

**T H E S I S**

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**A  
CORRESPONDENCE COURSE  
ON  
HOUSE PLANTS**

**Submitted by  
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**In partial fulfillment of the requirements  
for the Degree of Master of Agriculture  
Colorado State University  
Fort Collins, Colorado**

COLORADO STATE UNIVERSITY

DECEMBER 10, 1963

IT IS RECOMMENDED THAT THE REPORT PREPARED BY

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ENTITLED A CORRESPONDENCE COURSE ON HOUSEPLANTS

BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER OF AGRICULTURE

MAJORING IN HORTICULTURE

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## SURVEY OF STATE UNIVERSITIES OF HOME STUDY

### COURSES NOW AVAILABLE

#### Preface

Of the 50 State Universities of Land Grant Colleges queried on the subject of Extension Home Study Courses now available only three states, Maryland, Missouri and Texas failed to answer. Of the 47 remaining fourteen indicated that they now have some or a full schedule of Extension Home Study Courses now available. Among the fourteen states who answered positively, only one state now has a Home Study Course available and offered on the subject of "Care of Houseplants," namely Pennsylvania. The course from Pennsylvania State University is available to anyone who desires to participate at a cost of \$2.50. It is a fairly good course, though it seems to lack a little in fundamentals, but is long in discussing a few specialty flowering plants. The survey has, therefore, established that there is probably a very pronounced place for such a course.

#### Acknowledgements

Special appreciation for assistance and helpful suggestions are extended to Professor A. M. Binkley, who also acted in the important capacity as head of the Graduate Committee; special thanks are also given for counsel and source assistance to Dr. Jess Fults and Charles M. Drage. Appreciation is also expressed for the use of home study survey information to Stanley Boyes, and the encouragement for this report project to Dr. Charles J. Hoffman and Director Lowell H. Watts.

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**A CORRESPONDENCE COURSE ON HOUSEPLANTS**

LOX - 2-10-19

PA

EMOTION BOND

FOR COLLEGE

## LESSON 1

### ADAPTATION AND ENVIRONMENT

Some of the main factors that affect houseplant growth are light, temperature, humidity and ventilation. They will be discussed in this chapter. Others will be dealt with separately.

#### Light

Light is probably the most essential factor for the growth of houseplants. Without light, houseplants cannot manufacture food. Food production occurs as a result of a series of complex photo-chemical processes called photosynthesis. Some of the resulting energy is utilized in producing new leaves, stems and roots. In many homes the light is so dim that only shade-tolerant houseplants can be grown there. Houseplants respond not only to brightness or intensity of light, but also to day-length and quality or kind of light.

#### Light Intensity

Light intensity influences plant food manufacture, stem length, leaf color and flowering. A Geranium grown in low light tends to be spindly and the leaves light green in color. A similar plant grown in very bright light would tend to be shorter, better branched, and have larger leaves of darker green color. Houseplants may be classified according to their natural needs as high light requirement, medium light requirement and low light requirement.

The day-length or duration of light received by plants is also of some importance, but generally only to those houseplants, which are said to be photosensitive or sensitive to length of daylight.

Poinsettia, Kalanchoe and Christmas Cactus bud and flower only when the length of day is short (10 hours of daylight or less). Most flowering houseplants are said to be indifferent to day-length.

Adequate daylight is the best type of light for houseplants. Supplementary artificial light may serve plants in hallways or room dividers. Four to five hours of incandescent or fluorescent light may make up for a plant what it does not naturally receive from sunlight. A new type of fluorescent tube, that combines both red and blue light qualities, is now available. Under it, many houseplants, such as African Violets, may be grown successfully even in a dark basement room. This will be discussed in greater detail in another chapter.

#### Temperature

Most houseplants tolerate normal temperature fluctuations. In general foliage houseplants grow best between 70 and 80° F. during the day and from 60 to 68° F. at night. Most flowering houseplants prefer the same daytime range, but grow best at nighttime temperatures from 50 to 60° F. The lower night temperature induces physiological recovery from moisture loss, intensifies flower color and prolongs flower life. Excessively low or high temperatures may cause plant failures, stop growth or cause spindly appearance, and foliage damage or drop.

#### Ventilation

Most houseplants, especially flowering houseplants, are very sensitive to drafts or exposure near heat registers (16). Forced air dries the plants rapidly, overtakes their limited root systems and

may cause damage or loss of the plant. Most houseplants are sensitive to natural or blended gas. Some plants refuse to flower, while others drop flower buds and foliage. Blended gases are more toxic to houseplants than natural gases. Tomato plants are extremely sensitive to gas. They will turn yellow before the escaping gas can be noticed by members of a household.

### Humidity

The atmospheric humidity is expressed as a percentage of moisture saturation of the air. In most home situations the atmospheric or relative humidity is quite low. This indicates the selection of houseplants that can tolerate the conditions in the average home. The only alternatives are to provide for increased humidity by attaching a humidifier to the heating or ventilating system in the home (5). Also, placing gravel trays, in which an even moisture level is maintained, under the flower pots or containers, will increase the relative humidity in the vicinity of the containers holding the plants (24). As the moisture around the pebbles evaporates, the relative humidity is raised (7).

### Terminology (5)

Adventitious Roots - roots that are induced to form at nodes of plant stems.

Alkali - accumulation of white salt-like deposit at the soil surface or on unfinished clay pots.

Average Potting Soil - a soil for houseplants that contains, by volume, 2 parts of loam to 1 part of sand and 1/2 part of peatmoss.



**Air Layerage** - the inducement of adventitious roots along a stem while the upper portion of the plant remains attached to the lower portion.

**Bract** - a leaflike or membranous leaf, often brightly colored, growing below the inflorescence.

**Clay Pan** - a clay pot that is slightly shorter than a regulation porous red clay flower pot.

**Clay Pot** - a regular porous red clay flower pot.

**Cool Temperature** - a temperature range from 55 - 60° during the day and 45 - 50° at night.

**Cutting** - a terminal shoot or slip that has been severed from its parent plant to be rooted in a special medium.

**Dim Light** - low lighting intensity of a room interior away from windows.

**Disbudding** - removal of terminal flower buds on plants that are generally grown for foliage color effect (example - coleus).

**Dish Garden** - a group of several plants grown together in a single container, arranged in good taste.

**Division** - a separation by cutting into several smaller sections for the purpose of propagation (example - Sansevieria).

**Double Potting** - placing a porous clay pot with a plant inside a larger, often more ornamental container and lining space between pots with sphagnum moss.

**Fluorescent Light** - a source of light usually emanating from a mercury vapor tube.

**High Humidity** - atmosphere saturated with moisture, attainable only in a greenhouse or a terrarium.

Houseplant - any plant that may be successfully grown in the rooms of an ordinary dwelling. It may be annual or perennial, hardy or non-hardy outdoors from seed or bulb.

Humus Soil - a mixture of 2 parts of sphagnum peatmoss with 1 part of sand and 1 part of loam soil.

Inflorescence - the flowerhead of a single or multiple florets generally supported on a stem or stalk.

Internode - stem between two nodes.

Leaf cutting - a propagation or rooting of a single leaf (example - African Violet).

Low Humidity - normal humidity in an average dwelling that is not equipped with humidifiers.

Moderate temperature - a temperature range from 60 - 70° during the day and 50 - 55° during the night.

Node - potential breaking point of a stem from which roots or leaves may originate.

Osmunda fiber - a bark fiber from tropical Osmunda fern generally used for potting orchids.

Offset - a small separate plantlet forming from the roots of the parent plant, that may be separated by division.

Peatmoss - partly decomposed sphagnum moss from old subterranean bogs.

Perlite - a granular inorganic rooting medium or soil amendment made from distomaceous earth.

Pinching - removal of a plant's terminal growth to encourage lateral branching.

Potting Soil Mixture - equal parts of loam soil, sand, and peatmoss with optional addition of phosphate (1 teaspoon per quart).

Propagation - increase of plants by methods of seed, division layerage, cuttage or any other method.

Pubescent - a leaf surface with a hairy appearance.

Rhizome - underground, fleshy stem with buds from which shoots emerge.

Runner - a horizontal creeping stem that produces little clusters of leaves at joints or nodes.

Stem Cutting - a cutting for propagation made of a terminal shoot or tip or from stem sections containing at least one node.

Sphagnum Moss - dried natural moss that, when wet, holds several times its own weight in moisture.

Succulent - a plant that has thick, fleshy leaves, which store moisture for periods of excessive drought.

Terrarium - a collection of plants that are grown together in a single glass container which is open at the top.

Vermiculite - an inorganic material of mineral origin that is obtained from superheating mica used for plant propagation.

Wardian Case - an enclosed glass case that maintains a greenhouse-like humidity and is frequently used for the culture of orchids.

Warm Temperature - a temperature range from 75 to 85° during the day and from 70 to 75° at night.

Water Culture - plant culture by which roots are in water instead of soil as rooting medium.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1 CARE OF HOUSEPLANTS Question Paper 1

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F 1. A bract is the stem between two nodes.  
F 2. Pinching is the snipping off of a plant's lateral growth.  
T 3. Sphagnum moss holds several times its own weight in water.  
F 4. Pubescent is a leaf surface with waxy appearance.  
T 5. Perlite is a granular rooting medium for houseplants.  
F 6. Adventitious roots are underground fleshy stems with buds.  
T 7. Most flowering houseplants prefer a nighttime temperature from 50 to 60° F.  
F 8. Most flowering houseplants are sensitive to the length of daylight.  
T 9. Photosynthesis is a term that combines various food production processes in a plant.  
F 10. A plant grown in bright light tends to be spindly.

PART II: Complete the following statements.

1. Food production in plants by photo-chemical processes is called (Photosynthesis).

2. Plants that are sensitive to length of daylight are said to be (photosensitive).
3. Optimum temperatures for foliage plants are by day (70 to 80° F.) and by night (60 to 68° F.).
4. (Tomatoes) are known to be extremely sensitive to escaping household gases.
5. (Blue and Red) are two important qualities of light (light colors).
6. Optimum temperatures for flowering houseplants are by day (70 to 80° F.) and by night (50 to 60° F.).
7. Name four houseplant culture factors affected by light?  
(Answer): 1. Food manufacture - 2. stem length - 3. leaf color -  
4. flowering.
8. (Rhizome) is the name for an underground, fleshy stem with buds from which shoots emerge.
9. (Succulent) is the name for a group of plants that have thick, fleshy leaves that store moisture.
10. (Disbudding) is a practice of removing flower buds on houseplants.



## LESSON 2

### FOLIAGE PLANTS AS HOUSEPLANTS

Foliage houseplants are generally grown in many homes for their permanent decorative value. They are used for numerous purposes such as room dividers, and to bring into the living area of a home, the casualness of the garden (11). Many foliage plant species are suitable for home culture but the number is usually limited to those that are widely available at florist shops, garden shops, and specialty stores. The following list of foliage houseplants are the best known and most popular at the present time:

Aluminum Plant (Pilea); has silvery marks over its leaves, prefers moist soil and full sun if available. Not a large plant. Will grow in medium light intensity.

Aphelandra (Aphelandra); tolerates dim light (14) but grows best in indirect sunlight. Requires moist humus soil, warm temperature, but low humidity.

Begonia (Begonia); numerous species are adapted for indoor culture. Best known include Begonia rex, Angel Wing, and Wax Leaf varieties. Require rich humus soil that is kept moist. Grow best in indirect light but need warm temperature and high humidity.

Bloodleaf (Iresine); vivid red foliage, requires loam soil, full light and sparing watering.

Bromelia Sedums and Vriesia (Bromelia, etc.); this genus includes a number of different species including the Vriesia and Pineapple. They grow well under dry indoor conditions in

medium light; will sometimes flower if conditions are favorable. Require humus soil, and warm temperatures. Very showy genus of plants. Strong sun may burn foliage (8).

**Bryophyllum (Bryophyllum);** fast-growing, easy houseplant.

Separate little plantlets appear near notches of each leaf.

Average potting soil, light and moisture are satisfactory.

**Caladium (Caladium);** grown from tubers that go dormant during the winter months; leaves are large arrow-shaped, some have pink and red variegations of color. Require moist humus soil, indirect sunlight, warm temperatures and medium humidity.

Do not overwater as bulbs rot easily.

**Cast Iron Plant (Aspidistra);** another hardy tolerant plant that endures heat, lack of light and lack of moisture. Leaves are glossy green, requires average potting soil, moderate temperature and medium humidity.

**Chinese Evergreen (Aglaonema);** has dark green leaves on cane-like stems. Requires minimum of light and care. May be grown in water or humus soil that is kept moist. Adapted to low humidity and mediocre daylight.

**Coleus (Coleus);** available in a wide range of foliage colors and patterns, require much moisture and sunshine, regular moist potting soil, full sun, warm temperatures and medium humidity.

**Croton (Codiaeum);** have brilliantly colored leaves of various shapes. New leaves are dark green until maturity. Partial shade or full light at low temperatures may cause leaf drop. Very tolerant of mediocre light conditions and dry atmosphere.

**Dragon Plant (Dracaena);** slow-growing plants with dark green, elongated, sometimes spotted leaves. Regular potting soil must be kept moist; mediocre light (14), warm temperature, and low humidity are fundamental. Wash foliage monthly with soapy water.

**Dumb Cane (Dieffenbachia);** one of the most spectacular houseplants, grown for its colorful variegated foliage. Leaf size and shape resembles rubber plant, but it is more tolerant of mediocre light and dry room conditions than the rubber plant (3). Regular potting soil should be allowed to dry between watering. Warm temperature, low humidity, and indirect sunlight are essential. Do not overwater. Warning: Dieffenbachia sap may be toxic to open skin cuts.

**Ferns (Nephrolepis and others);** the most popular types are Bird's nest Fern, Boston Fern, Maidenhair Fern, Springer Fern, Sword Fern and Spider Ferns. Require rich moist soil, warm temperature, high humidity but subdued light. Water lightly except when new growth is very active. Do not permit to chill.

**Fiddle-leaf Fig (Ficus);** very tolerant houseplant, seldom needs repotting, needs intermediate light, average potting soil.

**Grape Ivy (Cissus);** a popular vine tolerant of adverse conditions. Will grow well with mediocre light (3) and average potting soil in medium room temperature.

**Ivy (Hedera);** available in many leaf sizes, some variegated. Make good easy to grow house plants. Should never be permitted to get the slightest bit dry. Regular potting soil

should be kept moist at all times. Grow in full sun, cool temperature and average humidity.

Jade Plant (*Crassula*); frequently called rubber plant also because of its fleshy roundish leaves. Accepts bright sun or intermediate shade (3). Requires medium to dry soil, becomes quite large in time. Low humidity is easily tolerated (3).

Norfolk Island Pine (*Araucaria*); branches born in symmetrical arrangement, requires moist humus soil, indirect light, moderate temperature and low humidity. Must be turned frequently to prevent irregular growth. An indoor conifer.

Palms (*Kentia* and *Cocos*); most varieties grow too large for the average home. Many different types are adaptable to the home. Require filtered light, moderate temperature and moist average potting soil.

Panda Plant (*Kalanchoe*); grey-green leaves with the texture of wool, reddish "stitches" on edges. Require average soil, medium light, cool temperature.

Peperomia (*Peperomia*); Tolerate neglect, available in fleshy green or variegated leaves. Some form leaf rosettes. They require regular potting soil mixture, indirect sunlight and warm temperature (3). Allow soil to dry between waterings.

Periwinkle (*Vinca*); *Vinca major* and *Vinca minor* can be used including variegated leaf forms; prefer full sun but cool temperature and average potting soil.

Philodendron (*Philodendron*); numerous philodendrons are found on the market. The so-called split-leaf or *Monstera*

*deliciosa* has irregular shaped perforated leaves. When the leaves fail to perforate, it is due to lack of light or low humidity. Requires good light and medium temperature. Other Philodendrons are more tolerant of average home conditions including *Philodendron hastatum*. *Philodendron squamifolium* requires moist regular potting soil, indirect light (3), and warm temperature. Wash leaves monthly with soapy water. Foliage shines or waxes are not necessary.

*Pothos (Pothos)*; appears like a smooth-stemmed, small-leaf philodendron and can be grown like it but it requires less water. Planted in rich humus soil it requires indirect light (3), and warm temperatures.

*Prayer Plant (Maranta)*; it folds up its leaves at night.

Leaves are light green above, purple beneath. Veins are fine, and have a silky sheen. Regular potting soil should be kept moist. Indirect light, warm temperature and high humidity are needed. Do not overwater.

*Rubber Plant (Ficus)*; has leathery oval leaves, grows best in warm moist atmosphere and in very good light. Should have the equivalent of full sun. Plant in regular potting soil that is kept moist and at warm temperature. Wash off leaves with soapy water from time to time.

*Snake Plant (Sansevieria)*; leaves are dark green or banded with lighter green; some varieties are longitudinally or laterally striped or speckled. They grow almost anywhere in regular potting soil, need to dry between irrigation, prefer mediocre light (3), warm atmosphere, but low humidity.



**Strawberry Geranium (Saxifraga);** very attractive small plant makes offset runners, requires intermediate light, average potting soil and less than daily watering.

**Succulents and Cacti (Cactus, Echeveria and others);** almost any type or variety of succulent or cactus will make a good houseplant. Some of the best are the Aloes and the Euphorbias. Also accepted are the Crassula, Sansevieria, Sedums, Bryophyllums, and Kalanchoe. Require sandy potting soil, should go dry between waterings, full sun, moderate temperature, and low humidity.

**Syngonium (Nephthytis);** they have an arrow-shaped leaf with silver, white or green centers. Require regular potting soil that is kept moist, indirect sunlight and warm temperatures. Need pole support and occasional pruning.

**Umbrella Tree (Schefflera);** produces large compound leaves on fleshy green stems. Regular potting soil should go dry between waterings; indirect sunlight and warm temperatures are required. Low indoor light requirement.

**Velvet Plant (Gynura);** rich purple velvet-like leaves. With plenty of sun and moisture, color turns darker. Average soil needed.

**Wandering Jew (Zebrina);** a vine that is fast-growing in regular potting soil; needs to be kept moist. Indirect sunlight, moderate temperature and medium humidity are required.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS Question Paper 2

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_

CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions true (T) or False (F).

- T   1. The Pineapple belongs to the Family of Bromeliads.
- F   2. The Dumb Cane is more difficult to grow in the home than the Rubber Plant.
- F   3. Succulents require a rich humus-type soil.
- T   4. Coleus require much sunshine and warm temperatures.
- T   5. A monstera must be placed very near good light.
- F   6. Ivies should be permitted to go dry between waterings.
- F   7. Snake Plant or Sansevieria requires special care for good culture.
- T   8. Crotons have very colorful leaves.
- F   9. Begonias grow best in direct sunlight on a South window.
- T   10. Succulents need very little water.

PART II: Complete the following questions and statements.

- 1. What light, moisture and temperature requirements do succulents need? (Answer: Full sun, or bright light, infrequent watering, and moderate temperature.)
- 2. What popular houseplant has similar-sized and shaped leaves as Rubber Tree? (Answer: Dumb Cane)

3. Which popular houseplant may be grown in water or humus soil?  
(Answer: Chinese Evergreen)
4. Which popular houseplant folds up its leaves at night? (Answer:  
Prayer Plant)
5. Which foliage houseplants are usually grown from bulbs? (Answer:  
Calla, Caladium)

PART III: Match the genus name with the common name.

- |                             |                        |
|-----------------------------|------------------------|
| 1. <u>  D  </u> Maranta     | A. Wandering Jew       |
| 2. <u>  B  </u> Gynura      | B. Velvet Plant        |
| 3. <u>  I  </u> Dracaena    | C. Umbrella Tree       |
| 4. <u>  J  </u> Crassula    | D. Prayer Plant        |
| 5. <u>  A  </u> Zebrina     | E. Bloodleaf           |
| 6. <u>  G  </u> Aglaonema   | F. Cast Iron Plant     |
| 7. <u>  E  </u> Iresine     | G. Chinese Evergreen   |
| 8. <u>  H  </u> Araucaria   | H. Norfolk Island Pine |
| 9. <u>  C  </u> Schefflera  | I. Dragon Plant        |
| 10. <u>  F  </u> Aspidistra | J. Jade Plant          |

### LESSON 3

#### FLOWERING PLANTS AS HOUSEPLANTS

Flowering houseplants are, in general, more difficult to grow than foliage plants. They are most often selected by advanced amateur gardeners because of their attractive, colorful flowers at certain times of the year. They normally require more attention, are more demanding of regular care, and require special soil, richly reinforced with humus. Fewer flowering houseplants have gained equal popularity accorded to foliage houseplants. Many can be grown if an artificial environment is maintained that resembles sub-tropical conditions (20).

The following list comprises the most widely grown at the present time:

African Violet (*Saintpaulia*); most common among flowering houseplants, produce single or double flowers of light blue, blue-red, pink, lavender, or purple colors. Rich potting soil mixture is needed in medium temperature and humidity. Requires indirect sunlight and much moisture. Should be sub-irrigated, wet leaves may become spotted from excess moisture. Petioles that touch the rim of the flower pot may rot. Aluminum foil over the rim may prevent this (25). Numerous opportunities for propagation exist.

*Amaryllis* (*Amaryllis*); grows from a tropical bulb, flower stem appears before leaves emerge. Requires rich humus soil that is kept moist. Grows best in full sun with medium humidity and moderate temperatures. The bulb should be potted two-thirds above soil level. African and Belgian bulbs are on the market. Flower stalk precedes foliage.

**Begonia (Begonia);** Fibrous-rooted begonias produce flowers continually. They may be white, pink, or scarlet. Tuberous begonias must be grown in pots of rich humus soil that are kept moist in full sunlight at warm temperatures and medium humidity. Plant tuberous-rooted begonia bulbs in March.

**Bird of Paradise (Strelitzia);** as a foliage plant very acceptable. Requires good light, good soil, not too much water. Flowers rarely except in greenhouses.

**Bougainvillea (Bougainvillea);** a good plant for a warm sun-porch. Colorful bracts in pink, red, and lavender; desires full sun and high humidity (11).

**Calla Lily (Zantedeschia);** interesting arrow shaped leaves, some are speckled; the flower is not a true flower but a petal envelope that surrounds the true flowers on a stem. Bulbs should be permitted to rest between flowering. Require regular potting soil that is moist, full sun, cool temperatures and medium humidity. Require full light indoors. Should be dormant during the summer.

**Christmas Cactus (Zygocactus);** grows best in rich moist soil and direct sun at 55 - 65° temperature. Prefers average humidity; rests in summer.

**Flame Violet (Episcia);** related to the African Violet but trailing in growth. Requires partial shade, low temperature, but high humidity.

**Geranium (Pelargonium);** available in fancy leaved varieties, an attractively flowering plant. Also in dwarfs and miniatures.



**Gloxinia (Sinningia);** requires special handling especially under artificial light. Started from tubers in winter, flower in mid-summer. Best temperature is around 60° in partial shade with medium humidity. High light requirement.

**Kafir Lily (Clivia);** has evergreen leaves similar to Amaryllis; flowers are orange red and produced on tall stalks. Keep cool but bright during winter.

**Kalanchoe (Kalanchoe);** a short day plant that flowers naturally in mid-winter. Can be forced by light manipulation, but requires full light.

**Moses-in-a-Boat (Rhoeo);** green pointed leaves with purple undersides. Requires cool temperature, much water, average potting soil.

**Orchid (Epidendrum);** better orchids for home color are the Cattleyas. Grow in pure humus or ground bark. Require a high humidity and room temperature. Moisten leaves daily; water pots weekly. Place at southern exposure behind lace curtains (2).

**Oxalis (Oxalis);** resembles shamrock or clover, small pink flowers, requires full sun, rich soil.

**Poinsettia (Euphorbia);** one of the most photo-sensitive plants. Requires artificial shortening of daylight to bring into flowering in mid-winter. Showy red flowers are bracts, axillary leaves. The actual flowers are the little yellow structures in the center of the red bracts. Require high light.

**Rose, Miniature (Rosa);** tiny flowers on dwarf plants require sun, cool location, average soil and daily watering. Slips are easily rooted.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS Question Paper 3

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F 1. Flowering houseplants must flower continuously to be acceptable.
- F 2. Christmas cactus should be grown in a very warm house.
- T 3. Bird of Paradise is a difficult plant to flower under average home conditions.
- F 4. African Violet may be grown in large planters.
- F 5. The flowers of Bougainvillea are true flowers.
- T 6. Mint-Scented Geraniums are grown mostly for their foliage.
- T 7. Orchids are not suitable for average home conditions.
- T 8. Poinsettias can be brought into bloom at any time of the year.
- T 9. Miniature roses can be grown from slips.
- F 10. Amaryllis produces flowers and leaves at the same time.

PART II: Complete the following statements or questions.

1. (Oxalis) resembles Shamrock.
2. The showy part of the Poinsettia flower is called a (bract).
3. Orchids require (high) humidity and (high) room temperature.

4. Leaves of (African Violet) may become spotted from excess moisture.

PART III: Match the genus name with the common name.

- |                          |                     |
|--------------------------|---------------------|
| 1. <u>H</u> Olivia       | A. Flame Violet     |
| 2. <u>D</u> Sinningia    | B. Christmas Cactus |
| 3. <u>A</u> Episcia      | C. Calla Lily       |
| 4. <u>F</u> Euphorbia    | D. Gloxinia         |
| 5. <u>I</u> Saintpaulia  | E. Moses-in-a-Boat  |
| 6. <u>C</u> Zantedeschia | F. Poinsettia       |
| 7. <u>B</u> Zygocactus   | G. Orchid           |
| 8. <u>J</u> Strelitzia   | H. Kafir Lily       |
| 9. <u>E</u> Rhoec        | I. African Violet   |
| 10. <u>G</u> Epidendron  | J. Bird of Paradise |

## LESSON 4

### METHODS OF PROPAGATION OF HOUSEPLANTS

Most houseplants may be propagated by one or more of the following methods, such as seeds, division, runners, layering, cutting, and even grafting in a few isolated instances (12). All except propagation by seed are vegetative. Some plants are too difficult to propagate, so the purchase of new plants is advised, whenever older plants have lost their appeal. One of the important aspects of houseplant culture is that the plants must be attractive in appearance and perform decorative function in the home (3). When a houseplant no longer fulfills this purpose, it must then be repaired, propagated or otherwise be replaced. The propagation of houseplants varies in degrees of difficulties. Some methods, therefore, lend themselves more readily for the amateur gardener than others.

#### Growing houseplants from seeds

Propagation of houseplants from seed is usually inexpensive, produces a large number of new plants, but requires a good deal of patience. Houseplants, which may be readily grown from seed, include African Violets, gloxinias, begonias, coleus, cacti and others. Some of these should only be grown from seed that has been freshly purchased from a reliable seedsman, who can give some assurances regarding germination and trueness of type. New varieties may be originated by the more experienced home gardener, who knows the genetics of his plants and is familiar with the necessary technique for pollination and harvesting of seed. Some houseplants require special germination treatment of the seed prior to culture (8).

Growing media for germination of seed can be made up of several distinctly different materials. They include sand, sphagnum moss, peatmoss, vermiculite, perlite, and loam soil. A number of different germination mixture formulas include several of these ingredients. Commercially the mixtures of vermiculite and peatmoss are often used. Vermiculite, sand, and perlite contain no plant nutrient values, so must have commercial plant food nutrients added with the water after the plants have germinated. Sterilization of all materials is suggested except vermiculite and perlite. Prepare any heat-resistant germination container for sterilization, moisten well, place in the oven and maintain a 200° F. temperature for one hour (5). Plastic bowls, aluminum frozen food holders, waxed dairy containers and other food receptacles make good germination containers at no expense to the home gardener. A popular germinating container is about 3 inches deep and has a few drainage holes on the bottom. A half-inch layer of sphagnum peatmoss is placed on the bottom, then two inches of rich garden soil, and a top layer of one-fourth inch of vermiculite or perlite. After sterilization, moisten the container from a pan from underneath until the entire medium is saturated with moisture. Small seeds are simply scattered over the vermiculite, larger seeds are covered with a small additional quantity of vermiculite (12). A large plastic polyethylene bag is now placed over the seeded container and folded under, so little moisture can escape from the planter until after the seeds are germinated. Chemical seed treatment with Arasan or Captan, is recommended to prevent seedling blight.

As soon as the seedlings show and germination is largely completed, the plastic bag is removed and the container placed in very



good light, out of direct reach of sunrays. Water must be administered from below, every few days, and temperatures should be a little cooler during the night than during the day. In pure vermiculite, mild starter solution plant foods should be administered with the water. As soon as the first true leaves have formed, the seedlings should be transplanted into 2½ to 3-inch clay flower pots with a similar soil mixture as was used in germination. When plants become pale green they should have a little plant food. If they grow spindly, they must have more light intensity or more hours of actual light each day.

#### Division of Houseplants

Division of houseplants is one of the safest and easiest ways of propagation (11). Also, the new plant will have identically the same characteristics that the parent plant displayed. Popular houseplants that are often propagated by division include: Sansevieria, cast iron plant, African Violet, philodendron and vinca vine. Remove the plants' roots from the container, and shake loose as much of the soil as possible. Quite generally the new plant can be broken loose from the parent plant. Pull the roots apart carefully and do not permit them to dry out any more than necessary. If the work must be interrupted, place moist sphagnum moss over the exposed roots. Repot the separated plants and plantlets into individual containers as quickly as possible. Containers should contain a similar soil medium as the one in which the plant grew before. Any divisions that come loose without roots are propagated easily like cuttings (16). Plants that have bulbs, like the gloxinia, can be divided by cutting the

bulbs into sections, each containing two or more eyes (or shoots). Dust cuts with a mild fungicide to prevent disease (11) (Arasan or Captan).

#### Propagation by Runners

A few plants, that have creeping stems or stolons, with clusters of little leaves at the nodes, may be propagated by runners. The pick-a-back plant is a good example. Ivy and Zebrina may also be increased by this method. Spider plant and Boston Fern are also included among the possibilities. Place the point of node in a 2½ to 3-inch flower pot with a rich soil mixture and hold the plant to the medium with a hairpin, or similar metal clip (12). Keep soil moist. In three to five weeks the new plant should be rooted and may then be separated from the parent plant.

#### Air Layering of Houseplants

Air layering, as a method of houseplant propagation, dates back to antiquity. Roots are induced to form along a stem while the new plant is still attached to the stock plant. This is often necessary with such plants as the Rubber tree or the Dieffenbachia, when they become tall and "leggy" and have largely lost their pleasing appearance. For equipment, a quantity of sphagnum moss, a chemical rooting compound, a 6 x 8-inch sheet of polyethylene plastic (transparent), some twine and electrician's plastic waterproof tape, are required. After selecting the spot where the air layer is to be made, make a slanting upward or downward incision with a sharp knife from 1 to 1½ inches long and insert a toothpick or matchstick into the cut to prevent healing of the cut (5). Treat the wound on both sides with a small amount of

rooting compound of indole-butyric acid such as "Rootone," which hastens the rooting of the layer. Next, wrap two handfuls of sphagnum moss that has been saturated with moisture and slightly wrung into a ball, around and into the cut. Hold the moss in place with twine, then wrap the ball with the plastic film. The plastic may be tied with rubberbands or better, with electrician's plastic waterproof tape (15). The finished ball should not be exposed to the sun. When a good root system has formed and becomes visible through the plastic film, the rooted layer may be severed from the parent plant and potted as quickly as possible. The remaining portion of the cane may form new shoots and can be remade into an attractive plant also.

#### Propagation of Houseplants by Cuttings

The most popular way of houseplant propagation is by cuttage. Slips or tip cuttings, stem cuttings, and leaf cuttings are the most popular. It is possible to make a great many propagations from a single plant in a relatively short time.

Slips or tip cuttings are used for propagating geranium, coleus, schefflera, Philodendron, Christmas cactus, and many others. Ends of shoots 3 to 5 inches long are usually broken off, or cut, if necessary. The lower leaves are removed to reduce moisture loss during rooting. The slips are easily rooted in vermiculite, perlite or sphagnum moss. Sand is also frequently used. Stem cuttings may be made of dracaenas, Dieffenbachias, and a few others. Cut sections from 2 to 3 inches long, that must contain at least two nodes or "eyes," are placed slightly below the surface of the rooting medium, similar to slips, but in a horizontal position. The upper eye will eventually sprout, while the lower node gives rise to a new root system (5).

Leaf cuttings can be made from leaves with or without leaf stalks or petioles. African Violet, Made plant, or sedums can be rooted in this manner. Rex begonia and peperomia as well as African Violet are propagated with their petioles submerged in rooting medium or water (16). Rooting will generally occur along the petiole or leaf stalk in about 4 to 6 weeks(28). Soon a small plantlet will also occur just above the roots, signaling that the plantlet is now ready to be placed in a good propagating soil mixture for further progress and growth. The use of rooting hormone is optional, but will often speed up the process. Good rooting media are vermiculite, perlite, sphagnum moss and sand. Temperature for rooting of cuttings is usually slightly higher than for the culture of the plant itself. 75° F. is generally considered a good mean temperature (28).

#### Grafting of Houseplants

Grafting is usually limited to cacti and then only when certain novelty plants are to be produced. One of the more common is the grafting of Christmas cactus on Prickly pear. Flat, cleft, and splice grafts may be used (12). They are made when the two given subjects serving as stock and scion are actively growing. The scion is held in place with two or three long cactus thorns. Nails or pins will rust and are not recommended. Rubber bands are used to hold the thorns in place until the connection is safely assured. If the graft does not take, the scion will commence to shrivel and dry up in time. All one can do then is to try again.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS, Question Paper 4

NAME \_\_\_\_\_ STREET OR RFD \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F 1. Growing houseplants from seed is easier than from cuttings or slips.
- F 2. Soil mixtures used for starting slips are the same as for starting seed.
- T 3. Vermiculite is a mineral material used for seed germination.
- F 4. Seedlings must be started in direct sunlight.
- T 5. Air layering is a good method to shorten tall plants.
- F 6. Peatmoss is used for air layering.
- T 7. Lower leaves of cuttings should be removed before rooting.
- F 8. Leaf cuttings can be made from all houseplants.
- F 9. Grafting of houseplants is a common practice.
- T 10. Sansevieria leaves can be cut in sections and rooted easily.

PART II: Complete these questions as indicated.

1. What is the advantage of propagation from cuttings over seed propagation? (Answer): Propagation from cuttings is faster and simpler.



2. List four types of vegetative propagation of houseplants?  
(Answer): 1. Leaf Cutting - 2. Cane Cutting - 3. Air Layerage -  
4. Runners.
3. The African Violet can be propagated by (leaf or crown) cuttings.
4. Define a cutting. (Answer): Ends of shoots 3 to 5 inches long,  
cut off or broken off, with lower leaves removed.
5. The encouragement of root formation along a stem is called  
(Air Layerage) .
6. (Chemical seed treatment) must be used to prevent seedling  
blight.
7. (Runners) is a method of houseplant propagation used with plants  
that have creeping stems or stolons.
8. List two types of growing medium for germination of seed. (Answer):  
1. Sphagnum peatmoss, 2. Vermiculite.
9. Houseplants perform a (decorative) function in the home.
10. The use of (Rootone, indole-butyric acid) chemical encourages  
rooting of houseplants.

## LESSON 5

### CONTAINERS AND SOIL MIXTURES FOR HOUSEPLANTS

#### Container for Houseplants

Though many types of houseplant containers have been developed through the years, the common porous red clay pot is still the most popular and most widely used of all. Plants, however, are grown in general for their decorative value in the home and the more ornate containers certainly can improve the general appearance of the houseplants (16). Containers may be fabricated of ceramics, plastic, fiberglass, wood, aluminum, copper, brass, leather and many other materials.

#### Clay and Ceramic Containers

Unglazed and glazed porous clay pots with drainage holes (7) are widely used by commercial houseplant growers and frequently left with the plant, when it is first purchased. Most often the more ornate type of container visible is nothing other than an outer shell to cover over the plain clay pot itself. Clay pots are able to absorb moisture through their walls. Frequently the greatest accumulation of roots is just next to the clay pot, because moisture and nutrients accumulate in the clay pores. They break easily, but are relatively inexpensive. Ceramic pots are most often glazed on the outside, sometimes also on the inside. It is best to look for containers of plain form and design, and of a single, not too vivid color, as the container should support the plant, but should not become overly attractive. Ceramic containers frequently are designed without

drainage holes. This necessitates placing a half-inch layer of pea gravel or coarse pebbles in the bottom of the container, before soil and plants are added to it. Glazed or ceramic containers are very decorative with cacti or succulents.

#### Other Containers

Plastic and fiberglass containers are usually quite light and easy to handle. They have become more popular in recent years because they are relatively inexpensive and quite attractive in shape and color. Some smaller containers have little room for soil and roots, and are largely ornamental. They should be avoided.

Certain containers have a fiberglass wick in the drainage hole, which draws moisture from a reservoir below for the plant above (5). Containers, in general, must be large enough to accommodate a houseplant, without being excessive in size. When a plant indicates that it is severely pot-bound or otherwise in need of refurbishment, it often indicates this by dropping some of its lower leaves. This is very evident with some plants like the Rubber plant, not so evident with slower-growing plants. At such a time, a container usually 2 inches larger, will suffice for the repotting. It is suggested to use all fresh soil, removing as much of the old potting soil that can be freed without injuring the root system unduly.

#### Humidifier Trays

Humidifier trays are highly recommended in areas where the relative humidity of the atmosphere normally is quite low (5). This can be achieved by placing 1/2 to 3/4 inches of gravel in a 1-inch deep metal tray and setting the houseplants on top of the gravel.

By keeping a good moisture supply in the gravel layer, the relative humidity around the plants can be held enough higher to make it worthwhile. If a humidifier can be attached to the home heating-ventilating system, this is indeed highly desirable since the majority of house-plants require a higher level of atmospheric moisture than is normally supplied in the Western states.

#### Miscellaneous Problems

Copper containers should not be in direct contact with plant roots as the oxide is somewhat toxic to them. A plastic inner lining or second pot can overcome the problem easily.

Porous clay pots should be scrubbed with a wire brush and soapy water when they are used over. This eliminates any residue of algae or fungi and often gives them a more acceptable appearance. Soaking of clay pots for 24 hours before use is also suggested so they can absorb all the moisture in the air spaces of the clay.

#### Hanging Plant Baskets

Hanging plants in a light, but draft-free doorway or hall can add grace and beauty to a home. The humidity of a kitchen makes for an ideal atmosphere for plants in a hanging basket (16). Many plants that trail naturally are well suited for this project. Where dripping of drainage water is undesirable, a plastic liner inside the container will hold the moisture inside the basket. Sphagnum moss makes a good outside lining before potting soil is added. One or more plants may be kept in a single hanging basket.

### Soils and Soil Mixtures for Houseplants

Soil provides for houseplants like for all other plants in several important and sustaining ways. It furnishes anchorage for the roots, thereby providing the support to hold plants upright. It also stores, in its air spaces between the soil particles, not only moisture for the plant but also nutrients and air, all highly essential in maintaining healthy plants in the home. Soil has numerous physical properties, which are of some importance in relation to plants. They must have good structure, proper cohesion, adequate porosity and favorable composition to be a desirable medium for the culture of houseplants. Otherwise, they must have aeration and drainage, humus content and micro-organisms, fertility and desirable reaction (pH). It must not contain any elements that may be toxic to houseplants. pH is a logarithm expression of alkalinity or acidity. A pH of 6 is acid, 7 is neutral and 8 is alkaline. Soils must have the most efficient composition or make-up for the type of plant or houseplant that is to be grown in it. According to generally accepted standards we can differentiate houseplant soils into three distinct types of composition: a. Average houseplants, foliage plants; b. flowering plants especially African Violets; and c. Cacti and succulents.

#### Soil for Average Foliage Houseplants

This soil should be moderately rich, have a good base of clay loam, and hold moisture and fertility adequately. It must be "crumbly," well-textured soil in any case. It is most generally made up of two parts of good garden loam, one part of clean sand, and one-half to one part of either peatmoss, leafmold, or vermiculite (13). Mixing about



1 teaspoon of Superphosphate with each quart of mixed potting soil is very desirable and encourages good root growth after repotting. Even if the garden soil is alkaline in reaction, the better qualities of sphagnum peatmosses have a sufficiently acid reaction so they will neutralize the mixture. This soil is used for all the foliage houseplants and some flowering houseplants that do not prefer too rich a soil. Compost or leafmold can replace a part of the peatmoss in the mixture.

#### Soil for Flowering Houseplants

This soil is often referred to as a "humus soil," because it contains about 50% humus rich materials, or similar ingredients. It is important that the soil will not become so rich that it is "soggy," after it is watered. Two parts of sphagnum or one part of sphagnum and one part of vermiculite is added to one part of garden loam and one part of clean sand (29). Add also 1 teaspoon of Superphosphate per quart of soil mixture. This soil is used generally for African violets, gloxinias, begonias, calla lilies and other tropical flowering plants.

#### Soil for Cacti and Succulents

This soil does not need any humus material, but is perfectly well composed of equal parts of sand, garden soil, and vermiculite or perlite. It is most preferred for cacti and other fleshy leaved, desert-type succulents.

#### Soil for Orchids

Fir tree bark or Osunda fiber are generally used in glazed or plastic pots. Size of container must be large enough so new growth

is 1 to 2 inches from the rim of container (2). Broken clay pieces can make up the lower inch in the container.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS, Question Paper 5

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F 1. Roots accumulate near the walls of clay pots because they want to grow to the outside.
- F 2. When a plant is severely potbound, it wilts and dies.
- F 3. Humidifier trays are used with such plants as cacti or succulents.
- T 4. A good houseplant soil mixture has two parts of garden loam, one part of sand and one part of peatmoss.
- T 5. Gravel is used where drainage is not provided in plant pot.
- T 6. Copper containers are not recommended for houseplants.
- F 7. Soil pH is a measure of fertility.
- T 8. Porosity is an important physical property of soil.
- T 9. The use of leafmold in preparing potting soil mixtures is recommended.
- T 10. Small amounts of Superphosphate may be added for flowering houseplant soils.

PART II: Complete the following questions or statements.

1. Name four soil factors important to houseplant growth. (Answer):  
1. Drainage, 2. Aeration, 3. Humus content, 4. Micro-organisms.

2. A good soil mixture for cacti or succulents contains (one part loam and one part sand).
3. Moisture and nutrients often accumulate in a clay pot's (pores).
4. When repotting a houseplant of average growth, the new pots must be about (2 inches) larger.
5. Soil provides for houseplants in three sustaining ways. What are they? (Answer): 1. Anchorage, 2. Moisture, 3. Nutrients.
6. A pH of 8.2 denotes (alkaline) reaction.
7. Soil mixtures for flowering houseplants must contain (two parts peatmoss, one part loam, one part sand).
8. Most sphagnum peatmosses are of (acid) reaction.
9. Other organic materials that may replace a portion of the peatmoss in the soil mixture are: (1. Compost, 2. Leafmold).
10. (Pea gravel, coarse sand) may be used for drainage for containers without drainage holes.

## LESSON 6

### WATERING, FEEDING AND GENERAL CARE OF HOUSEPLANTS

It is not only essential to prepare a proper soil mixture for houseplants, but equally important to provide for them the right amount of water at the proper time, plantfood, when it can best be utilized by the houseplant, and exercise the type of general care that would result in happy plant friends in our midst.

#### Watering Houseplants

Watering of houseplants can be a very simple process if we can train ourselves to use just a bit of old-fashioned common sense. It seems strange, therefore, that the greatest number of houseplant failures are due to improper watering. Certainly, watering should not become a daily, biweekly, or weekly routine. Plants vary greatly in their water requirements. Some plants have the ability to go for considerable periods without water, while others must have it almost every other day to survive. The best rule to follow is to watch the soil of the houseplant itself. Whenever it becomes dry at the surface, provided the pot has proper drainage, the soil turns somewhat lighter in color, signaling to us the need for water. Water requirements of plants vary also from one season of the year to the next. Many houseplants require more water during the summer than they do during the fall season. This is due to physiological changes within the plants. There is also a long-time argument about watering of plants, whether to apply the water from the top or from a saucer through the bottom hole. The question is still unsettled, leading to the conclusion



that both applications are acceptable whenever the water is needed. Both are not desirable if the soil is already adequately supplied with moisture. Continued sub-irrigation accumulates salts at the soil surface.

As a general rule it is well to observe houseplants often to ascertain their water requirements; to use tepid water instead of freshly tapped water (12); to remove excess water that has drained through to a saucer under the pot after a half-hour (25), and to repot those plants into larger pots, that do not seem to get by with a single daily watering. Rainwater offers little advantage over tap water (19). Pots without drainage holes must be given the pencil test from time to time. Insert a pencil to tell the moisture need by the hardness of the soil. Do not give your plants water that has been softened with commercial water softeners. The result is gradual loss of soil structure which transforms good potting soil into a dry, concrete-like crust.

### Feeding of Houseplants

Houseplants, like most other plants, need fertilizers containing three major plant food elements: Nitrogen (N), Phosphoric Acid (P), and Potassium (K). They are available in many different combinations and under a multitude of brand names (13). While regular garden fertilizer may be used, most houseplant enthusiasts today, use highly concentrated plantfoods that are sold specifically for houseplants in liquid, granular, or tablet form. Each must be analyzed on the label, indicating specifically how much water-soluble elemental nitrogen, phosphate or potash is available in every pound of this chemical. The

majority of these fertilizers are about 20-20-20. The first figure indicates available nitrogen, the second, available phosphate and the third, water-soluble potassium. Commercial garden fertilizers frequently have a lower analysis like 5-10-5 or 4-12-4 (19); about a half teaspoon of this fertilizer would be applied to the moist soil of a 6-inch pot. Commercial fertilizers used for houseplants are sold in granular, crystalline, liquid or tablet forms. Each should be used according to instructions on the package label. Frequency of fertilizer application varies somewhat with the vigor of growth and age of each plant. Some need it every two weeks, while others will flower well for several months without needing any supplemental application of plantfood. Some of the better soil mixtures contain sufficient plant food to last for several months; others are not as richly supplied with available nutrients. Some of the newer concentrated houseplant foods contain minute quantities of minor and trace elements besides N, P, and K. These are useful, although it is not proven that these other elements are needed or in which quantities they may be necessary. Many home gardeners, who use liquified plant food with their waterings of houseplants, will apply a small quantity once a month for 8 or 9 months, allowing for a few months of rest during late fall or early winter. The use of dehydrated manure, bloodmeal or bonemeal, organic sources of plant nutrients, is not generally preferred over the inorganic sources of plant nutrients. These organic materials may be mixed with other materials in the preparation of potting soils, but should not be administered to a plant that is already growing in a container or pot. Plants, however, rarely die from temporary lack of plantfood, but frequently are damaged from over application of fertilizer elements (7).

## General Care of Houseplants

### Potting

When cuttings or seedlings are sufficiently rooted to be on their own, they are ready to be potted into a very porous soil mixture for initial establishment. Two and one half to three-inch pots are generally used for the first potting. In any case, the cuttings should not remain in the rooting medium much longer, than it takes to produce 3/4-inch roots. The seedlings and cuttings should initially be planted at the same depth as they were in the rooting medium. Sometimes it is necessary to place the plants slightly deeper to hold them up properly in the new medium. Cover up the drainage hole in the bottom of the pot with a small piece of broken clay. Then place about a half-inch layer of potting mixture over the drainage hole cover and hold the plantlet with the fore and middle finger while the ring finger and thumb clasp the clay pot. This leaves the other hand to add more potting soil until the pot is full. Then with two fingers, push down slowly to compact the soil a little, but not unduly, which might injure some of the tiny roots and rootlets. Shift the young plants to larger pots as soon as they become "root-bound" or "pot-bound." The first watering should be done by submerging the lower half of the pots in a pan of water until the top layer of soil indicates saturation. Leave the newly potted plant in rather subdued light for two or three days, until it is fully recovered from the shock of transplanting.

### Repotting

Any actively growing houseplant needs repotting from time to time. This may occur very rarely with some slower growing plants, more frequently with others. A distinct sign that a plant is

in need of repotting is when it shows easy signs of wilting and starts to lose its lower leaves, one at a time, from the bottom up. When repotting becomes necessary due to these indications by the plant, it should be done without delay. Some houseplant gardeners transplant everything once each year (7), during January and February, when they have no chance for outside garden activities. Most plants are also more dormant at that time than at any other. To repot, especially numerous plants, some equipment is necessary; enough sand, garden loam, peatmoss and vermiculite, to allow for soil mixture preparation. Also a trowel, a pair of pruners, a dibble stick, containers of assorted sizes, a few stakes, and plant pot labels are needed.

The process of potting is very similar to the information described in the paragraph under that heading. Most plants remove easily from their pot, if the container is knocked upside down against any solid object. Hold your hand over the soil, straddling the plant between the fore and middle finger, while knocking it out of its present container. Remove some of the old soil without damaging the roots unduly. Repot in a larger container to provide new growing space for the root structure. Fill with soil to the rim and then firm the soil gently without compressing it too much. Watering should be done in a pan from below as is described in the paragraph on potting. Plants that have a tendency to grow too tall should also be "pinched" at this time. This is the removal of the terminal bud of young shoots to put the "force" on dormant lateral buds, creating a bushier plant in a few weeks.

### Training and Shaping Houseplants

This includes a number of minor care activities that show up the beginner from the more experienced houseplant grower. Pinching is one of them. It can be a one-time activity or continuous, depending on the need and desires. If a plant should be kept compact, but well filled out, frequent pinching will achieve this. Pruning is a similar activity; it includes removal of other than terminal shoot tips. Sometimes an entire branch or section of a plant should be removed for the sake of appearance. This can best be done with pruning. Disbudding is another related care activity. Certain flowerbuds are removed either to obtain larger bloom from a few choice buds, or to eliminate flowering of a very young plant or lately rooted cutting, that should not bear the physical drain of flowering so early. Where plants are grown in a specific pattern or along a prescribed path, training becomes necessary. Ivies and Hoya, as well as Philodendron and syngonium, are frequently grown in a formal pattern. This can be easily achieved by training them on specific trellises.

### Other Houseplant Care

Removal of alkali deposits at the soil surface and replacement with clean soil does more for appearance than for the plant itself. Dusting of houseplant leaves is also essential for good, clean appearance from time to time. Plant wax may be applied to leaves of foliage plants only after dusting, if this is the desire of the houseplant gardener. Only special products that are sold at florist shops and specialty stores may be used for this purpose.



### Vacation Care of Houseplants

When going away for only a week or two, it is not necessary for anyone to "plant-sit" for your houseplants. Give your plants a good, thorough watering before leaving, move them away from the brightest and warmest spot in the home and keep the temperature down a little. The plants will be little for the worse when you return. When planning to go away longer, smaller plants may be completely enclosed in plastic bags. With larger plants, simply enclose the pot, after thorough watering (27). Some plants have been carried this way for up to three months. A tray of sphagnum moss, that is well saturated with water, may also be set up, placing the houseplant containers between the sphagnum, which gives up moisture slowly to its surroundings.

### Gibberellic Acid

Gibberellic Acid is a relatively new plant growth stimulator. It has some specific uses in horticulture and botany, but has caused some unusual reactions with certain plants. No one will stop the houseplant gardener if such an experiment is desirable. The gardener can only blame himself if the project damages the houseplants. Gibberellic is an acid, not a plant nutrient. Its useful purpose needs to be more fully established.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS, Question Paper 6

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F   1. House plants should be watered with painstaking regularity.
- F   2. Watering from the bottom is better than watering from the top.
- T   3. Ordinary tap water, after it reaches room temperature, is fine for houseplants.
- T   4. Frequency of applying plantfood to houseplants varies according to the plant.
- F   5. Organic plant food is better than inorganic or chemical plant food.
- T   6. Repotting of houseplants is necessary only from time to time.
- T   7. Pinching is a form of pruning when applied to houseplants.
- F   8. Use of plant waxes is not recommended in the care of houseplants.
- T   9. Plant cuttings should be removed from rooting medium when roots reach 3/4 inch in length.
- T   10. Loss of lower leaves usually signals need for repotting.

PART II: Complete the following questions or statements.

1. Three major plant food elements provided by houseplant fertilizers are: (Answer): 1. Nitrogen, 2. Phosphate, 3. Potassium.
2. The greatest number of houseplant failures are due to (overwatering).
3. When soil becomes dry, it turns (lighter) in color.
4. The use of (tepid) water is recommended for houseplants instead of (freshly tapped) water.
5. The first figure in a 20-18-21 fertilizer analysis represents (Nitrogen).
6. (Bonemeal, dry manure and bloodmeal) are three organic houseplant fertilizers.
7. Houseplants may be (damaged, killed) from overapplication of fertilizers.
8. When roots have grown solidly against the clay pot wall, the plant is (pot-bound, root-bound).
9. Most houseplants are less actively growing during (winter: January, February).
10. Frequent (pinching, pruning) may keep a houseplant more compact in appearance.

## LESSON 7

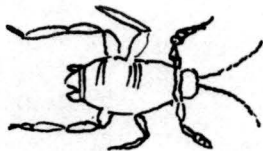
### COMMON INSECT PESTS AND DISEASES OF HOUSEPLANTS AND THEIR CONTROL

#### Insect pests and their control

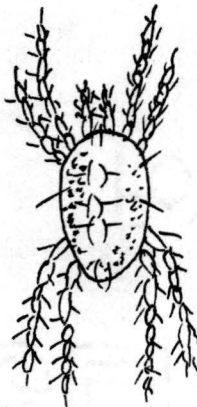
Generally speaking, houseplant pests are introduced from the outside, rather than invading the home by themselves. Any plant that is added to your collection should, therefore, be isolated for about 30 days (21), and again carefully inspected for any symptoms that could indicate an insect infestation. Insects are broadly classified by their feeding habits, namely chewing or sucking. Most houseplant insects are of the sucking habit. A number of houseplant pests may occur, but few of them are difficult to control with modern insecticides. If a plant of little individual value, is badly infested with a certain insect, it should be destroyed without delay, before it may become the source for further spread of the insect to other more valuable plants. Also, the use of sterilized soil usually helps prevent infestations of springtails and earthworms, which, in themselves, are no great problem, but are somewhat annoying. Insect build-ups can also be prevented by periodic washing of the foliage of all houseplants. This is best accomplished if a mild detergent solution is prepared in a bucket or tub so the foliage of entire plants may be submerged in the soapy water for about 30 seconds. While this does not prevent, it discourages insects from building up in numbers on a plant (17). Another effective method of controlling insects on houseplants is with an insecticide dip. The dip is prepared according to directions

to a strength, that will give good results, usually a tablespoon of 50% Malathion or D.D.T. for each gallon of liquid. Simply dip the foliage of each plant into the dip for about 30 seconds. Rubber gloves should be worn for protection. A cardboard disc, that is held over the rim of the pot, prevents soil from falling out of the container, as it is turned upside down. Handpicking of a few insects, when they first get started, is a good stopgap, if it works. Most often it does not serve for very long and sterner measures must soon be undertaken. Alcohol may also be used on a toothpick, match, swab, or a commercial Q-tip for the removal of aphids or mealy bugs (25).

The following insects are the most commonly found on houseplants:

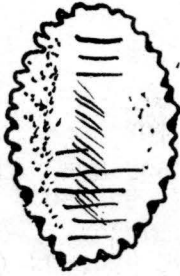


Aphids: They are soft-bodied sucking insects 1/16th to 1/8th inch long (17). They usually feed on newest growth and tender flowerbuds. They vary greatly in color. Both winged and wingless forms are found. Aphids excrete a sticky, honeydew that makes foliage appear shiny. Malathion and Pyrethrum sprays or dips are good control.



Mites: Both the Red Spider Mite and the Cyclamen Mite are found feeding on houseplants. They are so tiny that they are difficult to notice with the naked eye. Red Mite infested leaves take on a speckled grey-green appearance. Cyclamen mites cause deformed or stunted new growth (21). Best control for both is a dip of Kelthane or Malathion. Kelthane is the more effective chemical.

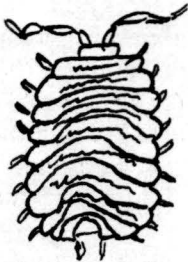




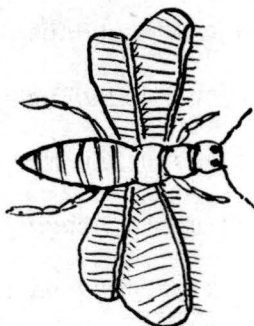
Mealybugs: They are soft-bodied insects that appear as though they were dusted with flour because of their waxy covering. They suck plant juices from stems and leaves. The best control is with Malathion and 1/2 teaspoon of liquid household detergent per gallon of spray or dip.



Scales: They are small, stationary insects that suck plant juices from either leaves or stems. They vary from 1/16th to 1/4th inch. Colors range from white to black. Some are soft-shelled, others, hard-shelled. Add a half teaspoon of household detergent to 2 teaspoons of 50% Malathion emulsion and dip or spray for control (21).

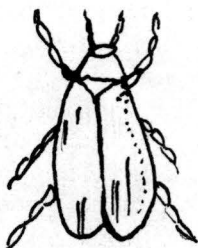


Sowbugs: Sowbugs have oval grey to brown segmented shell-like bodies. When disturbed they roll into a ball. They are more active at night, as they feed on decaying organic matter and small roots of houseplants (17). Control can be achieved with D.D.T. or Chlordane dust or spray.



Thrips: They are small, slender insects, 1/25th inch long or smaller. They are winged and can move about freely as adults. Sucking injury of young and adults causes irregular or streaked silvered areas that are speckled

with black specks of excrement. Control can be achieved with dips or sprays of D.D.T. or Malathion.



Whiteflies: They also are sucking insects, that feed mostly on the underside of leaves. The young appear scale-like and are found in numbers without moving about, while adults are 1/16th inch long and winged. Infested leaves become pale, turn yellow and drop off. Honeydew is excreted over surfaces where both adults and young feed. Dipping or spraying with Malathion or Rotenone solution is necessary at weekly intervals until control is effected (21).



Springtails and Gnats: Soil drenches with Malathion or D.D.T. are recommended, and Aerosol Push button sprays may also perform well for control.

Plants may also be sprayed with hand or pressure sprayers but this should be avoided inside the home. A garage is satisfactory or, weather permitting, the outdoors is even safer. Aerosols are sold under many commercial labels. They are generally considered reliable (9), but must be held at least 18 inches from the subject plant to avoid freezing damage from the mist of the spray.

#### Diseases of houseplants and their control

Houseplant diseases are difficult to control, but fortunately rare. Outbreak of any houseplant disease generally indicates that environmental conditions are irregular.

Mildew: The fungus appears like a white powder on the surface of leaves and flowerbuds. It is encouraged when plants have been kept too wet; when they are too crowded; when there is insufficient ventilation and also, when plants are kept in too dry atmosphere. Control may be achieved by correcting faulty growing conditions and by dips or sprays with sulfur, Karathane or Acti-dione P.M.

Stem Rot or Root Rot: This decay of stems or roots is often caused from overwatering or poorly drained conditions (21), that may exist in a container which has no drainage hole at the bottom. Often it is best to discard plants that display this type of disease symptom. Control is not easy, but may be tried with sulfur or Ferbam.

Botrytis Blight: This fungus disease causes a brownish gray mold, first spotting, then later rotting the leaves. It also affects stems at later stages. Often excessively high humidity encourages this condition and must be reduced to safer levels. Ferbam can also be tried for control.

Discoloration of Foliage: This could hardly be considered a disease condition, though the symptoms are frequently so similar to fungus diseases or insect damage, that they are easily mistaken for them. Foliage discoloration may be due to internal (systemic) or external causes. Frequently the lack of proper light, or adequate humidity is cause for this type of problem. Internal causes may include improper fertilization, wrong soil reaction, or irregular soil moisture conditions. When tips of leaves discolor, this is most often due to drafts, dry atmospheric surroundings, or just inadequate light (5). Such a plant must then be moved about to different spots in the home to determine by trial and error, what location may be more favorable for it.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS, Question Paper 7

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- T   1. A sound general rule suggests isolation of new houseplants for 30 days.
- T   2. Deformed or stunted new growth is usually a sign of damage by the Cyclamen mite.
- T   3. All-purpose aerosol spray bombs for houseplants are safe enough to use in a garage or basement room.
- T   4. Discoloration of houseplant foliage could be caused by environmental conditions.
- T   5. Stem rot disease is frequently a result of overwatering.
- F   6. Most houseplant insects are chewing insects.
- F   7. Sowbugs feed on leaves and other fresh plant tissue.
- T   8. Kelthane is recommended for the control of Mites.
- T   9. Rotenone is the insecticide most commonly found in houseplant sprays.
- T   10. The insecticide dip is the best method of controlling houseplant insects.

PART II: Complete the following statements or questions.

1. A mild (detergent) solution for washing of houseplant foliage is recommended.
2. A houseplant that is dipped into an insecticide solution should be held there for (30 seconds).
3. A small stationary insect that sucks plant juices is called a (scale).
4. Insects are broadly classified in two main divisions, (1. sucking, 2. chewing).
5. The most effective insecticides for aphids are (Malathion or Pyrethrum).
6. Besides insect or disease damage, houseplant foliage may be discolored by such causes as (1. inadequate light, 2. low humidity, 3. wrong soil reaction).
7. (Mildew) appears like a white powder on the surface of leaves and buds.
8. Botrytis blight of houseplants is often caused by (excessive humidity).
9. Aerosol or pressure spray cans must be held at least (18 inches) from the plant.
10. Control of sowbugs may be achieved with two chemicals, (Malathion, D.D.T.).



## LESSON 8

### DISH GARDENS AND TERRARIUMS

Not all plants are best grown by themselves alone in a container, because they may simply lack in desirable appearance as an individual. For those plants it is most common to provide the environment of the dish garden or terrariums. These containers may be as large or as small as may fit well into the location of the home that will be decorated by them. Today's modern architecture provides numerous opportunities for good use of dish gardens or terrariums.

#### The dish garden

Among the common mistakes in construction of dish gardens is that they are too shallow. This makes it impossible to hold enough soil for the plants, causing an early competition, which positions one plant against another, allowing the most vigorous to continue at the expense of the less aggressive ones. It stands to reason, therefore, that the dish garden must be adequate in width and depth. Another common mistake with dish gardens is that the plants, which are combined in a single container, do not have similar temperature, soil, and moisture requirements. So, anytime we water such a dish garden, we are bound to overwater some plants, and underwater others, creating a good chance for plant failures. It is regrettable that the plants that have the most interesting surface textures and forms, are often not useable because of their general difference in basic cultural requirements.

### Care of a dish garden

Though plants in dish gardens may fit together relative to care, they still may differ somewhat in their basic growing pattern. This, we can control to a degree by timely pruning and pinching. We can also, in time remove a single plant from this combination and replace it with a similar plant, only smaller in size, without completely rebuilding the entire dish garden. Omission of fertilizer applications will also slow up certain plants and allow others to catch up with them in the meantime. The type of soil used in a dish garden depends on the plants used and on the drainage. If the drainage is shallow, the soil must be fairly coarse and have a good base of gravel or crushed rock underneath. This base must be a minimum of 1 inch deep (16).

### Arrangement of plants in a dish garden

The arrangement of the plants within the dish garden is of great importance. After all, the same principles that apply to artistic floral arrangements, are also followed in the composition of dish gardens (25). There must be a focal point, that draws the eye due to its notable color, form or leaf surface. The other supporting plants must have a pleasing relationship to each other in proper scale, placement and visual weight. The plant surface textures, density and form of the foliage, and other relationships, are considered to produce a pleasing end product. The plants must also have a degree of size relationship or scale with the container of the dish garden. Very tall plants do not look natural in a very low bowl, while very short plants do not appear well arranged in a rather large planter. The use of small stones, sticks or cones often enhances a dish garden's appearance.

The dish garden should be placed where the majority of the plants within it are happy and obtain enough daily light exposure to prevent spindly growth. A window pane must be not more than 8 inches above the rim of the container (16). It is, therefore, best to consider the location before purchasing the plants. A thorough evaluation of the cultural conditions in the selected spot will dictate the plants that will occupy the dish garden.

### Terrariums

Any dish garden that uses, as its container, a glass bowl, aquarium or similar enclosed glass container, is called a terrarium. Most terrariums are open at the top though this is not absolutely essential. A Wardian case is a similar structure, that usually contains some regulated means of maintaining humidity and temperature, which is not done with terrariums. Large brandy snifters have recently become very popular for the arrangement of houseplants. They are artistically very decorative, a distinct advantage when they are placed on circular tables, where a round container is much more natural than a square-shaped one. Necessarily the space that is available for planting in a brandy snifter is very limited and utmost care must be exercised in the selection of plants. Terrariums are most adaptable to those types of houseplants that love a warm humid situation and cannot often be grown in a dish garden or in an ordinary dwelling. Cacti and succulents are not thought to be good plant subjects for terrariums because of the high moisture condition that generally prevails. Covering of the terrarium would cause so much condensation on the sidewalls of the container, that it is simply not suggested.

### Planting the terrarium

To plant a terrarium we need a few special handtools like tweezers and a dibble. The construction of the terrarium is slow and tedious. Apply a good 1-inch layer of gravel or crushed clay pieces at the bottom of the container. A 1-inch layer of sharp sand should follow, then a porous, but rich potting soil mixture is added about 1½ inches thick, though placed temporarily in a mound to one side and used as each plant subject is placed in its new medium (5). Each plant must be small enough to remain within an inch or so of the top rim of the container, but must be well past the seedling stage because there is no room for plant babies in such an arrangement. The tweezers are then used to place each plant carefully in the sand, then providing enough potting soil mix to cover up the root system, until all the plants are gradually arranged. An iced tea spoon eases the soil handling job. The use of peatmoss is sometimes suggested, but not really necessary because the humidity and moisture in the container usually is sufficiently high. Some terrariums are electrically heated, especially suited for plant and seed propagation. They are sold as miniature greenhouses. Small cones or stones, or little elfins and other artistic figurines are sometimes added to a terrarium to create additional interest and attraction.

### Care of the terrarium

The proper location of a terrarium is out of the direct sun, but in very good light (5). Watering must be done very sparingly, and only when the soil is extremely dry. The best way to determine the watering need is by digging with a spoon into the soil. If the soil appears dry, apply some water and check again in a few hours.

Soon you will be able to tell the normal water needs of a terrarium simply by gauging the soil color. The easiest way to ruin a terrarium is to keep the soil continuously wet. Standing water in the terrarium is certain assurance that the plants will not survive very long. Normal houseplants are not able to grow in waterlogged conditions. Keep removing any dead leaves that may naturally appear. Also, any plant that reaches above the rim of the container has then grown out of scale of the entire plant arrangement and must be either severely pruned or removed and replaced with a new, more properly sized or scaled plant specimen. Fertilization should be administered only occasionally, whenever the general appearance of the plants indicates that a supplemental feeding is needed.



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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS, Question Paper 8

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_

CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F   1. A dish garden may be quite shallow without detriment to houseplants.
- T   2. Plants in a dish garden must have the same soil and moisture requirements.
- T   3. Plants can be held to proper size and scale by pruning and pinching.
- T   4. Crushed rock is a good base in a dish garden container without drainage.
- F   5. Plants in a dish garden do not have to have similar light requirements.
- F   6. A terrarium and a dish garden are the same.
- F   7. A terrarium may be situated in direct sun for best culture.
- T   8. The use of figurines and other accessories is recommended with terrariums.
- F   9. Most plants in a dish garden will adapt themselves to their location.
- F   10. Dish garden plants should have similar leaf shape and texture.

PART II: Complete the following statements and questions.

1. A (dish garden) is a collection of plants grown together in a single container.
2. How can overwatering be prevented in a terrarium that has no drainage holes? (Answer): By placing a 3/4 to 1-inch layer of gravel in the bottom of the container.
3. Plants in a terrarium generally have (high) humidity requirements.
4. What is meant by proper scale relationship in a dish garden? (Answer): Plant subjects must create a feeling of balancing each other in visual values.
5. (Cacti or succulents) are not thought to be good subjects for terrariums.
6. When plants in a terrarium grow above the rim of the container, what must be done? (Answer): They must be pruned or replaced.
7. How often must terrariums be watered? Why? (Answer): Quite infrequently because the normal loss of moisture is greatly reduced and partially offset by condensation.
8. When plants in a dish garden grow tall and spindly, what action must be taken? (Answer): More light, artificial or natural must be provided, also lower temperature.
9. What is likely to happen when plants are too crowded in a dish garden? (Answer): The stronger plants will keep growing, the less aggressive will suffer.
10. Without exchanging plants in a dish garden, how can growth be controlled otherwise? (Answer): Withholding fertilizers usually slows up plant growth.

## LESSON 9

### USE OF ARTIFICIAL LIGHT IN THE CULTURE OF HOUSEPLANTS

Very few homes are so constructed that they naturally provide sufficient light for houseplants. This is not the fault of the architect or anyone else. After all, we expect a degree of privacy in our homes, and this cannot be achieved with large walls or panels of glass. A plant in full sun outdoors may receive as much as 10,000 foot-candles of light during a bright summer day (7). Yet in the average home, we have less than 60 foot-candles, the moment we step away from the window. In most commercial and amateur greenhouses, we have an average of 1,000 foot-candles, considerably more than in the living or dining room. Scientific tests have yielded the information, that African Violets grow best at 500 to 600 foot-candles (23). A 40 watt standard cool-white lamp, 12 inches above the foliage, will provide that amount of light if it is burned for 16 hours a day. Do not keep lights burning 24 hours a day -- it may have an adverse effect on some plants. In poorly lighted rooms, we can supplement the natural light with 3 to 4 hours of spotlighting in the evening (16). This would then about make up the difference and make it possible to grow the plant in its place satisfactorily. The majority of houseplants do well with 12 to 16 hours of artificial light each day (25).

#### Lighting trays and cases

Fluorescent tubes are now available in various lengths and strengths. A pair of 4-foot, 40-watt tubes spaced about 12 inches

apart will provide for an area about 30 inches wide on a table or tray, where many houseplants can be grown satisfactorily under average home conditions. Wooden or metal plant cases may be prepared from a number of structural materials. They can be arranged to contain as many as four separate trays. The distance between trays can be regulated from 12 to 18 inches, depending upon the type of plants to be grown and the normal height that they are expected to attain. The quality of construction and finish depends on where the case is to be placed in the house. For upstairs rooms, the product should be sufficiently attractive so it will be an asset decoratively, and will not detract from the home furnishings in general. A portion of a shelf may even be enclosed with glass or plastic, making it very possible to grow orchids in the living room area (18). Houseplants need both blue and red light qualities to grow properly. The soft white tubes or bulbs can supply the needed red, while the daylight fluorescents can supply the blue, especially if they are used in combination or pairs.

#### Special plant light fluorescents

In the past few years an American manufacturer of electrical equipment and light bulbs has produced a new type of fluorescent tube, called Gro-Lux. This tube was designed especially for the purpose of growing houseplants in poorly lighted portions of the home. The Gro-Lux fluorescent tubes combine all the light frequencies and color qualities to satisfy the needs of houseplants. The tubes may be arranged in pairs, three and fours, depending on the size of the area that is to be illuminated. While they appear to be a fine step in the right direction, making it possible for many amateur gardeners

to enjoy a wider assortment of houseplants, they do not constitute the final answer in this area of light engineering. Undoubtedly Gro-Lux and other competitive products will be improved over the years to give us eventually a potential of growing anything we wish to grow under average conditions in our homes. The arrival of more useable bulbs in shorter lengths will bring the enjoyment of fine indoor plants to a good many additional gardeners.

It will be well to remember that a houseplant which is artificially lighted, will normally require a little more moisture and fertilizer than the plant that is kept somewhat darker. The light needs of all plants, especially flowering plants, should be tested in each instance by varying the length of exposure and the distance from the bulb or tube to the foliage (18). If manual control of lights for houseplants is impractical, a timer switch can be wired into the lighting system, that will automatically control the length of exposure at the desire of the gardener.

Spotlighting of plants in living rooms, halls, and floor planters may be desirable for special effect or decorative purposes. It is essential that the spotlight is not too close to the plants as this may cause foliage burns, which would disfigure the plant and cause it permanent damage.

#### Growing plants in dim light

Many foliage houseplants can be acclimated to low light intensities by reducing watering to minimum levels; eliminating fertilization; reducing temperature; and providing occasional artificial light (5). A gradual adjustment to minimum cultural care levels is recommended.



The loss of older leaves occasioned by this practice will not cause permanent damage to the plants.

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CORRESPONDENCE COURSES IN AGRICULTURE

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Course Ex 1, CARE OF HOUSEPLANTS, Question Paper 9

NAME \_\_\_\_\_ STREET, RFD \_\_\_\_\_

CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

PART I: Mark the following questions True (T) or False (F).

- F   1. All electrical bulbs and tubes supply the same type of light.
- T   2. The amount of measurable light in a room's interior is normally less than 100 foot-candles.
- T   3. Lack of light causes spindly growth with most houseplants.
- F   4. Spotlighting is not considered a good supplemental light source.
- F   5. The distance between fluorescent tubes and plant foliage must be 24 inches.
- T   6. Plants vary more than nominally in their daily light requirement.
- T   7. A North window ledge is considered the best natural light situation for houseplants.
- T   8. Close spotlighting of a houseplant can cause foliage burns.
- F   9. Artificial lighting of houseplants requires higher humidities and temperatures.
- T   10. Houseplants may be taken outdoors during the summer to obtain more adequate light.

PART II: Complete the following questions and statements:

1. How can daily light be supplemented easily in a poorly lighted room? (Answer): By spotlighting houseplants daily for 3 to 4 hours.
2. African Violets require a light intensity of (500 to 600) foot-candles.
3. How long must a lamp or tube be burned daily for normal light needs? (Answer): 18 hours.
4. Burning lights 24 hours each day may have an (adverse) effect on houseplants.
5. Is the interior of an ordinary home adequately lighted for growing houseplants? (Answer): Except for a few plants, light conditions are inadequate.
6. Distance of fluorescent tubes to plant trays must be from (12 inches) to (18 inches).
7. Light conditions in the average amateur greenhouse are about (1,000) foot-candles.
8. To prevent lopsided plant growth, houseplants must be (turned frequently).
9. What is the best method to find out the light needs of a flowering houseplant? (Answer): Expose it to various light until the best is found.
10. Must all houseplants have some natural light each day? (Answer): No. Some, like African Violets, are grown very well in basements without any natural light.

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