the foliage. Leggy Dieffenbachia can be air-layered just below the leaves.

Storage — Store at 60-70 degrees F. Dieffenbachia is one of the **least cold tolerant** groups of foliage plants. They can be seriously damaged if temperature is allowed to drop below 60 degrees F. Do not store without light for more than 5 to 7 days. Lower leaves will turn yellow with excessive light exclusion. Keep soil moist during storage or leaf drop may occur.

Pruning — Remove all dead or dying leaves and discard.

Insects — Aphids and Spider Mites are the major insects found on Dieffenbachia. Aphids cause younger leaves to be distorted and discolored. Spider Mites cause leaves to be mottled and dusty, yellowing and droopy. Fine webs at the growing tip and on leaves can cause drying and curling with severe infestation. Control — wash whole plant with soapy water or spray with a registered insecticide for use on Aphids or Spider Mites.

Disease — Leaf Spot (bacterial and fungal) and Stem and Crown Rot are major diseases of Dieffenbachia. Yellow-brown or reddish spots or water soaked spots on leaves or stems are indications that the organisms are present. Keep foliage dry, improve air circulation, reduce temperature. Remove infected tissue and discard.

Uses — The large specimen plants are ideal for lobbies and mall areas and smaller ones are used as filler plants and desk plants. The Dieffenbachia works well with other plant combinations, but it should be potted separately because of watering differences.

DRACAENA

- Common Name:** 1. Janet Craig Dracaena
Corn Plant
Warneckei Dracaena
Dragon Tree
2. Gold Dust Dracaena
Ribbon Plant
- Scientific Name:** 1. Dracaena deremensis 'Janet Craig'
(dra-SEE-na day-re-MEN-sis)
Dracaena fragrans massangeana
(dra-SEE-na FRAHG-rans ma-SAHNJ-eh-AHN-a)
Dracaena deremensis 'Warneckei'
(dra-SEE-na day-re-MEN-sis war-NECK-ee-eye)
Dracaena marginata
(dra-SEE-na mar-gin-AHT-a)
2. Dracaena godseffiana
(dra-SEE-na god-SEFF-ee-ahn-a)
Dracaena sanderiaia
(dra-SEE-na sand-der-ee AHN-a)
- FACTS:** What would interior plantscaping do without the genus Dracaena. There are 20 species from which to choose. The leaves are usually oval to lance-shaped, from three to twenty-three inches long, erect growing or tending to curve depending on the species. The color of the leaves has tremendous variability from emerald to gray-green, with yellow or white stripes or spots. Plants grow to many different heights. Depending on the variety, they can grow from six inches to fifteen to twenty feet.
- Light** — Partial shade to bright indirect light (75-250 fc). I.(group) Some species also survive (without growing) in shade as low as 25 fc.
- Temperature** — Optimum daytime 70-75 degrees F. Nighttime minimum 60-65 degrees F. 1. (group) can tolerate as cool as 55 degrees F. for short periods. 2. (group) can tolerate as cool as 50 degrees F. for short periods.
- Water** — Never allow the soil to dry out, but don't keep it saturated.
- Fertilizer** — Fertilize every two months with a complete soluble indoor plant fertilizer.
- Problems** — Leaves turn yellow and then brown with insufficient light. Leaf tips and edges often turn brown and yellow and brown patches may occur along leaf blades. This is caused from two factors. One, is the fluoride sensitivity. Avoid the use of fluoridated water if possible. Second, if the soil is allowed to dry out the same symptoms will occur.
- Pruning** — Lower leaves are often lost as Dracaenas grow, especially if light is insufficient for lower foliage; top portions can be air-layered. Portions of the remaining stem can be rooted for additional plants. The brown tips of the leaves are pruned off as needed.
- Lasting Quality** — Dracaenas will thrive indefinitely in good conditions and with proper care.
- Storage** — Store at 60-75 degrees F. and 75-85% humidity. Most Dracaenas will tolerate periods of up to 7 days without light and the lower leaves will not turn yellow. Plants exposed to low temperatures and low-humidity will develop severe tissue necrosis along leaf margins.
- Insect Control** — Mealy bugs, spider mites and scale insects are the most common insects seen on the Dracaenas. Washing with warm soapy water every 2-3 weeks is the best control. There are biologicals on the market and if all else fails spray with a registered chemical.
- Disease Control** — Bacterial leaf spot (Pseudomonas) and leaf spot (Fusarium Phyllosticta) are the most common diseases of Dracaenas. To control keep foliage dry, improve air circulation and remove infected leaves.
- Uses** — The Dracaenas are relatively slow growing and will thrive in the same container for years. Their glossy, leathery leaves give them good resistance to most problems and low humidity.

FERN

- Common name:**
1. Boston Fern
Dallas Fern
Nappa Valley Fern
Tall Feather Fern
Lace Fern or Feather Fern
 2. Maidenhair Fern
 3. Birdsnest Fern
 4. Silver Table Fern or Brake Fem

- Scientific Name:**
1. Nephrolepis exaltata 'Bostoniensis'
(neff-ro-LEP-is egs-al-TAHT-a bos-ton-i-ENS-is)
Nephrolepis exaltata 'Dallas'
(neff-ro-LEP-is egs-al-TAHT-a dal-es)
Nephrolepis exaltata 'Napa Valley'
(neff-ro-LEP-is egs-al-TAHT-a nap-a val-e)
Nephrolepis exaltata 'Rooseveltii'
(neff-ro-LEP-is egs-al-TAHT-a ROSE-velt-eye)
Nephrolepis exaltata 'Whitmanii'
(neff-or-LEP-is egs-al-TAHT-a WHT-man-eye)
 2. Adianrum raddianum
(ah-dee-AHN-tum radd-ee-AHN-um)
 3. Asplenium nidus
(as-PLEN-ee-um NID-us)
 4. Pteris ensiformis 'Victoriae'
(TER-is en-si-FOR-mis vic-FOR-ee-eye)

FACTS: Nephrolepis and its cultivars are one of the most hardy and most popular of the indoor ferns. It can decorate an area for a long time. The newer more compact cultivars have provided more diverse uses for these ferns. The other Ferns mentioned give various textures and color to the interiorscape.

Light — Partial shade to bright indirect light (75-250 fc) 1. Sun in winter; shade in summer or unbroken north light all year.

Water — Keep soil uniformly moist but not wet. Prefers humidity at 80-95%.

Fertilizer — Fertilize ferns every 3 months with a complete indoor plant fertilizer.

Problems — Brown leaf edges can result from dry air, waterlogged soils, or an accumulation of excess salt. Older fronds die naturally as fresh young growth is made.

Storage — Store Ferns at 60 -70 degrees F. and humidity 75-85%. HIGH HUMIDITY is very important levels below 50% will cause leaflets to brown. Ferns do not store well in the dark, so avoid storage periods longer than 7 days to prevent leaflet loss. Ethylene sensitive levels above 1 ppm will cause serious damage.

Lasting Quality — Ferns will grow indefinitely in good conditions and with proper care.

Pruning — Trim off older fronds as they die back.

Insects — Scale Insects, Mealy bugs, Aphids and White Flies. Wash off or rub off with fingernail. Ferns are very sensitive to chemical damage. Use only with caution.

Disease — Gray-Mold (Botrytis) and Rhizoctonia can be problems. Moldy gray tissue or wet soggy tissue turning brown-black near the soil line. Remove infected fronds and allow ferns to dry out; better air circulation; do not mist; reduce temperature.

Uses — Best used in hanging basket, around water features, or as a desk plant.

FICUS

- Common Name:**
- 1. Rubber Tree
 - Abidjan
 - Decora
 - Variegated Rubber Plant
 - 2. Weeping Fig
 - Fiddleleaf Fig
 - Indian Laurel
- Scientific Name:**
- 1. *Ficus elastica*
 - (FEEK-us or FYK-us eh-LAHST-ti-ka)
 - Ficus elastica* 'Abidjan'
 - (PEEK-us or FYK-us eh-LAHST-ti-ka AB-i-john)
 - Ficus elastica* 'Decora'
 - (FEEK-us or FYK-us eh-LAHST-ti-ka deh-KOR-a)
 - Ficus elastica* 'Doescheri'
 - (FEEK-us or FYK-us eh-LAHST-ti-ka DO-sher-eye)
 - 2. *Ficus benjamina*
 - (FEEK-us or FYK-us ben-ja-MEEN-a)
 - Ficus lyrata*
 - (FEEK-us or FYK-is li-RAHT-a)
 - Ficus retysa nitida*
 - (FEEK-us or FYK-is re-TOOS-a NIT-i-da)

FACTS: Ficus (figs) have occupied a leading position in the world of houseplants for many years. A botanical link between the different species lies in the milky liquid excreted from a cut or damaged stem. Rubber Tree grows indoors from 2 to 10 feet. There are many new brightly colored varieties being developed and used in interior plantscaping. Weeping Fig has graceful, drooping branches with long leathery shiny leaves with long tapering points. It grows from 6 to 20 feet indoors.

Light — Partial shade to bright indirect light (75-250 fc). Thrives in full sun when conditioned to it. Reduce shade by stages 7-14 day intervals.

Temperature — Optimum daytime 70-75 degrees F. Nighttime minimum temperatures are 60-65 degrees F. Will tolerate as cool as 50 degrees F. for short periods of time.

Water — Keep soil uniformly moist but not wet. Do not let roots set in water.

Fertilizer — Fertilize every 2 months with a complete indoor plant fertilizer.

Problems — Leaves will be lost if there is insufficient light, cold drafts, dry soil, or excessive salts in the soil. Fig trees frequently drop some mature leaves after moving to a new location, as they adapt to the different environment.

Storage — Store at 55-70 degrees F. and 65-85% humidity. Ficus can tolerate temperatures as cool as 50 degrees F. in shipment without damage. Ficus vary in reaction to storage without light, but severe leaf drop can occur on some species if light is excluded for more than 7 days. Ethylene sensitive exposure to ethylene levels above 2 ppm can result in leaf drop. Severe leaf drop can occur on Weeping Fig and Indian Laurel if soil is allowed to dry out.

Lasting Quality — Ficus will thrive indefinitely in good conditions and with proper care.

Pruning — Removal of the growing tip encourages branching on vigorously growing Rubber plants though often at the sacrifice of appearance.

Insect — Scale Insects, Mealy Bugs and Thrips are the major insects. Clusters of brown-gray scales under leaves and on stems. Rub off with fingernail or use rubbing alcohol. Mealy Bugs have a cottony white secretion on stems and under leaves. Wash with soapy water or use rubbing alcohol. Thrips-soapy water will help. If all else fails, use a registered insecticide for the insect.

Disease — Leaf Spot starts with tiny round bumps under the leaves, later enlarges to brown specks. Then the leaves turn yellow and drop off. Keep the foliage dry; improve air circulation and reduce temperature.

Uses — These plants are usually used as large specimen plants in lobbies, malls, offices and homes.

PALM

Common Name:	Areca Palm Bamboo Palm Parlor Palm or Neanthe Bella Palm Kentia Palm or Paradise Palm Lady Palm
Scientific Name:	<u><i>Chrysalidocarpus lutescens</i></u> (kris-al-id-o-KAR-pus loo-TESS-ens) <u><i>Chamaedorea erumpens</i></u> (kam-ee- DOR-eh-a eh-ROOM-pens) <u><i>Chamaedorea elegans 'Bella'</i></u> (kam-ee- DOR-eh-a eh, EL-e-gans BELL-a) <u><i>Howea forsteriana</i></u> (HOW-ee-a for-ster-i-AHN-a) <u><i>Rhapis excelsa</i></u> (RA -pis ex-SELL-sa)

Light — Partial shade to bright indirect light.(75-250 fc). Also tolerate deep shade for short periods (25-75 fc).

Temperature — Optimum days 70-85 degrees F (21-24 C). Night time minimum 62-65 degrees F (17-18 C). Tolerates as cool as 50 degrees F for short periods.

Water — Keep soil moist but not wet. Never let soil dry out completely.

Fertilizer — Fertilize Palms every 2 months with a complete soluble indoor plant fertilizer.

Problems — Collection of dust since they filter dust from the air they need to be washed with a damp cloth or sponge periodically. This will also help in control of **spider mites and mealy bugs**.

Pruning — None required except to remove dead fronds.

Lasting Qualities — Palms thrive indefinitely in good conditions and with proper care. Palms are generally durable and long-lived plants well suited to inside environments.

Storage — Store at 50-70 degrees F and 65-75% humidity Palms can tolerate dark storage for 19 days without injury. They will store indefinitely under 150 fc. However, **don't** allow the soil to dry out while in storage.

Insect Control — Spider mite damage looks like mottled and dusty tips on younger leaflets. Control is washing and spraying plant with soapy water, biological control or miticide.

Uses — Large plants can be used as specimen floor plants. Smaller palms can be used on tables and shelves or seedling palms are ideal for terrariums or European gardens.

PHILODENDRON

Common Name:

1. Heart-leaf Philodendron
2. Saddle-leaf Philodendron
3. Emerald Queen Philodendron
4. Red Princess Philodendron

Scientific name: 1. Philodendron scandens oxycardium
(fill-o-DEN'-dron SKAN-dens ox-i-Car-dee-um)
2. Philodendron selloum
(fill-o-DEN-dron sell-OH-um)
3. Philodendron X 'Emerald Queen'
(fill-o-DEN-dron em-e-reld kwen)
4. Philodendron X 'Red Princess'
(fil-o-DEN-dron red prin-ses)

FACTS: The plant genus of Philodendron rank second in the popularity of indoor plants. Each plant species has leathery, different shaped leaves; even the young and mature leaves of a single specimen show marked dissimilarities making it difficult to describe them. Most of these plants are of the creeping or climbing type.

Light — 1. Deep shade to bright indirect light (25-250 fc). 2.,3., 4., Partial shade to bright indirect light (75-250 fc).

Temperatures — Optimum daytime 70-75 degrees F. Nighttime minimum temperatures differ.

Water — Keep soil uniformly moist but not wet. Red Princess-let soil partially dry between waterings. If soil dries out completely, water may run right through the pot without moistening the roots.

Fertilizer — Fertilize every 2-3 months with a complete indoor plant fertilizer.

Problems — Small leaves and spindly growth can result from insufficient light, being waterlogged, or an accumulation of excess salts in the soil. If new leaves turn black over part or all of surface; this results from extreme increase in temperature, as from 65 degrees F. to 95 degrees F.

Storage — Store at 60-75 degrees F. and 65-85% humidity. Most species and cultivars will tolerate dark periods up to 7 days without loss of quality and up to 10 days with just minor loss in quality. Plants should not be stored or shipped with wet foliage, especially when the possibility of bacterial infection exists. Ethylene sensitive leaves may turn grey-green or yellow and appear wilted at ethylene levels above 2 ppm.

Lasting Quality — Philodendrons will thrive indefinitely in good conditions and with proper care.

Pruning — Trim vigorously growing shoots to retain full leafiness and to encourage branching. When supported on pole or bark, pruning will maintain a given height; when it becomes too long, the tallest stem is cut back to its lowest 2 or 3 leaves, and a new shoot grows from there to assure a succession of new growth.

Insects — Philodendrons generally are tough plants, not usually troubled by insects. However mealy bugs can be found. Wash the plant with warm soapy water or if necessary spray with a registered insecticide for use against mealy bugs.

Disease — Plants generally become subject to bacterial or fungal leaf spot if grown in damp and humid conditions. Keep foliage dry; improve air circulation and reduce high temperatures.

Uses — Their use depends upon the Philodendron. Heartleaf can be used in hanging baskets, totem poles and as a ground cover for large surfaces. The others are used mainly as specimen plants.

POTHOS

- Common Name:** 1. Pothos, Golden Pothos, Devil's Ivy
2. Marble Queen
3. Tricolor
- Scientific Name:** 1. Epipremnum aureum
(eh-pih-PREM-num AR-ee-um)
2. Epipremnum aureum 'Marble Queen'
(eh-phi-PREM-num AR-ee-um mar-be! kwen)
3. Epipremnum aureum 'Tricolor'
(eh-phi-PREM-num AR-ee-um tri-color)
- FACTS:** Many people consider Pothos a Philodendron. However, it is not, and it has a new scientific name. There are several varieties of Pothos. Generally, the leaves are heart shaped and can be waxy and satiny. Leaves can be two to five inches in length with a tapering point. They range from dark or bluish green to marbled with white or yellow.
- Light** — Deep shade to bright indirect light (25-250 fc). Tolerates low light, however because of the variegation the plant needs bright indirect light to maintain the foliage color.
- Temperature** — Optimum daytime temperature 70-75 degrees F. Nighttime temperature minimum is 62-65 degrees F. Tolerates as cool as 45 degrees F. for short periods.
- Water** — Keep soil uniformly moist but not wet.
- Problems** — Weak spindly growth can result from insufficient light, waterlogging, or an accumulation of excess salt in the soil.
- Storage** — Store at 60-75 degrees F. and 65-85% humidity. Pothos will tolerate periods of 7 days without light in storage without loss in quality. After 10 days however, serious leaf loss will occur. Plants should not be stored or shipped when foliage is wet, especially when the possibility of fungal or bacterial disease exist. Ethylene sensitive leaves may turn off-color if plants are exposed to ethylene levels of less than 2 ppm.
- Lasting Quality** — Pothos will thrive indefinitely in good conditions and with proper care.
- Pruning** — Trim tips of vigorously growing shoots to encourage branching and fresh new growth from the base. To maintain a given height on pole or bark, cut the longest shoot to its lower 2 or 3 leaves, and a new shoot will grow from there to assure a succession of new growth.
- Insects** — Pothos is a tough plant and is not usually bothered by insects.
- Disease** — Plants generally become subject to disease in damp and humid conditions. The diseases are Root Rot, Bacterial Soft Rot and Bacterial Leaf Spot. Control — keep foliage dry; improve air circulation; remove infected tissue.
- Uses** — Pothos can be used in many ways including hanging baskets, ground covers in large areas, totem poles for desk or tables or as large planters to cover harsh walls.

SCHEFFLERRA

- Common Name:**
1. Schefflera
Umbrella Tree
 2. Dwarf Schefflera
Hawaiian Schefflera

- Scientific Name:**
1. Brassaia actinophylla
(bruss-EYE-a ak-tin-o-FIL-la)
 2. Brassaia arboracola
(bruss-FA'E-a ar-bor-a-COLA)

FACTS: The leaves of both Schefflera's resemble the canopy of an umbrella, thus the common name of "umbrella plant". In young plants, the long-stemmed, leathery, deep, glossy green foliage is initially divided into 3 or 5 leaflets. As the plant grows older, it divides further.

Light — Partial shade to bright indirect light (75-250 fc). Also tolerates deep shade for short periods of time.

Temperature — Optimum daytime temperatures 65-75 degrees F. Optimum night time temperatures 60-65 degrees F. Temperatures above 70 degrees F. will cause the plants to grow lanky. Will tolerate temperatures as cool as 45 degrees F. for short periods of time.

Water — Keep soil uniformly moist but not wet.

Fertilizer — Fertilize every two months with a complete indoor plant fertilizer.

Problems — Leaf burn and yellowing is caused by drafts and/or spider mite infestation. Frequent and extreme temperature fluctuations and also excessive soluble salts (from fertilizer or water) in the soil can cause this problem.

Lasting Quality — Schefflera will thrive indefinitely under good conditions and proper care.

Storage — Store at 55-65 degrees F. and 70-85 % humidity. Schefflera will not tolerate storage without light for more than 7 days without loss of quality. They will store at 150 fc or higher indefinitely. Do not allow soil to dry out in storage.

Pruning — Not required.

Insect Control — Spider Mites, Mealy Bugs and Scale Insects are the major insects of concern. Spider Mite damage makes the leaves motley, dusty and with burned margin; fine webs under the leaves, in growing tips and stem angles. Mealy Bugs leave a cottony white secretion on stems under leaves. They also can cause mottled foliage. Scale Insects are clusters of brown-gray scales under leaves and on the stems. Mottled foliage also can signal scales. Control-wash and spray plants with warm soapy water. Scale Insects are more difficult to remove because of their hard outer covering which chemicals do not penetrate. Rub off with thumbnail or use rubbing alcohol. Use chemicals registered for use against these insects.

Disease Control — Leaf spot (Altemaria) and Leaf spot Edema (Cercospora) Round brown spots on leaves of elongated patches on stem signal Leaf spot. Minute swellings in leaves becoming red-brown patches are symptoms of Edema. Keep foliage dry, improve air circulation. Remove infected tissue. Spray with registered fungicide.

Uses — Hawaiian Schefflera is becoming more popular as smaller specimen plants for home and office are needed. The larger Schefflera is most often seen in lobbies, shopping malls, etc. as a larger specimen. Seedlings work well in terrariums, dish or European gardens.

SWEDISH IVY

Common Name: 1. Swedish Ivy, Creeping Charlie

Scientific Name: 1. Plectranthus australis
(plek-TRAN-thus aus-TRA-lis)

FACTS: Swedish Ivy has small bright green, roundish waxy leaves. It usually grows only twelve inches tall and is a trailing plant. It produces clusters of small white flowers and blooms under high light conditions. There are variegated forms of it. Its common name came from its first popularity as a houseplant in Sweden.

Light — Medium to high light conditions are needed.

Temperature — Optimum daytime temperatures are 60-75 degrees F. nighttime temperatures 55-60 degrees F.

Water — Keep soil moist to a little dry.

Fertilizer — Fertilize every 3 months with a complete indoor plant fertilizer.

Problems — If over watered it will rot.

Storage — Will store for only short periods of time.

Pruning — To keep plant growing, pinching its growing tips will keep it more dense.

Insects — The only pest problems are occasionally Mealy Bugs, nematodes and White Flies. Wash with warm soapy water or rubbing alcohol.

Disease — Bacterial Soft Rot comes from overwatering or too high humidity.

Uses — It is best used as a hanging basket or as a ground cover.

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