

SUPERSEDED

Care of

House PLANTS



This archival publication may not reflect current scientific knowledge or recommendations.
Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

rd E. Widmer
C. Snyder

UNIVERSITY OF MINNESOTA

Agricultural Extension Service

U.S. DEPARTMENT OF AGRICULTURE

CONTENTS

| | |
|--|-----------|
| Culture | 3 |
| Control of Insects on House Plants..... | 8 |
| Control of Diseases of House Plants..... | 11 |
| Flowering Plants | 11 |
| Forcing Spring Flowering Bulbs | 17 |
| Fruiting Plants | 19 |
| Foliage Plants | 19 |
| Cacti and Succulents | 27 |
| Growing Plants Under Special Conditions | 28 |
| Water Culture | 28 |
| Artificial Light | 28 |
| Dish Gardens and Planters..... | 30 |
| Terrariums | 31 |
| Suggestions | 32 |
| For Special Locations..... | 32 |
| For Low or High Temperatures..... | 32 |
| Tough Plants | 32 |

Care of

HOUSE PLANTS

GROWING potted plants is one of the most popular indoor pastimes today. House plants provide color and beauty during the winter months, especially for holidays when entertaining is at a peak. Plants are now considered an important part of interior decoration.

In addition, the growing of plants in the home helps satisfy the gardening urge for those who cannot have outdoor gardens and for those who wish

to continue their horticultural activities during the long Minnesota winters. It also presents a challenge for even the most ardent outdoor gardeners.

Culture

The artificial conditions under which house plants are grown present many problems. A thorough understanding of the principles involved will simplify the procedure and insure a greater degree of success.

Soil mixtures. Since plants obtain water, nutrients, and air from the soil, the proper soil mixture is of utmost importance. Most flowering plants will thrive well in this mixture:

3 parts good garden loam

2 parts organic matter

1 part sand

Add bone meal or 20 per cent superphosphate to the soil mixture at the rate of one cup to each bushel of soil. Rotted manure, leaf mold, compost, peat, or acid peat moss may be used as a source of organic matter.

If acid peat moss is used, substitute a cup of a 4-12-4 or a 5-10-5 fertilizer for the bone meal or superphosphate.

If the garden loam is heavy or clay-like, increase the proportion of sand. If the garden loam is light or sandy, omit the sand.

Foliage plants usually grow best in a soil mixture containing 50 per cent organic matter. Acid peat moss should be used as a source of organic matter for acid loving plants such as azaleas, camellias, and gardenias. A higher proportion of sand is advisable for cacti and succulents (plants with thick leaves or stems).

Fertilizers. Fertilizers are required after the soil fertility is exhausted. When good soil is used at potting time, most house plants will not require additional fertilizer for three to four months.

The best way to apply fertilizer is in the liquid form. If special soluble house plant fertilizer is used, follow the manufacturer's directions. If a garden fertilizer such as a 6-10-4 or a 5-10-5 is used, dissolve 1 teaspoonful in a

quart of water. Stir well and preferably let stand overnight before using.

When applying liquid fertilizers use enough of the solution to wet the entire soil mass. Most plants require fertilization every five or six weeks when actively growing. Resting or dormant plants should not be fertilized.

Containers. Glazed or unglazed earthenware, metal, or wood containers may be used if the soil is watered properly. Ordinary clay flower pots are porous and plants in such pots require frequent watering. Plants in nonporous containers should be watered less frequently to avoid a waterlogged soil.

Regardless of the type of container, a drainage hole in the bottom is advisable if the plant is watered from the top. Take great care to avoid saturating the soil of containers with no drainage outlet. Self-watering pots now on the market are satisfactory for some plants such as African violets.

Repotting. Plants obtained from the florist in full bloom usually do not require repotting until they have completed their growth and are ready to enter another growing period. Repotting will be necessary when the plant top outgrows the pot and there is not enough room for the roots.

If a plant requires water more often than once every 24 hours, it is safe to assume that a larger pot is required. Some plants require repotting annually, while slow growing species may re-

quire only the replacement of a little of the topsoil with fresh soil.

In repotting, remove the shoulder of soil around the top and also any loose soil. To remove the soil, use a gradual squeezing motion to avoid breaking the tender young white roots. The appearance of the plant and pot in combination should help determine the proper size pot to use. Clean pots only should be used.

Broken pieces of flower pots, gravel, or similar material may be placed in the bottom of the pot for drainage. The only benefit obtained from the use of charcoal in the bottom of the pot or in the soil is to maintain good drainage.

When shifting to a larger pot place some soil in the bottom of the pot and firm the soil around the old root ball. Leave enough room in the top of the pot for proper watering ($\frac{1}{2}$ inch for a 4-inch pot and 1 inch for an 8-inch pot). Water the soil thoroughly at first. Do not water again until the soil dries out on the top.

Watering. In watering, the temperature of the water is especially significant. Do not use ice cold water, especially on tropical plants. Water of room temperature is desirable and should be applied in the morning whenever possible. It is also advisable to avoid getting water in the crown of plants such as the cyclamen and African violet where it may encourage decay.

Fig. 1. The artillery plant in pots that are (left to right) too small, proper size, and too large.



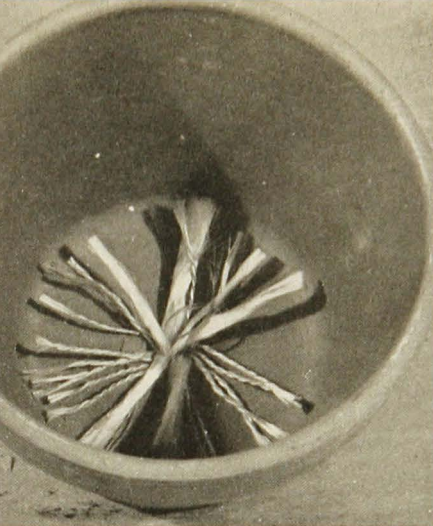


Fig. 2. A glass wick may be used for self-watering.

watering will vary with many factors such as weather, type and size of plant, and the stage of growth of that plant. The majority of successful growers check their plants daily and water when necessary. Usually the plant requires water when the surface of the soil appears dry. A person who becomes familiar with different kinds of plants can detect when water will be needed by noticing, for example, the color of the foliage or the wilting of the leaves.

Watering from below is good as it wets the soil more thoroughly, but it is not essential. Do not keep the pot standing in water for prolonged periods, however. Plants can also be "self-watered" from below. Such self-watering pot units may be purchased or they may be fabricated in the home.

Soak the soil thoroughly when watering. Overwatering encourages a rotting of the roots and is often noted in the foliage by a change in color from green to yellow. Lack of water can result in dwarfing, foliage spotting, and eventual loss of the plant.

Some of these units have a glass wick to carry water up into the soil. The wick is pulled through the drainage hole in the pot, unraveled, and spread in all directions on the bottom of the pot. The soil ball is then replaced in the pot, leaving out any drainage material such as broken pieces of pot. Then the soil ball is firmed down to assure contact with the wick, and the pot is placed on a container that holds water. The lower end of the wick is inserted in the water.

The prolonged use of water which passes through a water softener may result in poor plant growth. In such cases the plant should be repotted in fresh soil and watered with water which does not pass through the softener.

The proper water level in the container must be determined from experience. If the soil is kept too wet, lower the water level; if the soil is too dry, raise the water level. The container should always contain water. If the container dries up or if the soil in the pot becomes too dry, half submerge the pot in water for 30 minutes. This method of watering is not recommended for plants which prefer a relatively dry soil, such as tuftroot, cacti, and succulents.

Air humidity. The humidity of heated homes in this area is quite low during the winter. Some means of increasing the humidity of the air in the home will definitely aid plant growth. A relative humidity of 40 to 60 per cent is best. Many house plants will benefit from a regular spraying with clean, soft water at least once a week. Growing plants on a waterproof tray that contains moist sand, crushed rock, or colored pebbles will also help solve the humidity problem, but be sure the pots themselves are not setting in water. Plants requiring very moist air should be planted in a terrarium. See page 31.

No time schedule can be followed in watering plants since the frequency of

Ventilation. Proper ventilation is more essential for human beings than it is for plants, but sudden temperature changes and drafts should be avoided.

Many house plants are especially sensitive to small quantities of escaped gas in the atmosphere. Avoid careless lighting, poor combustion, and slight leaks in gas ranges. Poor combustion in coal furnaces and kerosene heaters can be equally harmful. Tomato plants, African violet blossoms, or fresh cut carnations are good gas indicators. The tomato plants will droop and the foliage will turn yellow; African violet blooms will shrivel and drop prematurely; and the carnation flowers will "go to sleep" (petals will fold upward).

Such plants are affected by gas long before humans detect it. Pure ethane, butane, and propane are not injurious to plants. Natural gas in itself is not harmful to plants, but manufactured or blended mixtures of natural and manufactured gas are toxic to plants.

In light, plants discharge oxygen and take carbon dioxide from the air. At night the process is reversed but the quantity of carbon dioxide given off by plants is so minute that it is of no significance. Plants need not be removed from sickrooms or bedrooms at night.

Temperature. Adverse temperatures account for the failure of many house

plants. Most plants will grow well in a day temperature ranging from 65° to 75° F., but night temperatures should be approximately 10° lower. Flowering plants, with the exception of a few such as the African violet and the gloxinia, will last much longer at night temperatures as low as 50° regardless of the conditions. Foliage plants, most of which originated in tropical areas, generally prefer day temperatures up to 80° and night temperatures between 60° and 70°.

In some instances it may be well to remove plants from a warm room to a cool place at night. During the cold period of the year, plants located near windows are subject to much lower temperatures than plants in the remainder of the room. In the case of green foliage plants requiring high temperatures, it will be wise to protect them in some way such as pulling shades or drapes or placing newspaper between the plants and the window.

Light. Light conditions in the average home are poor—light coming from one side only and often in small quantities. A plant growing in a sunny window or strong light can stand higher temperatures than can the same plant growing in poor light. Excessively high temperatures and low light intensity form a fatal combination.

Some plants require more light than do others, so keep this factor in mind when choosing a plant for a particular location. Flowering plants usually require sunlight or bright light most of the day. Although foliage plants will thrive in less light, their location should be bright enough to permit reading of a newspaper most of the day.

It has been shown that some plants such as African violets can be grown



Fig. 3. Fiddleleaf philodendron growing on an upright support of fernwood. Plants in ordinary red clay pots may be placed in more attractive containers for a neater effect in the home.

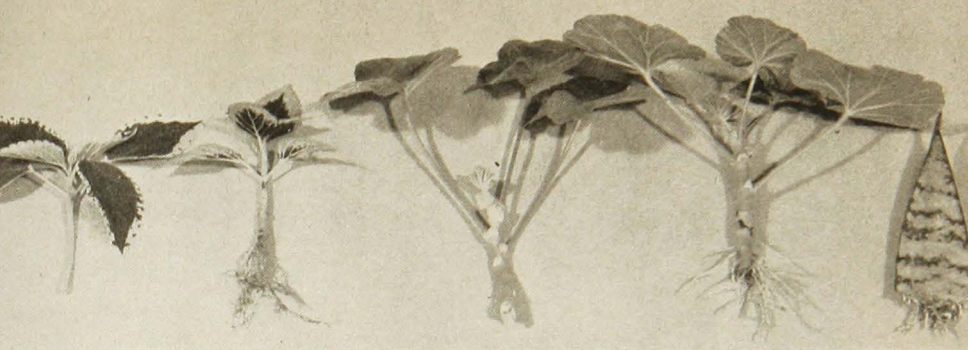


Fig. 4. Coleus, geranium, and snake plant cuttings. The coleus and geranium are seen unrooted and rooted ready for potting.

under artificial light (see page 28). The use of artificial light to supplement natural daylight may keep plants thriving for longer periods when they are grown in dark locations.

Rest periods. Most house plants pass through seasonal growth cycles as do outdoor plants, although the cycle is not equally apparent with all plants. In general, water and fertilizers should be reduced or withheld entirely during periods of low activity. More detailed information is provided on specific plants later in this bulletin.

Training. Pinching of the growing tip of many plants at the proper time will produce stockier, more shapely plants. Geraniums, begonias, coleus, and ivies will illustrate this point. Plants such as ferns, tulips, lilies, and African violets do not require pinching, however.

Older plants may often require pruning or shearing to keep them within bounds and to maintain a favorable shape. Train trailing plants to follow a support when growing; don't wait until they are too large to tie up. Not all trailing vines require support since the cascade effect is often desirable.

Summer care. Many house plants thrive better and are easier to care for outdoors during the summer if they are adaptable to outdoor conditions. They can be grown on porches or terraces or in the garden border. However, African violets, gloxinias, and a few other tender plants should be left indoors all summer.

In areas of the state where summer nights are quite cool, keep plants indoors if they require temperatures of 60° or more. A great many plants can be carried through the summer with a minimum of care by sinking the pots to the rims in the garden border, remembering to respect the light requirements of the various types of plants. Flowering plants usually prefer a semi-shady location at this time.

Set the plunged pots on a base of gravel, clinkers, or sand to insure good drainage. Lift or twist the pots once a month to discourage rooting through the drainage hole. A location protected from strong winds is also to be desired.

Before the nights become cool in late summer or autumn lift the pots and re-pot the plants if necessary before returning them indoors. Do not return diseased or insect-infested plants to the home.

Fast growing plants which are fairly easy to propagate, such as fuchsias, geraniums, and coleus, may be planted directly in the border. New plants raised from summer cuttings will produce house plants for the following season.

Vacation care. Many persons enjoy a vacation away from home for one or more weeks each year and the care of house plants may present a problem on such occasions. The simplest procedure, where many house plants are involved, would be to have a friend check the plants for watering needs at regular intervals. If only a few plants are in-



Fig. 5. Ti plant with the pot and soil wrapped in plastic to conserve moisture while the family is away.

involved it may prove easier to move the plants to a friend's home or to place the plants outdoors in a protected location during the summer vacation.

If none of the above suggestions is practical, the pots may be wrapped in polyethylene plastic, fastening the plastic around the base of the plant to reduce water loss from the soil. In such instances the soil is thoroughly watered before wrapping. An alternate method would be to place the house plants in a group, water thoroughly and surround the pots with moist sphagnum or acid peat moss. This procedure increases the humidity of the surrounding atmosphere and keeps the soil moist for a longer period.

Propagation. Most house plants are propagated by cuttings. Terminal or stem cuttings are the most commonly used types. Leaf cuttings employing only a portion of a leaf may be used for plants such as the rex begonia, bryophyllum, sedum, and sansevieria. Leaf petiole cuttings are used with the African violet, peperomia, Christmas begonia, and gloxinia. Leaf bud cuttings which include a portion of the stem to which the petiole is attached are used with philodendron, English ivy, Japanese grape ivy, and others.

Cuttings may be rooted in clear sand, vermiculite, a mixture of peat moss and sand, or in some instances, water. Rooting of some cuttings may be rather difficult in the home because of the low humidity unless some type of propagating case, terrarium, or cover is used. Large glass jars may be used to cover the cuttings if excessive condensation is not allowed to form.

Ordinary window glass about 9 inches in height may be used to enclose the area above a flat. Seal the cracks with transparent adhesive tape to avoid drafts and to keep the glass in place. Cover the top of the case with two pieces of glass which may be moved to increase or decrease ventilation. Bottom heat, which usually speeds up the rooting of cuttings, may be supplied by a five-watt bulb placed in a flat lined with aluminum foil such as that used for frozen foods. Place this flat under the flat used for propagation.

The temperature of the rooting medium should not exceed 75°. Check the temperature with a thermometer. Don't place such structures in strong sunlight.

A limited number of plants such as ferns, maranta, and African violets may be divided to increase the number of plants. A number of others including annuals, asparagus fern, lantana, and cacti are propagated by seed.

Control of Insects on House Plants

A. A. Granovsky

House plants may become infested with any of several kinds of insects that thrive in the favorable temperature and growing conditions found in the average home. These insects may be brought into the house on newly acquired potted plants or on cut flowers. They can easily enter through opened doors and windows or may occasionally be brought in from the

outdoors on clothing. In time, they multiply and spread to other plants in the house, select the ones on which they prefer to feed, and multiply. Often they escape early detection, but once established they can do much damage and are sometimes quite difficult to control.

The presence of insects can easily be detected by periodic examination of the plants. Each insect produces a characteristic type of injury. The most common damage to house plants is caused by sucking insects that draw out the vital sap of plants. This may greatly interfere with normal growth, development, and blossoming.

Some pests attack the surface of leaves, producing a white stippled damage. This is very injurious to plants. Insect infestation is usually (though not always) responsible for one or more of the following: lack of vigor, loss of normal color, stunting, failure to develop new shoots, and various types of discoloration such as yellowing or browning of foliage. Some plants may actually be killed by insects.

PRINCIPAL PESTS OF HOUSE PLANTS

Aphids or plant lice, the most common pest of house plants, may be green, pink, red, brown, or black in color. They usually feed in colonies, infesting growing tips and attacking the under-

side of leaves. Plants become unthrifty and stunted and leaves turn yellow and often curl. A sticky honeylike substance (honeydew) on the leaves and cast off skins are signs of aphid infestation.

Aphids can be controlled with nicotine sulfate, 1 or 2 teaspoons to one gallon of water, plus 2 tablespoonfuls of soap flakes. Rotenone or pyrethrum may also be used. Malathion is one of the newer insecticides which is very effective against aphids. It can be used as a spray at the rate of 1 to 2 teaspoonfuls of 50 per cent emulsifiable concentrate to one gallon of water, or 2 tablespoonfuls of 25 per cent wettable powder per gallon. It also can be used as 4 per cent dust.

Mealy bugs infest the joints of stems and the main veins of leaves. They live under white cottonlike protecting masses; heavy honeydew on the leaves may reveal their presence. Plants are badly stunted and often killed. Malathion, as for aphids, gives good control, and DDT is also effective in early stages of infestation. The wettable powder form of DDT is usually safest for use on plants. The white masses may be effectively removed with a cotton-tipped swab which has been dipped in rubbing alcohol. Frequent washing of plants and good care prevents the establishment of mealy bugs.

White flies may be troublesome and by flying to other plants may infest all of them. They feed on the lower sides of the leaves, giving off much honeydew. The young are scalelike and don't move. Plants attacked by these flies do not do well and may die. One or two tablespoonfuls of 50 per cent DDT wettable powder in a gallon of water gives complete control if applied two or three times at weekly intervals.

Scale insects of various color and forms are common on woody plants and ferns. They feed on the lower side of

Fig. 6. A simple propagating case which makes it easy to root cuttings in the home.



leaves and discolor the foliage around their feeding places. Some species leave a honeylike residue on the leaves.

Individual scales may be treated with cotton swabs dipped in nicotine sulfate or alcohol. DDT and malathion will control very young scales in the crawling stages. Good care of plants and frequent washing of foliage will prevent heavy scale insect infestation.

Thrips are tiny narrow insects of yellowish, gray, brown, or black color. They are very active when disturbed and hide in the foliage. They scrape the leaf surface with their sharp mouthparts, producing small, white, irregular patches, and they deposit small black specks over the infested foliage. DDT or malathion in spray or dust forms will give good control of thrips.

Spider mites or red spiders are one of the worst pests to house plants. They breed best in dry, warm places and may infest all plants. The injury is much like that of thrips—small white dots over the surface of leaves. This white speckling produces a bleached and unhealthy appearance in the foliage and the plants are often killed. When the insects are numerous, there will be a fine webbing over the plants.

Fine dusting sulfur may be dusted over the dry plants. Aramite at the rate of one teaspoonful of 15 per cent wettable powder to one gallon of water gives good control, but treatment must be repeated to destroy newly hatched spider mites. Dimite and malathion are also effective.

Cyclamen mites are very hard to control for they feed in the heart of the plants and may curl the young leaves, cause plants to become excessively hairy, and deform young shoots. Infested plants seldom overcome the injury and are best discarded. Cyclamen mites may be found on African violets, begonias, cyclamen, English ivy, geraniums, and a few other plants.

Malathion and aramite give the best control under home conditions.

Fungus gnats invade potted soil and may injure the roots of plants. They are small white worms in the larval stages which often come to the surface when pots are watered. Adults are very small, black, mosquitolike flies. They are easily controlled by a light dusting of the soil surface with a 5 per cent chlordane dust. Regular watering will carry the insecticide into the soil.

Spring tails or collembola are often seen running over the potted soil. If especially numerous they may injure the roots of plants. **Symphilids** or greenhouse centipedes are close relatives of insects and are known to do much damage to plants by feeding on root hairs, thus seriously weakening and stunting the plants. Both of these pests can be controlled with 5 per cent chlordane dust applied to the surface of the soil.

Earthworms occasionally may be found in potted plants. Such plants should be repotted and earthworms eliminated because they clog the drainage hole and lump the soil by tunneling among the roots of plants.

INSECTICIDES

Concentrations of different insecticides vary, and directions on the package should be followed carefully. When wettable powders are used in sprays, it is necessary to agitate the spray, not allowing it to settle at the bottom of spraying equipment. A variety of aerosols are now available for use on house plants.

Aerosols present one of the most convenient methods of controlling insects on house plants, because there is no need for mixing and diluting chemicals. The aerosol is always available for instant use at the first sign of an insect. As there are many different types of aerosols developed for many purposes, it is important to read the manufac-

turer's recommendation to determine whether you are purchasing a type that is safe for spraying house plants. If a wrong type of aerosol should be used by mistake, plants may be badly injured or killed.

Great caution should be used in handling all of the insecticides.

Control of Diseases of House Plants

Louise T. Dosdall

Blights and leaf spots develop on many plants, but in most cases the injuries are caused by faulty culture conditions. Such troubles can be corrected only by such things as proper regulation of the water supply, soil aeration, and fertilizers.

Fungus and bacterial diseases are rather infrequent in plants grown in the home. When they do occur, they can be controlled in most cases by cutting out the diseased parts and avoiding wetting the foliage.

Sometimes powdery mildew, which produces a powdery white growth on leaves, is brought in on plants from the greenhouse or from outdoors. It develops commonly on roses, chrysanthemums, hydrangeas, tuberous begonias, and African violets. The growth of the fungus can be checked by spraying or dusting the plant with sulfur or with a suitable fungicide containing sulfur or copper.

More serious often are the root rot diseases caused by various fungi in the soil. Any soil that has grown flowers or vegetables is likely to contain some of these fungi. Root rots are aggravated by wet heavy soils, so much trouble can be avoided by providing good soil drainage and by not overwatering or crowding the plants.

The most effective control, however, is by soil disinfection by means of chemicals or heat. Small quantities of soil for home use can be sterilized by placing about four inches of soil in a pan and setting this in an oven set at a low temperature. This soil should contain enough moisture to avoid excessive drying during the baking, and it is best to stir the soil several times. The temperature of the soil itself should be brought up to 180° and maintained at this temperature for 20 minutes.

If old clay pots are to be used, wash them free of soil particles, then heat the pots in boiling water for 30 minutes. These directions also apply to the broken pieces of pottery used for drainage. Porcelain pots should be washed clean and scalded with boiling water.

Sometimes house plants are infected with virus diseases which cause a stunting of growth, spotting, mottling or curling of the leaves, or yellowish spindly shoots. Such diseases occur commonly in geraniums, callas, tulips, cinerarias, and calceolarias. Once a plant is infected with a virus disease, any cuttings or plant divisions will be infected. The best policy is to discard the plant and start with a new one.

Flowering Plants

Achimenes is a summer flowering plant arising from a thickened underground stem called a rhizome. The rhizomes are planted from March to May and placed in a sunny window.

Partial protection from the sun may be necessary during the summer. After flowering the plant is allowed to dry and the rhizome is stored in the pot or in dry sand at 45-50°.



Fig. 7. An African violet with multiple crowns or growing points.

African Violet (*Saintpaulia*), probably the most popular flowering house plant today, is especially well adapted to the average well heated home. A night temperature of 68-70° and a day temperature up to 75° is preferred. The night temperature should never drop below 60° since chilling may prevent flowering, cause the leaves to curl downward around the edges and turn a pale-green color, and weaken or even kill the plant.

Good light is necessary to grow quality plants but avoid direct sunlight in midday except for the period from mid-November to mid-February. Excessive light will produce sunken sunscald spots on the leaves and flowers.

Fig. 8. Five separate plants obtained by dividing the African violet shown above.



Poor light may result in wonderful foliage but no blooms.

Keep the soil moist, using water of room temperature. Do not let cold water touch the leaves and keep the plant out of the sun when the foliage is wet or the upper leaf surface will become spotted. Single crown plants bloom more freely and produce better appearing plants. Propagation is by leaf cuttings and divisions.

Amaryllis (*Hippeastrum*) is planted from October to March with the bulb two-thirds above the soil level. Use pots with a diameter of not more than three inches greater than that of the bulbs. Best growth is obtained in full sun at a minimum temperature of 60° and with a good supply of water.

After flowering has ceased, keep the plant actively growing. Place it out in the garden when danger of frost has passed. The pot may be plunged in the ground or the bulb may be planted directly in the ground in a partially shaded location. It should be brought indoors before frost in the fall.

Although the amaryllis can be kept in continual growth, most people prefer to dry off the plants in early fall since the foliage is not especially attractive. If the bulbs were planted directly in the garden, dry them off after lifting and store in a cool location until about January 1 when they are potted. If the bulbs are grown in pots continually, repot in fresh soil about January 1. Be careful not to injure the fleshy roots. Dormancy may be broken by watering.

Azalea (*Rhododendron*) lasts longest if purchased with many buds and only a few open flowers. Bright light or direct sunlight and a constant moisture supply are preferred.

After the plant has flowered, keep it in a bright window until the danger of frost has passed. At this time plunge the pot in the soil out-of-doors and in a partially shaded location. Be sure to keep the soil moist. Prune the plant before July 1 to keep it well shaped.

Fig. 9. *Amaryllis*, an especially colorful flowering plant for the home.

Before frost bring it indoors and keep it in a cool, well lighted location until January 1. At this date place the plant in a warm bright window for forcing into bloom. The cool period permits development of the flower buds and results in a uniform floral display. Since an acid soil is required, acid peat moss is very satisfactory.

Balsam (Impatiens) may be grown from seeds or cuttings. The plants grow best at a temperature of 65° and with good light. Pinch to obtain well shaped plants. Set out in the garden after danger of frost.

Begonias

Perpetual or Everblooming Begonia (*Begonia semperflorens*) prefers full sun during the winter but partial shade during the summer. It needs a uniform supply of water and thrives best with a minimum night temperature of 60°. The plant will fail to flower when a night temperature of 70° or more is maintained during the short day period. It is a good bedding plant and may be carried over the winter by means of cuttings taken from the base of the plant in late summer.

Calla Begonia (*B. semperflorens*) is a unique type which is a bit more difficult to grow than the everblooming variety. It should not be grown in direct sunlight.

Melior or Christmas Begonia (*B. socotrana*) lasts for several months if it had many buds when purchased and it is properly cared for. It should be kept in full sun at a cool (50°) night temperature. Keeping the plant too dry greatly shortens the life of the blooms. Although it is not the easiest begonia to grow, it is possible to reproduce it by cuttings in late March. The cuttings are grown to flowering specimens for the following Christmas. Avoid direct sun in the summer.



Holland or Bardse Begonia has larger flowers than the melior type and some blooms are double. Culture is similar to that of the melior.

Miscellaneous begonias, most of which are of the fibrous rooted type, require sun or bright light and a uniform moisture supply.

Tuberous begonias. Plants must be started indoors for outdoor bloom. The tubers are planted in shallow containers of peat, sand, or vermiculite in March and April. Place the hollow side of the tuber up with the top exposed. Keep moist, but not wet at 70° F. Once the plants are well started, they are planted in six- or eight-inch pots using an organic soil mix and placing the tuber just below the soil surface. Grow at 60°-65° F. and shade from strong sun.

Place outdoors in a protected location when warm weather arrives. In late summer or early fall the plants are dried by a gradual reduction of the water supply. When all growth dies down, remove the tuber from the soil, dry in sunlight for a day or two, re-



Fig. 10. An azalea with good proportion of flowers and buds.

move all parts of the old stem and store in peat moss or sand at 38°-45° F. over the winter.

Browallia (*B. speciosa*) makes an attractive blue-flowered house plant which can be grown in sunny or partially shaded windows. Sow seed from June to August for bloom in late winter or early spring.

Calceolaria should be purchased with both buds and open flowers. This plant requires a bright location, abundant moisture, and a night temperature of 50° (if possible) for maximum life. It is an annual and should be discarded when flowering has ceased.

Calla Lily (*Zantedeschia*) is often grown as a pot plant; the white being



planted in August and the yellow in November. These plants will grow continuously if permitted to do so. One rhizome is planted per pot. Callas prefer a sunny or bright location and an abundant moisture supply. The white prefers a 55° night temperature and the yellow a 60° to 65° night temperature. In June the plants are dried off and kept as cool as possible.

Camellia prefers a moist soil, a bright location, and a high humidity—especially during the flowering period. During the fall and winter prior to flowering a night temperature of 40° to 50° is recommended. Following flowering 50° is the best temperature. Excessively high temperatures induce bud drop, faded flower color, and smaller blooms. An acid soil is required.

Christmas Cactus (*Zygocactus truncatus*) grows best when it is kept constantly moist, unlike other cacti. It prefers sunshine and forms flower buds at a 55° night temperature regardless of day length or at a night temperature of 63-65° during short days. Flower buds may drop if the temperature is too high or the light intensity too low. No flower buds will develop when the night temperature is maintained at 70-75°.

Chrysanthemum plants purchased from the florist require abundant moisture and a bright location. Partially opened flowers of the colored varieties will not develop their full color when kept out of sunshine. The flowers of the chrysanthemum are among the longest lasting of flowering pot plants, especially when kept as cool as possible at night.

Plants purchased in full bloom in the spring may be cut back to a point four inches above the soil after flowering

Fig. 11. Steel begonia, one of the toughest begonias for house plant purposes.

Fig. 12. The attractive rex begonia.

and then planted in the garden. If they are not a late blooming type, the plants will bloom again out of doors in the fall.

Plants growing in the garden may be potted in late August or early September for flowering in the home, but they should be kept out of doors as long as possible because they require full sun. The chrysanthemum is not a satisfactory house plant when not in bloom.

Cineraria culture is the same as for *Calceolaria*.

Crocus—See section on forcing spring flowering bulbs, page 17.

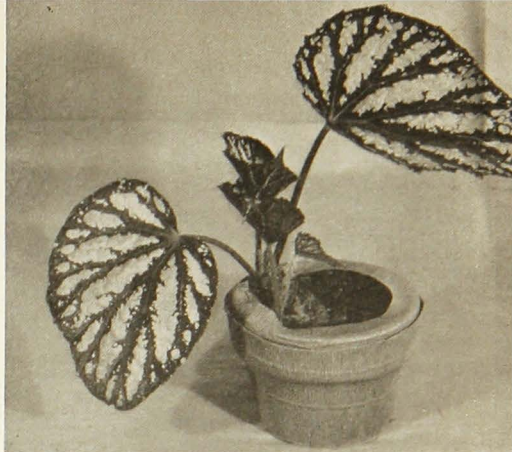
Crossandra prefers a bright location, moist soil, and a minimum temperature of 70°. The foliage turns yellow when kept too cool.

Crown of Thorns (*Euphorbia mili* also called *E. splendens*) is a spiny plant which resembles a cactus, but is closely related to the poinsettia. It is tolerant of a wide range of conditions, but prefers full sun and a moderately dry soil in November and December.

Cyclamen plants require sunshine and a cool (50°) night temperature. Plants with many buds as well as open flowers will last longest. Water them when the soil appears dry at the surface, but avoid getting water in the crown of the plant. Wilting of the plant at high temperatures when the soil is dry will usually result in yellowing of the leaves. Bud blasting and yellowing of the leaves will also occur if the night temperature is too high or the light intensity too low.

After flowering the plant may be kept dry until June. At this time replant the corm (fleshy bulblike structure) in fresh soil, being careful to keep the corm half above and half below the soil line. If grown properly, it will bloom again the following winter.

Easter Lily requires bright light and abundant moisture. It will thrive at a



variety of temperatures but a 60° night temperature is preferable. Single bulbs may be planted in a five- or six-inch pot before Christmas, although they do not force as easily in the home as do most bulbs. They may be started at once without benefit of cold storage.

After the plant has bloomed, keep it watered until the foliage yellows. When weather permits, plant it in the garden in a well drained location, covering the bulb with six inches of soil. The bulbs are usually hardy but it may be necessary to cover the area with a straw mulch in northern Minnesota.

Fuchsia will make an interesting house plant if grown in full sun in a cool room, and it will flower in the shade during the summer. Good drainage is essential.

Gardenia requires full sun and a night temperature near 60°. Buds will form but fail to develop at a night temperature of 70° or more. High temperature and low light intensity induce bud drop. An acid soil is required and a high humidity is beneficial.

Geraniums (*Pelargonium*) are available in a wide variety of types. They require full sun, cool temperature, and moderate watering for successful pot plant culture. Propagation is by cuttings.

Gloxinia (*Sinningia speciosa*) thrives best in bright light but should be protected from the direct rays of the mid-



Fig. 13. Cyclamen, a good flowering house plant throughout the winter.

day sun after May 1. It prefers a warm (65-70° at night) atmosphere, a moist soil, and good air circulation. Bud blasting or rot is usually associated with poor air circulation, too dry an atmosphere, or insect injury. Legginess is due very often to overwatering when the tuber is first started. Insufficient light also induces leggy, spindly growth.

Unless the plant is a new variety which prefers to be kept in constant growth, keep the soil dry until the foliage dries after the plant has finished flowering. Then store the tubers in their pots or in sand or peat at a minimum of 50°. In February or March replant the tubers in fresh soil and start them at a 70° temperature. Tubers usually bloom in four months.

Hyacinth—See section on forcing spring flowering bulbs, page 17.

Hydrangea plants require much water, especially when in bloom. They prefer full sunlight and the blooms last longer when kept cool at night. After the plant has flowered, cut back to three inches from the ground and plant in the garden. Pot the plant before September 1 and leave outdoors until the first light frost. Store in a cool, dark place until January 1, and then bring it up to a warm sunny window. Keep soil moist in storage.

Hydrangeas require frequent fertilization during forcing. Many varieties will produce blue flowers when grown in an extremely acid soil and pink flowers when grown in a slightly acid soil.

Italian Bellflower (*Campanula isophylla*) is often erroneously called Star of Bethlehem. Its habit of growth makes it well suited to hanging baskets. This plant requires a bright location, plenty of moisture, and a cool (50°-60°) night temperature. Flowering shoots should be removed at pot level when the flowers fade.

Kalanchoe (*Kalanchoe blossfeldiana*) should be kept in bright light or full sunshine. The scarlet flowers are appropriate for Christmas or St. Valentine's Day. This plant may be kept in active growth for flowering the next year, but fresh plants are usually better.

Lily of the Valley—See section on forcing spring flowering bulbs, page 17.

Narcissus—See section on forcing spring flowering bulbs, page 17.

Orchids are not usually good house plants unless special provisions are made to satisfy their cultural needs. Orchids can be grown in glass cases located in bright windows since the humidity can be kept at a higher level in this way. Detailed references should be consulted before attempting to grow orchids in the home.

Oxalis should be kept in a sunny window at a temperature between 50° and 60°. Water it normally, but avoid maintaining an extremely wet soil. A slightly alkaline or neutral soil is best.

Poinsettia (*Euphorbia pulcherrima*) is usually purchased in full bloom. It requires bright light and should not be allowed to wilt or it will lose some of its leaves. Do not subject poinsettias to drafts, sudden temperature changes, or temperatures below 60°. Temperatures

above 75° also shorten the life of the blooms.

Plants may be carried over for a second year by drying them after flowering and storing them in a cool, well ventilated place. In May cut back the plants to a point five inches above the ground line, repot them in fresh soil, and return them to a bright window to renew active growth. When night temperature does not drop below 60° out of doors, the pots may be plunged in the garden in a location partially protected from the midday sun. Plants may be pinched until September 1 to keep them short, but pinching the same shoot more than once will result in small flowers.

At the approach of cool nights take the plants indoors and keep them in a sunny, airy location with a night temperature of 60° to 65°. Higher night temperatures or exposure to artificial

light after sunset following October 10 will delay or prevent flowering.

Primrose (Primula) culture is the same as for *Calceolaria*.

Rose requires full sun, abundant moisture, and a night temperature around 60°. Plants with the buds partially open when purchased last the longest. Most varieties sold by florists as holiday pot plants will make good garden plants. After the plant has bloomed cut off old flower clusters and keep the pot plant in active growth in a sunny location until weather conditions permit placing in the garden. Such roses should be protected during the winter, however, or they may fail to survive.

Scilla—See section on forcing spring flowering bulbs, page 17.

Tulip—See section on forcing spring flowering bulbs, page 17.

Forcing Spring Flowering Bulbs

Well known types of bulbs such as tulips, narcissi (daffodils), hyacinths, and crocus, as well as less familiar types such as grape hyacinths, scillas, and even lilies of the valley, may be planted in pots for flowering in late winter and spring. To insure success, only bulbs of good quality and size should be used.

The bulbs are potted in shallow pots called bulb pans containing a soil with a good water holding capacity and good drainage. One part of sand may be substituted for one part of organic matter in the soil mixture suggested for flowering plants on page 3. Use a soil

low in nutrients and manure that is well rotted, as the bulbs require only a limited nutrient supply to flower. Too high a nutrient level may rot the bulbs.

Hyacinths and narcissi are planted as close as the bulbs will allow. Tulips are planted at the rate of five or six bulbs per five-inch pan, or six to nine bulbs per six-inch pan. Place the flat side of the tulip bulb against the side of the pan so that the first leaf spreads over the outside of the pan. As a gen-

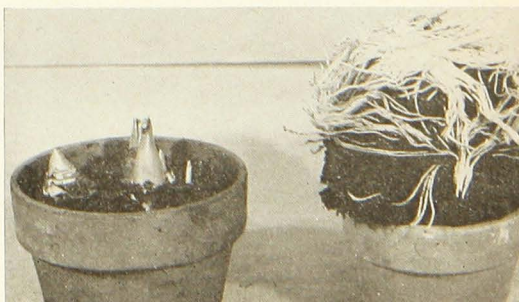


Fig. 14. Hyacinths with top and root development indicating they are ready for forcing.



Fig. 15. Narcissi (daffodils) add color during the spring months.

eral rule, bulbs other than the three just mentioned are planted so as to leave as much space unoccupied by bulbs as the bulbs already occupy in the pan. Water the soil thoroughly after planting the bulbs.

Place the pans in a cool basement at a 40° to 50° temperature for a minimum of 10 to 12 weeks. Hyacinths prefer a 50-55° temperature until the new shoots are 1½ inches above the bulb. The soil must be moist while in storage.

If a cool basement is not available, the pans may be placed outdoors in a

trench 10 to 12 inches deep, and on a two-inch layer of sand or gravel to insure good drainage. Fill in around and over the pans with sand, leaving a two-inch layer covering the top of the pan. Cover the sand with a 10-inch layer of soil and place a 10-inch mulch of sawdust, leaves, or hay over the soil.

Beginning in January, or when the roots are well developed, bring the pans into a warm room for forcing. Best growth is obtained in full sun and in a moist soil. When in full bloom, remove the plants from the sun to a bright location. Early during the forcing season it may be wise to keep hyacinths in the dark for a few days, or to place a heavy paper around the plant (on the outside of the pot rim) to draw the flower stalk up above the leaves.

After the plant has flowered, leave the foliage on the bulb, apply a complete fertilizer, and keep the bulb in active growth until it yellows. At this point dry the soil. These bulbs may be planted in the garden in the fall, but get fresh bulbs each year for indoor forcing.

Paper white narcissus, lily of the valley, Roman hyacinth, hyacinth, and a few other bulbs may be grown in pebbles rather than soil, if the water level is kept just below the bottom of the bulbs. A little charcoal may help to keep the water fresh. Paper white narcissi and lilies of the valley are usually placed directly in the sun, while the hyacinths may benefit from storage in a cool dark location until the roots are two to three inches long, especially in the early part of the forcing season. Special vases or bottles are available for holding hyacinth bulbs.



Fig. 16. The rugged variegated Chinese evergreen in fruit.

When window space is at a premium, bright basement window sills are often useful for growing the bulbs to the flowering stage, as well as for maturing the foliage after flowering.

Planning in advance will enable the householder to have a continuous display of flowers during the bulb forcing season in late winter and early spring.

Fruiting Plants

Ardisia crenulata, an attractive, slow growing plant, should be grown at a minimum of 60°. The plants may be grown out of doors in partial shade during the summer if adequate moisture is provided. A slightly sandy soil of relatively low fertilizer content is most satisfactory. Older plants develop red berries which last for over a year.

Citrus plants such as oranges and lemons are sometimes grown as house plants. They prefer a sunny location, moist soil, and a night temperature of 55° to 65°.

Jerusalem Cherry (*Solanum pseudo-capsicum*) is obtained from the florist when full of fruit. It lasts much longer if kept at a night temperature of 50°. Place in bright light and keep soil

moist. Too dry soil or escaping gas in the home may cause dropping of the leaves and fruit.

Ornamental Pepper (*Capsicum frutescens*) should be exposed to full sun at a minimum temperature of 55°. Lack of water will cause rotting of the fruit and loss of foliage.

Variegated Chinese Evergreen (*Aglaonema commutatum*) will bear long lasting clusters of berries which are green at first and gradually turn yellow, orange, and finally red in color. It grows best with a minimum temperature of 65° and a good water supply. It is extremely tough and will do well even in relatively dark locations. This plant is attractive for its foliage as well as its fruit.

Foliage Plants

Acalypha (**Copper Leaf**) requires a high soil moisture content, full sun, and a minimum temperature of 60°. Propagate from cuttings in late summer.

Acorus gramineus (**Sweet Flag**) and the white striped variety **variegatus** will grow in sun or shade but they require plenty of water.

Adiantum (**Maidenhair Fern**) — See Ferns.

Aglaonema (**Chinese Evergreen**) is one of the toughest house plants avail-

able. It prefers good light, a minimum temperature of 65°, and a good supply of water. The plant can grow in poor light even at high temperatures, however, and will also grow in water or in a dry soil.

Several species are available. **A. roebelini**, often called *Schismatoglottis* by the florist, is very attractive with its broad gray-green leaves variegated with dull silver.

Several species are available. **A. simplex**, the most common form, has solid

green leaves. *A. roebelini*, often called Schismatoglossis by the florist, is very attractive with its broad gray-green leaves variegated with dull silver.

Aluminum plant—See *Pilea cadieri*.

Anthericum—See *Chlorophytum*.

Aralia—See *Fatsia*.

Araucaria excelsa (Norfolk Island Pine) is an interesting evergreen with needlelike leaves borne on branches rising in whorls at regular intervals along the stem. An extremely tolerant plant, it will survive in cool or warm, light or dark locations. Best growth is obtained in the sun with a temperature of 65° and a moist soil.

Artillery Plant—See *Pilea*.

Arrowhead—See *Nephtytis*.

Asparagus of two types is grown. *A. plumosus* (Fern Asparagus) has very fine needlelike dark green leaves with twisting stems. *A. sprengeri* (Sprenger

Asparagus) has coarse yellow-green needlelike leaves and drooping stems; it produces red berries in good light. Best growth is obtained in full sun in the winter and bright light in the summer. Keep the soil moist and the temperature between 60° and 70°. Propagation is by seeds.

Aspidistra elatior (Cast-iron Plant) is a very rugged plant that has been grown for a good many years. There is also a white striped variety, *variegata*. Although the plant will survive almost any condition in the home, best growth is obtained when the plant is given medium to bright but not direct sunlight, a generous water supply, and a temperature of 60° to 70°.

Asplenium—See *Ferns*.

Aucuba japonica (Gold Dust Plant), with its gold-spotted, dark green leaves, will withstand temperatures down to freezing. The variety *goldeana* is especially attractive with the center of the leaf a golden-yellow and the border green. Provide plenty of water, sun or bright light, and a temperature below 75°.

Australian Laurel—See *Pittosporum tobira*.

Australian Umbrella Tree—See *Schefflera*.

Bloodleaf—See *Iresine*.

Boxwood—See *Buxus*.

Bowstring Hemp—See *Sansevieria*.

Brassaia—See *Schefflera*.

Buxus sempervirens (Boxwood) is quite tolerant of varied conditions but prefers a sunny location.

Caladium requires a 65° minimum temperature, bright light, and a uniformly moist soil. After the foliage



Fig. 17. Roehrs dumb cane—one of the best of the *Dieffenbachia* varieties.



Fig. 18. Various forms of *Dracaena*: sanders dracaena on the left, spotted dracaena in the center, and *Dracaena boringuensis* on the right.

dries in the fall store the tuberous root in dry peat moss or sand at a 60° temperature. Tubers are usually started in March or April although low humidity in the home may make forcing difficult.

Cast-iron Plant—See *Aspidistra*.

Chinese Evergreen—See *Aglaonema*.

Chlorophytum (Anthericum or Spider Plant) prefers a moist soil and sun or partial shade.

Cissus grows best in bright light at a minimum temperature of 60°. Provide a well drained soil and plenty of water. Numerous types are available including the popular *C. rhombifolia* (**Grape Ivy**), the fast growing *C. antarctica* (**Kangaroo Ivy**), and *C. discolor* (**Begonia Ivy**), the showiest of the group which is most attractive when young. The last may not be as easy as the others to grow in the home.

Codiaeum (Croton) requires full sun except during the summer to develop full leaf color. Provide a uniform supply of water and a minimum temperature of 65°. Crotons are available in a wide variety of leaf shapes and colors.

Coleus requires full sun to develop its best foliage color. Pinch to induce

branching, and keep the soil moist. It can be planted in the garden during the summer.

Copper Leaf—See *Acalypha*.

Cordyline terminalis (Ti Plant) prefers a moist soil, a minimum temperature of 60°, and sun or bright light. However, it is relatively tolerant of reduced light intensity. Some variegated forms are exceedingly colorful. Propagation is by cuttings, and a four-inch section of the main stem is sufficient to produce a new plant.

Croton—See *Codiaeum*.

Cryptanthus (Zebra Plant) may be grown in sun or shade at a minimum of 60°. Keep the soil dry but be sure there is enough moisture to keep the plant growing. It will withstand a great deal of neglect.

Cyperus alternifolia (Umbrella Sedge) grows in either sun or shade if there is a constant water supply.

Cyrtomium—See *Ferns*.

Dieffenbachia (Tuffroot or Dumb Cane) must be kept on the dry side at a minimum temperature of 60°. Although the plant is tolerant of poor light conditions, growth is best in

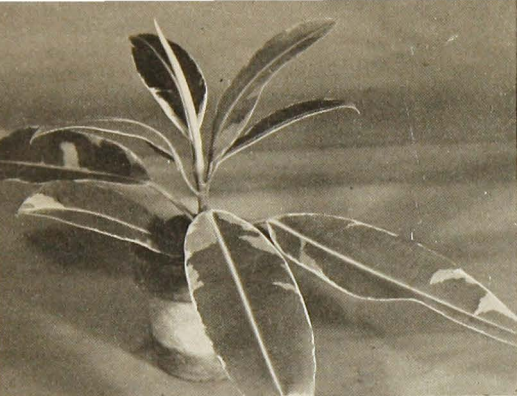


Fig. 19. The variegated rubber plant.

bright light. The best varieties include **D. picta (Spotted Dumb Cane)** with yellowish-white blotches on dark green leaves; **D. Rudolph Roehrs (Roehrs Dumb Cane)**, which has a yellow-green leaf blade blotched with ivory and edged in green; and **D. amoena**, with some white coloring along the veins. The last named will withstand a somewhat lower temperature than the others.

Dracaenas grow best in bright light at a minimum temperature of 65° and in a moist, well drained soil. Good types for the home include **D. fragrans massangeana (Massange Dracaena)**, which has broad strap-shaped green leaves with a gold band down the middle of each leaf; **D. godseffiana (Spotted Dracaena)**, a small type with dark green leaves spotted with pale yellow; **D. rothiana (Roth Dracaena)**, an especially tough plant with rich green leaves and a somewhat wavy leaf margin; **D. sanderiana (Sanders Dracaena)**, a medium sized type which has broad white bands bordering its gray-green foliage; **D. boringuensis**, the green counterpart of Sanders Dracaena; and **D. deremensis Warnecki (Warnecki Dracaena)**, with white stripes down the center of gray-green leaves.

Dumb Cane—See *Dieffenbachia*.

Dyckia culture is the same as for *Cryptanthus*.

Episcia which has been called the Flame Violet is not really a violet. This relative of the African Violet has the

same cultural requirements as the African Violet except that it desires a little more light. *Episcias* are grown primarily for their foliage effect. Numerous species and varieties are available with foliage in shades and combinations of green, bronze, silver, copper, and purple. Most types bear scarlet flowers at certain times of the year.

Euonymus (Spindletree) prefers bright light and a good water supply. Several attractive, variegated dwarf forms are available. It is subject to red spider.

Fatsyhedera lizei grows best in cool locations under the same conditions required by *Hedera* (English Ivy).

Fatsia is often called *Aralia japonica* by florists. Culture is the same as for *Hedera*.

Ferns all have the same cultural requirements, with the exception of **Platycerium bifurcatum (Staghorn Fern)**. This variety is usually wired to a piece of bark or wood to which some *Osmunda* fiber has been attached. It will survive temperatures as low as 40° with no ill effects. Submerge in water at frequent intervals to prevent drying out.

Most other ferns thrive well in a soil containing at least 50 per cent organic matter. Keep them in bright light but out of direct sunlight, at a 65° minimum temperature, and in a moist soil. Some of the more popular types include **Asplenium nidus (Birdsnest Fern)**, **Cyrtomium falcatum (Holly Fern)**, **Nephrolepis exaltata (Boston Fern)** and its many varieties, and **Pteris (Table Ferns)**—the smallest of the group. **Adiantum (Maidenhair Fern)** will not thrive in the home unless the plant is kept in a humid atmosphere.

Ficus (Rubber Plant or Fig) is best suited to a temperature above 60° and a moist soil. Growth is best in bright light, although the plants will endure

Fig. 20. Fiddleleaf fig may be used where a tall narrow plant is desired.

poor light. The main types include *F. elastica* (India Rubber Plant) and its showy variegated variety, *F. elastica variegata*; the large leaved *F. pandurata* (Fiddleleaf Fig); and *F. pumila* (Climbing Fig), a small leaved vine.

Fig—See Ficus.

Fittonia is a spreading plant which requires warmth, humidity, and bright light. This plant does best in a terrarium although it is often grown successfully without a terrarium. There are two forms, *Fittonia verschaffelti argyroneura* (Silvernerve *Fittonia*) and *Fittonia verschaffelti* (Rednerve *Fittonia*).

Ginger—See *Zingiber zerumbet*.

Gold Dust Plant—See *Aucuba*.

Gynura aurantiaca (Velvet Plant) does best in a moist soil in full sun. Pinch to keep compact.

Hedera helix (English Ivy) grows best in bright light, although it is tolerant of poor light. A cool temperature is preferred—except by the variegated varieties—to discourage insect attacks. A large selection of varieties and associated types are available, including the following: *H. helix variegata* (Variegated English Ivy); the small leaved variegated type, *Glacier Ivy*; the small green leaved type, *Pittsburgh Ivy*; a compact, small form with interesting foliage, *Green Ripple*; a self-branching, small leaved form, *Maple Queen*; *Curli-locks*, which has wavy leaf margins; *H. helix conglomerata* (Japanese Ivy), an upright form with very compact growth on a wooden stem; and *H. helix cordata* (Heart-shaped Ivy).

Helxine soleirolii (Baby's Tears or Irish Moss) prefers bright light and ample soil moisture. It occasionally dies down and then after a period of rest grows back.

Howea—See Palms.



Hoya carnosa (Wax Plant) likes a minimum of 60°, sun or bright light, and a high moisture level in the soil. *H. carnosa variegata* (Variegated Wax Plant), which requires a slightly higher temperature, has attractive white leaf margins. Both are climbers and should be provided with a suitable support. *Hoya* is also attractive for its flowers. Water less frequently during its rest period in the fall.

Iresine (Blood Leaf) should be grown in full sun with a moist soil and a temperature around 60°. It may be a poor house plant during the winter because of lack of light. Prune the plant for a better shape.

Ivies—See *Cissus*, *Hedera*, *Pothos*, or *Senecio*.

Kentia—See Palms.

Maranta leuconeura kerchoviana (Banded *Maranta* or Prayer Plant) should be grown in bright light with a

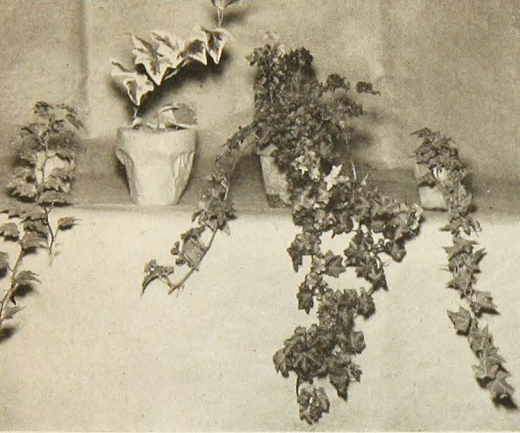


Fig. 21. Various forms of English ivy: (left to right) maple queen, variegated English ivy, curllocks, and Pittsburgh ivy.

moist soil at a 65° minimum temperature.

Vigorous new growth, usually starting in early February replaces the old foliage. The new growth is encouraged by removing old foliage when the new shoots first appear.

Monstera—See **Philodendron**.

Mother of Thousands—See **Saxifraga**.

Nephrolepis—See **Ferns**.

Nephtytis afzeli (Arrowhead) thrives in either bright or poor light, in a moist soil, and at a 60° minimum temperature. It is a climber and does well on a bark support. Occasional pruning may be necessary. The variety, **Emerald Gem**, a compact slow growing variety with dark green glossy leaves, is well suited to use in planters.

Norfolk Island Pine—See **Araucaria**.

Palms do fairly well in poor to bright light but should not be in direct sun in summer. Keep the soil moist. A 60° minimum temperature should be maintained except when light is very poor (50°). **Howea forsteriana (Forester Sentrypalm)**, commonly called **Kentia** in the commercial field; **Neanthebella**; and **Phoenix humilis loureiri**, also known as **P. roebeleni (Roebelen Date Palm)**, are the palms generally grown as house plants.

Panamiga—See **Pilea**.

Pandanus veitchi (Veitch Screwpine) tolerates unfavorable conditions, but

much of its variegation will be lost if the soil is kept dry. A minimum temperature of 65° and a moist soil are preferred. Keep in bright light but avoid direct sun in the summer.

Pellionia, a trailing plant, prefers bright light, a moist soil, and a minimum temperature of 60°. Two different variegated types **P. daveauana** and **P. pulchra** are generally grown.

Peperomias will withstand a great deal of neglect but should not be kept wet or the leaves will rot off. They thrive best in bright light, although they will tolerate poor light even at high temperatures. However, variegation will be less in poor light. Avoid direct sun in summer and temperatures below 60°.

Many popular species includes **P. obtusifolia (Ovalleaf Peperomia)** with solid green leaves; **P. obtusifolia variegata (Variegated Ovalleaf Peperomia)**, which is predominantly golden-yellow with green areas; **P. sandersi (Sanders Peperomia or Watermelon Plant)**, which has red petioles and silver stripes on the leaves; **P. rotundifolia (Coinleaf Peperomia)** with shiny, dark green leaves; **P. classifolia**, which has a reddish-brown margin on the green leaves; **P. scandens**, a climbing or trailing species; **P. percata**, a fast grower with light green leaves; and **Silver Marble** with yellow leaf margins.

Pepper—See **Piper**.

Periwinkle—See **Vinca**.

Philodendron is probably the most popular of all foliage plants today. This plant grows best in a moist soil and in bright light. Leaf and plant size is reduced by poor light as well as by the lack of nutrients. A minimum temperature of 65° is recommended. Most philodendrons are climbers and do well when provided with a support which

can be kept moist. Leaves will yellow or become spotted from lack of water, too small a pot, low temperature, poor drainage, or other cultural shortcomings.

Popular species include the well known vine *P. cordatum* (**Heartleaf Philodendron**) and some of the large climbing types such as *P. dubium* (**Cut-leaf Philodendron**); *P. guttiferum* with somewhat smaller leaves; *P. hastatum* (**Spadeleaf Philodendron**); *P. panduriforme* (**Fiddleleaf Philodendron**); *P. pertusum*, which is really *Monstera deliciosa* (**Swiss Cheese Plant**); and *P. tripartitum* (**Trileaf Philodendron**).

Recently self-heading, nonclimbing forms of philodendron were introduced to the commercial market. Some of these new types include *P. bipinnatifidum* (**Twicecut Philodendron**); *P. foesterianum*, whose leaves are not as deeply cut as the preceding species; *P. selloum*, which has almost solid leaves when young and cut leaves when larger; and *P. undulatum* with large, wavy, almost solid leaves.

Phoenix—See **Palms**.

Pick-a-back Plant—See **Tolmiea**.

Pilea prefers a moist soil, partial shade in summer, and full sun in winter. *P. microphylla* (**Artillery Plant**) requires pinching to prevent legginess, but *P. involucrata* (**Panamiga** or **South**

American Friendship Plant) is self-branching. *P. cadierei* (**Aluminum Plant**) has unusual silver markings on dark green leaves and requires pinching to produce compact plants.

Piper nigrum (**Black Pepper**) is a vine with dark blue-green foliage. Culture is the same as for philodendron.

Pittosporum tobira (**Australian Laurel**) is a tough, slow growing plant resembling the rhododendron. Place in bright light and keep soil moist.

Platycerium—See **Ferns**.

Podocarpus macrophyllus (**Yew Podocarpus**) with dark green leaves withstands adverse conditions and low temperatures very well. Water moderately.

Pothos, which is also known as **Scindapsis**, is often confused with the heart-leaf philodendron. *Pothos*, with ridged stems, should not be watered as freely as the smooth stemmed philodendron, which requires a constantly moist soil. A minimum temperature of 65° and bright light are preferred, although the plants will survive indefinitely in poor light. **Silver Marble**, a highly variegated form, should be grown at temperatures above 70°. *P. aureus* (**Devil's Ivy**) is a glossy green with limited yellow spotting.

Prayer Plant—See **Maranta**.

Fig. 22. Various forms of peperomia: variegated ovalleaf peperomia on the left, *P. percata* in the center, and silver marble on the right.





Fig. 23. The cutleaf philodendron, a climbing variety.

Rubber Plant—See *Ficus*.

Sanchezia nobilis glaucophylla prefers bright light and a moist soil. This plant grows best at temperatures over 60°, although it often survives much lower temperatures in window boxes.

Sansevieria (**Bowstring Hemp** or **Snake Plant**) is really a succulent, but it is discussed under foliage plants because of its wide popularity. It is extremely tolerant and will withstand almost any adverse condition except low temperature. It will grow best at 65-70° in partial shade and in a uniformly moist soil.

The three types most widely grown are *S. trifasciata laurenti* (**Variiegated Snake Plant** or **Congo Snake Plant**), which has yellow bands along the leaf margins; *S. zeylanica* (**Ceylon Snake Plant**), which is the same as the first type except for the absence of yellow leaf margins; and *S. hahni* (**Hahn's Dwarf Snake Plant**), which has a flat rosette type of growth. *S. cylindrica*—not so common as the other types—has cylindrical leaves.

Saxifraga sarmentosa (**Strawberry Geranium**, **Strawberry Begonia**, or **Mother of Thousands**) gets its name

from the many young plants produced on runners. Grow this plant in the sun or partial shade and in a moist soil.

Schefflera actinophylla (**Australian Umbrella Tree**) thrives very well if kept on the dry side in a warm room.

Schismatoglottis—See *Aglaonema*.

Scindapsus—See *Pothos*.

Screwpine—See *Pandanus*.

Selaginella kraussiana (**Krauss Selaginella**) has the same cultural requirements as ferns.

Senecio mikanioides (**German Ivy**) requires sun or bright light and will withstand a night temperature as low as 50°.

Serissa foetida variegata (**Variiegated Serissa**) prefers sun or bright light and a moist soil.

Snake Plant—See *Sansevieria*.

South American Friendship Plant—See *Pilea*.

Spider Plant—See *Chlorophytum*.

Spindletree—See *Euonymus*.

Strawberry Begonia or **Strawberry Geranium**—See *Saxifraga*.

Sweet Flag—See *Acorus*.

Swiss Cheese Plant—See *Philodendron*.

Syngonium podophyllum (**Trileaf Wonder**) and several similar varieties require the same culture as *Nephtytis*.

Ti Plant—See *Cordyline*.

Tolmiea menziesi (**Pick-a-back Plant**) is unique because young plants arise at the junction of the leaf blade and the petiole. Growth is best in bright light and in a uniformly moist soil.

Tradescantia (**Wandering Jew**) roots readily in water and grows in moist soil or water. It does well in shaded

Fig. 24. Silver marble pothos thrives best if kept warm and dry.

locations. Green and several variegated types are available.

Trileaf Wonder—See *Syngonium*.

Tuftroot—See *Dieffenbachia*.

Umbrella Sedge—See *Cyperus*.

Velvet Plant—See *Gynura*.

Vinca major variegata (Periwinkle) grows well in the sun and in a uniformly moist soil, preferably at a 60° temperature.

Wandering Jew—See *Tradescantia*.

Wax Plant—See *Hoya*.



Zebra Plant—See *Cryptanthus*.

Zebrina—See *Tradescantia*.

Zingiber zerumbet (Ginger) is of interest primarily for its spicy fragrant leaves. This plant is well adapted to conditions found in the average home.

Cacti and Succulents

Plants are classified as cacti according to their flower characteristics, and are usually recognized by their numerous spines and their absence of leaves. Succulents have fleshy leaves or stems but do not always possess spines. Almost all cacti are classified as succulents but not all succulents are cacti.

The slowest growing, toughest, and often most attractive types have been chosen for house plant purposes. They are used as specimen plants as well as in novelty dishes and dish gardens (see page 30).

A sandy, well drained soil should be used. Although plants in this grouping will survive quite well in poorly lighted locations, full sunlight is necessary for best growth and flowering, especially in regard to the cacti.

Keep the plants relatively dry during the winter, adding only enough water to keep the stems from shriveling. Water more frequently during periods of active growth and during the summer. Contrary to popular opinion the

application of fertilizer at least a few times a year will improve growth if the plants are kept in a sunny location. A minimum temperature of 65° is desirable.

POPULAR CACTI

Aporocactus flagelliformis (Rattail Cactus)

Astrophytum (Bishop's Cap, Sand Dollar)

Cephalocereus senilis (Old Man Cactus)

Chamaecereus silvestri (Peanut Cactus)

Echinocereus (Hedgehog Cereus)

Echinopsis (Easter Lily Cactus)

Epiphyllum (Orchid Cactus)—treated like a geranium

Mammillaria (Pincushion Cactus)

Opuntia (Prickly Pear)

Pachycereus marginatus (Organ Pipe Cactus)

POPULAR SUCCULENTS

| | |
|--|--------------------------------|
| Aloe | Gasteria (Deer's Tongue) |
| Ceropegia woodi (Rosary Vine) | Haworthia (Cushion Aloe) |
| Crassula (Jade Plant, Scarlet Paint Brush, Watch-chain Plant) | Kalanchoe (Bryophyllum) |
| Echeveria (Hen and Chickens) | Portulacaria |
| Euphorbia (Crown-of-Thorns) | Sedum (Stonecrop Live-Forever) |
| | Sempervivum (Houseleek) |

Growing Plants Under Special Conditions

Water Culture

Most house plants can be grown in water where careful attention is paid to aerating the water, adding fertilizers, regulating acidity, and changing the solution every two or three weeks. Such manipulations usually involve far more work and trouble than growing the same plants in soil.

There are a few plants, however, that can be grown for long periods in tap water with very little trouble. This group includes the coleus, Chinese evergreen, English ivy, philodendron, pothos, snake plant, sweet potato, tradescantia, and trileaf wonder. If the plants get too large for their containers, new plants can be started by placing cuttings in water.

A few pieces of charcoal will help to keep the water fresh. If green algae form on the roots, change the water and wash the roots. The use of a dark container which keeps light off the roots will tend to discourage the growth of green algae.

Artificial Light

The use of artificial light for growing plants is not new, but it is only recently that anyone has attempted to

grow plants in the home under artificial lights. Artificial light may be used to supplement natural daylight in the home or to replace the natural daylight.

The difficulty in using artificial light as the sole source of illumination is to get enough light without increasing the temperature too much. Fluorescent lights have been a real help in this direction. The fluorescent tubes should be backed by reflectors for most efficient use of the available light. Usually two 40-watt tubes are placed in each reflector. Better results are obtained if the light fixtures are adjustable so that they may be raised or lowered depending on plant height. If the plants are grown in a special area such as a basement, painting nearby walls white will also increase the efficiency of the available light. Lights may be used for as long as 20 hours per day, but should not be kept burning constantly as this may prove harmful to some species. A time switch to turn the lights on and off may be obtained at almost any electrical supply store.

Usually, only plants that grow in nature in reduced light will do well under fluorescent light. Certain conditions must be satisfied if plants are to be grown successfully under artificial

light. Water only when the plants need moisture to avoid getting soft, leggy plants and to avoid the development of diseases. Do not allow the plants to wilt, however. Since plants under artificial light do not have as much light nor are they usually watered as often as plants in natural light, they require only one-third to one-half as much fertilizer. If plants still look weak and spindling when the above conditions are met, the temperature may be too high.

Plants grown at high temperatures require a higher light intensity and poorly lighted plants become soft, weak, and spindling unless grown in the lower limits of their temperature range. Light requirements also vary with individual species and varieties.

African Violets grow especially well under fluorescent lights. Experimentation at Ohio State University has shown that African violets grow best when soft white or daylight tubes placed 12 inches above the plant tops are used for 18 hours each day. This will provide an intensity of approximately 600 foot-candles.

Gloxinias require 15 to 16 hours of light per day when daylight tubes are used. The lights are placed 3 inches above young plants and 12 inches above older plants.

Seedlings may be grown under blue or daylight tubes or combinations thereof. Place the lights 10 to 12 inches above the seedlings and burn 15 hours per day. If seedlings are spindling try increasing the light period to 18 or 20 hours.

Cuttings root best under pink tubes. Keep the lights on for 10 or more hours daily. The cuttings should be no less than 15 inches below the lights until rooted.

Foliage plants of a wide variety may be grown under artificial light. Experiments at Rutgers University showed

that a combination of fluorescent and incandescent light is superior to either type of light alone. Incandescent light in addition to daylight fluorescent light is beneficial to the plants and takes away the cold appearance imparted to plants under this type of fluorescent light. Rutgers workers placed foliage plants into the following groups based on their light requirements (16 hours daily).

PLANTS REQUIRING LOW LIGHT

(15-25 foot-candles)

Australian Umbrella Tree
 Cast Iron Plant
 Chinese Evergreen
 Fiddleleaf Philodendron
 Gold Dust Plant
 Heartleaf Philodendron
 Norfolk Island Pine
 Roth Dracaena
 Sanders Dracaena
 Snake Plant
 Spadeleaf Philodendron
 Spotted Dumb Cane
 Swiss Cheese Plant
 Trileaf Wonder

PLANTS REQUIRING MEDIUM LIGHT

(25-50 foot-candles)

Aluminum Plant
 Anthericum
 Boston Fern
 Cutleaf Philodendron
 Devils Ivy
 Holly Fern
 Kentia
 Peperomias

Roehrs Dumb Cane

Aglaonema Roebelinii

Steel Begonia

PLANTS REQUIRING HIGH LIGHT

(50-100 foot-candles)

English Ivies

Fatshedera

Fiddleleaf Fig

Grape Ivy

Pick-a-Back Plant

Pothos Silver Marble

Variegated Rubber Plant

The following information may serve as a foot-candle guide. A person requires 20 foot-candles for casual reading, 30 foot-candles for prolonged reading, 40 foot-candles for sewing, and typists should have 50 foot-candles. If this guide is not adequate it may be possible to borrow a light meter from your local power company.

Fig. 25. An attractive planter—plants are in good proportion to the container.



Dish Gardens and Planters

Dish gardens are plantings of small, relatively slow growing plants in open shallow containers. Since such containers seldom have a drainage opening, be careful not to overwater. If the container is deep enough, place a half inch layer of gravel, sand, or charcoal in the bottom under the soil to improve drainage. A thin layer of sand, colored gravel, or pebbles may be placed on top of the soil after planting to further improve the appearance of the garden.

Be careful to include in the same container only plants with similar cultural needs. Cacti and succulents are excellent subjects for dish gardens (see section on cacti and succulents, page 27). Other suitable plants include boxwood, dracaena (small type), euonymus, Irish moss, ivies, mother of thousands, pellionia, peperomias, phoenix date palm, pilea, podocarpos, serissa, sweet flag, and wax plant.

Deep containers, often used for large plants, are usually referred to in the trade as planters. Such containers may be constructed of brass, wood, plastic, or pottery. Many modern homes have built-in planters in front of picture windows, near entry ways, in hallways as room dividers, or in other similar locations. Built-in planters should be waterproof and rust proof and are usually made of stone, concrete, or metal.

Metal containers may be coated with an asphalt emulsion (tar is toxic to plants) to make the container waterproof, to prevent rusting, or to prevent a toxic effect if the container is made of copper. Such planters vary from 6 to 14 inches deep. Allow space to permit up to 2 inches of broken crock, charcoal, or stone in the bottom of the planter to provide good drainage. If the planter is deep enough, plants may be left in their original pots. Space between the pots is then filled with sphagnum or peat moss. When this

Fig. 26. An overgrown planter.

system is followed, the plants may be rearranged at will and overgrown or poor ones may be replaced without disturbing the remaining plants.

Here again it is necessary to combine only plants with similar cultural requirements to insure a long lasting planting.

Cacti are not often used in planters, although some of the succulents prove very useful. Many of the small plants suggested for use in dish gardens are suitable for planters, and the following plants are also recommended: African violet, ardisia, aucuba, banded maranta, Chinese evergreen, croton, dumb cane, fatshedera ivy, fittonia, philodendron (small types), pick-a-back plant, pothos, screwpine, sansevieria, schismatoglottis, and trileaf wonder.

Terrariums

Terrariums are miniature gardens enclosed in glass. The glass enclosure may be a round glass globe, fish aquarium, brandy glass, bottle, or any similar container. Such gardens are especially useful for plants which require high humidity. Many of the plants other than cacti and succulents listed for dish gardens also flourish in terrariums. Cuttings may be easily rooted in these containers because of the humid atmosphere.

A piece of glass is used to cover the top of the glass container. This cover should be constructed so that it may be moved to ventilate the terrarium when excessive amounts of moisture collect on the inside of the glass. The soil should be kept moist but not boggy. Keep the terrarium in bright light but never in direct sunshine.

Terrarium plantings are relatively easy to construct. Place a one-inch



layer of gravel, pebbles, broken crock, or charcoal under the soil to improve drainage. Line the sides below the soil level with sheet moss (available at your local florist), keeping the green side out to present a finished effect. Mound the soil higher on one side to provide a naturalistic setting. A soil containing one-quarter loam, one-half leaf mold or peat, and one-quarter sand is preferred. Use plants of equal rates of growth so the faster growing ones will not crowd out the slower plants.

Native plants as well as cultivated plants may be used. The native plants include the following: bloodroot, dog-tooth violet, dutchman's breeches, evergreen seedlings, small ferns, ground pine, jack-in-the-pulpit, maidenhair fern, moss, mushrooms and toadstools, partridge berry, pitcher plant, violet, wild strawberry, and wintergreen.

Cultivated plants suitable for the terrarium include African violet, banded maranta, begonia, Chinese evergreen, coleus, creeping fig, croton, dracaena (small types), fittonia, grape ivy, English ivy (small types), Irish moss, mother of thousands, palm (small types), peperomia, philodendron (small types), pothos, snake plant, selaginella, and wandering jew.

Suggestions for Special Locations

SOUTH OR WEST WINDOWS

| | | |
|----------------------|------------|--------------|
| Ageratum | Calla Lily | Oxalis |
| Amaryllis | Coleus | Poinsettia |
| Azalea | Cyclamen | Rose |
| Begonia (in winter) | Gardenia | Sweet Flag |
| Bloodleaf | Geranium | Tulip |
| Cacti and Succulents | Lily | Velvet Plant |

NORTH WINDOW

| | | |
|----------------------------|---------------------|-------------------|
| African Violet (in summer) | Dracaena | Philodendron |
| Anthericum | Fern | Pick-a-back Plant |
| Arrowhead | Dumb Cane | Pothos |
| Baby's Tears | Ivy | Rubber Plant |
| Australian Umbrella Tree | Mother of Thousands | Snake Plant |
| Cast-iron Plant | Norfolk Island Pine | Tuftroot |
| Chinese Evergreen | Peperomia | Wandering Jew |

EAST WINDOW

| | | |
|----------------|--------------|---------------|
| African Violet | Gloxinia | Screwpine |
| Banded Maranta | Ivy | Serissa |
| Caladium | Peperomia | Silk Oak |
| Dracaena | Philodendron | Tuftroot |
| Fatsyhedera | Pothos | Wandering Jew |
| Fern | Rubber Plant | Wax Plant |

Suggestions for Low and High Temperatures

LOW TEMPERATURE (below 60° at night)

| | | |
|-------------------|----------------------------|---------------------|
| Australian Laurel | Christmas (Melior) Begonia | German Ivy |
| Azalea | Cineraria | Gold Dust Plant |
| Baby's Tears | Cyclamen | Mother of Thousands |
| Calceolaria | English Ivy | Norfolk Island Pine |
| Camellia | Fatsyhedera | Spindletree |
| Cast-iron Plant | Geranium | Vinca |

HIGH TEMPERATURE (65-75° at night)

| | | |
|--------------------------|---------------------|-------------------------|
| African Violet | Chinese Evergreen | Philodendron |
| Australian Umbrella Tree | Croton | Pothos |
| Banded Maranta | Gloxinia | Silver Marble Peperomia |
| Cacti and Succulents | Norfolk Island Pine | Snake Plant |
| Caladium | | Tuftroot |

Tough Plants

| | | |
|--------------------------|-------------------------------------|----------------|
| Arrowhead | Grape Ivy | Rubber Tree |
| Australian Umbrella Tree | Peperomia | Screwpine |
| Cast-iron Plant | Philodendron (cordatum and selloum) | Snake Plant |
| Chinese Evergreen | Pothos | Trileaf Wonder |
| Fiddleleaf Fig | | Tuftroot |
| | | Zebra Plant |

UNIVERSITY OF MINNESOTA, INSTITUTE OF AGRICULTURE, ST. PAUL 1, MINNESOTA

Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Service and United States Department of Agriculture Cooperating, Skuli Rufford, Director. Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914.

15M-4-57